POSITION PAPER

Aid, Environment and Climate Change

wider.unu.edu/recom

UNU-WIDER gratefully acknowledges specific programme contributions from the governments of Denmark (Ministry of Foreign Affairs, Danida) and Sweden (Swedish International Development Cooperation Agency—Sida) during the period 2011-13 for ReCom. UNU-WIDER also gratefully acknowledges core financial support to its work programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Preface

This position paper on Aid, Environment, and Climate Change, prepared under the UNU-WIDER ReCom programme of Research (Re) and Communication (Com) on foreign aid, is intended to improve the understanding of the role foreign aid has played and can help play in local and global environmental issues. The paper lays out the challenges brought on by climate change and the 'public good' nature of the environment, the existing responses to the challenges in the aid context, and suggestions for future directions for aid and research efforts in the task of helping developing countries in the mitigation of climate change and adaptation to its impacts.

A first draft of this position paper was originally prepared by UNU-WIDER to serve as an input to the ReCom results meeting on 'Aid and Our Changing Environment' held at Sida Headquarters in Stockholm, Sweden on 4 June 2013. It has since been revised and updated based on the deliberations at the results meeting and new research inputs. The position paper builds in particular on:

- More than 30 background papers prepared for ReCom by members of UNU-WIDER's global network, including a range of leading specialists in the aid area from both developing and developed countries;
- Four of these background papers were prepared by DIIS;
- Papers prepared for the UNU-WIDER conference on Climate Change and Development Policy, held in Helsinki on 28-29 September 2012;
- Existing research already published in a variety of forms reviewed under the ReCom programme;
- Research outputs by UNU-WIDER staff; and
- Comments received at the results meeting and other inputs and comments received since this document was put in the public domain, including a series of detailed observations by Danida.

Background papers and other outputs from the ReCom programme on which this position paper builds can be found through the ReCom website http://www.wider.unu.edu/recom, as well as the attached list of references. Materials from the 4 June results meeting in Stockholm are also presented on the ReCom website.

The theme leaders for the final ReCom position paper on the Aid, Environment, and Climate Change are UNU-WIDER External Project Director Channing Arndt of University of Copenhagen and Professor Finn Tarp, Director of UNU-WIDER. Other UNU-WIDER contributors include Tony Addison, Yongfu Huang, Heidi Kaila, Aziz Karimov, Lena Lindbjerg Sperling, James Thurlow, Roger Williamson, and Tuuli Ylinen. They have collaborated with the UNU-WIDER communication and position paper production support team consisting of: : Kennedy Ambang, Dominik Etienne, Anu Laakso, Carl-Gustav Lindén, Susan Servas, James Stewart, Paul Silfvenius, Minna Tokkari, Janis Vehmaan-Kreula, Anna-Mari Vesterinen, Annett

Victorero, Lisa Winkler, Tuuli Ylinen and Lumi Young, whose editing work is gratefully appreciated.

UNU-WIDER is grateful for all of the analytical efforts and support, which have made this study possible; and we acknowledge with appreciation significant research contributions from the following professionals: P. Abbott, C. Arndt, W. Akpalu, A. Angelsen, C.F. Bach, Y. Bambio, N. Banks, D. Bevan, L. Buur, Z. Chen, I. Elgizouli, M. Funder, E. Garmendia, N. Givá, L. Gomez-Echeverri, Z. Guo, M.W. Hansen, J. He, P.S. Heller, T.W. Hertel, J. Huang, J.S. Juana, S. Kablan, G. Kahyarara, E. Kateregga, E. Kato, P.E. Kauppi, M. Kjær, J. Koo, R.K. Larsen, J. Li, C.A. Mamosso, M. Marani, C. Marcoux, E. Muchapondwa, T. Ngaido, E. Nkonya, W. Nyangena, E. Ojea, B.C. Parks, U. Pascual, C.M. Peratsakis, J. Phelps, M.G. Quibria, H.M. Ravnborg, J.T. Roberts, H.-H. Rogner, O. Therkildsen, M.J. Tierney, A. Tomo, D.K. Twerefou, S. Umbadda, D. Victor, J.L. Vilsen, and J. von Braun.

UNU-WIDER would also like to express our warmest appreciation to Danida and Sida for financial support and collaboration during the past three years of the ReCom project. Particular thanks for their efforts go to Tove Degnbol, Henning Nøhr, Anders Granlund, Lena Johansson de Château and Pernilla Sjöquist Rafiqui. It is our hope that our joint effort will lead to better informed aid policy and policy action in an area that is of utmost importance to the world's poorest people as well as to humanity as a whole.

Finn Tarp
Director, UNU-WIDER
21 March 2014

About ReCom

ReCom–Research and Communication on Foreign Aid is a UNU-WIDER co-ordinated research programme implemented over 2011-2013 in partnership with Danida (Ministry of Foreign Affairs of Denmark) and Sida (Swedish International Development Cooperation Agency). The Danish Institute for International Studies (DIIS) and the UNU-WIDER global network of partner institutions and researchers are also involved in ReCom research. The aim of the programme is to research and communicate what works and what can be achieved through development assistance. For this purpose, a specific programme website wider.unu.edu/recom was created.

IMAGE 1
The ReCom website

Source: wider.unu.edu/recom

Foreign aid is a complex and multi-faceted issue, involving many countries, institutions, and people—researchers, aid officials, policy makers, NGOs, companies and civil society organizations. Currently, the evidence for what works in aid is fragmented and not easily accessible thereby limiting, in particular, the transfer of successful interventions across countries. There is limited evidence for what works on a large scale—understanding this is a key objective if more aid is to be used well, and if challenges such as adaptation to climate change are to be met successfully.

To better understand and improve the effectiveness of aid requires a multi-disciplinary approach—bringing together the best from social sciences, in particular economics and political science, as well as other relevant disciplines. Better understanding can only come from mobilizing a global network of development researchers and practitioners to share their knowledge. No single actor can grasp all of the dimensions of aid, especially when we take into account the number of complex issues—such as conflict, climate change, the emergence of new aid donors—involved in the context that aid is operating in. Many developing economies are growing, a success in part due to aid itself, but immense development challenges remain, not least in adapting to climate change and reducing poverty. It is the power of the network that guarantees ReCom its credibility as a source of knowledge on development and aid when communicating these new trends and challenges, and what they mean for aid practice and for achieving aid effectiveness.

Over 2011-2013, ReCom has been bringing together 300 researchers from all parts of the world—in fact from 60 different countries—to research and communicate what works, and what could work, in development assistance, including the potential to scale-up and transfer small but successful interventions as larger aid programmes. Some 227 individual studies have been published or are forthcoming in the WIDER Working Papers series as well as an additional 13 studies by DIIS—each of them summarized in a research brief published on the ReCom website (see Appendix 5). An important part of the quality assurance process of ReCom is to publish studies in peer-reviewed fora. A large number of the studies have been submitted to, or have already been published in, internationally refereed journals and as UNU-WIDER books (see Appendix 1).

The thematic focus of the research programme covers five key issues in international development assistance: growth and employment; governance and fragility; social sectors; gender equality; and environment and climate change. Poverty and inequality cuts across all these issues, for there can be no sustained poverty reduction without achievements for aid in each. By these means, ReCom is also helping to shape the debate on the Millennium Development Goals (MDGs) and the post-2015 development agenda.

To be of use the new knowledge generated by research must be customized and shared. This is done by effective communication with national policy makers, aid officials, parliamentarians, and other practitioners in NGOs and social movements. Communication has been as important to ReCom's success as research.

ReCom's knowledge-sharing process therefore involved the exchange of information and views. Discussion of the research results set up new questions for further investigation. These exchanges were designed to capture the insights of policy makers and practitioners, which then fed back into further rounds of knowledge creation and sharing. This has been the core of ReCom.

Through more than 75 presentations and seminars, seven ReCom results meetings, and a website dedicated to communicating the research, ReCom has

focused on adding to the existing evidence base and communicating with policy makers as well as the broader audience 'what aid has done, and what aid can do better in the future' thereby improving aid practice and policy, ultimately increasing the benefits of aid for recipient countries. Appendix 2 provides a list of all ReCom presentations and seminars that took place during 2011-2013. In addition, social platforms (YouTube, Twitter, Facebook, etc.) and a monthly ReCom newsletter have been used to disseminate the knowledge produced through ReCom.

Box 1: ReCom results meetings

People-to-people knowledge sharing has been a central part of the overall communication strategy of the co-ordinating partners of ReCom. Especially the ReCom results meetings have been the anchor of the communications activities as they have proven to be an excellent vehicle for bringing researchers, practitioners and policy makers together to exchange knowledge on key development and aid issues, and because the knowledge transferred and communicated in them contained the essential facets of each research theme. During the programme period, the following seven ReCom results meetings took place in Copenhagen and Stockholm:

- 'Aid, Growth and Macroeconomic Management', Copenhagen, 27 January 2012
- 'Democracy and Fragility', Stockholm, 10 May 2012
- 'Jobs – Aid at Work', Copenhagen, 8 October 2012
- 'Aid and the Social Sectors', Stockholm, 13 March 2013
- 'Aid and Our Changing Environment', Stockholm, 4 June 2013
- 'Challenges in Fragility and Governance', Copenhagen, 23 October 2013
- 'Aid for Gender Equality', Copenhagen, 16 December 2013

IMAGE 2
ReCom results meeting 'Aid and Our Changing Environment'

Source: © UNU-WIDER

The ReCom research findings have been compiled in five substantive position papers, one for each theme, that speaks to a broad audience interested in foreign aid and the respective theme. The position papers specifically target policy makers in donor agencies and their partner countries, as well as private foundations and civil society organizations.

Compared with the other four position papers, the Aid, Environment and Climate Change takes a more forward looking approach. Global environmental change, in which climate change is a major driving force, is transformative in terms of the potential damage to the planet if left unchecked, the economic restructurings required to remain within reasonable environmental boundaries, and the international architecture in which foreign assistance operates. This position paper focuses on these transformational forces, particularly as they operate in concert with the changing contours of the development challenge.

As noted, this position paper draws from working papers commissioned under ReCom, a comprehensive review of existing literature, and comments received at the Aid, Environment and Climate Change results meeting and subsequently. While categorization is never completely straightforward, it is possible to allocate the working papers listed in the annotated bibliography into a series of groups. These are (with the number of papers listed in parentheses):

- The global aid architecture (4),
- Agriculture (7),
- Natural resource management (4),
- Pollution abatement (7),
- Capacity building (2),
- Environmental governance and regulation (2),
- Cross country comparisons of development patterns (2),
- Case studies of aid and environment in Africa (5), and
- DIIS studies (4).

Adaptation to climate change is a cross-cutting theme that is the focus of the working papers listed above.

The work under the ReCom program finds that the world possesses an aid system that has worked to enhance the lives of billions of people. This system is now being asked to confront complex and inter-locking developmental and environmental challenges. And, the system is responding. However, the international architecture, of which aid institutions form an important part, is not properly configured to confront the 21st century developmental or environmental challenges. Reforms to aid systems and institutions are required to improve performance. At the same time, it is critical to bear in mind that aid cannot succeed alone. However, when combined with appropriate public policy initiatives outlined in this report, aid can play a crucial role in achieving developmental and environmental objectives.

Turning to publications, a key paper on the 'triple crisis' has been published in the *African Development Review*, and a special journal issue is underway with *Development Policy Review*. It builds on existing experience outlined in this report and takes a long run perspective looking forward with an emphasis on the international initiatives required to confront the challenges of the 21st century and the role of aid and aid institutions in confronting these challenges. The papers present both new knowledge and incisive synthesis of existing

information, and leading authors synthesize and analyse broad trends in critical areas such as climate change, land and land use change, international agriculture more generally, and energy with respect to their roles as drivers of both economic and institutional transformation. A final article seeks to bring the existing pieces of evidence together in a new and coherent manner and draw out what can be said at this juncture.

A common theme is that aid and aid institutions constitute an important element of the global response to inter-linked global developmental and environmental challenges. As such these institutions are being drawn into new arenas beyond the traditional focus of improving the livelihoods of poor people in low income countries. Substantial institutional reforms are likely required to confront these new challenges and traditional development challenges amid a new geography of poverty and fragility. Other submissions include a volume on aid effectiveness for environmental sustainability, which Oxford University Press is presently reviewing.

Acronyms and abbreviations

3H Basin	Huang-Huai-Hai River Basin
ACCCRN	Asian Cities Climate Change Resilience Network
AFD	Agence Française de Dévelopment
AGECC	Advisory Group on Energy and Climate Change (UN Secretary General's)
AR4	IPCC Fourth Assessment
CAD	Comprehensive Agricultural Development
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CFI	Commercial Financial Institution
CGIAR	Consultative Group on International Agricultural Research
CIF	Climate Change Fund
COP	Conference of Parties
CO2	Carbon Dioxide
DAC	Development Assistance Committee (OECD)
Danida	Danish International Development Agency
DIIS	Danish Institute for International Studies
DTMA	Drought Tolerant Maize for Africa
ERR	Expected Rate of Return
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEA	Global Energy Assessment
GEF	Global Environmental Facility (of the World Bank)
GHG	Greenhouse Gases
IAIL3	Irrigated Agriculture Intensification Loan III
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation (World Bank Group)
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change

LDC	Least Developed Country
MDB	Multilateral Development Bank
MDGs	Millennium Development Goals
NGO	Non-Governmental Organization
ODA	Official Development Aid
OECD	Organisation for Economic Co-operation and Development
OOF	Other Official Flows
PBA	Performance-Based Aid
PES	Payments for Environmental Services
REDD	Reduced Emissions from Deforestation and forest Degradation
RETs	Renewable Energy Technologies
ROI	Rate of Return on Investment
SAPs	Structural Adjustment Programmes
SCCF	Special Climate Change Fund
SE4ALL	Sustainable Energy for All
Sida	Swedish International Development Cooperation Agency
SSA	sub-Saharan Africa
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
USAID	Agency for International Development
WB	World Bank
WFP	World Food Programme
WRI	World Resources Institute

Executive summary

'Aid, Environment, and Climate Change' is one of five themes addressed under the ReCom Programme of Research and Communication on Foreign Aid.[i] Global environmental change in general and climate change in particular arguably pose humanity's biggest challenge of the twenty-first century. By itself, climate change has the potential to undermine all other efforts at environmental conservation as well as the potential to substantially threaten human welfare. Current emissions paths imply a near certainty of temperature rises greater than 2°C compared with pre-industrial levels, which are associated with 'dangerous anthropogenic interference with the climate system' (United Nations 1992), and a disturbingly high probability of extreme, potentially catastrophic, temperature outcomes in the latter half of this century (Weitzman 2011; Webster et al. 2012).

Just as climate change has the potential to drastically alter the global environment, climate change is also potentially transformative with respect to foreign assistance. Developing countries, with their high climate-sensitivity and relatively low adaptive capacity, are particularly vulnerable to climate change (Parry et al. 2007). And, a considerable level of warming is already built into the system. Developing countries are also key to any successful global mitigation strategy. As such, coping with global environmental change has become an urgent international priority in which development institutions, research, and practice are increasingly involved.

Against this background, we ask the following overall question in this position paper:

What can we learn from past successes of development co-operation in coping with global environmental change, and from the failures experienced, and how does the world move forward to scale-up successes?

This study on 'Aid, Environment, and Climate Change' faces a particular challenge in comparison to other ReCom themes, namely that, while donor action in the environmental field is now long-standing (we have seen projects in a wide range of environmental areas), issues grouped under the rubric global environmental change, particularly climate change, are a relatively newly recognized challenge for developing countries. In addition, the implications of climate change on the impacts, adaptation, and mitigation sides have been relatively small compared to what is anticipated over the course of the twenty-first century. Sound evidence on aid impacts remains fragmentary and still emerging, and these bits of evidence must be projected into an uncertain future. We aim to bring the existing pieces of evidence together in a new and

[i] See http://www.wider.unu.edu/recom for further detail on this programme of research and communication co-ordinated by UNU-WIDER over the period 2011–13 with financial support from Danida and Sida. This website also contains all of the research outputs and other material produced so far under the ReCom programme and a series of relevant links to partner institutions.

coherent manner and draw out what we believe can be said at this juncture. We distil this experience into the following five lessons.

Lesson 1: The past 50 years have demonstrated that low-income countries often grow and become middle-income countries. Under the desired future state of the world, the current set of low-income countries will become middle-income countries in the context of declining global greenhouse gas (GHG) emissions and a stabilizing climate. Given that major investments to be made in the near term will influence economic structure in the long term, environmental considerations may well rationally enter current investment calculations in many low-income countries, and by implication in aid. At the same time, the adaptation agenda, in significant measure, reinforces the existing aid and development agenda. A sensible basic premise at this juncture is that the best adaptation response to climate change at national level in low-income countries may well be rapid development that leads to a more flexible and resilient society. Such a society would be better positioned to deal with future socio-economic impacts of climate change as they present themselves.

Lesson 2: It is desirable that the attention the aid system devotes to middle-income countries increases (without crowding out the attention to low-income countries, which could be achieved by adhering to established aid targets). This is driven by (i) the concentration of absolutely poor people in middle-income countries, (ii) the key role that middle-income countries must play in combating global environmental problems, and (iii) the needs of middle-income countries for some assistance in adapting to climate change. Desired development and environmental goals must be supported through appropriate policy frameworks and investment decisions funded principally through private sources or domestic public finance. Aid can mainly hope to play supporting and catalytic roles that will typically fall under the rubric of soft assistance. Reforms in the existing aid architecture are required in order to achieve this objective.

Lesson 3: The role of aid and aid institutions in the provision of global/regional public goods should be maintained or, even better, enhanced. Agriculture presents a particularly good example (though not the only one). A concerted effort should be made to reform and reconfigure international agricultural institutions such that they better respond to twenty-first century challenges. The case for an emphasis on agricultural technology is particularly strong.

Lesson 4: Aid should continue to seek to help catalyze the transformations required to confront and mitigate environmental issues. These initiatives will function much more effectively in the presence of broad public policy initiatives such as a price on GHG emissions.

Lesson 5: While, in principle, aid for information could be categorized under Lesson 3, it deserves special mention. Aid has long been recognized as a knowledge-intensive activity. Two points merit particular mention. First, Lessons 2–4 serve to place even more emphasis on the role of information collection, organization, analysis, and dissemination. These roles should become even more central in aid efforts. Second, looking forward, the desired

state of the world envisions that global GHG emissions peak and then enter a sustained decline. It is hard to see how consistent, long-term emissions reductions could be achieved without an adequate monitoring system that independently and credibly tracks emissions at the country level. Aid can play a key role here, for example by creating a specialized, independent, and technically competent institution that would credibly monitor and corroborate country level emissions data.

To conclude, development aid, by itself, cannot 'save the planet' and secure much needed and much desired outcomes in furthering development, poverty reduction and environmental stewardship. Development aid and development institutions have the potential to become important catalytic actors in achieving developmental and global environmental objectives. However, this requires bold reforms and political action. Without the necessary complementary frameworks in place, future aid risks substantially under-performing. The people of the world, particularly the roughly 1.3 billion poor, who remain in the midst of more wealth than ever before in the history of humankind, deserve better.

Contents

Appendices

Boxes

Figures

Images

Tables

1 Introduction

The twenty-first century presents the world with daunting long-term challenges, risks, and vulnerabilities, as well as a fundamental sense of uncertainty about the future of the globe. Perhaps most prominent among these are the inter-linked challenges of human development and global environmental change. This position paper considers what works, what does not work, and what could work in foreign aid in the pursuit of a sustainable human development agenda characterized by global environmental change and the need for planetary stewardship.

This position paper relies on an extensive review of existing literature including more than 30 background papers developed under the aegis of the ReCom project. The background papers draw on the expertise of leading figures in the analysis of global environmental issues from all over the world. *The red thread tying together these background papers and this position paper is a focus on global environmental change, with emphasis on the implications for the international institutional architecture in general and this architecture as it relates to the conduct of foreign assistance in particular.*[1] Because the implications of climate change are so large and so pervasive for the global environment, for development prospects and planning, and for the international institutional architecture related to foreign assistance, substantial attention is devoted to climate change.

As such, this position paper is, especially in comparison with the other four themes addressed in the ReCom programme, a more forward looking exercise. While donor action in the environmental field is now long-standing (we have seen projects in a wide range of environmental areas), global environmental change in general and climate change in particular are relatively newly recognized challenges for developing countries. In addition, the implications of climate change are only beginning to manifest themselves and effective global mitigation policies have yet to materialize. As a consequence, sound evidence on aid impacts remains fragmentary and still emerging. We aim to bring the existing pieces of evidence together in a new and coherent manner and draw out what we believe can be said at this juncture.

The remainder of this position paper is structured as follows. Section 2 provides a summary of outcomes. It seeks to address four key questions:

- What works?
- What could work?
- What is scalable?
- What is transferable?

In so doing, Section 2 synthesizes the findings of the ReCom Aid, Environment, and Climate Change theme. The combination of Sections 1 and 2 provides a standalone summary of the principal findings. Readers are, nonetheless, encouraged to continue to subsequent sections where more nuance and detail are provided. Section 3 presents the state of debate and analytical approach. Section 4 covers key areas and means of intervention. The final Section 5 takes stock and concludes.

2 Summary of outcomes

2.1 The context for aid, environment, and climate change

The socio-economic background and context in which this position paper is set constitutes one of broad development success in many of the areas in which foreign aid has traditionally been active. We have an aid system in place that has worked in helping to improve living conditions in a wide variety of country contexts and across an array of indicators over the past 50 years or so. Notable improvements have been registered in, for example, per capita GDP, consumption poverty, infant mortality, life expectancy, and educational attainment.

In sum, the weight of evidence indicates that aid has worked, and it has worked at scale. While aid has not been as potent as aid optimists originally hoped and aid has clearly experienced specific failures, on average and over time the aid system has delivered improvements in broadly targeted development objectives.

In spite of these positive results, ample development challenges remain. With respect to the traditional concerns of poverty, vulnerability, and marginalization, more than one billion people are absolutely poor in today's world (as measured by the US$1.25/day criterion). In addition, 36 countries continue to be mired in low-income status (down from 63 countries in 2000). The Organisation for Economic Co-operation and Development (OECD 2012a) characterizes an even larger number of states, 47, as fragile, implying that some middle-income countries are characterized as fragile.

The contours of the development challenge are also changing. The remaining group of low-income and fragile states likely represent a core of more difficult cases where the repetition of standard development recipes may not apply. In addition, due to the graduation of many states to middle-income status, the geography of poverty has shifted. Not long ago, the vast bulk of absolutely poor people lived in low-income countries. Today, about three out of four absolutely poor persons live in middle-income countries. As a consequence, development concerns with respect to the poor must encompass middle-income countries, especially those where the poor or other disadvantaged groups are excluded from ongoing development processes.

Finally, huge environmental challenges overlay and interact with more traditional development challenges. In the past two centuries, the human impact on the environment has frequently been acute, particularly on relatively localized scales. As the scope of human activity has expanded, so has the scale of environmental issues. Humanity now confronts a series of environmental challenges grouped under the rubric of global environmental change. Rockström et al. (2009) propose a set of nine planetary boundaries:

- Climate change;
- Rate of biodiversity loss;
- Nitrogen cycle;
- Phosphorous cycle;
- Stratospheric ozone depletion;
- Ocean acidification;
- Global freshwater use;
- Change in land use;
- Atmospheric aerosol loading;
- Chemical pollution.

These boundaries are, according to Rockström, either already surpassed or threatened largely because of fossil fuel use and environmental disruptions due to agriculture. While each of these boundaries is critical in its own right, climate change sits at the top of the list for good reasons given its potential to transform the environment of the planet and its role as a driver behind other planetary boundaries such as biodiversity loss and ocean acidification (World Bank 2012b). Global emission levels at present are consistent with global temperature rises at the end of the twenty-first century that are greater than 2ºC. Formal analysis of likely outcomes by Webster et al. (2012) imply, on the current emissions path, a near certainty of temperature rises associated with 'dangerous anthropogenic interference with the climate system' (United Nations 1992) and a disturbingly high probability of extreme, potentially catastrophic, temperature outcomes in the latter half of this century (Weitzman 2011).

With respect to foreign assistance, climate change is also potentially transformative. Developing countries, with their high climate sensitivity and relatively low adaptive capacity, are likely to be particularly vulnerable to climate change (Parry et al. 2007). And, a considerable level of warming is already built into the system. Developing countries are also key to any successful global mitigation strategy. Since 1970, nearly 90 per cent of emissions growth has occurred outside the countries that were members of the OECD in 1990 (see Figure 12). As a result, developing countries and development institutions have begun to pay particular attention to environmental issues in general and climate change in particular.

In summary, while the weight of evidence indicates that aid has worked to deliver development as traditionally measured, the contours of the development challenge are shifting. Aid must adapt to these new circumstances. The question, 'what could work', is critical, particularly with respect to global environmental challenges. Partial answers to that question can be obtained by considering what has been done.

2.2 The response to date

The particular forms of response of aid institutions to environmental challenges generally and global environmental change in particular can be divided into four groups:

- Enhance the profile of environmental considerations in overall aid flows;
- Launch institutional initiatives;
- Reform existing institutions in order to better address environmental issues; and
- Develop 'smart approaches' at the project, programme, and sector level.

In the following sub-sections, we briefly describe and assess each of these responses of foreign aid in turn.

2.2.1 Enhance the profile of environmental considerations in existing aid operations

Three major trends emerge from an analysis of a detailed dataset encompassing more than US$5.4 trillion in official government assistance in over a million project/activity records (Marcoux et al. 2013). First, aid flows have been trending towards more environmental assistance for more than three decades. The change is substantial with the ratio of aid characterized as 'dirty' to aid characterized as 'environmental' falling from about eight in the early 1990s to roughly three in 2008. Second, within the past decade, environmental aid is increasingly coming from bilateral sources. In 2000, bilateral aid represented about half of the US$10 billion (real US$ 2000) categorized as environmental aid. By 2008, bilateral aid represented about two-thirds of the US$15 billion (real US$ 2000) categorized as environmental aid. Finally, funding has recently been shifting from local environmental issues to supra-national environmental issues, such as climate change. Roughly US$2 billion (real US$ 2000) was annually allocated in supra-national environmental aid between 1990 and 2005. This amount has recently increased to nearly US$6 billion (real US$ 2000), accounting for roughly 40 per cent of total environmental assistance.

As noted, developing countries will have to adapt to climate change and will, as a group, play a critical role in determining global emissions levels. Within the scope of traditional development institutions, projects designed to assist developing countries in their efforts to adapt to climate change have formed a significant portion of the recent trend towards more environmentally oriented assistance while efforts to reduce emissions (mitigation) have tended to concentrate under the institutional initiatives discussed in the next sub-section.

From the perspective of aid allocations for adaptation, the following two interrelated questions are pertinent:

- When are serious climate change development impacts likely to be felt?
- What are the best adaptation options from a development perspective?

How soon climate change will begin to seriously impair development prospects is a matter of some debate. For example, the implications from published studies on agricultural yields in tropical countries range from relatively mild at least out to 2050 to quite severe as early as 2020. Recent economy-wide assessments conclude that, while expected climate change is unlikely to positively support overall growth/development and may be strongly negative for some sectors and regions, climate change is unlikely to preclude growth and development prospects prior to about 2040 (World Bank 2009; 2010; Arndt et al. 2012) leaving a window to prepare for a warmer future.

While developing countries face a warmer future with high certainty, the wide ranges in estimates of the source and magnitudes of developmental impacts are indicative of the uncertainties that bedevil adaptation and associated aid policies. Consider only the quantity and distribution of rainfall. Should one prepare for a drier future or a wetter one? Science gives no sure answer. The possibilities for 'mal-adaptation'—preparing for one climate future when a different future may actually occur—are substantial. Due to these uncertainties, much recent work on adaptation emphasizes flexibility and robust policies that provide benefits across a broad array of climate outcomes (Hallegatte 2009; Arndt and Thurlow 2013).

Recent research also emphasizes a strong confluence between the adaptation agenda and the development agenda. Rapid development that leads to a more flexible and resilient society is clearly a desirable form of adaptation. Climate change adaptation needs do serve to highlight some items already on the development agenda such as agricultural research, regional river basin management, and vulnerability of infrastructure to extreme events. Overall, the uncertainties associated with climate change combined with the broader challenges posed by global environmental change more generally underscore the importance of human capital accumulation and flexible and competent public and private institutions. These two elements will enhance the ability of societies to adapt to the challenges posed by global environmental change, whatever they turn out to be.[2] Finally, uncertainties notwithstanding, investment decisions inherently relate to a vision of the future. In this light, long-run public investments should be made with due consideration to the implications of climate change as these investments are likely to influence economic structure for decades. One of the few advantages conferred by the relative lack of infrastructure that characterizes most developing countries is the ability to choose the shape of backbone infrastructure. This observation also applies to confronting the mitigation challenge, which is the issue in focus in the next section.

In sum, with respect to adaptation to climate change, the perspective that development works is an appropriate launch point. Hence, the lessons from development experience to date,

detailed in the other four ReCom position papers, are highly relevant. While the new contours of the development challenge offer ample justification for departures from traditional development practice, the pursuit of development objectives—development as adaptation—logically remains front and center.

2.2.2 Institutional initiatives

While there may be disagreement on the implications of one, two, or even 3°C of warming for development prospects in poor countries, there is widespread agreement that higher levels of warming produce greater impacts at an exponential rate. At some point, these impacts could completely overwhelm the ability of societies to adapt. This reality, combined with the weight of developing countries in current and projected future emissions, has generated a strong interest in mitigation.[3] This mitigation imperative has been a driving force (though not the only force) behind four institutional aid-related initiatives:

- Reducing Emissions from Deforestation and Forest Degradation (REDD),
- Clean Development Mechanism (CDM),
- Global Environment Facility (GEF), and
- Green Climate Fund (GCF).[4]

From the perspective of aid and aid institutions as well as development more broadly, two shared aspects of these four institutional initiatives merit mention. First, the main focus is not on low-income countries. The REDD+ initiative is, in considerable measure, dictated by the location of forests. For example, Angelsen (2013) details the cases of Brazil and Indonesia. With respect to the CDM, more than half of all CDM projects have taken place in China (UNFCCC 2012a). The distribution of projects undertaken by the GEF is vast and weighted towards middle-income countries. Finally, the GCF has not begun operations yet. However, as with the other funds, the mandate of the GCF would lead to a focus on middle-income countries.

Second, to a very large degree, the success of all four of the initiatives listed above depends on more general public policy initiatives designed to reduce emissions.[5] The current dearth of strong policy initiatives constrains their activities and effectiveness. For example, the ability of REDD+ to credibly commit to long-term purchases of environmental services is limited by a lack of demand for certified emissions reductions. This has helped to catalyse the institutional evolution of REDD+ towards an entity with features more in common with traditional development assistance. Similarly, for the CDM, demand uncertainty for certified emissions reductions is the major issue discussed in the 2012 annual report of the Executive Board of the CDM. If nobody demands certified emissions reductions, then the CDM will cease to function. The GCF is, at the moment, essentially a hollow shell due to lack of financing. Proceeds from a carbon tax are meant to be a major source of finance for the GCF by 2020. Finally, the GEF was never designed to finance the major transformations required to achieve sustainable emissions levels.

Rather, the GEF envisions a role 'crowding in' complementary private sector and local finance in order to drive the transformation process. Public policy initiatives favouring clean technologies would greatly facilitate the ability of GEF to play its envisioned role.

Overall, the scale of the global mitigation challenge is vast and inherently involves developing countries. The above four initiatives represent a major share of the international response to date. Despite these initiatives, current emissions trends are strongly at odds with global temperature stabilization objectives. The lack of a public policy basis for emissions reductions underlies the abject failure of international efforts to meet the mitigation challenge to date. In this context, it is difficult to evaluate whether these four initiatives, if supported by appropriate public policies, could in practice help catalyse a long-run process of transformation at the scale required while still leaving space for low- and middle-income countries to achieve well-established, more traditional development goals.

Nevertheless, the fundamentals behind the four initiatives appear to be sound. Forestry is increasingly regarded as a promising and relatively low-cost source for emissions reductions (relevant to REDD+). An increased reliance on renewable energy sources likely favours regions with more sun, wind, and unexploited hydropower potential. These regions are frequently located in developing countries, providing a basic rationale for the CDM. There are manifestly enormous technical and policy challenges associated with transitioning to cleaner energy sources providing a rationale for the GEF. Finally, the basic idea behind the GCF, dedicating a portion of carbon tax revenues to help catalyse investment in low carbon sustainable development, is appealing.

In sum, development institutions are increasingly being called upon to help meet the mitigation challenge. Efforts to meet this mitigation challenge are not working at the required scale. Nonetheless, the four initiatives discussed above fall into the category of 'what could work?'. With adequate supporting policies, there are clear opportunities for these initiatives to function at scale and to transfer successful approaches to different contexts.

2.2.3 Reforming existing institutions

In this section, we opt to focus on agriculture. Agriculture lies at the confluence of the sustainable development agenda. Agriculture is critical for growth and poverty reduction; it is strongly influenced by population growth and diet upgrading; it is impacted by climate change; it is potentially a source of low emissions energy via biofuels; it is one of the two major drivers towards surpassing the planetary boundaries identified by Rockström et al. (2009) (due to its role as a source of emissions and other pollutants through inputs, production practices and land use change); and it is a potential emissions sink through reforestation and sustainable land management.

Historically, agriculture has produced some of the clearest and largest successes attributed to foreign assistance. For example, the Consultative Group for International Agricultural Research (CGIAR) is credited with developing the

technologies that enabled the 'green revolution' in Asia. Yet, it is equally clear that, at present, the relevant international institutions focused on agriculture do not deliver the necessary public goods at the needed scale. The existing disarray reflect issues and developments that go well beyond the aid system as such, but aid should be used more pro-actively to further the much needed institutional reforms.

In a review of the system for ReCom, von Braun (2013) emphasises the need for reform and provides a list of seven international public goods that the global system must aim to provide to function effectively:

- Natural resource management related to biodiversity, water, and soils;
- Climate change adaptation and mitigation;
- Trade and food reserves;
- Sound competition policy and standards for foreign direct investment;
- International research and innovation in food and agriculture;
- Responding to and preventing food and nutrition emergencies;
- Trans-boundary food safety and health related investments and standards.

