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Adaptation made to measure

A guidebook to the design and results-based monitoring of climate change adaptation projects

Second edition

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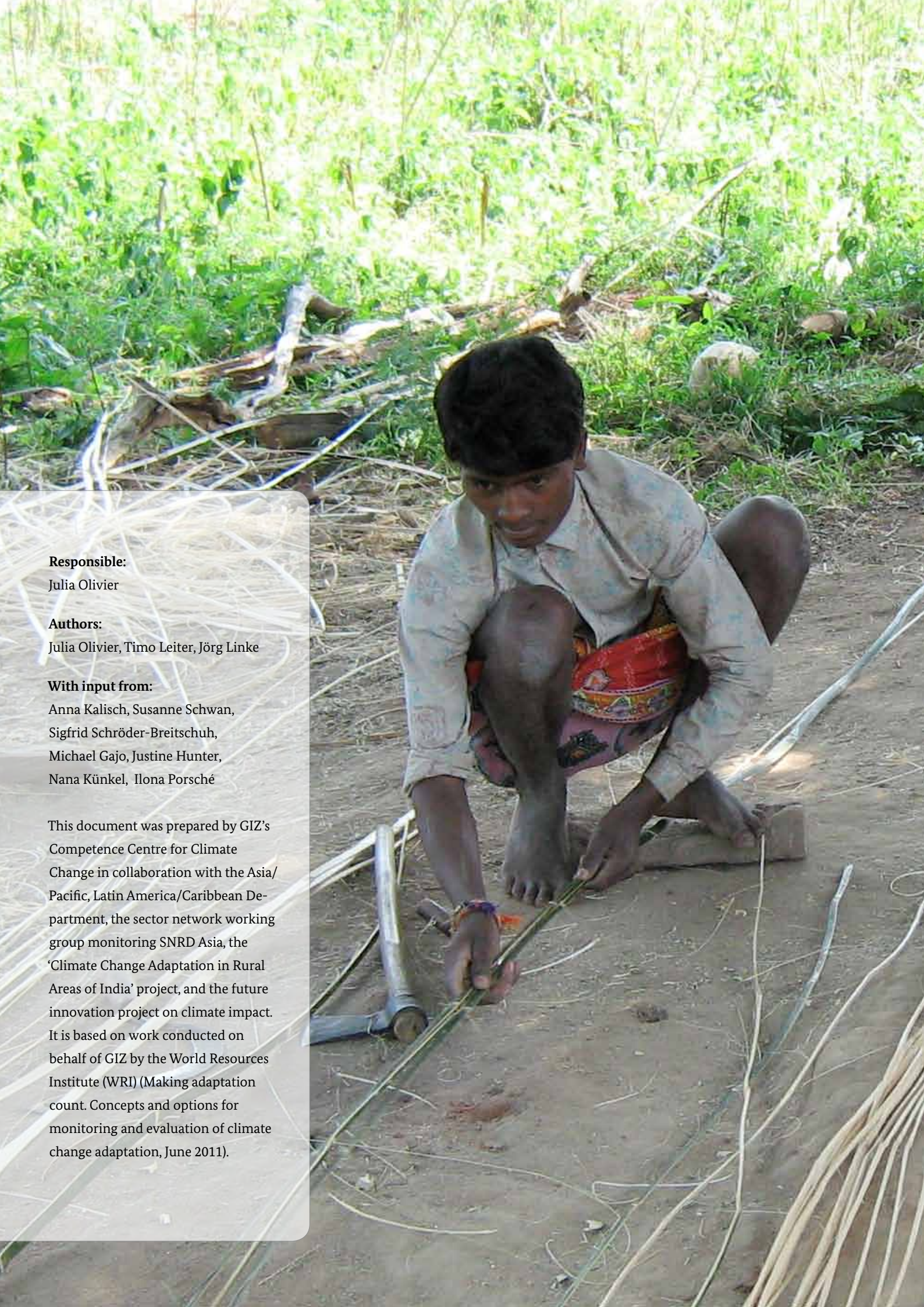

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This document was prepared by GIZ's Competence Centre for Climate Change in collaboration with the Asia/Pacific, Latin America/Caribbean Department, the sector network working group monitoring SNRD Asia, the 'Climate Change Adaptation in Rural Areas of India' project, and the future innovation project on climate impact. It is based on work conducted on behalf of GIZ by the World Resources Institute (WRI) (Making adaptation count. Concepts and options for monitoring and evaluation of climate change adaptation, June 2011).

Contents

Preface

With its wide-ranging impacts, climate change has become one of the major challenges to humankind. More frequent natural disasters, mounting weather extremes, increasing water scarcity, flooded coastal areas and accelerated species extinction count among the direct impacts of climate change in almost every nation, and especially in developing countries and emerging economies. To meet this challenge, after they have exploited their own financial resources, such countries need additional financial support. In recent years the international community stepped up its efforts to assist developing countries in adapting to climate change impacts. Germany, too, has made a strong commitment to mitigating global climate change and facilitating sustainable development in the face of such change. As the volume of resources directed to climate financing grows, it is becoming more important than ever to verify the results achieved by adaptation projects and components – hence the current debate on management for results and results-based monitoring.

Verifying and attributing the medium- and long-term results of adaptation measures poses particular challenges, largely because of the uncertainty inherent to climate projections and socio-economic trends. There is also a need to identify the indirect adaptation results of conventional development interventions.

The 'additionality' of climate adaptation measures is a further topic of development policy discourse. The key point here is that, in addition to safeguarding against weather risks that already prevail, climate adaptation projects consider, above all, the *anticipated future* climate trends and implement specific measures to mitigate the adverse effects of climate change.

Many development and climate policy bodies are elaborating their own strategies, goals and standards for the monitoring and evaluation of climate change adaptation measures. A number of studies on management for results and results-based monitoring in relation to adaptation activities have also been conducted, and all recommend a case-by-case approach. There is virtually no guidance on results-based monitoring at programme, sector or country level. This guide seeks to equip international cooperation personnel to take a systematic approach towards developing adaptation projects and results-based monitoring systems for such interventions. Defining specific indicators by which the results of adaptation measures may be verified is a key element of such work.

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Notes on this guide

Why has this guide been written?

Faced with new and rapidly expanding adaptation portfolios in most international cooperation institutions, many project managers are voicing their need for support, particularly when it comes to designing and monitoring projects which are either adaptation-related or explicit adaptation projects. The criticism that current development cooperation has simply been 're-labelled' as being adaptation can only be countered if there is **clear evidence of the contribution adaptation measures make to reducing vulnerability** to the impacts of climate change. This requires an understanding of what results can realistically be achieved and how they can be demonstrated.

Indeed, as well as playing a key role at international climate policy level, **the additionality aspect of climate adaptation** also poses practical questions at project level. What constitutes an adaptation project and what does not? Which specific factors must be accounted for when defining cause-effect correlations and indicators? How does this affect results-based monitoring? This guidebook seeks to provide answers to these questions and practical tips on how to apply them to projects with the help of illustrative case studies and an accompanying excel tool.

Who is the guide for?

This guide is addressed to GIZ personnel and representatives of governments, other bilateral and multilateral donors and NGOs engaged in planning and implementing adaptation projects. It is intended as an aid to designing and monitoring adaptation projects.

It also provides a reference source for national and international organisations, NGOs and research bodies that seek a practical frame of reference for the results-based design of adaptation interventions and verification of the results achieved.

How is the guide structured?

The guide is divided into three parts: (1) an introduction, (2) a practical part explaining the recommended step-by-step approach to designing an adaptation project and setting up its monitoring system, and (3) a summary.

The practical part is illustrated with specific examples for each of the steps from a **GIZ project in India**. The Indian-German cooperation project 'Climate Change Adaptation in Rural Areas of India' (CCA RAI), which GIZ carries out on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), aims to create political conditions for increasing the adaptive capacity of rural communities on multiple levels, and to develop practical instruments for

implementation. To cater for different agro-climatic zones in India, the federal states of Madhya Pradesh, Rajasthan, Tamil Nadu and West Bengal were selected for the project. GIZ and its Indian partners have adopted a multilevel approach at local, federal state and national level and operate in different intervention sectors:

- **State Action Plans on Climate Change** (SAPCCs) geared to the national plan of action (NAPCC) are being drafted for all federal states in India. GIZ supports the preparation of action plans in 16 states.
- **Vulnerability assessments:** development of a structured approach for conducting climate change vulnerability and risk assessments and their implementation at federal state level.
- **Implementation of adaptation measures** in vulnerable communities of the four federal states. Local vulnerability and risk assessments are carried out and form the basis on which adaptation measures are being planned. Tested adaptation measures can then be further adjusted and implemented in regions with similar agro-climatic conditions.
- *Climate Proofing* **of government programmes for rural development** protect public investments from the adverse impacts of climate change.
- **Assessment of funding mechanisms for adaptation** that can strengthen the adaptive capacities of the poor rural population.
- **Information and knowledge management** aims at publicising experiences and findings as well as approaches and technologies for adaptation to climate change.
- **Competencies, resources and capacity are developed (human capacity development)** through training for multipliers and government representatives.

New features of the updated version

About a year after its first publication this guidebook was updated in November 2013 to incorporate the most recent international developments on adaptation M&E and further increase its practicability to the reader. Improvements in this new version include:

- A newly developed excel tool to implement the five-step approach (see page 11)
- An updated repository of adaptation indicators (see step 4)
- New references and literature added throughout the guide

The guidebook, the excel tool and the indicator repository are available on www.AdaptationCommunity.net under Monitoring & Evaluation.

Questions and suggestions?

Please feel free to share your experiences in putting this guide into practice and make suggestions for improving it. We are happy to answer any questions: email Julia Olivier (Julia.Olivier@giz.de) or Timo Leiter (Timo.Leiter@giz.de). Thank you very much!

1. Climate adaptation measures and management for results

1.1 Climate adaptation in the context of development cooperation

Designing adaptation projects and systems for monitoring them requires a solid understanding of adaptation to climate change. The OECD Development Assistance Committee (DAC) defines adaptation to climate change as follows:

'An activity should be classified as adaptation-related if it intends to reduce the vulnerability of human or natural systems to the impacts of climate change and climate-related risks by maintaining or increasing adaptive capacity and resilience' (OECD/DAC, 2010).

This encompasses a range of measures, from the preparation and dissemination of climate scenarios and climate change impact assessments over capacity development in government departments, official agencies and companies to the planning and implementation of direct interventions. Direct interventions may involve physical, economic or environmental measures, such as dyke construction, the provision of insurance against extreme weather events, the introduction of new cropping methods or the restoration of mangroves as a natural form of flood protection (BMZ, 2012).

Development work has traditionally taken account of climate variability and weather extremes like drought or floods, and is generally aimed at improving the conditions under which people live. Adaptation to climate change is not, therefore, a completely new area for development support: indeed, it overlaps with established fields, such as disaster risk reduction, sustainable agriculture and management of natural resources. What makes climate adaptation different is that it addresses both current *and* expected climate conditions and their consequences for human beings and ecosystems. The characteristics that define an adaptation project – that is, its additionality compared with a conventional development project – are set out in Table 1. It distinguishes between projects with an explicit and major focus on adaptation (right column) and those with a significant but not predominant focus on adaptation (left column). Recommendations for further reading on the relationship between climate adaptation and development, and in particular on the additionality of adaptation, are given in the "Key references 1" box in the annex.

Adaptation to climate change and development may be mutually reinforcing or mutually obstructive. Adaptation can assist development, for example by making local lifestyles more resistant to extreme weather events. Likewise, development can strengthen local capacity to cope with unforeseen changes, for example by expanding education or infrastructure. Conversely, however, development work that ignores the possible threat posed by future climate change is unsustainable, making adaptation to climate change a very important issue in the development cooperation context.

