

Monitoring climate change adaptation projects with the MACC-Tool

Handbook

This handbook guides users in their application of the **Excel-based tool “Monitoring Adaptation to Climate Change (MACC)”**. The MACC tool is based on the GIZ guidebook **“Adaptation Made to Measure”** which proposes five steps to design an adaptation project and develop its results-based monitoring system (Figure 1).

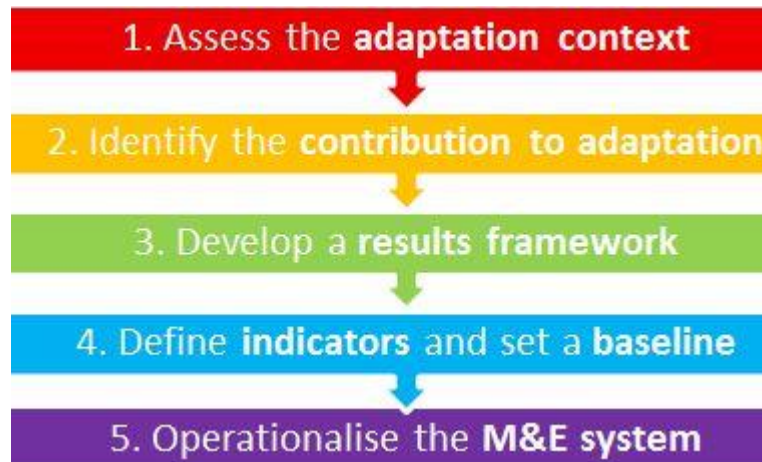


Figure 1: The five steps of “Adaptation made to measure”.

The MACC tool has been developed by the project „Effective adaptation finance (M&E Adapt)” on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ). The MACC tool and the guidebook *Adaptation Made to Measure* can be downloaded on www.AdaptationCommunity.net under Monitoring & Evaluation → Project-level M&E.

The handbook begins with two overview chapters on:

- **Structure & layout** of the Excel sheets
- **Opportunities & limitations** of the tool

It then proceeds with **detailed guidance on how to implement the five steps** shown in Figure 1 with the MACC tool. **Video tutorials** for every step are also available. The handbook also explains the **data tab**, lists **further readings** and publishing information.

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Structure & Layout

The MACC tool consists of **10 Excel sheets** (also called “tabs” or “page”):

- A **start tab** with introductory information and a table of content
- **One tab for each of the 5 steps** with the fifth step being further divided into three sub-steps (5-A, 5-B, 5-C)
- A **data tab** with all the data that is being entered
- A tab with **legal information** and contact details

Each tab that relates to the 5 steps comprises an **introductory panel** at the top of the page (indicated by the light bulb symbol) which explains what the respective step is about and **instructions** on what to do (indicated by the worker symbol).



Underneath the instructions are the **action fields** in which data can be entered. The data that you fill in in each tab is automatically transferred to all other tabs where it is needed. The **data tab** tabulates all data being entered (see page 15).



On the right of each tab you find **info boxes** that feature links to websites and publications, definitions and in the case of the first and third step also **tool boxes** that invite to copy and paste elements to the respective action field. Every tab has its own **video tutorial** that provides explanations, advice and examples. The link to the video tutorial is provided in an info box on the top right of each tab.



At the bottom of each tab you can indicate whether you have completed the respective step. This information will then be automatically shown on the start page.

Opportunities & Limitations

The MACC tool guides project managers in the design of adaptation projects and enables them to carry out the ongoing results-based monitoring in one electronic file. The automatically generated **indicator and project progress charts** intuitively illustrate whether a project is on track in meeting its targets (see Step 5-C). The charts and the underlying monitoring data can also be **exported** and inserted into documents, presentations or Emails.

There are, however, also some **limitations** to this monitoring tool. As with many Excel-based applications, once a formula has been deleted or altered unintentionally, functions may not be carried out anymore. Therefore, you should not make any changes outside the dedicated action fields and under no circumstances delete any cells even if they seem empty. Saving successive versions of the tool as separate files helps to recover formulas and formatting.

The Start Tab

The Start tab introduces you to the different steps and provides an overview of the tool. It also includes a table of content.

The **table of content** allows clicking on each of the steps to directly jump to the respective tab within the Excel file. A status bar located to the right of the table of content indicates for every step whether it's "in progress" or "complete" (see screenshot 1). The status is based on your selection at the end of each step where you are being asked whether or not you have completed the respective step.

