Integrating climate change adaptation into development planning

A practice-oriented training based on an OECD Policy Guidance

Annex to the Trainer's Handbook

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of
BMZ
Federal Ministry for Economic Cooperation and Development

The training course and associated materials are based on an OECD Policy Guidance "Integrating Climate Change Adaptation into Development Co-operation", published in May 2009. They were generously funded by the **German Federal Ministry for Economic Cooperation and Development (BMZ) and developed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH** in coordination with OECD and a broad range of reviewers from development agencies, NGOs and research institutions from around the world. The authors gratefully acknowledge the valuable feedback contributed by reviewers and training participants.

Additional modules on understanding climate science, finding climate information, and dealing with uncertainty were developed by the project *Inventory of Methods for Adaptation to Climate Change (IMACC)* funded by the **International Climate Protection Initiative (IKI)** of the **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety**. The review and extension of Module 6 on Monitoring and Evaluation was jointly funded by the BMU and BMZ, and developed by the IMACC project and the Climate Protection Programme for Developing Countries (see next page for project descriptions).

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On behalf of

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

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GIZ's Climate Protection Programme for Developing Countries helps developing countries adapt efficiently and appropriately to changed climatic conditions. Working together with our partners, we identify the options for action with regard to affected people, economic sectors and ecosystems.

The key task of the Climate Protection Programme for Developing Counties is to mainstream climate protection within the various activities of German Development Cooperation. This applies both to reducing greenhouse gas emissions and to measures to adapt to climate change.

These tasks, however, cannot be successfully tackled by climate protection experts alone. The Climate Protection Programme for Developing Countries can therefore only work effectively if it is integrated into the networks of development cooperation and globally organised climate protection, and collaborates with national and international partners.

http://www.giz.de/climate

Inventory of Methods for Adaptation to Climate Change (IMACC) is a global project by GIZ funded by the **International Climate Protection Initiative** of the German **Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)**. The project aims at user-driven application and advancement of existing tools and methods for adaptation, developing capacities for adaptation action and supporting South-to-South exchange, particularly among its seven partner countries: Grenada, India, Indonesia, Mexico, Philippines, Tunisia and South Africa.

IMACC is operating the platform AdaptationCommunity.net which provides introduction to key topics, examples of adaptation experiences as well as webinar recordings and an exchange forum. IMACC has also supported the development of additional modules of the training "Integrating Climate Change Adaptation into Development Planning" including the new modules on Monitoring and Evaluation (M&E).

AdaptationCommunity.net

Have you carried out or participated in the training? If yes, we would appreciate hearing from you! Please send your feedback (Who organised the training? Who participated in the training? How did you find it? What worked and what did not?) to climate@giz.de.

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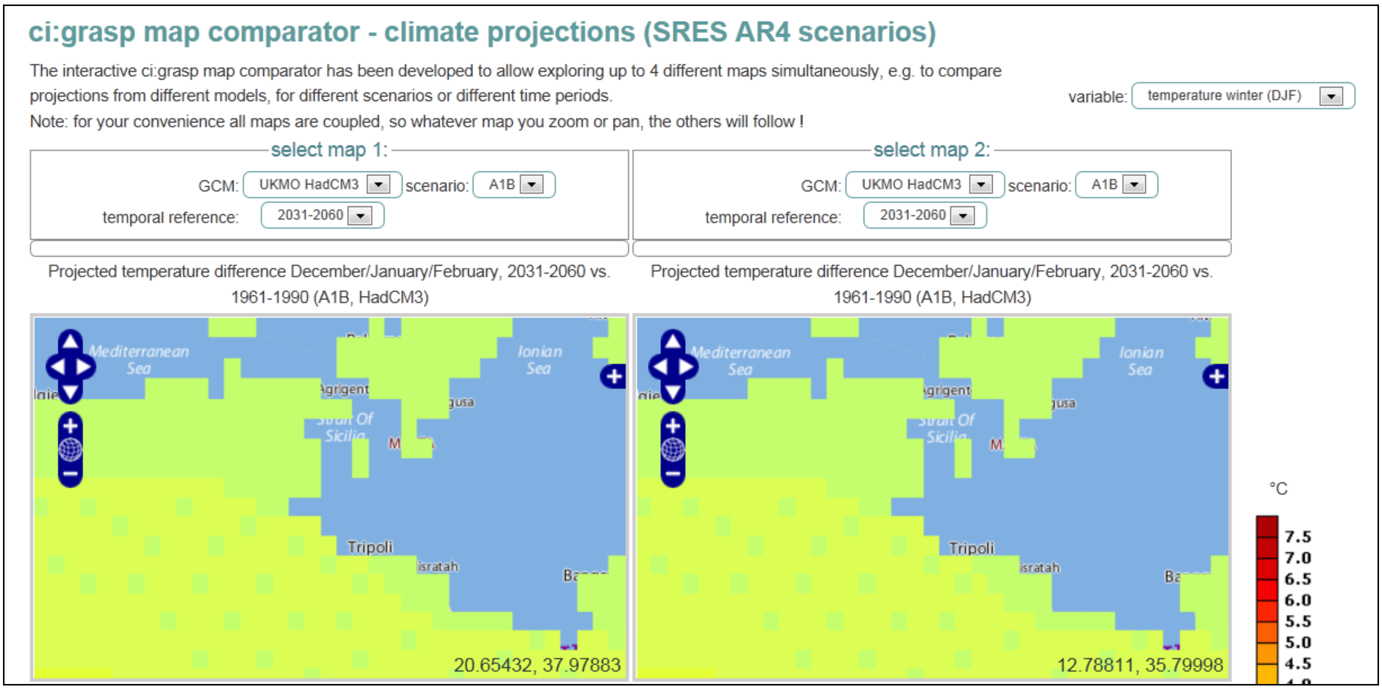
1 Exercise Solutions for Module 2B