PROJECTS WITH PARTIAL FOCUS ON ADAPTATION	EXPLICIT ADAPTATION PROJECTS
OBJECTIVES LEVEL	
Project planning and implementation make use of *information on climate change* and its impacts.	
Climate expertise is channelled into project implementation though specialist institutions or personnel qualified in climate change adaptation, impacts and vulnerability.	
Project managers, project personnel and major partners are experienced in climate change and adaptation.	
In simplified form, the project describes *climate risks and opportunities*, specifically those related to the groups identified as being at particular risk in the project context.	The project uses a sound and transparent methodological approach to describe and detail climate *risks and opportunities* and the needs of groups at particular risk in the project context.
Based on the anticipated impacts of climate change, the project offers a rationale for how *its theory of action* will contribute to *reducing the vulnerability* of the population or to *increasing the adaptive capacity* of regions and groups that are at particular risk.	The project uses a sound and transparent methodological approach to describe *the theory of change* of the project. This approach makes clear the assumptions that underpin the capacity of the measures to contribute to *reducing vulnerability* and/or to *raising the adaptive capacity* of regions or social groups at particular risk. The results are made available in writing.
The anticipated contribution to climate change adaptation is clearly defined by at least one adaptation-related *indicator at objective level* and the causal interrelations of the results framework are described verifiably.	The anticipated contribution to climate change adaptation is clearly defined by adaptation-related *indicators at objective level* and the causal interrelations of the results framework are described verifiably.
BEYOND THE OBJECTIVES LEVEL	
Securing ecological, economic and social development goals despite climate change.	

Table 1

Minimum requirements for adaptation projects

In practice, there is a **continuum of adaptation activities**, from projects with an explicit adaptation focus via those with adaptation components and those with co-benefits for adaptation to those with no relevance to adaptation. Accordingly, project objectives, targeted results and systems for monitoring them have different priorities. Below, we describe the significance and challenges of specific, realistic and results-based design, monitoring and evaluation of projects at the adaptation end of the continuum.

1.2 Results orientation in climate adaptation projects

The OECD-DAC Paris Declaration makes clear that management for results and clearly verifiable project outcomes are key operational requirements for international cooperation. We therefore need to define the anticipated results of adaptation measures (the adaptation-related results framework) and clearly verify performance (results monitoring and evaluation). As with non-climate projects, results-based monitoring facilitates the **steering, accountability and knowledge management** of adaptation measures. In particular, it facilitates ongoing assessment of the assumptions underlying the results framework and, therefore, also the tracking of project progress. It also promotes inter-project knowledge management, which is particularly important in the adaptation context as this field is relatively new, hence the substantial need for learning.

The first stage in designing projects and monitoring systems is to ascertain the anticipated consequences of climate change for people and/or ecosystems and to define how the development measure can make a plausible contribution to the sustainable reduction of vulnerabilities and increased resilience. Based on this results framework, adaptation-specific indicators are defined to assess progress of the project and achievement of its objectives. Apart from the focus on specific indicators and the analysis of the adaptation context, this results-based monitoring system differs little, if at all, from conventional results-based systems in terms of design and approach. However, some specific features must be taken into account, and these are described in more detail in the next section.

1.3 Challenges of adaptation-specific results-based monitoring

The specificity of adaptation (see 1.1) poses a number of challenges for monitoring and verification of results. These are the result primarily of uncertainties in predicting local and regional climate change impacts, the timescale over which climate change unfolds, and the complexity of climatic and social interrelationships. This makes it more difficult to define a suitable reference point for measuring results. Below, we take a closer look at these challenges.

- **Context-dependence and the absence of a universal indicator for performance measurement:** Adaptation to climate change takes place within specific and diverse socio-cultural, socio-political and local or regional settings, so measures are equally diverse and may range from building water reservoirs and planting mangroves to improving building standards. By contrast with mitigation projects, which can be assessed in terms of the re-

duction in greenhouse gas emissions, this diversity means that the success of adaptation measures cannot be assessed by means of a single universal indicator. Vulnerabilities and their causes also vary widely from one location to another, making it difficult to compare adaptation results and identify transferable recommendations.

- **Uncertainty about specific climate trends:** Adaptation measures are implemented in the context of climate variability and uncertain climate projections. Highly relevant parameters may, therefore, change in the course of the project and new information, such as improved climate data and projections may become available. This may have consequences for project activities and the frame of reference for monitoring: shifting baselines can hamper project progress review and evaluation.

- **Extended timeframes:** Climate change occurs over decades, so the ultimate success of adaptation projects can frequently be assessed only after the projects have been concluded. The longer the period of time, the more uncertain emission and climate projections, and the resulting impacts of climate change, become.

- **Complexity of determinants:** Changes in the climate are frequently not the sole cause underlying certain trends but occur in combination with and/or exacerbate other stressors. The increased risk of bushfires in Mozambique, for example, is the result not only of greater aridity but also of the spread of slash-and-burn clearance in response to population growth and the decline in traditional governance of natural resources (INGC, 2009). This diversity of influences means that causal links need to be considered more broadly rather than focusing solely on climatic conditions, and this makes it more complex to measure results. The complexity of socio-economic systems also makes it more difficult to attribute results to specific interventions. For instance, there may be complex interfaces with other development measures, or sectoral changes may also help to boost resilience and alleviate vulnerability to the impacts of climate change. This makes it difficult to attribute measurable changes to a specific project.

- **Difficulty in defining a standard of comparison (the 'business as usual' scenario):** Comparison with what would probably have occurred without the adaptation measure (a 'counterfactual analysis') is central to an assessment of the effectiveness of adaptation. This analysis explores how climatic changes would have affected society and ecosystems without the relevant adaptation measures. For example, to measure the effectiveness of newly introduced drought resistant seeds, estimates of the yields that would have been achieved without these new seeds are needed. Yet, without the drought resistant seeds farmers might have shifted to other crops or sought other sources of income. Counterfactual analysis therefore requires assumptions about alternative development scenarios ('what would have happened if') that can have a considerable influence on the measurement of results.

These challenges highlight the need for ongoing monitoring and, hence, assessment of whether the selection or design of the adaptation measures needs to be changed. This makes project steering flexible enough to deal with uncertainties. The five-step model described in the following section helps to tackle these challenges and provides support in designing and implementing results-based adaptation projects.

2. Five steps to designing a results framework and developing a results-based monitoring system for adaptation projects

We propose five consecutive steps to designing an adaptation project and its results framework and developing a results-based monitoring system (Figure 1). They are based on the work of the World Resource Institute in collaboration with GIZ (WRI & GIZ, 2011). We describe the individual steps in detail below.

Fig. 1

Five steps to designing a results framework and developing a results-based monitoring system for adaptation projects

Source: Modelled on WRI & GIZ (2011)

The Five-step monitoring tool ‚MACC'

To assist project managers and staff in implementing the five-step model shown in figure 1, GIZ has developed an excel tool called MACC (Monitoring Adaptation to Climate Change). The excel tool guides users through each of the five steps. Data can be directly entered into the excel file making the tool a very practical devise for project monitoring. The tool allows defining up to 15 results with up to three indictors each. The results can be sorted to different project sub-components and visualised in a results framework. Milestones can be identified for every indicator for different points in time and compared to actual indicator values. Based on these customized entries the tool calculates the progress towards the target value and converts it into colour codes. A special feature is the spider chart which illustrates the current results progress at a glance (Figure 2). The tool is easy to navigate and entries for one step are automatically transferred to the next, saving time and ensuring consistency. Video tutorials explain the tasks for every step. A handbook provides further details.

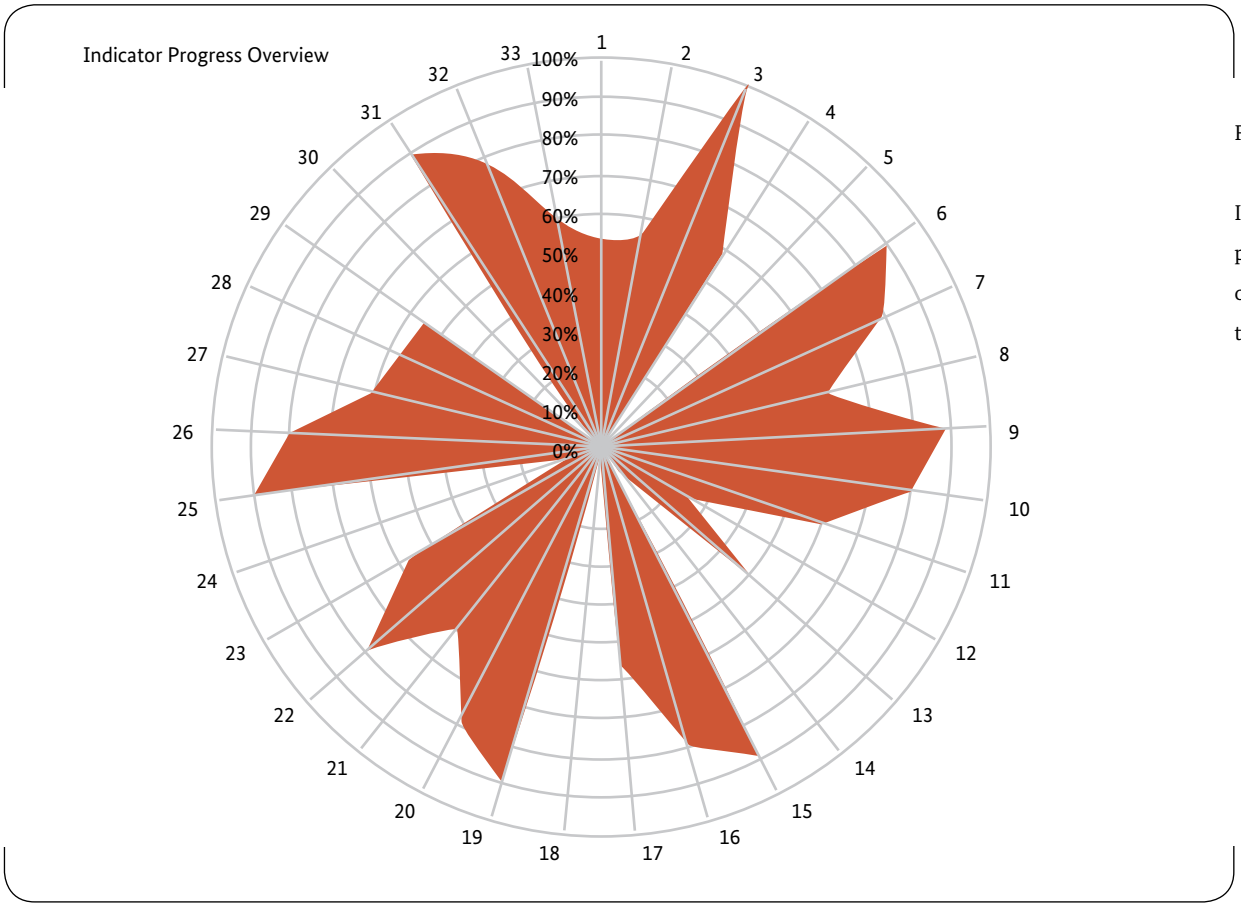


Fig. 2

Indicator progress chart of the MACC tool.