Table of Content	Status
STEP 1 - Assessing the Context for Adaptation	✔ complete
STEP 2 - Identifying the contribution to adaptation	✔ complete
STEP 3 - Developing a results framework	⚠ in progress...
STEP 4 - Defining Indicators and Setting a Baseline	⚠ in progress...
STEP 5 - Operationalizing the results-based monitoring system	
Stage A - Assigning responsibilities	⚠ in progress...
Stage B - Reporting on Progress	[continuous]
Stage C - Charting Progress	[continuous]

Screenshot 1: Table of Contents.

The top right corner of the Start tab features a number of info boxes providing the link to the video tutorial and to the guidebook *Adaptation Made to Measure* on which the tool is based.

Step 1 – Assessing the Context for Adaptation

The first step helps you to determine the context of your adaptation intervention. The context includes the observed and potential consequences of climate change and how they interact with other social, political and environmental changes. A common way to analyse the context is through a **vulnerability assessment**. The process of conducting such an analysis is comprehensively described in the GIZ publication *The Vulnerability Sourcebook* which can be downloaded at www.AdaptationCommunity.net under "Vulnerability assessment" (it is also available in French and Spanish). Various supplementary materials like an indicator template are also available.

In Step 1 of the MACC Tool you are asked to describe the adaptation context through a **climate change impact chain** following the guidance of the Vulnerability Sourcebook. This includes specifying your system of interest (A), i.e., the geographical area, population group and/or ecosystems which your intervention aims at, the exposure (B), the climate sensitivity (C), the potential impact (D), the adaptive capacity (E) and the resulting vulnerability of the system (F). Definitions of these terms can be found to the right of the main panel.

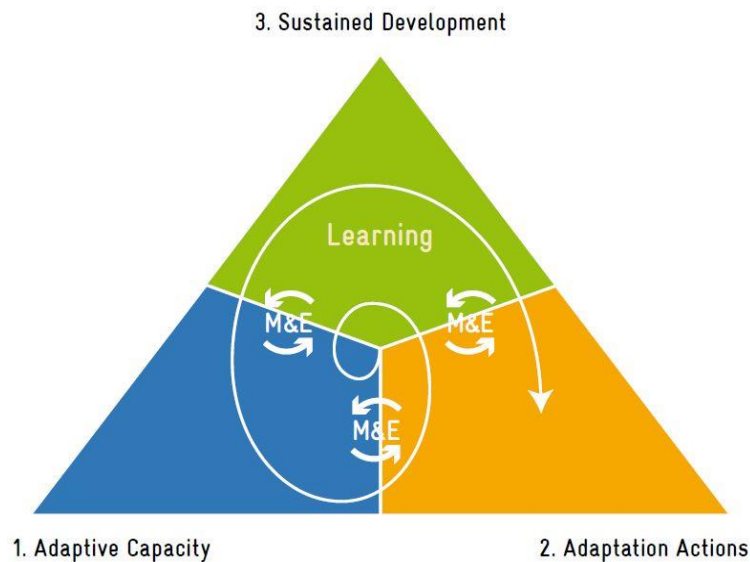
Once you have filled in all the Boxes (A-F) you can **elaborate your own climate change impact chain** in action field 2 by using the elements in the box to the right of the main panel. There are six elements which can be copied from the element box to the action panel: 'Exposure', 'Adaptive Capacity', 'Sensitivity', 'Potential Impact', a red arrow and a red line. You can simply copy and paste the respective boxes to freely complete and arrange them according to the context of your project. As guidance an example of a climate change impact chain is shown on the right side of the action field. Details of the example can be found in the *Vulnerability Sourcebook*. You can further describe the adaptation context by specifying activities of other organisations (G).

As an alternative to using this action field you may also draft the climate change impact chain in power point or any other software or visualization tool. In case a detailed vulnerability assessment has already been undertaken, Step 1 may assist in reflecting the key results and their implications for the design of the adaptation project. After you have filled in all relevant information you can indicate that you have completed the first step at the bottom of the page and you can proceed with step 2.

Step 2 – Identifying the Contribution to Adaptation

In step 2 you are asked to specify the principle way in which your intervention is meant to contribute to adaptation. Three different ways, referred to as **adaptation dimensions**, are distinguished (see Figure below).

Dimension 1 denotes the building of **adaptive capacity**, i.e. creating or strengthening the abilities of relevant actors to better respond to climate variability and change. The **second dimension** comprises **adaptation actions**, i.e., concrete measures for reducing risks and vulnerabilities. These are the interventions that directly lead to adaptation while activities in dimension 1 only create the potential for effective adaptation to take place. **Dimension 3** encompasses the attainment of **sustainable development** in spite of the adverse effects of climate change. In order to achieve sustainable development goals, both adaptive capacity and adaptation actions are necessary, thus all three dimensions complement each other.