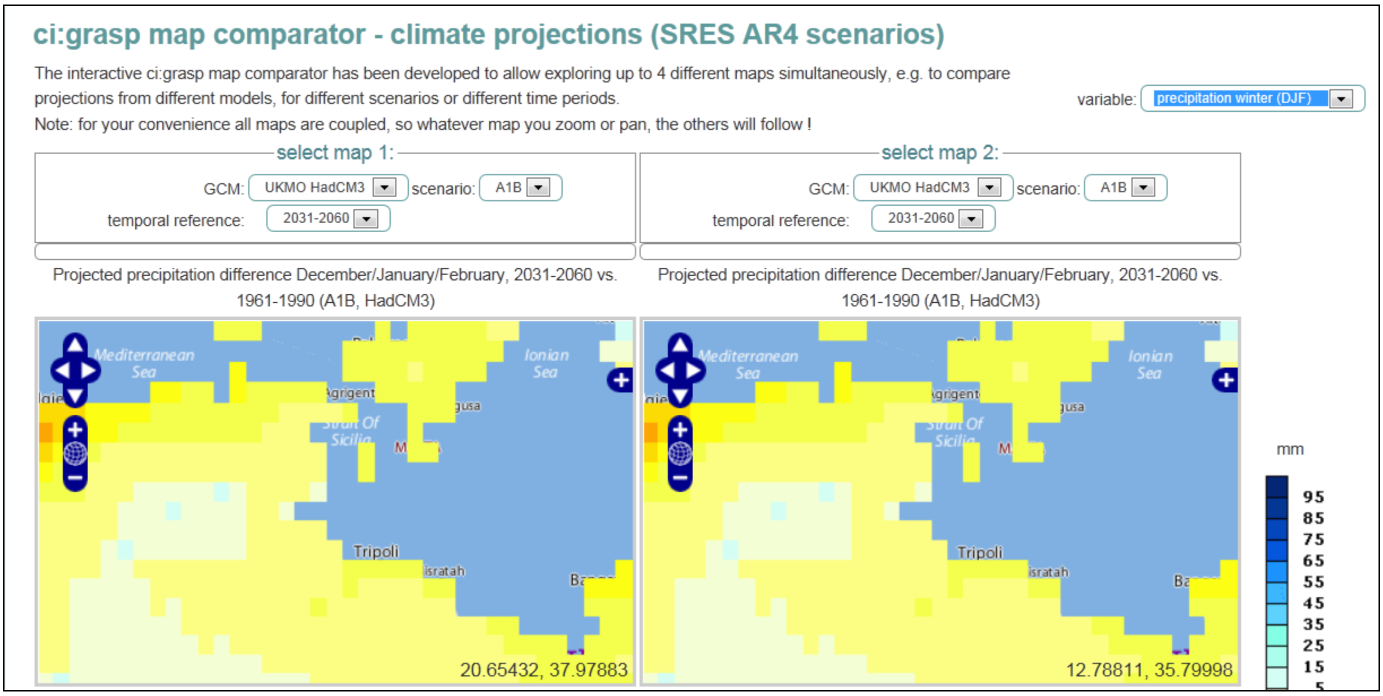
Case work "Finding information on ci:grasp" – Solutions

