

# A Registry of Nationally Appropriate Mitigation Actions: Goals, Outcomes, and Institutional Requisites

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**Abstract** This article examines key issues in operationalizing a registry of nationally appropriate mitigation actions (NAMAs) undertaken by developing countries party to the United Nations framework convention on climate change. It analyzes goals, outcomes, and institutional prerequisites underlying various proposals to determine how a NAMA mechanism could work in international climate cooperation. The different proposals for how NAMA shall be designed relate to three basic effort-sharing arrangements in a future climate regime: binding commitments for all Parties, purely voluntary commitments for all, and legally binding commitments for Annex I countries but voluntary ones for others. We conclude that a NAMA registry could be designed so as initially to suit all three types of effort-sharing regimes. The article identifies three areas of potential common ground in a registry irrespective of effort-sharing type: the principle of common but differentiated responsibilities, the sustainable development objectives of the Convention, and the need for a systemic transition toward low-carbon energy technologies.

**Keywords** Registry · NAMA · Climate policy · Effort sharing · Sustainable development

## INTRODUCTION

Two gridlocks have particularly plagued negotiations for the United Nations framework convention on climate change (UNFCCC). First, how should the costs and responsibilities of taking action be distributed among Parties to the Convention? Developed country Parties are striving to broaden the participation of developing country Parties, while the latter reiterate that such participation should not conflict with their

development priorities. Second, negotiations are becoming bogged down by the question of whether global emissions should be capped by means of top-down targets for Parties or whether a bottom-up approach should be used, in which countries list the targets they are willing to meet.

Embedded in the discussion is a parallel struggle over the design of a new UNFCCC mechanism, i.e., nationally appropriate mitigation actions (NAMAs) undertaken by developing countries. NAMAs can be seen as manifesting three versions of effort sharing in a future climate regime: (1) NAMAs can be seen as the first step toward larger expected contributions and potentially binding commitments from developing countries. To achieve the target of limiting the maximum global mean temperature increase to 2°C the Intergovernmental Panel on Climate Change indicates that the global emissions should be at least halved by 2050, with developed countries reducing their emissions by 80–95%. NAMAs could provide a way for developing countries to assume a share of the needed reductions, which may not be covered by the joint commitments by developed countries. These actions are to be domestically supported by non-Annex I countries. (2) NAMAs could be part of a new regime under the Convention, which relies entirely on voluntary contributions from both developed and developing countries. This would replace the model of the Kyoto Protocol's first commitment period, which sets a global cap and distributes the mitigation commitments. These actions may or may not be supported by Annex I countries. In the absence of legally binding commitments, these actions will likely be supported through domestic public and private sources or bi-laterally. (3) A future regime could continue to build on Annex I countries having legally binding mitigation commitments to a global cap supplemented by NAMAs as voluntary developing country contributions based on the

principle of common but differentiated responsibilities. These actions may be internationally supported (i.e., by Annex I countries) or domestically sponsored by the implementing countries. The proposals for a NAMA mechanism have attracted considerable interest in the UNFCCC negotiations, but details of its operationalization are still largely uncertain. Designing the registry represents a first hurdle for the mechanism, and how it will be done depends on the types of NAMAs demanded. The UN climate change conference in Durban in December 2011 decided on a registry of NAMAs (UNFCCC 2011). The registry will be important in setting the stage for what NAMAs can achieve. Most details are still up in the air. In particular since there are fundamental differences on what principles the coming agreement, that shall be in effect 2020, shall be based.

## AIM

This article examines how current proposals for a NAMA registry might function under various potential climate agreements. We address three specific questions:

- What goals, outcomes, and institutional prerequisites are associated with different NAMA proposals?
- How are NAMAs intended to serve as an intervention in international climate diplomacy to break the two impasses of effort sharing and the future design of the UNFCCC?
- What are the prerequisites for a registry that accommodates the various aims of NAMAs?

We conclude that the design of a registry for NAMAs can offer a balancing ground for any agreement on a future climate regime. The registry can be initiated to suit all three types of effort sharing. If an agreement is reached, the details can be changed accordingly. We have identified three potential areas for common ground for a registry irrespective of which of the three types for regime that will prevail: the principle of common but differentiated responsibilities, the sustainable development objectives of the Convention and the need for systemic switch toward low-carbon energy technologies.

This article starts by providing background on NAMAs as instruments to enhance mitigation efforts undertaken by developing countries and on the registry needed to operationalize them. After presenting our theoretical and methodological framework, we continue by analyzing the goals, outcomes, and design of the registry, and then discuss how a registry could be designed taking these various objectives into account. We end by concluding that a NAMA registry could be designed so as initially to suit all three types of effort-sharing regimes. We point at three areas of potential

common ground for a registry: the principle of common but differentiated responsibilities, the Convention's sustainable development objectives, and the need for a systemic transition to low-carbon energy technologies.

## BACKGROUND

The Bali action plan (UNFCCC 2007) allowed for increased discussion of enhancing developing country participation in global climate change mitigation efforts through NAMAs (Pahuja and Linnér 2010). The NAMA agreement, however, resulted from intense negotiations at the very end of the UN climate negotiations in Bali in 2007. Compromises made during its negotiation as well as the brevity of its wording have subsequently led to open interpretation of the agreement (e.g., van Asselt et al. 2010; Fukuda and Tamura 2010; World Resources Institute 2010).