These are all areas where the state—and by implication foreign aid—has traditionally been assigned important responsibilities.

In hopes of better meeting these challenges, reform efforts have been ongoing. For example, CGIAR has recently reorganized itself around a series of 15 collaborative research programmes. The idea is to bring to bear multiple perspectives from different centres of expertise on complex problems. The challenge of increasing production while preserving local environmental quality in the context of climate change was a major motivator behind the reforms. Reform efforts at other important institutions are less advanced.

In sum, the discussion of development as adaptation in Section 2.2.1 emphasized continued focus on development objectives while recognizing and adjusting to the challenges imposed by the changing international context discussed in Section 2.1. Agriculture provides a useful example. Even though agricultural institutions have delivered some of the clearest historical examples of successful aid interventions, international organizations with an agricultural mandate are not generating the required public goods. Greater attention, alongside a systemic rethink such as the one suggested by von Braun (2013), is required.

2.2.4 Environment and climate change aid

A large number of project, programme, and sector level activities are reviewed in Section 4.4 in order to consider best practices. This review also allows consideration of issues surrounding aid architecture through which aid has in practice been delivered in the area of environment and climate change in recent years. The review supports:

- Foreign aid that promotes integration rather than fragmentation;
- Programme rather than project-based approaches;

- Aid in support of technology development and innovation; and
- Foreign aid in support of mechanisms to mobilize, catalyse and leverage private and domestic public investment.

It is important to highlight that the first two points apply more directly to low-income countries and fragile states. In more sophisticated middle-income countries, governments are typically aware of the dangers of fragmentation and their own crucial role in generating, organizing, and executing integrated policy frameworks. These governments may not be keen to engage with donor institutions in formal discussions about these frameworks.[6] At the same time, the fourth bullet applies with particular force in the middle-income country context because aid flows are highly likely to comprise a small share of overall investment. If a relatively small amount of aid can succeed in making a much larger initiative more effective or more efficient, the returns to aid can be very large.

In sum, global environmental change in general and the adaptation and mitigation challenges in particular are among the forces providing impetus for engagement of aid and aid institutions in middle-income countries. Effective modes of operation and opportunities for success are likely to differ substantially and transferring lessons from low- to middle-income environments run risks of not working.

2.3 Lessons and recommendations

Before proceeding to lessons and recommendations, it is important to first consider the appropriate level of ambition. In preparing this study, frequent interaction took place with UNU-WIDER's global network of researchers (who have prepared a wealth of background studies); with policy makers from many different countries; and with communication specialists, whose main (and important) task it is to communicate ReCom results and findings. We were regularly asked: 'Can aid save the planet?'

In our assessment, the question itself leads (implicitly) to inflated expectations—and the obvious answer is '*No*', for all kinds of reasons (including if nothing else aid's relatively limited size). Yet, this leads in turn to another (implicit) and equally erroneous impression, namely that there is nothing aid can do. Aid can, based on past experience, do quite a lot, even if it cannot alone and by itself save the planet.

With this said, we sum up and conclude by outlining our key lessons and recommendations. They include the identification and delineation of five specific roles for foreign aid in environment and climate change in the years to come.

- *Lesson 1:* The past 50 years have demonstrated that low-income countries often grow and become middle-income countries. Under the desired future state of the world, the current set of low-income countries will become middle-income countries in the context of

declining global GHG emissions and a stabilizing climate. Given that major investments to be made in the near term will influence economic structure in the long term, environmental considerations may well rationally enter current investment calculations in many low-income countries, and by implication in aid. At the same time, the adaptation agenda, in significant measure, reinforces the existing aid and development agenda. A sensible basic premise at this juncture is that the best adaptation response to climate change at national level in low-income countries may well be rapid development that leads to a more flexible and resilient society. Such a society would be better positioned to deal with future socio-economic impacts of climate change as they present themselves.

- *Lesson 2*: It is desirable that the attention the aid system devotes to middle-income countries increases (without crowding out the attention to low-income countries, which could be achieved by adhering to established aid targets). This is driven by (i) the concentration of absolutely poor people in middle-income countries, (ii) the key role that middle-income countries must play in combating global environmental problems, and (iii) the needs of middle-income countries for some assistance in adapting to climate change. However, desired development and environmental goals must be supported through appropriate policy frameworks and investment decisions funded principally through private sources or domestic public finance. Aid can only hope to play supporting and catalytic roles that often fall under the rubric of soft assistance; and reforms in the existing aid architecture are required. Even functioning at their best, traditional aid institutions are not currently configured to help middle-income countries confront their inter-linked developmental and environmental challenges.
- *Lesson 3*: The role of aid and aid institutions in the provision of global/regional public goods should be maintained or, even better, enhanced. Agriculture presents a particularly good example (though not the only one). A concerted effort should be made to reform and reconfigure international agricultural institutions such that they better respond to twenty-first century challenges; and there is a strong rationale for enhanced investment in international agricultural systems. The case for an emphasis on agricultural technology is particularly strong.
- *Lesson 4*: Aid should continue to assist with the financing of the transformations required to confront and mitigate environmental issues. These initiatives will function much more effectively in the presence of broad public policy initiatives such as a price on GHG emissions. In the meantime, there are ample opportunities to initiate or move forward these transformation processes within existing policy frameworks. To do nothing would be unacceptable.
- *Lesson 5*: While, in principle, aid for information could be categorized under Lesson 3, it deserves special mention. Aid has long been recognized as a knowledge-intensive activity. Two points merit particular mention. First, Lessons 2–4 serve to place even more emphasis on the role of information collection, organization, analysis

and dissemination. These roles should become even more central in aid efforts. Second, looking forward, the desired state of the world envisions that global GHG emissions peak and then enter a sustained decline. It is hard to see how consistent, long-term emissions reductions could be achieved without an adequate monitoring system that independently and credibly tracks emissions at the country level. Aid can play a key role here, for example by creating a specialized, independent, and technically competent institution that would credibly monitor and corroborate country level emissions data.

To conclude, we reiterate that development aid, by itself, cannot 'save the planet' and secure much needed and much desired outcomes in furthering development, poverty reduction, and environmental stewardship. Development aid and development institutions do have, as demonstrated in this position paper, the potential to become important catalytic actors in achieving developmental and global environmental objectives. However, this requires bold reforms and political action. Without the necessary complementary frameworks in place, future aid risks substantially under-performing and ending up as a large set of disparate projects. The people of the world, particularly the roughly 1.3 billion poor, who remain in the midst of more wealth than ever before in the history of humankind, deserve better, much better.

3 State of the debate and analytical approach

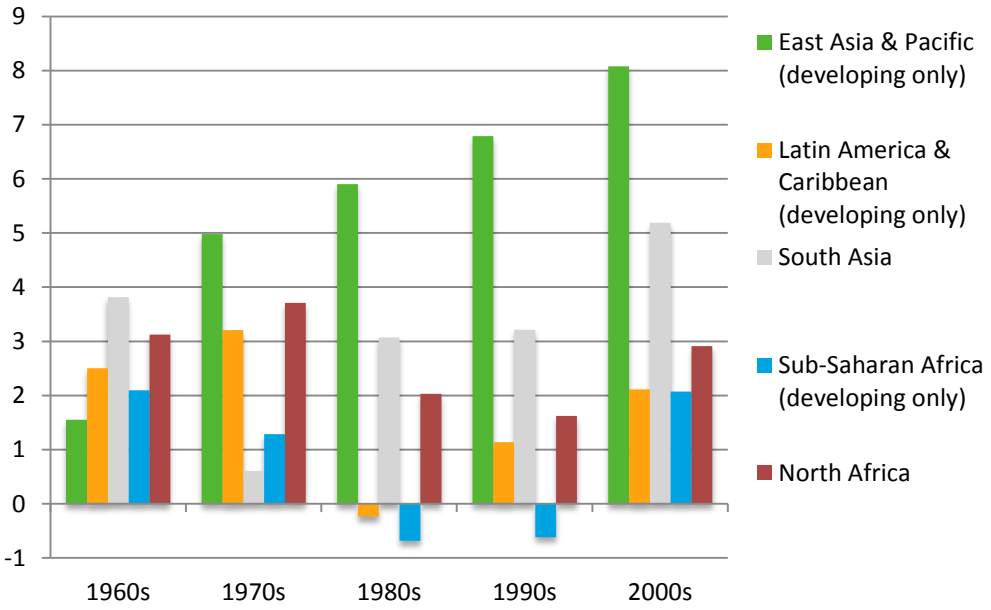
3.1 Development success

The inter-linked challenges of development while coping with global environmental change that confront countries and aid institutions today force consideration of broad scale transformations that must take place over long time frames. Before considering these daunting challenges in detail, it is worthwhile to reflect briefly on the problems that faced the development community 50 years ago, at the dawn of the foreign assistance era as it gradually emerged after the Second World War.

In the early 1960s, the annual value of production per person in Asia was only about US$150 (in constant 2000 prices). While consumption poverty statistics are not available for that time period, it is likely that a majority of the world's population would have been considered absolutely poor (i.e., living on less than US$1.25 per day). Other indicators were similarly low; the life expectancy for populations of developing countries in Asia and Africa was only about 45 years. Infant mortality rates of about 140 deaths per 1,000 births in South Asia and Africa played a substantial role in depressing life expectancy at birth. In 1960, gross primary school enrolment rates were low at about 80 per cent in developing countries and, in sub-Saharan Africa (SSA), at a stunningly low level of 33 per cent (Easterly 2008).

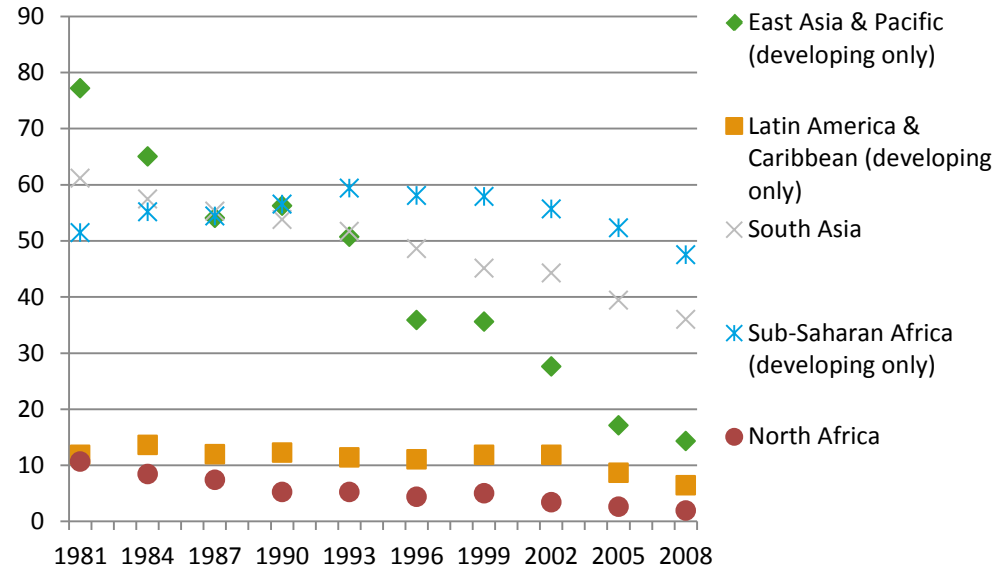
Figures 1 to 5 illustrate trends in these development indicators from the earliest available data point in the World Development Indicators up to 2010. The overall trends are unmistakably positive. The African growth tragedy of the 1980s and into the 1990s, where per capita GDP declined in SSA for nearly two decades (see Figure 1), is the most noticeable blight on the development record. Nevertheless, growth has returned to SSA since the mid-1990s. Globally, the share of the population living in absolute poverty has fallen drastically since 1980 when measurements began, and more recently has begun to fall in Africa coinciding with the return to growth. While the extent of this drop is subject to debate and is characterized by substantial variation across countries, the general aggregate trend (Figure 2) is clear.[7]

FIGURE 1
Average annual real per capita GDP growth by major region and by decade



Source: World Bank, World Development Indicators.

FIGURE 2
Poverty headcount at US$1.25 per by region

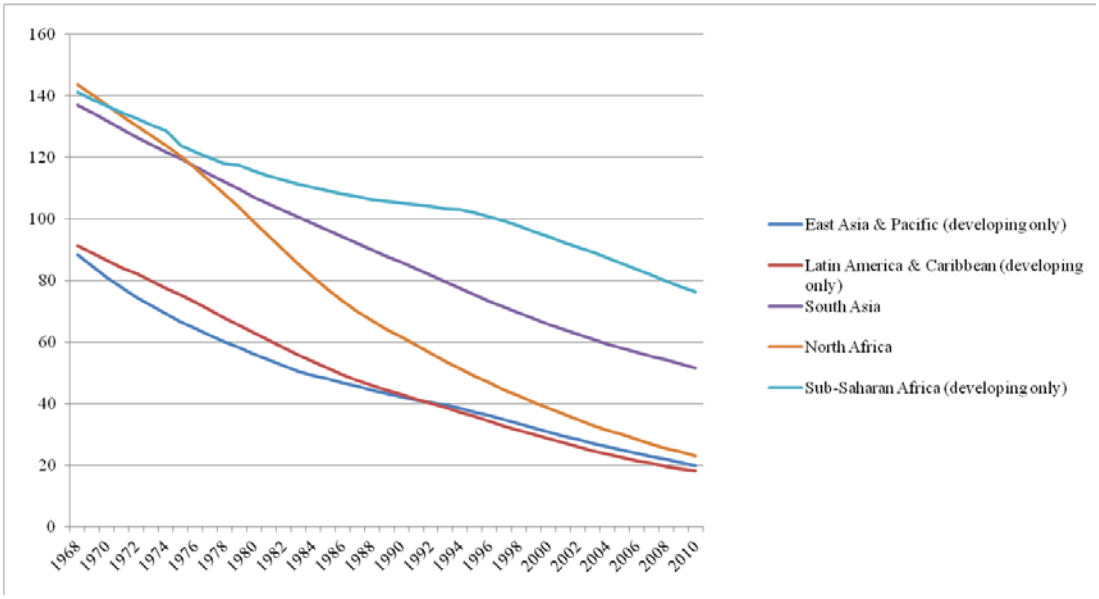


Source: World Bank, World Development Indicators and PovcalNet.

Gains in social indicators, such as health and education, are at least as impressive as the economic gains and tend to be more uniform across developing regions. For example, in 1960, infant mortality rates were above 80 in all developing regions of the world and were concentrated around 140 in

three major regions (see Figure 3). By 2010, infant mortality rates had declined to below 80 in all developing regions and were concentrated around 20 in three major regions.[8]

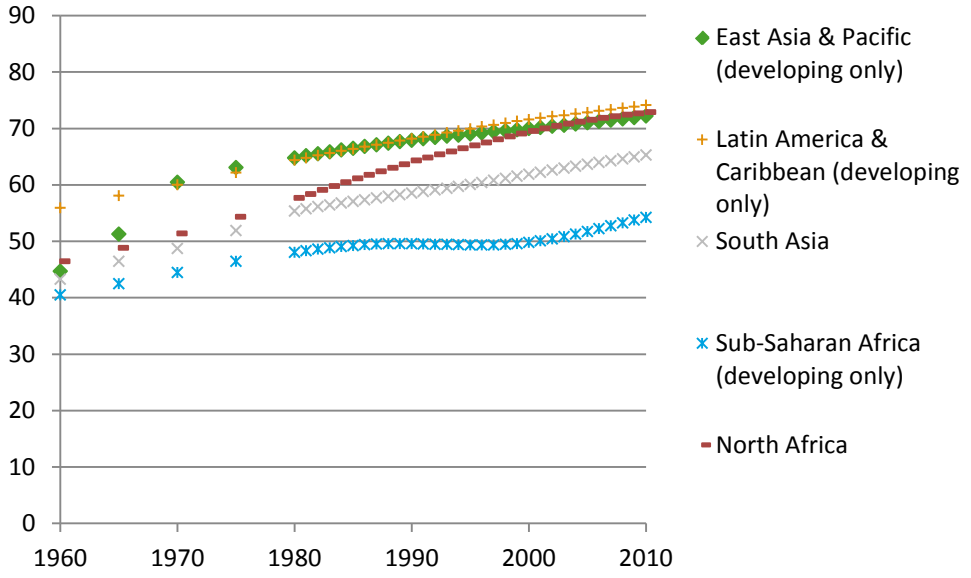
FIGURE 3
Infant mortality rate (deaths per 1000 births)



Source: World Bank, World Development Indicators.

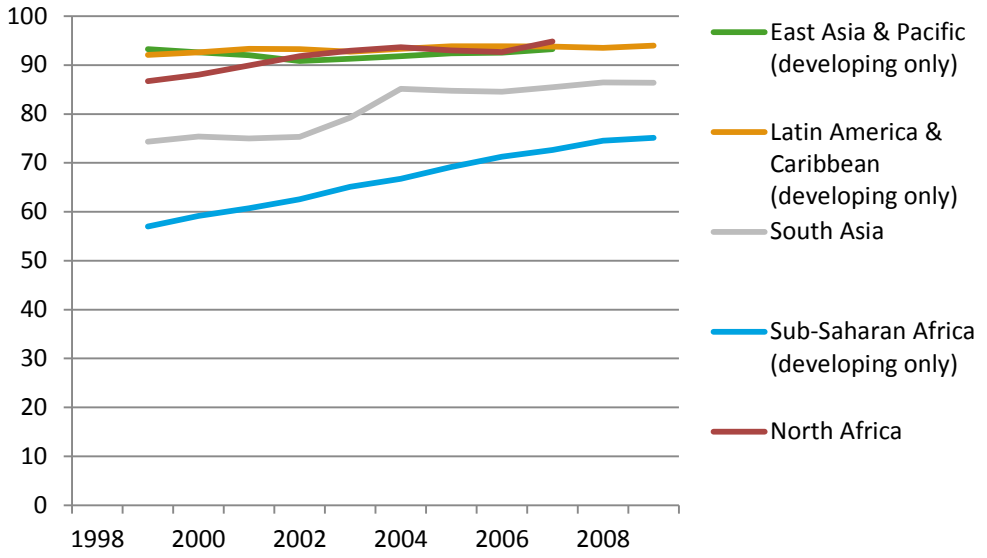
Income growth, reduced infant and child mortality rates, and enhanced education opportunities have driven the global trend towards increased life expectancy (Figure 4), greatly reduced family size and substantially increased investment per child as reflected in net primary school enrolment figures (Figure 5).

FIGURE 4
Life expectancy at birth in years



Source: World Bank, World Development Indicators.

FIGURE 5
Net primary school enrolment in per cent



Source: World Bank, World Development Indicators

The population growth rate in developing countries has declined from a high of about 2.4 per cent per annum in the late 1960s to about 1.3 per cent per annum in 2010. The medium variant population forecast of the United Nations projects that global population will be about 9.3 billion in 2050 (up from 6.9 billion in 2010) and then remain relatively stable thereafter. The challenges to the agricultural sector and to the environment posed by population growth and diet upgrading over the next 40 years are considerable and will be discussed in subsequent sections. Nonetheless, prospects for permanently defusing the dismal and inexorable arithmetic set forth by Thomas Malthus in his 1798 *Essay on the Principle of Population*, that population grows geometrically while food supply only grows arithmetically, are clearly present.

Broadly speaking, over the past 50 years, aid has sought to improve the economic and social conditions of poor people, and, while far too many people still remain poor in today's world, the proportion of people who are poor has declined substantially. The role of aid in bringing about this improvement has been the subject of debate. However, the bulk of the available up-to-date evidence (generated in considerable measure under ReCom) points to positive and significant results. Aid has contributed to economic growth and to a host of other economic and social indicators (Arndt et al. 2010; 2011; Juselius et al. 2013; Mekasha and Tarp 2013)[9]. Obviously aid is not a panacea, and experience has taught us that aid for development is less potent than aid optimists had initially hoped.[10] Nevertheless, the aid system confronts the issues of today with a substantial wealth of experience and a track record of working towards the resolution of complex problems.

3.2 No shortage of development challenges

In spite of the positive results noted above, ample development challenges remain. With respect to the traditional concerns of poverty, vulnerability, and marginalization, more than one billion people are absolutely poor in today's world (as measured by the US$1.25/day criterion). In addition, 36 countries continue to be mired in low-income status. The OECD (2012a) characterizes an even larger number of states, 47, as fragile, implying that some middle-income countries are characterized as fragile. The definition of a fragile state makes for sober reading:[11]

> 'A state with weak capacity to carry out the basic state functions of governing a population and its territory and that lacks the ability or political will to develop mutually constructive and reinforcing relations with society (OECD 2011a)'.

The presence of some large middle-income countries in the fragile state category and the graduation of some very populous countries, particularly India and China, to middle-income status have dramatically altered the profile of the countries where the majority of poor people reside. Not long ago, the vast bulk of absolutely poor people lived in low-income countries. Today, about three out of four absolutely poor persons live in middle-income countries. As a consequence, development concerns with respect to the poor of the world must encompass middle-income countries, especially those where the poor or other disadvantaged groups, who are often women,[12] are excluded from ongoing development processes.

3.3 Environmental challenges

Huge environmental challenges overlay and interact with the more traditional development challenges. Humanity is considered by many scientists to have entered the epoch of the 'anthropocene' where human activities out-compete natural processes in terms of impacts on the environment (Crutzen 2002).

In the past two centuries, the human impact on the environment has frequently been acute, particularly on relatively localized scales. As the scope of human activity has expanded, so has the scale of environmental issues. Humanity now confronts a series of environmental challenges grouped under the rubric of global environmental change. Rockström et al. (2009) propose a set of nine planetary boundaries:

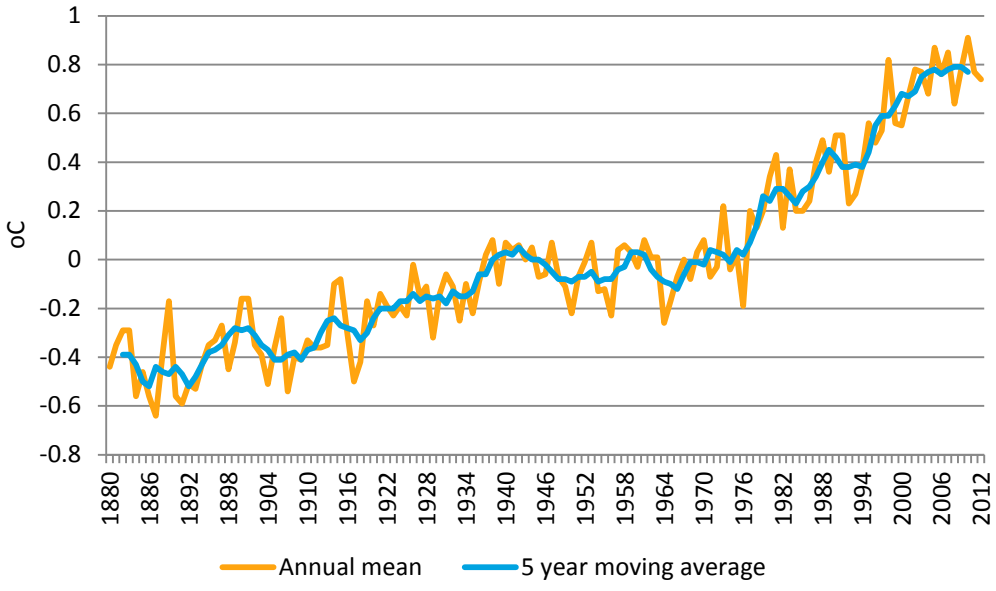
- Climate change;
- Rate of biodiversity loss;
- Nitrogen cycle;
- Phosphorous cycle;
- Stratospheric ozone depletion;
- Ocean acidification;

- Global freshwater use;
- Change in land use;
- Atmospheric aerosol loading; and
- Chemical pollution.

According to Rockström et al. (2009), these boundaries are either already surpassed or threatened 'largely because of a rapidly growing reliance on fossil fuels and industrialized forms of agriculture' (Rockström et al. 2009). While each of these boundaries is critical in its own right, climate change sits at the top of the list for good reasons given its potential to utterly transform the environment of the planet and its role as a driver behind other planetary boundaries such as biodiversity loss and ocean acidification (World Bank 2012b). Climate change is also intricately linked with agriculture most obviously in terms of the implications of climate for agriculture. Agriculture, including forestry, is also a driver of climate that can potentially operate as either a major emissions source or major emissions sink. Stabilization of global temperatures requires transformation of energy systems and an evolution of agricultural systems away from agriculture as a source of emissions and towards agriculture as an emissions sink. Because energy and agricultural systems are also core elements of economic development, we focus our discussion on climate change in this section. Agriculture receives special attention in later sections.

Figure 6 illustrates global mean surface temperature trends since the dawn of the industrial revolution. The upward trend in global mean temperature is clear.

FIGURE 6
Global mean surface temperature anomaly



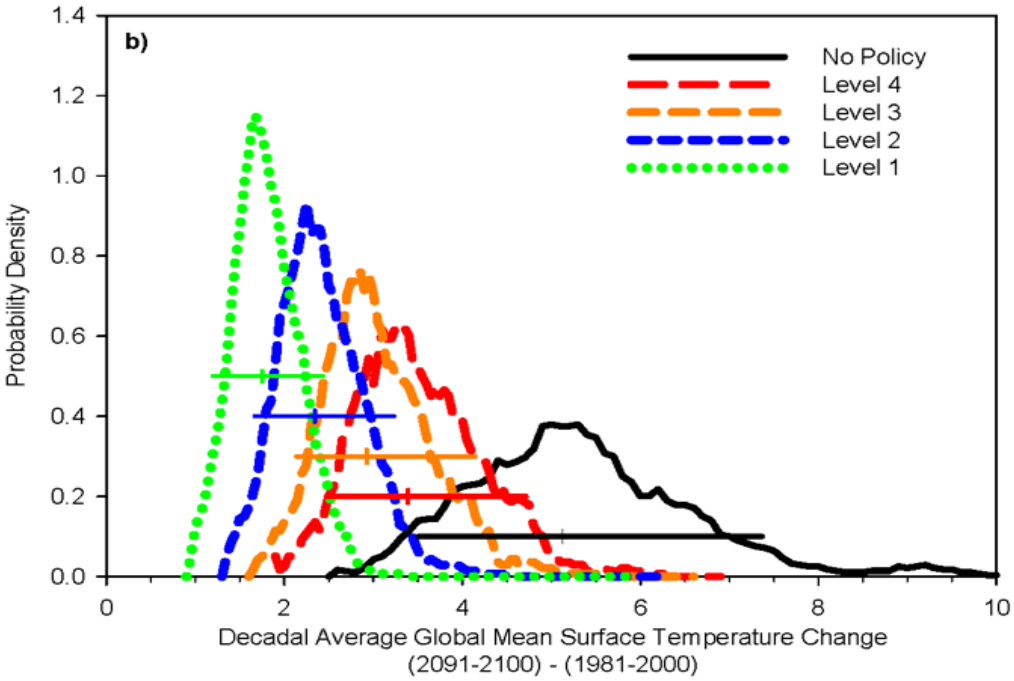
Source: United States National Aeronautics and Space Administration.

In considering climate change, two points deserve to be highlights:

- First, impacts will phase in over time. Even though the accumulation of GHGs in the atmosphere is affecting our climate today, the vast bulk of the implications of climate change will unfold over the course of the twenty-first century. Particularly in the absence of mitigation policy, climate change impacts are likely to be much more profound in the latter half of the twenty-first century than in the next decade, for example. This does not mean that climate change impacts over the next few decades can be ignored. Rather, it means that the degree of climate change in the next few decades is likely to be small relative to what is coming in the latter part of the twenty-first century, again particularly if adequate global mitigation policies fail to materialize.
- Second, the exact extent of warming and associated impacts is not known with certainty. Robust findings include increases in global average temperatures, an increase in precipitation globally, rising sea levels and an increased probability of extreme weather events. At the same time, the particulars of climate change are often deeply uncertain, meaning that it is difficult to determine the range of potential outcomes and the likelihood of a given set of outcomes. For example, while total rainfall globally is robustly predicted to increase, projections of the distribution of future rainfall both across space and seasonally often range from substantial increases to substantial decreases (Solomon et al. 2007).[13]

Figure 7 provides estimated distributions of global average temperature increases. The horizontal axis shows projected global mean temperature change in ^{o}C comparing the end of the twentieth century with the end of the twenty-first century. The vertical axis is a measure of likelihood. The coloured lines in the figure represent an attempt to define the range of potential temperature changes by the end of the twenty-first century and the likelihood that any given set of outcomes will occur under alternative policy scenarios for limiting global GHG emissions. The figure illustrates well the above two fundamental points of climate change, which need to be understood when grappling with what foreign aid could do in the future to be most effective.[14]

FIGURE 7
Estimated frequency distribution of global mean surface temperature change by 2100 (°C)



Source: Webster et al. (2012).

A number of implications arise from the figure. As noted, the precise magnitude of global temperature increase is unknown. In the absence of mitigation policy, represented by the black line labeled 'No Policy', global average temperature rise over the course of the twenty-first century ranges from a minimum of about 2.5°C to more than 10°C with the most likely outcomes clustered around 5°C.

Two sources of uncertainty drive this wide range in temperature outcomes. First, the rate of change in the concentration of GHGs in the atmosphere over the course of the twenty-first century is unknown. GHG concentrations depend upon changes in technology, the nature and rate of economic growth, population growth, policies pursued (especially mitigation policy), and other factors. Second, the temperature change associated with a given increase in concentrations of GHG is not known precisely. For example, the rate of change in global temperature as a result of changes in the composition of the atmosphere is difficult to estimate. Temperature increases will phase in; so a graph similar to Figure 7 but focused on 2050 would illustrate a temperature increase of 1–3°C in the 'No Policy' scenario relative to the average at the end of the twentieth century. In conclusion, we highlight that there is uncertainty—but around a very high level of temperature increase.

The right hand side of the distribution depicted in Figure 7 is particularly sobering. Under the 'No Policy' scenario, the likelihood of global temperature increases of 7°C or more over the course of this century are about 9 per cent. This estimate of likelihood is itself uncertain and likely to be refined.

Nevertheless, the prospect of the global climate tipping irreversibly towards a vastly warmer equilibrium level that is potentially very dangerous to humankind constitutes one of the most potent arguments for the implementation of mitigation policy in the near term; and therefore should not be ignored in research and in policy-making (Weitzman 2011).

The final observation from Figure 7 sounds a more optimistic note. Policy matters. The colored lines in Figure 7 show temperature changes under alternative mitigation policy scenarios. Level 1 'Stabilization' reflects atmospheric concentrations of GHGs at about 560 parts per million (ppm) CO_2 equivalent or an approximate doubling of concentrations relative to pre-industrial levels. Levels 2, 3, and 4 reflect, respectively, concentrations of about 660, 780, and 890 ppm CO_2eq at the end of the century while the 'No Policy' scenario reflects a median concentration of about 1,330 ppm. Mitigation policies result in a much cooler globe on average and dramatically lower the likelihood of extreme outcomes.

Unfortunately, global emission levels at present are consistent with the 'No Policy' scenario. It is important to highlight that Figure 7 depicts likely temperature rise from the end of the twentieth century rather than from pre-industrial levels. Drawing from Figure 6, the distributions in Figure 7 would need to be shifted to the right by an additional 0.8°C to compare with pre-industrial levels. Based on Figure 7 and including this rightward adjustment, the 'No Policy' scenario yields global temperature rises at the end of the twenty-first century that are uniformly substantially greater than 2°C. This implies, on current track, a near certainty of temperature rises associated with 'dangerous anthropogenic interference with the climate system' (United Nations 1992) and a disturbingly high probability of extreme, potentially catastrophic, temperature outcomes in the latter half of this century (Weitzman 2011).[15]

3.4 Development aid and climate finance

Climate change is in the process of transforming the environment of the planet over the course of the twenty-first century. With respect to foreign assistance, climate change is also potentially transformative. This is true for a number of reasons but may be understood simply from the potential financial magnitudes involved. The incremental financing and investment needs for climate mitigation and adaptation in developing countries are, without doubt, difficult to assess. Large variations across studies are observed often due to differences in methods, targets, and time frames.[16] Nevertheless, the numbers are uniformly large with recent assessments placing incremental financing and investment needs for climate mitigation and adaptation at values greater than the estimated financial needs to meet the MDGs, often by a factor of two or more.

To date, while some promises have been made, actual funding to address mitigation and adaptation needs in developing countries is nowhere near any of

the estimates. Furthermore, the relative roles of private finance, domestically sourced public finance, and international finance remain to be worked out. It is highly likely that international public finance (aid) will account for no more than a relatively small fraction of the needs (Vandeweerd et al. 2012). In the best of circumstances, international public finance will have catalytic and advisory roles with the bulk of actual financing coming from private and domestic public sources. Even so, the potential for environmental issues in general and climate finance in particular to significantly influence aid flows and aid institutions is large (Arndt and Bach 2011).

These large incremental needs reflect a widespread recognition that developing countries, with their high climate sensitivity and relatively low adaptive capacity, are likely to be particularly vulnerable to climate change (Parry et al. 2007). As a result, developing countries and development institutions have begun to pay particular attention to environmental issues in general and climate change in particular. The particular forms of response can be divided into three groups:

- Enhance the profile of environmental considerations in existing aid operations;
- Launch new institutional initiatives; and
- Reform existing institutions in order to better address environmental issues.

The next section considers each of these responses of foreign aid in turn. It also provides selected examples of environment and climate change aid.

