

CGE Training Materials for Vulnerability and Adaptation Assessment

Chapter 1 Introduction

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1.1. Introduction

1.1.1. About the training materials

All Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are required to report periodically on their activities to implement the provisions of the Convention. The preparation of these periodic reports, known as national communications, is mandated by Article 4, paragraph 1, and Article 12, paragraph 1, of the Convention, in which all Parties shall communicate to the Conference of the Parties (COP), through the UNFCCC secretariat, the following elements of information:

1. A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol, to the extent to which the Party's capacities permit, using comparable methodologies to be promoted and agreed upon by the COP;
2. A general description of steps taken or envisaged by the Party to implement the Convention;
3. Any other information the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its national communication, including, if feasible, material relevant for calculations of global emission trends.

The "Guidelines for the preparation of initial national communications from Parties not included in Annex I to the Convention" were adopted at the COP 2 in Geneva in 1996. By decision 8/CP.5, the COP established a Consultative Group of Experts (CGE) on national communications from Parties not included in Annex I to the Convention (non-Annex I Parties) in order to improve the process of preparing national communications by non-Annex I Parties. At COP 7, by decision 31/CP.7, a process of reviewing the guidelines was initiated with the aim of improving them. The CGE made major contributions to the review of the guidelines.

At COP 8, the Parties adopted the revised guidelines by decision 17/CP.8. In accordance with decision 17/CP.8, annex, paragraph 29:

...non-Annex I Parties should provide information on their vulnerability to the adverse effects of climate change, and on adaptation measures being taken to meet their specific needs and concerns arising from these adverse effects.

The same annex, paragraphs 28–36, further covers additional information on "programmes containing measures to facilitate adequate adaptation to climate change," which provides guidance on methodological approaches and reporting.¹

The COP, by decision 1/CP.16, provide further guidance on reporting, including enabling and supporting the implementation of adaptation, preparing national adaptation plans (NAPs) at the national and subnational levels, formulating and

¹ The text of decision 17/CP.8 and its annex are provided at the front of these training materials, for reference.

implementing NAPs by the least developed countries (LDCs) and calling for enhanced reporting.²

The COP, by decision 19/CP.19, decided to continue the CGE for a period of five years from 2014 to 2018 and that it should function in accordance with the revised terms of reference contained in the annex to that decision. The objectives of the CGE are to improve the process of and preparation of national communications and biennial update reports (BURs) by non-Annex I Parties by providing technical advice and support to such Parties, and to build the capacity of technical experts nominated to the UNFCCC roster of experts for the technical analysis of BURs under the international consultation and analysis process.

The CGE, as a part of its work programme for 2014–2018, agreed to update the existing “CGE Training Materials on Vulnerability and Adaptation Assessment”³, which were updated in 2011 and in 2012.

These training materials are designed to facilitate the preparation of national communications by non-Annex I Parties in accordance with the “Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”. The updated training materials are intended to take into account recent developments under the Convention as well as the latest science, in particular, the findings of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), which became available in 2013 and 2014.⁴ This document is part of the third edition of those support materials.

1.1.2. Role of the training materials

The purpose of these training materials is to facilitate the preparation of the V&A section of national communications submitted by non-Annex I Parties. The materials provide a synopsis of some of the main methods being used by non-Annex I Parties to assess V&A to climate change. The training materials emphasize methods that are readily accessible, applicable and/or have been used in the preparation of national communications to date. Selected examples from Annex I Parties are also included where there is potential applicability within the context of non-Annex I Parties. The training materials also provide guidance on obtaining data with relevance in the application of specific methods and tools.

The training materials comprise this publication and a series of presentations, which assist non-Annex I Parties in using the materials as a training resource. The presentations include notes to presenters and provide more detail on some of the methods, data sources and examples of how and where the methods have been applied. These two resources are intended for use together.

Before using these training materials, it is important to understand that they provide an overview of methods, tools and data, including advantages and limitations. Information is provided to enable readers to obtain software, find further information on methods and access additional resources. The materials do not provide a detailed discussion

² Paragraphs 11, 14, 15, and 60 of the decision 1/CP.16 address these matters.

³ The training materials are available at <<http://unfccc.int/349.php>>.

⁴ The Fifth Assessment Report of the IPCC is available at <<http://ipcc.ch/report/ar5/index.shtml>>.

of the array of available methods and models, nor do they provide detailed information on a particular framework for assessing V&A, nor on particular assessment methods. These decisions must be made by non-Annex I Parties and tailored specifically within each Party's context.