Most importantly, conflict has arisen concerning three questions. (a) How should NAMAs be supported? The Bali action plan established only that NAMAs should be supported and that the support should be subject to measurement, reporting, and verification (MRV). However, it did not specify how funding should be raised and verified (Kim et al. 2009). (b) What NAMAs should be monitored and verified, and how (Ellis and Moarif 2009)? (c) How should achieved emission reductions be accounted for to avoid double counting (Cheng 2010; Erickson and Lazarus 2011)? A contested issue, given the distinction between developed and developing country Parties, has been whether Annex I countries should deliver support first, or whether non-Annex I countries should first deliver their actions. In these discussions, the institutional design for linking actions and support has emerged as a key issue, giving rise to several institutional design proposals.

In an earlier article (Pahuja and Linnér 2010), we discuss options for how a registry could forge a credible link between support and actions. The logic of the mechanism is as follows: through a registry of acceptable actions taken to mitigate GHGs, the mechanism enables the international recognition of such actions. The registry should include estimated financial support and technology transfer needs for developing country pledges that require them. Although most of the NAMA mechanism design remains to be determined, some sort of monitoring system will clearly be required for both internationally and domestically supported actions for the purposes of transparency, through either an MRV or international consultation and analysis (ICA) system. The registry could enable both MRV and ICA monitoring of mitigation actions, and must also provide an institutional mechanism for the MRV monitoring of developed country NAMA support. The Cancún Agreement elaborated on the processes required for

mitigation actions undertaken by developing countries while reaffirming “that social and economic development and poverty eradication are the first and overriding priorities of developing country Parties” (UNFCCC 2010a). Cancún resulted in a schedule for establishing guidelines for some crucial elements of registry operationalization.

The Cancún agreement included a general declaration that emissions trading and project-based mechanisms developed under the Kyoto Protocol should continue as options whereby developed countries could meet their emission targets. However, the text is vague as to how this should be accomplished. It opened the possibility for new market-based mechanisms to be determined at Conference of the Parties (COP) 17 in Durban, for example, a “sectoral crediting mechanism” in line with proposals for allowance-based NAMAs (UNFCCC 2010b). As ideas concerning an internationally expanded carbon market are examined, proposals to include credits for mitigating development actions will likely remain under discussion.

## STUDY DESIGN

For the analysis of how a NAMA registry might function under various potential climate agreements, the study draws on an extensive review of policy documents and proposals regarding NAMAs in the UNFCCC database and in other relevant literature. We searched the UNFCCC database for proposals that use the terms “NAMAs” and “nationally appropriate mitigation actions”. We used ISI Web of Knowledge to identify peer-reviewed literature on NAMAs and Google to search for policy proposals concerning the registry from organizations outside UNFCCC.

For the analyses of the stated aims of the various types of NAMAs, we draw on intervention theory. In line with Vedung (1997), we define an intervention theory as “all empirical and normative suppositions that public interventions rest upon”. The word “theory” in “intervention theory” refers to the opposite of practice. Intervention theory refers to how various actors believe that a policy intervention should work, what effects it will have, and what ends it will meet (Linnér et al. unpubl.).

Policy proposals are often based on several intervention theories, since groups often have different expectations of the effects of an intervention (Weiss 2000). Following Chen (2005) and Linnér et al. (unpubl.), we distinguish between two intervention theory models: a change and an action model. The change model includes how actors define the intervention’s goals and outcomes and the leverage mechanisms that are supposed to lead to them. “Goals” refer to the stated as well as unstated situation(s) various actors aim to produce by means of the intervention. “Outcomes” refers to the expected actions to

be taken by various actors (Mickwitz 2006). “Leverage mechanisms” are the actions believed to trigger the intervention’s outcomes (Chen 2005). The action model describes what is believed to be needed for the desired intervention to be implemented. This model describes the assumptions regarding what is needed for implementation, such as facilitating institutions, resources, legal framework, and support mechanisms. An important part of the analysis is to relate the action and change models to the contexts in which they are supposed to work.

In our analysis MRV aspects to a NAMA registry, we have also used data from a questionnaire conducted by the Centre for Climate Science and Policy Research at the UNFCCC Conference of Parties at the COP-16/CMP-6 in Cancun, Mexico in 2010. We have analyzed the 560 completed responses on how important it is for the respondents that certain items are quantifiable and monitored in a transparent manner as part of an international review. The items included domestic and international NAMAs, support for NAMAs as well as some other discussed areas for MRV. A stratified sample of participants at COP-16/MOP-6 according to their principal role and geographical origin was asked if they agreed to fill out the survey. The respondents rated their preferences on a seven-point Likert scale, ranging from not important (1) to very important (7). They filled the questionnaire on site and handed it back to the person who distributed it.

## Previous Research

An emerging body of academic reports deals with the scope, design, and support of NAMAs (Fransen et al. 2008; Breidenich and Bodansky 2009; CCAP 2009; Ellis and Moarif 2009; Levina and Helme 2009). Sterk (2010) and Fukuda and Tamura (2010) map and categorize the mitigation actions of non-Annex I Parties listed in Annex II of the Copenhagen Accord.

