

Chapter 25

Developing an Environmental Sustainability Toolkit to Integrate Climate Change Issues in Development Cooperation

Tom Waas and Jean Hugé

Abstract The KLIMOS research platform on climate change and development cooperation is an inter-disciplinary and inter-university research platform working on climate change adaptation and mitigation in development cooperation. Within KLIMOS, our team is working on the integration of environmental sustainability issues in development interventions in Belgium's southern partner countries, through the development of an environmental sustainability toolkit. The toolkit consists of a screening instrument and a database that need to be used together when preparing, monitoring and/or evaluating development interventions. This allows development practitioners in North and South to mainstream key environmental sustainability aspects such as climate change, but also biodiversity, desertification and deforestation, into the different aid modalities (projects, budget support, programmes, national strategies, etc.). A number of case studies will be conducted to test the toolkit in different contexts and to familiarize future users with the approach. In the context of this paper, we will describe the genesis of the toolkit, as well as the contents and the process of the proposed first version (toolkit 1.0). Finally, we will analyse the potential of the toolkit in the Sahel partner countries of the Belgian fund for food security through a brief case study in Benin. The paper concludes with some thoughts on how to fine-tune the toolkit methodology with the integrated water resources management (IWRM) approach, which is used successfully by non-governmental organizations in the region. The case study will allow us to bridge the gap between "abstract" climate change mainstreaming goals and the local realities in the South, by enriching the toolkit approach with IWRM insights.

T. Waas · J. Hugé (✉)

Biology Department (DBIO/APNA), KLIMOS Research Platform on Climate Change and Development Co-operation, Vrije Universiteit Brussel,
Pleinlaan 2, 1050 Brussels, Belgium
e-mail: Jean.Huge@vub.ac.be

Keywords Environmental sustainability toolkit • Integrated water resources management • Development co-operation • Benin • Belgium

Introduction

Humanity faces far-reaching anthropogenic environmental problems, putting increased pressure on socioeconomic and institutional systems. Climate change, biodiversity loss, deforestation, desertification, poverty, no or limited access to safe drinking water, lack of basic sanitation and healthcare, food insecurity are expected to become ever more prevalent, despite international commitments to tackle these problems (such as the millennium development goals). The dramatic state of the environment and its vast and threatening impact on human well-being is firmly stated by the United nations environment programme (UNEP 2007):

Imagine a world in which environmental change threatens people's health, physical security, material needs and social cohesion (...) Some people experience extensive flooding, while others endure intense droughts. Species extinction occurs at rates never before witnessed. Safe water is increasingly limited, hindering economic activity. Land degradation endangers the lives of millions of people. This is the world today.

“Global change” thus forces us to think innovatively and to develop practical responses as soon as possible. Worldwide, “sustainable development” is considered to be the overarching concept that will provide the best way to address the complex interrelated environmental and human development challenges of the twenty first century. Even if sustainable development became widely used in international politics, the concept is often (mis)used, without real understanding.

Moreover, while many interpretations circulate, the concept has clear interpretational limits and one can distinguish between useful and trivial or meaningless interpretations (for example, unlimited and continued “sustainable” economic growth) (Lélé 1991). In order to clarify the meaning of the concept, we turn towards the first key documents defining the concept. Pursuant to the global political endorsement of sustainable development at the United nations conference on environment and development (UNCED), in 1992 in Rio de Janeiro, we adopt the report “our common future” (Brundtland report) (WCED 1987) as a reference. We distinguish between the report's sustainability “mission statement and its operational definition”.

According to the former, sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” It contains within it two key concepts:

- the concept of “needs”, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

The latter defines sustainable development as follows: “In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.”

Similarly, the Intergovernmental panel on climate change (IPCC) fourth assessment report—climate change a major focus of greening tools—adopts the operational definition of “our common future” (Verbruggen 2007).

Within the context of this paper and this toolkit, we emphasize the most marginalized aspect of sustainable development in the cooperation sector, being the ecological/environmental pillar, hence the use of the term “environmental sustainability”. Environmental sustainability represents only one essential part of sustainable development. Hugé and Hens (2007) define it as “the ability to maintain the qualities that are valued in the physical environment”. These include the ecosystem services underpinning human life and the various linkages between these services and the socioeconomic bases of society. The ecological dimension is thus emphasized, even if firmly embedded in the broader definition of sustainability.