4 Key areas and means of intervention

4.1 Environmental aid flows

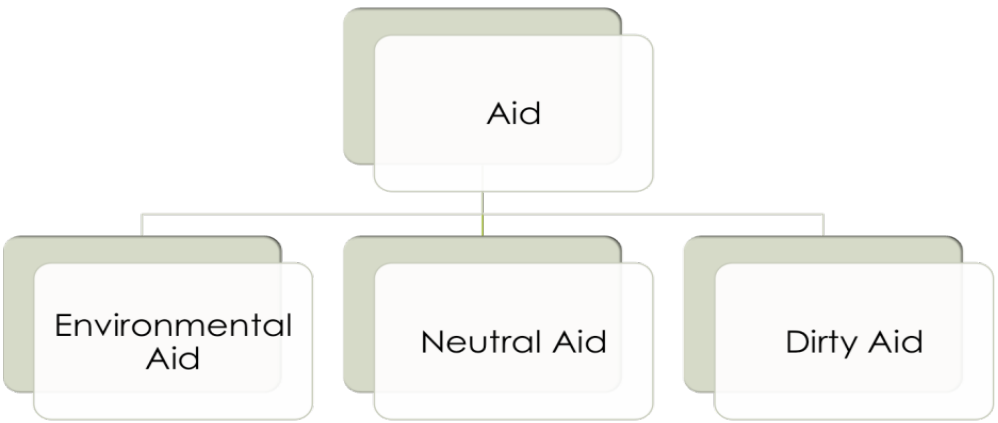
4.1.1 Categorizing aid funds and flows

There have been numerous attempts to analyse the allocation of environmental aid. They have focused largely on environmental aid as a public good (Kapur 2002); the normative evolution of environmental aid lending practices among donors (Hicks et al. 2008); and the use of game theory to explain environmental aid allocation (Bernheim and Whinston 1986; Kaul et al. 2003). In many instances, studies of aid allocation rely on donors to self-identify environmental projects in their aid portfolios. This is problematic due to the lack of a standardized and widely understood identification process.

Marcoux et al. (2013) independently assess all aid at the project level for environmental impact drawing on the AidData.org data portal. The AidData.org portal seeks to provide a complete and detailed picture of foreign assistance activities globally. It currently contains US$5.4 trillion in official government assistance in over a million project/activity records. Rather than rely on reporting by donors as is the case with OECD data, aid projects in the AidData.org data portal are independently categorized according to their environmental type and projected average result.

Based on project descriptions (also from the AidData.org data portal), a combination of automated and manual case matching was conducted. Each project in the database was categorized as environmental aid, neutral aid, or dirty aid as illustrated in Figure 8.

FIGURE 8
Environmental aid categorizations



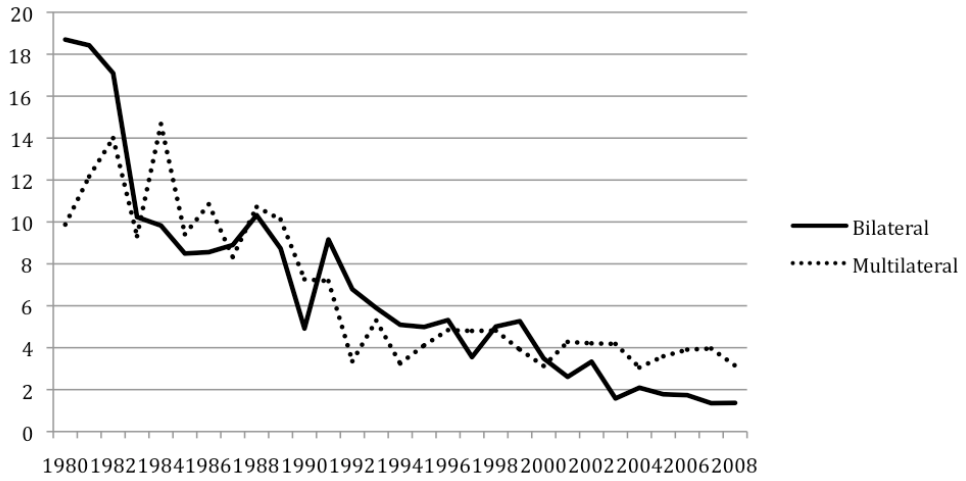
Source: Marcoux et al. (2013).

Consistent with the naming conventions employed in the AidData.org data portal, environmental aid projects were further categorized between those focused on localized environmental issues, labelled 'brown' aid, and those focused on supra-national environment issues, labelled 'green' aid.[17] So what do we learn?

4.1.2 Trends

Three major trends emerge from an analysis of the dataset. First, aid flows have been trending towards more environmental assistance. Figure 9 illustrates the global ratio of dirty to environmental aid since 1980. This ratio has been trending downward for both bilateral and multilateral aid. The change is substantial with the ratio falling from about seven in the early 1990s (for both sources) to about one and three for bilateral and multilateral aid respectively by 2008.[18]

FIGURE 9
Ratio of dirty to environmental aid flows by channel



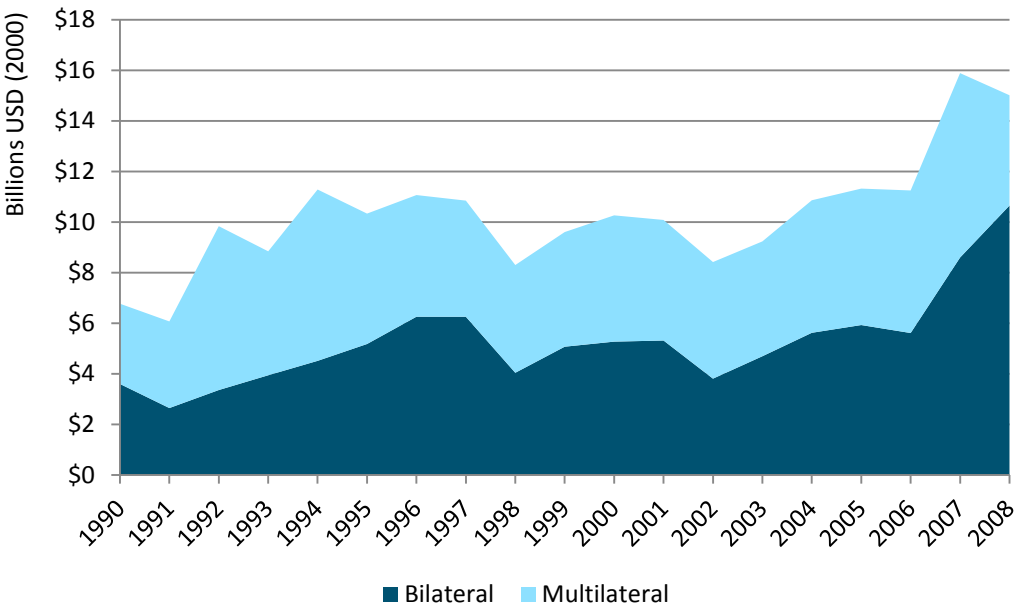
Source: Marcoux et al. (2013).

Second, environmental aid is increasingly coming from bilateral sources as shown in Figure 10. This trend has been particularly marked in recent years. In 2000, bilateral aid represented about half of the US$10 billion (real US$ 2000) categorized as environmental aid. By 2008, bilateral aid represented about two thirds of the US$15 billion (real US$ 2000) categorized as environmental aid. In other words, the volume of environmental aid from bilateral sources approximately doubled while the value of environmental aid from multilateral sources remained essentially constant.

Third, funding has recently been shifting from local environmental issues ('brown' aid) to supra-national environmental issues ('green' aid) as illustrated in Figure 11. AidData.org estimates that roughly US$2 billion (real US$ 2000) was annually allocated in supra-national environmental aid between 1990 and 2005. This amount has recently increased to nearly US$6 billion (real US$

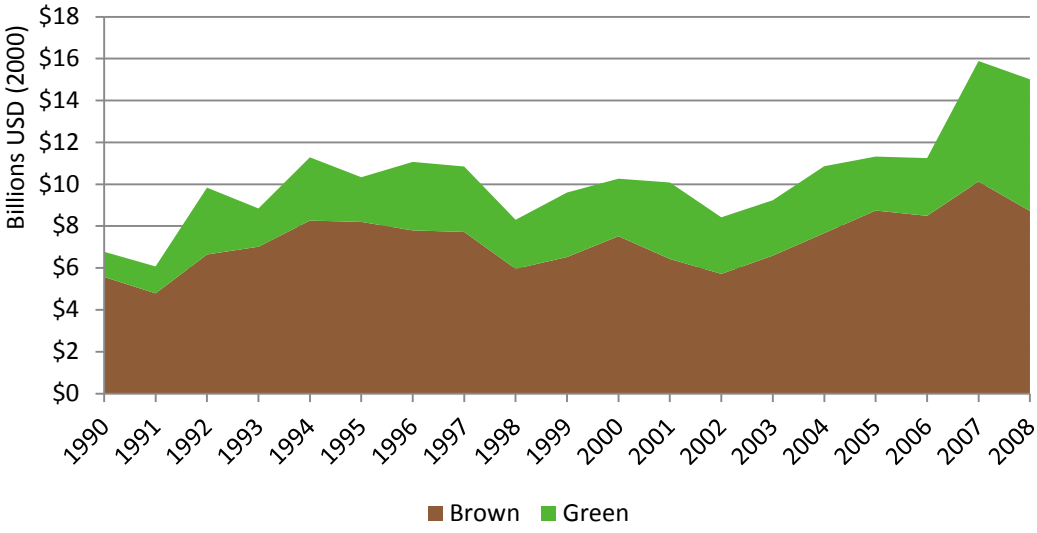
2000) accounting for roughly 40 per cent of total environmental assistance with climate change adaptation assistance a notable driver of this trend.[19]

FIGURE 10
Bilateral and multilateral environmental aid flows



Source: Marcoux et al. (2013).

FIGURE 11
Environmental aid flows by supra-national (green) and local (brown) environmental objectives



Source: Marcoux et al. (2013).

However, it must be noted that current aid levels are modest compared to the estimates regarding the costs that climate change adaptation and mitigation require. (Addison et al. 2011) note that international estimates of the per annum costs for developing countries range between US$140–175 billion by 2030 for mitigation and US$75–90 billion for adaptation, whereas current total *official development assistance* (ODA) levels are around US$100 billion per annum.[20]

4.1.3 Assessment

The identified trend towards a greater focus on the environment in general and climate change adaptation in overall assistance patterns is understandable given the potential importance of climate change. It is, as already noted above, well-accepted that a considerable degree of warming is already built into the global climate system (Solomon et al. 2007). Hence, regardless of whether global mitigation policies are adopted (or not) in the relatively near future, developing countries will have to adapt to climate change. Projects designed to assist developing countries in their efforts to adapt to climate change have formed a significant portion of the recent trend towards more environmentally oriented assistance (Marcoux et al. 2013).

From the perspective of aid allocations for adaptation, the following two interrelated questions are pertinent:

- When are serious climate change development impacts likely to be felt?
- What are the best adaptation options from a development perspective?

The timing of climate change impacts is a matter of considerable debate. Consider, for example, the debate on the implications for agricultural yields, which has the virtue of being well- developed and usefully illustrating a series of fundamental issues. We begin with those finding strong impacts on agriculture and agricultural production in the relatively near term, and then turn to studies which suggest more modest impacts.

On the one hand, for Africa, Working Group II's contribution to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment (AR4) states that 'projected reductions in yield in some countries could be as much as 50 per cent by 2020, and crop net revenues could fall by as much as 90 per cent by 2100, with small farmers being the most affected' (Parry et al. 2007). Lobell et al. (2011) use experiment station data on maize field trials in Africa and find that 'roughly 65 per cent of present maize-growing areas in Africa would experience yield losses for 1°C of warming (very likely to occur prior to 2050) under optimal rain-fed management'. These are large impacts.

On the other hand, Ringler et al. (2010) report reductions in maize yields in SSA of about 5 per cent on average due to climate change by 2050 using process-based crop models developed by the International Food Policy Research Institute (IFPRI). Impacts on other crops vary from stronger (root crops, such as cassava and yams) to slight or mildly positive (rice, millet, and sorghum). These estimates produced by Ringler et al. (2010) are not outliers.

For example, the Ringler et al. estimate of the impact of climate change on maize yields is quite close to the average for maize presented in a meta-analysis of crop yield studies in low latitudes, which can also be found in the contribution from Working Group II of the AR4 (Parry et al. 2007).

Recent assessments combine a series of known impact channels and consider growth and development implications out to 2050. These assessments conclude that, while expected climate change is likely to negatively affect overall growth/development with strong negative effects for some sectors and regions, climate change is unlikely to derail development prospects at least over the next three decades or so (World Bank 2009; 2010; Arndt et al. 2012). These three assessments rely on crop modelling approaches similar to those of Ringler et al. (2010). They also ignore impact channels where information is highly fragmentary, such as implications for human health. Greater reductions in crop yields or the failure to incorporate an important impact channel would result in larger macro-economic effects with lower income households likely to suffer more.

The broad ranges in estimates of developmental impacts, even in the relatively well developed domain of implications for agriculture, highlight the potential pitfalls associated with adaptation policies. Consider only the quantity and distribution of rainfall. Should one prepare for more or less precipitation? Science gives no sure answer. Unfortunately, while the attention accorded to climate change adaptation has solid foundations, the best adaptation policies are far from clear. The possibilities for 'mal-adaptation'—especially preparing for one climate future when a different future may actually occur—are substantial. As a result, it is not always clear that shifting from traditional development priorities to identified or suggested adaptation priorities is in practice the best adaptation policy.

In order to cope with these uncertainties and avoid 'mal-adaptation', emphasis in recent work has been placed on flexible and robust policies that provide benefits across a broad range of potential climate futures (Hallegatte 2009; World Bank 2009; 2010; Arndt and Thurlow 2013). Policies and aid programmes that allocate greater attention to agricultural research, regional river basin management, and vulnerability of infrastructure to extreme events are likely to provide benefits across a broad array of climate futures; and in a variety of both low- and middle-income countries. Agricultural research has the added benefit of helping developing countries that are hit hardest by food price crises, by accelerating the development of their agricultural sectors and thus alleviating worries regarding future food security issues. These efforts need to be integrated with institutional reforms, however, to insure their effectiveness (Abbott 2012).

More generally, because more developed societies generally have the human and institutional capabilities to cope with shocks and to take advantage of new opportunities, it may well be that the best adaptation to climate change, alongside the flexible and robust policies mentioned above, is rapid development that leads to a more flexible and resilient society. Countries that reach the middle of the twenty-first century with large shares of their

populations engaged in subsistence agriculture, substantial illiteracy, and lethargic institutions, may face grim prospects indeed. This is especially true if the global community fails to develop a fair and effective mitigation policy. As such, the adaptation agenda, in significant measure, reinforces the existing aid and development agenda.

The vast uncertainties associated with climate change underscore, in particular, the importance of two already prominent items on the aid and development agenda. They are:

- Human capital accumulation: A more educated populace is more likely to be able to adapt to the challenges posed by global change, whatever they turn out to be. Chen and He (2013) find that educational improvements can translate directly into heightened climate change mitigation and adaption.
- Flexible and competent public and private institutions: within any given country, a particular sector or a particular set of regions may be negatively affected, while other sectors or regions may be stimulated.

The basic premise is that a more educated populace, supported by flexible and competent public and private institutions, will be better able to react to these differential implications as they present themselves. This resiliency to climate change will also apply to confronting other developmental and environmental challenges (see also Moberg and Simonsen (2011)).

However, even aggressive adaptation policies cannot endlessly substitute for mitigation policies. As illustrated in Figure 7, potentially catastrophic levels of warming are possible on the current emissions trajectory. Consequently, there is a strong interest in mitigation. This mitigation imperative has been a driving (or the driving) force behind a series of institutional aid-related initiatives, to which we now turn.

4.2 Institutional initiatives

The following sub-sections describe four institutional initiatives with significant or full engagement in mitigation activities:

- Reducing Emissions from Deforestation and Forest Degradation (REDD);
- Clean Development Mechanism (CDM);
- Global Environment Facility (GEF); and
- Green Climate Fund (GCF).

An assessment of these initiatives is contained in a final sub-section.[21]

4.2.1 Reducing Emissions from Deforestation and Forest Degradation (REDD)[22]

In 2007, the annual conference of the parties (COP) of the UN framework convention on climate change (UNFCCC) decided to fully integrate forests in developing countries into the negotiations on a new climate agreement. Under the heading of REDD or REDD+ (also including carbon stock enhancements), forests are seen as critical in limiting global warming to 2°C or less (Hertel 2013b; Hertel 2013a; Reilly et al. 2013). Donors have pledged billions of dollars, countries have developed and started implementing national REDD+ strategies, NGOs and other proponents are engaged in hundreds of REDD+ projects at the local level (some of which are further referred to in Section 4.4).

REDD+ was originally an idea about payment to countries and projects for reduced emissions through preservation or enhancement of forests, with funding primarily from carbon markets. Since then, REDD+ has changed focus in several significant and interrelated ways:

- First, it has moved from a carbon focus to become multi-objective, with livelihoods/poverty, biodiversity, indigenous rights, good governance, etc. being added as worthy objectives.
- Second, international funding mainly comes from bilateral and multilateral development aid budgets rather than carbon markets.
- Third, the domestic policy dimension has changed from payments for environmental services (PES) to broader policies. This change has been driven by several factors, including the lack of a new international climate agreement (making market funding unavailable); the numerous challenges of establishing a PES system; and the political dynamics of REDD+, where different interest groups have inserted their agendas into the REDD+ agenda.

Today, at the international level REDD+ appears quite similar to previous efforts of conditional and result-based aid. This 'aid-ification' of REDD+ (Seymour and Angelsen 2012; Wertz-Kanounnikoff and McNeill 2012) can be explained by several factors.

- First, other sources of finance were unavailable due to the failure to establish a global carbon market that integrates REDD+ credits.
- Second, many donors were involved in the REDD-relevant sectors (forest, conservation, rural development, institution building, etc.), with ongoing activities that could, with light modifications, be relabelled as REDD+.
- Third, the aid system already provided a mechanism and modality to transfer fresh money to REDD+ countries.
- Fourth, REDD+ money was labelled as aid in order to reach international targets for aid as share of GDP.

Yet, the core idea of REDD+ as aid is to apply conditionality or make payments to countries (and projects) that are performance- or results-based. We note that performance-based aid (PBA) or conditional aid is by no means new. For example, conditionality was an essential part of the structural adjustment programmes (SAP) from the mid-1980s, led by the World Bank and IMF.

SAPs have been both credited with (eventually) bringing about the macro-economic stability that has underpinned recent greatly improved growth performance in Africa and criticized as a form of neo-imperialism and ill-conceived packages of first best policy in realities that suffered from structural rigidities and fundamental development challenges not addressed in simple economic models. Disbursement of aid money in SAPs was supposed to be conditioned on deep policy reforms, and a leading development economist notes: 'This is indeed the core of what conditionality is supposedly about—aid buys reform. Unfortunately, it does no such thing' (Collier 1997: 56). Results- or output-based aid has also been applied in other areas, e.g., in the health sector (Eldridge and Palmer 2009).

Whichever view of SAPs is taken, REDD+ has notable similarities to SAPs and other forms of PBA, but this experience is rarely brought into the REDD+ debate (an exception is Resnick et al. (2012)). Angelsen (2013) propounds three reasons for this phenomenon. First, the poor reputation of SAPs and conditional aid in many circles may cause hesitation to consider parallels. Second, despite the engagement of a number of traditional development institutions, Angelsen's analysis finds that REDD+ has often been driven by environmental (and climate) agencies with limited development aid experience, and ability to assess the inherent trade-offs in making choices for the future. Third, it is probably also a human faculty to think that 'this time it's different'. But, most of the experiences and challenges of PBA in other sectors are highly relevant to REDD+ aid and should be considered more explicitly.

This discussion is not meant to dismiss the idea of purchase of environmental services in general or the REDD+ initiative in specific. In fact, in the assessment set forth in section 4.2.5, we conclude that the fundamental idea is sound and worth pursuing. Rather, it is to point out that performance-based transactions within the aid system have not always been as straightforward as originally hoped. Lessons from earlier efforts, especially the need for credible monitoring of outcomes and the need to credibly deliver payments (or not) contingent on those outcomes, apply directly to REDD+ (Angelsen 2013; Kauppi 2013). Pascual et al. (2013) provide greater details).

4.2.2 Clean Development Mechanism (CDM)

As specified in Article 12 of the Kyoto Protocol, the CDM was set up with two equally important aims: to mitigate GHG emissions in a cost-effective manner, and to boost sustainable development in the host countries. The dual objectives of the CDM are meant to serve as important drivers for both developing countries and developed countries to engage in CDM projects.

The CDM embodies the principle of 'common but differentiated responsibilities'. It seeks to flexibly involve developing countries in the world's GHG abatement activities while incorporating sustainable development objectives explicitly into emission reduction efforts. This mechanism itself is an innovation which is meant to contribute to carbon pricing and 'commodification' processes and aims at generating synergies between global emission reduction targets and local sustainable development objectives (Olhoff et al. 2004). More specifically, it is the first global environmental offset instrument of its kind, providing financial incentives for the developed countries to invest in low-carbon projects in the developing countries which help to induce the host countries onto a low-carbon development path, and contribute to the stabilization of the global atmospheric GHG emissions.

One major concern with the CDM is its additionality (Schneider 2007; Rosendahl and Strand 2009). As an offsetting mechanism, CDM projects should contribute to global emission reductions. The CDM provides value by offering credits for eliminating GHG emissions that are 'additional to any that would occur in the absence of the certified project activity' (UNFCCC 2011). As stated by Rosendahl and Strand (2009), the CDM, as an offset mechanism, keeps global carbon emissions levels the same but shifts emissions reduction costs from Annex I countries, where emission reduction costs are higher, to non-Annex I countries, where emission abatement costs may be much lower. If there were no flaws with CDM, the globe would attain the same level of abatement at lower cost. These cost savings can be used to benefit both developed and developing countries.

In the absence of comprehensive accounting for GHG emissions by country, the assessment of additionality is not easy. For example, the integrity of the CDM might be contaminated by baseline manipulation (Rosendahl and Strand 2009). People are also concerned that CDM's focus on low-cost emission reductions might, to some degree, compromise the host countries' sustainable development (Paulsson 2009).

So far the existing research evidence is mixed. On the one hand, there is research claiming that CDM has questionable additionality and has failed to bring about real and additional emission reductions to the host countries (Schneider 2007; Rosendahl and Strand 2009). An examination of 93 randomly selected CDM projects as well as interviews and literature review conducted by Schneider (2007) find that about 40 per cent of the CDM-registered projects were questionable in terms of additionality. Based on a series of model analysis, Rosendahl and Strand (2009) argue that CDM projects do not imply full offset of GHG mitigation.

On the other hand, there is empirical evidence for CDM's positive impacts on emission reductions (Sutter and Parreño 2007; Lütken 2011). By comparing the pre-CDM predictions of the mechanism's market size with the projections of the current trajectory of potential mitigation entering the CDM pipeline, Larson et al. (2010) find that, despite its limitations (unbalanced sector composition), CDM has been very successful in achieving emission reductions and is well on the way to reaching an average annual flow of 700 million

certified emissions reductions by 2012. The study by Lütken (2011) on the geographic distributions of CDM projects demonstrates that the least developed countries (LDCs), especially in Africa, have also enjoyed a reasonable share of the world's total launched CDM projects. Sutter and Parreño (2007) and Huang et al. (2012a) are also positive with respect to the achievement of emissions reductions in CDM host countries.

The contribution of CDM to sustainable development is also debated. Some researchers claim that CDM projects have not benefited host countries in terms of sustainable development (Olsen 2007). Paulsson (2009) argues that in some cases reduced emissions have come at the expense of sustainable development objectives. However, others argue that that CDM has brought considerable sustainable development benefits to host countries (Austin et al. 1999; UNFCCC 2011; Huang et al. 2012b).

We assess the CDM generally in Section 4.5.

4.2.3 Global Environmental Facility (GEF)

In response to the challenges of climate change, the international community has initiated several global funds raised through both bilateral and multilateral channels for 'climate finance' for developing countries (OECD 2009). Under the UNFCCC, two multilateral funds address climate-related needs and are managed by the GEF. They are the Least Developed Countries Fund and the Special Climate Change Fund (SCCF) (OECD 2009; Pettengell 2009). The GEF unites 182 countries in partnership with international institutions, NGOs, and the private sector to address global environmental issues while supporting national sustainable development initiatives.

The GEF is currently the largest public funder of projects to improve the global environment. As an independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has provided US$9.2 billion in grants and claims to have leveraged more than US$40 billion in co-financing for more than 2,700 projects in more than 168 countries. This amount is not large compared to other flows. For example, the total amount of official development assistance (ODA) disbursed by Development Assistance Committee (DAC) donors in 2012 (a single year versus the cumulative total over more than two decades) amounted to approximately US$130 billion.

As this section is concerned with mitigation, we focus here on the mitigation activities of the GEF. Operational Programmes 5 and 6 of the GEF focus on helping countries remove 'barriers to large-scale application, implementation, and dissemination of least economic cost energy-efficient technologies (whether commercially established or recently developed)' (GEF) and remove 'barriers to the use of commercial or near-commercial renewable energy technologies (RETs), reduce any additional implementation costs for RETs that result from a lack of practical experience, initial low volume markets, or

from the dispersed nature of applications, such that economically profitable "win-win" transactions and activities increase the deployment of RETs' (GEF).

The aims of the GEF range from removing institutional and capacity related barriers, helping establish energy service companies, helping develop viable and sustainable markets for renewable energy technologies through the formulation of appropriate policy and regulatory frameworks, supporting demonstration projects to show viability of introduction of renewable energy in remote areas, and promoting lifestyle changes (GEF).

The recent report by Ravindranath et al. (2012) emphasizes that GEF 6 (2014 to 2018) strategies should be directed towards moving investment from single technology or component-based initiatives to systemic approaches—including a combination of energy demand reduction, low-carbon option deployment, innovative IT systems, energy security, and policy and capacity development. This report concludes that the GEF should continue assisting recipient countries to select and evaluate technologies, policies, measures, regulations, financial (dis-)incentives and financial needs, technology transfer mechanisms, and institutional capacity that will help them to move more rapidly and comprehensively to a low-carbon pathway, consistent with national sustainable development goals (Ravindranath et al. 2012).

4.2.4 Green climate fund (GCF)

The UN climate negotiations in Copenhagen in late 2009 ended with only a voluntary agreement on reducing emissions, and not even full consensus on that (Ciplet et al. 2013). However, after pressure from the G77 and threats from the Africa group to walk out, it did result in a major pledge from wealthy countries on climate finance.

The Copenhagen Accord promised US$30 billion in 'fast start' climate finance to be delivered in 2010–12, 'scaling up' to a total of US$100 billion a year, 'jointly mobilized' by states, but including private and public funding in the form of loans and grants. Both were promised to be 'balanced' between funding for emissions reductions (mitigation) and for coping with climate impacts (adaptation).

This newly-established GCF is being operationalized with the Republic of Korea hosting the GCF Secretariat. Its new 24-member board has equal representation from the developed and developing countries (Marcoux et al. 2013). Parties agreed that the Fund will be overseen by a body under the United Nations, as advocated by developing countries, rather than the GEF, which was advocated by the USA and EU, and direct access to funds will be allowed.

Developing country delegates and civil society campaigners from both the North and South have essentially pursued a strategy of 'if you build the institutional structure, the funds will come'. However, history indicates that many funds have been created in multilateral processes but have been inadequately financed. While the steps toward the establishment of the GCF

have been widely celebrated as a victory, important questions remain unanswered about how much funding it will govern. To date, adequate financing has not been forthcoming, and actual operations have not yet begun.

With respect to revenue, the report of the High Level Advisory Group on Climate Change Finance (2010) assesses the potential revenue sources in order to achieve the US$100 billion target by 2020. Carbon taxes levied in developed countries are highlighted as a chief source of finance to be channelled towards developing countries via the Green Climate Fund. This group estimates that in 2020, 10 per cent of total revenues from carbon taxes in developed countries, or about US$30 billion per year if the carbon tax is US$20–25 per ton, could be redirected towards developing countries. An additional US$10 billion could be raised and channelled to LDCs if fuels used for international transportation were subjected to the same tax.

Beyond the (hypothesized) carbon taxes, the group did not achieve agreement on the sources or composition of the remaining US$60 billion, although they mention that it would likely contain private flows, loans, or grants from multilateral institutions, and perhaps some non-traditional revenue sources such as a financial transactions tax.

4.2.5 Assessment

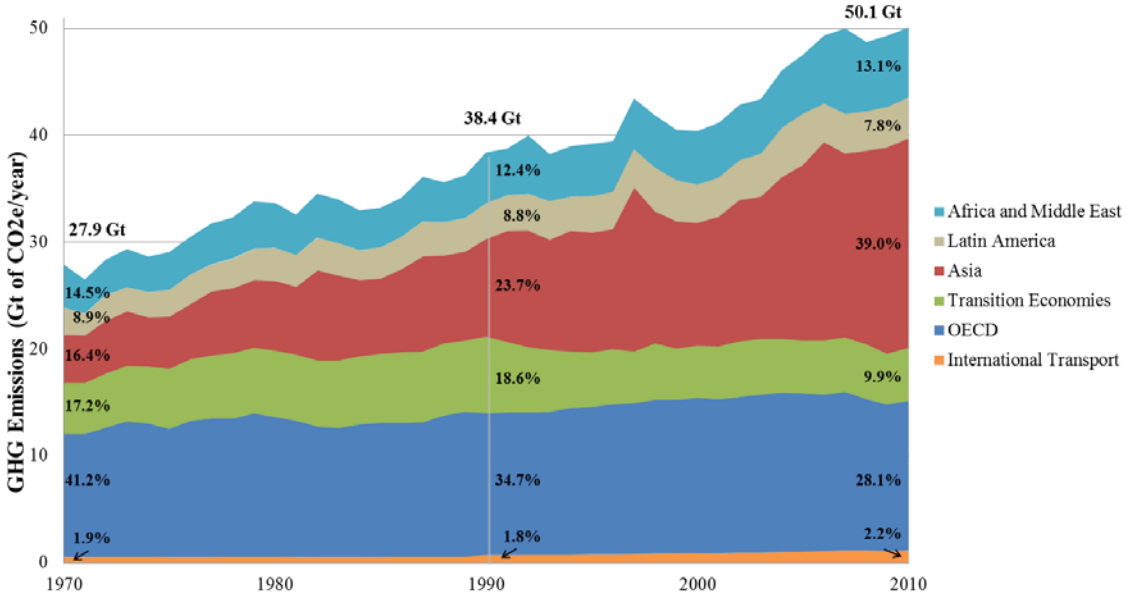
From the perspective of aid and aid institutions as well as development more broadly, two shared aspects of these four institutional initiatives merit mention.[23]

- First, the main focus in not on low-income countries. The REDD+ initiative is, in considerable measure, dictated by the location of forests. For example, Angelsen (2013) details the cases of Brazil and Indonesia. With respect to the CDM, more than half of all CDM projects have taken place in China (UNFCCC 2012a). The distribution of projects undertaken by the GEF is vast and weighted towards middle-income countries. Finally, the GCF, as emphasized, has not begun operations yet. However, as with the other funds, the mandate of the GCF would lead to a focus on middle-income countries.
- Second, the dearth of public policies designed to limit GHG emissions strongly limits the effectiveness of all four initiatives. As already emphasized, the functioning of REDD+ is limited by a lack of demand for emissions reductions. This has catalysed a shift towards an entity with features more in common with traditional development assistance. For the CDM, demand uncertainty for certified emissions reductions is the major issue discussed in the 2012 annual report of the Executive Board of the CDM. If nobody demands certified emissions reductions, then the CDM will cease to function. The GCF is, at the moment, essentially a hollow shell due to lack of financing. As noted, proceeds from a carbon tax are meant to be a major source of finance for the GCF by 2020. Finally, the GEF was never designed to finance the major transformations required to achieve sustainable emissions levels.

Rather, the GEF envisions a role 'crowding in' complementary private sector and local finance in order to drive the transformation process. Complementary public policies, such as a price on GHG emissions, would greatly facilitate the ability of GEF to play its envisioned role.

Figure 12 provides a perspective on the above two points with respect to the emissions reduction challenge. The importance of middle-income and newly developed countries in global annual emissions emerges clearly from the figure. In 2010, traditional developed countries, indicated here as members of the OECD in 1990, accounted for about 28 per cent of global emissions and international transport for about 2 per cent. The remaining 70 per cent, or approximately 35 giga tons of CO_2 equivalent per year, is emitted elsewhere. Asia is the largest emitting region. The general trend increase in global GHG emissions is also strongly apparent from Figure 12. Finally, since 1970, the vast majority (nearly 90 per cent) of emissions growth has occurred outside the countries that were members of the OECD in 1990.

FIGURE 12
Greenhouse gas emissions in CO_2 equivalent per year by region



Note: The GHGs are composed of CO_2 equivalent totals excluding short-cycle biomass burning (such as agricultural waste burning and savannah burning) but including other biomass burning (such as forest fires, post-burn decay, peat fires, and decay of drained peat lands), all anthropogenic CH4 sources, N2O sources and F-gases.
Source: Emission Database for Global Atmospheric Research (EDGAR) v4.2., JRC (2012) http://edgar.jrc.ec.europa.eu/index.php
Converted to CO_2 equivalent calculated using the GWP100 metric of UNFCCC. http://unfccc.int/ghg_data/items/3825.php
Regions based on IAMC AR5 Database https://secure.iiasa.ac.at/web-apps/ene/AR5DB/dsd?Action=htmlpage&page=about#regiondefs

Figure 12 illustrates clearly that current emissions trends are strongly at odds with global temperature stabilization objectives. To stabilize the climate,

emissions need to decline dramatically over the course of the twenty-first century rather than grow. Even if one allows for negative emissions (e.g., net sequestering of CO_2) towards the end of the twenty-first century, global emissions must begin to decline in the relatively near term and then must fall continuously to negative or near zero levels by the end of the century in order to keep temperature rise in the region of 2°C (Meinshausen et al. 2009).

In summary, the scale of the mitigation challenge is vast; and, international efforts to meet this challenge have fallen short by a considerable margin. The four initiatives discussed above represent a major share of the international response to date. However, it is widely recognized that the challenge cannot be met with public funds from public institutions alone. This is a key result, stated clearly by Vandeweerd et al. (2012):

> …actions to promote low-emission and climate-resilient development must be largely public policy-based and private-sector financed where international public finance is used catalytically alongside much larger capital flows. (page 2).

Because the public policy basis for emissions reductions is largely absent, it is difficult to evaluate whether these initiatives could in practice help catalyse a long-run process of transformation at the scale required while still leaving space for low- and middle-income countries to achieve well-established, more traditional development goals.