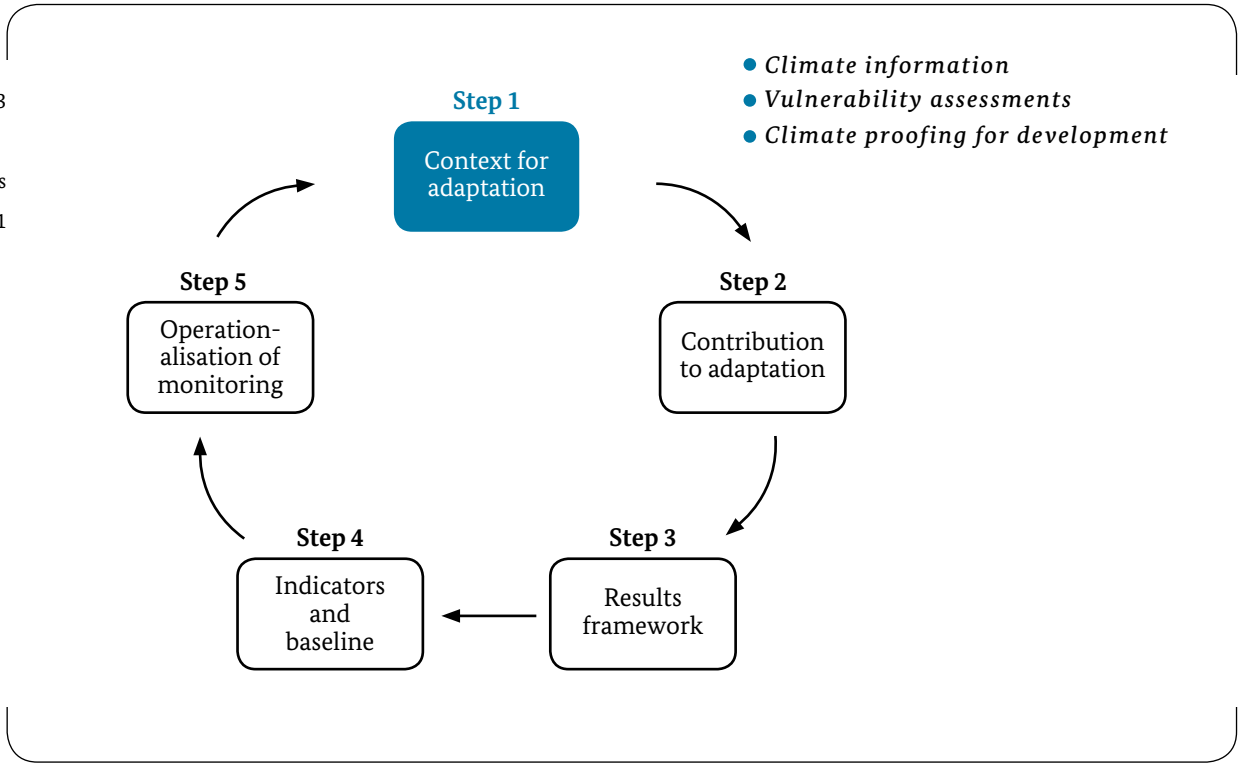
The indicator overview chart provides a snapshot of the current level of achievement of every indicator towards the target value. For example, 80% of the traget value set for indicator 7 has already been achieved.

The MACC tool and handbook are available on www.AdaptationCommunity.net under Monitoring & Evaluation and Tools and Training Materials: https://gc21.giz.de/ibt/var/app/wp342deP/1443/index.php/knowledge/monitoring-evaluation/tools-and-training-material/

Step 1:
Assessing the context for adaptation

Fig. 3

Prompts for step 1



By way of preparation for climate adaptation projects, a review is usually made of the context for adaptation, covering the anticipated impacts of climate change and local vulnerabilities. This requires an **analysis of relevant climate and non-climate stressors.**

Current climatic conditions and variability may be ascertained from local agencies, meteorological services and international organisations or through participatory discussions with stakeholders, including the local population.

Anticipated climate conditions and the attendant intensity and frequency of extreme weather conditions may be ascertained through relevant international and national research (for example, IPCC reports or national communications to UNFCCC) or via climate information platforms including the Climate Impacts: Global and Regional Adaptation Support Platform (ci:grasp) or the Climate Change Knowledge Portal of the World Bank (see Annex 2). Where available, empirical data or local and regional forecasts may also be used. The GIZ publication, 'Climate Change Information for Effective Adaptation: A Practitioner's Manual' provides a good overview of the work of compiling, analysing and communicating climate information in the context of adaptation.

EXAMPLE * INDIA

SIMPLE BUT SIGNIFICANT - VULNERABILITY ASSESSMENTS FOR LOCAL ADAPTATION PROJECTS IN INDIA

The Indian-German cooperation project 'Climate Change Adaptation in Rural Areas of India' (CCA RAI) is implemented by GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). To plan pre-selected adaptation measures in vulnerable communities in detail and to identify the target group for the measures, CCA RAI carries out vulnerability and risk assessments at local level.

The vulnerability assessments are conducted by non-governmental organisations (NGOs) that work with GIZ to implement adaptation measures. The NGOs are deliberately given broad scope to select the methodology and tools for data collection. Depending on their capacities, the NGOs can decide themselves on which participatory rural appraisal methods they use to collect qualitative data and which scientific data they use. The use of research findings depends substantially on the data available at local level and how reliable they are. Since the network of weather stations is sparse, local historical weather data are frequently unavailable or of little informational value. Local vulnerability assessments therefore adopt a bottom-up approach based primarily on local knowledge and observations that are collated with trend analyses (e.g. based on available rainfall and temperature data) or the available literature on the anticipated impact of climate change (e.g. federal state climate action plans and vulnerability assessments or national communications to the UNFCCC). This approach is now recommended by the IPCC for conducting local vulnerability analysis (IPCC, 2012).

To ensure that vulnerability assessments apply the same conceptual framework, local analyses are based on the IPCC concept of vulnerability. Unlike national or federal state vulnerability assessments, local analyses – and, hence, local adaptation measures – focus substantially on the current challenges that climate variability represents. Reducing the current vulnerability of communities also strengthens their adaptive capacity to deal with the impacts of climate change. Existing research findings illustrate the extent to which future challenges match current ones. In this context, the assessment of coping strategies and their potential for adaptation plays a major role in vulnerability assessment. Repeated vulnerability assessments after project implementation determine the extent to which adaptation measures actually help reduce vulnerability in the individual communities. The prime concern here is the assessment of increased adaptive capacity, because long-term findings on the actual impacts of climate change cannot be made during the project lifetime.

The CCA RAI team supports the NGOs with workshops, both to promote sharing of knowledge at local level and to enable them to discuss methods and the findings of their vulnerability assessments. The team also helps them set up their M&E system based on these findings.

Climate impact and risk analyses or vulnerability assessments may be carried out to identify regions, social groups or economic activities that are at risk. Based on the IPCC (2001) definition, vulnerability assessments usually consider three components: exposure to current and expected climate variability and change *(exposure)*; susceptibility to these factors *(sensitivity)*; and the estimated capacity to adapt (adaptive capacity). Box 1 provides an overview of selected methods and information for conducting vulnerability assessments. Depending on needs and conditions, a vulnerability study may vary greatly in scope, from a simple population survey, as in the UNDP Vulnerability Reduction Assessment (UNDP, 2008), to detailed scientific studies. Process-based mainstreaming tools, such as the GIZ tool Climate Proofing for Development, the IIED tool CRiSTAL and others (see Box 2), also provide practical support.

Assessing the context for adaptation within project planning can be a challenge, as the relevant climate-specific data are not always available. Analysis should, however, be more detailed than a stakeholder analysis or a project risk assessment as they are frequently done as part of project appraisal missions. In practice, simple risk or vulnerability assessments provide a suitable framework, but these have so far been used only sporadically as part of project preparation. The findings of simple vulnerability assessments should then be integrated into the initial phase of the project and reflected in future project design (see Indian example on p. 13).

Next to assessing climate information it is essential to analyse non-climatic drivers of change and their interrelationships. This helps in understanding how best to address these changes and contribute to reducing vulnerability. The outcome of the first step is, then, to identify the context for adaptation through detailed study of anticipated climate changes and their effects. On this basis, step 2 sets out the project's contribution to adaptation.

BOX 1:
SELECTED INFORMATION AND METHODS FOR VULNERABILITY ASSESSMENTS

General information:

- Experiences of GIZ with vulnerability assessments at local level: https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/va/vulnerability-guides-manuals-reports/giz-2013-en-vulnerability-assessment.pdf
- AdaptationCommunity.net: introduction to and application examples of vulnerability assessments. https://gc21.giz.de/ibt/var/app/wp342deP/1443/index.php/knowledge/vulnerability-assessment/
- PROVIA (Programme of Research on Vulnerability, Impacts and Adaptation) guidance on vulnerability, impacts and adaptation assessments: http://www.provia-climatechange.org/
- Technical paper 3 of the UNDP Adaptation Policy Framework on assessing vulnerability: http://content.undp.org/go/cms-service/stream/asset/?asset_id=2200850

Methods of vulnerability assessment

- Guide to UNDP's Vulnerability Reduction Assessment (VRA): http://www.gcca.eu/sites/default/files/soraya.khosravi/final_vra_guidebook4.pdf
- CARE's Handbook on Climate Vulnerability and Capacity Analysis: http://www.careclimatechange.org/cvca/CARE_CVCAHandbook.pdf
- Mapping the vulnerability of communities using GIS. An example from Mozambique. Toolbox and manual: http://projects.stefankienberger.at/vulmoz/wp-content/uploads/2008/08/Toolbox_CommunityVulnerabilityMapping_V1.pdf

BOX 2:
SELECTED PROCESS-BASED MAINSTREAMING TOOLS AND METHODS

Tools and methods:

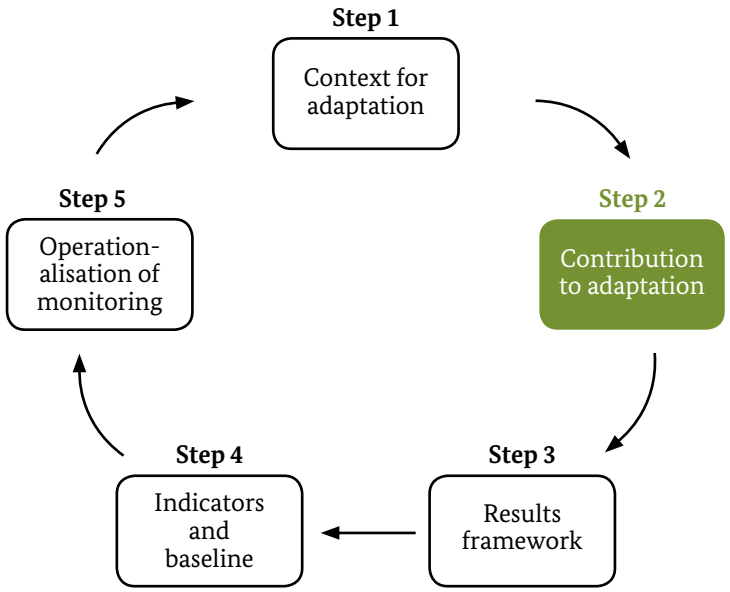
- Climate proofing for development. Adapting to climate change, reducing risks http://star-www.giz.de/fetch/9X00irq7g001jQs809/giz2011-0223en-climate-proofing.pdf
- Incorporating the concept of climate change adaptation into municipal planning. GIZ Experiences in Mali. http://star-www.giz.de/fetch/cd4L0gu00lQ001cX8a/giz2013-0075en-climate-change-municipal-planning-mali.pdf
- Environmental and climate assessment (in-depth adaptation assessment): http://star-www.giz.de/fetch/4Q0ox4X0001G0gE9d1/giz2013-0546en-environmental-climate-assessment.pdf
- CRiSTAL (Community-based Risk Screening Tool – Adaptation and Livelihoods): http://www.iisd.org/cristaltool/
- AdaptationCommunity.net: introduction to and application examples of mainstreaming adaptation. https://gc21.giz.de/ibt/var/app/wp342deP/1443/index.php/knowledge/mainstreaming/

The following **guiding questions** are helpful for step 1 (Assessing the context for adaptation):

- Are relevant data and information available on climatic risks and vulnerabilities?
- Are major drivers and directions of climatic and non-climatic changes and their inter-relationships understood and taken into consideration for the project design?
- Is the resulting picture of the adaptation context adequate, or is further research and analysis needed?
- Can sections of the population, regions or sectors be identified as being at particular risk?