1.1 Exercise 1A: Projected Temperature Difference



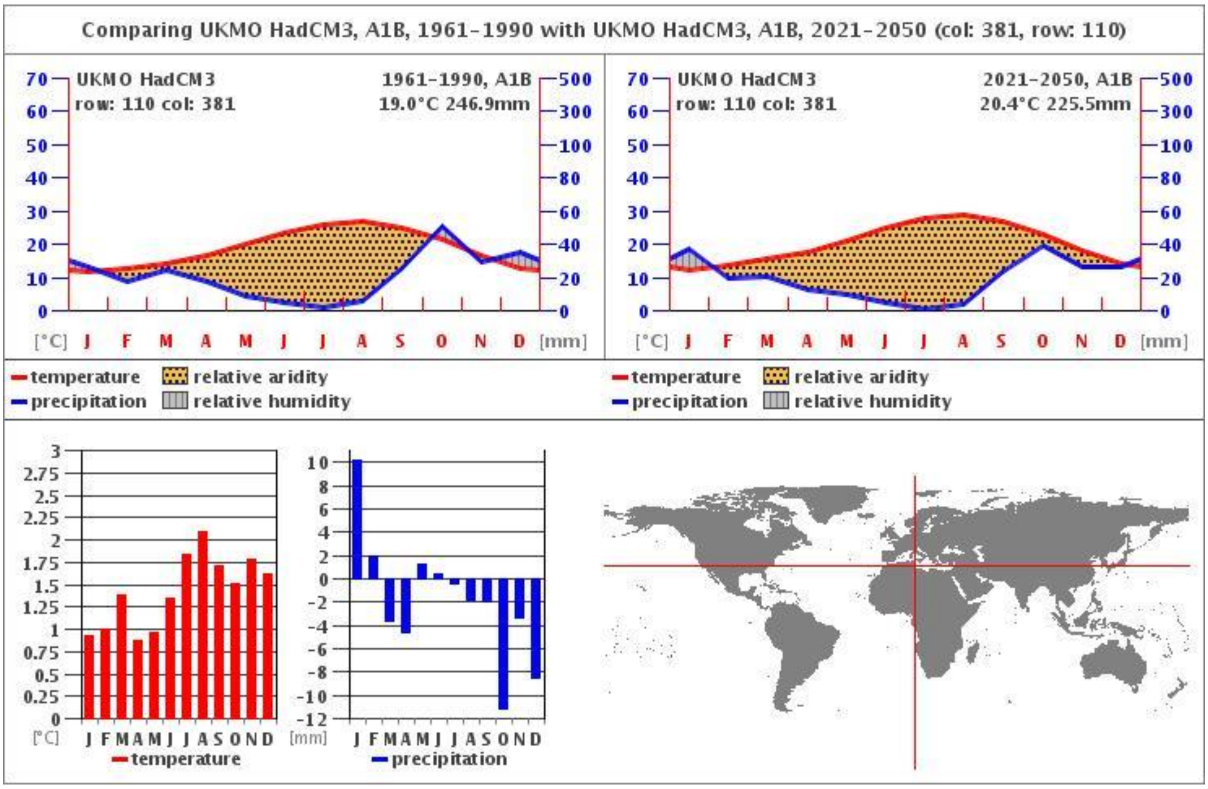
1.A.1: Temperature increase of 1-2°C
1.A.2: Increasing temperature from North to South

1.2 Exercise 1A: Projected Precipitation Difference



1.A.3: Decreasing precipitation
1.A.4: Major changes on the northern coast

1.3 Exercise 1B: Climate diagrams for Sfax



1.4 Exercise 1.B.2: Projected temperature and precipitation changes

Temperature is projected to increase in every month of the year. Temperature changes vary between less than +1°C in January, April and March to more than +2°C in August. Temperature increases are especially high in the second half of the year – June to December – with temperature increases above +1.25°C.
Precipitation changes are especially large in January, October and December. Whereas in January precipitation is projected to increase by 10 mm, precipitation decreases by more than 10 mm in October and around 8 mm in December respectively. In February, March and June precipitation is projected to increase no more than 2 mm, whereas decreases of up to 4 mm (April) are projected for the other months. In summary, Tunisia's climate will be characterised by less precipitation in the period 2021-2050 in comparison to the baseline period.