Country-specific analyses have examined how to design policies and institutional arrangements for NAMAs (Höhne et al. 2008; Teng et al. 2009; van Asselt et al. 2010; Mintzer et al. 2010). Bakker and Huizenga (2010) analyse the potential of NAMAs to spur sustainable transport transformation in developing countries, while Glemarec (2010) examines NAMAs in relation to financial markets in support of a low-carbon transition.

In his analysis of obstacles to establishing an emissions trading scheme (ETS) in India, Upadhyaya (2010) discusses the opportunities to operationalize NAMAs so that a national-level ETS can be included and linked to an international carbon market. How a NAMA registry can be designed and set up, including how it can be linked to international support, has been analysed by, for example, Kim et al. (2009), McMahon and Moncel (2009), and

Muller and Gomez-Echeverri (2009). Cheng (2010) has addressed how NAMAs can be applied in the building and industrial sectors, proposing a detailed framework for registering building sector NAMAs.

### Analysis

The NAMA registry is still sketchy. The specific design of the instrument hinges on the purpose of NAMAs and the registry. In the following, we will distinguish between the primary and implicit impacts, outcomes, and institutional prerequisites envisioned in the current proposals.

## IMPACTS OF NAMAS

### The Primary Goal

Paragraph 1(a) of the Bali action plan (UNFCCC 2007) calls for setting a long-term global goal of emission reductions as part of a shared vision of long-term cooperative action. The NAMAs should contribute to this goal. The UNFCCC negotiations in Cancun set the goal of limiting the global mean temperature increase to 2°C relative to preindustrial levels.

### Implicit Goals

Sustainable development is not yet an explicit goal of NAMAs, as sustainable development criteria are not yet included in the core proposals. The Durban decision on a NAMA registry did not decide to include criteria for sustainable development. It merely encouraged countries to develop their low-carbon development strategies “in the context of sustainable development” (UNFCCC 2011:11). However, some proposals from the Copenhagen negotiations do include sustainable development criteria (UNFCCC 2009). Nevertheless, NAMAs should be understood in the “context” of sustainable development. This can be interpreted as indicating that contributing to sustainable development is a direct goal of NAMAs or a stipulated condition of proposed actions.

Sustainable development as a goal is enshrined in the UNFCCC in Article 3.4: “The Parties have a right to, and should, promote sustainable development”. What, then, are sustainable development goals? An obvious, but sometimes overlooked distinction in international environmental negotiations is between priorities that are nationally set versus internationally agreed. Examples of the latter include the clearly defined targets in the UN’s millennium development goals (United Nations 2000) and in the Johannesburg plan of implementation from the world summit on sustainable development in 2002 (United Nations 2002). International sustainable development policies are gradually

shifting focus from specific products or processes to transforming entire systems, such as food, power generation, and sanitation (Román et al. unpubl.). Domestic targets, however, can be virtually anything, since they are nationally defined. According to current practice, it is not for one country to decide what constitutes a nationally appropriate sustainable development target for another.

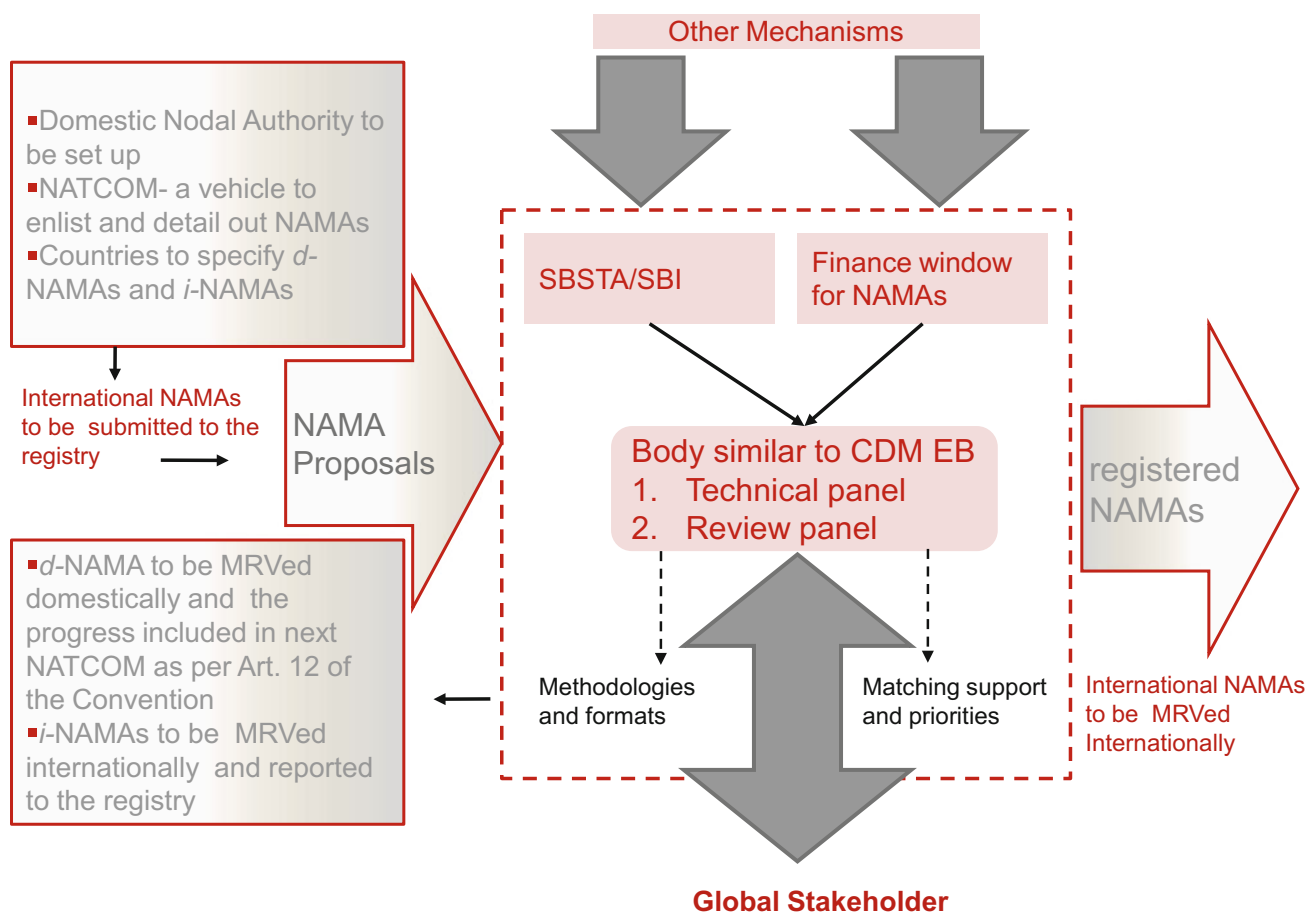
When examining NAMA proposals, we conclude that the expected impacts in essence are implicit goals related to the three types of climate regime. The intervention goals that NAMAs are intended to achieve vary significantly between the Parties. Obviously, many Annex I Parties see the NAMA system as an opportunity to spur developing countries to specify mitigation contributions as part of the agreements following the Kyoto Protocol’s first commitment period (e.g., European Community 2009). In contrast, developing countries emphasize NAMAs as leverage to hold developed countries to binding commitments for financial and technological support. These two views of the implicit goals of NAMAs determine the controversies concerning how the registry should be designed.