Nevertheless, the fundamentals behind the four initiatives appear to be sound. As noted, forestry is increasingly regarded as a promising relatively low-cost source for emissions reductions (relevant to REDD+). An increased reliance on renewable energy sources likely favours regions with more sun, wind, and unexploited hydropower potential. These regions are frequently located in developing countries, providing a basic rationale for the CDM. There are obviously enormous technical and policy challenges associated with transitioning to cleaner energy sources providing a rationale for the GEF. The basic idea behind the GCF, dedicating a portion of carbon tax revenues to help catalyse investment in low carbon sustainable development, is appealing. Finally, these and other institutions are gaining valuable experience in the opportunities and challenges associated with fostering the institutional and technical innovations that will be required to simultaneously achieve develomental and environmental objectives (Hultman et al. 2012). In short, these institutions should continue to press forward in anticipation of a more favourable public policy environment.

Whilst in this process, the international community could also profitably consider the institutional arrangements that might best capitalize on the fundamental rationales discussed in the preceding paragraph. The current mode, of which these four initiatives form a part, is international fund proliferation in response to specific needs. This mode is unlikely to be the best solution. While climate finance is not the only area subject to fund proliferation, it is a fertile one. The web site climatefundsupdate.org lists, as of November 2013, 23 distinct climate related funds.

As Arndt and Bach (2011) point out, fund proliferation reflects, at least in part, a lack of consensus on governing structures and distribution mechanisms. While developed countries have preferred using existing structures (notably the World Bank/GEF structure with respect to climate finance), many developing countries have preferred creating new structures with a more balanced representation and more direct distribution mechanisms. These tensions are evident in both climate finance and traditional development assistance. The general principle of direct access is in line with the Paris and Accra Declarations on aid efficiency. And, the creation of these funds is in line with the desire from developing countries for new governance structures as mentioned above. However, overall, the fund proliferation phenomenon represents an increased fragmentation of development finance with potentially negative implications for aid effectiveness.[24]

4.3 Reforms of existing institutions with focus on agriculture

4.3.1 Background and context

Developing countries continue to face massive challenges in developing their agricultural and rural sectors where some 75 per cent of the world's poor live. This amounts to no less than 900 million people, who depend in large measure on smallholder agriculture as their primary economic activity. Millions of rural individuals continue, in spite of the development successes referred to in Section 2.1 to be separated from their more wealthy counterparts elsewhere, not only by income inequality, but also by inequality of access to basic services and public goods.

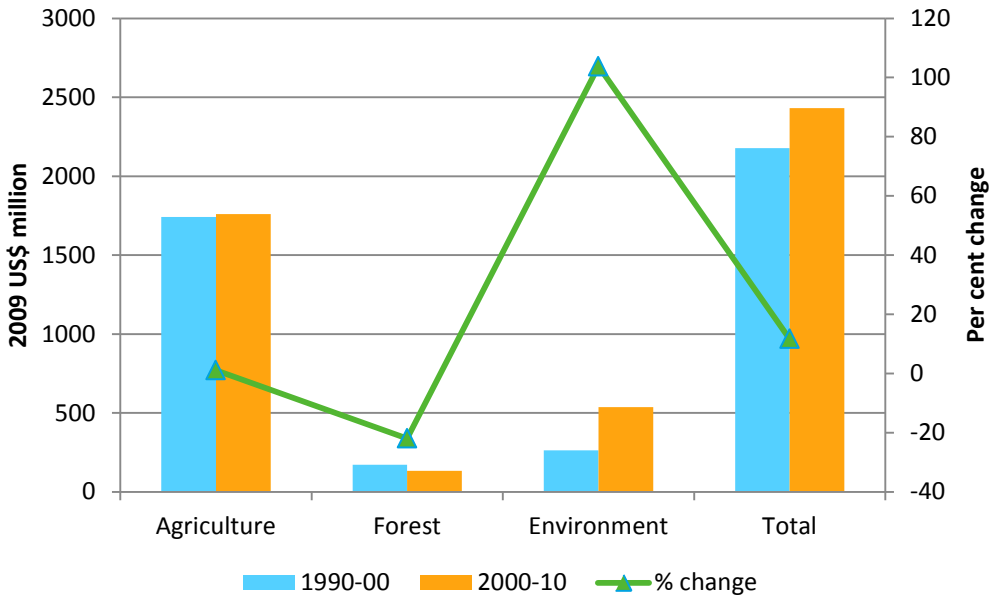
In a sense, the world is witnessing a bifurcation between agricultural systems in rich and poor countries, where farm size, agro-ecologies, technology adoption, market integration, and access to basic services are increasingly stratified along global and regional income lines. The lack of priority to agricultural development in aid allocations and aid practice over the past decades is, on this background, notable and has rightly been a cause of concern in both aid theory and practice.[25]

As noted, agriculture is the second major driver behind threats to surpass the planetary boundaries propounded by Rockström et al. (2009). Global environmental change has added a whole new dimension of complex trade-offs and issues to the agricultural development challenge (World Bank 2007). Overall, agriculture lies at the confluence of the sustainable development agenda. Agriculture is critical for growth and poverty reduction; it is strongly influenced by population growth and diet upgrading; it is impacted by climate change; it is potentially a source of low emissions energy via biofuels; it is a significant source of emissions through inputs, production practices, and land use change; and it is a potential emissions sink through reforestation and

sustainable land management. For these reasons, agriculture receives particular attention in this position paper.

The ministries of environment and agriculture in many SSA countries receive donor funds to support their budgets (Emerton et al. 2006; Lambert 2006; Wittemyer et al. 2008). For instance, the GEF invested about US$2 billion in protected areas programmes in Africa and Latin America in 1991–2006 (GEF 2006). Nkonya et al. (2013) show that total donor support to environment, agriculture, and forestry sectors increased by about 12 per cent in 2001–10 compared to its level in 1990–2000 (FIGURE 13).

FIGURE 13
Change in ODA and non-ODA support to agriculture, forestry, and environment, 1990–2000 to 2001–10



Source: Nkonya et al. (2013) based on Tierney et al. (2011).

In light of the very substantial challenges facing agriculture, Hertel (2013a) argues that 'pinning down technological progress [in agriculture] is the key to understanding the long run trajectory of the agricultural sector, food prices, and global land use'. Rapid technological progress in agriculture would provide space for the achievement of these multiple, conflicting goals. From a development and aid perspective, it is important to highlight that there are powerful reasons to believe that efforts at achieving technological progress should be focused on developing countries.

- First, an increasing number of specialists believe that yields in developed countries are approaching the biophysical limits at which the ability of plants to convert sunlight, water, and nutrients into grain cannot be easily increased. For example, Fischer et al. (2012) constrain further potential yield growth to roughly 20 per cent beyond current levels for these reasons. As yields in developing countries, particularly

those in Africa, are often a small fraction of potential yields, these biophysical limits essentially do not apply within relevant time frames.

- Second, because population growth and diet upgrading will be concentrated almost exclusively in developing countries, the vast majority of the growth in the demand for food will also be concentrated in developing countries. Food is most logically produced near potential demand sources. Again, Africa looms large in population projections and potentially in diet upgrading. According to the UN medium variant population projections, Africa will account for about half of global population growth between 2010 and 2050, by which time, nearly one in four people on the planet will be African. If the current economic growth rates which are being experienced on the African continent persist (or accelerate), and the benefits of this growth are reasonably well shared, then rapid diet upgrading is highly likely to occur as well.

In sum, concerted action in agriculture and agricultural research no doubt holds many of the pieces of the jigsaw required to address the current trade-offs inherent in the combined search for economic development and the pressing need to address environmental challenges. In the next section, we consider the Consultative Group for International Agricultural Research (CGIAR) as an example of a key international agricultural institution that has undertaken substantial institutional reforms in response to these challenges. The section after that highlights key areas and institutions where the reform process has been particularly slow.

4.3.2 Reforms in the consultative group for international agricultural research (CGIAR)

The discussion in the preceding section emphasized the critical role of agricultural research, particularly research relevant to developing countries, in facing environmental and development challenges. CGIAR is credited with developing the technologies that enabled the 'green revolution' in Asia, which is one of the largest and clearest success stories registered in the history of development assistance. CGIAR is currently being called upon to produce the innovations in agriculture, including supporting policies and frameworks that will enable agriculture to meet the manifold challenges of the twenty-first century.

In hopes of better meeting these challenges, CGIAR has recently reorganized itself around a series of 15 collaborative research programmes. The idea is to bring to bear multiple perspectives from different centres of expertise on complex problems. The challenge of increasing production while preserving local environmental quality in the context of climate change was a major motivator behind the reforms. These institutional reforms have only recently been put into place. This prevents any comprehensive evaluation of their impact at this stage. Nevertheless, CGIAR represents a good example of an important international institution undergoing a comprehensive rethink of

their mode of operation in the face of new challenges generally and environmental challenges in particular.

4.3.3 Other core global level organizations

The existing core set of aid related global level organizations engaged in agriculture, food, and nutrition also include:

- Food and Agriculture Organization of the United Nations (FAO);
- World Food Programme (WFP); and
- International Fund for Agricultural Development (IFAD).

Other institutions with significant engagement in agriculture, food, and nutrition as parts of their mandate are the World Health Organization (WHO), United Nations Children's Fund (UNICEF), United Nations Environment Program (UNEP), World Bank, and World Trade Organization (WTO). These institutions all serve important functions, and all have made important contributions in the past—rightly seen by the global development community as impressive aid successes—which have been amply documented. The green revolution has already been mentioned. In addition, many people's lives have been saved due to the WFP, and, without the statistical information and advice of FAO, priority setting would be impossible for many governments (von Braun 2013). Similar examples can be given for the other institutions mentioned, such as the evident and impressive vaccination campaign successes promoted by the WHO.

Unfortunately, CGIAR is not the only element of the system in need of reform. For example, an independent evaluation report on FAO published in 2007 concluded:

> 'The Organization is today in a financial and programme crisis that imperils the Organization's future in delivering essential services to the world. (von Braun 2013)'

Some would argue that this crisis has lasted for several decades. In addition, we note that IFAD was evaluated in 2005 and urged to undertake fundamental changes in design and strategies. These and other evaluations are now being responded to by these organizations with reform initiatives, but the processes of reform are slow.

Importantly, these individual reviews will not be able to comprehensively address the question of how the entire global food system might work best as a whole in the twenty-first century environment. Agricultural development is largely the responsibility of national governments, who have to be the drivers of agricultural development and food security, together with the private and non-governmental sectors and actors more broadly. At the same time, it is clear that international aid and international institutions play important supportive roles, particularly in developing countries.

4.3.4 Assessment

In a review of the system, von Braun (2013) argues that the relevant international institutions at present do not deliver the necessary public goods at the needed scale. Although not providing a comprehensive solution to the problem, von Braun does provide a list of seven international public goods that the global system must aim to provide to function effectively:

- Natural resource management related to biodiversity, water, and soils;
- Climate change adaptation and mitigation;
- Trade and food reserves;
- Sound competition policy and standards for foreign direct investment;
- International research and innovation in food and agriculture;
- Responding to and preventing food and nutrition emergencies;
- Trans-boundary food safety and health related investments and standards.

These are all areas where the state—and by implication foreign aid—has traditionally been assigned important responsibilities. And where, as von Braun (2013) argues, there is need for institutional rethink and reconfiguration. For example, he notes that the FAO should be 're-invented' and strengthened to deliver the public goods that facilitate sustainable agricultural growth under climate change, food security information and global food safety services while limiting environmental damage. It is well beyond the scope of this study to pursue all of these areas of debate in detail, but the implications for the future design of aid, including its role and architecture, are potentially wide-ranging.

The proposed solution to the problems identified by von Braun is not a call for some global mega-organization. Rather, it is a system that combines government-to-government networks with inclusion of corporate and civil society organizations and combined with a small set of global organizations of the traditional type. This reflects the reality that in practice, global governance in today's world does not only—and actually not even mainly—happen through formal global organizations. It increasingly occurs through a complex global web of government networks, where a collection of nation states communicate via heads of states, ministers, parliamentarians, and the UN, and where corporations and NGOs participate in various ways. Government networks are networks of national governments and even province level governments whose officials come together on a regular basis to exchange information, co-ordinate activities, and adopt policies to address common problems at a global scale (Slaughter 2004).

All of these actors already play key roles in global policy domains such as public health, crime prevention, and energy, but, arguably, not enough in areas of agriculture, food, and nutrition, which are fundamental to achieving food security, addressing poverty, and preserving the environment. As Slaughter (2004) points out 'government networks are ideal mechanisms of international co-operation on international problems that have domestic roots, as they directly engage participation and the credibility of the individuals who must

ultimately be responsible for addressing those problems'. These circumstances do apply to agriculture and food and the related natural resource management challenges; and aid is arguably well placed to take on the task of helping move the system forward.

4.4 Selected examples of environment and climate change aid

In this section we provide a set of illustrative, concrete examples of what has worked and what aid could do differently in environment and climate change at the project, programme, and sector level within the broader framework and results reviewed and summarized above. The overview of examples, which has emerged in the ReCom process over the past year, cannot be all-inclusive due to the multitude of projects, but the selection here is aimed to capture a variety of key results in key sectors, identify core messages, and stimulate discussion, and further thought.[26] General conclusions from these examples are drawn in the second half of Section 5.1.

Nevertheless, some of the most common programmes in operation are mentioned here and were selected because of the lessons they offer for how foreign aid can or should be designed to improve the performance of foreign aid in the environment and climate change area in developing countries.

4.4.1 Energy sector[27]

Energy related development aid during the first decade of the twenty-first century is estimated at close to US$60 billion of which renewable energy technologies received about US$8 billion (OECD 2012b). Multilateral development banks (MDBs) provided some US$70billion of energy related funding of which energy efficiency projects received US$8.2 billion and renewable projects US$10.1 billion, see TABLE 1. However, the Secretary General's Advisory Group on Energy and Climate Change (AGECC) estimated the funding requirements for access and energy efficiency at US$205 to US$245 billion annually (AGECC 2010) — a huge funding gap compared with the funds available between 2000 and 2010.

TABLE 1
Total and energy related gross ODA and other official flows (OOF) disbursements, 2002–10, in US$ millions

	2002	2003	2004	2005	2006	2007	2008	2009	2010
ODA–All donors	67,367	80,414	92,149	120,771	120,241	122,168	144,423	139,893	148,380
ODA–DAC countries	58,575	69,432	79,854	107,838	104,814	104,206	121,954	119,778	128,465
OOF–DAC countries	119	-420	-5,418	1,986	-9,822	-5,491	-55	10,119	5,878
Total ODA and OOF	68,370	81,181	89,376	124,746	112,150	121,352	147,253	149,376	153,320
Energy–DAC	889.6	945.1	1,632.2	3,083.5	3,046.4	3,476.6	3,716.7	3,417.9	4,910.5
Energy–MDBs	499.0	444.1	647.7	579.3	598.0	899.5	1,697.6	1,768.5	2,385.2
Energy–all donors (DAC)	1,388.6	1,389.2	2,280.0	3,662.8	3,644.3	4,376.0	5,414.3	5,186.5	7,295.7
Energy–OOF	1,346.5	708.9	723.6	627.6	669.5	1,290.9	1,667.8	6,867.9	5,508.1
Total Energy of which	2,735.2	2,098.1	3,003.6	4,290.4	4,313.8	5,667.0	7,082.1	12,054.4	12,803.8
Renewables, incl. Hydro	153.7	239.9	358.3	619.4	653.1	1,077.0	1,044.0	1,566.1	2,082.2
Hydro	109.1	176.5	296.0	544.6	488.3	818.4	666.6	792.5	1,186.9
Geothermal	8.4	0.5	2.3	2.4	3.6	11.8	33.8	53.9	46.7

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Solar	8.9	35.6	25.4	27.3	37.0	44.3	130.6	389.5	440.7
Wind	17.1	22.4	27.6	32.7	112.4	186.0	180.8	291.6	332.3
Ocean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Biomass	10.2	4.9	7.0	12.4	11.4	16.6	32.2	38.5	75.5
Share of energy in total ODA and OOF, %	4.7	3.0	3.8	4.0	4.1	5.4	5.8	10.1	10.0
Share of renewables in total energy, %	5.6	11.4	11.9	14.4	15.1	19.0	14.7	13.0	16.3
Share of renewables in total ODA and OOF, %	0.2	0.3	0.4	0.5	0.6	0.9	0.7	1.0	1.4

Note: A disbursement is the actual placement of resources at the disposal of a recipient country or agency. This is different from 'commitment, which is a firm written obligation by a government or official agency, backed by the appropriation or availability of the necessary funds, to provide resources of a specified amount under specified financial terms and conditions and for specified purposes for the benefit of a recipient country or a multilateral agency. The conditionality often leads to delays or lower actual disbursements.
Source: ©OECD (2012b) and Rogner (2013).

A project co-financed by the GEF, the government of the Netherlands, the government of Australia, and the government of China was initiated in 1999 (ending in 2008) with the aim of promoting the adoption of renewable energy technologies in China. The project utilized a mix of comprehensive capacity building measures (which targeted key public as well as private organizations), support in the formulation of new policies and regulatory measures (such as policies on biogas, wind, and village power sectors as well as the Renewable Energy Law of 2005), overall technical assistance, and co-financing support of demonstration projects.

The overall funding available for the project was approximately US$25 million—a relatively small amount of money in relation to the magnitude of the challenge and the size of the country. Nevertheless the project achieved transformative results. It helped to build capacities in the renewable energy industries and it helped leverage several government programmes in support of energy for the poor. And its demonstration projects of market-based systems helped transform the village power sector. The multifaceted programmatic approach to the problem helped achieve impressive results in a relatively short period of time (Liu and Xin 2011).

The case of Vietnam's success in increasing access to energy through its rural electrification programme provides other valuable lessons. In 1975, Vietnam's rate of electrification among poor households was about 2.5 per cent. In 2009, the rate was 96 per cent despite its still relatively low level of average national income. Well-targeted international assistance and foreign aid played a big role. It is true that many international institutions provided much foreign aid to support the electrification of many communes throughout the country, and to help in the construction and rehabilitation of small hydropower facilities and distribution networks. Assistance has also been provided in infrastructure development and the International Financial Corporation (IFC) provided support for small photo voltaic businesses (Reiche et al. 2000).

Many factors contributed to Vietnam's success in increasing electricity access in a relatively short period of time. They include local conditions (ample hydroelectric resources), local customs (which put on premium on electrification and willingness to pay), multiple funding sources and technical assistance from various international foreign aid sources, consistent and persistent policies within a good policy, institutional and regulatory framework context, and a strong political commitment.

Reviewing the effectiveness literature with in area of renewable energy, Rogner (2013) finds a range of factors that together are important inputs for the effectiveness. These consist of, but are not limited to, commitment, good regulatory framework and enabling laws at all levels of society, alignment with overall development plans and guaranties for ODA loans. At the more specific level privatized operation and maintenance with user tariffs that cover costs appears to be a critical element of success (Rogner 2013).

In the question of what could work Rogner (2013) points toward the problems of financing as a potential area of intervention. The expected rate of return

(ERR) required by public or private investors often cannot be met. Financial and regulatory incentives, as well as concessional financing schemes, can significantly lower the investment and ERR barriers. Here simple tax reductions and exemptions tend to have the lowest impact (not considering economic opportunity cost). By contrast, concessional financing schemes tend to have the highest impact and are likely to be the most cost-effective incentives in terms of their overall impact on generating costs and competitiveness (Kulichenko and Wirth 2011). Cost reductions could also result from scaling up of the level of implementation. But more importantly, the countries involved would benefit from the project economically through a high localization factor of technology components and services. The latter could be accelerated by concessional loans and grants.

4.4.2 Industrial sector[28]

Aid in the industrial sector would appear to generate satisfactory results as green investments in energy efficiency often reap much higher rates of return than conventional investments. Examples include Bangladesh, where an energy-efficiency initiative in the steel sector (preparation of leaks and insulation of pipelines) harvested a 260 per cent rate of return on investment (ROI) in less than four months' time and saved 137 tons of CO_2 per year (UNEP 2011). Similar cases were found in China, Ghana, Mongolia and Honduras. In the Chinese chemicals sector an initiative to install a heat recovery system to recover heat from a combined heat and power system yielded a 96 per cent ROI after seven months and contributed to CO_2 emission abatement by 51,137 tons per year (UNEP 2011).

In Ghana, energy-efficiency interventions were made in the textiles industry where hi-tech de-scaling equipment for the boiler and steam pipes was installed. Such green investment generated 159 per cent ROI after four months (UNEP 2011). Another effective aid project for reduction of industrial pollution was mainly funded by Agence Française de Développement (AFD) in Egypt. It was also supported by the National Bank of Egypt, in the form of green credit lines worth €142 million. The project aimed to encourage industries to employ clean technologies, which would lead to pollution reduction. Significant results were achieved. In total these projects were estimated to reduce annual sulphur dioxide emissions by 22,700 tons and particulate matter (i.e., dust) emissions by 104,000 tons. By the way of comparison, these volumes correspond respectively to 15 per cent and 31 per cent of France's industrial emissions, excluding energy. Moreover, the projects financed reduced annual CO_2 emissions by 650,000 tons, i.e., the emissions of about 250,000 cars (for further discussion see Kablan (2013)).

4.4.3 Urban sector

In the immediate future, 93 per cent of global population growth is expected to be in urban areas of developing countries, (UN-Habitat 2011). Consequently, some 80 per cent of the world's population will be living in towns and cities by 2030, (UNFPA 2007). The large growth of cities in developing countries

results in poverty becoming an increasing urban problem (Banks 2011). Already in 2002 the poverty rates in Indian states were higher in urban areas than in rural (Buckley and Kalarickal 2005).

Based on a study of SSA cities' development since 1970s, Stren (2012) suggests that the delivery of essential services, capacity building at local level with the support from aid agencies, and good co-ordination between donors and recipients with a demand-driven approach, seem to have a positive effect on green urbanization (Li 2013). Environmental concerns have been integrated into many aid programmes, in which aid has to pass the environmental test. In addition, environmental protection has been established as an objective in its own right (Stokke 1996).

The Cities Alliance (Cities Alliance 2012) is set as a global partnership between various urban stakeholders (e.g., governments, NGOs, and slum dwellers) to promote the vision of 'Sustainable Cities without Slums', which mainly focuses on urban dwelling improvement and urban development policies, (Banks 2011; Li 2013). Its country programme highlights the importance of building a systematic framework to enhance the co-operation between urban stakeholders, and of public and private investment for developing green urban communities. The alliance is especially concerned with secondary cities, as early and decisive action provides the best opportunities for managing rapid urbanization and ensuring a sustainable urban future for all citizens.

Green investment in waste management and recycling supported by aid has brought about positive environmental impacts. In particular, recycling of building materials contributes positively to the greening of the buildings. Studies demonstrate that recycled materials caused less than half of the harmful effects on the environment compared to new materials (Thormark 2006).

Other effective sustainable building options include fluorescent lamps, solar water heaters and efficient thermal envelopes (heat flow control layers). By examining the energy efficiency options in the buildings sector in Lebanon, Chedid and Ghajar (2004) demonstrate that the installation of fluorescent lamps and solar water heaters, and enforcing efficient thermal envelopes gave rise to considerable energy savings. Similarly, such energy efficiency interventions as the employment of effective thermal envelops and green lighting generated satisfactory energy savings in China (Li and Yao 2009).

Box 2: Tianjin City

China is currently constructing an eco-city in the coastal district of Tianjin to serve as a practical, replicable, and scalable model for sustainable development.

Tianjin City is located in one of the fastest developing districts in China in the Bohai Bay region which, after the Pearl River delta and Yangtze River delta, is the country's largest growth engine. As the site was comprised mainly of saltpans, barren land, and polluted waterways, the necessary technology and expertise were provided by Singapore, based on previous experiences with respect to the Suzhou Industrial Park. According to a master plan, the district is initially to derive energy from a waste

incinerator plant as well as several other options for clean fuel, renewable, and geothermal energy. A light-rail transit system, supplemented by a secondary network of trams and buses is to be the main mode of transportation, covering 90 per cent of public transport needs (Joss et al. 2011). All buildings are to conform to stringent energy efficiency standards that include advanced water-saving and waste management systems with particular emphasis on the reduction, reuse, and recycling of waste. As Tianjin City is located in a low rainfall area, the eco-city is to draw a significant part of its water supply from non-traditional sources. The existing wetlands around the city are to be protected to enhance biodiversity. The city layout is based on an integrated mixed land usage system to create variety in the landscaped 'eco-neighbourhoods' with green 'eco-valley' corridors that will serve as main public open spaces. Private sector agents are also involved, and 125 companies were registered by 2010 in the eco-city. The Sino-Singapore Tianjin Eco-City signed agreements with Hitachi, Philips, Siemens, ST Engineering and two leading property developers in Asia to develop a 'green central business district. It is expected that by 2020, the eco-city will create 80,000 to 100,000 jobs, contributing a total of 40–50 billion Yuan to GDP.

Social harmony is a key consideration of Tianjin City, covering such areas as education, healthcare, and culture. Important instruments include subsidized public housing to help meet the housing needs of low-income people and to enable different social strata to live together, catering to the needs of the elderly and disabled, and providing public facilities and respecting local heritage.

Source: Li (2013).

Another successful example of how foreign aid has been used to develop green buildings in developing countries is the case of Indonesia. IFC helped the government of the capital province, Jakarta, to develop a green buildings code. The code sets energy and water efficiency requirements for large commercial and high-rise residential buildings, and will require climate change adaptation practices to be included in building designs (Shrader and Sayyed 2012).

In addition, the Weihai (a Chinese city) project financed by the World Bank in 2011 is another successful case of foreign aid for sustainable transportation. It was aimed at strengthening Weihai's capacity for urban transport planning and management. The loan granted was equal to US$56 million out of a total cost of US$145 million. The objective of the project was to 'support Weihai to realize its goal of being a green public transport-oriented ecological and liveable city' by improving the quality of public transport and non-motorized transport systems in critical corridors in Weihai for citizens who travel on those corridors. By providing high quality and efficient transport alternatives to private motor vehicle use, the project improved the city's quality of life as well as induced a much more sustainable development trajectory.[29]

Last, water supply and sewage are also important issues in cities, and they must be performed in an ecological way. One example of successful foreign aid is the Olandes Sewage Treatment Plant. The World Bank financed the US$4.69 million project designed to clean up domestic waste water from Marikina and Quezon City and help reduce pollution in Marikina River in Manila (Philippines). This project reduced the pollution in Metro Manila waterways and the Manila Bay, as well as reduced health hazards caused by human

exposure to sewage by expanding the septage management approach of the Metropolitan Waterworks and Sewerage System (Kablan 2013).

The examples above illustrates that international aid could play an important role in promoting eco-cities with the development of policies or it could pursue a smaller role in filling the gap left by authorities with regard to vulnerable groups (Li 2013).

4.4.4 Environmental regulation

We provide three examples based on research carried out by the Danish Institute for International Studies (DIIS).

Unfunded mandates on the frontline: Rio+20 and local environmental governance (Ravnborg 2012)[30]

Twenty years ago, the UN Conference on Environment and Development in Rio gave momentum to the establishment of an institutional framework for environmental governance. Apart from the three so-called 'Rio Conventions'—UNFCCC (climate), CBD (biodiversity), and UNCCD (desertification)—the conference gave impetus to the formulation and approval of national environmental legislation.

As an example, prior to 1987 only one country in SSA, namely Senegal, had enacted environmental legislation. By 2002, ten years after Rio, this number had increased to 33 countries and in 2008, of the 46 SSAn countries, 38 had environmental legislation in place. Moreover, the 1992 Rio conference and the subsequent Agenda 21 underlined the importance of including all levels (from the global to the local) in the governance of natural resources and the environment; and many developing countries have embarked upon processes of administrative de-concentration and political decentralization.

Development assistance has contributed to the above processes. GEF has channelled funding to assist developing countries to meet the objectives of international environmental conventions, including the three Rio conventions. Moreover, a DIIS review undertaken as part of the Danida and Sida-funded Research and Communication Programme (ReCom) of development co-operation agreements signed with Tanzania, Kenya, Mali, Nicaragua, and Vietnam, shows that development assistance provided by Danida and other bi- and multilateral donor organizations has contributed both to the preparation of environmental legislation and to subsequent efforts to develop associated regulatory frameworks and organizational capacity. The review was undertaken on the basis of the OECD Development Database on Aid Activities, complemented by the AidData.

Exactly how much development assistance has been allocated to strengthen environmental governance—in terms of numbers of agreements and amount of monetary support—is, however, hard to tell, as available data on development co-operation agreements is far from complete. Moreover, the information that is reported does not allow for an assessment of the extent to

which official development assistance commitments with respect to environment and climate are actually being met.

In addition to the data on monetary support on environmental governance being insufficient, in a recent study by Ravnborg et al. (2013) the authors point out several other challenges in enforcing environmental governance. Ravnborg et al. (2013) find that even though mandates for environmental governance frameworks have been successfully put to place, the funds allocated have so far been insufficient to ensure their effective enforcement. A specific challenge for effective environmental governance to take place is that the claim-making capacity of local communities needs to be strengthened. Ravnborg et al. (2013) highlight that development co-operation can contribute to this by, for instance, strengthening the capacity of local authorities to respond to environmental concerns presented by citizens.

From national to local environmental management in Kenya (Funder and Marani 2013)[31]

In the past 20 years, many African countries have established national laws and institutions for environmental management. But how and to what extent have these been implemented on the ground? And what has been the role of development co-operation in this? Funder and Marani (2013) demonstrate how Kenya's Environmental Management Act has been locally implemented in a rural county in Kenya. The focus is on the everyday aspects of environmental management, including informal arrangements and local institutional competition.

The authors find that good progress has been made in developing the national frameworks, and that development co-operation has played a significant role in this.[32] They also highlight that there is now a need to focus more on developing decentralized environmental management, and to engage more with local government structures.

Environmental governance of uranium mining in Niger (Larsen and Mamosso 2013)[33]

Niger is well-known in the international media as one of the world's poorest countries, struggling with chronic structural hunger and malnutrition. What is less well-known is that Niger also hosts the fourth largest uranium production in the world. Export values totalled over €348 million in 2010 alone, representing more than twice the total development assistance finance received during the same year. The exploitation of the mineral wealth (including uranium, gold, phosphate, coal) by international investors is expanding, with granted and requested mining permits comprising close to 10 per cent of the national territory.

In recent years, Niger has elaborated a considerable legislative and administrative framework for environmental governance. These advances are noteworthy and development co-operation has contributed to fostering many of these advances, including the decentralization and land tenure reform and the legal recognition of pastoral rights. However, donor funded programmes in the mining sector are principally aimed at the diversification and expansion of

the sector, with little emphasis on the environmental and social safeguards. In fact, attention to environmental impacts or risks associated with the mining sector goes seemingly without mention in the guiding documents of the principal development partners, including the EU, the World Bank, UNDP, and the African Development Bank.

The above situation is in stark contrast to the grievances expressed by representatives of local populations in the mining zones and pastoral peoples as well as government representatives. Moreover, due to deficiencies in public administration, there are considerable constraints in enforcing and implementing the legislative and administrative framework—the very same framework, which development co-operation has helped to put in place. Larsen and Mamosso (2013) argue that development partners should pro-actively support enforcement of the existing environmental regulations of the mining sector. This could, among other things, form a response to the capacity gaps articulated by government agencies, such as the Environmental Impact Assessment Bureau and the National Centre for Radioprotection.

4.4.5 Agriculture

Methane emission constitutes an important component of global GHG emissions. It is a widespread consensus that the potential to reduce methane emissions at its major source—rice fields—is high (FAO 2010), but the problem is how to incorporate a methane emission reduction objective into farming practices while also maintaining or even improving agricultural productivity. Foreign aid intervention in the agricultural sector in the Philippines is one good example where emission reductions were achieved through new irrigation schemes. Investment also benefited the farmers who participated in the programme in Bohol Island, one of the biggest rice-growing areas of the Philippines. As this case indicates, a programme aimed at reducing GHG emissions can be successful if it is incorporated into the agricultural development agenda, provides incentives for farmers to participate, and addresses the interests of major stakeholders.[34]

Another agriculture sector example is 'the Mainstreaming Climate Change Adaptation in Irrigated Agriculture', which was a project supported by the GEF-managed SCCF and focused on the Huang-Huai-Hai River Basin (3H Basin) in the northern plains of China. The project was successful in increasing local ability to react to changing circumstances. For example, more than 1,000 water user associations, 209 farmer associations, and 20 specialized farmer co-operatives were established under the overall Irrigated Agriculture Intensification project (IAIL3). According to interviews with national officials, the project also generated a general framework and approach for the Office of the National Comprehensive Agricultural Development (CAD), the Ministry of Finance on integrating and mainstreaming climate change adaptation into the national CAD programme.[35]

The activities included a series of measures to promote capacity building, technical assistance, knowledge sharing, public awareness, and the preparation of a national climate change adaptation plan for CAD. The procedure for

integrating and mainstreaming climate change adaptations into the national plan also engaged officials from the National Development and Reform Commission, the Ministry of Finance, and provincial government, and scholars from the Chinese Academy of Sciences and the Chinese Academy of Agricultural Sciences.

Through the efforts of SCCF and IAIL3 projects, communities are currently better informed about climate threats and, importantly, about their ability to sustain and perhaps even improve that knowledge and use it to guide future coping choices. Equipped with a toolkit of immediate instruments, the communities are better prepared to protect their livelihoods, and to expand the toolkit in accordance with changing climatic circumstances and increased knowledge.

This project represents the beginning of an adaptive capacity that rural communities across the developing world will need to safeguard their livelihoods against the effects of global warming. The project created the first line of defence in five provinces across the 3H basin by exploring and demonstrating how the achievements of IAIL3 and other CAD initiatives can be used to safeguard against climate change. More detailed information on the project is given in World Bank (2012a) and Li and Conrad (2012).

One more example include the Drought Tolerant Maize for Africa (DTMA) project which was launched in 2006 and was jointly funded by the Bill and Melinda Gates Foundation, the Howard G. Buffett Foundation, USAID, and the UK Department for International Development (DFID). Co-ordinated by the International Maize and Wheat Improvement Center and the International Institute for Tropical Agriculture, the current 10-year phase of DTMA covers the period 2006–16 and focuses on 'expanded use by farmers of certified, drought-tolerant maize seed, and should enable delivery of enough seed to benefit 30–40 million people in SSA and provide added grain worth US$160–200 million each year in drought-affected areas' (DTMA 2012).