Development cooperation is an important pillar of international development politics to combat poverty in developing countries. While environmental protection and human development are inherently linked, the field of development cooperation only recently explicitly started to introduce sustainability considerations in its activities, as such contributing to the environmental sustainability goal (goal seven) of the millennium development goals (MDGs). The rise of climate change issues on the international political agenda (IPCC 2007), the visible and projected consequences and costs of climate change in the South (Stern 2006), as well as the acknowledgement of the interrelationships between food security, vulnerability, aid efficiency and poverty reduction have all contributed to create a sense of urgency for environmental integration.

This evolution triggered the interest of the development community to design and apply well-adapted environmental integration/sustainability tools. With regard to climate change, this led to the mushrooming of so-called “climate proofing tools”, while different other types of impact assessment (environmental impact assessment, strategic environmental assessment and sustainability assessment) are being improved and applied in the field of development cooperation (OECD 2006). Countries such as Sweden and Germany and Belgium (this paper) are actively developing climate integration tools to improve the quality of their development interventions in the South.

This paper focuses on the development of policy-supporting tools, aimed at improving the way development interventions (policies, plans, programmes, projects...) are designed, implemented and evaluated.

While actions in favour of sustainability may range from shifting individual consumption patterns and implementing new business models to a re-organization of the economic system, innovative governance instruments for sustainable development are widely regarded as key factors of success in fostering

sustainability. Governance, defined by Petschow (2005) as “the sum of many ways in which individuals and institutions manage their common affairs” can be interpreted in various ways, but it always involves a variable degree of cooperation between official government institutions and external partners such as the general public, businesses and/or non-governmental institutions. The term “sustainability assessment” can be seen as an overarching concept, and can be a powerful instrument fostering sustainable development. It is defined as “an ex ante evaluation of a proposal, aiming at the integration of sustainability principles at all levels of decision-making by adapting the initial proposal in order to make it coherent with aspirational sustainability principles agreed upon by a range of stakeholders”. The theoretical advantages of sustainability assessment are manifold. Assessing the sustainability of a policy proposal before its implementation provides decision-makers with an overview of the impacts of that particular proposal on the economy, on society and on the environment. This kind of exercise highlights the strengths and weaknesses of a proposal by taking into account various spatial and temporal scales. Through a thorough multidisciplinary analysis of the proposal, potential risks and conflicts are detected in an early stage, allowing to manage and to adapt the proposal adequately. The involvement of stakeholders fosters consensus and facilitates the solution of potential conflicts. Ultimately, sustainability assessment allows decision-makers to make fully informed decisions, without jeopardizing the freedom of political decision-making (Gibson 2005).

Influenced by the international development discourse on climate change, by the scientific advances in sustainability science, and by national pressure groups, the main actors of the Belgian official development cooperation (DGDC and BTC) have repeatedly expressed their commitment to a better environmental sustainability mainstreaming in their interventions (among others, at the March 2007 International conference on climate change and development cooperation in Brussels and in the Minister of development cooperation’s policy note). In order to turn this commitment into reality, the KLIMOS Research platform for climate change and development cooperation is developing an environmental sustainability toolkit (from here on, we will refer to it as “the toolkit”). This paper discusses the methodology followed to develop the toolkit, the toolkit’s first version and a pilot application.

The Environmental Sustainability Toolkit: Methodology

The “Environmental sustainability toolkit or toolkit” aims to be a user-friendly and intervention-oriented tool that will be incrementally developed to support the integration of environmental sustainability considerations, including climate change (adaptation and mitigation), in the development intervention of Belgium and developing countries.

Therefore, an “action research” approach was adopted, continuously integrating implementation and evaluation in a participatory way, involving various stakeholders. This process will be backed by different capacity-building initiatives and knowledge sharing through active involvement in relevant (inter)national networks. Action research entails that a team of professional researchers works together with stakeholders to define problems to be examined, to co-generate relevant knowledge about these problems, to learn and execute social research techniques, to take actions and to interpret the results of actions based on what they have learned (Greenwood and Levin 1998).

When developing an action-oriented toolkit, one needs to concentrate on two key issues: the contents of the toolkit as such (e.g., which criteria will be used to assess the environmental sustainability of the planned interventions); and the process aspects of actually implementing the toolkit and embedding it in existing and/or future institutional arrangements and daily practice. Taking this into account, the following steps were followed to develop the toolkit:

1. overview of existing “greening” tools aimed at environmental and/or climate change integration in development interventions;
2. interactive meetings with future users to guarantee a needs-based approach;
3. development of a first version of the toolkit (Toolkit 1.0);
4. planning of a pilot application of the toolkit’s first version on a well-defined development intervention focused on “integrated water resources management”.