The distinction between the three dimensions is meaningful because each is likely to require different kinds of interventions, indicators and information needs.

In the action field 1 you are asked to indicate the proportion of your project that is related to building adaptive capacity (see screenshot 2). This should be expressed as a percentage and

can be based on a rough estimate. For your assessment of the proportion you can refer to the analysis that you conducted in the previous step where you analysed the adaptation context including the already existing adaptive capacity, as well as your knowledge of your project. You can fill in your estimate next to 'Adaptive Capacity' and the tool will automatically complement the number for 'Adaptation Actions'. In the box on the right hand side you are asked to elaborate on your assessment, i.e. explaining how you determined the percentage value which you entered.

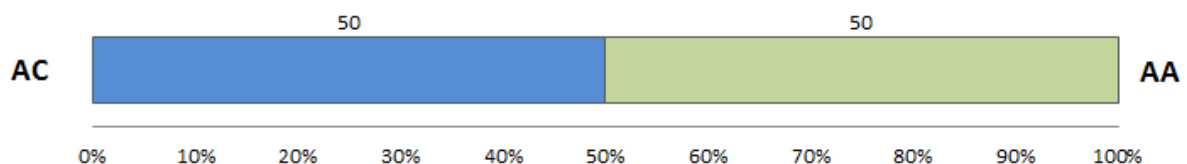
What composition of the dimensions **adaptive capacity** and conducting **adaptation actions** does your project have?

Please provide an estimate.

Adaptive Capacity - AC (%)

Adaptation Actions - AA (%)

Please elaborate on your reasoning...



Screenshot 2: Estimating the proportion of the adaptation dimensions of your project.

In action field 2 you are asked reflect on how the dimensions 1 and 2 of your adaptation project can contribute to sustainable development in spite of adverse effects of climate change (dimension 3). You are asked to explain these contributions in the provided box. In

action field 3 you can indicate that you have completed the step and are ready to proceed with step 3.

Step 3 – Develop a results framework

The aim of step 3 is to define the intended results of your project and map how they are connected to jointly achieve the project's overall objective. In action field 1 you are asked to name the **overall objective** of your project. If your project is made up of multiple **components** (may also be referred to as modules), they can be specified in action field 2. If your project does not have different components, simply fill in the topmost entry space in action field 2 with an overarching term that corresponds to the project.

Then, in action field 3, the **intended results** of your project can be spelled out. Results are intended or unintended, positive or negative changes in a situation or in behaviour that occur as the direct or indirect consequence of an intervention.¹ Taken together the results should contribute to the achievement of the project's overall objective. A maximum of 15 results can be entered in action field 3. The first one corresponds to the overall project objective and is automatically copied from action field 1. For each result you are asked to provide additional information in the provided boxes which will facilitate the subsequent monitoring:

- **Result:** Specify the intended result. Try to be as specific as possible.
- **Start date** and the **Intended duration** in which the result is intended to be achieved. For duration there is a drop-down menu where you can select any number of months between 1 and 48. This information is used in Step 5-B to calculate the end date.
- **Component:** Beneath the heading *Component* there is a drop-down menu where you can select the project component that the respective result is assigned to.
- **Adaptation dimension:** Below the heading *Dimension* you can indicate by selecting from a drop-down menu which adaptation dimension the result refers to. You can choose between 'Building adaptive capacity', 'Adaptation action' and both. (Explanations of these terms are provided under step 2).