Box 3: Sustainable fishing in Sub-Saharan Africa

Renewable resources like fish stocks have the potential to self-generate and could thereby provide perpetual flow of benefits if catch rates are kept at a sustainable level. Currently Africa produces around 8 per cent of total global fish landings (Tidwell and Allan 2001). Further around 10 million people in SSA are engaged in small-scale fishing, processing, and trading (Markwei et al. 2008). In Senegal and Namibia for example fisheries account for around 7 per cent of total GDP (Béné 2006).

Most fishing areas in SSA are currently either fully or overexploited, but despite this fact much aid going to the fisheries sector focuses on fisheries development or capacity enhancement (NEPAD 2011). Sumaila et al. (2012) estimated that about 60 per cent of the total subsidies to capture fisheries in Africa are capacity enhancing or bad subsidies.

Analysing the potential role for foreign aid in supporting sustainable fishery, Akpalu (2013) finds that aid can indeed contribute positively in various different dimensions. First, aid should focus on building institutions to define and enforce access rights,

making the current systems more effective and exclude outsiders from intruding local fishing areas. Second, aid should support research in determining desirable effort levels in order to regulate the efficiency of the equipment allowed. Another area of research where development aid could prove useful is in species phenotypic diversity and ecosystems, which could improve stock management. Finally, it is underlined that overfishing is often connected to bad governance, and it is therefore suggested that foreign aid to fisheries should be tied to good governance.

Source: Akpalu (2013).

Recent studies suggest that the return to this investment is impressively high. Farmers in the 15 participating countries had access already by 2012 to 34 drought-tolerant seed varieties and hybrids (DTMA 2012). Yields of drought-tolerant maize over normal varieties, depending on the seriousness of actual drought conditions, have improved between 3–34 per cent, which has significantly increased farmer income, household food security, and local food supply.

An impact assessment reported by La Rovere et al. (2010) shows that 'at the most likely rates of adoption, based on several recent studies and expert advice, drought tolerant maize can generate US$0.53 billion from increased maize grain harvests and reduced risk over the study period, assuming conservative yield improvements'. The report also estimated the likely impacts of the project under a more optimistic yield gain scenario, and concluded that the economic benefit could reach as high as US$0.88 billion in the 15 African countries covered in this project.

An interesting case is also described by Umbadda and Elgizouli (2013). Authors reviewed the case of Ethiopia's PSNP which is financed by a number of partners to the tune of US$4.4 billion over a period of 2005 and 2014. This programme aimed to support the sustainable system that was targeted to improve food security for at least five million people. Activities of the programme included recovering water tables and vegetation covers, increasing carrying capacity of livestock, small irrigation, farming, training, and other activities related to reducing food insecurity. An earlier review in 2008 showed those households who have access to both a productive social safety nets programme and an agricultural support packages tended to be food secure (Gilligan et al. 2009). The Independent Evaluation Group (IEG) of the World Bank (2011) also evaluated the programme and remarked it as being effective, pragmatic, and flexible.

4.4.6 Forestry

Foreign aid to forestry sector management and conservation started strongly emerging following the 1992 Rio Earth Summit, via a range of international conventions, instruments, and financing facilities (Pascual et al. 2013). One of the most important ones for forestry sector is the GEF. It has supported recipient countries with unconditional grants to cover the incremental costs of those activities which have targeted to protect the surrounding environment

(Parker et al. 2009). As experience shows designing new policies that maximize the effectiveness of foreign aid in forest resource management merit careful consideration, particularly in the existence of limited natural resources and failures in the performance of historical investments (Winterbottom 1990; Kanowski et al. 2011).

To date, climate finance for the forest sector is overwhelmingly about carbon emissions. However, sustainable forest management goes beyond carbon sequestration and involves other socio-economic and environmental standards. Currently, the majority of pilot projects are financed through the World Bank's Forest Carbon Partnership Facility, the UN's REDD programme and via bilateral development assistance. Forestry projects contribute to adaptation by recovering degraded forests and preventing considerable carbon to be released into the atmosphere. Evidence produced by these programmes has reinforced the hope that slowing down deforestation is possible. Olhoff et al. (2004) re-emphasize what has been specified in the Kyoto Protocol that clean development mechanism (CDM) projects, namely such carbon sequestration activities are very beneficial for participating countries, but at the same time dangerous if they do not follow strict rules.

One of the successful CDM projects is the Humbo Project[36], the first large scale project of its kind in Africa. It resulted in enlarged wood production and tree products while improved land management also accelerated grass growth. Moreover, it is expected that the regeneration of native forests will supply significant habitat for many local species and lessen flooding and soil erosion. Research shows that many carbon sequestration projects in Africa help increase smallholders' livelihoods via carbon credit sales. There is evidence that many carbon sequestration projects also improved the local resource base and helped conserving biodiversity.

Scherr et al. (2004) find that carbon sequestration through afforestation and reforestation generates locally valued ecosystem services such as more regular and higher quality water supplies as well as control of soil erosion and sedimentation. For instance, in Western Sudan, in one carbon sequestration project rangelands were restored through conservation activities such as planting trees and grass to stabilize sand dunes and create windbreaks. Participatory rangeland management plans were also developed. A similar effort is the Western Kenya Integrated Ecosystem Management Project.[37]

The unprecedented level of finance of REDD makes this initiative unique in its scope and complexity but, efforts to stop deforestation and enhance the sustainable management of forest ecosystem are not new. As Kanowski and Catterall (2010) point out decades of experience regarding policy efforts to try to tackle deforestation and forest degradation to inform the strategies to advance REDD+ and deliver its co-benefits are relevant here. Valuable lessons have been learnt that need to be accounted for as suggested by other scholars (e.g., (McDermott et al. 2007; Brown et al. 2008; Levin et al. 2008; Angelsen and Brockhaus 2009; Pfaff et al. 2010; Skutsch and McCall 2010).

More specifically, some of the evidence regarding community forest management addresses illegal logging (Tacconi 2007), the creation of protected areas (Curran et al. 2004), or campaigning against illegal logging (Lawson and MacFaul 2010). Various initiatives, such as enhancing market access for non-timber forest products, integrated conservation and development projects, forest certification, and community-based natural resource management, were all once believed to be the way forward for tropical forest conservation. Still, in many cases they have turned out to be based on impracticable assumptions that have undermined the high expectations set for them (Blom et al. 2010).

4.4.7 Capacity building

The ReCom working papers 'Foreign aid for climate change related capacity building' (Chen and He 2013) and 'Foreign aid for capacity building to address climate change: Insights and applications' (Victor 2013) address the issue of what works and what is scalable in capacity building related to climate change.

In terms of what works, Chen and He (2013) highlight that capacity building programmes have the best chance of succeeding when they are country-driven, include a wide range of national stakeholders, and involve a high degree of in-country ownership. When it comes to adaptation, most effective outcomes can be obtained by 'mainstreaming climate change concerns into the normal process of investing in climate-sensitive infrastructures rather than discrete adaptation projects' (Victor 2013). Furthermore Victor (2013) finds that adaptation requires that foreign assistance leverage other sources of investment since funds that are dedicated to adaptation—such as hardening of transport infrastructures or investing in more resilient forms of agriculture—are probably many thousands of times smaller than the total spending on those same activities.

When it comes to taking part in international climate negotiations, Chen and He (2013) see that obtaining negotiating power is an essential part of capacity building for the least developed countries. They point out that an exemplary programme in this area has been the NECTAR project (Negociations Climat Toute l'Afrique Renforcée), which was aimed at assisting African LCDs develop national strategies so as to enhance their capacity to participate in international negotiations and to target the obstacles they face during talks (EU (European Union) 2012). The project organized workshops for African climate negotiators where they were trained in climate negotiation strategies and skills and were given the opportunity to establish relevant contacts within other countries. Chen and He (2013) argue that the programme helped to enhance the LDCs' influence and bargaining power in the Durban conference.

In terms of what is scalable, the lessons learned from climate change capacity building are more problematic. Victor (2013) finds that when it comes to capacity building scalability is relatively difficult to address yet due to at least two reasons. First, since the central goal of capacity building is to rework (and build) local institutions, Victor (2013) sees that the relevant guides must be tailored to each local circumstance and must be credibly sustained over a long period of time. Victor (2013) points out that for instance in adapting to rising

sea levels, evidence suggests that tailoring is perhaps even more important than directly transferring lessons from one setting to another, since every locality is different.[38] Second, since capacity building for climate change is still in the early stages of planning also in developed countries there is little evidence to address the issue of scalability.[39]

Box 4: Green growth: theory and evidence

Huang and Quibria (2013c) in their ReCom working paper 'Green growth: theory and evidence' point out that the development of a green growth index is still at its infancy. 'There is no universally accepted single aggregate index of green growth in the literature. OECD (2011b) has developed a conceptual framework as well as a set of indicators for green growth. These indicators could be useful in helping governments monitor their progress towards green growth and identifying key areas of national concern' (Huang and Quibria 2013c)

Huang and Quibria propose a model using OECD's Database on Green Growth Indicators (2012) to build an aggregate index of green development and study how institutional factors have impacted on the development of the index. Their key finding is that the extent of green growth in a given country depends not only on domestic learning and determination to achieve the national politically desired target, but also on the green growth performance of its neighbouring countries. (Huang and Quibria 2013c) find that there is a convergence of green growth among the nations in the sample (namely OECD and BRIC countries).

5 Conclusions

5.1 Taking stock

Before considering the future challenges and roles of aid in environment and climate change, we briefly take stock of the review, results, and discussion thus far. The basic results-based storyline, which emerges is as follows:

- The world has an aid system that has broadly worked in helping to improve the living conditions of poor countries and poor people over the past 50 years or so. While broad, this assessment is a useful reference point when assessing the role and effectiveness of aid.
- Even abstracting from global environmental issues, the aid system requires reform to meet current challenges. This is due, first, to the shifting distribution of poor people between low- and middle-income countries following the reclassification of some of the former into the latter. To this come the particularities of fragile states and the remaining group of low-income countries as well as the increasing importance of South-South co-operation and other factors.
- Global environmental issues, particularly climate change, now overlay traditional development issues, and it is exceedingly challenging to identify and sort out the inherent trade-offs and complementarities. Because development is, in many ways, the best adaptation strategy, there are substantial overlaps between adaptation policies and traditional development policy, particularly in terms of human and institutional capabilities. Adaptation needs do influence priorities in areas such as agriculture, water resources, and infrastructure design.
- For a host of reasons, aid institutions have also become engaged in the global mitigation challenge. Aid institutions effectively represent a significant share of the current global response.
- The above four points are combining to significantly increase the profile of middle-income countries from the perspective of aid and aid institutions.
- The aid system has responded to environmental challenges generally by increasing the profile of the environment in ongoing activities, launching initiatives designed to confront global environmental issues, and initiating a process of reform of important international institutions.
- The global system is failing to deliver mitigation at anywhere near the levels required. This failure can be traced principally to inadequate public policies to limit emissions of GHGs.
- From the perspective of the aid system, particularly those initiatives principally oriented towards mitigation, the (near) absence of supportive public policies is deeply problematic. The four major initiatives considered in Section 4.2 are best viewed as complements to appropriate public policies. In the current desultory policy

environment, these initiatives cannot achieve their intended goal, which is to help catalyze the transformations required to stabilize the climate system. Nevertheless, the fundamentals behind the four initiatives considered appear to be sound. And, some good ideas have been put into practice and valuable experience has been gained. With appropriate public policies in place, performance of the aid system with respect to achieving mitigation objectives should be expected to improve substantially.

- With regard to the relevant international institutions for the promotion of agriculture and agricultural research, which are critical in addressing existing trade-offs between economic development and global environmental challenges, the global system does not at present deliver the required public goods at the scale needed. The present disarray reflect issues and developments that go well beyond the aid system as such, but attention should be paid to how aid could be used pro-actively to further the much needed institutional reforms.

Turning to the set of specific examples of aid and environment interventions pursued at project, programme, and sector level, common issues and lessons emerging include:[40]

Foreign aid in support of transformative rather than incremental change

Given the centrality of environment and climate change issues, the urgency for timely action, and the need for transformative change, incremental changes will not be sufficient and will not succeed adequately in addressing existing development and environmental challenges. For the most part, foreign aid is project-focused rather than programme- or system-oriented. This, coupled with the fragmentation of donors does not contribute to the ultimate type of action that is required for a transformation of, for example, the global energy system.

Nevertheless, it is evident that foreign aid has indeed helped many countries in many respects. However, those which have achieved impressive transformations, such as Vietnam, did not succeed solely because of foreign aid but rather because well-targeted foreign aid was combined with national persistence, political commitment, and co-ordination with helpful domestic policies and regulatory frameworks.

Foreign aid that promotes integration rather than fragmentation

The literature suggests that the most effective strategies for addressing today's challenges are those that promote integrated approaches. New demands require more integrated approaches involving many stakeholders, strategies that cut across sector, and broad policy dialogue. In the weak administrative environments that characterize many low-income countries and fragile states, aid fragmentation can work perversely. It strains human and financial resources of recipient countries as they seek to satisfy the procedures and demands of each donor. It often leads to duplication or, worse, to certain areas of importance being left unattended while countries are busy managing the

fragmented aid that they receive (Gomez-Echeverri 2010). The recent trend towards 'bilateralization', illustrated in Figure 10, is notable in this respect.

Programme- rather than project-based approaches to foreign aid to low-income countries

Evidence shows that much of the foreign aid in the area of environment and climate change is implemented through projects. Combined with the trend towards more bilateral aid, average environmental project size has been declining (Marcoux et al. 2013). This in turn leads to discreet and punctual action rather than systems-oriented action. As discussed in more detail below, support to middle-income countries may be inherently discreet and punctual. However, for low-income and some fragile status, evidence indicates that more systems-oriented action would be the most effective.

There have been many efforts to shift away from project-based approaches. To be truly effective, strategies, policies, measures, and programmes would ideally need to be co-ordinated with policies with other key sectors in the economy such as agriculture, health, transport, industry, and buildings, to name just a few. In more sophisticated middle-income countries, this co-ordination may already be occurring and governments of these countries may not be keen to engage with donor institutions in discussing these frameworks.[41] However, in many low-income and fragile states, fragmented project-based foreign aid may exacerbate existing institutional disarray with negative implications for long-term sustainability and country ownership.

Aid in support of technology development and innovation rather than equipment supply

Achieving science and technology capacities are fundamental for countries to advance on economic development goals. And, technological development, innovation, and transfer are central to the energy and other transformations that are required for addressing global climate change challenges. Technological development, in its whole spectrum, is therefore necessary for developing countries as they pursue socio-economic and development and transformations of their energy systems. Ideally, to be effective, foreign aid would need to address the many stages of the innovation process that include starting from basic research through to incubation, demonstration, market creation (some time niche markets), and ultimately, widespread diffusion stages (Hultman et al. 2012; Grubler et al. 2012).

Unfortunately, very little of foreign aid has gone to long-term support for innovation and technological development (Naudé 2011). The foreign aid that is most effective is that which would support countries over a long period of time in the various stages of the complex system of technology innovation.

Foreign aid in support of mechanisms to mobilize, catalyse, and leverage private and domestic public investment rather than stand-alone project funding

Very significant amounts of investment resources will be required to finance the development, deployment, diffusion, and transfer of clean technologies in developing countries—mostly for renewable energy and energy efficiency; and

it has already been highlighted that a large portion of these resources will need to come from the private sector. Does foreign aid have a role to play in this large scale financing operation?

Foreign aid has traditionally played an important role in providing loan financing for large infrastructure projects and for sector reforms and technology development in important sectors. There is no doubt that these will continue to play an important role as they fill a gap of financing needs, particularly in low-income countries. But, foreign aid can also effectively help countries set up or strengthen what are referred to as public finance mechanisms that can play crucial roles in leveraging financing for, for example, energy projects. These mechanisms include:

- Credit lines to local commercial financial institutions for both senior and mezzanine debt;
- Guarantees to share with local (CFIs) the commercial credit risks;
- Debt financing of projects by entities other than CFI;
- Private equity funds investing risk capital in technology innovations;
- Carbon finance facilities to monetize the advanced sale of emissions reduction to finance project investment costs;
- Grants and contingent grants to share project development costs;
- Loan softening programmes to mobilize domestic sources of capital;
- Inducement prizes to stimulate research and development or technology development;
- Technical assistance to build the capacity of all actors along the financing chain.

By supporting the establishment and strengthening of these mechanisms, foreign aid can help promote investments in clean technologies, particularly those that are in the later stages of the technology innovation pathway but still facing significant market barriers. Foreign aid can help to bring down market barriers, bridge gaps, and share risks with the private sector (Maclean et al. 2008).

5.2 The future role of aid in environment and climate change

It was at the outset noted that the present position paper has faced a particular challenge in comparison to other ReCom themes. Climate change is a relatively newly recognized global challenge involving many aspects of society. This implies that existing evidence is somewhat fragmented, and that the results presented are to some extent 'speculative'.

Nevertheless, we have throughout aimed at putting the different pieces together with a view to establishing a meaningful, coherent, and policy-relevant whole with existing challenges identified in what we hope is a comprehensive

and consistent manner. A natural next question, given ReCom's focus and mandate, is to ask:

> 'What should the development community expect from aid and what should it demand the 'aid system' do/deliver in the coming years in light of the results found and in light of the new and emerging global context in which foreign aid finds itself?'

To respond, we begin by setting the level of ambition right, and subsequently outline five lessons, which in our assessment stand out. They are meant as a roadmap to the future roles of aid in environment and climate change.

Setting the level of ambition right

In preparing this study frequent interaction took place with UNU-WIDER's global network of researchers (who have prepared a wealth of background studies); with policy makers from many different countries; and with communication specialists, whose main (and important) task it is to communicate ReCom results and findings. We were regularly asked: 'Can aid save the planet?'

In our assessment asking a question such as the one just put, is outright dangerous in relation to foreign aid. It leads (implicitly) to inflated expectations—and the obvious answer is '*No*', for all kinds of reasons (including if nothing else aid's relatively limited size). Yet, this leads in turn to another (implicit) and equally erroneous impression, namely that there is nothing aid can do. Aid can, based on past experience do quite a lot, even if it cannot alone and by itself save the planet.

Five key lessons about aid's future role

Lesson 1: Development assistance designed principally to achieve welfare improvements in poor countries is as needed as ever. While numerous countries have graduated to middle-income status, 36 countries remain mired in low-income status. It is important to recognize that, after 50 years of assistance, the countries that continue to be mired in low-income status are likely to be more difficult cases (Collier 2008). Each case will have its own particularities, and repetitions of the same formulas that have been tried over recent decades may not be the best approach.

With respect to environmental considerations for aid to low-income countries, it is worthwhile to emphasize that aid is a long run forward-looking enterprise. Arndt et al. (2011) find that economic growth implications of aid only emerge after about a three decade period of engagement. Aid is meant to facilitate recipient countries' efforts to transform their economic and social structures towards more desirable outcomes. And, decisions made in this process, for example in basic economic infrastructure, have lasting implications. The role that environmental considerations, particularly global environmental considerations, should play in these decisions is a matter judgment. There is,

for example, ample justification for substantial emissions growth as part of the development process in low-income countries.

Nevertheless, an important lesson of the past 50 years is that low-income countries often grow and become middle-income countries. Under the desired state of the world, the current set of low-income countries will become middle-income countries in the context of globally declining GHG emissions and a stabilizing climate. Within this context, these countries will eventually begin to engage in global mitigation. Given that major investments being made in the near term will influence economic structure in the long term, environmental considerations may well rationally enter current investment calculations in many low-income countries. It would be unfortunate for countries to arrive at middle-income status with an economic structure that requires transformation in order to cope with twenty-first century realities, particularly if more appropriate structures could have delivered the same development performance. Indeed, one of the few advantages associated with low-income status is that future economic structure is, in considerable measure, a matter of choice.

Lesson 2: Notwithstanding lesson 1, it is desirable that the share of attention that the aid system devotes to middle-income countries increase without crowding out resource transfers to the low-income countries. This is driven by (i) the concentration of absolutely poor people in middle-income countries, (ii) the key role that middle-income countries must play in combating global environmental problems, and (iii) the needs of middle-income countries for some assistance in adapting to climate change. In low-income countries, aid financial flows are frequently macro-economically significant. In middle-income countries, concessional aid flows are small next to needs and are highly likely to remain so. Desired development and environmental goals must be achieved through appropriate policy frameworks and investment decisions funded principally through private sources or domestic public finance.

Under these conditions, aid can only hope to play supporting and catalytic roles that fall under the rubric of soft assistance. Examples of these roles for confronting environment and development issues include:

- technology development and transfer;
- regulation and regulatory frameworks;
- other policy advice;
- institution building;
- information systems; and
- other analysis and technical assistance.

Two aspects of a trend towards soft assistance merit mention. Because aid, in these contexts, is almost certain to be small relative to the application of domestic resources, the leverage that aid effectively receives opens the possibility for very high returns on aid investments. For example, if US$10 million in soft assistance ends up increasing the annual social return on a US$1 billion investment by one per cent, then the benefit/cost ratio to the aid is

enormous. For example, aid can, if sensibly used, help develop and demonstrate the value of better seeds and farming technology. When farmers apply such technology, the economic returns to already invested capital (including infrastructure) and other factors of production may increase significantly; and properly designed can also promote gender equity as shown by Arndt and Tarp (2000). Another example is the potential unblocking of new investment flows which may not be forthcoming due to information failures, which aid can help overcome.

Second, to the extent that the aid system was designed at all, it was designed with the objective of helping poor people in poor countries. At its best, this system worked with domestic institutions in poor countries, which were invariably characterized by distinctly limited capacity, to develop broad scale packages of policies, technical advice, and finance. In contrast, middle-income countries are a lot less likely to demand broad scale aid packages due to greater technical capacity and the small relative size of aid. Even functioning at their best, it is not clear that traditional aid institutions are properly configured to help middle-income countries confront their inter-linked developmental and environmental challenges.

Lesson 3: The role of aid and aid institutions in the provision of global/regional public goods should be maintained or enhanced. Agriculture presents a particularly good example (though not the only one). Particularly as part of an effort to reform and reconfigure international agricultural institutions such that they better respond to twenty-first century challenges, there is a strong rationale for enhanced investment in international agricultural systems. For agriculture, the case for an emphasis on technology is particularly strong. Unlike other areas such as energy, where improved solar panels are likely to work just as well in Africa as in North America, agricultural innovations tend strongly to be location-specific.[42] The spillovers to developing countries, particularly those in Africa, from public and private agricultural research in developed countries may be limited.[43] Given the critical global role agricultural sectors in developing countries will play in the first half of the twenty-first century, there is a convincing rationale for major investment of aid funds in international agricultural systems.

Other areas with obvious roles for aid include trans-boundary river basin management, regional growth arrangements including regional power pools, and technology generation where, as in agriculture, global research advances may not apply to developing countries (e.g., cook stoves).

Lesson 4: Assist with the financing of the transformations required to confront environmental issues. There are fundamental rationales behind the design of the new aid initiatives discussed in Section 4 (REDD+, CDM, GEF, and GCF). If the world community could take bold action to put in place an appropriate, overarching global policy environment and complementing public policies, these institutions are positioned to make substantial contributions.

Lesson 5: While, in principle, aid for information could be categorized under Lesson 3, it deserves special mention. Aid has long been recognized as a

knowledge-intensive activity. Indeed, institutions such as the World Bank now bill themselves as 'knowledge banks', and the UNU-WIDER 2014–18 work programme will be explicitly focused on creating and sharing knowledge.

Two points merit particular mention. First, Lessons 2–4 serve to place even more emphasis on the role of information collection, organization, analysis, and dissemination. These roles should become even more central in aid efforts.

Second, looking forward, the desired state of the world envisions that global GHG emissions peak in the relatively near term and then decline fairly rapidly thereafter. As pointed out by Arndt and Bach (2011), it is hard to see how consistent, long-term emissions reductions could be achieved without an adequate monitoring system that independently and credibly tracks emissions at the country level. In principle, fossil fuel use is relatively simple to monitor as fossil fuels come from (or pass through) a few easily distinguishable points. As noted by Angelsen (2013), the other principal sources of emissions, agriculture and deforestation, pose greater, though certainly not insurmountable, measurement challenges.[44] This auditing task would appear to be indispensable, but auditing tasks do not fit well within existing institutional structures. There is therefore a good case for creating a specialized, independent, and technically competent institution that would credibly monitor and corroborate country level emissions data.

5.3 Final remarks

In the previous sections, we have referred to political feasibility on occasion without going into detail. Amidst the disarray and dysfunction that has characterized global climate policy, there does appear to be some agreement that the international system is gradually shifting towards a system of more regularized payments and away from a system based on, for want of a better word, charity. To be sure and as emphasized in Lesson 1 above, low-income countries continue to require assistance. And, the poor in middle-income countries, as emphasized in Lesson 2, also merit attention. This is particularly true for marginalized populations within middle-income countries who are not benefiting from ongoing growth processes. At the same time, the political enthusiasm in donor countries for providing concessional assistance to middle-income countries is likely to be even more limited than commitments to low-income countries. Hence, the budget for addressing continued absolute poverty in middle-income countries may well be limited (further strengthening the arguments for the soft assistance approaches, with their potential for very high returns).

It is in the environmental area where the concept of payments has advanced the most. The political economy difficulty is that developed and developing countries have different conceptions of the basis for payments (Arndt and Bach 2011). The developed country conception has tended to revolve around payment for the provision of environmental services, particularly emissions reductions (see, for example, Heller (2012) and Angelsen (2013)). Developing

countries, on the other hand, tend in many cases to think of payments as owed in compensation for the burdens imposed by climate change mitigation and adaptation. This conception of payments owed is the genesis of the argument that climate finance should be 'new and additional' to existing development finance that has been emphasized again and again in climate negotiations. The COP decisions speak of nothing less than the 'provision of scaled-up, new, additional, adequate and predictable financial resources' to address the adaptation and mitigation needs of developing countries (UNFCCC 2011).

The developing country conception and accompanying demands for additional finance is in line with the 'polluter pays' principle, which is applied in the USA amongst other countries. Nevertheless, there are a number of thorny issues associated with viewing mitigation and adaptation costs as payments owed.

- First, the desired payments are not happening despite substantial efforts. Meanwhile, fundamental global problems are not being resolved. And, other issues of importance to developing countries, such as the governance structures of international institutions, remain to be addressed.
- Second, the difficulties associated with calculating the appropriate value for compensation are vast. As discussed, estimates for mitigation and adaptation costs differ drastically at the global level. Finding a basis for allocating these costs across countries would introduce further complexities.
- Third, and perhaps most importantly, even if the enormous uncertainties and technical difficulties associated with estimating the expected costs of climate change could be resolved, the developed country liability for these costs would still be a matter of debate. After all, human welfare is arguably as high as it has ever been and is, by many measures, advancing rapidly for a historically unprecedented number of people. The gains registered in many developing countries are clearly based, at least in some measure, on technical and institutional advances pioneered in developed countries. An argument exists that increased levels of GHGs in the atmosphere, new information technologies (e.g., mobile phones), resource depletion, smallpox eradication, new seed varieties, and all of the other gains and encumbrances of modern society come as a package. It is, in this view, inappropriate to ignore all gains, focus on the costs, tally up the total, and hand over a bill.

A more promising basis for regular payments may lie on the mitigation side. Mitigation payments can also be viewed as revenue sharing from a tax on the global commons (Pearce 1991). Suppose the globe targets total emissions in 2015 at (say) 7 per cent more than the level observed in 2012 and then specifies a gradual path that first slows the rate of emissions growth and then begins to reduce emissions globally. Assuming these targets are respected, they effectively establish a right to emit up to the targeted level in each year.

Who owns these rights? Because per capita emissions in developing countries are typically vastly less than per capita emissions in developed countries, distribution of the rights by country on a population basis would mean, for most developing countries, ownership of many more emissions rights than they actually use, especially in the early stages when the global quota is large. Developed countries, on the other hand, would uniformly emit more than their quota rights. A market for emissions rights would allow developing countries to sell their emissions rights to developed countries. The price of a permit would depend upon the difficulty in achieving the global emissions target.

A per capita allocation of emission rights in the initial years of an effective quota system would likely generate enormous (i.e., politically infeasible) financial flows from developed to developing countries. However, a system that initially allocated permits to countries mainly on the basis of historical emissions and then gradually trended towards a per capita basis could possibly provide a politically more tenable transfer levels to lower income countries that could be used to pursue development objectives. It would also generate incentives to achieve stabilization of the global climate at least cost globally.

The emission rights just referred to are just one dimension of the global political economy framework that needs to be built for the role and impact of aid to be maximized in the area of environment and climate change. We reiterate, development aid, by itself, cannot 'save the planet' and secure much needed and much desired outcomes in furthering development, poverty reduction and environmental stewardship. Development aid and development institutions do have, as demonstrated in this position paper, the potential to become important catalytic actors in achieving developmental and global environmental objectives. However, this requires bold reforms and political action. Without the necessary complementary frameworks in place, future aid risks substantially under-performing and ending up as a large set of disparate projects. The people of the world, particularly the 1.3 billion poor people, who remain in the midst of more wealth than ever before in the history of humankind, deserve better, much better.

References

Abbott, P. (2012). 'Foreign Assistance and the Food Crisis of 2007–08'. WIDER Working Paper 2012/019. Helsinki: UNU-WIDER.

ACCCRN (2009). 'Responding to the Urban Climate Challenge'. Boulder, Colorado, USA: Asian Cities Climate Change Resilience Network.

Addison, T., C. Arndt, and F. Tarp (2010). 'The Triple Crisis and the Global Aid Architecture'. WIDER Working Paper 2010/01. Helsinki: UNU-WIDER.

Addison, T., C. Arndt, and F. Tarp (2011). 'The triple crisis and the global aid architecture'. *African Development Review*, 23(4): 461-478.

AGECC, U. (2010). 'Energy for a Sustainable Future: Summary Report and Recommendations'. *UN (United Nations)/The Secretary-General's Advisory Group on Energy and Climate Change. New York, USA.*

Akpalu, W. (2013). 'Foreign aid and sustainable fisheries management in sub-Saharan Africa'. WIDER Working Paper 2013/100. Helsinki: UNU-WIDER.

Angelsen, A. (2013). 'REDD+ as Performance-based Aid'. WIDER Working Paper 2013/135. Helsinki: UNU-WIDER.

Angelsen, A. and M. Brockhaus (2009). *Realising REDD+: National strategy and policy options*: CIFOR (Free PDF Download).

Arndt, C. and C.F. Bach (2011). 'Foreign Assistance in a Climate-Constrained World'. WIDER Working Paper 2011/66. Helsinki: UNU-WIDER.

Arndt, C., P. Chinowsky, K. Strzepek, and J. Thurlow (2012). 'Climate change, growth and infrastructure investment: the case of Mozambique'. *Review of Development Economics*, 16(3): 463-475.

Arndt, C., S. Jones, and F. Tarp (2010). 'Aid, Growth, and Development: Have We Come Full Circle?'. WIDER Working Paper 2010/96 Helsinki: UNU-WIDER.

Arndt, C., S. Jones, and F. Tarp (2011). 'Aid Effectiveness: Opening the Black Box'. WIDER Working Paper 2011/44 Helsinki: UNU-WIDER.

Arndt, C. and F. Tarp (2000). 'Agricultural technology, risk, and gender: A CGE analysis of Mozambique'. *World Development*, 28(7): 1307-1326.

Arndt, C. and J. Thurlow (2013). 'Climate uncertainty and economic development: Evaluating the case of Mozambique to 2050'. WIDER Working Paper 2013/042. Helsinki: UNU-WIDER.

Austin, D., P. Faeth, R. Seroa da Motta, C.E. Young, Z. Ji, and L. Junfeng (1999). 'How much sustainable development can we expect from the clean development mechanism?'.

Banks, N. (2011). 'Improving Donor Support for Urban Poverty Reduction: A focus on South Asia'. WIDER Working Paper 2011/68. Helsinki: UNU-WIDER.

Béné, C. (2006). 'Small-scale fisheries: assessing their contribution to rural livelihoods in developing countries'.

Bernheim, B.D. and M.D. Whinston (1986). 'Menu auctions, resource allocation, and economic influence'. *The quarterly journal of economics*, 101(1): 1-31.

Bevan, D. (2012). ' Aid, Fiscal Policy, Climate Change, and Growth'. WIDER Working Paper 2012/077. Helsinki: UNU-WIDER.

Blom, B., T. Sunderland, and D. Murdiyarso (2010). 'Getting REDD to work locally: lessons learned from integrated conservation and development projects'. *Environmental Science & Policy*, 13(2): 164-172.

Brown, D., F. Seymour, and L. Peskett (2008). 'How do we achieve REDD co-benefits and avoid doing harm?'. In A. Angelsen (ed.), *Moving Ahead with REDD*. Bogor: CIFOR.

Buckley, R.M. and J. Kalarickal (2005). 'Housing policy in developing countries: Conjectures and refutations'. *The World Bank Research Observer*, 20(2): 233-257.

Buur, L., O. Therkildsen, M.W. Hansen, and M. Kjær (2013). 'Extractive Natural Resource Development: Governance, Linkages and Aid'. DIIS Report 203:28. Copenhagen: Danish Institute for International Studies.

Chedid, R.B. and R.F. Ghajar (2004). 'Assessment of energy efficiency options in the building sector of Lebanon'. *Energy policy*, 32(5): 647-655.

Chen, Z. and J. He (2013). 'Foreign aid for climate change related capacity building'. WIDER Working Paper 2013/046 Helsinki: UNU-WIDER.

Ciplet, D., J.T. Roberts, and M. Khan (2013). 'The politics of international climate adaptation funding: Justice and divisions in the greenhouse'. *Global Environmental Politics*, 13(1): 49-68.

Cities Alliance (2012). 'A Strengthened Partnership for Inclusive Cities'. 2011 Annual Report. Washington DC: Cities Alliance.

Collier, P. (1997). In C. Gwin, J. M. Nelson, E. Berget al (eds), *Perspectives on Aid and Development*. Washington, DC: Overseas Development Council.