### Outcomes: Operationalizing NAMAs through a Registry

A number of actions need to be taken by various groups to achieve the intended goals, what we, in line with intervention theory analysis, refer to as outcomes, i.e., changes in actor behavior following an output. Outcomes are defined as assumptions as to what actions are expected and the consequences they are thought likely to lead to (Mickwitz 2006).

Broadly, NAMAs are of two types, i.e., domestic NAMAs (independent mitigation action) and international NAMAs (mitigation actions enabled by developed country Party support). The former comprise three effort-sharing regimes—legally binding mitigation commitments for all (type 1), purely voluntary commitments for all (type 2), and legally binding commitments for Annex I countries and voluntary ones for others (type 3)—while the latter comprise only types 2 and 3 regimes. The action model underlying NAMAs requires a multilateral registry to secure the expected outcomes.

The “d-NAMAs” will be supported domestically, the emission reductions achieved will be accounted for by the implementing country, and the MRV will be conducted domestically. The achievements of d-NAMAs should be reported in national communications in accordance with Article 12 of the UNFCCC. The “i-NAMAs” will be supported internationally; the emission reductions achieved will be accounted for by the host country, whereas the MRV will be conducted internationally under new guidelines to be prepared (Fig. 1). It is important to highlight that what is meant by “international MRV” has yet to be determined by COP.



**Fig. 1** Potential design of a global registry of nationally appropriate mitigation actions

A potential third version is allowance NAMAs (a-NAMAs), in which national mitigation actions in developing countries would result in carbon credits to be traded on an international emissions market (Fig. 2). Any reductions above the pseudo target would then be eligible for participation in allowance auctioning. Both *d*-NAMAs and *i*-NAMAs could be eligible for a-NAMA treatment. The rationale for a-NAMAs is that they might spur both types of expected outcomes. They might raise more funding for participating developing countries, making it more appealing to propose targets and comply with them. This third version of NAMAs fits into types 1 and 3 climate regimes.

The proposals for a-NAMAs, however, prompt three concerns, all relating to the design of the registry. First, the risk of countries assuming lower pseudo targets for *i*- and *d*-NAMAs entails stricter assessment of whether the proposed actions are based on reasonable assumptions of the mitigating effect. Second, environmental NGOs and others have raised concerns about the risk of double accounting, in which the same actions are counted as the mitigation contributions of developing country Parties, while

developed countries use them to offset their commitments (CAN International 2011).

The answer to these concerns would be to design a registry to meet three criteria: (i) The registry should insure that the “crediting” of NAMAs does not simply provide another offset market for developed country Parties. For example, a-NAMAs could be designed so that any reductions over and above the pseudo target would then be able to participate in allowance auctioning. The auction proceeds can go into the national budget to be used for future *d*-NAMAs (Fig. 3). However, in both cases, an international MRV would be conducted for the entire NAMA (Pahuja and Linnér 2010). (ii) The registry should bring balance to the MRV debate, as it will have to be declared initially whether given *d*-NAMAs and *i*-NAMAs are to be eligible for a-NAMAs. (iii) International MRVs may counteract perverse incentives to set higher baselines. However, the extent and effectiveness of a-NAMAs hinge on the scope of the future emissions market and the demand for carbon offsets.