1.5 Exercise 1.B.3: Particularly large changes

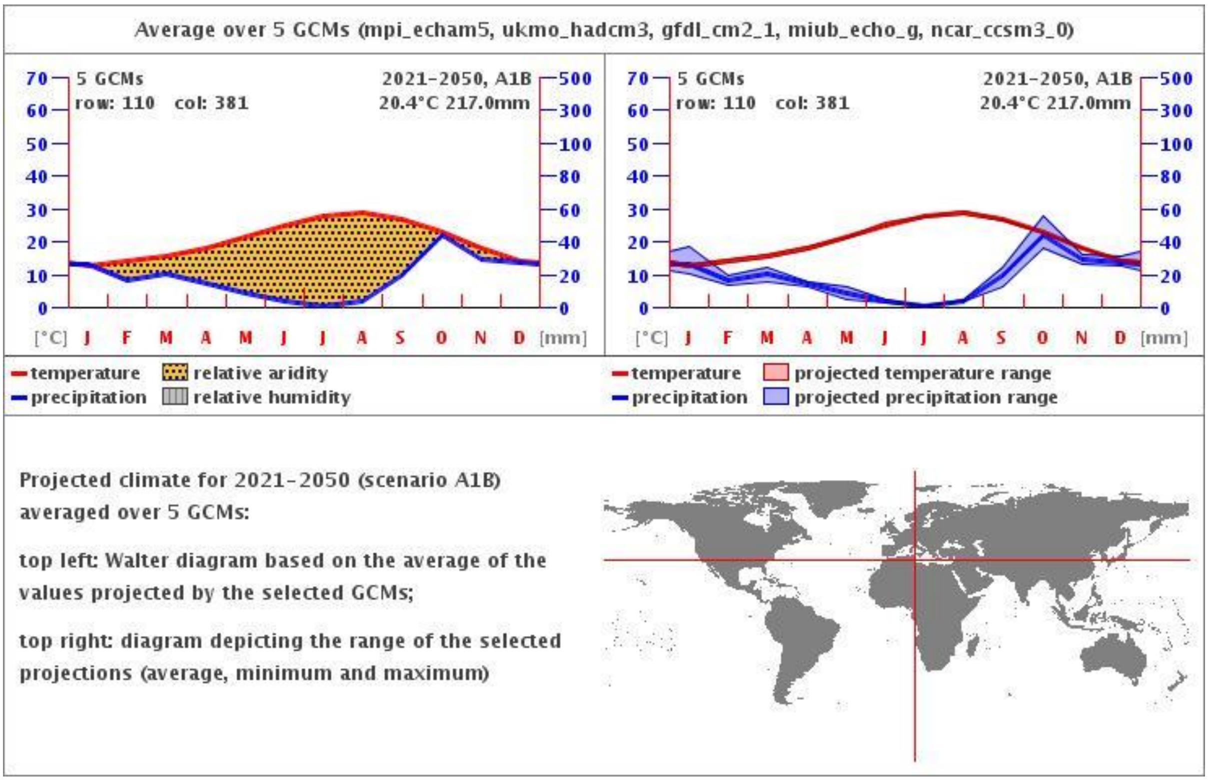
The largest temperature changes are projected for July, August and November with increases above +1.75°C.
Precipitation changes are especially large in January (+10mm), October (-11mm) and December (-8mm).

1.6 Exercise 1.B.4: Shifts in dry and wet seasons over time

The wet season is projected to be shorter in 2021-2050. Whereas in the period 1961-1990 the months October and December have been wet these months are projected

to be
dry in 2021-2050. The wet season in 2021-2050 is projected to last from the end of December to January – approximately 1.5 months instead of 3.

1.7 Exercise 1B: Range of projections over different GCMs for Sfax.



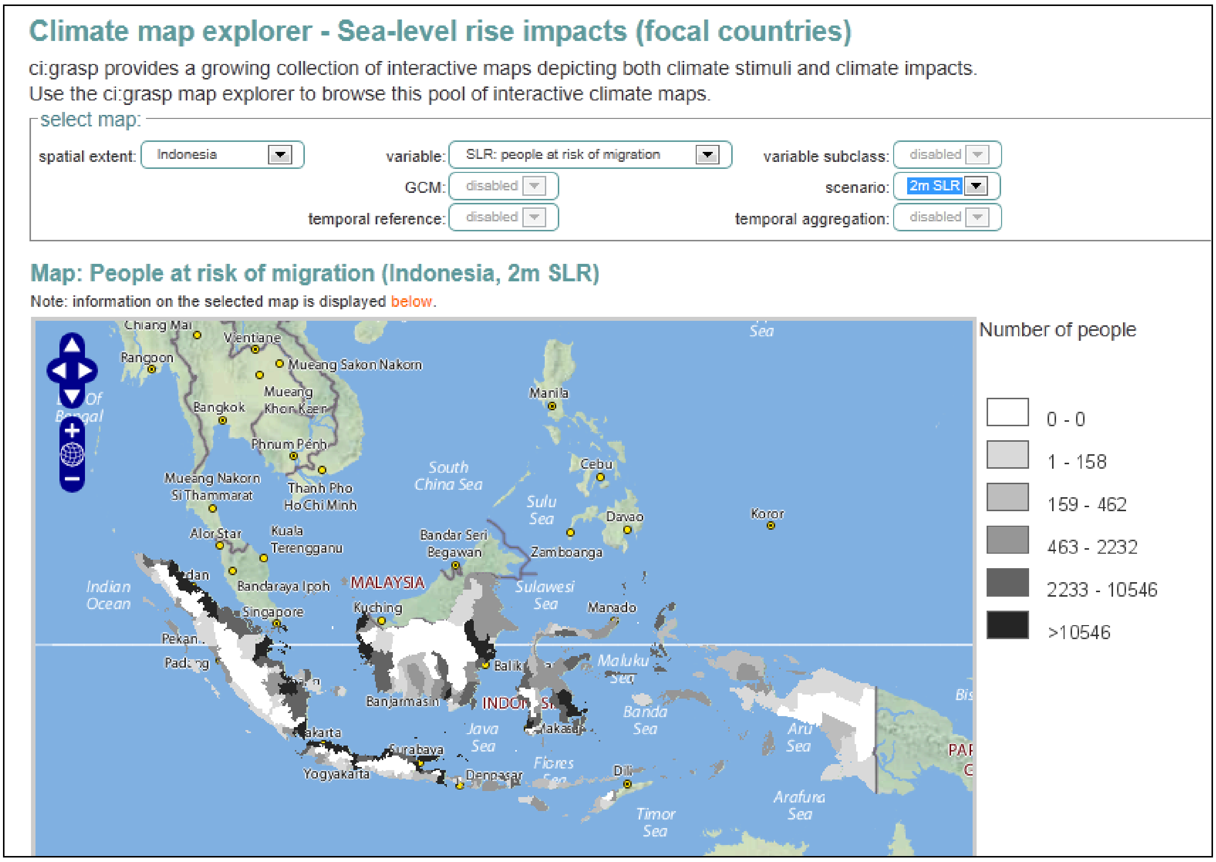
1.8 Exercise 1.B.5: Range of temperature and precipitation projections