Step 2:
Identifying the contribution to adaptation

Fig. 4
Prompts for step 2



● *WRI & GIZ, 2011, chapter 3*

Based on the analysis of the adaptation context in step 1, the basic orientation of a project can be determined. This means specifying the principle way a project intends to contribute to adaptation. Three stylised **dimensions of the adaptation process** can be distinguished, from building capacities to adapt over concrete adaptation actions to safeguarding development goals (compare figure 5). Thinking of the adaptation process in these dimensions assists in designing an adaptation project and its results-based monitoring system in the subsequent steps. The following provides a more detailed description of the **three adaptation dimensions** (WRI & GIZ, 2011):

- **Dimension 1: building adaptive capacity:**
  This denotes the development of problem-solving abilities to enable the relevant actors or persons affected (local people, state agencies, private sector, etc.) to respond better to climate variability and change and to extreme weather conditions. Capacity-building projects thus boost the *potential* for adaptation to climate change.

  Examples: Support for preparing downscaled climate change projections, climate change impact and vulnerability assessments; strengthening the ability to conduct, interpret and communicate relevant analyses; target group-specific interpretation and communication of climate information and advice on its use; advice in developing adaptation strategies and mainstreaming climate aspects in planning processes.

- **Dimension 2: measures for reducing identified risks/vulnerabilities (adaptation actions):**
  Adaptation actions capitalise on adaptive capacity and ensure that the capacity is used to directly reduce specific risks or vulnerabilities.

EXAMPLE * INDIA

CONTRIBUTIONS TO ADAPTATION BY THE INTERVENTION SECTORS OF THE ADAPTATION PROJECT CCA RAI IN INDIA

With its various intervention sectors, the Indian-German 'CCA RAI' adaptation project addresses all three adaptation dimensions while focusing on building adaptive capacitiy.

Building adaptive capacity

Developing a replicable and structured approach and conducting *vulnerability and risk assessments at federal state level* enables the authorities to identify adaptation needs and particularly vulnerable districts and sectors. Along with the federal state climate action plans, whose preparation is supported by GIZ, vulnerability and risk assessments thus form a key basis for policy-making and enable the federal states to take appropriate action.

Information and knowledge management both raises awareness of the possible consequences of climate change and enhances problem-solving capabilities at local, federal state and national level.

Developing competencies, resources and capacity through training in adaptation supports the integration of climate aspects into national and federal state development programmes and other planning processes.

Measure for reducing identified risks/vulnerabilities (adaptation actions)

Concrete *adaptation measures* implemented by the project are, for example, the introduction of drought-resistant crop varieties or agro-forestry techniques to diversify livelihoods.

In the intervention area F*inancing mechanisms for adaptation* it is examined how insurance against crop failure may help to mitigate the risk of crop loss and debt as a result of drought or heavy rainfall..

Successful development despite climate change

The instrument *Climate Proofing for Development* is used to ensure development objectives of government programmes are achieved and to analyse how the contribution of investments and programmes to climate change adaptation can be maximised.

The *climate action plans of the federal states* also provide analysis of the extent to which their planned development goals are jeopardised by climate change and the measures that need to be taken to ensure that the goals are achieved.

Financing mechanisms for adaptation, such as savings and insurance, provide support and help communities to recover from extreme weather events and enable them to restore their previous standard of living.

Examples: Use of seeds or crops that are better adjusted to changing climatic conditions; changes in cultivation methods and/or water management; creation of water reservoirs; ecosystem-based measures, such as planting mangroves as protection against flooding; health protection measures, such as the implementation and use of heat stress warning systems; economic measures, such as insurance against crop failure.

- **Dimension 3: successful development despite climate change (sustained development):** Against a backdrop of climate change, adaptation to its inevitable impacts is increasingly important if sustainable development is to be achieved. The third dimension of adaptation projects therefore focuses primarily on achieving development goals and/or securing the progress already made despite the adverse effects of climate change. This dimension may include both capacity-building and direct measures to reduce identified risks. In contrast to the first two dimensions, however, greater focus is placed here on securing development goals.

  Example: A development cooperation project aims at improving protection of the local population against malaria in a certain region, for example through education, better medical care, and use of mosquito nets across the region. Warming in the relevant region could cause mosquitoes to proliferate and increase malaria transmission. To counteract this, ongoing measures could be stepped up or expanded, for example by extending the use of mosquito nets to regions at higher altitudes previously considered to be free of malaria.

It is not always possible to draw a clear demarcation line between these three dimensions, because they are mutually enhancing. Adaptation actions require adequate adaptive capacities, and it is the two together than can secure development goals. Rather than being mutually exclusive categories, they are, therefore, building-blocks for achieving adaptation as part of sustainable development (Figure 5). Lessons learned from one of the three dimensions should also inform the others to facilitate the ongoing improvement of the adaptation process as a whole.

Viewing a project as part of a wider adaptation and development process can assist in setting the relative weightings of the three dimensions accordingly. For example, if in a certain region or sector predominantly adaptive capacity has been strengthened so far (as is the case for the majority of countries in Southern Africa as the *Adaptation Partnership (2011)* has shown), the three-dimension model could point to increasingly planning direct adaptation actions and/or placing them in the context of sustainable development. The distinction between the three dimensions is also helpful because each may require different indictors or data collection methods (see step 4). Since adaptation projects ultimately seek to secure development, dimension three is overarching the other two dimensions (Figure 5).

Figure 4 locates the contribution of step 2 in the five-step model.

The following **guiding questions** are helpful for the second step (Identifying the contribution to adaptation):

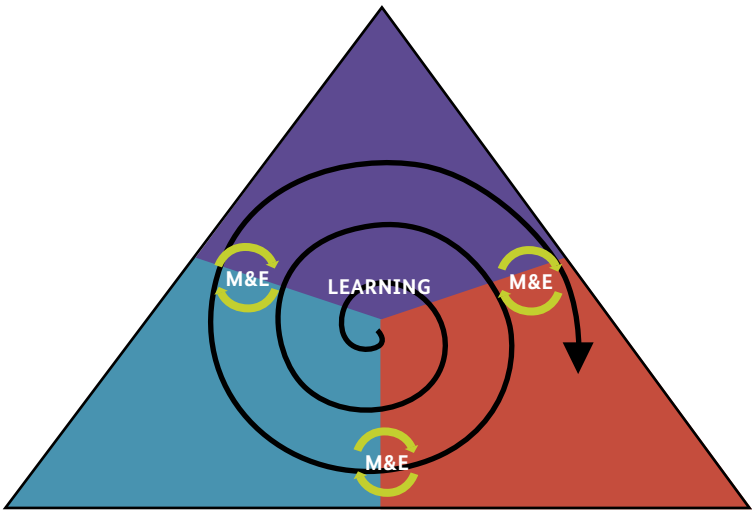


Fig. 5

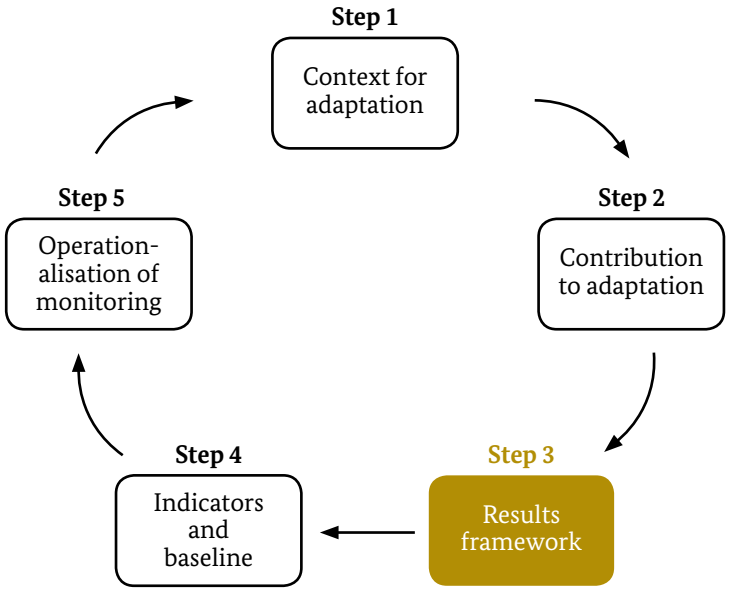
The three dimensions of adaptation

Source: WRI & GIZ, 2011.

- Based on the analysis of the adaptation context, is it possible to identify one or more priority dimension(s) on which the project should concentrate for maximum effectiveness?
- What is the relative weighting of dimensions one and two in the project and how far does it contribute to safeguarding development goals?

Step 3:
Developing a results framework

Fig. 6



Prompts for step 3

- *GIZ's integrated results model (cf. fig. 7)*
- *For further literature on results matrices and strategic options see "Key references 3" in the annex.*

On the basis of the adaptation context (identified in step 1) and the adaptation dimensions (identified in step 2), step 3 specifies the anticipated results of a project and how they are to be achieved (strategy). The envisaged process of change is now depicted not as a linear results chain but as a more complex **results framework**. This framework describes the logical connection and interrelationship of results and how they contribute to the overall objective, as shown in Figure 7. Results are understood as changes of conditions or behaviour that result from an intervention. A development project undertakes specific activities which are expected to lead to predefined results located within the sphere of responsibility (these results appear in white boxes within the area of responsibility which is the area shaded blue in Figure 7). In addition, development activities may contribute to results outside the sphere of responsibility of the project.

As soon as the project **objective** has been set in collaboration with the partners, the focus switches to how it can best be achieved. There may be several **strategic options**. The most appropriate one must be selected, taking into account the comparative advantages of the implementing organisation and partner contributions. The key questions in Box 3 can help here.

As soon as a strategic option has been chosen, **activities** and the thereto employed **instruments*** are assigned to the related results for greater differentiation (see Figure 7 and Indian example on page 23).

* The term 'instruments' describes means (inputs) which GIZ employs to deliver its services, e.g. in the context of an international cooperation programme. The four main categories are human capacity development, financing, material goods and deploying experts.

The results can also each be assigned to one of the **three adaptation dimensions** from Step 2. This is illustrated on page 23 with the example of an adaptation project in India. The allocation to the three adaptation dimensions helps when selecting suitable indicators in the next step.

A major function of the results framework is to reveal how and on what **assumptions** the results achieved will reduce vulnerability or strengthen resilience. For this, hypotheses are posited about the connection between objective, results and activities, as has been done in the example from India for each intervention sector of the CCA RAI project. For example, the following adaptation hypothesis was drawn up for the activity "Implementation of adaptation measures (pilot projects)": *'The implementation of adaptation measures contributes to strengthening the resilience of communities in dealing with climate change. Testing, assessing and showcasing of results of these projects contributes to general adaptation knowledge and to spreading good practices.'*

A key task of results-based monitoring is to continuously re-assess these hypotheses, which is particularly important in the context of uncertain climate projections and the socio-economic changes entailed in adaptation projects.

Further literature on drawing up results frameworks and selecting strategic options is listed in the "Key references 3" box in the annex.

Figure 6 depicts the contribution of step 3 to the five-step model.