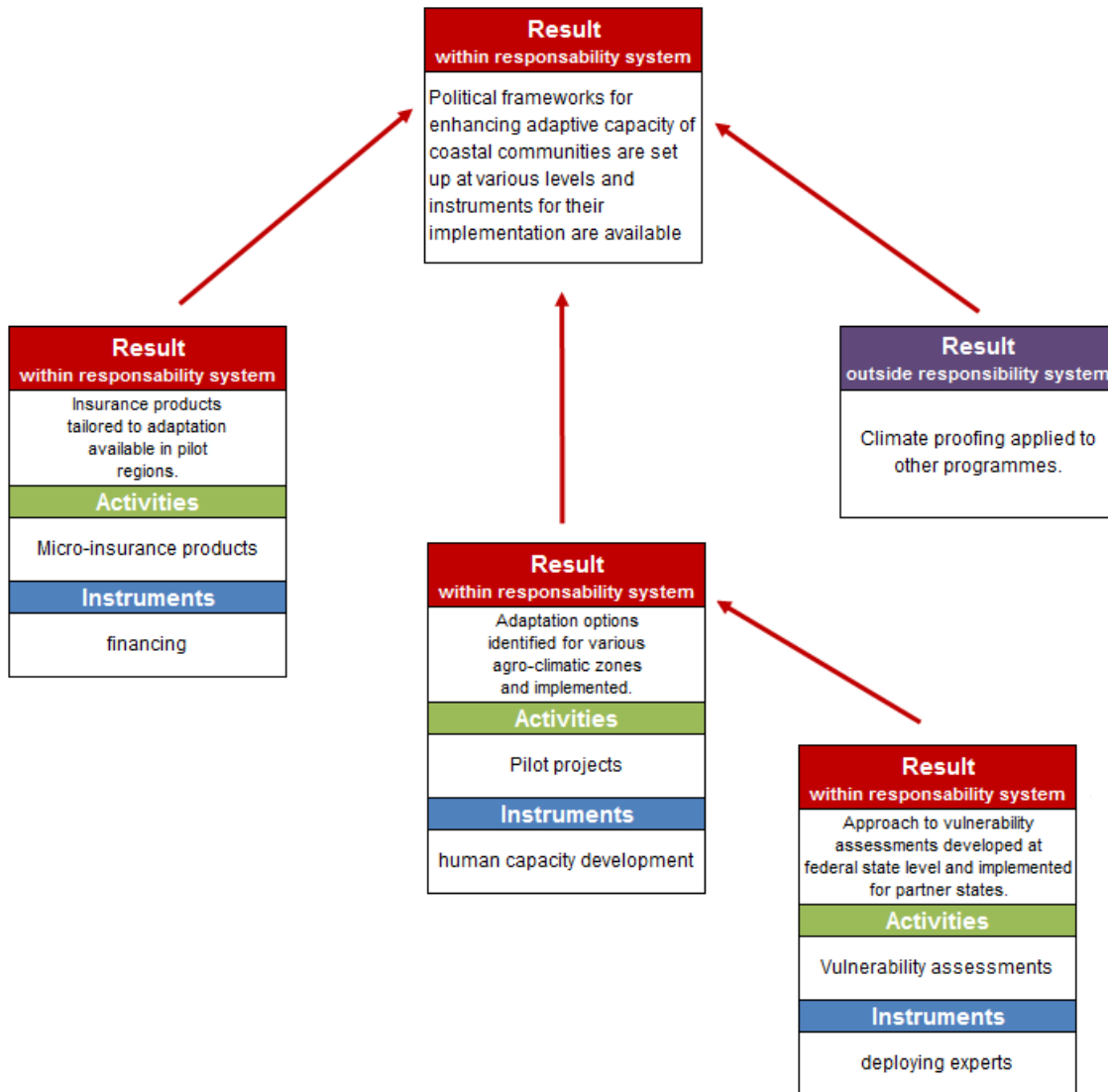
Once you have filled in your results and the accompanying information you can map how the different results relate to each other and how they help to jointly achieve the overall objective. This can be done in action field 4 in form of a **results framework** (may also be referred to as *theory of change*). In doing so it is relevant to distinguish between results that are directly being influenced by the intervention and thus in its **sphere of responsibility** and those that are conducted by other actors and thus outside your influence.¹ You can specify results which are relevant for the project objective, but remain outside the area of responsibility, in action field 5.

¹ For further details please see GIZ (2013): Results-Based Monitoring System - Framework of reference. [Link](#).

You can draw the results framework in action field 4 by using the elements in the **toolbox** to the right. There are 5 elements which can be copied from the Tool Box to the action field: 'Results within responsibility system', 'Activities', 'Instruments', 'Results outside responsibility system' and an arrow. To start with your overall project objective, copy the red 'Results within responsibility system' box and by using the drop down menu inside the box select the first result. For all other results within your area of responsibility copy the red box together with the activities and instrument boxes (compare example below). You can freely fill in specific activities and instruments which support your intended results. 'Activities' refer to any actions taken to achieve the result. The term 'instruments' describes the means of implementation. For example GIZ is using the categories: (1) human capacity development, (2) financing, (3) material goods, and (4) deploying experts.