Importantly, it is recognized that the role of these training materials is to support the skills and experience development by non-Annex I Parties through their previous experiences with V&A assessment. These experiences may have been gained through the completion of previous national communications, or other initiatives such as the national adaptation programmes of action (NAPAs), activities through the Nairobi work programme (NWP) and NAPs, or actions undertaken within a country (or regional groups) for national-level impact assessment and adaptation planning.

1.1.3. Structure of the training materials

This publication structured to address key topic areas.

It is intended to:

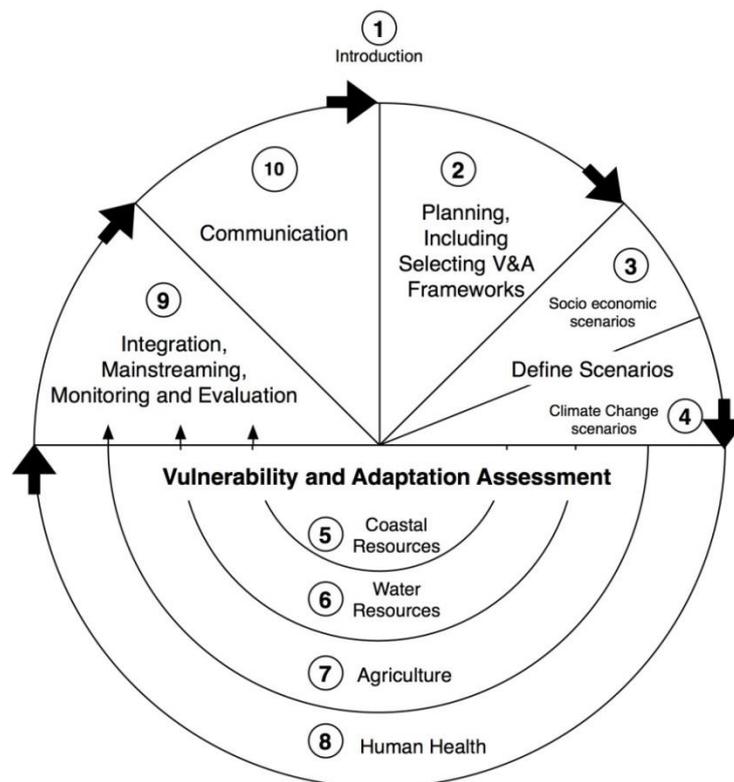
1. Integrate the sectoral perspective on V&A (e.g. coastal resources, human health, water resources) with the process perspective (e.g. tools, data, best practice, policy integration);
2. Move towards a 'practical guidance' approach from the more generic approach, by seeking to integrate case studies and examples from national communications submitted to date.

The structure of this publication follows a diagram (shown in figure 1-1), with separate chapters for each 'segment' of the wheel, namely chapters 2–4 and chapters 9–10. Sector chapters, namely chapters 5–8, have been restructured from the second edition to ensure consistent guidance on the key sectoral drivers, sensitivity, vulnerability, data, methods and tools.

This publication comprises ten chapters:

1. Introduction (this chapter)
2. Vulnerability and adaptation frameworks
3. Baseline socioeconomic scenarios
4. Climate change scenarios
5. Coastal resources
6. Water resources
7. Agriculture
8. Human health
9. Integration, adaptation, mainstreaming, monitoring and evaluation
10. Communication of vulnerability and adaptation assessment in national communications.

Figure 1-1
Structure of the handbook for V&A assessment



Source: Adapted from the United States of America Environmental Protection Agency templates.

As mentioned earlier, this is the third edition of the Training Materials for V&A Assessment. The main structure of the report, in particular the ten chapters, has remained unchanged. Substantial revisions to each chapter have been made to capture developments in V&A methods. Some specific changes include:

1. Chapter 3 has been rewritten to reflect the development of shared socioeconomic pathways;
2. The sector chapters (chapters 5–8) have been restructured. These chapters focus on analytic methods and data sources. Discussions on drivers of change, vulnerability of the sector to climate change and adaptation policy have been moved to appendices for each chapter. For example, the coastal chapter has appendices on coastal resources immediately following the chapter. The presentation of how to analyse adaptation in each sector remains in the chapter. Discussions of cross-sector integration and mainstreaming are now only in chapter 9.