BOX 3:
KEY QUESTIONS FOR SELECTING A STRATEGIC OPTION

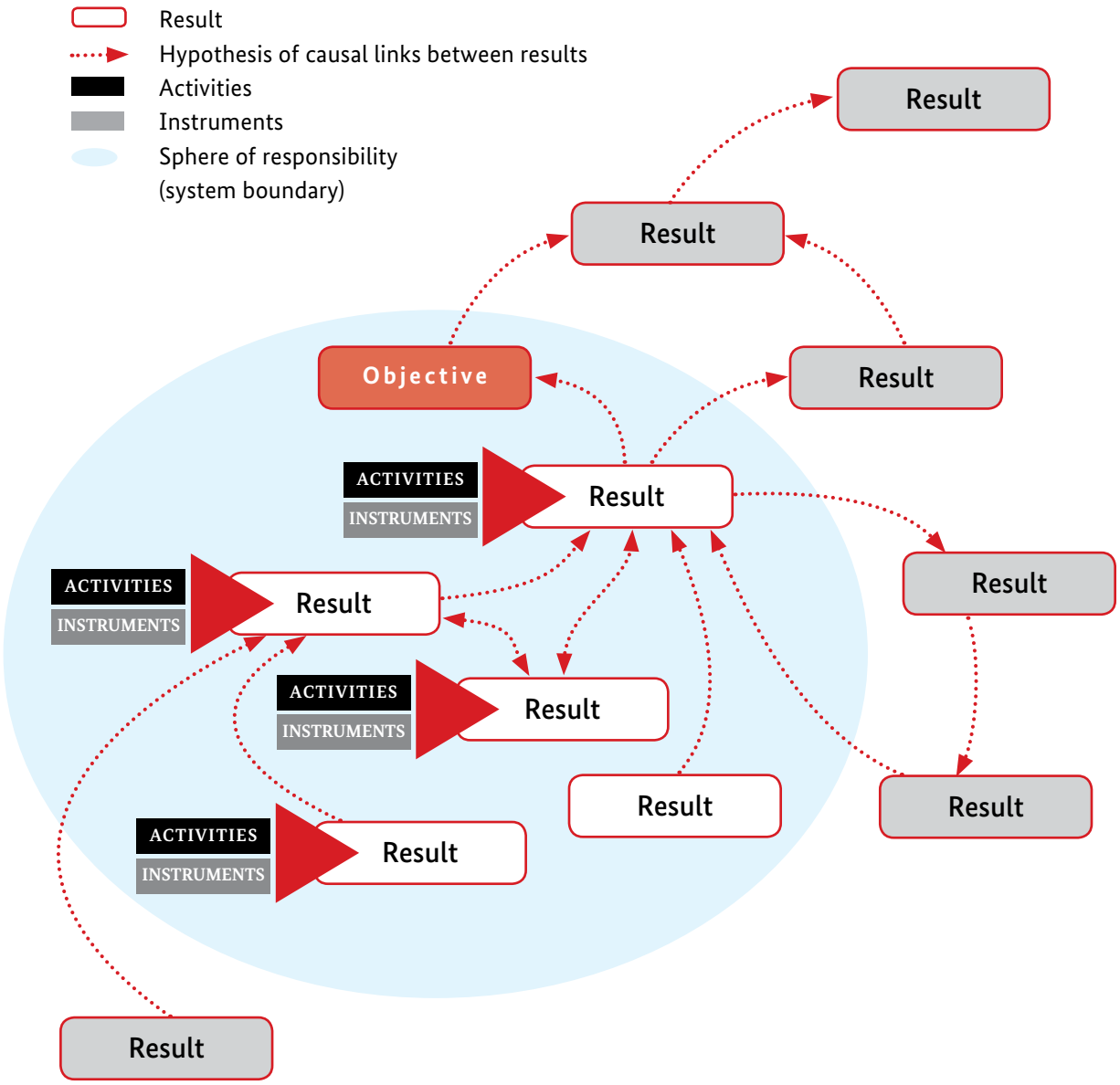
- What or who needs to change to systematically enable adaptation to climate change? What are barriers and enabling factors of adaptation?
- How should the strategy be framed so that the activities have a high degree of leverage?
- How does the strategy cater for feasibility in terms not only of resources but also of the cultural and political context?
- Which instruments should we deploy? What partner inputs are necessary?
- Who has to be involved (stakeholder analysis)?
- Where are other donors already involved?
- What are we particularly good at?
- What complementarities can we identify with other actors/donors (cooperation, co-financing, etc.)?
- What risks need to be taken into account?

The following **guiding questions** are helpful for the third step (Developing a results framework):

- Do the project objectives address the adaptation needs and priorities identified in step 1?
- Does it appear plausible and realistic that project objectives can best be achieved under the selected strategic option?
- Can experience from similar adaptation projects be helpful in selecting the strategic option and defining realistic results?
- Have the hypotheses been clearly and logically presented in the results framework so that they can be monitored?

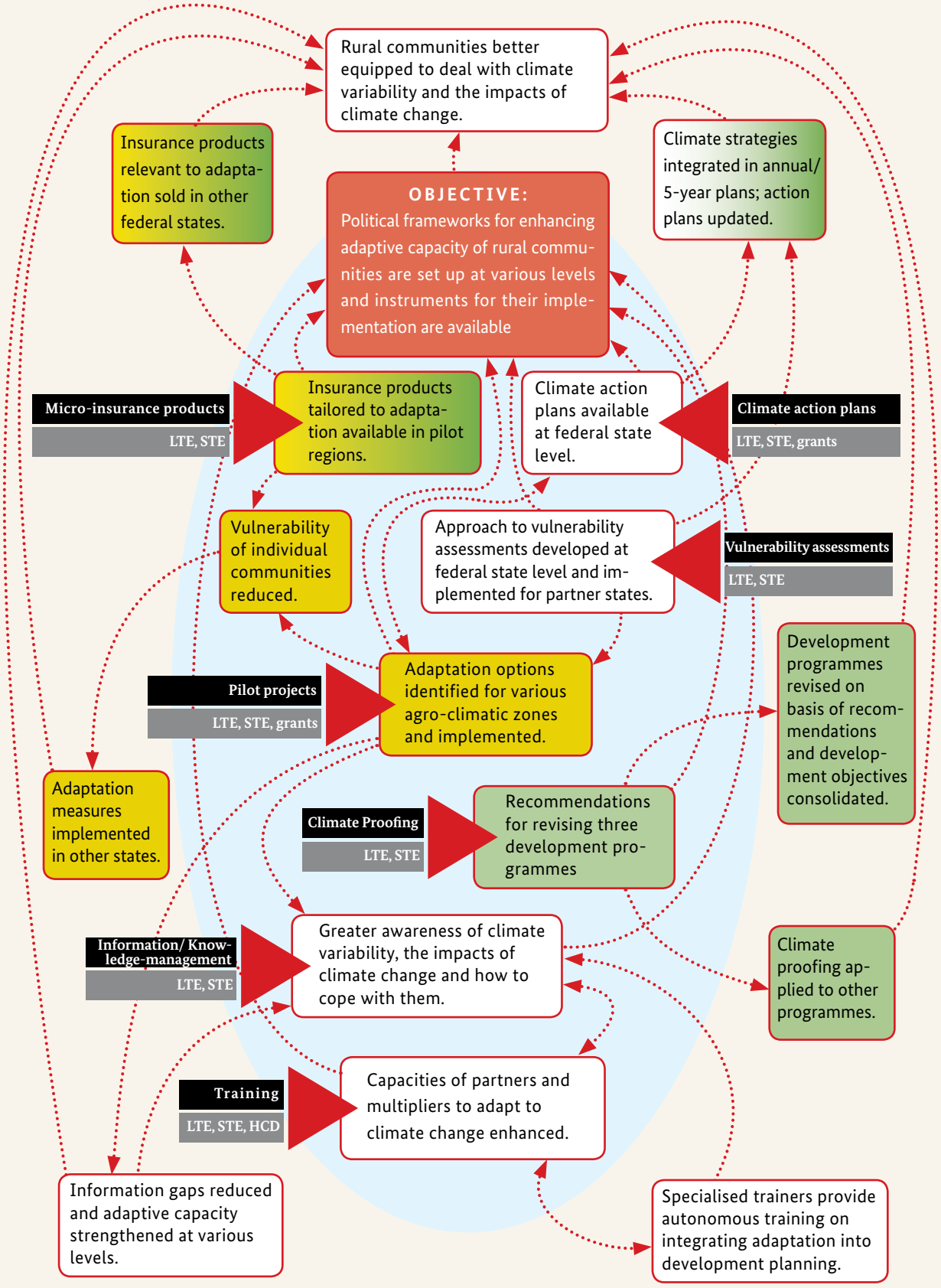
Fig. 7

The GIZ Results Model



Source: GIZ 2012.

EXAMPLE * INDIA

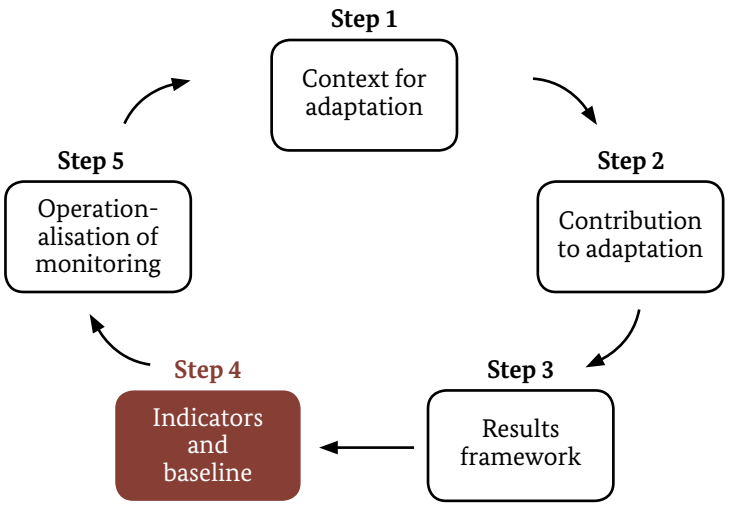


Results: adaptive capacity; Results: adaptation actions; Results: development success despite climate change; STE: short-term expert; LTE: long-term expert; HCD: Human Capacity Development; Hypothesis of causal links between results; Activities; Instruments; Sphere of responsibility

Results framework for the GIZ project 'Climate Change Adaptation in Rural Areas of India (CCA RAI)'

Step 4:
Defining indicators and setting a baseline

Fig. 8



Prompts for step 4

- *Saved health, saved wealth metrics (Perspectives & GIZ 2013)*
- *Repository of adaptation indicators (see page 26)*
- *GTZ (2010) guide to baseline studies*

Once the context for adaptation (step 1), the adaptation dimension(s) (step 2) and the results framework (step 3) of a project have been identified, step 4 involves defining indicators and setting a baseline to form the basis of project monitoring and evaluation.

a) Defining indicators

Classifying results by their contribution to the process of adaptation carried out in step 3 (see the three dimensions of step 2) helps to define indicators. Results that are attributed largely to *adaptive capacity* (dimension 1) relate to the development of potential that can lead to adaptation, e.g. the existence of a national adaptation strategy, the availability of early warning systems or the implementation of educational campaigns. By contrast, the results of *adaptation actions* (dimension 2) are more focused on whether adaptation has actually taken place and/or whether the related vulnerability has been reduced. Results that mainly help to secure development (dimension 3) generally use indicators that describe the course of the respective development, be it in health, education or food security. Sample indicators for the three dimensions are listed below:

- **Dimension 1:** Building adaptive capacity (developing requisite problem-solving capabilities)

  Sample indicators: existence and quality of coordination/mainstreaming processes, availability of climate information and analytical capabilities, risk management capacity in dealing with increasing climatic variability, operational early warning systems for risks such as extreme weather conditions or contagious diseases.

- **Dimension 2:** Measures for reducing identified risks/vulnerabilities (adaptation actions):

  Sample indicators: reduction of water demand per unit of agricultural output, extent of diversification of income in regions affected by extreme weather events, increased ratio of at-risk households with disaster risk insurance coverage

EXAMPLE * INDIA

EXAMPLE OF ADAPTATION INDICATORS FROM PILOT MEASURES OF THE ADAPTATION PROJECT CCA RAI

The following describes selected indicators of local adaptation measures implemented by NGOs in the four partner federal states of the CCA RAI project. These local projects fall under the 'implementation of adaptation measures' intervention sector of CCA RAI.