Collier, P. (2008). *The bottom billion: Why the poorest countries are failing and what can be done about it*: Oxford University Press.

Crutzen, P.J. (2002). 'Geology of mankind'. *Nature*, 415(6867): 23-23.

Curran, L.M., S.N. Trigg, A.K. McDonald, D. Astiani, Y. Hardiono, P. Siregar, I. Caniago, and E. Kasischke (2004). 'Lowland forest loss in protected areas of Indonesian Borneo'. *Science*, 303(5660): 1000-1003.

DTMA (2012). 'Five Years of Addressing the Needs of Smallholder Farmers in Africa'. DTMA Brief. Nairobi: CIMMYT.

Easterly, W. (2008). 'Can the west save Africa?': National Bureau of Economic Research.

Eldridge, C. and N. Palmer (2009). 'Performance-based payment: some reflections on the discourse, evidence and unanswered questions'. *Health Policy and Planning*, 24: 160-166.

Emerton, L., J. Bishop, and L. Thomas (2006). *Sustainable Financing of Protected Areas: A global review of challenges and options*: IUCN.

EU (European Union) (2012). 'Submission by Denmark and the European Commission on Behalf of the European Union and its Member States. Capacity-building under the Convention and under the Kyoto Protocol: Information on the Activities Undertaken Pursuant to Decisions 2/CP.7, 2/CP.10 and 29/CMP.1.'.

FAO, U. (2010). 'Climate-smart agriculture policies: practices and financing for food security, adaptation and mitigation'. *Food and Agriculture Organization. Rome, Italy*.

Fischer, T., D. Byerlee, and G. Edmeades (2012). 'Crop yields and food security: will yield increases continue to feed the world?'. Proc. 12th Australian Agronomy Conference, Armidale, NSW.(http://www. regional. org. au/au/asa/2012/agriculture/7936_ fischerra. htm).

Funder, M. and M. Marani (2013). 'Implementing national environmental frameworks at the local level: A case study from Taita Taveta County, Kenya'. DIIS Report 2013:06. Copenhagen: DIIS.

Gef. from www.thegef.org.

Gef. 'Operational Program Number 5 Removal of Barriers to Energy Efficiency and Energy Conservation '. Accessed 12.12. 2013 from http://www.thegef.org/gef/sites/thegef.org/files/documents/document/OP_5_English.pdf.

Gef. 'Operational Program Number 6 Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs'. Accessed 12.12. 2013 from http://www.thegef.org/gef/sites/thegef.org/files/documents/document/OP_6_English.pdf.

GEF (2006). 'GEF Biodiversity Strategy in Action'. Washington DC: GEF.

Gilligan, D.O., J. Hoddinott, and A.S. Taffesse (2009). 'The Impact of Ethiopia's Productive Safety Net Programme and its Linkages'. *Journal of Development Studies*, 45(10): 1684-1706.

Gomez-Echeverri, L. (2010). 'National Funding Entities; their role in the transition to a new paradigm of global cooperation on climate change. European Capacity Building Initiative (ECBI) Policy Report': Oxford [available at www. eurocapacity. org].

Gomez-Echeverri, L. (2013). 'Foreign aid and sustainable energy'. WIDER Working Paper 2013/093. Helsinki: UNU-WIDER.

Grubler, A., F. Aguayo, K. Gallagher, M. Hekkert, K. Jiang, L. Mytelka, L. Neij, G. Nemet, and C. Wilson (2012). 'Policies for the Energy Technology Innovation System (ETIS)'. In *Global Energy Assessment - Toward a Sustainable Future*: Cambridge University Press.

Hallegatte, S. (2009). 'Strategies to adapt to an uncertain climate change'. *Global Environmental Change*, 19(2): 240-247.

Heller, T. (2012). 'What's Next for Green Growth?': The CPI Policy Blog.

Hertel, T.W. (2013a). 'Global Change and the Challenges of Sustainably Feeding a Growing Planet'. Washington DC.

Hertel, T.W. (2013b). 'Land, environment and climate: Contributing to the global public good'. WIDER Working Paper 2013/107 Helsinki: UNU-WIDER.

Hicks, R.L., B.C. Parks, J.T. Roberts, and M.J. Tierney (2008). *Greening aid?: Understanding the environmental impact of development assistance*. Oxford: Oxford University Press.

High Level Advisory Group on Climate Change Finance (2010). 'Report of the SecRetaRy-GeneRal'S hiGh-level adviSoRy GRoup on climate chanGe financinG': United Nations.

Huang, Y. and J. He (2012). 'The Decarbonization of China's Agriculture'. WIDER Working Paper 2012/074 Helsinki: UNU-WIDER.

Huang, Y., J. He, and F. Tarp (2012a). 'Is the Clean Development Mechanism Effective for Emission Reductions?'. WIDER Working Paper 2012/073 Helsinki: UNU-WIDER.

Huang, Y., J. He, and F. Tarp (2012b). 'Is the Clean Development Mechanism Promoting Sustainable Development?'. WIDER Working Paper 2012/072. Helsinki: UNU-WIDER.

Huang, Y. and M.G. Quibria (2013a). 'The global partnership for inclusive growth'. WIDER Working Paper 2013/059. Helsinki: UNU-WIDER.

Huang, Y. and M.G. Quibria (2013b). 'The global partnership for sustainable development'. WIDER Working Paper 2013/057. Helsinki: UNU-WIDER.

Huang, Y. and M.G. Quibria (2013c). 'Green growth: theory and evidence'. WIDER Working Paper 2013/056 Helsinki: UNU-WIDER.

Hultman, N., K. Sierra, J. Eis, and A. Shapiro (2012). 'Green Growth Innovation: New Pathways for International Cooperation.' Global Green Growth Institute and Brookings Institution.

Joss, S., D. Tomozeiu, and R. Cowley (2011). 'Eco-Cities: A Global Survey 2011'. *University of Westminster*, 24: 2012.

JRC (2012). 'Emission Database for Global Atmospheric Research (EDGAR)'.

Juselius, K., N.F. Møller, and F. Tarp (2013). 'The Long-Run Impact of Foreign Aid in 36 African Countries: Insights from Multivariate Time Series Analysis*'. *Oxford Bulletin of Economics and Statistics*.

Kablan, S. (2013). 'Foreign aid, green cities and buildings'. WIDER Working Paper 2013/048. Helsinki: UNU-WIDER.

Kanowski, J. and C.P. Catterall (2010). 'Carbon stocks in above-ground biomass of monoculture plantations, mixed species plantations and environmental restoration plantings in north-east Australia'. *Ecological Management & Restoration*, 11(2): 119-126.

Kanowski, P.J., C.L. McDermott, and B.W. Cashore (2011). 'Implementing REDD+: lessons from analysis of forest governance'. *Environmental Science & Policy*, 14(2): 111-117.

Kapur, D. (2002). 'The common pool dilemma of global public goods: Lessons from the World Bank's net income and reserves'. *World Development*, 30(3): 337-354.

Kaul, I., P. Conceicao, K. Le Goulven, and R.U. Mendoza (2003). *Providing global public goods: managing globalization*. Oxford: Oxford University Press.

Kauppi, P.E. (2013). 'Foreign aid and sustainable forestry'. WIDER Working Paper 2013/109 Helsinki: UNU-WIDER.

Kulichenko, N. and J. Wirth (2011). 'Regulatory and Financial Incentives for Scaling Up Concentrating Solar Power in Developing Countries'. *Energy and Mining Sector Board Discussion Paper, Paper*(24).

La Rovere, R.K., G. Abdoulaye, T. Dixon, J. Mwangi, W. Guo, and M. Z Banziger (2010). *Potential impact of investments in drought tolerant maize in Africa*: CIMMYT.

Lambert, A. (2006). 'Sustainable Financing for Environmental Projects in Africa: Some Ideas for Consideration'. Brazzaville, Congo.

Larsen, R.K. and C.A. Mamosso (2013). 'Environmental governance of uranium mining in Niger. A blind spot for development cooperation?'. DIIS Report 2013:02. Copenhagen: DIIS.

Larson, D.F., A. Dinar, and S.M. Rahman (2010). 'Will the clean development mechanism mobilize anticipated levels of mitigation?'. WB Policy Research Working Paper 5239. Washington, DC: The World Bank.

Lawson, S. and L. MacFaul (2010). *Illegal logging and related trade: Indicators of the global response*: Chatham House UK.

Levin, K., C. McDermott, and B. Cashore (2008). 'The climate regime as global forest governance: can reduced emissions from Deforestation and Forest Degradation (REDD) initiatives pass a'dual effectiveness' test?'. *International Forestry Review*, 10(3): 538-549.

Li, B. and R. Yao (2009). 'Urbanisation and its impact on building energy consumption and efficiency in China'. *Renewable Energy*, 34(9): 1994-1998.

Li, J. (2013). 'Foreign aid, urbanization and green cities'. WIDER Working Paper 2013/051. Helsinki: UNU-WIDER.

Li, Q. and B. Conrad (2012). 'Building a Line of Defense Against Climate Change: From Reactive Coping to Adaptive Capacity in China's Irrigated Agricultural Development'. Washington DC: World Bank.

Liu, S. and L. Xin (2011). 'Going renewable - China's success story in capacity development (Case Study 6, Towards an 'Energy Plus' approach for the poor: A review of good practices and lessons learned from Asia and the Pacific)'. Beijing, China: United Nations Development Programme.

Lobell, D.B., M. Bänziger, C. Magorokosho, and B. Vivek (2011). 'Nonlinear heat effects on African maize as evidenced by historical yield trials'. *Nature Climate Change*, 1(1): 42-45.

Lütken, S. (2011). 'Indexing CDM distribution: Level ling the Playing Field'. CD4CDM Working Paper Series 10. Roskilde: UNEP Risø.

Maclean, J., J. Tan, D. Tirpak, V. Sonntag-O'Brien, and E. Usher (2008). 'Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation': United Nations Environment Programme.

Marcoux, C., B.C. Parks, C.M. Peratsakis, J.T. Roberts, and M.J. Tierney (2013). 'Environmental and climate finance in a new world: How past environmental aid allocation impacts future climate aid'. WIDER Working Paper 2013/128 Helsinki: UNU-WIDER.

Markwei, C., L. Ndlovu, E. Robinson, and W. Shah (2008). 'Sub Saharan Africa summary for decision makers. International Assessment of Agricultural Knowledge'. *Science and Technology for Development (IAASTD). See http://www. agassessment. org, accessed*, 30(12): 08.

McDermott, C.L., A. O'Carroll, and P. Wood (2007). 'International Forest Policy–the instruments, agreements and processes that shape it'. United Nations Forum on Forests, UN Department of Economic and Social Affairs, New York, DESA.

Meinshausen, M., N. Meinshausen, W. Hare, S.C.B. Raper, K. Frieler, R. Knutti, D.J. Frame, and M.R. Allen (2009). 'Greenhouse-Gas Emission Targets for Limiting Global Warming to 2 degrees C'. *Nature*, 458: 1158–1162.

Mekasha, T.J. and F. Tarp (2013). 'Aid and growth: What meta-analysis reveals'. *The journal of development studies*, 49(4): 564-583.

Moberg, F. and S.H. Simonsen (2011). 'What is resilience? An introduction to social-ecological research'. Stockholm: Stockholm Resilience Centre.

Muchapondwa, E. (forthcoming). 'Aid and the Environment in Africa: A Synthesis of Eight Case Studies'. WIDER Working Papers. Helsinki: UNU-WIDER.

Naudé, W. (2011). 'Foreign Aid for Innovation: The Missing Ingredient in Private Sector Development?'. Working Paper 2011/35. Maastricht: UNU-Merit.

NEPAD (2011). 'Development Aid for Fisheries in Africa: Setting out Key Principles for Fisheries Governance Reforms'. South Africa: NEPAD.

Nkonya, E., J. Koo, E. Kato, and Z. Guo (2013). 'Trends and patterns of land use change and international aid in sub-Saharan Africa'. WIDER Working Paper 2013/110 Helsinki: UNU-WIDER.

OECD (2009). 'Financial Resources and Investment for Climate Change'. Addis Ababa: OECD.

OECD (2011a). 'Supporting Statebuilding in Situations of Conflict and Fragility: Policy Guidance'. DAC Guidelines and Reference Series: OECD Publishing.

OECD (2011b). *Towards Green Growth: Monitoring Progress*: OECD Publishing.

OECD (2012a). 'Fragile States 2013: Resource flows and trends in a shifting world': OECD.

OECD (2012b). 'Statistics on Resource Flows to Developing Countries'. Paris: OECD.

Olhoff, A., A. Markandya, K. Halsnæs, and T. Taylor (2004). 'CDM Sustainable Development Impacts'. Guidelines. Roskilde: UNEP Risø Centre.

Olsen, K.H. (2007). 'The clean development mechanism's contribution to sustainable development: a review of the literature'. *Climatic Change*, 84(1): 59-73.

Parker, C., J. Brown, J. Pickering, E. Roynestad, N. Mardas, and A.W. Mitchel (2009). 'The little climate finance book'. *Global Canopy Programme. UK: Oxford*.

Parry, M.L., O. Canziani, J. Palutikof, P.v.d. Linden, and C. Hanson (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Fourth Assessment Report of the IPCC Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

Pascual, U., E. Garmendia, J. Phelps, and E. Ojea (2013). 'Leveraging global climate finance for sustainable forests: Opportunities and conditions for successful foreign aid to the forestry sector'. WIDER Working Paper 2013/054 Helsinki: UNU-WIDER.

Paulsson, E. (2009). 'A review of the CDM literature: from fine-tuning to critical scrutiny?'. *International Environmental Agreements: Politics, Law and Economics*, 9(1): 63-80.

Pearce, D.W. (1991). *Blueprint 2: greening the world economy*: Earthscan.

Pettengell, C. (2009). *Beyond Aid: Ensuring adaptation to climate change works for the poor*: Oxfam.

Pfaff, A., E.O. Sills, G.S. Amacher, M.J. Coren, K. Lawlor, and C. Streck (2010). 'Policy impacts on deforestation: lessons learned from past experiences to inform new initiatives'. Durham: Nicholas Institute.

Ravindranath, N., R.E. Sims, D. Ürge-Vorsatz, M. Beerepoot, R.K. Chaturvedi, and L. Neretin (2012). 'Climate Change: A Scientific Assessment for the GEF'. Washington, DC: The Scientific and Technical Advisory Panel of the Global Environment Facility.

Ravnborg, H. (2012). 'Unfunded mandates on the frontline: Rio+20 and local environmental governance'. DIIS Comment: DIIS.

Ravnborg, H.M., R.K. Larsen, J.L. Vilsen, and M. Funder (2013). 'Environmental Governance and Development Cooperation: Achievements and Challenges'. DIIS Report 2013: 15. Copenhagen: Danish Institute for International Development.

Reiche, K., A. Covarrubias, and E. Martinot (2000). 'Expanding rural electricity access to remote areas: off-grid rural electrification in developing countries'. World Power.

Reilly, J., S. Paltsev, K. Strzepek, N.E. Selin, Y. Cai, K.-M. Nam, E. Monier, S. Dutkiewicz, J. Scott, and M. Webster (2013). 'Valuing climate impacts in integrated assessment models: the MIT IGSM'. *Climatic Change*: 1-13.

Resnick, D., F. Tarp, and J. Thurlow (2012). 'The Political Economy of Green Growth: Cases from Southern Africa'. *Public Administration and Development*, 32(3): 215-228.

Ringler, C., T. Zhu, X. Cai, J. Koo, and D. Wang (2010). 'Climate Change Impacts on Food Security in Sub-Saharan Africa'. IFPRI Discussion Paper 01042. Washington DC: IFPRI.

Rockström, J., W. Steffen, K. Noone, Å. Persson, F.S. Chapin, E.F. Lambin, T.M. Lenton, M. Scheffer, C. Folke, and H.J. Schellnhuber (2009). 'A safe operating space for humanity'. *Nature*, 461(7263): 472-475.

Rogner, H.-H. (2013). 'The effectiveness of foreign aid for sustainable energy'. WIDER Working Paper 2013/055 Helsinki: UNU-WIDER.

Rosendahl, K.E. and J. Strand (2009). 'Simple Model Frameworks for Explaining Inefficiency of the Clean Development Mechanism'. World Bank Policy Research Working Paper Series. Washington DC: The World Bank.

Scherr, S.J., A. White, and D. Kaimowitz (2004). 'A new agenda for forest conservation and poverty reduction. Making Markets Work for Low Income Producers'. Forest Trends. Washington DC: CIFOR.

Schneider, L. (2007). 'Is the CDM fulfilling its environmental and sustainable development objectives? An evaluation of the CDM and options for improvement'. Berlin: Öko-Institut for Applied Ecology.

Seymour, F. and A. Angelsen (2012). In A. Angelsen, M. Brockhaus, W. D. Sunderlin and L. V. Verchot (eds), *Analyzing REDD+: Challanges and Choices*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).

Shrader, H. and A. Sayyed (2012). 'Financing Climate Change Mitigation in the Building Sector'. Singapore: UNEP.

Skutsch, M.M. and M.K. McCall (2010). 'Reassessing REDD: governance, markets and the hype cycle'. *Climatic Change*, 100(3): 395-402.

Slaughter, A.M. (2004). 'Disaggregated sovereignty: Towards the public accountability of global government networks'. *Government and Opposition*, 39(2): 159-190.

Solomon, S., D. Qin, M. Manning, R. Alley, T. Berntsen, N. Bindoff, Z. Chen, A. Chidthaisong, J. Gregory, G. Hegerl, M. Heimann, B. Hewitson, B. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, G. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T. Stocker, P. Whetton, R. Wood, and D. Wratt (2007). 'Technical Summary'. In S. Solomon, D. Qin, M. Manninget al (eds), *Climate Change 2007: The Physical Science basis: Summary for policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK and NY, USA: Cambridge University Press.

Stokke, O. (1996). 'Foreign Aid: What Now?'. In O. Stokke (ed.), *Foreign Aid towards the Year 2000: Experiences and Challenges*. Geneva: EADI.

Stren, R. (2012). 'Donor Assistance and Urban Service Delivery in Africa'. WIDER Working Paper 2012/49. Helsinki: UNU-WIDER.

Sumaila, U.R., W. Cheung, A. Dyck, K. Gueye, L. Huang, V. Lam, D. Pauly, T. Srinivasan, W. Swartz, and R. Watson (2012). 'Benefits of rebuilding global marine fisheries outweigh costs'. *PloS one*, 7(7): e40542.

Sutter, C. and J.C. Parreño (2007). 'Does the current Clean Development Mechanism (CDM) deliver its sustainable development claim? An analysis of officially registered CDM projects'. *Climatic Change*, 84(1): 75-90.

Tacconi, L. (2007). 'Illegal Logging and the Future of the Forest'. In L. Tacconi (ed.), *Illegal Logging*. London: Earthscan.

Thormark, C. (2006). 'The effect of material choice on the total energy need and recycling potential of a building'. *Building and Environment*, 41(8): 1019-1026.

Tidwell, J.H. and G.L. Allan (2001). 'Fish as food: aquaculture's contribution: Ecological and economic impacts and contributions of fish farming and capture fisheries'. *EMBO reports*, 2(11): 958.

Tierney, M.J., D.L. Nielson, D.G. Hawkins, J.T. Roberts, M.G. Findley, R.M. Powers, B. Parks, S.E. Wilson, and R.L. Hicks (2011). 'More dollars than sense: refining our knowledge of development finance using AidData'. *World Development*, 39(11): 1891-1906.

Twerefou, D.K. (2013). 'Aid and environment in Ghana'. WIDER Working Paper 2013/123. Helsinki: UNU-WIDER.

Umbadda, S. and I. Elgizouli (2013). 'Foreign aid and sustainable agriculture in Africa'. WIDER Working Paper 2013/081 Helsinki: UNU-WIDER.

UN-Habitat (2011). 'Cities and Climate Change: Global Report on Human Settlements 2011'. *United Nations Human Settlement Programme. London, Earthscan*.

UNEP (2011). 'Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers'. Paris: United Nations Environment Programme.

UNFCCC (2011). 'Benefits of the clean development mechanism 2011'. Bonn: UNFCCC.

UNFCCC (2012a). 'Clean Development Mechanism: Executive Board Annual Report': United Nations.

UNFCCC (2012b). 'Report on the workshops of the work programme on long-term finance': United Nations.

UNFPA (2007). 'State of the World Population 2007: Unleashing the Potential of Urban Growth'. New York: United Nations Population Fund.

United Nations (1992). 'UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE '.

Vandeweerd, V., Y. Glemarec, and S. Billett (2012). 'Readiness for Climate Finance: A framework for understanding what it means to be ready to use climate finance'. New York: United Nations Development Programme.

Victor, D. (2013). 'Foreign aid for capacity-building to address climate change: Insights and applications'. WIDER Working Paper 2013/084 Helsinki: UNU-WIDER.

von Braun, J. (2013). 'International co-operation for agricultural development and food and nutrition security: New institutional arrangements for related public goods'. WIDER Working Paper 2013/061. Helsinki: UNU-WIDER.

Webster, M., A.P. Sokolov, J.M. Reilly, C.E. Forest, S. Paltsev, A. Schlosser, C. Wang, D. Kicklighter, M. Sarofim, and J. Melillo (2012). 'Analysis of climate policy targets under uncertainty'. *Climatic Change*, 112(3-4): 569-583.

Weitzman, M.L. (2011). 'Fat-tailed uncertainty in the economics of catastrophic climate change'. *Review of Environmental Economics and Policy*, 5(2): 275-292.

Wertz-Kanounnikoff, S. and D. McNeill (2012). In A. Angelsen, M. Brockhaus, W. D. Sunderlin and L. V. Verchot (eds), *Analyzing REDD+: Challanges and Choices*. Bogor, Indonesia: Center for International Forestry Research (CIFOR).

Winterbottom, R. (1990). *Taking stock: the tropical forestry action plan after five years*. Washington DC: World Resources Institute.

Wittemyer, G., P. Elsen, W.T. Bean, A.C.O. Burton, and J.S. Brashares (2008). 'Accelerated human population growth at protected area edges'. *Science*, 321(5885): 123-126.

World Bank (2007). *World development report 2008: Agriculture for development*: World Bank.

World Bank (2009). *World Development Report 2010: Development and Climate Change*. Washington DC: World Bank.

World Bank (2010). 'Economics of Adaptation to Climate Change: Synthesis Report'. Washington, DC. : World Bank.

World Bank (2011). 'Increased Productivity and Food Security, Enhanced Resilience and Reduced Carbon Emissions for Sustainable Development Opportunities and Challenges for a Converging Agenda: Country Examples'. Climate-Smart Agriculture. Washington, DC: World Bank.

World Bank (2012a). 'China - Third Irrigated Agriculture Intensification Project and Mainstreaming Climate Change Adaptation in Irrigated Agriculture Project'. Washington, DC: World Bank.

World Bank (2012b). 'Turn Down the Heat: Why a 4 degree Celsius Warmer World Must be Avoided'. Washington, DC: World Bank.

Notes

[1] As such, some important but more localized environmental issues, such as indoor air pollution and localized water contamination, are not addressed directly.

[2] Human capital and functioning institutions are basic inputs into the applications of the concept of resilience as set forth by Moberg and Simonsen (2011).

[3] Since 1970, nearly 90 per cent of emissions growth has occurred outside the countries that were members of the OECD in 1990 (see Figure 12 in the main text).

[4] As will be noted later in the document, the challenge of climate change has spawned a vast number of funds and initiatives. Functional entities include the Climate Investment Fund (CIF) and Sustainable Energy for All, among others. We choose to focus on these four.

[5] For an empirical modelling of the need for government action to promote Green Growth see Huang and Quibria (2013c)

[6] Less formal discussions with individual experts or groups of experts are likely to be welcome.

[7] See also UNU-WIDER's Growth and Poverty Project: http://www.wider.unu.edu/research/current-programme/en_GB/GAPP/.

[8] For further background and references see the ReCom position paper on 'Aid and the Social Sectors'.

[9] Also Huang and Quibria (2013a) find evidence supporting that foreign aid has significantly spurred inclusive growth (measured as inequality adjusted human development index) in aid recipient countries, especially through health and education related transmission channels.

[10] For further background and references see the ReCom position paper on 'Aid, Growth and Employment'.

[11] Another ReCom position paper will address the topic of 'Aid, Governance and Fragility'.

[12] A forthcoming UNU-WIDER ReCom position paper will address the topic of 'Aid and Gender'.

[13] Economists distinguish between risk and uncertainty. Risk refers to undesirable shocks and events, which are nevertheless predictable with some degree of certainty in the form of relatively stable and estimable probabilities. For example, wagering "heads" in the flip of a fair coin has a

50 per cent chance of success. There is risk, but no uncertainty. Uncertainty refers to a deeper and more systemic absence of knowledge about the likelihood that shocks will strike and what their potential impact may be. For example, what is the probability of major cyclone strikes over the period 2020–29? Nobody knows for sure. This is largely due to ongoing systemic change, which reduces the value of historical information in assessing the future. This is a subtle, but extremely important point, often missed in the public debate and in the media. See http://www.wider.unu.edu/research/current-programme/en_GB/development-under-climate-change_1/ for a short brief on UNU-WIDER's attempt to help fill this knowledge gap.

[14] It is a formal attempt to convert uncertainty, where ranges and associated probabilities are not assigned, into risk, where they are.

[15] Even the Level 1 Stabilization scenario fails to contain global average temperature rise below 2°C, relative to preindustrial, for most climate outcomes.

[16] The UNFCCC (2012b) contains a reasonably comprehensive listing of recent estimations.

[17] Twerefou (2013)also argues that, at least in the Ghanaian aid context, aid for environmental and climate change issues are concentrated only in these sectors, even though aid to other sectors could also be used: for example, aid to education could be used partly as a tool to combat environmental problems such as environmental degradation. Muchapondwa (forthcoming) also advocates a multisectoral approach of aid to tackle environmental issues.

[18] Also, Umbadda and Elgizouli (2013) note that agricultural aid to Sub-Saharan Africa has also experienced an increase in priority lately, after a continuous decline of agriculture aid volume and share during 1981–2001. The increase has been due to reactions to the 2007–08 food price crisis.

[19] Bevan (2012) discusses the role of other forms of financing besides development aid, including taxation and borrowing, and the linkages of fiscal policy with climate change and future aid flows.

[20] Abbott (2012) notes that food price crises call for increased support for agriculture development, as agriculture's share of total development aid has been shrinking since the mid-1980s.

[21] In addition to these mechanisms, Bevan (2012) suggests the calculation of country-specific net savings rates as a measure of sustainability to help with the analysis of mitigation of and adaptation to climate change. Adjusted net saving, an initiative of the World Bank, takes into account a country's 'capital consumption of produced assets, investments in human capital, depletion of natural resources and damage caused by pollution by adjusting

the more conventional gross savings rate calculated in the national accounts' (Bevan 2012).

[22] This section draws heavily from Angelsen (2013).

[23] These two observations also apply to the recent Sustainable Energy for All initiative (SE4All).

[24] See Arndt and Bach (2011) and (Bevan 2012) for more details.

[25] See the 2008 World Development Report on Agriculture (World Bank 2007). See also http://www.wider.unu.edu/publications/newsletter/articles-2010/en_GB/06-2010-de-Janvry-Sadoulet/ for Professors Sadoulet and de Janvry's assessment of the development prospects for Africa, in light of the triple crisis, which has been at the core of the UNU-WIDER work programme for the years 2010–13 (Addison et al. 2010).

[26] A variety of reports and publications of the United Nations Development Programme (UNDP) cover climate change finance (institutional issues and leveraging mechanism) and energy access and rural electrification. The UNDP (www.undp.org) also publishes a number of case studies, mostly in the area of energy access, which provide information about what works and other lessons born of experience.

[27] See Gomez-Echeverri (2013) for a comprehensive treatment of aid and energy issues.

[28] For a discussion of donors' role in promoting industrial links to provide sustainable growth in resource rich countries see Buur et al. (2013) and Huang and Quibria (2013b)

[29] See http://documents.worldbank.org/curated/en/2009/12/11618163/china-china-weihai-green-transport-corridor-project-china-weihai-green-transport-corridor-project

[30] See http://www.diis.dk/sw116721.asp. See also Ravnborg et al. (2013)for a comprehensive treatment of the concept of environmental governance itself—'the establishment, the reaffirmation, or change of institutions (policies, laws, procedures, practices and organisations) to resolve conflicts—overt or latent—between actors over environmental resources' (Ravnborg et al. 2013).

[31] See http://www.diis.dk/sw128467.asp

[32] See for example Muchapondwa (forthcoming) for an evaluation of aid projects in eight different Sub-Saharan African countries.

[33] See http://www.diis.dk/sw127264.asp

[34] Umbadda and Elgizouli (2013) note that in the context of Ethiopia's Productive Safety Nets Programme (PSNP), a large-scale programme designed to improve food security through environmental regeneration, small irrigation, training, and other activities, food security was improved when people had access to an agricultural support package in addition to the PSNP.

[35] For an analysis of the reasons for rising GHG emission in Chinese agriculture see Huang and He (2012)

[36] See https://cdm.unfccc.int/Projects/DB/JACO1245724331.7/

[37] See http://documents.worldbank.org/curated/en/2010/12/13919102/kenya-western-kenya-integrated-ecosystem-management-project

[38] For instance, this finding is supported by evidence from the Asian Cities Climate Change Resilience Network (ACCCRN 2009), a consortium of cities that deals with helping vulnerable cities in four Asian countries adapt to sea level and other climate impacts.

[39] Victor (2013) points out that for instance California faces a wide array of likely impacts of climate change and is still in the early stages of planning comprehensive adaptation responses. This is to a large scale due to tailoring its capacity building to the particular effect and local institutions.

[40] We draw here on Gomez-Echeverri (2013) and Arndt and Bach (2011).

[41] There is a distinction here between formal institutional discussions and less formal analysis and advice.

[42] While the process of converting sunlight to electricity functions in essentially the same way in the developed and developing world, developing countries may require additional innovations in finance because developing countries typically face higher opportunity cost of capital and the costs of renewable technologies are typically front-loaded.

[43] For example, one of the most widely used biotechnology innovations in the USA is herbicide resistant maize. This innovation is of limited value in contexts where very little herbicide is used.

[44] Measurement and verification are equally salient for the preservation and/or expansion of GHG sinks as envisioned under payments for environmental services.

Appendix 1: Externally peer-reviewed publications[i]

A1.1 Books and journal special issues

A1.1.1 Published and forthcoming

Addison, T., and F. Tarp (eds) (forthcoming). 'Aid Policy and the Macroeconomic Management of Aid'. Special issue of World Development.

1. Aid Policy and the Macroeconomic Management of Aid
   T. Addison and F. Tarp

2. Assessing Foreign Aid's Long-Run Contribution to Growth and Development
   C. Arndt, S. Jones, and F. Tarp

3. Aid and Income: Another Time-series Perspective
   M. Lof, T.J. Mekasha, and F. Tarp

4. Aid Supplies over Time: Addressing Heterogeneity, Trends and Dynamics
   S. Jones

5. Business Cycle Fluctuations, Large Macroeconomic Shocks, and Development Aid
   E. Dabla-Norris, C. Minoiu, and L.-F. Zanna

6. Consequences of Aid Volatility for Macroeconomic Management and Aid Effectiveness
   J. Hudson

7. International Coordination and the Effectiveness of Aid
   A. Bigsten and S. Tengstam

8. The Hard Challenge of Aid Coordination
   F. Bourguignon and J.-P. Platteau

9. Aid and Government Fiscal Behavior: Assessing Recent Evidence
   O. Morrissey

10. Fiscal Composition and Aid Effectiveness: A Political Economy Model
    P. Mosley

11. Policy Responses to Aid Surges in Countries with Limited International Capital Mobility: The Role of the Exchange Rate Regime
A. Berg, R. Portillo, and L.-F. Zanna

Gisselquist, R. M. (ed.) (forthcoming). 'Aid and Institution-Building in Fragile States: Findings from Comparative Cases'. Special issue of The Annals of the American Academy of Political and Social Science.

1. Introduction: Applying Comparative Methods to the Study of State-Building: Key Concepts and Methodological Considerations
R. M. Gisselquist

2. Aid and Institution-Building in Fragile States: Taiwan, South Korea, and South Vietnam 1950s-1970s
K. Gray

3. Aid and Policy Preference in Fragile Oil-Rich Countries: Comparing Indonesia and Nigeria
A. H. Fuady

4. Aid and Governance in Vulnerable States: Bangladesh and Pakistan since 1971
M. Khan

5. Introduction Aid and Institution-Building in Central America: The Re-Formation of Rule of Law Institutions in Post-Conflict Societies
J. M. Cruz

6. Foreign Aid, Resource Rents and Institution-Building in Mozambique and Angola
H. Perez Nino and P. Le Billon

7. State-Building through Neotrusteeship: Kosovo and East Timor in Comparative Perspective
L. M. Howard

8. Aid and Institution-Building in Fragile States: The Case of Somali-Inhabited Eastern Horn of Africa
K. Menkhaus

9. Aid and Institutions in Rwanda and Burundi
D. Curtis

10. Post-War Reconstruction in Sierra Leone and Liberia in Comparative Perspective
A. K. Onoma

11. Findings from Comparative Cases
R. M. Gisselquist

Gisselquist, R. M., and M. Niño-Zarazúa (eds) (forthcoming). 'Experimental and Non-Experimental Methods in the Study Government Performance: Toward a Middle Ground?'. Special issue of The Journal of Globalization and Development.

1. Introduction: What Can Experimental Methods Tell Us about Government Performance?
   R. M. Gisselquist and M. Niño-Zarazúa

2. Evaluating Antipoverty Transfer Programs in Latin America and Sub-Saharan Africa: Better Policies? Better Politics?
   A. Barrientos and J. M. Villa

3. A Structural Approach to Generalization in Social Experiments
   F. Martel Garcia and L. Wantchekon

4. The Ethics of Field Experimentation
   M. Humphreys

5. The Porous Dialectic: Experimental and Non-experimental Methods in Development Economics
   R. Dehejia

6. Measuring Government Performance in Public Opinion Surveys in Africa: Towards Experiments?
   M. Bratton

7. Ancillary Experiments: Opportunities and Challenges
   K. Baldwin and R. Bhavnani

Gisselquist, R. M., and D. Resnick (eds) (forthcoming). 'Aiding Government Effectiveness in Developing Countries'. Special issue of Public Administration and Development.