1.1.4. Key sources of related information

The materials presented here should be read in conjunction with companion documents, prepared by the UNFCCC secretariat, which provide technical assistance to non-Annex I Parties in the preparation of their national communications (see table 1-1).

Additional sources of information specific to particular aspects of V&A assessment are provided in each chapter. For example, chapter 2 provides sources of general guidance on V&A assessment, while chapters 5–8 provide guidance on V&A assessment in the sectors they cover. Published national communications (UNFCCC, 2014b) provide a valuable source of information.

In addition to the resources listed in table 1-1, other networks and resources can be found through the UNFCCC knowledge resources and publications on adaptation knowledge platforms/networks (UNFCCC, 2014a).

Table 1-1
Key companion documents for V&A assessment

Source	Title	Description	Link
UNFCCC	Reporting on Climate Change: User Manual for the Guidelines on National Communications from Non-Annex I Parties	User manual, launched at the ninth Conference of the Parties (COP 9) in 2003; designed for use by Parties and national experts responsible for the preparation of various sections of national communications.	< http://unfccc.int/resourcement/usermanual_nc.pdf >
UNFCCC	UNFCCC Compendium on Methods and Tools to Evaluate Impacts of, and Vulnerability and Adaptation to, Climate Change	Compendium launched in 2008 as part of the Nairobi work programme on impacts, vulnerability and adaptation (V&A) to climate change, covering emerging assessment methodologies and tools on a sector level.	< http://unfccc.int/adaptation/nairobi_workprogramme/knowledge_resources_and_publications/items/5457.php >
UNFCCC	UNFCCC Resource Guide for Preparing the National Communications of Non-Annex I Parties – Modules 1–4	Resource guide launched in 2008 consisting of four modules: The Process of National Communications from Non-Annex I Parties; Vulnerability and Adaptation to Climate Change; National Greenhouse Gas Inventories; and Measures to Mitigate Climate Change.	< http://unfccc.int/essential_background/background_publications_htmlpdf/items/2625.php >
UNFCCC	Annotated Guidelines for the Preparation of National Adaptation Programmes of Action	Guidelines designed for least developed countries to plan for addressing the urgent and intermediate needs of adapting to the adverse effects of climate change.	< http://unfccc.int/essential_background/library/items/3599.php?such=&symbol=UNFCCC/PRT/202%20B#beginning%29 >

Source	Title	Description	Link
UNFCCC	National Adaptation Programmes of Action: Overview of Preparation, Design of Implementation Strategies and Submission of Revised Project Lists and Profiles	Technical paper drafted by the Least Developed Countries Expert Group (LEG) describes the steps in the preparation of national adaptation programmes of action (NAPAs) and explores options for addressing problems identified by NAPA teams, while building upon lessons learned and best practices. This is a useful resource, while recognizing the transition during 2012 to the new NAP process (outlined in chapter 2).	< http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=6988#beg%29 >
United Nations Development Programme National Communications Support Programme (UNDP NCSP)	The National Communications Process – NCSP: Resource Kit	This resource kit released in 2006 provides guidance on the key sources of information and planning steps required for the preparation of national communications.	< http://ncsp.undp.org/sites/default/files/NatCom%20Process.pdf >
UNFCCC	National Adaptation Plans: Technical Guidance for National Adaptation Plan Process	Guidance prepared by LEG; NAPs will be a key element of adaptation activities at the national level under the Convention, and would be directly supported by the V&A assessments within national communications.	< http://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high_res.pdf >

1.1.5. Understanding the context of the assessment

Most countries have already assessed vulnerability to climate change and have at least identified adaptations or have implemented some adaptation measures. It is important that assessments build on this record to ensure that new assessments enhance the knowledge base rather than repeat what has come before.

Many non-Annex I Parties have already submitted two national communications, while some have already submitted their third national communications and one has submitted its fifth communication.⁵ Consequently, the majority of non-Annex I Parties have some experience in the development of V&A assessments. In addition, many LDCs have also undertaken NAPAs and some have prepared or begun to prepare NAPs.

In the NAPA process, the LDCs carried out rapid participatory vulnerability assessments and rigorous exercises of identifying and prioritizing potential adaptation options. Many NAPA projects were funded through the UNFCCC adaptation funds.

⁵ See UNFCCC website at <http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php>.