This paper will discuss the results of these three main project sections that have been realized so far (spring 2010).

Overview of Existing “Greening” Tools in Development Cooperation

In order to build on existing experiences, the KLIMOS research team first compiled an overview of existing tools for environmental integration in development cooperation. This overview was published as a KLIMOS working paper; we here provide a summary, without introducing every analysed tool, instead focusing on the categories of tools. While the developed tools have a different focus and target different groups, they all aim to “green” development. Greening refers to the cross-cutting integration of environmental sustainability principles in policies, plans, programmes and projects. Some tools focus on adaptation to climate change, others on biodiversity and yet others on environmental sustainability aspects as a whole.

The overview aims to introduce to the reader a range of tools with varying scope, origin, objective and methodology. This paper draws upon an analysis of publicly available documents, as well as upon scientific literature and NGO materials.

Instead of focusing on each separate tool, we propose a series of possible categorizations which will allow potential users to define what they expect from (a combination of) tools. Indeed, “greening” development aid will be facilitated by using (parts of) operational instruments developed by other agencies (cross-fertilization) and through collaboration with other agencies and institutions. Cross-fertilization and collaboration can considerably reduce time and efforts invested in the development of operational measures and contribute to greater donor harmonization, as is called for by the Paris declaration on aid effectiveness (Gigli and Agrawala 2007).

All of the following categorizations are merely indicative. The categorization of tools cannot be absolute. Although many of the presented tools have target audiences and stated objectives, their use and application is context-dependent. As most of the tools are openly accessed, they can all be used in a wide variety of ways.

Categorization According to the Tool’s Objectives

We propose three categories:

1. Information tools

These tools, databases and platforms provide a wide variety of audiences with environmental, climate and/or vulnerability related information. Most of these tools are open source. They are not decision-making tools, but provide development practitioners with inputs that can be utilized for risk management and adaptation management processes, as well as in the design process of any development intervention. A number of international organizations provide country environmental profiles. These are reports that include the analysis of the country’s environmental situation, current policies, institutional capacities and environmental cooperation experience with clear recommendations for the integration of the environment during preparations of country strategies.

2. Tools targeting intervention design

These so-called integration tools have been developed to screen projects, programmes and policies and to develop priorities. They are tailored toward specific decision-making processes and aim at integrating environmental sustainability issues throughout a stepwise process approach. These tools often entail the use of both quantitative models and stakeholder consultation. Most of these tools focus on a set of entry points (annual negotiation sessions, international conferences, participation in PRSP preparation, preparation of country strategies, sector planning reviews, etc.) in various aid modalities (country programmes, sector programmes, projects).

3. Frameworks and guidelines

These tools provide a general approach to environmental sustainability integration and are centred around principles and best practices. They are not specifically tailored to specific interventions such as the tools under (2).

Categorization According to the Decision-making Level and to the Aid Modalities

As the majority of the presented tools are to be used by development agencies' staff in a variety of situations, it is useful to categorize the tools according to their use in the existing aid modalities architecture. To that end, we follow the OECD's (2009) concept of entry points: stages in the intervention cycle where environmental sustainability issues can be integrated. This categorization is combined with a focus on the decision-making level: the national, the sectoral or the local level.

Categorization According to Main Target Audience

Various tools target different audiences, ranging from development agencies' staff in the North, field officers, non-governmental organizations, officials in the partner countries, grassroots communities, etc. Some tools are more general and hence do not have a specific target audience.

Conclusion on “Greening” Tools

This overview of existing greening tools in the field of development cooperation provides a source of inspiration for the development of an environmental sustainability toolkit targeting the actors of the Belgian development cooperation. It is clear that the development and the use of greening tools, and in particular climate-related tools, is a very dynamic field. Keeping the existing tools in mind will contribute to the development of a state-of-the-art toolkit, tailored to the needs of its future users.