The top right Walter Diagram shows that the 5 GCMs project identical temperature changes. This can be concluded from the red temperature line and the absence of a red shaded area. The precipitation projections of the 5 GCMs differ slightly. However, projections show the same trend. Differences in projections are greatest in the rainy season, January, December and October.

1.9 Exercise 1.B.6: Conclusions from the analysis

Tunisia and the area around the city of Sfax in particular, faces warmer months throughout the whole year with a temperature increase of more than +2°C in summer. In general, the area will be drier and the wet season will be shorter. This in particular is expected to have consequences for agriculture and should be analysed in greater depth.

1.10 Exercise 2A: Impact maps for Indonesia – risk of migration (2m SLR)

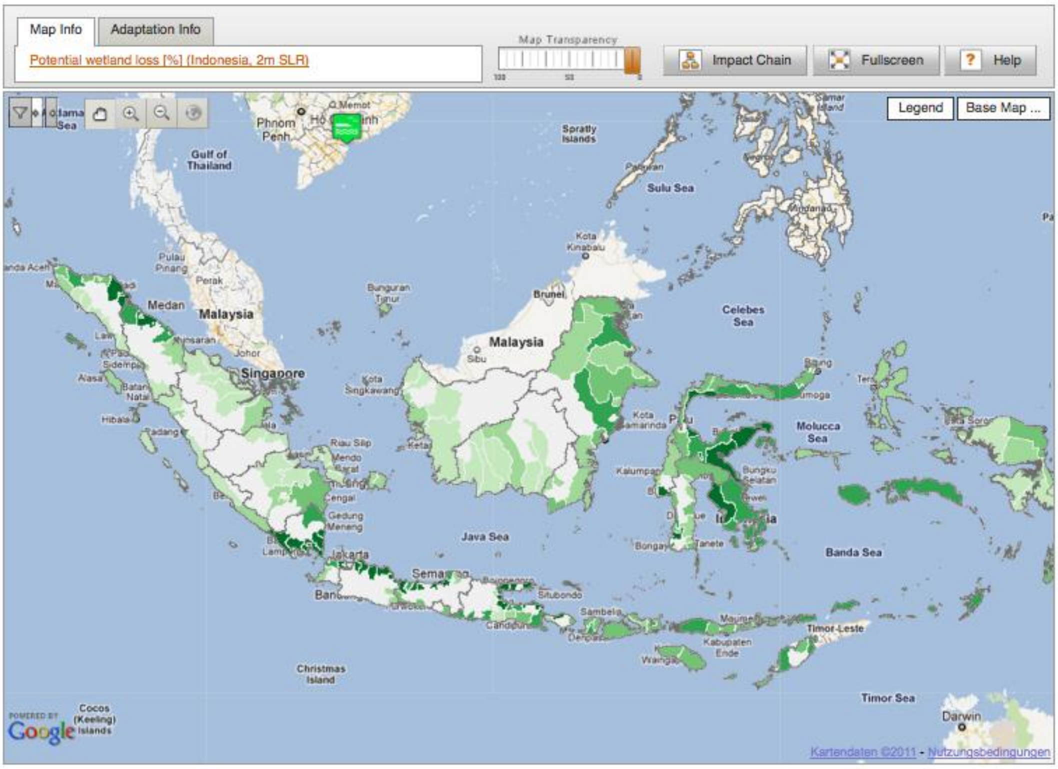


1.11 Exercise 2.A.2: Most vulnerable areas in Indonesia (in terms of the number of people at risk of migration) to sea-level rise (major cities in these areas)