Developing requisite problem-solving capabilities (adaptive capacity)

Community institutions in the project region have received training on at least one occasion in adaptation to climate change and are equipped to integrate climate aspects in community planning *(village plans)*.

250 households in the project region have been informed about climate variability and change and are more aware of possible risks and adaptation measures.

Measures for reducing identified risks/vulnerabilities (adaptation actions)

Cultivation of pasture land to ensure an adequate supply of fodder in periods of drought: increasing biomass (in kg) by at least 20% per 40 hectares of pasture land (land to be brought into cultivation); reducing target group spending on fodder by an average of 40%.

Construction of 35 farm ponds to irrigate 80% of the total 28 acres of land, of which at least 7 acres are used for cultivating rice, and increase yield by 20%.

Diversification of agricultural production: the target group cultivates at least 12 crop plants adapted to the local climate to generate income from agricultural production.

Successful development despite climate change (securing development goals)

Goald of food security: 50% of farmers in the project region confirm that drought-resistant rice varieties produce more reliable yields than other varieties despite lengthy periods of drought (compared with fields growing non-drought resistant varieties).

- **Dimension 3:** Successful development despite climate change (securing development goals):

  Sample indicators: stable income in particularly vulnerable sections of the population, reduced dependence on highly climate-sensitive sectors, availability of climate-resilient infrastructure, expansion of, and participation in, educational provision. Universal metrics, such as 'saved wealth' or 'saved health' may also be applied (see Table 6, page 33) (Perspectives & GIZ, 2013).

How indicators are defined depends on the specific result, the desired information content of the indicator, and factors such as data availability and the costs of data collection. As an illustration, a **repository of adaptation indicators from real projects** and the related context has been compiled in an excel file which can be downloaded at AdaptationCommunity.net under Monitoring & Evaluation and Further reading. Table 3 shows the structure of the indicator repository and Table 4, page 29, provides selected examples. The indicator examples have been taken from adaptation projects of GIZ and other international organisations such as the Global Environment Facility. They have been selected on the basis of their ability to demonstrate adaptation specific results. The indicator repository can provide ideas for indicator formulation but it does not represent a set of best practises which can be directly copied because indicators need to be defined for their particular context and purpose. The repository aims to be a 'living document' - if you have indicators which you would like to include please email the authors (see contact details on page 5).

Well-designed indicators comply with quality criteria such as the SMART rule:

- Specific: the indicator is precisely formulated, not vague.
- Measurable: it is feasible to quantify the indicator.
- Agreed: the indicator is accepted by project partners.
- Relevant: the indicator is valid and describes the underlying issue.
- Time-bound: a temporal reference is given.

Quality criteria for adaptation indicators are also described in WRI & GIZ (2011). *Practical* aspects, such as data availability, costs and responsibilities should also be considered at the indicator selection stage (see step 5).

b) Setting a baseline

A key reference point for planning, monitoring and evaluation is the **baseline**, the starting point before the beginning of an intervention. The results framework, the indicators and the adaptation context determine which baseline variables are most relevant. To compile baseline data, recourse may be had to the analysis of the adaptation context under step 1. The World Bank has defined five categories of data of relevance to adaptation, which are described in Table 2, page 27 (World Bank, 2010).

The information needed to collect baseline data may either be obtained by using available datasets from authorities, international organisations or global information platforms or be com-

CATEGORIES OF DATA	DESCRIPTION
Climate data	Climate parameters, such as temperature, rainfall or humidity, and local habitat parameters, such as soil condition, soil/water salinity, etc.
Socio-economic data	Indicators of economic and social well-being in a community. This may include, for example, income, food security, health and security. The specific adaptation aspect involves determining the impacts of climate change on these factors.
Data on institutional and policy processes	Capacity and existence of appropriate institutions (official or unofficial) and the legal framework (e.g. whether climate change policies exist and how they are implemented).
Ecosystem services	The extent to which ecosystem services are affected by the impacts of climate change.
Coping strategies	What strategies the local population has so far used to cope with current climate variability.

Table 2

Categories of data relevant to setting a baseline for adaptation projects

piled locally by project personnel or partners (pointers in step 1). Alternatively, or additionally, information on the experience of the local population may be collected using participatory methods, such as interviews or focus groups, and used as baseline recording. This can also be helpful if data such as historical climate conditions have not been collected in the relevant region in the past and so are unavailable. An overview of quantitative and qualitative survey methods and their advantages and disadvantages is provided in the GTZ guide to baseline data collection (GTZ, 2010).

c) Additional help with verifying adaptation results

Providing evidence of the actual contribution to climate change adaptation is a central concern (see 1.2). Some studies show that earlier adaptation projects frequently confined themselves to describing the activities for implementing a project rather than documenting the results they were able to achieve (Perspectives Climate Change, 2011; IDS, 2008). To deal with the specific challenges of measuring adaptation (for example, uncertainty of climate projections, long timeframes etc. – see 1.3), the methods summarised in Table 5 can also be used to record results.

Table 3

Structure of the repository of adaptation indicators

COLUMN	DESCRIPTION
SECTOR	Included are: biodiversity, agriculture, water, human health, education, tourism and multisectoral examples.
ADAPTATION DIMENSION (ADAPTIVE CAPACITY, ADAPTATION ACTIONS, SUSTAINED DEVELOPMENT)	The adaptation dimension refers to the specific which the indicator is measuring (and not to the objective because the objective may cover a range of different results which may belong to different dimensions).
OBJECTIVE	Stating the most relevant objective, e.g. the objective of a project component which the result belongs to. In case this was not available, the overall project objective is stated.
INDICATOR (ORIGINAL WORDING)	Indicator in the original wording as used in the real example.
INDICATOR (REWORDED)	A generalized wording without reference to particular places or numeric levels (e.g. X% rather than 40%).
DATA NEEDS	Describes the data needed to quantify the indicator.
DATA COLLECTION METHOD	Describes the method to gather the needed data
COSTS	Provides a general estimation of the costs based mainly on the data collection method on a scale from low to high.

Ideally, adaptation results can be measured through **repeated climate change vulnerability assessments**. In a simplified form of repeated stakeholder surveys, this is being done by the UNDP Vulnerability Reduction Assessment (2008). Repeatedly conducting complex indicator-based vulnerability assessments, however, is resource intensive and short-term changes might be difficult to detect in a composite index. Focusing on the changes in each and every indicator is thus important. Another challenge is that vulnerability is dynamic and its underlying causes and interrelationships may change over time, possibly rendering a static indicator framework invalid. Nevertheless, based on the analysis of the adaptation context in step 1 key vulnerability factors should be taken into account when developing the results framework (step 3) and when formulating indicators (step 4). On behalf of BMZ, GIZ is currently developing and pilot testing a methodology to use repeated vulnerability assessments to monitor results of adaptation projects (a short project description is provided in GIZ, 2013).

In **counterfactual analysis**, the project outcomes are compared with what would probably have occurred without the intervention. This is based on the acknowledgement that a simple com-

COLUMN	IN RELATION TO STEP	EXAMPLE 1	EXAMPLE 2
SECTOR	1	Agriculture and Water	Mulitsectoral
ADAPTATION DIMENSION	2	Adaptation actions	Adaptive capacity
OBJECTIVE	3	Regional and municipal authorities have improved their institutional capacities and services to secure access to water and to promote efficient water use at smallholder producer level, accounting for climate change.	Major actors (user groups, municipalities and localised government services) in the intervention areas manage water and land resources in climate-sensitive way.
INDICATOR (ORIGINAL WORDING)	4	Taking account of their particular vulnerabilities to climate change, 6,000 smallholder producers apply management schemes to improve their access to water and/or efficient water use.	The ratio of municipalities (as % of all municipalities) in the respective intervention areas that have integrated adaptation measures into their development plans, amounts to x%.
INDICATOR (REWORDED)	4	Smallholder producers apply management schemes that improve access to water or efficient water use.	Municipalities have incorporated adaptation measures into their development plans.
DATA NEEDS	5	Number of producers who apply suitable management schemes to improve their access to water and/or organise water use more efficiently.	Development plans of local governments.
DATA COLLECTION METHOD	5	Surveys of the target group	Development plans at local level
COSTS	5	High to very high, depending on inputs needed for survey	Low

Table 4

Examples from the adaptation indicator repository

Table 5

Special results measurement methods in adaptation projects

METHOD	DESCRIPTION
Repeated vulnerability assessments	Comparison of repeated vulnerability assessments over time
Counterfactual analysis	Comparison of project results with development in a control region or group where no equivalent adaptation measures have been conducted.
Dynamic baseline	Adjustment of baseline data collected at the start of the project where conditions have substantially changed (particularly climate factors and their consequences) to maintain the relevance of the benchmark.
Opportunistic results measurement	Comparison of the consequences of extreme events occurring during the project term with the impact of similar events at the start of the project or simultaneously in comparable regions without adaptation measures.
Universal metrics	Use of indicators to quantify the results of adaptation projects in a cross-sectoral and cross-project metric, e.g. the number of saved lives or the value of protected assets.

parison of outcomes before and after the project is seldom adequate, particularly for longer-term projects and where settings are shifting. Instead a suitable comparator (the 'business as usual' scenario) is sought that will plausibly depict the development that might have taken place had it not been for the project. Similar regions or communities may, for example, be selected where no equivalent intervention has taken place. If these regions or groups are already identified at the start of a project, their development can be monitored continuously as the project runs. Unlike the simple before-and-after comparison, this also affords the opportunity to determine the causes of the outcomes achieved and verify the causal links. Further details on types of target/actual comparisons are available in the GTZ guide to baseline studies (GTZ, 2010).

There are multiple factors of influence, which develop dynamically, and projections for climate and social factors are uncertain (section 1.3), meaning that the context for adaptation

projects may change substantially under certain circumstances. If, for example, the objective of a project is to boost agricultural output, but unexpectedly severe droughts occur during implementation, project success might be defined merely as maintenance of the original output level. To cope with this problem of **shifting baselines**, the relevance of comparators needs to be assessed and, where appropriate, adjusted. This is particularly the case if the baseline at the start of a project has been set as the sole standard of comparison for results measurement. The longer the project term, the greater the need to reassess the relevance of baseline figures.

BOX 4:
CASE STUDY OF OPPORTUNISTIC RESULTS MEASUREMENT IN MOZAMBIQUE

Mozambique is one of the countries most severely affected by the impacts of climate change worldwide (Maplecroft, 2010). Working on behalf of BMZ, GIZ has been implementing a disaster risk management project in the country for ten years. Among other things, it has set up a community-based early warning system involving the establishment and training of several hundred local committees. 4.5 million people were affected by floods in 2000, of whom 800 died, but there were far fewer victims during similar floods in 2008 and 2011. The early warning system meant that large numbers of people at risk could be brought to safety in time: over 100,000 in 2008 and almost 40,000 in 2011. This is rated as evidence of the effectiveness of the measures taken.

In the area of disaster risk management, extreme events (droughts, floods, etc.) that occur during the project term can be used for **'opportunistic results measurement'** alongside the defined adaptation indicators The impact of such an unforeseeable extreme event can then be compared with the impact of similar events prior to the project or the effects in regions without intervention (see case study in Box 4). This offers an opportunity to verify project success using a practical case study.