The method that was followed to design the environmental sustainability toolkit's first version was inspired by the combination of scientific expertise and participation (see next section). It is in line with the general “philosophy” underpinning the future application of the toolkit: involving the future toolkit users in its development is necessary as successful implementation of environmental sustainability measures will require the consent of all actors of decision-making in order to be successful. The method of development is rooted in the idea of the key importance of participation in sustainability thinking and acting. We refer to Kasemir et al. (2003) for a detailed description of the theory and practice of participation in sustainability science, as these scholars' research provided a source of inspiration for our research.

Interactive Meetings with Future Users

In order to develop a toolkit tailored to the needs of its future users, a series of interactive meetings was arranged. The future users of the toolkit are broadly composed of three categories: officials from the Belgian development cooperation

(Directorate-general for development cooperation and Belgian technical cooperation); non-governmental organizations (in North and South); and officials from the partner countries' ministries. In the project's first phase (2009–2010), meetings were set up with the users in Belgium:

- Meetings with the various sections of the DGDC (D0: Management; D1: Governmental programmes; D2: Humanitarian and food security programmes; D3: Non-governmental programmes; D4: Multilateral and European programmes; D5: Awareness-raising programmes).
- Meetings with the “attachés” (officers working in the Belgian partner countries in the south).
- Meeting with the Belgian technical cooperation (the Belgian development agency).
- Meeting with a number of Belgian NGOs at a seminar.

Although an exhaustive overview of the results of these meetings lies outside the scope of this paper, we hereby list some key questions raised:

- Will the toolkit be integrated within the existing project management cycle?
- Will the toolkit be user-friendly and not use too many indicators?
- How much time and effort will it cost to comply with the toolkit?
- Will the toolkit be user-friendly for non-environmental experts?
- Are there guarantees for harmonization with other donors?
- Will the toolkit slow down or even block decision-making?
- Will the toolkit be updated regularly?
- Will country—and region—specific information be available?
- Which dimensions of sustainable development will be included?
- ...

It is clear that the future users had many question on the concrete design and application of the toolkit. The meetings were always very lively and the attitude of all stakeholders was constructive, even though some healthy scepticism was regularly encountered. The KLIMOS research team tried to take all questions into account, and this resulted in the design of a first version of the toolkit, Toolkit 1.0 (see next section).

Toolkit 1.0

The toolkit's first version, “Toolkit 1.0” consists of two main elements, which should be used together. The user starts on a the homepage of the toolkit (access to the site will be made public in 2011), where, next to a brief introduction, two sections are visible:

- the environmental screening tool
- the database (under the heading “search for information”)

The environmental screening tool provides a stepwise guide that should be used in all circumstances when applying the toolkit. This is shown in Box 1 below.

Box 1: Key steps of the environmental screening tool (part of the environmental sustainability toolkit)

Aim

The aim of the “Environmental screening tool” is to include and consider environmental considerations in development cooperation.

Such an analysis is indispensable because environmental sustainability and human development are interdependent. Environmental sustainability is an essential condition to meet the needs of present generations without compromising the ability of future generations to meet their own needs, in particular the needs of the world’s poor. Meeting basic human needs and poverty alleviation on the other hand is an essential condition to realize environmental sustainability and to keep within the environmental limits of the planet. Therefore, during the different stages of the policy cycle environmental considerations should be addressed to reduce environmental risks and vulnerabilities of a project, and to counteract or minimize a projects impact on the environment.

Method

To accomplish an environmental analysis, an “Environmental screening tool” was developed. The tool is part of the “Environmental sustainability toolkit” (www.kuleuven.ac.be/klimos) which next to it, consists of a database with relevant and accessible environmental information for consultation to complete the “Environmental screening tool”.

The “Environmental screening tool” consists of a set of *guiding questions* to assess a project’s environmental risks and vulnerabilities, and impacts.

To use the tool the following steps should be followed:

Step 1: Complete the questionnaire

Step 2: Summarize the answers by listing the key issues for each completed question

Step 3: Draw one of the following three overall conclusions:

⇒ Accept



⇒ Minor changes are required



⇒ Major changes are required



Step 4: Paste the summary and overall conclusion to the evaluation dossier of the project and add the completed “Environmental screening tool” in appendix.

This list of steps is then followed by a questionnaire, which is different for each priority sector of the Belgian development cooperation. These sectors are:

- agriculture and food security;
- education;
- health;
- infrastructure.