Under the Cancun Adaptation Framework, COP 17 adopted the NAP process. This process allows LDCs and other developing country Parties to complement the NAP process by developing national plans on adaptation. NAPs are intended to take a strategic view of adaptations and enable countries to plan for the medium and long term.

The Least Developed Countries Expert Group (LEG) has published guidance on preparing NAPs (LEG, 2012). The process complies with the Convention, is country driven and is not prescriptive, but provides guidance on how NAPs may be developed. The NAP process is discussed in more detail in section 2.3.2.

Many countries have already engaged in the NAP process. In addition, many donors – such as the United Nations Development Programme (UNDP), the Deutsche Gesellschaft für International Zusammenarbeit (GIZ), the United Kingdom Department for International Development (DFID) and the United States Agency for International Development (USAID) have active programmes supporting NAP development.

Finally, a range of non-governmental organizations (NGOs), including academic institutions and private sector organizations, have also undertaken V&A assessments. Many can be accessed online through clearing house mechanisms, including the UNDP Adaptation Learning Mechanism (ALM, 2011). By reviewing the existing materials, non-Annex I Parties have the ability to carefully assess the strengths and weaknesses of previous V&A assessments undertaken in their country.

1.1.6. Definition of key terms

Before getting started it is important to understand the concept of vulnerability to climate change and to be consistent in the use of specific terms. The terminology used throughout these training materials is from the Glossary of Terms used in the IPCC AR5, which has a specific Glossary, and is available online (IPCC, 2014). Some modifications of the definitions in the IPCC report have been made. Key terms used throughout this resource are defined below.

- **Adaptation:** The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or take advantage of beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects. Adaptation can take a number of different forms, including but not limited to:
 - Reactive adaptations are done in response to changing climate conditions;
 - No regret adaptations are adaptations that can be justified based on current or observed conditions but also can be justified when considering future climate change;
 - Incremental adaptations are adjustments made to anticipate climate change but which often do not change functions of a system;
 - Transformational adaptations are changes in form or function of a system such as change in location, use or livelihoods;
- **Adaptive capacity:** The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences;

- **Climate change impacts:** Effects on natural and human systems. This includes the effects on natural *and* human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts and sea level rise, are a subset of impacts called physical impacts;
- **Potential impacts:** All impacts that may occur given a projected change in climate, without considering adaptation;
- **Residual impacts:** The impacts of climate change that would occur after adaptation;
- **Sensitivity:** The degree to which a system is affected, either adversely or beneficially, by climate variability or climate change. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g. damage caused by an increase in the frequency of coastal flooding due to sea level rise);
- **Vulnerability:** The propensity or predisposition to be adversely affected by climate variability or change. *Vulnerability* encompasses a variety of concepts and elements including sensitivity or susceptibility to harm, exposure to climate variability or change, and lack of capacity to cope and adapt.

1.1.7. Acknowledgements

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1. Chapter 1, Introduction: Joel B. Smith, Abt Associates
2. Chapter 2, Vulnerability and Adaptation Frameworks: Joel B. Smith and Mary Huisenga, Abt Associates
3. Chapter 3, Baseline Socioeconomic Scenarios: Dr Kristie Ebi, University of Washington
4. Chapter 4, Climate Change Scenarios: Joel B. Smith, Abt Associates and Dr. Radley Horton, Columbia University
5. Chapter 5, Coastal Resources: Dr Robert Nicholls, University of Southampton
6. Chapter 6, Water Resources: Dr David Yates, National Center for Atmospheric Research
7. Chapter 7, Agriculture: Dr Gerrit Hoogenboom, Washington State University and Dr John Antle, Oregon State University
8. Chapter 8, Human Health: Dr Kristie Ebi, University of Washington
9. Chapter 9, Integration, Adaptation, Mainstreaming, Monitoring and Evaluation: Joel B. Smith, Karen Carney and Mary Huisenga, Abt Associates

10. Chapter 10, Communications of Vulnerability and Adaptation Assessment in National Communications: Joanna Pratt, Holly Surbaugh and Christine Teter, Abt Associates.

1.2. References

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- IPCC (Intergovernmental Panel on Climate Change). 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. IPCC Working Group II Contribution to AR5. Annex II. Glossary. Available at <<http://ipcc.ch/report/ar5/wg2/>>.
- LEG (Least Developed Country Expert Group). 2012. *National Adaptation Plans: Technical Guidelines for the National Adaptation Plan Process*. Bonn: United Nations Framework Convention on Climate Change. <http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/7279.php>.
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