1. Introduction
   R. M. Gisselquist and D. Resnick

2. Policing Reforms and Economic Development in African States: Understanding the Linkages, Empowering Change
   O. Marenin

3. Economic Governance: Improving the Economic and Regulatory Environment for Supporting Private Sector Activity
   C. Kirkpatrick

4. The Impact of Adult Civic Education Programs in Developing Democracies
   S. Finkel

5. Foreign Aid and Decentralization: Policies for Autonomy and Programming for Responsiveness
   J. Tyler Dickovick

6. Taxation and Development: A Review of Donor Support to Strengthen Tax Systems in Developing Countries
   O.-H. Fjeldstad

7. Civil Service Reform: A Review
   S. Repucci

Resnick, D. (ed.) (forthcoming). 'Urban Governance and Service Delivery in African Cities'. Special issue of Development Policy Review.

1. Urban Governance and Service Delivery in African Cities: The Role of Politics and Policies
   D. Resnick

2. Urban Service Delivery in Africa and the Role of International Assistance
   R. Stren

3. Opposition Politics and Urban Service Delivery in Kampala, Uganda
   G. Lambright

4. Strategies of Subversion in Vertically-Divided Contexts: Decentralisation and Urban Service Delivery in Senegal
   D. Resnick

5. Vertical Decentralisation and Urban Service Delivery in South Africa: Does Politics Matter?
   R. Cameron

Resnick, D., and N. van de Walle (eds) (2013). 'Democratic Trajectories in Africa: Unravelling the Impact of Foreign Aid'. Oxford, UK: Oxford University Press.

1. Introduction: Why Aid and Democracy? Why Africa?
   D. Resnick and N. van de Walle

2. Democratization in Africa: What Role for External Actors?
   D. Resnick and N. van de Walle

3. Foreign Aid and Democratic Development in Africa
   S. Dietrich and J. Wright

4. Foreign Aid in Dangerous Places: The Donors and Mali's Democracy
   N. van de Walle

5. Two Steps Forward, One Step Back: The Limits of Foreign Aid on Malawi's Democratic Consolidation
   D. Resnick

6. The Changing Dynamics of Foreign Aid and Democracy in Mozambique
   C. Manning and M. Malbrough

7. Donor Assistance and Political Reform in Tanzania
   A. M. Tripp

8. Foreign Aid and Democratic Consolidation in Zambia
   L. Rakner

9. Beyond Electoral Democracy: Foreign Aid and the Challenge of Deepening Democracy in Benin
   M. Gazibo

10. Ghana: The Limits of External Democracy Assistance
    E. Gyimah-Boadi and T. Yakah

11. Conclusions and Policy Recommendations
    D. Resnick

A1.1.2 Under review and in preparation

Addison, T., M. Niño-Zarazúa, and F. Tarp (eds). 'Aid, Social Policy and Welfare in Developing Countries'.

1. Introduction: Aid, Social Policy and Welfare in Developing Countries
   T. Addison, M. Niño-Zarazúa, and F. Tarp

2. Public Spending, Welfare and the Quest against Poverty and Income Inequality in Developing Countries
   F. H. Gebregziabher and M. Niño-Zarazúa

3. On the Impact of Sector-Specific Foreign Aid on Welfare Outcomes: Do Aid Modalities Matter?
   A. Abdilahi, T. Addison, M. Niño-Zarazúa, and F. Tarp

4. Aid, Political Cycles and Welfare in sub-Saharan Africa
   B. Chiripanhura and M. Niño-Zarazúa

5. The Progressivity and Regressivity of Aid to the Social Sectors
   B. Baulch and L. Vi An Tam

6. New Actors in Development Assistance: the Africa-Brazil Co-operation in Social Protection
   I. Costa Leite, B. Suyama, and M. Pomeroy

7. Targeting Social Transfer Programmes: Comparing Design and Implementation Errors Across Alternative Mechanisms
   R. Sabates-Wheeler, A. Hurrell, and S. Devereux

8. The Donor Co-ordination for Effective Government Policies? Implementation of the New Aid Effectiveness Agenda in Health and Education in Zambia
   S. Leiderer

Addison, T., L. Scott, and F. Tarp (eds). 'Renaissance or Retreat? Aid in Changing Times'.

1. Introduction
   T. Addison, L. Scott, and F. Tarp

2. Aid as a Second-Best Solution. Seven Problems of Effectiveness and How to Tackle Them
   R. Manning

3. Rethinking the World of Aid in the Twenty First Century
   P. Heller

4. Aid and Poverty: Why Does Aid Not Address Poverty (Much)
   A. Shepherd and S. Bishop

5. Aid, Structural Change and the Private Sector in Africa
   J. Page

6. Aid and Infrastructure Financing: Emerging Challenges with a Focus on Africa
   T. Addison and P.B. Anand

7. Foreign Assistance and the Food Crisis of 2007-08
   P. Abbott

8. Improving Donor Support for Urban Poverty Reduction: A Focus on South Asia
   N. Banks

9. A Changing Landscape with New Players and Challenges
   A. Chimhowu

10. Aid as a Catalyst for Pioneer Investment
    P. Collier

11. Global Poverty, Aid, and Middle-Income Countries: Are the Country Classifications Moribund or Is Global Poverty in the Process of 'Nationalizing'?
    A. Sumner

12. Conclusions: Renaissance or Retreat?
    T. Addison, L. Scott, and F. Tarp

Addison, T., and F. Tarp (eds). 'Macroeconomic Management of Aid'.

Arndt, C., and F. Tarp (eds). 'Aid, Environment and Climate Change'.

1. Environmental and Climate Finance in a New World: How Past Environmental Aid Allocation Impacts Future Climate Aid
   C. Marcoux, B. C. Parks, C. M. Peratsakis, J. T. Roberts, and M. J. Tierney

2. Foreign Assistance in a Climate- Constrained World
   C. Arndt and C. Friis Bach

3. Land, Environment and Climate: Contributing to the Global Public Good
   T. W. Hertel

4. International Cooperation for Agricultural Development and Food- and Nutrition Security: New Institutional Arrangements for Related Public Goods
   J. von Braun

5. REDD+ as Performance-Based Aid
   A. Angelsen

6. Foreign Aid and Sustainable Energy
   L. Gomez-Echeverri

7. Aid, Environment, and Climate Change
   C. Arndt and F. Tarp

Gisselquist, R. M. (ed.). 'Good Aid in Hard Places: Evaluating and Explaining Reform "Success" in Fragile Contexts'.

1. Good Aid in Hard Places: Evaluating and Learning from What Has Worked in Fragile Contexts
   R. M. Gisselquist

2. The National Solidarity Program: Assessing the Effects of Community Driven Development in Afghanistan
   A. Beath, F. Christia, and R. Enikolopov

3. Delivering Good Aid in Hard Places: The Yemen Social Fund for Development Approach
   L. Al-Iryani, A. de Janvry, and E. Sadoulet

4. The World Bank's Health Projects in Timor-Leste: The Political Economy of Effective Aid
   A. Rosser and S. Bremner

5. Afghanistan's Health Sector Rehabilitation Program
   M. K. Rashidi, F. Feroz, N. Kamawal, H. Niayesh, G. Qader, and H. Saleh

6. Education from the Bottom Up: UNICEF's Education Program in Somalia
   J. H. Williams and W. C. Cummings

7. Success When Stars Align: Public Financial Management Reforms in Sierra Leone
   H. Tavakoli, W. Cole, and I. Ceesay

8. Liberia's Gender-Sensitive Police Reform: Starting from Scratch? Improving Representation and Responsiveness
   L. Bacon

9. Impact Assessment of the Facilitadores Judiciales Program in Nicaragua
   M. Barendrecht, M. Kokke, M. Gramatikov, R. Porter, M. Frishman, and A. Morales

10. Finn Church Aid and the Somali Peace Process
    R. Lepistö and J. Ojala

Gisselquist, R. M. (ed.). 'The Challenge of Chronic State Weakness: Implications for State-building'.

1. The Challenge of Chronic State Weakness
   R. M. Gisselquist

2. Intervention, Aid, and Institution-Building in Iraq and Afghanistan: A Review and Critique of Comparative Lessons
   J. Monten

3. International Aid to Southern Europe in the Early Post-war Period: The Cases of Greece and Italy
   D. A. Sotiropoulos

4. Aid and State Development in Ghana and South Korea
   J. Kim

5. Foreign Aid and the Failure of State-Building in Haiti under the Duvaliers, Aristide, Préval, and Martelly
   T. F. Buss

6. Consociational Settlements and Reconstruction: Bosnia in Comparative Perspective (1995 to present)
   S. Stroschein

7. Aid, Accountability, and Institution-Building in Ethiopia: A Comparative Analysis of Donor Practice
   B. Abegaz

Niño-Zarazúa, M. (ed.). 'Education Aid and Development: Have We Got It Right?'.

1. Introduction: Foreign Aid and Education: Principles and Actions
   M. Niño-Zarazúa

2. The Effectiveness of Foreign Aid to Education: What Can Be Learned?
   A. Riddell

3. International Organizations and the Future of Educational Assistance
   P. Heyneman and B. Lee

4. Making Aid Work for Education in Developing Countries: an Analysis of Aid Effectiveness for Primary Education Coverage and Quality
   K. Birchler and K. Michaelowa

5. What Works to Improve Education Quality in Developing Countries
   S. Masino and M. Niño-Zarazúa

6. Class Size versus Composition: Do They Matter for Learning in East Africa?
   S. Jones

7. How to Move from Measuring Separate Outcomes of School Food Provision to an Integrated Indicator Related to Learning?
   A. Gelli, F. Espejo, J. Shen, and E. Kristjansson

Niño-Zarazúa, M. (ed.). 'Aid and Public Health Policy in Developing Countries'.

1. Introduction: Foreign Aid and Public Health Interventions in Developing Countries
   M. Niño-Zarazúa

2. Aid Effectiveness in the Health Sector
   M. Martínez Álvarez and A. Acharya

3. Global Collective Action in Health: The WDR+20 Landscape of Core and Supportive Functions
   N. Blanchet, M. Thomas, R. Atun, D. Jamison, F. Knaul, and R. Hecht

4. External Assistance and Aid Effectiveness for Maternal and Child Health: Challenges and Opportunities
   Z. A. Bhutta and S. Aleem

5. Universal Access to Drinking Water: The Role of Foreign Aid
   R. Bain, R. Luyendijk, and J. Bartram

6. Every Drop Counts: Assessing Aid for Water and Sanitation
   P.B. Anand

7. International Aid for Diarrheal Disease Control: Effectiveness and Potential for the Future
   R. A. Cash and J. Potter

8. What Do We Know about Non-Clinical Interventions for Preventable and Treatable Childhood Diseases in Developing Countries?
   M. Seguin and M. Niño-Zarazúa

9. Policy Interventions against HIV/AIDS, Tuberculosis and Malaria in Developing Countries: What are their Micro-Economic effects?
   A. B. Amaya and M. Niño-Zarazúa

10. On the Effectiveness of Policy Interventions Against Neglected Tropical Diseases
    M. Quattri and M. Niño-Zarazúa

11. Conclusion
    M. Niño-Zarazúa

Page, J., S. Jones, and F. Tarp (eds). 'Aid, Structural Transformation and Employment'.

Pritchett, L., M. Woolcock, and M. Andrews. 'Remaking the Developing Project: Why Building State Capability for Implementation is the 21st Century Development Problem, and What to do About It'.

A1.2 Individual journal articles and book chapters[ii]

A1.2.1 Published and forthcoming

Addison, T., C. Arndt, and F. Tarp (2011). 'The Triple Crisis and the Global Aid Architecture'. *African Development Review*, 23(4): 461-478.

Andrews, M., L. Pritchett, and M. Woolcock (2013). 'Escaping Capability Traps Through Problem Driven Iterative Adaptation (PDIA)'. *World Development*, 51: 234-244.

Arndt, C., S. Jones, and F. Tarp. (2010). 'Aid, Growth, and Development: Have We Come Full Circle?'. *Journal of Globalization and Development,* 1(2): 1-29.

Arndt, C., S. Jones, and F. Tarp (forthcoming). 'Aid Effectiveness'. In M. Ndulu (ed.), *Problems, Promises, and Paradoxes of Aid: Africa's Experience*. Ohio: Ohio University Press.

Gisselquist, R.M. (forthcoming 2014). 'Paired Comparisons and Theory Development: Considerations for Case Selection'. *PS: Political Science & Politics*, 47(2).

Jones, S., and F. Tarp (forthcoming). 'Jobs and Welfare in Mozambique'. In G. Betcherman (ed.), *World Development Report 2013: Country Case Study Volume*. Washington, DC: World Bank.

Juselius, K., N.F. Møller, and F. Tarp (2012). 'The Long-Run Impact of Foreign Aid in 36 African Countries: Insights from Multivariate Time Series Analysis'. *Oxford Bulletin of Economics and Statistics*.

Mekasha, T.J. and F. Tarp (2013). 'Aid and Growth: What Meta-Analysis Reveals'. *The Journal of Development Studies*, 49(4): 564-583.

Nanivazo, M. (forthcoming). 'Social Transfer Programmes and School Enrolment in Malawi: A Micro-simulation'. *African Development Review*.

Pritchett, L., M. Woolcock, and M. Andrews (2013). 'Looking Like a State: Techniques of Persistent Failure in State Capability for Implementation'. *The Journal of Development Studies,* 49(1): 1-18.

Tarp, F. (2011). 'Foreign Aid and Development'. In B. Badie, D. Berg-Schlosser, and L. Morlino (eds), *International Encyclopedia of Political Science*. Thousand Oaks, CA: SAGE Publications, Inc.

Tarp, F. (2012) 'The Rationale of Foreign Aid Policy'. In P. Andersen, I. Henriksen, J. H. Petersen and H. Zobbe (eds), *How Does the World Look?*. Copenhagen: Jurist og Økonomforbundets Forlag.

Woolcock, M. (2013). 'Using Case Studies to Explore the External Validity of 'Complex' Development Interventions'. *Evaluation,* 19(3): 229-248.

Appendix 2: Events and presentations

1. Seminar: 'Aid and Development, Asia and Africa: The Role of Infrastructure and Capacity Development, East Asia: Growth and its Implication for African Development', School of Oriental and African Studies (SOAS), University of London, UK, 17-18 February 2011.
2. Seminar: 'The Impact of Aid: What is the Impact of Aid, Economic Development, Recipient Governments and Donors Themselves?', Sida, Stockholm, Sweden, 9 March 2011.
3. Presentation: 'Aid, Growth and Development: Are We Getting Results?', Finnish Development Days, Ministry for Foreign Affairs of Finland, Helsinki, Finland, 22 March 2011.
4. Seminar: 'Aid: Working for Development', Danish Ministry for Foreign Affairs, Copenhagen, Denmark, 17 June 2011.
5. Conference: 'Foreign Aid: Research and Communication', UNU-WIDER, Helsinki, Finland, 30 September-1 October 2011.
6. Conference: 'Macroeconomic Management of Foreign Aid', Nairobi, Kenya, 2-3 December 2011.
7. Seminar: 'Development Effectiveness: New Ideas, New Challenges', Development Policy Department, Ministry for Foreign Affairs of Finland, Helsinki, Finland, 19 January 2012.
8. ReCom Results Meeting: 'Aid, 'Growth and Macroeconomic Management', Copenhagen, Denmark, 27 January 2012.
9. Seminar: Sida Development Talks: 'Development Assistance and Growth, Sida, Stockholm, Sweden, 13 March 2012.
10. Seminar: 'Aid and Growth: an Overview, London, UK, 19 March 2012.
11. Seminar: 'Two Steps Forward, One Step Back? Progress, Setbacks, and Possibilities for Democratization, Africa', Helsinki, Finland, 18 April 2012.
12. Lecture: 'Foreign Aid and Domestic Politics, Recipient Countries', Stockholm, Sweden, 10 May 2012.
13. ReCom Results Meeting 'Democracy and Fragility', Stockholm, Sweden, 10 May 2012.
14. Seminar: 'Does Aid Contribute to Economic Development?', Helsinki, Finland, 15 May 2012.
15. Seminar: 'Cutting Edge Executive Education', Harvard University, Cambridge, Massachusetts, USA, 15-18 May 2012
16. Seminar: 'Foreign Aid and Democracy in Africa', London, UK, 17 May 2012.
17. Seminar: 'Urban Governance and Service Delivery, Africa', Cape Town, South Africa, 5 June 2012

18. Seminar: 'Donors, Democracy and Development: Unravelling the Impact of Aid in Africa', Accra, Ghana, 8 June 2012.
19. Gender Equality Theme Meeting, Helsinki, Finland, 12-13 July 2012.
20. Seminar: 'Urban Governance and Service Delivery, Africa: The Role of National Policies, Institutions, and Politics', within World Urban Forum 6, Naples, Italy, 5 September 2012.
21. Conference presentation: 'Successful Societies', Princeton University, New Jersey, USA, 21 September 2012.
22. ReCom Results Meeting: 'Jobs: Aid at Work', Copenhagen, Denmark, 8 October 2012.
23. Presentation: 'Aid, Growth and Development', Danish Economic Society, Copenhagen, Denmark, 9 October 2012.
24. Presentation: 'Has Foreign Aid Improved Governance in Sub-Saharan Africa? Experimental and Quasi-Experimental Findings' at Nordic Africa Days, Reykjavík, Iceland, 18-19 October 2012.
25. Presentation at a UNDP Seminar: New York, USA, 24 October 2012.
26. Presentation: 'Building State Capability: A PDIA Approach' at CID's 5th Annual Global Empowerment Meeting (GEM12), Harvard Kennedy School, Cambridge, Massachusetts, USA, 25 October 2012.
27. Presentation made to the World Bank Middle East and North Africa (MENA) region team, Washington DC, USA, 30 October 2012.
28. Presentation made to USAID governance group, Washington DC, USA, November 2012.
29. Presentation: 'Aid, Growth and Development', Danish Society for International Development and the Centre for African Studies, Copenhagen University, Copenhagen, Denmark, 2 November 2012.
30. Presentation: 'Does Foreign Aid Help?', IBIS General Assembly, Copenhagen, Denmark, 3 November 2012.
31. Presentation at EU European Social Fund Conference, the Netherlands, 6 November 2012.
32. Presentation: SIDA Development Talks, 'Capturing and Communicating Results: Complex Contributions', Stockholm, Sweden, 8 November 2012.
33. Presentation of ReCom results at workshop, 'The New Global Development Agenda', Ministry for Foreign Affairs of Finland and UNU-WIDER, Helsinki, Finland, 12 November 2012.
34. Presentation at MIT Department of Urban Studies and Planning Seminar: Cambridge, Massachusetts, USA, 14 November 2012.
35. Presentation at DFID, London, UK, 15 November 2012.
36. Workshop: 'Growth and Building State Capability through Problem-Driven Iterative Adaptation (PDIA)', Government of Uganda, Kampala, Uganda, 6-8 December 2012.

37. Presentation in RAND Graduate School Seminar: 10 January 2013.
38. Seminar at American University, School of International Service, Washington DC, USA, 30 January 2013.
39. ReCom Results Meeting: 'Aid and the Social Sectors', Stockholm, Sweden, 13 March 2013.
40. Guest lecture at Johns Hopkins University, School of Advanced International Studies, Washington DC, USA, 1 April 2013.
41. Presentation: 'Does Aid Contribute to Economic Development?', African Development Bank, Tunis, Tunisia, 4 April 2013.
42. Presentation at World Bank Institute, Washington DC, USA, 29 April 2013.
43. Presentation at the Harvard University Cutting Edge Executive Education Seminar, Cambridge, Massachusetts, USA, 13-17 May 2013.
44. Presentation at Civilian Training of the US Department of Defense, Washington DC, USA, 23 May 2013.
45. ReCom Results Meeting: 'Aid and Our Changing Environment', Stockholm, Sweden, 4 June 2013.
46. Promotion and exhibition booth on ReCom at the Deutsche Welle Global Media Forum, Bonn, Germany, 17-19 June 2013.
47. Promotion and exhibition booth on ReCom at the 8th World Conference of Science Journalist 2013, Helsinki, Finland, 24-28 June
48. Workshop: 'How to Make News Out of Foreign Aid', 8th World Conference of Science Journalists, Helsinki, Finland, 24 June 2013.
49. Lecture at World Bank DEC, Washington DC, USA, 26 June 2013.
50. Guest lecture at Sydney Law School, Sydney, Australia, 17 August 2013.
51. Lecture at South African National Treasury, Pretoria, South Africa, August 2013.
52. Presentation at Harvard Business Review, Brasil Public Management Training for local government officials, Brasilia, Brazil, 20 August 2013.
53. Symposium: 'Experimental and Non-Experimental Methods to Study Governance Performance: Contributions and Limits', New York, USA, 22-23 August 2013.
54. Lecture at Syracuse University, New York, USA, September 2013.
55. Briefing: ReCom programme for UNU-WIDER conference participants held, Helsinki, Finland, 19 September 2013.
56. Guest lecture at Columbia University, New York, USA, 20 September 2013.
57. Lecture at Johns Hopkins University Baltimore, USA, September 2013.
58. Public lecture at University of Bath, Bath, UK, 14 October 2013.

59. Panel discussion at American Evaluation Association, Washington DC, USA, 17 October 2013.
60. ReCom Results Meeting: 'Challenges, Fragility and Governance', Copenhagen, Denmark, 23 October 2013.
61. Workshop: 'Untying Development: Promoting Governance and Governments with Impact', Harvard University, USA, 23 October 2013.
62. Panel discussion: 'Impact Evaluation as a Learning Tool for Development Effectiveness Tomorrow', Inter-American Development Bank, Washington DC, USA, 24 October 2013.
63. Joint UNU and UNU-WIDER event: 'Fragility and Aid: What Works?', New York, USA, 25 October 2013.
64. Presentation: 'ReCom: What Works, Foreign Aid', Ministry for Foreign Ministry of Finland's Planning Day, Helsinki, Finland, 31 October 2013.
65. Lecture at New York University, USA, October 2013.
66. Conference presentation at LACEA-LAMES 2013, Latin American Economics Association (LACEA), Mexico City, Mexico, 2 November 2013.
67. Presentation: 'Aid, Environment and Climate Change', IDB-NDF seminar on Innovative Climate Financing Mechanisms, Nordic Development Fund, Helsinki, Finland, 4 November 2013.
68. Presentation at World Bank Institute Seminar, Washington DC, USA, 5 November 2013.
69. Panel discussion: 'Foreign Aid and Democracy, Africa', Carnegie Endowment for International Peace, Washington DC, USA, 6 November 2013.
70. Lecture at Australian Embassy, Jakarta, Indonesia, 11 November 2013.
71. Presentation: Overseas Development Institute, London, UK, 15 November 2013.
72. Project meeting: 'Aid and Institution-Building, Fragile States: Lessons from Comparative Cases', Helsinki, Finland, 15-16 November 2013.
73. Presentation at World Bank Seminar, Myanmar, 18 November 2013.
74. Presentation at World Bank Seminar, Nairobi, Kenya, 2 December 2013.
75. Project meeting: 'Good Aid, Hard Places: Learning from What Has Worked, Fragile Contexts', Helsinki, Finland, 12-13 December 2013.
76. ReCom Results Meeting: 'Aid for Gender Equality', Copenhagen, Denmark, 16 December 2013.

Appendix 3: Commissioned papers

A3.1 Annotated bibliography

Abbott, P. (2012). 'Foreign Assistance and the Food Crisis of 2007–08'. WIDER Working Paper 2012/019. Helsinki: UNU-WIDER.

> Dramatically increased international agricultural commodity prices from 2007 to mid-2008 brought food inflation and greater incidence of poverty and malnutrition to developing countries. The international community responded strongly to these concerns in 2008 and 2009, promising greater financial support for food aid, safety nets, and agricultural development. Foreign assistance was small relative to promises made by donors, increased grain and fertilizer import costs, budgetary costs of mitigating policy responses, and investment costs needed to accelerate agricultural production. High returns to agricultural research require that enabling institutions are developed. National ownership and governance of initiatives that share donor objectives focusing on poverty and long-run development are critical to success.

Addison, T., C. Arndt, and F. Tarp (2010). 'The Triple Crisis and the Global Aid Architecture'. WIDER Working Paper 2010/001. Helsinki: UNU-WIDER.

> The global economy is passing through a period of profound change. The immediate concern is with the financial crisis, originating in the North. The South is affected via reduced demand and lower prices for their exports, reduced private financial flows, and falling remittances. This is the first crisis. Simultaneously, climate change remains unchecked, with the growth in greenhouse gas emissions exceeding previous estimates. This is the second crisis. Finally, malnutrition and hunger are on the rise, propelled by the recent inflation in global food prices. This constitutes the third crisis. These three crises interact to undermine the prosperity of present and future generations. Each has implications for international aid and underline the need for concerted action.

Akpalu, W. (2013). 'Foreign aid and sustainable fisheries management in sub-Saharan Africa'. WIDER Working Paper 2013/100. Helsinki: UNU-WIDER.

> The fisheries sector in sub-Saharan Africa has benefitted from high and increasing amounts of foreign aid for over four decades. In the 1990s when evidence emerged that most stocks were overcapitalized and overfished, the effectiveness of fisheries development aid, particularly

those directed at fishing capacity enhancement, came into question. This report examined the relationship between development aid and capture fisheries management in sub-Saharan Africa and found that, indeed, capacity enhancing subsidies can explain losses in the fisheries sector. Furthermore, we have argued that assigning and protecting fishing rights may not be sufficient to generate first best outcomes in practice. Development aid should, in addition to building fisheries institutions, be directed at fisheries research and development, tied to good governance, as well as be directed at protecting fish stocks.

Angelsen, A. (2013). 'REDD+ as Performance-based Aid'. WIDER Working Paper 2013/135. Helsinki: UNU-WIDER.

REDD+, when it officially became part of the international climate agenda in 2007, was an idea about payment to countries and projects for reducing emission from forests, with funding primarily from carbon markets. REDD+ has since become multi-objective; the policy focus has changed from payments for environmental services (PES) to broader policies, and international funding is mainly coming from development aid budgets. This 'aidification' of REDD+ has made it similar to previous efforts of conditional, result-based, or performance-based aid (PBA). But, experience of PBA, in other sectors, has hardly been brought into the REDD+ debate. A major conclusion from earlier research is that aid cannot buy policy reforms, yet this remains a major idea in current REDD+ discourses. This paper reviews the main challenges in designing and implementing a system of PBA in terms of donor spending pressure, performance criteria, benchmark setting, risk sharing, and credibility, in terms of amount of funding provided. It then reviews four bilateral REDD+ agreements Norway has entered with Tanzania, Brazil, Guyana, and Indonesia. Some elements of performance-based payments were included, and these agreements and the aid experience provide valuable lessons for design and implementation of future REDD+ mechanism.

Arndt, C. and C.F. Bach (2011). 'Foreign Assistance in a Climate-Constrained World'. WIDER Working Paper 2011/066. Helsinki: UNU-WIDER.

The emergence of climate finance has the potential to catalyse positive changes in the institutional architecture and distribution mechanisms for financial flows to lower income countries. The nature of the challenge of development in the context of climate change argues for recipient country leadership in the implementation of co-ordinated development, adaptation, and mitigation strategies based on predictable and long-term financial flows. Transparent and effective information systems in recipient countries should be a key prerequisite to the initiation and continuation of these flows. While some positive steps have been taken, there remains a very long way to go addressing the

interlinked development, adaptation, and mitigation challenges of the twenty-first century.

Bambio, Y. (2013). 'Aid and environment in Burkina Faso'. WIDER Working Paper 2013/139. Helsinki: UNU-WIDER.

The main objective of the paper is to determine the actual aid flows that have an environmental focus in Burkina Faso. The environment literature highlights important environment issues in air, land and water, including deforestation, desertification, irreversible negative effects on biodiversity, and urbanization issues. It implies serious adverse consequences on wellbeing in developed countries, but also in developing countries in particular. The negative impact of climate change in Burkina Faso is particularly worrying because of the country's dependence to subsistence agriculture, its high vulnerability to natural disasters, its lack of adequate healthcare and other adaptation/resilience capacities. Stakeholders, including Burkina Faso's government and donors in environment and development areas, acknowledge the urgent need of facing these challenges efficiently, the first of which seems to be deciding how to finance the environment strategies. Of the €8 million needed per year, the government's investment in environment is less than 1 per cent. The financing alternative could be aid, but donor support to the sector in Burkina Faso is considered insufficient. Furthermore, efficiency in environmental project implementation is more worrying.

Banks, N. (2011). 'Improving Donor Support for Urban Poverty Reduction: A focus on South Asia'. WIDER Working Paper 2011/068. Helsinki: UNU-WIDER.

The growing urbanization of poverty poses a significant challenge to governments and donors alike, particularly in Asia, which houses 60 per cent of the world's slum dwellers. Donors have been slow to respond to the urban challenge, however, both in their funding patterns and their priorities. There remains, therefore, significant scope for tangible benefits for the urban poor through greater formal and informal recognition, and in the process, through improved access to services and infrastructure, and improved health outcomes. Key to meeting these goals, however, is overcoming the social and political exclusion of the urban poor, which has so far been a key obstacle to donor involvement in the urban sector. Where national governments in developing countries remain reluctant to recognize the urban poor, donors must seek new funding mechanisms for urban poverty reduction, as discussed here. Where there have been successes in improved service delivery for the urban poor, it has been generated by collective mobilization of low-income households themselves, as active agents, allowing them to press their demands for greater legitimacy and recognition in rules and regulations, entitlements, and service provision.

New forms of partnership will be required. For greater progress in urban poverty reduction to be made, however, the ability to support new forms of decentralized aid must be accompanied by a greater commitment from donors to urban poverty within their priorities and funding patterns.

Bevan, D. (2012). 'Aid, Fiscal Policy, Climate Change, and Growth'. WIDER Working Paper 2012/077. Helsinki: UNU-WIDER.

This paper sets out to provide an introduction to two sets of questions, and to some relevant literature that has tried to answer them. The first set of questions concern what determines growth in low-income countries, and how the answers are conditioned by the history of fiscal policy design (public capital, debt and deficit management, for example). The second (related) set of questions concerns how to design fiscal policy in face of future uncertainties over climate change, structural change, and the evolution of aid flows. The paper is intended to ask questions, rather than answer them, but at least to provide some structure within which to do this.

Chen, Z. and J. He (2013). 'Foreign aid for climate change related capacity building'. WIDER Working Paper 2013/046. Helsinki: UNU-WIDER.

The current climate change crisis has repeatedly alerted humanity to the urgency of tackling this pressing global challenge before it is too late. Developing countries, which have contributed negligibly to the present climate change problem are, nevertheless, hit the hardest by, and are most vulnerable to, its negative effects. Despite the ongoing efforts of foreign aid to promote capacity building in the developing countries, little is known about the effectiveness of foreign aid in terms of developing climate change related capacity, what lessons and experiences we can draw from past and present aid projects, what areas of foreign aid we can improve to boost capacity building and what successful aid experiences can be applied to a wider context. This paper aims to bridge this research gap by investigating what works, what could work, what is scalable and what is transferrable in foreign aid for capacity building.

Gomez-Echeverri, L. (2013). 'Foreign aid and sustainable energy'. WIDER Working Paper 2013/093. Helsinki: UNU-WIDER.

Energy is linked to most of the major global challenges of the twenty-first century. Poverty eradication, climate change, ecosystem management, world health and security are all influenced by energy, its availability, cost, emissions and other impacts. Unfortunately, energy systems as currently configured are not contributing effectively to the realization of most goals agreed upon by the international community.

In order for energy systems to help deliver on the promises of these goals (e.g., stabilizing greenhouse gases emissions at levels agreed upon by the United Nations Framework Convention on Climate Change, helping countries achieve universal energy access by 2030 and better energy security) they would need to be significantly transformed. Because this transformation will need to be pursued in a global and cooperative approach, foreign aid must necessarily play a major role in this effort. This paper surveys some of the challenges of foreign aid to the energy sector in a rapidly changing environment, and the changes that it has had to make to be relevant and effective. The purpose of this paper is to undertake a brief examination of the energy foreign aid landscape within this changing context in order to extract lessons learned and determine best practices.

Heller, P.S. (2011). 'Rethinking the World of Aid in the Twenty First Century'. WIDER Working Paper 2011/067. Helsinki: UNU-WIDER.

Many concerns can be raised about the effectiveness of current aid programmes to developing countries. The appropriateness of aid is particularly questionable when one considers the likely character of the challenges that the global economy will confront in 2025, as suggested by alternative global scenario exercises. This paper argues for urgent reconsideration of the focus of aid by Development Assistance Committee (DAC) countries, extending from: the priorities that aid should be used for (with greater emphasis on global public good initiatives); the ways that DAC donors can contribute to these different policy objectives; and the roles that different aid actors should play.

Hertel, T.W. (2013). 'Land, environment and climate: Contributing to the global public good'. WIDER Working Paper 2013/107. Helsinki: UNU-WIDER.

This paper discusses global public goods related to the world's land resources, their current provision and likely future provision, their potential impacts on the world's poorest households, as well as prospects for using foreign assistance to enhance these outcomes. Specifically, the paper discusses: carbon sequestration, the provision of biodiversity and ecosystem services, water management, and investment in research, policies, and institutions to facilitate adaptation to climate change. Within this context, access to geospatial analysis tools and information on climate, land use and tenure, poverty and environmental indicators will become increasingly valuable to both public and private decision makers.

Huang, J. (2013). 'Financing sustainable agriculture under climate change with a specific focus on foreign aid'. WIDER Working Paper 2013/047. Helsinki: UNU-WIDER.

Agricultural development is facing great challenges in meeting global food security and is expected to face even greater difficulties under climate change. The overall goal of this paper is to examine how foreign aid in particular can be used to achieve the joint objectives of development, mitigation of and adaptation to climate change in agriculture in the developing world. The results show that agriculture is underinvested and foreign aid has not increased sufficiently to assist developing countries in achieving sustainable agriculture; substantial funds are needed to finance the wide range of measures for mitigating and adapting to climate change. The paper attempts to examine the successful cases where agricultural mitigation of and adaption to climate change have worked in the developing countries. In this respect, we pose four main questions: What works? What could work? What can be scaled? And what can be transferred?