For each sector, the questionnaire consists of eight sections. In Toolkit 1.0, only climate change is dealt with. In the future versions of the toolkit, biodiversity and land use will also be covered, in order to ensure a multidimensional interpretation of environmental sustainability. For now, however, the toolkit is limited to climate change issues. Sections 1 and 2 focus on the impact of climate change on the intervention and on the possible adaptation measures (which are listed). Sections 3 and 4 focus on the impact of the intervention on climate change, and on the possible mitigation measures (which are listed). Sections 5, 6, 7 and 8 focus on management and legislation:

Box 2: Key sections of the questionnaire of the environmental screening tool

1. Are there any climate change risks that might affect the intervention, such as ...
2. If the intervention might be affected by climate change risks, are appropriate adaptation measures taken, such as ...
3. Does the intervention have any expected impact on climate change, through ...
4. If it is expected that the intervention will have an impact on climate change, are appropriate mitigation measures taken, such as ...
5. Does the development partner has the capacity to deal with climate change (skills, financial resources ...)?
6. Are climate change issues addressed in implementation, monitoring, follow-up and evaluation?
7. Does the intervention require any assessment according to the national legislation of the partner country, in which climate change issues could be addressed?
8. Is there any climate change legislation that might influence the intervention?

In order to correctly complete the environmental screening tool's questionnaire and in order to complete the stepwise approach in a satisfactory way, a vast amount of information is presented in the database. The information can be accessed through four entry points. These are:

- Country (each of the 18 Belgian partner countries' NAPA, PRSP, etc.—if available ...).
- Sector (education, health, agriculture, ...).
- Intervention (project, programme, budget support ...).
- Theme (for now: only climate; in the future: also land use and desertification).

By following the stepwise approach of the environmental screening tool and thanks to the questionnaire, the users are guided towards a policy-supporting approach aimed at enhancing the quality of the design of their interventions. Any background information needed to apply the environmental screening tool can be accessed at any time through the regularly updated database.

Planned Pilot Application: Integrating IWRM in the Toolkit

The overview of existing tools and the interactive meetings with the future users resulted in a first version of the toolkit, presented above. In order to test if the developed tool is applicable on real-life development interventions, we applied it on a case study.

Officials from the Belgian development cooperation's fund for food security proposed to test the developed Toolkit 1.0 on a development project in Benin, called the *Projet d'Appui à la Croissance Economique Rurale* (PACER—project to support rural economic development). The project focuses on the development of the production chain of rice, tubers and grapefruit in various carefully selected regions of Benin. As the pilot application of the toolkit needs to be conducted in close collaboration with the officials involved in its design and implementation, the timing had to be adapted to the agendas of both researchers and officials. This means that until now (autumn 2010), the assessment has no field-testing part; this pilot assessment has been a desk study so far. For now, we will delve deeper into one of the components of the project, namely the focus on “integrated water resources management” (IWRM). Toolkit 1.0 currently focuses on climate change, without taking other dimensions of environmental sustainability into account. This pilot testing not only allows us to test how well the toolkit functions in a practical action-research context, but it also allows the KLIMOS research team to fine-tune the toolkit's contents by gaining insight on IWRM in a development cooperation context. IWRM fosters a sustainable and holistic perspective on water use and acknowledges the wide range of functions and services provided by water basins. In practice, this means that organizations fostering IWRM work together with local stakeholders to identify risks of degradation of the water resources (both in terms of quality and quantity) so as to implement protective measures such as protecting the drinking water sources, reforestation and protection of river banks, etc. This needs to be done while taking into account the different functions and services of the local water resources, ranging from consumption to cleaning, biodiversity protection, fishing, microclimatic regulation, etc.

Thus, IWRM is a key aspect of environmental sustainability, and should hence be an integral part of the toolkit. The linkages between IWRM and climate adaptation are evident, and just like climate change adaptation, water resources management has experienced an important paradigm shift. From an engineering approach based on controlling environmental problems with technical solutions, water management has shifted to a more holistic approach considering human attitudes and collective behaviours as an integral part of the management response (Pahl-Wostl et al. 2008). Many climate change adaptation responses proposed in Toolkit 1.0 are a combination of technical solutions (which are of course needed and particularly useful) and management/behavioural solutions, which emphasize social learning aspects. The design and application of the toolkit itself is also a learning process, and it might be very useful for the Belgian development actors to build on the IWRM experience of specialist actors such as the NGO Protos, to multiply the capacity-building and learning effects of early toolkit uses. Next to the paradigmatic and learning similarities between climate change adaptation and integrated water resources management, the geographic concentration of Belgium's partner countries in severely water-stressed countries in the Sahel belt further points to the need for a pooling of knowledge and experience.