A third strand of concern relates to these countermeasures, in that the strict conditions to which the registry is

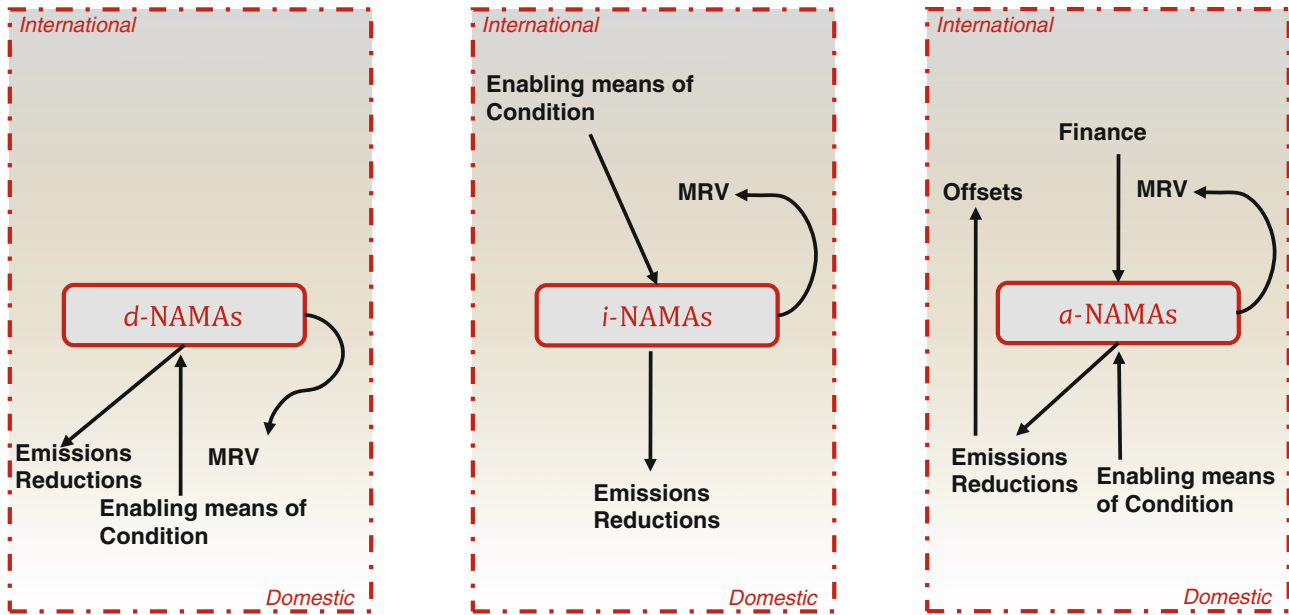


Fig. 2 Types of nationally appropriate mitigation actions

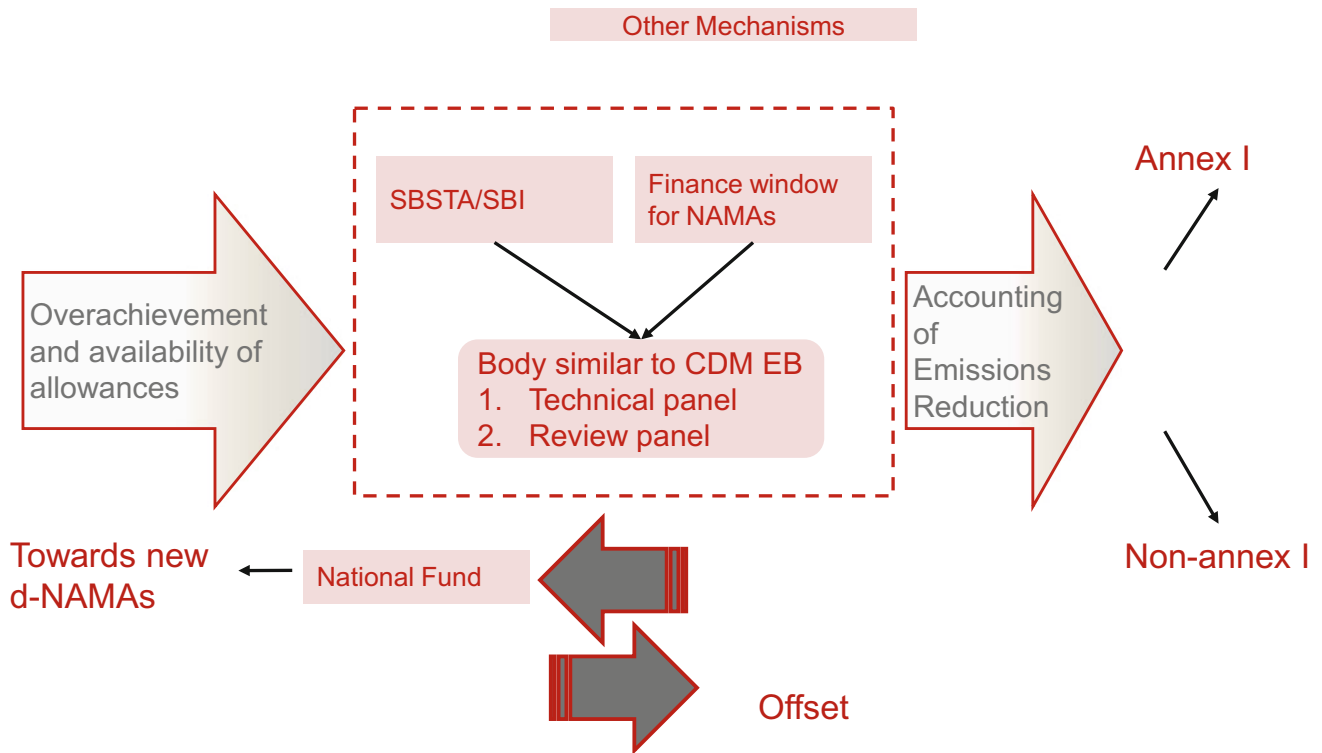


Fig. 3 Potential design of a global registry of nationally appropriate mitigation actions: exemplified by a-NAMAs

subject could make the mechanism less effective in spurring change in some sectors. Bakker and Huizenga (2010) conclude that the transport sector is unlikely to participate in a carbon credit offsetting scheme due to the required data-intensive monitoring processes and a lack of funding to set up a robust system for such monitoring. These

challenges severely limit the potential for transport sector participation in a firm MRV system. Bakker and Huizenga (2010) argue that NAMAs could potentially spur a shift to sustainable transportation in developing countries, if the control requirements are less strict. There is a risk that the credited NAMAs, subject to stricter control requirements,

would counteract the potential to stimulate this transformation of the transport sector. The authors urge policy-makers to “keep it simple” (Bakker and Huizenga 2010: 325).

Governance aspects constitute other fundamental outcomes of the action models. Creating new institutions and providing guidelines are two prerequisites for setting up a registry. Governance arrangements include a governing body for the registry. As a UNFCCC instrument, the registry should be accountable to COP, via a technical panel and an MRV panel. The three types of NAMAs must be treated differently, which needs to be facilitated by the registry.

A challenge for the design of the international registry is that some outcomes cannot be determined through international cooperation. The control of domestic implementation is a matter of national sovereignty. Internationally supported NAMAs will be subject to MRVs, whereas domestic ones will be appraised through international consultancy and analysis. For this to work, both types of NAMAs call for a domestic institutional setting in the form of a national implementing body to oversee actions and the use of funds in each host country.

The registry may include a list of proposed actions and information related to the expected outcome, such as direct emission reductions and removals, indirect benefits, and sustainable development co-benefits. This will require increased discussion and agreement regarding the methodologies for *ex-ante* estimations. For strict MRV of support and actions, the proposal would also need to estimate the full incremental cost of each action, specify the technology needed, and determine how and in what timeframes the actions should be implemented. The proposal should also estimate the agreed full cost of capacity-building along with developed country support in terms of technology, finance, and capacity-building.