10 examples of cities in most vulnerable areas:

1. Medan
2. Jakarta
3. Semarang
4. Gaung
5. Palembang
6. Banyuasin II
7. Penengahan
8. Surabaya
9. Ujungpandang
10. Kendari

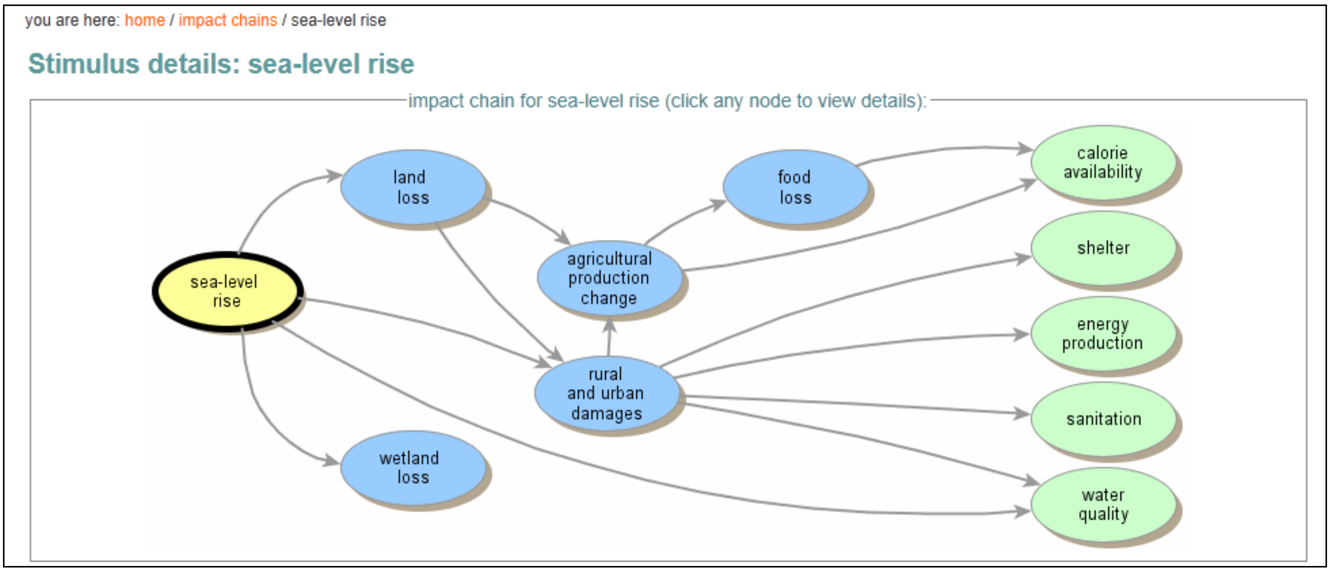
1.12 Exercise 2B: Impact maps for Indonesia – potential wetland loss (2m SLR)



1.13 Exercise 2.B.3: Most vulnerable wetland areas on the island of Sumatra

1. Medan
2. Perbaungan
3. Serba Jadi
4. Langsa
5. Tamiang Hulu
6. Sibolga
7. Palembang
8. Bandar Lampung
9. Waway Karya
10. Penengahan
11. Cukuh Balak
12. Pesisir Selatan

1.14 Exercise 3: Impact chain for sea-level rise



1.15 Exercise 3.1: Does the impact chain reflect the situation for Indonesia?

The impact chain shows impacts from sea-level rising on a very general level. The impacts presented in the impact chain do apply to Indonesia. However, many of the impacts faced by Indonesia are missing. These are outlined in the next exercise.

1.16 Exercise 3.2: Examples of additional impacts of sea-level rise

Examples of impacts that could additionally be included in the impact chain:

- Ecosystem Damages -> Loss of Biodiversity -> Failing Ecosystem Services (as a consequence of wetland loss)
- Saline intrusion -> Reduction of Drinking Water and Crop failure (leading to agricultural production loss)
- Increased Flooding in Coastal Areas (e.g. due to a loss of ecosystems, such as mangroves, providing protection from storms and floods)
- Rural and Urban Area damages (this impact could be subdivided into a number of impacts such as damages to housing, loss of livelihoods, decreasing income from damaged businesses or agricultural production loss)
- Migration -> More pressure on resources such as land and food on national level.