You can further copy the box which specifies 'results outside the responsibility system' if this is relevant for your project. In this case you would not copy the Activities and Instruments boxes because they are not carried out by your project. You can arrange and relate all elements/boxes in such a way that your comprehensive results framework is depicted (see screenshot 3 for an example). This exercise may be done in a participatory manner with project stakeholders and partners to ensure ownership and input of multiple perspectives.

At the end in action field 6 you may again indicate whether you have completed this step.



Screenshot 3: Example of a result framework.

Step 4 – Defining Indicators and Setting the Baseline

The purpose of step 4 is to **define the actual indicators** which will be used to measure and hence monitor the project. This step builds on the definition of results in step 3 by asking you to formulate indicators for each result. Indicators should be **specific, relevant and measurable**. Thus, in this step and the next you define what exactly ought to be measured and how.

There is **no general set of adaptation indicators**. Adaptation indicators need to be formulated in light of a specific context. Depending on the context the same indicator may or may not be an adaptation indicator. For example, the indicator “Per capita consumption of fresh water” can be an adaptation indicator if there is water stress due to climate change and if there are measures that aim to lower water consumption. However, in a situation of no or

only negligible impacts of climate change on fresh water availability the same indicator might indicate the success of traditional water conservation measures but it would not refer to adaptation to climate change. Hence, for adaptation projects it is particularly important to clarify in how far the chosen indicators actually measure adaptation.

GIZ has compiled a list of indicators that have been used as adaptation indicators. They can be found in the publication **Repository of Adaptation Indicators** (also available in Spanish: *Repositorio de Indicadores de Adaptación*). It is available for download at www.AdaptationCommunity.net under Monitoring & Evaluation. You can also find the download link in the MACC tool to the right of the introductory panel of Step 4. Please note that the indicators in the repository are just meant as examples – they may still need to be adjusted if applied in another context. Therefore, each indicator in the repository is explained with a table outlining the background of the indicator and its adaptation relevance. **Further information on adaptation indicators** can be found in the following publications:

- GIZ (2013): **Adaptation made to measure**. A guidebook to the design and results-based monitoring of climate change adaptation projects. (Also available in French and Spanish). Available for download on www.AdaptationCommunity.net → [direct Link](#)
- Bours, B., McGinn, C. & Pringle, P. (2014): Guidance note 2: **Selecting indicators for climate change adaptation programming**. <http://www.ukcip.org.uk/wp-content/PDFs/MandE-Guidance-Note2.pdf>
- Climate-Eval (2015): **Good practice study on Principles for Indicator Development, Selection, and Use in Climate Change Adaptation Monitoring and Evaluation**. <https://www.climate-eval.org/study/good-practice-study-principles-indicator-development-selection-and-use-climate-change>

Action field 1 of Step 4 consists of a list of all your results including the component which they are part of. This information has been automatically carried over from the previous step. In action field 1 you can now **define up to two indicators for each result**. The first result, which represents the overall objective of the project, allows for up to five indicators. A maximum of 33 indicators can be defined in total.

The top box leaves room for a short description of the indicator as can be seen in screenshot 4. Below you find fields to enter the baseline and the target value. The **baseline value** presents the value of the indicator at the starting point of the intervention. The **target value** represents the value which is aimed for at the end of the project or at any other set date. In addition, you may also want to define milestones along the way. **Milestones** describe the values you want to have reached at a certain point in time. This can be useful to monitor the progress made in achieving your target. In step 5-B you are asked to provide milestone

values to compare them with your measured values. In case you want to add further information about the indicator, an additional field is provided for comments (any information entered here is not transferred to the following steps).

Result 1 - Example: Political frameworks for enhancing adaptive capacity of coastal communities are set up at various levels and instruments for their implementation are available

Component "Example: Implementation of coastal adaptation instruments"
 Dimension: **Building Adaptive Capacity & Adaptation Action**

The screenshot shows a form for entering an indicator. On the left, the text 'Indicator 1' is written vertically. The main form area contains a title box with the text 'Workshops for political leaders conducted'. Below the title, there are two input boxes: 'Baseline' with the value '0' and 'Target' with the value '10'. A red arrow points from the baseline box to the target box. Below these boxes is a larger text area with the placeholder text 'type your comment...'. The entire form is enclosed in a light gray border.

Screenshot 4: Indicator entry.