The *i*-NAMAs need to be submitted to the registry in which the mitigation actions and matching of enabling means of implementation are listed and subject to international MRV. The registry could comprise a technical and a review panel and is informed by the other mechanisms and institutions under the COP, such as the financing mechanism. Both subsidiary bodies (*i.e.*, the technical and review panels) would then match the NAMA proposals with the available support and inform the other mechanism about the required NAMA support. The technical panel would be responsible for the new methodologies and formats required and for support matching.

In the survey of participants at the UN Climate Conference in Cancun 2010, MRV of NAMAs, both in term of action and support, had a high degree of support has high support (Table 1). Although, it was ranked lower compared to, for example, MRV of Annex I countries commitment to

reduce emission and Annex I support to non-Annex I countries in general. Since details of NAMAs are still negotiated and the mechanism is not yet operationalized the preferences has to be interpreted with caution. Still, the survey indicates that Annex I support for NAMAs was less important for Party delegates from these countries, compared to delegates from developing countries. However, the priorities for MRV of domestic and international NAMAs were similar, among delegates from developing and developed countries. Half of the respondents answered that MRV of domestic NAMAs is of high importance (6 and 7 on a 7 point Lickert scale), with slightly less support from Party delegates. A third of the participants, whether a delegate or non-state actor, indicate that MRV of international NAMAs is not of mediate importance (1–5).

Another key component of the action model is raising the matching funding, which could be done in five ways: (1) The funding pledged in the Copenhagen Accord put in addition to fast-tracked USD 30 billion, and additional USD 100 billion annually by 2020 planned to come from both public and private sources; (2) New additional funds for NAMAs; (3) Bilateral funding channelled through the UNFCCC mechanism; (4) Emissions trading revenues; (5) A combination of the four above. The Green Climate Fund, established in Cancún, may be used to support NAMAs, as may bilateral financing agreements and potentially even carbon credits. The next COP, in Durban, South Africa, is expected to decide on the creation of a fund, central registry, and guidelines for measuring, reporting, and verifying NAMAs and their support (UNFCCC 2011).

The action models of the various registry proposals display evidence of conflicting views in three particular areas: (i) enabling means of implementation (*e.g.*, finance, technology, and capacity building); (ii) MRV actions and support; and (iii) accounting for emission reductions.