2 Exercise Material and Solutions for Modules 2A & 2B

2.1 Exercise "Dealing with scepticism"

Main learning objectives
- Be able to confront the main sceptic arguments on climate change with sound arguments
Further learning objectives
-
Terminology
Link with other modules
<u>Requires</u> - Introduction from 2A <u>Is linked to</u> - Module 2A - Module 2C <u>Lays the foundation for</u> -
<u>Suggestions for running the exercise</u>

Time consideration (min)	*Reading time*	Intro	Exercise	Presentation of results	Reflection	All in all
	0	0	10	10	0	0

Necessary reading	No extra time needed

Intro	- Explain task and *show the two different sets of information*
	  - ***Bold and italic***: statements of climate sceptics
	  - Normal font: arguments of climate change scientists/practitioners
	- Distribute the material
	- Ask participants only to unfold the corner if they believe they have found the right partner

Exercise	- Pairs find together and discuss (statement and matching argument) - Prepare a 1 min presentation to plenary which covers all major aspects given on the handout.
Presentation of results	- All pairs present their discussion in plenary
Reflection	- At the end of Module 2A
Additional info	- Do a head count of participants in the room right before the exercise, and hand out only as many pairs (statement-argument) as there are participants. - For uneven numbers you may want to consider stepping in yourself. - Announce "two minutes!" before time is over
Preparation	- Prepare the handouts: copy and cut the following pages; fold over the signs - Keep one set complete to cross-check in case you get lost

Exercise "Dealing with scepticism" – Material for distribution

The warming trend is a consequence of changes in measurement instruments.

► Yes, there has been significant improvement in data collection techniques and scientific analyses within the last decades. ►

However, global warming can be proven by using temperature measurements; a scientifically validated time line of temperature has existed since the 1850s. The melting of glaciers and the sea-level rise gives additional proof of global warming.

There is scientific evidence that the global temperatures increased by about 1°C in the 20th century. This statement is based on a physical law called Stefan-Boltzmann which was already detected in the 19th century.

Winter 2010/11 in Germany was extremely cold but climate change scientists forecast higher temperatures in winter in our region. Something is wrong with their judgments.

♥ Make the distinction between weather (now) and climate (>30 year trends). ♥

Just as events at individual locations do not allow for judgments on a larger scale, singular events (even 3 bad and rainy summers in a row) do not indicate a global climatic trend.

Anyway, scientists do not make forecasts but projections. This means, based on the climate models, scientists give indications of a certain likelihood that climate signals will change by a certain trend and to a certain extent over a number of years. They will never tell you if there will be sunshine on your 85th birthday!

The climate has always changed and the world has managed to survive. What we read in the newspapers is nothing but alarmism.

Yes, in the Earth's climate history there have always been warmer and colder periods.

However, never before has change occurred to this extent in such a short time (+1°C in 100 years, and most of that in the last decade). This means that the Earth system's response capacity, i.e. natural adaptation, will be significantly challenged and will most likely be unable to deal with climate change impacts within our comfort zone.

For some climate signals changes can be projected with higher likelihood and confidence, e.g. sea level rise, global mean temperature increase. Effects related to precipitation, are more difficult to project, e.g. droughts.

To deduce effects on socio-economic and ecosystems, we can rely on decades of experience, e.g. droughts and loss of livelihoods in the Sahel region, and current observations, e.g. the discontinuity between the start of the growing season and the pollinators' development. Countries in the Global South especially will be more affected and have less means to manage negative effects.

During some periods in the past hundred thousand years, the Earth was even warmer. Humankind has therefore no influence on the occurrence of warmer periods.

Distinguish between climate on geo-historical time scales and anthropogenic climate change!

Throughout history, the planet Earth has experienced warmer and colder periods. The Earth's climate is influenced by many "natural" external and internal factors, e.g. changes in orbital settings, greenhouse gas release by volcanism etc. which also cause changes of global temperature and CO_2 concentration in the atmosphere.

Humankind itself has become a planetary factor, because it has contributed to an increase in CO_2 emissions by 36% within the last 150 years. This increase is due to the burning of fossil fuels as well as deforestation.

Carbon dioxide is only a minor compound of the atmosphere and cannot account for global warming.

∞ The atmosphere that shields our planet, consists of different gases: water vapour, carbon dioxide, methane, nitrous oxide and others. Water vapour is the most relevant greenhouse gas (95%). But contrary to water vapour, CO_2 and the other gases stay in the atmosphere many years (i.e. change the composition). ∞

The atmospheric shield acts like a greenhouse. This natural effect was already discovered and described in the 18th century. Based on the Stefan-Boltzman law (1879/1884), we can measure the Earth's radiative balance. The natural greenhouse effect amounts to ~33ºC, i.e. without the effect it would be freezing down here!

Anthropogenic greenhouse gas forcing accounts for only 2-3% of natural forcing. A rough estimate shows that 2-3% of 33 ºC is very similar to what the IPCC has stated about anthropogenic warming (up to 1°C).

The fact that there are 23 different climate models and they all lead to different results, shows that there is no sound scientific basis.

♣ There are 23 general circulation models (GCM), because they were elaborated by a variety of institutions around the world. They differ in terms of spatial resolution as well as the physical processes they depict. ♣

The GCMs are physical representations of the Earth's system, i.e. atmosphere, ocean, cryo-sphere and land surface – not snapshots. They are based on data derived from the emissions scenarios.