In contrast with mitigation, there is no single universal indicator to assess success / results globally and uniformly (such as the reduction of CO_2 equivalents). Rather, as also in other areas, project-specific indicators must be defined for the results anticipated. However, there are attempts to quantify the results of adaptation projects in a cross-sectoral and cross-project unit like 'saved wealth' and 'saved health' which seek to quantify the avoided economic losses and avoided damage to human health (Stadelmann et al., 2011). Table 6 illustrates the methodological requirements and the requisite data for calculation. The feasibility and usefulness of applying these metrics at project level depends on the timeframe, the focus and the scope of the planned project, available data and resources. A detailed pilot application to coastal protection adaptation projects in Viet Nam has been documented in Perspectives & GIZ (2013).

The choice of relevant baseline parameters, the definition of indicators and the methods used to measure them creates the basis for the results-based monitoring system. Its further operationalisation is described in the next step. Figure 6 shows the contribution of step 4 in the five-step model.

The following guiding questions are helpful for step 4 (Defining indicators and setting a baseline):

- Have adaptation-related factors been identified to form the baseline and can the requisite data be obtained?
- Are indicators available to measure objective and results as specified in the results framework?
- Do the indicator targets appear realistically attainable over the project term?
- Based on the selected indicators, is it possible plausibly to verify the contribution of the project to climate adaptation (that is, to establish a direct connection between climate change and the anticipated result)?
- Where appropriate, have special methods been selected for results measurement, such as comparable regions or universal indicators and are the necessary resources available to apply them?

BOX 5:
EXAMPLE OF 'SAVED WEALTH' CALCULATION FOR AN ADAPTATION PROJECT

A valley is populated by half a million people. Historically, floods have occurred only rarely in the area, but in recent years precipitation patterns have changed significantly and the amount of rainfall now frequently exceeds the drainage capacity of the river bed, causing substantial flooding. As predicted by several independent studies, the frequency and intensity of such floods will further increase. Without any adaptation measures, the resulting damage is estimated at 100 million dollars per decade. The adaptation interventions planned as part of a major adaptation project running over thirty years could prevent two thirds of this damage. In the absence of climate change, the total wealth of the inhabitants and their assets accumulated over this time period is valued at 4 billion Euro. Saved wealth can thus be calculated as follows:

Absolute ***saved wealth*** equals the maximum total damage multiplied with the proportion that can be avoided through adaptation.
Absolute ***saved wealth*** = (100 million Euro * 3 decades) * 2/3 = 200 million Euro

Relative ***saved wealth*** is the ratio of avoided damage (that is, absolute saved wealth) relative to the total wealth that would have been generated in the absence of climate change.
Relative ***saved wealth*** = 200 million Euro / 4000 million Euro = 5%

Result: 5% of the region's total wealth can be saved through the project's adaptation measures.

This simplified example assumes an equal distribution of damage and estimates the wealth that would have been generated in the region without climate change. If the development of damages and wealth accumulation over time is to be accounted for, respective annual amounts need to be discounted using a discount rate. For a detailed description and application of the methodology for estimating saved wealth see Perspectives & GIZ, 2013.

METRIC	DATA REQUIREMENTS	METHODOLOGICAL DIFFICULTIES
Saved wealth: Ratio of wealth in a region or town protected by adaptation measures against devaluation or destruction due to the impacts of climate change	Estimated annual anticipated economic loss without adaptation and estimated overall wealth of region or town	1. Uncertainties in estimating climate impacts and monetising their associated damages 2. Complex interrelated causes of climate and social factors - losses not necessarily attributable solely to climate change 3. Difficulty in distinguishing between current climate variability and climate change
Saved health: Number of years of life saved through adaptation measures (death before life expectancy) and years that would have been impaired by illness or disability without such measures	Estimated number of deaths prevented and average age; number of estimated illnesses and disabilities prevented and their severity measured on a scale (WHO standards)	1. Presupposes that health impairments can be attributed directly to climate change 2. Difficulty in distinguishing between existing climate variability and climate change

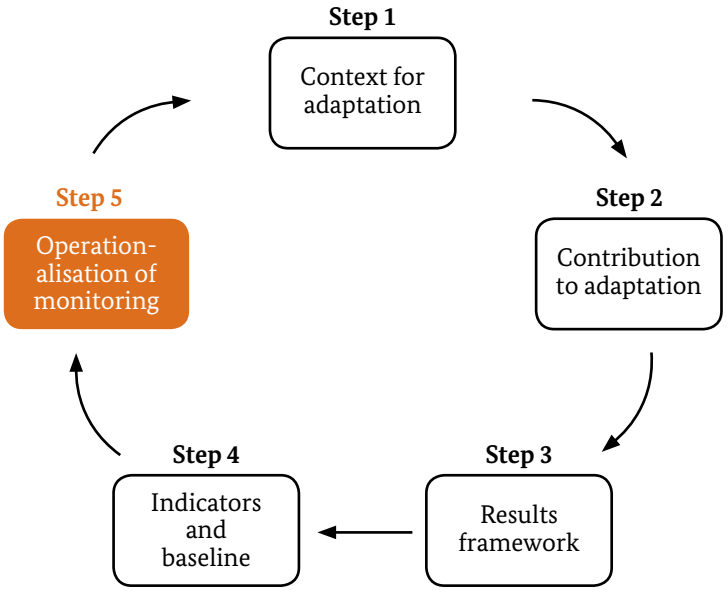
For a detailed description and application of the methodology for estimating saved health and saved wealth see Perspectives & GIZ, 2013.
For simplified example that illustrates the idea of saved wealth see Box 5, page 32.

Table 6

Two universal metrics for measuring results in adaptation projects

Step 5:
Operationalising the results-based monitoring system

Fig. 9



Prompts for step 5

- *MACC tool (see page 11)*
- *GIZ (2012): Results-based monitoring at GIZ, Orientation frame, Eschborn.*
- *GIZ (2012): Quality criteria for results based monitoring, Eschborn.*
- *Online databases for knowledge exchange (Ci:grasp, Adaptation-Community.net, etc)*

A major priority for results-based monitoring is the systematic monitoring of the process of change by continuously assessing results and the accompanying indicators and supporting hypotheses at every level of the results framework. The substantive focus of the monitoring system is therefore largely determined by the results framework (step 3), the selection of indicators and the specification of related targets (step 4). **Highly aggregated results** are also important, that is, results that are not attributable to the project alone but that have a bearing on its objectives. If, for example, a project aims at securing yields of a certain crop, the overall food situation in the relevant region is significant, offering a way to verify whether a project has contributed to achieving overarching development policy objectives. Another substantive aspect of particular relevance for adaptation is the systematic observation of factors surrounding a project (outside of its sphere of responsibility) that could influence the achievement of objectives **(risk monitoring).**

Having set the substantive focus of the monitoring system, the concern in its operationalisation shifts particularly to the following issues:

- Who is responsible for the monitoring system and who ensures the performance of the main cross-cutting functions (planning, coordination, quality assurance, documentation, etc.)?
- Which data need to be collected for the purpose of measuring indicators?
- How are data generated (e.g. from databases or through participatory procedures)?

EXAMPLE * INDIA

EXAMPLES OF DATA COLLECTION IN 'CCA RAI '

Developing requisite problem-solving capabilities in preparation for climate change and dealing with climate variability (adaptive capacity):

In the intervention sector of human capacity development, 'CCA RAI' conducts training courses to equip participants to integrate climate change aspects in development planning at different levels in the partner federal states (www.ccarai.org/training.html). The target group normally comprises government officials, decision-makers and adaptation practitioners from various government and non-governmental organisations. Training of trainers has also been conducted. Two instruments are used for the systematic supervision of training results: structured interviews and reflection workshops:

A questionnaire format has been developed as a basis for **structured interviews**. The trainers, who have been trained by 'CCA RAI', use this to survey around two thirds of the trainees two months after the end of training, mostly by telephone. The aim is to find out how relevant the training content and methods were for the participants and whether they have been able to apply what they have learned. The interviews are also intended to identify the need for further training in adaptation.

Reflection workshops are conducted to evaluate the experience of the trainers trained by 'CCA RAI' in carrying out adaptation training in the federal states. Training experiences and challenges are discussed and additional training needs in the partner federal states identified.

Measures for reducing identified risks/vulnerabilities (adaptation actions):

In the 'CCA RAI' intervention sector *'Implementing adaptation measures'*, repeated vulnerability assessments are conducted to ascertain the contribution of adaptation projects to reducing vulnerability in individual communities (cf the Indian example, page13). As these are projects with a small geographical radius and a short term (two years), the main methods used to determine vulnerability are participatory procedures and surveys. Interviews are carried out to gather socio-economic data that provide indications of the adaptive capacities of the target group. Participatory methods, such as focus group discussions, seasonal diagrams and timelines, are used to obtain information about local climate variability and its effects on small-scale agriculture. Where possible, local observations on weather and climate change are collated with quantitative data, such as rainfall and temperature data from nearby weather stations/meteorological services. These data are particularly important in recording baseline values in the first vulnerability assessment made at the start of the project.

- How and by whom are data collected, processed and analysed?
- Who meets the costs?

The cost of data acquisition and evaluation must be considered in step 4 so that excessive demands are not placed on project resources. The excel tool accompanying this guide can be used to enter data and generate interactive progress charts (see page 11).

Finally, the **dissemination of lessons learned** beyond the confines of a specific project plays a major role in results-based monitoring: there is a substantial demand for learning and exchange in adaptation, so interesting project outcomes should also be compiled and disseminated at national and international level. This can be done by sharing experiences at online communities of practise such as AdaptationCommunity.net or by feeding the lessons learnt into online databases, such as www.ci-grasp.org or www.adaptationlearning.net (see Key references 2 in the Annex). Figure 9, page 34, shows the contribution of step 5 in the five-step model.

The following guiding questions are helpful for step 5:

- Have responsibilities been defined and has an institutional framework been established to implement the monitoring system?
- Have procedures and methods for collecting all the requisite data been specified?
- How are the monitoring data linked with project management? Are they, for example, fed into annual planning?
- How are lessons learned made available beyond the project to others (knowledge management)?

Summary

The growing amount of international climate financing creates a particular need for clear, adaptation-related results verification to justify continued funding. Adaptation to climate change is still a comparatively new field of international cooperation with its own specifics but also with close links to existing areas of work and methods, for example in disaster risk management, rural development, agriculture, natural resource management and water.