We can classify the change model used in most developing country proposals as a support model, whereas most developed country proposals use a mitigation model. We see conflict over how these action models are conceived. The registry has emerged as perhaps the most important feature of the various NAMA proposal action models. The suggestions for a registry largely unite the two change models. As such, the registry must provide leverage to implement the two change models and bring about agreement between them.

## DISCUSSION

To bring together NAMAs from a vast range of proposals to form a functional mechanism, the Parties need to agree on an operational definition. How a registry might facilitate the goals of NAMAs hinges largely on the type of climate

**Table 1** Importance of monitoring and quantifying items as part of an international review. Party representatives at COP 16, %

	Annex I ( <i>n</i> = 63)	Non-Annex I ( <i>n</i> = 136)	Total for parties and observers ( <i>n</i> = 560)
A1 commitments: emission reduction	75	84	81
A1 support to non-A1	60	74	69
A1 support to NAMAs	56	68	64
A1 support to Adaptation	54	81	70
A1 support to REDD+	59	74	64
Domestic NAMAs	41	49	50
International NAMAs	67	67	66
Cph pledges: fast track finance	65	65	63
Cph pledges: mitigation contribution	73	62	65

regime to which it will be linked. Will NAMAs represent a first step toward binding commitments for developing countries, or an additional step toward voluntary contributions from both developed and developing countries? Or will a Kyoto Protocol-type treaty prevail, with legally binding Annex I mitigation commitments that can be reached through flexible mechanism like emission trading supplemented by voluntary contributions from developing countries? Even though this will not be determined in the near future, NAMA is about to be launched as a mechanism.

Based on our analysis of the various aims of NAMAs, we find three areas of potential common ground, irrespective of the type of regime that eventually succeeds: the principle of common but differentiated responsibilities, the sustainable development objectives of the Convention, and the need for a systemic transition to low-carbon energy technologies. These are core elements of any future regime.

We suggest that NAMAs can be defined as voluntary mitigation actions by developing country covering a program, policy or sector, which are considered nationally appropriate by the respective country but have sustainable development co-benefits. Internationally supported NAMAs should be enabled by developed country support through capacity building, finance, and technology transfer, which should be subject to MRV monitoring. If they so desire, developing countries may undertake mitigation action independent of Annex I country support, free of any international obligations.

By addressing baskets of policies or entire sectors, NAMAs could contribute to a systemic transition to low-carbon energy technology. If we are to reduce emissions to 50% below 1990 levels by 2050, decarbonization needs to average 4.4% per year with 3% annual GDP growth. This should be compared with the historical decarbonization rate of a 1.5% decrease in carbon dioxide emissions per unit of GDP from 1980 to 2006, a period with 3.5% average annual GDP growth (Pielke 2010). Accordingly, if a substantial

systemic contribution to the target of limiting the global mean temperature increase to 2°C is an overarching goal of the NAMA mechanism, the registry need to provide items where Parties can explain how the proposed NAMAs is intended to contribute to enhancing the decarbonization rate domestically or internationally while promoting sustainable development. It may be argued that the meagre track record for sustainable development criteria in climate policy instruments would discourage such an attempt. The Clean Development Mechanism, where emission reductions and sustainable development gains were to be achieved in developing countries through private or public investments from developed country in return for emission allowances has displayed a only scanty tangible evidence of sustainable development benefits (Lövbrand et al. 2009).

However, when sustainable development criteria are dissolved, like the Brazilian bio-diesel programme (Maroun and Schaeffer, unpubl.) they are even harder to maintain. As a criterion in a registry, it could at least contribute to maintaining attention to the sustainable development objectives.

To make an effective and lasting contribution to the stabilization goals of the Convention, NAMAs must aspire to be “game changers”. They must contribute to substantial systemic change and not simply be add-ons to global mitigation calculations of who is doing what in international climate policy. Accordingly, when registering a NAMA, a Party should explain how the NAMA could contribute to systemic change by reducing emissions and/or promoting sustainable development.

The registry could offer a systematic and organized mechanism to operationalize NAMAs. A NAMA registry provides a possible leverage mechanism linking the support and mitigation change models of most proposed NAMAs. The registry is intended to match countries’ NAMA proposals with available support. This process might be linked to UNFCCC funds for financing mitigation actions and to a new mechanism for technology transfer between



developed and developing countries. It also offers to link mitigation goals with sustainable developmental objectives, which has been a long-standing challenge for the climate convention (Linnér and Jacob 2005; Linnér 2006).

A fundamental question is whether the detailed action models really further the identified change models, i.e., does the complicated structure of action models make them less flexible and hence less likely to capture opportunities for systemic change? For example, if the goal is to incentivize the participation of developing countries, particularly those with large and growing economies, a-NAMAs could hypothetically provide leverage for greater participation. However, their effectiveness as incentive depends on whether international climate negotiations succeed in setting a global emission cap, with national caps distributed to a number of Parties. Currently, such an agreement seems unlikely to be concluded in the near future.

The effectiveness of a-NAMAs as a leverage mechanism for emission reductions depends also on the scale of reductions and the time scale applied. For smaller emission reductions in the short-term, the emissions trading mechanism may facilitate some cost-effective emission reductions. Since a-NAMAs would function as a scaled-up CDM. However, the literature is divided on the how successful CDM has been in inducing emission reductions, technology transfer, and sustainable development objectives (e.g., Bakker and Huizenga 2010; Cox 2010), in particular evidence is lacking for more substantive effects on society. If NAMAs are to contribute to significant investments in developing or diffusing completely new and game-changing low-carbon technologies, evidence is meagre that carbon credit instruments will have such an effect (Pielke 2010).