To assess the project’s progress **the MACC tool requires all indicators to be quantified**. If there are no quantitative indicators, you can attempt to find numerical expressions of qualitative observations. For instance you can obtain quantitative expressions of a qualitative indicator by assigning a percentage to it, with e.g. 0% being the baseline and 100% the target value. Another approach is to define different qualitative conditions and then attach numerical values to it. For example, different levels of mainstreaming of adaptation into planning processes can be described and each level can be given a numerical score (this is called a “Likert scale”). The quantitative values entered in Step 5-B form the basis of the numerical progress charts in step 5-C. On the bottom of the page, in action field 2 you can indicate whether you are finished entering indicators.

Step 5-A – Operationalization: Assigning Responsibilities

Step 5 consists of three different parts which together operationalize the results-based monitoring system.

The purpose of step 5-A is to define **monitoring rules** for each indicator. This encompasses specifying the way data is collected, assigning who is responsible for it and defining the frequency of measurement.

All indicators that you have defined in step 4 appear in action field 1, sorted according to their respective results (and now they are numbered). Each is followed by three fields that ask you for completion. In the first field you can name one or more persons and/or organizational units responsible for monitoring the indicator (see screenshot 5). The second box requires a

description of the data source and method of data collection. The third field asks you to indicate how often - that means in which intervals - the indicator should be measured. There is a drop-down menu where you can select a period between 1 month and 24 months. On the bottom of the page you can indicate in action field 2 that you have completed this step.

Result 2 - Coasts of the project region are befitted with mangrove forests and sufficient areas that allow a inter

I6 Planting of 30 ha of mangroves along the coast.

Responsible for monitoring:

Data source and method of collection:

Monitoring to take place every:

Screenshot 5: Entry of monitoring responsibilities and mode of monitoring

Step 5-B – Operationalization: Reporting on Progress

This part is the second stage of step 5 and represents the actual continuous monitoring process – the entry of monitoring data. In action field 1 you can find a list of all indicators that you previously defined. Next to each indicator you can see a status bar (which is explained in detail below) or, if insufficient data is entered, the designation “(no data)” (see screenshot 6). Simply click on the title of any indicator and you jump to the respective section in action field 2 where data can be entered.

List of all indicators and status as of 10/12/2013

I1	Number of technical experts trained.	major deviation
I2	Number of square kilometers reserved as a retreat area.	on track
I3	Number of early warning networks established in local communities.	minor deviation
I4	please provide a definition of the indicator...	(no data)
I5	please provide a definition of the indicator...	(no data)

Screenshot 6: List of indicators with status bar.

Below the list of indicators, the **data entry fields for each indicator** can be found in action field 2 (see screenshot 7). The details of each indicator which you specified in steps 3, 4 and 5-A are listed: responsibilities, measurement intervals and data sources, as well as the start and end dates, the baseline value and the target value. The end date is automatically calculated from the start date and the intended duration you specified in step 3.

First of all you can set specific **milestone values** for specific dates in the future. These should have ideally been defined at the time the target values were agreed upon (Step 4). Thus, when you get to Step 5-B the tables shown in screenshot 7 would already include milestone values and dates. During the course of the intervention, you step by step fill in the actual measured values. It is not necessary to have a milestone value for every measurement. For example, you could enter measurements every 6 month and only have a milestone every 12 month. In that case you would simply leave the missing milestone cells blank. Please note that whenever a milestone is provided, the MACC-tool assumes that your dates of measurement are identical with the milestone dates. The reason is that in order to calculate the status bar, the tool needs to compare two numbers. Therefore there is only one column to enter dates. If you had specified a milestone for a certain date but end up not measuring it around that date, then you need to decide if your actual measurement date is still appropriate to compare it to the milestone value. If it is not, then you can simply leave the corresponding measured value blank and proceed to the next row.

Result 2 - Coasts of the project region are befitted with mangrove forests and sufficient areas that allow a intentional flooding in case of natural extreme events.

I6 Planting of 30 ha of mangroves along the coast.

Responsible: Timo Leiter, GIZ
 Measurement intervalls: 12 months
 Data source and method of collection: consultation of the local government's annual statistics on mangrove forest developments

	Date	Measured value	Milestone value
Start date	01.01.2014	Start value 0	to be defined below
	03.01.2015	3	5
	13.01.2016	6.5	10
	19.12.2016	10	15
	11.01.2018	13.5	20
			intended milestone value
			intended milestone value
			intended milestone value
			intended milestone value
			intended milestone value
			intended milestone value
End date	01.01.2020	Target value 30	

Reporting on Progress

Progress on 10/12/2013 45%

Status on 10/12/2013 minor deviation

Screenshot 7: Data entry field for one indicator.