Ultimately, although the toolkit is not meant to be the overarching response to any development problem—that would admittedly be overly ambitious and

unnecessary—in the future it is to provide a thorough answer to any development practitioner aiming at improving the design of his interventions. It thus needs to consider as many aspects of environmental sustainability as possible. The fruitful experiences with IWRM can be very helpful to inform the further development of the toolkit. One could, for instance, think of a “good practice” section, as well as a stronger uptake of linkages between climate change issues and water issues in the Sahel region.

Conclusions

Climate change and other environmental problems are threatening the achievement of development commitments, and more importantly, are directly threatening vulnerable populations in the South. The development community has embraced the concept of sustainable development for some time now, but implementing sustainable development and realizing its objectives is still a challenge.

Developing integrated instruments to mainstream environmental sustainability concerns (and climate change issues in particular) in development cooperation interventions is now a priority for many development actors, as shown by the plethora of existing tools. Embarked on the process of developing an environmental sustainability toolkit for the actors of the Belgian development cooperation, the KLIMOS research team used an action research methodology to ensure adequate participation of all concerned stakeholders. The delivery of a first version of the environmental sustainability toolkit is the result of the first research phase. The toolkit is intended to be used in the different phases of the development intervention. We therefore follow the widely known “Plan–Do–Check–Act” approach to ensure that the toolkit method will be used iteratively and will gradually lead to an improvement of the quality of decision-making in the field of development cooperation.

In order to enhance the quality of the toolkit’s contents and applications, a pilot-testing phase is planned. However, even before the testing phase, it is clear that successful development approaches can be an important source of inspiration to further develop the toolkit. Integrated water resources management has already been used for years, in particular by NGOs, and a lot can be learned from these experiences. The social learning fostered by IWRM, the multidimensional approach to management, the combination of scientific and participatory knowledge and the focus on adaptation to changing environments are important parallels with the climate change adaptation challenges faced in vulnerable regions such as the Sahel. The KLIMOS research team advocates the uptake of these experiences in the toolkit and will work towards a better integration of successful examples of more environmentally sustainable development cooperation in the next few years. This will hopefully lead to a more sustainable development in the future.

References

- Gibson R (2005) Sustainability assessment—criteria and process. Earthscan
- Gigli S, Agrawala S (2007) Stocktaking of progress on integrating adaptation to climate change into development co-operation activities, COM/ENV/EPOC/DCD/DAC(2007)1/FINAL, OECD, Paris
- Greenwood DJ, Levin M (1998) Introduction to action research—social research for social change. Sage Publications, London
- Hugé J, Hens L (2007) Sustainability assessment of poverty reduction strategy papers. *Impact Assess Proj Apprais* 25(4):247–258
- IPCC (2007) Summary for policymakers. In: *Climate Change 2007: impacts, adaptation and vulnerability. Contribution of Working Group II to the fourth assessment report of the Intergovernmental panel on climate change*. Cambridge University Press, Cambridge
- Kasemir B, Jäger J, Jaeger CC, Gardner MT (2003) *Public participation in sustainability science—a handbook*. Cambridge University Press, Cambridge
- Lélé S (1991) Sustainable development: a critical review. *World Dev* 19(6):607–621
- OECD (2006) *Applying strategic environmental assessment. good practice guidance for development co-operation*. OECD, Paris
- OECD (2009) *Integrating climate change adaptation into development co-operation. Policy Guidance*, OECD Paris
- Pahl-Wostl C, Tabara D, Bouwen R, Craps M, Dewulf A, Mostert E, Ridder D, Taillieu T (2008) The importance of social learning and culture for sustainable water management. *Ecol Econ* 64:484–495
- Petschow A (2005) *Environmental policy integration—greening sectoral policies in Europe*. Earthscan, London
- Stern N (2006) *The stern review on the economics of climate change*. Cambridge University Press, Cambridge
- Verbruggen A (2007) *Glossary. Climate change 2007: mitigation of climate change*, IPCC. Cambridge University Press, Cambridge
- WCED (world commission on environment, development) (1987) *Our common future*. Oxford University Press, Oxford
- UNEP (2007) *Global environmental outlook—environment for development*. United Nations Environmental Programme. Progress Press, Valetta, Malta