Since many development goals presupposes access to cleaner and cheaper energy, NAMAs targeting the development of low-carbon energy technologies in less-developed countries could enhance sustainable development. Finance and capacity building for research, development, diffusion, and deployment (RDD&D) of these technologies could be significantly scaled up as a part of NAMA support. However, it is significantly more difficult to put figures on exactly what such support would generate in terms of emission reductions, since it is very uncertain whether or when such investments would generate breakthroughs and the successful deployment of new technologies. Although such targets may be included in NAMAs, new low-carbon technologies also need to be supported outside a strict MRV mechanism, since their inherent risk means largely uncertain outcomes in terms of practical low-carbon innovations. An alternative would be to include targets for RDD&D investments and efforts in NAMAs, without putting an estimated emission reduction figure on the proposed actions.

## CONCLUSIONS

Proposals in international climate negotiations suggest supporting NAMAs in basically three different ways: (1) by the support path, in which financial and technological support from developed countries furthers implementation; (2) by the recognition path, in which countries take on voluntary targets recognized by the Convention in a registry; and (3) by the accreditation or allowance path, in which support is raised through emission reduction credits for actions that exceed the targets set. Besides facilitating the implementation of NAMAs, the registry also has a huge symbolic value. It provides a showcase for countries assuming the responsibility to take action. Getting recognition in the international community is an important asset in international relations, in particular for countries who aspire for a position at the high tables of global diplomacy (Karlsson et al. 2012). Although some countries will be incentivized to propose domestic NAMAs, how responsibilities to tackle climate change are shared will remain a fundamental question for negotiations. The design of the registry is a key upcoming issue, as it will define the mechanism and resolve underlying debates on effort sharing in a future climate regime.

Negotiations on the distributional principles of a future effort-sharing regime are protracted. Will the mitigation commitments be legally binding for all (type 1), purely voluntary for all (type 2), or legally binding for Annex I countries and voluntary for others (type 3)? This debate reflects various views and priorities regarding the basic principle of common but differentiated responsibilities and regarding how the Convention's emphasis on equity should be operationalized. In this debate, developing country criticism often reflects a concern that types 1 and 2 regimes may simply be ways for Annex I countries to elude this basic principle.

However, effort sharing can be operationalized in other ways than mitigation commitments. A legally binding treaty on support from richer to poorer countries, all making voluntary mitigation commitments (type 2), would be another way to operationalize the principle of common but differentiated responsibilities. For example, such a regime could provide binding commitments of support for NAMAs and adaptation in developing countries based on gross domestic product per capita (purchasing power parity). However, this would require the re-framing of current negotiations from emission targets to low-carbon technology investment targets (Linnér and Hjerpe 2011).

We conclude that the design of a NAMA registry could offer a balancing ground for any agreement on a future climate regime. The registry could be designed so as initially to suit all three types of effort-sharing regimes; when an agreement is finally reached, the details of the registry

can be adjusted accordingly. Irrespective of which type of regime ultimately prevails, we have identified three areas of potential common ground for a registry: the principle of common but differentiated responsibilities, the Convention's sustainable development objectives, and the need for a systemic transition to low-carbon energy technologies.

By targeting sectors or policy areas, rather than projects, NAMAs have the potential to contribute to systemic change. Consideration of how given NAMAs might contribute to the transition to the low-carbon economy should thus be included in any national reporting. To make the process transparent, the registry must make available to global stakeholders the NAMAs submitted to the registry, details regarding their support, and any available implementation reports. Also, strictly enforced requirements of MRV of NAMAs emission targets may hamper NAMAs contribution to systemic change, particularly in some sectors, like transportation. A majority of both delegates and non-state

actors responding to the questionnaire question on MRV at the UN climate conference in Cancun, 2010 saw MRV as highly important for all items they were asked to rank, except domestic NAMAs. Relative the other items, international NAMAS mustered less importance in particular compared to Annex I countries' mitigation commitments.

NAMAs should be implemented in the context of sustainable development. It is not clear how this shall be interpreted. A weaker operationalization of this criterion is that it should not impede sustainable development goals. A stronger version is that NAMAs should promote sustainable development co-benefits. The phrase "nationally appropriate" indicates that the NAMAs are designed to address concerns other than just climate; it also indicates that they cannot be defined so as to stipulate appropriate domestic sustainable development criteria. However, it is acceptable to specify, as a baseline, that NAMAs policies and measures should further (stronger criteria), or at least

**Fig. 4** Nationally appropriate mitigation actions (NAMAS), the design of a new mechanism in the climate convention. Photo by Asif Akbar (Stock.xchng)



not impede (weaker criteria), sustainable development targets to which UNFCCC Parties have agreed in other UN agreements, such the millennium development goals.

Our study indicates that many proposals for a registry seek leverage to promote positive synergy between the various goals of the support change and mitigation change models. However, attempting to accommodate the full range of diverging goals and outcomes could overload the mechanism, discouraging risk taking and participation in sectors in which emission reductions are more difficult to quantify for stringent verification (Fig. 4).

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