Below the data entry field, each indicator has two information bars, a progress bar and a status bar. The **progress bar** shows **what percentage of the target value has already been achieved**. Here the latest value measured is compared to the target value.

The **status bar** displays the status of the indicator based on a **comparison between the latest milestone and its corresponding measured value**. Even if there are newer measured values without a corresponding milestone, the status bar will always refer to the latest milestone and its corresponding value. Thus, the calculation of the status bar is independent of the calculation of the progress bar.

The **status** is assigned to one of **four categories** as indicated in the table below. Please note that the status bar only works if at least one milestone has been defined. As long as no milestone has been defined the status bar states “no data”.

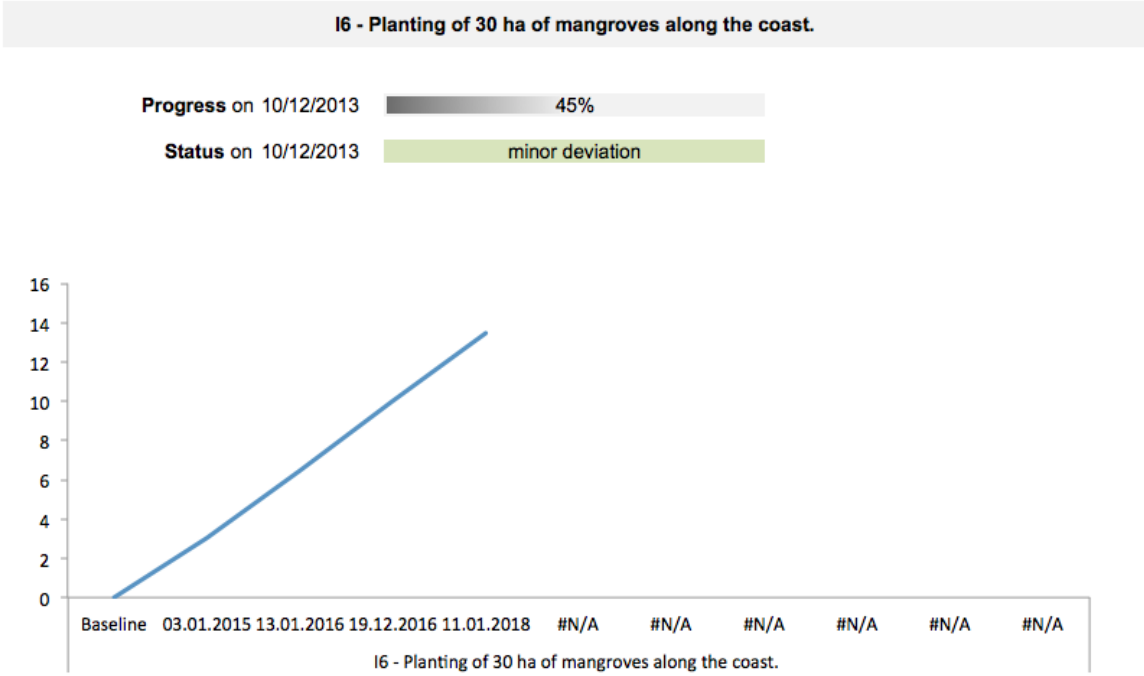
Category	Gap between milestone and measured value	Colour code
On track	Up to 20%	green
Minor deviation	Up to 40%	light green
Major deviation	Up to 75%	orange
Off track	More than 75%	red

To the right of introductory panel and the action fields you can once again access further information: Here you find the link to the video tutorial, explanations of the status bar and the milestone values.

Step 5 C – Operationalization: Charting Progress

This step allows you to get an **overview on the progress of your project** based on your previous data entries. Action field 1 displays the **progress of single indicators** over time. At the top there is a drop-down menu, which contains all indicators that have previously been defined. The selection of an indicator leads to a progress chart that presents the values measured over time (see screenshot 8). This way you can see at one glance how the values have developed over time. In addition, the **progress bar** depicting the progress with respect to the final target value as well as a **status bar** showing the degree to which defined milestones have been attained are shown (for details on progress bar and status bar please refer to Step 5-B).