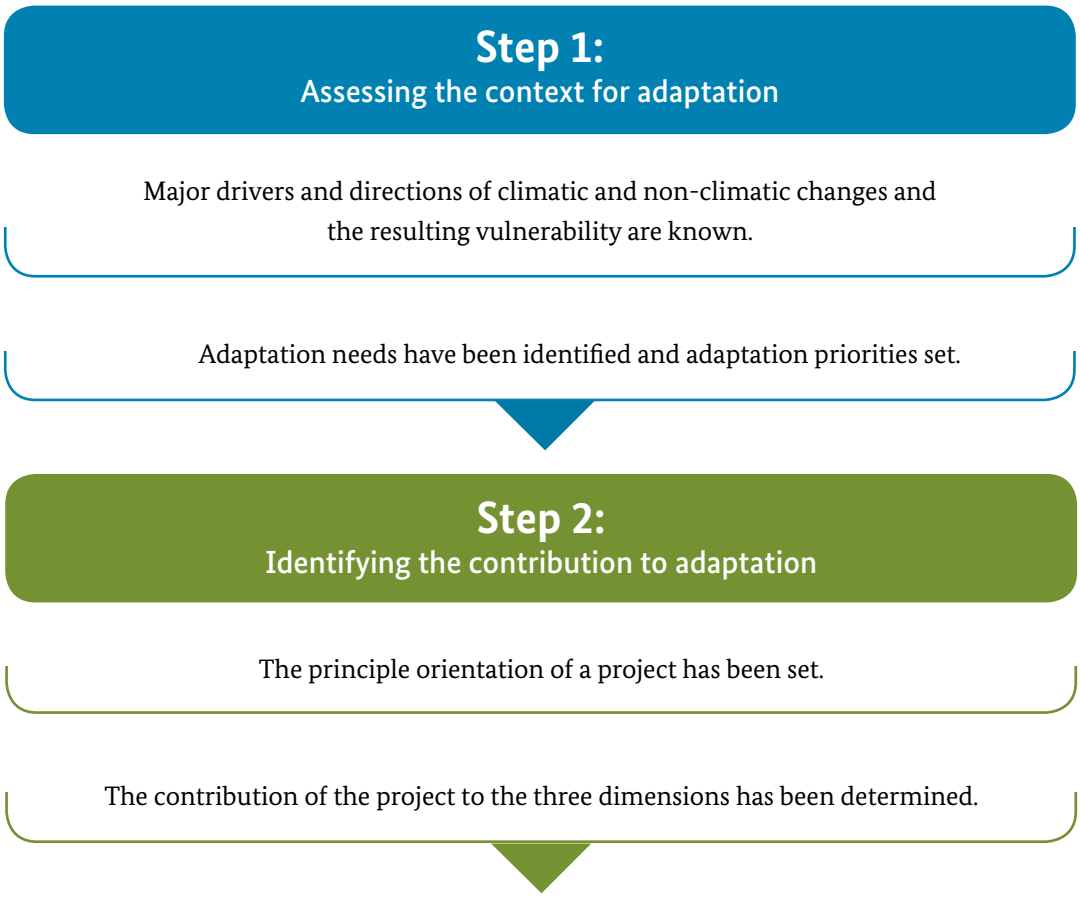
This guide seeks to help project designers and implementers to design adaptation projects from the outset to pinpoint specific aspects of adaptation to climate change and provide the requisite clear evidence of results achieved by means of an appropriate results monitoring system.

It therefore pays special attention to demonstrating the relation between adaptation and development and the challenges posed by the specifics of adaptation for the design of related projects and measurement of their results. It proposes a five-step model, summarised in Figure 10.

Specific examples of projects and indicators, particularly the CCA RAI project in India and the excel repository of adaptation indicators (see step 4), illustrate the content and are intended as a reference point in designing adaptation projects and their monitoring systems. An accompanying excel tool has been developed to apply the five-step model (see page 11). The tool is available on AdaptationCommunity.net under Monitoring & Evaluation.

Fig. 10

Outcomes of the five steps



Step 3:
Developing a results framework

The project objective has been set in conjunction with the partners.

The strategic orientation to achieving this objective has been agreed on.

The relevant results framework is in place. This includes the definition of results and activities to be delivered by the project.

The underlying assumptions of the results framework, including those about future climate change, have been explicitly specified.

Step 4:
Defining indicators and setting a baseline

The pre-project context (baseline) has been determined. Where possible and meaningful, vulnerability assessments and the review of adaptive capacities have been taken into account.

Indicators for results and activities of the results framework have been defined.

Achievement of the objectives appears plausible.

Where necessary, special methods for results measurement have been selected.

Step 5:
Operationalising the results-based monitoring system

Monitoring has been operationalised and put in place.

Suitable procedures are put in place to establish a close integration between project steering and the results-based monitoring system.

Knowledge is disseminated beyond the project (e.g. in online communities of practise like AdaptationCommunity.net).

References and recommendations

Adaptation Partnership (2011): Review of current and planned adaptation action: Southern Africa, iisd. http://www.iisd.org/adaptation/ap_review/

BMZ (2012): Anpassungsstrategie. Bonn.

GIZ (2011): Adaptation to Climate Change. New findings, methods and solutions. http://star-www.giz.de/dokumente/bib-2011/giz2011-0159en-climate-change.pdf

GIZ (2011b): Adaptation to Climate Change with a Focus on Rural Areas and India. http://www2.gtz.de/dokumente/bib-2011/giz2011-0479en-climate-change-rural-india.pdf

GIZ (2012): GIZ's Integrated Results Model: A working aid for appraisal and offer preparation, Eschborn.

GIZ (2012): GIZ's Results-Based Monitoring System: Framework of reference , Eschborn.

GIZ (2012): Quality criteria for results based monitoring, Eschborn.

GIZ (2013): Assessing and monitoring climate vulnerability. Project factsheet. https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/va/vulnerability-guides-manuals-reports/giz2013-en-climate-vulnerability-assessment.pdf

GTZ (2010): Baseline Studies. A Guide to Planning and Conducting Studies, and to Evaluating and Using Results. Monitoring and Evaluation Unit, July 2010. http://star-www.inwent.org/dokumente/bib-2010/gtz2010-0547en-baseline-studies.pdf

IDS (2008): Evaluating adaptation to climate change from a development perspective. http://www.unisdr.org/files/7845_GEF20final20report20Oct20081.pdf

INGC (2009): Study on the Impact of Climate Change on Disaster Risk in Mozambique: Synthesis Report. National Institute for Disaster Management, May 2009.

IPCC, 2012: Summary for Policymakers. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 1-19.

Maplecroft (2010): Natural Disasters Risk Index 2010. http://www.preventionweb.net/files/14169_NaturalDisasters2010.pdf

OECD/DAC (2010): Addendum on the Climate Change Adaptation Marker. DCD/DAC(2007)39/FINAL/ADD3. http://www.oecd.org/dataoecd/1/45/45303527.pdf

Perspectives Climate Change (2011): Monitoring the adaptive effect of GIZ's natural resource management and adaptation projects. Analysis of the GIZ project portfolio in Asia, Latin America

and the Caribbean, Hamburg (*Available on request from Jörg Linke (joerg.linke@giz.de).*

Perspectives & GIZ (2013): Saved health, saved wealth: an approach to quantifying the benefits of climate change adaptation. Practical application in coastal protection projects in Viet Nam. https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/me/me-guides-manuals-reports/giz_2013_Saved_health_saved_wealth_-_an_approach_to_quantifying_the_benefits_of_climate_change_adaptation.pdf

Stadelmann, M. et al (2011): Universal metrics to compare the effectiveness of climate change adaptation projects: http://cc2011.earthsystemgovernance.org/pdf/2011Colora_0126.pdf

UNDP (2008): A Guide to the Vulnerability Reduction Assessment, UNDP Working Paper, December 2008: http://www.gcca.eu/sites/default/files/soraya.khosravi/final_vra_guidebook4.pdf

World Bank (2010): Guidance Note 8: Monitoring and Evaluation of Adaptation Activities: http://siteresources.worldbank.org/EXTTOOLKIT3/Resources/3646250-1250715327143/GN8.pdf

WRI & GIZ (2011): Making adaptation count: concepts and options for monitoring and evaluation of climate change adaptation: http://pdf.wri.org/making_adaptation_count.pdf

Current literature on designing and operationalising results-based monitoring systems for adaptation projects

The following documents provide good insight into specific aspects of designing and applying monitoring and evaluation systems in adaptation projects.

- **Bours, D. / McGinn, C. and Pringle, P. (2013):** Monitoring and evaluation for climate change adaptation: A synthesis of tools, frameworks and approaches. http://www.ukcip.org.uk/me-resources-review-new-report-from-ukcip-sea-change-cop/

- **iied (2013):** An operational framework for Tracking Adaptation and Measuring Development (TAMD). http://pubs.iied.org/10038IIED.html?c=climate

- **OECD (2012):** Monitoring and evaluation for adaptation: lessons from development co-operation agencies. http://www.oecd-ilibrary.org/content/workingpaper/5kg20mj6c2bw-en

- **WRI & GIZ (2011):** Making adaptation count: concepts and options for monitoring and evaluation of climate change adaptation. http://pdf.wri.org/making_adaptation_count.pdf

- **UKCIP (2011):** AdaptME toolkit. Adaptation Monitoring and Evaluation: http://www.ukcip.org.uk/wordpress/wp-content/AdaptME/AdaptME.pdf

Practical tips are also available via online communities:

Visit AdaptationCommunity.net (http://www.AdaptationCommunity.net), SEAchange (http://www.seachangecop.org) or GEF Climate-eval (http://www.climate-eval.org/)

Annex

KEY REFERENCES 1:
ADDITIONALITY OF ADAPTATION IN A DEVELOPMENT COOPERATION CONTEXT

- **WRI** (2007): Weathering the Storm. Options for Framing Adaptation and Development. http://pdf.wri.org/weathering_the_storm.pdf
- **OECD** (2009): Integrating Climate Change Adaptation into Development Co-operation. http://www.oecd.org/dataoecd/45/45/44887764.pdf
- **UNDP** (2010): A Toolkit for Designing Climate Change Adaptation Initiatives. http://www.undp-aap.org/sites/undp-aap.org/files/A%20Toolkit%20for%20Designing%20Adaptation%20Initiatives%20(Mar%202010).pdf

KEY REFERENCES 2:
SELECTED CLIMATE CHANGE DATA SOURCES

Country specific climate change information

- **IPCC (Assessment and Synthesis Reports):** http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
- **National Communications to the UNFCCC** (Under the UNFCCC, developing countries are obliged to submit national communications which normally include information on climate change impacts and adaptation in the particular national context): http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php

Web based climate change data and information platforms

- **Climate impacts: global and regional adaptation support platform (Ci:grasp):** a web-based climate information service providing a sound information basis on climate stimuli, climate impacts, vulnerabilities, and response options in selected countries on an open, web-based platform. Developed by PIK and GIZ, funded by BMU: http://www.pik-potsdam.de/cigrasp-2/index.html
- **Climate Change Knowledge Portal:** This portal by the World Bank is intended to provide quick and readily accessible global climate and climate-related data to the development community: http://sdwebx.worldbank.org/climateportal/

- AdaptationCommunity.net provides knowledge and application examples of adaptation topcis including climate information and serivces. http://www.adaptationcommunity.net

- The **Adaptation Learning Mechanism**, UNDP's Global Knowledge Sharing Platform, contains a searchable database of adaptation projects: www.adaptationlearning.net

- **WeAdapt** provides information on climate adaptation using Google Earth: http://weadapt.org

- **SERVIR:** The regional visualisation and monitoring system for Mesoamerica and Africa integrates satellite and other geospatial data for improved scientific knowledge and decision making. Developed by USAID, NASA, IAGT, the University of Colorado, and CATHALAC: http://www.servir.net

The **knowledge navigator** helps finding relevant climate change websites: http://kn.ids.ac.uk/

KEY REFERENCES 3:
RESULTS-BASED MONITORING

- **GIZ** (2012): GIZ's Integrated Results Model: A working aid for appraisal and offer preparation Eschborn.

- **GIZ** (2012): GIZ's Results-Based Monitoring System: Framework of reference, Eschborn.

- **GIZ** (2012): Quality criteria for results based monitoring, Eschborn.

- **GIZ** (2010): Baseline Studies. A Guide to Planning and Conducting Studies and to Evaluating and Using Results. Monitoring and Evaluation Unit, July 2010. http://star-www.inwent.org/dokumente/bib-2010/gtz2010-0547en-baseline-studies.pdf

- **OECD** (2010): Evaluating Development Co-operation: Summary of Key Norms and Standards. Second edition. http://www.oecd.org/dataoecd/12/56/41612905.pdf

List of abbreviations

BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
CCA RAI	Vorhaben „Klimaanpassung in ländlichen Regionen Indiens“ (Climate Change Adaptation in Rural Areas of India)
CI:GRASP	Climate Impacts: Global and Regional Adaptation Support Platform
EZ	Entwicklungszusammenarbeit
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (part of the new GIZ since 2011)
IDS	Institute of Development Studies, University of Sussex, UK
IIED	International Institute for Environment and Development
IZ	Internationale Zusammenarbeit
PIK	Potsdam Institute for Climate Impact Research
MDG	Millennium Development Goals
NAPA	National Adaptation Programme of Action
OECD	Organisation for Economic Co-operation and Development
WRI	World Resources Institute

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