Huang, Y. and J. He (2012). 'The Decarbonization of China's Agriculture'. WIDER Working Paper 2012/074. Helsinki: UNU-WIDER.

Agriculture is one of the major greenhouse gas (GHG) emission sources in China. This paper aims to identify the key factors that have led to rising GHG emissions in China's agricultural sector in recent decades. This research allows for spatial variations and particularities across provinces, making use of regional data from 31 provinces in mainland China. It investigates the effects of agricultural machinery, different energy types, fertilizer consumption, pesticide employment and agricultural investment on carbon emissions. The findings of this research contain significant policy recommendations for Chinese policy makers in terms of how to decarbonize China's agricultural sector, based on diverging circumstances of each region's agricultural system. It also has important implications for emission abatement policies in other developing countries sharing a similar emissions profile and regional characteristics.

Huang, Y., J. He, and F. Tarp (2012). 'Is the Clean Development Mechanism Effective for Emission Reductions?'. WIDER Working Paper 2012/073. Helsinki: UNU-WIDER.

This research studies whether the Clean Development Mechanism (CDM) of the Kyoto Protocol achieves its objective of emission reductions in the host countries. It empirically investigates the impacts of CDM projects on CO2 emission reductions for 60 CDM host countries over 2005-10. This research makes use of the newly-developed econometric methods for dynamic panel data models associated with X-differencing procedure. It provides evidence in support of a decline in CO2 emissions in the CDM host countries. It has important policy implications that encourage the international community to support developing countries' efforts towards low-carbon development via CDM projects.

Huang, Y., J. He, and F. Tarp (2012). 'Is the Clean Development Mechanism Promoting Sustainable Development?'. WIDER Working Paper 2012/072. Helsinki: UNU-WIDER.

> One of the dual objectives of the Clean Development Mechanism (CDM) of the Kyoto Protocol is to promote sustainable development in the host countries. With different CDM indicators for 58 CDM host countries over 2005-10, this paper empirically assesses whether CDM project development fulfils this objective of sustainable development. Using a unique dynamic panel data method based on long-differences of the model, this research provides evidence in support of significant contribution to sustainable development of CDM projects in the host countries. It sheds light on the role of CDM projects in the process of sustainable development with clear policy implications for developing countries and the wider world.

Huang, Y. and M.G. Quibria (2013). 'The global partnership for inclusive growth'. WIDER Working Paper 2013/059. Helsinki: UNU-WIDER.

> This paper investigates the determinants of inclusive growth with a focus on foreign aid. Based on the Solow growth model, a theoretical model has been developed which shows that foreign aid can stimulate inclusive growth if it is effectively used for augmenting either physical or human productive capacity. Based on UNDP's (2011) Human Development Index, this research calculates the inequality-adjusted human development index, and uses its growth rate to measure inclusive growth. The empirical section of this paper finds evidence for a significantly positive effect of foreign aid on inclusive growth in the sample countries. It further suggests that foreign aid fosters inclusive growth effectively, particularly when aid is directed to health and education. This research has important implications for an enhanced global partnership in areas such as foreign aid to achieve an inclusive society.

Huang, Y. and M.G. Quibria (2013). 'The global partnership for sustainable development'. WIDER Working Paper 2013/057. Helsinki: UNU-WIDER.

> This paper examines whether foreign aid, together with other economic, social and environmental factors, contributes to sustainable development. It starts with a theoretical model where sustainable development is modelled as a different kind of growth that protects the environment. Using factor analysis and newly developed estimation methods for a dynamic panel data model with endogenous regressors, the empirical section finds evidence that foreign aid has been a significantly positive influence on sustainable development in aid recipient countries. This effect is very likely to go through channels related to growth and resources as well as a technology channel with respect to energy intensity. This research has important implications for

a post-2015 development framework on international collective action with regard to a sustainable future.

Huang, Y. and M.G. Quibria (2013). 'Green growth: theory and evidence'. WIDER Working Paper 2013/056. Helsinki: UNU-WIDER.

What are the major determinants of green growth? What role can the government play to promote green growth? To address these questions, this paper develops a simple Green Solow model that sheds light on the role of finance and technology in the process of green growth. The empirical section of the article augments this canonical green growth model to include structural variables relating to finance, technological development, trade openness, natural resource exploitations, and areas where the government can play an important role. In addition, the use of the spatially-corrected generalized method moments approach affords us to explore the role of such factors as growth performance of the neighbouring countries, domestic learning or determination to achieve its national desired target, and political and economic shocks in the process of green growth. It is hoped that research reported in the paper will stimulate further research in the area.

Juana, J.S. (forthcoming). 'Aid and the environment: The case of Botswana'. WIDER Working Papers. Helsinki: UNU-WIDER.

Botswana has serious environmental problems which, if not addressed, will undermine the attainment of sustainable economic development. This study attempts to determine what aid flows have actually been doing with regard to the environment in Botswana. The results show that although both the national government of Botswana and top aid donors have concerns for environmental sustainability in sustainable economic development, the actual amount allocated to the sector is an insignificant proportion of the overall development budget. This will undermine national and global objectives of attaining lasting environmental and economic development. The donor agencies interviewed during the course of this study suggested that the government of Botswana needs to prioritize the environmental sector and coordinate the donor aid disbursed to the sector.

Kablan, S. (2013). 'Foreign aid, green cities and buildings'. WIDER Working Paper 2013/048. Helsinki: UNU-WIDER.

This paper attempts, first, to assess foreign aid effectiveness in fostering green city procedures in developing countries. For this purpose, we rely on the following aid effectiveness criteria: national ownership; harmonization; alignment and mutual accountability; and results management. The analysis shows that some programmes are effective and scalable. Secondly, using a GMM model, we try to link CO2

emissions from residential buildings as well as commercial and public services to foreign aid for renewable energy sources. The results show that the effect of foreign aid is significant with a negative impact on CO2 emissions. The relationship is linear but also quadratic, indicating that there is a threshold before foreign aid can be effective in reducing CO2 emissions. Efforts of the international community for climate change mitigation through the promotion of green city procedures should be supported to reach appreciable levels so that foreign aid will help to promote green cities procedures and green building in developing countries.

Kahyarara, G. (forthcoming). 'Aid and environment in Africa: The case of Tanzania'. WIDER Working Papers. Helsinki: UNU-WIDER.

This paper provides an assessment of what aid flows have actually been doing in the area of environment in Tanzania through a critical review of the flows, modalities and management of aid. Focusing on the funding for environmental degradation projects, the study notes that budget expenditure allocation to these activities is around 0.04 per cent of Tanzania's total expenditure. This is a problem given that in the near future, financing for climate change alone would need around US$1 billion per year (or nearly 10 per cent of the budget). Ultimately, aid money is critical for Tanzania, as over 90 per cent of funds for environment come from donors. To ensure maximum effectiveness of aid, Tanzania, in collaboration with its many development partners, introduced the Tanzania Joint Assistance Strategy. This resulted in an improvement in the country's operational development strategies and by 2010 out of 13 indicators with applicable targets, six were met. The paper concludes that environmental efforts in Tanzania depend heavily on donor money. This will not be sustainable because, with time, moral hazard will develop to the extent that environmental protection obligations will need to be integrated with economic activities. This calls for reinforcing the 'polluter pays' principle.

Kateregga, E. (2013). 'Aid and the environment: Uganda'. WIDER Working Paper 2013/142. Helsinki: UNU-WIDER.

This paper seeks to (i) establish the areas in which aid from the major donors is concentrated; (ii) examine how aid has been allocated to the environmental sectors, and (iii) review the factors behind the success of environmental projects. Using data from the Aiddata.org database, the distribution of environment-related aid, commitments and disbursements from the major donors over the period 2005–11 is examined. Recipients of aid and donors were interviewed to learn their perceptions on aid flows and the success of environmental projects. The analysis shows that although many of the key donors commit aid to environmental sectors, there was considerable non-disbursement by both multilateral and bilateral donors; a small percentage of aid from

multilateral donors was geared towards the environment. Strong involvement of local communities in projects is a key to the success of environmental projects.

Kauppi, P.E. (2013). 'Foreign aid and sustainable forestry'. WIDER Working Paper 2013/109. Helsinki: UNU-WIDER.

Foreign aid can contribute to sustainable forestry in many ways. The goal is to secure forest benefits of the future, without compromising the needs of the present generations. This paper elaborates on forestry aid as it has evolved in the past. Future directions are suggested, referring to short and midterm projects, as well as long-term programmes. Tree planting has worked in the past, and is an option for scaling up the activity in the future. Distributing fuel efficient cooking stoves could work in a similar way, sparing trees and at the same time improving the quality of rural life. Planted trees and new stoves can be made available in the near term, that is, within a time horizon of one to five years. In the mid-term, over a time span of 5-15 years, forest inventory and monitoring systems are relevant candidates for successful foreign aid in forestry, although the methods are not yet sufficiently developed to become applied in tropical rain forests. The support of universities and the infrastructure for higher education in forestry, agriculture, and rural development is important in the long term. Forestry, which generally operates in remote rural areas, is susceptible to logistical problems and resource misuse. It is important in forestry aid to circumvent corruption risks of both in recipient nations and in donor organizations. Forestry aid must emphasize domestic action by local experts, as well as capacity building in the recipient countries.

Li, J. (2013). 'Foreign aid, urbanization and green cities'. WIDER Working Paper 2013/051. Helsinki: UNU-WIDER.

Rapid urbanization, and particularly the associated problems of urban poverty, unsustainable development and environmental degradation, pose an enormous challenge to many developing countries. In the last decade more foreign aid has been diverted to urbanization and green city development. This paper studies aid's implementation strategies and effectiveness by investigating 'what works in foreign aid on urbanization and green cities', 'what could work', and 'what is scalable and transferable in foreign aid on urbanization and green cities'. Three case studies are carried out: Tianjin City which was constructed according to a newly designed eco-city plan, Wenchuan and Beichuan which needed to be re-built after an earthquake, and Curitiba which rose from an existing city. The paper shows that a transferable and scalable aid framework which combines concerns related to poverty, environment and governance both at policy and implementation level is needed in order for aid to succeed in supporting developing countries' urbanization and green city development.

Marcoux, C., B.C. Parks, C.M. Peratsakis, J.T. Roberts, and M.J. Tierney (2013). 'Environmental and climate finance in a new world: How past environmental aid allocation impacts future climate aid'. WIDER Working Paper 2013/128. Helsinki: UNU-WIDER.

> This paper updates previous work that categorizes foreign aid projects in terms of their likely impact on the natural environment. Trends in the global distribution of environmental aid over time are then documented. This shows that environmental aid has increasingly focussed on global environmental issues (especially climate change), rather than local issues in recipient countries. Somewhat surprisingly, the authors also find that environmental aid is increasingly allocated through bilateral aid agencies rather than through the increasing number of multilateral channels created for this purpose. After providing these descriptive statistics and demonstrating trends, they offer a tentative explanation for this puzzling pattern. They argue that each individual aid project represents a negotiation between donor and recipient. This additional level of bargaining significantly conditions the costs and benefits of multilateralism for donors, especially as recipients have multiple outside options for obtaining development finance. Reflecting the growing political salience of global environmental threats, donors are providing increasing levels of environmental aid, and especially climate finance. However, at the same time, donors are increasingly failing to co-ordinate their allocation of climate finance (and other environmental aid) within multilateral institutions. At a practical level, this raises the question whether the effect of increasing levels of funding will be undercut by decreasing co-ordination and efficiency.

Muchapondwa, E. (forthcoming). 'Aid and the Environment in Africa: A Synthesis of Eight Case Studies'. WIDER Working Papers. Helsinki: UNU-WIDER.

> Abstract forthcoming.

Ngaido, T. 'Aid, Environment and Climate Change in Africa: Case of Senegal'. WIDER Working Papers. Helsinki: UNU-WIDER.

> This paper reviews the dynamics of the financing baseed its analysis on the rich dataset of AidData ranging over 1993-2010, with around 9,077 observations on projects funded in Senegal by various multilateral as well as bilateral donors. The study started in the same year as the establishment of the environment ministry, 1993, to assess the perspectives as well as the evolution of the financing of the environment. Such an approach has large benefits as it helps to (1) capture changes in financial commitments and disbursement within and across sectors; (2) show the composition and changes of the portfolio of donors and levels of funding in the sector; (3) document which

subsectors of the environment are receiving more resources; and (4) demonstrate effects achieved to date.

Nkonya, E., J. Koo, E. Kato, and Z. Guo (2013). 'Trends and patterns of land use change and international aid in sub-Saharan Africa'. WIDER Working Paper 2013/110. Helsinki: UNU-WIDER.

> The sub-Saharan Africa region recorded the fastest conversion of forest land to agriculture in the past 20 years. The region also has the widest yield gap and together with Latin America and Caribbean has the largest unused arable land. However, there are wide variations across countries and this offers valuable lessons on the drivers of agricultural intensification and land use dynamics. This study shows only few countries experienced a decrease in cropland extent. Additionally, few countries with low agricultural potential have shown higher actual maize yield while others with high potential have shown lower actual yield.

Nyangena, W. (2013). 'Aid and the environment: The case of Kenya'. WIDER Working Paper 2013/133. Helsinki: UNU-WIDER.

> We investigate allocations of foreign aid by donors to the environment sector in Kenya covering the period 2001-12. Our data are largely obtained from official government and global aid databases complemented with donor interviews. We find that donor funding remained significant with emphasis on economic sectors such as agriculture, industry infrastructure and public debt. Allocations to environment have not been priority for donors in spite of several policy statements. Further, aid flows remained unpredictable, with huge disbursements occurring as emergency funds during disasters.

Pascual, U., E. Garmendia, J. Phelps, and E. Ojea (2013). 'Leveraging global climate finance for sustainable forests: Opportunities and conditions for successful foreign aid to the forestry sector'. WIDER Working Paper 2013/054. Helsinki: UNU-WIDER.

> Forest loss and degradation remains a leading environmental problem. The long history of sustainable forest management has often failed to meet expectations—constrained by funding, governance, capacity and competing interests. Initiatives from the climate change policy arena are opening new ways for a broader mainstreaming of forest management, specially through foreign aid mechanisms towards Reducing Emissions from Deforestation and Forest Degradation (REDD+). This paper addresses key questions regarding the potential of REDD+ to support sustainable forest management in the context of complex, multiple stakeholder interests and negotiations, including those of local resource users and international donors.

Rogner, H.-H. (2013). 'The effectiveness of foreign aid for sustainable energy'. WIDER Working Paper 2013/055. Helsinki: UNU-WIDER.

> Foreign aid and technology transfer are an essential contribution, especially for the least developed countries, towards meeting the Millennium Development Goals as well as facilitating adaptation to, and mitigation of, climate change. The deployment of technologies harvesting renewable energy flows and efficiency improvements is the key for improving access to modern energy services and mitigating climate change. However, support of sustainable energy, until recent, has been the step-child of foreign aid and its efficacy has been questioned. This paper reviews what the literature has to offer as to the effectiveness of foreign aid for sustainable energy and climate mitigation.

Tomo, A. and N. Givá (forthcoming). 'Aid and Environment in Mozambique'. WIDER Working Papers. Helsinki: UNU-WIDER.

> Abstract forthcoming.

Twerefou, D.K. (2013). 'Aid and environment in Ghana'. WIDER Working Paper 2013/123. Helsinki: UNU-WIDER.

> This paper discusses aid and the environment in Ghana. The analysis indicates that expenditure by the government of Ghana has increased consistently since 2000, with seven sectors weakly linked to the environment taking about 78.9 per cent of all government expenditure. Furthermore, the rate of increase of environmental expenditures has not kept pace with overall expenditure. External aid disbursement to environmental sectors has expanded and efforts are being made by the development partners to steer more grants instead of loans to environment-related activities. A 19-sector analysis of data from the AidData dataset from 1993 to 2009 indicates that the environmental sector ranks 11th in terms of project numbers, commitments and disbursements. A worrying phenomenon is the average disbursement rate of 27.8 per cent which is lower than the average rate of disbursements for all the 19 sectors (29 per cent), indicating the poor implementation of environmental projects. Also, cross-cutting issues such as climate change, biodiversity and desertification appear to be important only for the environmental sectors even though some of these, such as education, can be used to combat environmental degradation. Poor commitment of aid to the environmental sectors reflects the views of the development partners that the non-environmental sectors require more aid than the environmental sectors, even though donors recognize that non-environmental sectors have environmental impacts and are addressing them in their activities.

Umbadda, S. and I. Elgizouli (2013). 'Foreign aid and sustainable agriculture in Africa'. WIDER Working Paper 2013/081. Helsinki: UNU-WIDER.

> Although agriculture is important for the livelihood of most Africans, especially the poor, donors did not accord it a high priority. Both volume and share of aid earmarked for agriculture in sub-Saharan Africa not only remained low, around five per cent, but continuously declined between 1981-2001, before picking up after the world food crisis in 2007-08. Aid recently became a top agenda in donors' priorities because of concerns about its effectiveness and also because of budget pressures in donor countries as well as queries raised by their tax payers. However, despite scepticism about its effectiveness there exist successful experiences in aid supported projects that could be candidates both for scaling up and transferability across countries.

Victor, D. (2013). 'Foreign aid for capacity-building to address climate change: Insights and applications'. WIDER Working Paper 2013/084. Helsinki: UNU-WIDER.

> The paper examines the role of foreign aid in building capacity to address climate change. While the experience with this topic is relatively recent and not yet extensive, analogous questions have arisen in many other areas of foreign aid. It is likely that climate change aid programmes work best in countries with well-functioning systems of public administration, sound management of public finances, and independent media that hold government accountable for performance—all factors widely known to make other aid programmes more effective and adaptive. As countries try to expand climate aid quickly, historical patterns suggest bilateral aid—which is easier for donors and recipients to control—is likely to expand much more than multilateral aid. A shift is also likely from an emphasis on mitigation of emissions to a growing role for adaptation. Expanding climate aid must confront what I call the 'aid paradox', which is that the conditions of national capacity under which aid is most likely to be effective are least likely to be present in the countries that are most in need of foreign aid because they cannot raise needed funds on their own.

Von Braun, J. (2013). 'International co-operation for agricultural development and food and nutrition security: New institutional arrangements for related public goods'. WIDER Working Paper 2013/061. Helsinki: UNU-WIDER.

> Following an overview on the fast changing global context of agriculture, and food and nutrition security, this paper provides a framework for identifying the set of essential international public goods for a well-functioning world agriculture and food system: natural resource management related to biodiversity, water, and soils; climate change adaptation and mitigation; trade and food reserves; competition policy and standards for foreign direct investment; international

research and innovation; responding to and preventing food and nutrition emergencies; and trans-boundary food safety and health related investments and standards. The deficiencies of the current institutional arrangements in support of agricultural development and food and nutrition security are reviewed and a perspective for re-design is presented. It comprises three focal clusters of organizational setups under a global platform: a cluster on food and nutrition security for the poor; a second one on protection of natural resources; and a third one on enhanced sustainable intensification and productivity growth. A gradual approach toward re-design based on current building blocks of international organizations is proposed, allowing for more involvement of non-government global actors as well as intensified government-to-government (G-to-G) networking in order to improve international public goods delivery in support of development goals. Some re-design actually occurs already in this direction, but it is rather ad hoc. To move the re-design process forward more strategically, and less ad hoc needs a high-level, broad based, legitimized time-bound dialogue forum that embraces the whole set of international public goods for agricultural development and food and nutrition security, and addresses the organizational implications.

A3.2 Annotated bibliography of DIIS papers

Buur, L., O. Therkildsen, M.W. Hansen, and M. Kjær (2013). 'Extractive Natural Resource Development: Governance, Linkages and Aid'. DIIS Report 2013:28. Copenhagen: Danish Institute for International Studies.

Literature reviews and limited fieldwork in Mozambique, Tanzania and Uganda help to identify main factors that influence the political incentives for governments in African countries to use industrial policies and other measures to create linkages between extractive industries and other parts of the economy, which generate jobs, sustain growth and alleviate poverty. This governance perspective complements analyses of the economic implications of resource-based development strategies. Both perspectives help to identify main implications for donor assistance to extractive natural resource-driven development. The basic message is that linkages policies can clearly help to create jobs and reduce poverty in resource rich African countries, but this potential has not yet been sufficiently exploited. For this to happen, governments should pursue more active industrial policies, which 'fit' the domestic political constraints and opportunities. Donors should also be more active in linkage creation through technical and organisational advice and by supporting training, technical education and technology transfers.

Funder, M. and M. Marani (2013). 'Implementing national environmental frameworks at the local level: A case study from Taita Taveta County, Kenya'. DIIS Report 2013:06. Copenhagen: Danish Institute for International Studies.

> Since the 1990s, many African countries have invested in efforts to develop national frameworks to address crosscutting environmental management issues and problems. But how and to what extent have these national frameworks been implemented at the local level? And what has been the contribution of development cooperation in this respect? This report seeks to improve our insight into such issues through a detailed case study of the implementation of Kenya's Environmental Management and Coordination Act (EMCA) in Taita Taveta County in Southern Kenya. The study is primarily focused on the operations of one institution, namely the National Environment Management Authority (NEMA), which is a key authority in implementing the EMCA. The study focuses on the everyday aspects of implementing the EMCA on the ground in the past seven years, including the situation of the local Environment Officer, his/her relations to other actors in the area, and the implications of institutional competition and power relations. The main emphasis is on issues related to institutional development, enforcement, environmental planning and mainstreaming, and implications for public engagement.

Larsen, R.K. and C.A. Mamosso (2013). 'Environmental governance of uranium mining in Niger. A blind spot for development cooperation?'. DIIS Report 2013:02. Copenhagen: Danish Institute for International Studies.

> Niger is well known in international media as one of the world's poorest countries, struggling with chronic structural hunger and malnutrition. What is less well known to many is that Niger also hosts the fourth largest uranium production in the world. Export values totalled over 348 million Euros in 2010 alone, representing more than twice the total development assistance finance received during the same year. The exploitation of the mineral wealth (including uranium, gold, phosphate, coal) by international investors is expanding, with granted and requested mining permits comprising close to 10 per cent of the national territory.
>
> A growing body of media and NGO reports have pointed to severe environmental, social and human health impacts associated with the mining activities. In contrast, the environmental issues associated with the uranium mining sector, or mining activities in general, go seemingly without mention in the guiding documents of the principal development co-operation donors.

Ravnborg, H.M., R.K. Larsen, J.L. Vilsen, and M. Funder (2013). 'Environmental Governance and Development Cooperation: Achievements and Challenges'. DIIS Report 2013:15. Copenhagen: Danish Institute for International Studies.

> Despite their generally low ecological footprint, many people in developing countries suffer from environmental problems caused by a combination of low levels of investment in human wellbeing, environmentally harmful production practices, and poor and often discretional environmental governance. Environmental governance may be understood as 'the establishment, the reaffirmation or change of institutions (policies, laws, procedures, practices and organisations) to resolve conflicts – overt or latent – between actors over environmental resources'. Environmental governance takes place at many levels of society through statutory as well as through customary institutions and with the involvement of a wide range of actors.

Appendix 4: Outcomes

TABLE A4.1
Summary of Donor Interventions: Aid, Environment and Climate Change

General goal: Enhance the profile of environmental considerations in overall aid flows

Three trends:

1) There is an increase in environmental assistance in the past three decades
2) Environmental aid is increasingly from bilateral sources
3) Funding is shifting from local to supranational environmental issues

Area of Intervention	Context	Future opportunities and challenges	Evaluation
Launch new institutional initiatives	Main focus is not on low income countries		Could work
Reducing Emissions from Deforestation and Forest Degradation (REDD)	Field of activity largely determined by location of forests	Forestry is promising and relatively low cost source for emissions reductions	Works and could work better; scalable; transferable (but depends on location of forests)
Clean Development Mechanism (CDM)	More than half CDM projects in China. Demand uncertainty for certified emissions reductions is a major issue	Many developing countries have sun, wind and unexploited hydropower	Could work; scalable and transferable if funding available
Global Environment Facility (GEF)	GEF not designed to finance major transformations.	Possibility of crowding in of complementary private sector and local finance – but needs public policy initiatives on clean technologies. Huge technical and policy challenges associated with transition to cleaner energy sources	Could work – depends on policy environment and private sector finance; scalable; transferable

Area of Intervention	Context	Future opportunities and challenges	Evaluation
Green Climate Fund (GCF)	Currently a hollow shell due to lack of financing	Principle that dedication of % of carbon tax revenues to catalyse investment in low carbon sustainable development is convincing but largely not yet applied	Could work; scalable; transferable
Reform existing institutions	Are agriculture institutions 'fit for purpose' in light of 21st century challenges?		System does not work as it should (von Braun 2013)
Consultative Group for International Agricultural Research (CGIAR)		CGIAR credited with developing technologies which enabled green revolution in Asia CGIAR has also made some progress on institutional reform	Works
Other international institutions		Continue reform process for other institutions	Could work
Develop 'smart approaches' at project, programme and sector level (e.g. in energy sector, industrial sector, urban sector, environmental regulation, agriculture, forestry)	ReCom review supports: • aid which promotes integration • programme, not project support • aid which supports technology and innovation • aid which encourages private and domestic public investment		Could work; scalable; transferable

Appendix 5: Research briefs

The research briefs are two-page documents providing in a compact and easy language some of the key findings and implications of WIDER Working Papers from ReCom programme. The briefs are also the building blocks of the highly praised ReCom website (www.wider.unu.edu/recom), which delivers a wide range of knowledge on the five themes of the research programme. All papers coming out of the ReCom programme will also have research briefs on the ReCom website.

1. Impact of aid for health and education on gender equity and human development - WIDER Working Paper 2013/66
2. Assessing the role of gender in DfID and Sida challenge funds - WIDER Working Paper 2013/043
3. How to promote sustainable jobs in Mozambique - WIDER Working Paper 2013/45
4. The effectiveness of aid to women's political participation in MENA - WIDER Working Paper 2013/74
5. Lessons from US interventions to Japan, Afghanistan and Iraq - WIDER Working Paper 2013/108
6. Maximizing the effectiveness of foreign aid in the forestry sector - WIDER Working Paper 2013/054
7. Supporting design of green cities - Working Paper 2013/051
8. Neotrusteeship in post-conflict states – lessons from Kosovo and East Timor - *WIDER Working Paper 'Aid and Institution-Building in Fragile States: State-Building through Neotrusteeship: Kosovo and East Timor in Comparative Perspective'*
9. Policing reforms in African states – exploring the link to economic development - WIDER Working Paper 2013/013
10. Gender sensitivity of World Bank investments - WIDER Working Paper 2013/017
11. Using foreign aid to incentivize pioneer investing - WIDER Working Paper 2013/004
12. Building a capable state in Afghanistan - WIDER Working Paper 2013/063
13. Global poverty, middle-income countries and the future of development aid - WIDER Working Paper 2013/062
14. How to achieve economics of peace? - WIDER Working Paper no. 2012/47
15. Confronting climate change: The role of land - WIDER Working Paper 2013/107

16. Trends in environmental aid: global issues, bilateral delivery - *WIDER Working Paper 'Environmental and Climate Finance in a New World'*
17. Improving food security: what works and what could work? - WIDER Working Paper 2013/061
18. Foreign aid, capacity building and climate change - WIDER Working Paper 2013/46
19. Job creation and small and medium size enterprises - WIDER Working Paper 2012/94
20. How can aid help mitigate the problem of overfishing in Africa? - *WIDER Working Paper 'Foreign Aid and Sustainable Fisheries Management in Sub-Saharan Africa'*
21. How can aid help agriculture become more resilient to climate change? - WIDER Working Paper 2013/047
22. Gender mainstreaming: the comparative case of the Nordic Development Agencies - WIDER Working Paper 2012/91
23. An assessment of a village development programme in Mozambique - WIDER Working Paper 2012/88
24. Curbing early childhood undernutrition in lower and middle income countries – findings and lessons for the future - *This research brief is based on a series of systematic reviews and evaluations conducted by Elizabeth Kristjansson, Damian Francis, Selma Liberato, Trish Greenhalgh, Vivian Welch, Eamonn Noonan.*
25. Principled aid: ways to attain MDG4 and MDG5 - *This research brief is based on 'A review of external assistance and aid effectiveness for maternal and child health: challenges and opportunities'*
26. Evaluations: crucial for the spread of social protection programmes - WIDER Working Paper 2013/009
27. Education aid - a way forward - WIDER Working Paper 2013/018
28. What is the effect of aid on primary enrolment and quality of education? - WIDER Working Paper 2012/21
29. Aid, poverty, and the working poor - WIDER Working Paper 2012/86
30. What works? - lessons from aid to education - WIDER Working Paper 75/2012
31. Healthcare: Barriers to effective aid - WIDER Working Paper 2012/69
32. The development process – the problem of imitating success - WIDER Working Paper no. 2012/63
33. The development process - escaping the capability trap - WIDER Working Paper no. 2012/64
34. Gender and transitional justice - WIDER Working Paper no. 2012/06
35. Does aid promote development? - WIDER Working Paper 2011/44

36. Foreign assistance in a climate-constrained world - WIDER Working Paper 2011/66
37. Service delivery in Nairobi and Mombasa - WIDER Working Paper no. 2012/92
38. Aid for statistics in Africa - WIDER Working Paper no. 2012/99
39. Aid and management training - WIDER Working Paper no. 2012/99
40. Financing growth in low-income countries - WIDER Working Paper no. 2012/77
41. Barriers to effective civil service reform in developing countries - WIDER Working Paper no. 2012/90
42. Growth for low-income countries? - WIDER Working Paper no. 2012/77
43. The unique character of EU aid - WIDER Working Paper no. 2012/76
44. Greenhouse gas emissions and China's agriculture sector - UNU-WIDER working paper no. 2012/74
45. Democratic consolidation and donor activity in Malawi - UNU-WIDER working paper no. 2012/28
46. Foreign aid and Ghanaian democracy - UNU-WIDER working paper no. 2012/40
47. Aid and Dutch Disease - UNU-WIDER working paper no. 2012/26
48. The fungibility problem: Budget support, aid on delivery or project aid? - UNU-WIDER working paper no. 2012/68
49. Foreign aid and Malian democracy - UNU-WIDER working paper no. 2012/61
50. The role of ODA in infrastructure financing - UNU-WIDER working paper no. 2012/56
51. Should aid be allocated according to need or governance capacity? - UNU-WIDER working paper no. 2012/54
52. The second best solution - seven problems of aid effectiveness - UNU-WIDER working paper no. 2012/24
53. Divided authority in Kampala, Uganda - UNU-WIDER working paper no. 2012/51
54. Urban service delivery in Africa and the World Bank - UNU-WIDER working paper no. 2012/49
55. Taxation, public expenditure and aid effectiveness - UNU-WIDER working paper no. 2012/29
56. The global triple crises - finance, environment and food - UNU-WIDER working paper no. 2010/01
57. The supply side of aid - UNU-WIDER working paper no. 2011/04

58. Aid and structural change in Africa: a new agenda - UNU-WIDER working paper no. 2012/21
59. Delivering aid through religious organizations - UNU-WIDER working paper no. 2011/73
60. How to spend it? - UNU-WIDER working paper no. 2012/05
61. Aid to Mozambique: a trade-off between governance and democracy? - UNU-WIDER working paper no. 2012/18
62. Economic aid vs. democracy aid: democratic consolidation in Africa - UNU-WIDER working paper no. 2012/20
63. Democracy in Benin: achievements and challenges - UNU-WIDER working paper no. 2012/33
64. Is there a micro-macro paradox in aid? - UNU-WIDER working paper no. 2010/96
65. A meta-analysis of the literature on aid and growth - UNU-WIDER working paper no. 2011/22
66. Aid effectiveness in 36 African countries - UNU-WIDER working paper no. 2011/51
67. Responding to aid-induced Dutch Disease - UNU-WIDER working paper no. 2011/95
68. Aid and economic growth: the case of Sierra Leone - UNU-WIDER working paper no. 2012/07
69. Aid, debt, and public expenditure allocation - UNU-WIDER working paper no. 2012/42
70. Vulnerability, aid and accelerated growth - UNU-WIDER working paper no. 2012/31
71. Democratic transitions in Africa: the impacts of development aid and democracy assistance - UNU-WIDER working paper no. 2012/15
72. Zambia - Foreign Aid and Democratic Consolidation - UNU-WIDER working paper no. 2012/16
73. How Aid Supplies from Donor Countries Respond to Economic Crisis - UNU-WIDER working paper no. 2012/25
74. Ghana's oil resources toward economic growth and human development - UNU-WIDER working paper no. 2012/22
75. Aid and government fiscal behaviour: What does the evidence say? - UNU-WIDER working paper no. 2012/01
76. Can the coordination of aid cut costs for donors? - UNU-WIDER working paper no. 2012/32
77. What does good governance mean? - UNU-WIDER working paper no. 2012/30

78. Lessons of Experience in International Democracy Support - UNU-WIDER working paper no. 2011/84
79. The unintended consequences of foreign aid in Tanzania - UNU-WIDER working paper no. 2012/37
80. Aid in North Africa after the 'Arab Spring' – UNU-WIDER working paper no. 2011/72
81. Aid volatility across development sectors - UNU-WIDER working paper no. 2012/35
82. Rethinking aid allocation in light of current global challenges - UNU-WIDER working paper no. 2011/67
83. The politics of urban poverty reduction - UNU-WIDER working paper no. 2011/68
84. Female Empowerment and Extreme Poverty Reduction: Progressing On One without the Other? - UNU-WIDER working paper no. 2012/02
85. Learning how to promote social protection from Cambodia's garment workers - UNU-WIDER working paper no. 2011/81
86. How can food aid be more effective? - UNU-WIDER working paper no. 2012/19
87. Food Aid: What we know and what we need to know - UNU-WIDER working paper no. 2012/34

Notes in appendices

[i] This list does not include some papers that will be submitted after the completion of the ReCom position papers.

[ii] This list does not include papers currently under review.

More about ReCom

wider.unu.edu/recom

UNITED NATIONS UNIVERSITY UNU-WIDER

DIIS

MINISTRY OF FOREIGN AFFAIRS OF DENMARK DANIDA INTERNATIONAL DEVELOPMENT COOPERATION

Sida