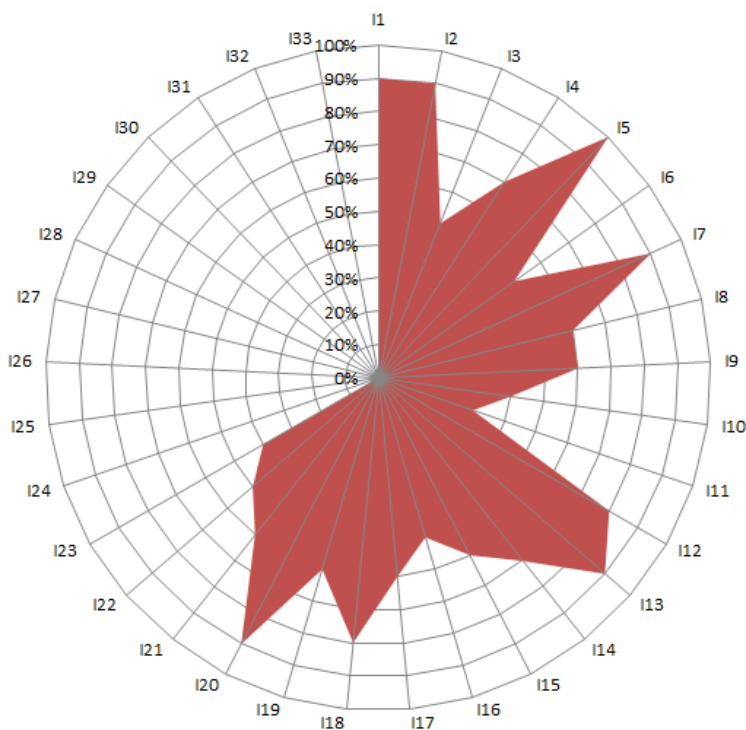
Single Indicator Progress. Please select an indicator to be displayed.



Screenshot 8: Single indicator progress chart.

In action field 2, you can see a spider graph that shows the **overall project progress** expressed by all indicators relative to their target values (see screenshot 9). The more space is filled, the higher is the progress from an overall perspective.

Be aware that if only one indicator has been entered in the tool, the same data will be taken as hypothetical second indicator in order to show a plane.



Screenshot 9: Project progress overview.

Both charts can easily be copied from the Excel tool into a text document or an Email programme using a screenshot function or copying the graph directly.

Data sheet

After the tabs of the five steps there is a **data tab** which includes **all data entries from Steps 3 – 5B**. It is sorted by indicators with each indicator in one row. Caution: you should not make any changes in the data tab or else the respective calculations will be distorted.

If you want to change values you need to do so in the respective action fields in the relevant step.

Further reading

Adaptation M&E Toolbox: provides an overview of tools and trainings for adaptation M&E at local and national level. http://www.adaptationcommunity.net/?wpfb_dl=287

Bours, D., McGinn, C., & Pringle, P. (2014b). **Guidance note 1: Twelve reasons why climate change adaptation M&E is challenging.** Retrieved from: <http://www.ukcip.org.uk/wp-content/PDFs/MandE-Guidance-Note1.pdf>

GIZ (2013): **Adaptation made to measure: A guidebook to the design and results-based monitoring of climate change adaptation projects**, second edition. [Also available in French and Spanish] <http://www.adaptationcommunity.net/knowledge/monitoring-evaluation-2/project-level-adaptation-me-2/adaptation-made-to-measure/>

GIZ (2013): **Results-Based Monitoring System - Framework of reference.** <http://www.managingforimpact.org/resource/giz%E2%80%99s-results-based-monitoring-system-framework-reference>

GIZ (2014): **The Vulnerability Sourcebook.** Concept and guidelines for standardised vulnerability assessments. [Also available in French and Spanish] <http://www.adaptationcommunity.net/knowledge/vulnerability-assessment/vulnerability-sourcebook/>

Leiter, T. (2016): **Key considerations for M&E of community-based adaptation to climate change: lessons from experience.** Proceedings of the 9th Community-based Adaptation Conference. African Centre for Technology Studies. [available from late 2016]

Leiter, T. (2016): **The Adaptation M&E Navigator:** A decision support tool for the selection of suitable approaches to monitor and evaluate adaptation to climate change. In: Uitto, J., Puri, J., & van den Berg, R.D. (Editors): *Evaluating Climate Change Action for Sustainable Development*. Open access: <http://www.springer.com/gp/book/9783319437019>

The **online version** of the **Adaptation M&E Navigator** is available at: <http://www.adaptationcommunity.net/knowledge/monitoring-evaluation-2/multi-level-adaptation-me/adaptation-me-navigator/>

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The MACC handbook is available online on www.AdaptationCommunity.net under
“Monitoring & Evaluation”. Direct link:

<http://www.adaptationcommunity.net/knowledge/monitoring-evaluation-2/project-level-adaptation-me-2/excel-tool-macc/>