The current generation of climate models has become increasingly accurate. The IPCC considers all 23 models equally consistent according to a set of quality criteria, such as participation in the inter-model comparison. They have all been subjected to tests, and have demonstrated to reproduce observed features of recent climate and past climate changes compared to observations at plausible level.

Climate models are not reliable in forecasting climate development over the next 100 years.	≈	None of the climate models will ever forecast climate development. A climate model is a representation of the Earth's system not a crystal ball. The climate of the future depends on current and future decisions – yours, mine, those of the politicians we elect and economies we support. Thus, modern climate models provide if-then projections based on data derived from emissions scenarios, e.g. population growth rates or whether cleaner technologies are implemented rapidly or not. While the physical basis of the climate system is well understood, the impossibility of exactly forecasting human development introduces considerable uncertainty into model projections and is one reason why science provides different pathways (climate scenarios).	≈
Volcanic eruptions emit much more carbon dioxide than humankind	≡	During the evolution of the Earth throughout billions of years, volcanic activity has been much higher, as has been the concentration of atmospheric CO_2.This activity slowed down during the geohistoric development and 4 billion years ago the atmospheric composition consisted of 80% water vapour, 10% CO2, and other trace gases. Further cooling of the planet lead to heavy rainfall, which filled the oceans. 3.5 bn years ago the first bacteria started photosynthesis and reduced the carbon dioxide concentration. Today, volcanic activity remains constant and at a lower level than on early Earth. CO_2 emissions from volcanic eruption now amount to approx. 1-2% of what is currently released by humankind.	≡

Scientists are downplaying the uncertainty in their reports. *

Scientists are well aware of the different sources of uncertainty, e.g. the limited understanding of certain phenomena; the still imperfect simulation of some global phenomena; the challenge of dealing with information from different scales (e.g. clouds are a local phenomenon which needs to be re-calculated to fit the global scale of the models); the lack of detailed observations.... *

This is why IPCC rigorously checks the information used. All data used have been previously reviewed. To communicate the degree of certainty in key findings, the IPCC report scientists judge the validity of information (i.e. the level of confidence) in terms of evidence as well as agreement between different sources of information. For quantifiable uncertainty (i.e. probability) a scale of likelihood is used, indicating that ≥66% probability equals “likely”.

Key messages indicate the confidence level/likelihood, as well as detailed numbers and time horizons.

Earth is not entering a warmer phase, but a new ice age.

ϴ

Considering the development of the climate in the last 600 000 years we are currently experiencing a warm period (inter-glacial) of the Holocene. It is indeed likely that the next geological era will be an ice age. When this will happen remains unclear and the time span is rather long in comparison to the time span of processes that are subsumed under human induced climate change.

Human interference with climate will occur at least 10 times more rapidly than the temperature change at the end of the last ice age and effects will occur on a much shorter time scale as compared to geohistoric time scales. The question remains as to whether nature and society can adapt to those rapid changes.

ϴ

2.2 Exercise "Impact chains"

Main learning objectives						
- Understand that looking at climate change stimuli and impacts in a systematic way helps you to organise your strategy and select an appropriate entry point for adaptation action						
Further learning objectives						
- Limit confusion caused by the idea that "everything is related to everything" - Each impact chain analysis has to take into account the circumstances of the assessment (exposure unit).						
Terminology						
Impact chain, stimulus, direct impact, indirect impact (see NOTE on 1st page!)						
Link with other modules						
Requires - Introduction from 2A Is linked to - Module 2A - Module 2B Lays the foundation for -						
Suggestions for running the exercise						
Time consideration (min)	*Reading time*	Intro	Case work	Presentation of results	Reflection	All in all
	0	0	10	10	5	25
Necessary reading	No extra time needed					
Intro	- Explain task - Distribute the material					
Exercise	- Groups come together and discuss (two impact chains: drought (*italic*) sea-level rise (normal font)					
Presentation of results	- Group leaders (cards marked by *) explain impact chain in plenary - Once, both groups are organised, ask the other group to look at the impact chain: Do they see other ways of organising the factors? How can they explain them? (especially impact chain 2)					
Reflection	- Do a quick round (e.g. talking stick) to gather first impressions, e.g. on the difference between the two impact chains; note more detailed observations for the reflection at the end of the module.					
Additional info	- Do a head count of participants in the room right before the exercise, and hand out only that as information sheets as there are participants. If fewer than 20, make a selection of cards from chain 2. - You could do the task in plenary: ask the group dealing with the easier case (sea-level rise) to go first while the other participants observe, and then swap for the second case (drought). - For other ideas see task 3 in casework 2B.					
Preparation	- Prepare the material to distribute: copy and cut the following pages - Keep a printout of the complete impact chains in case you get lost					

Exercise "Impact Chains" – Material for distribution

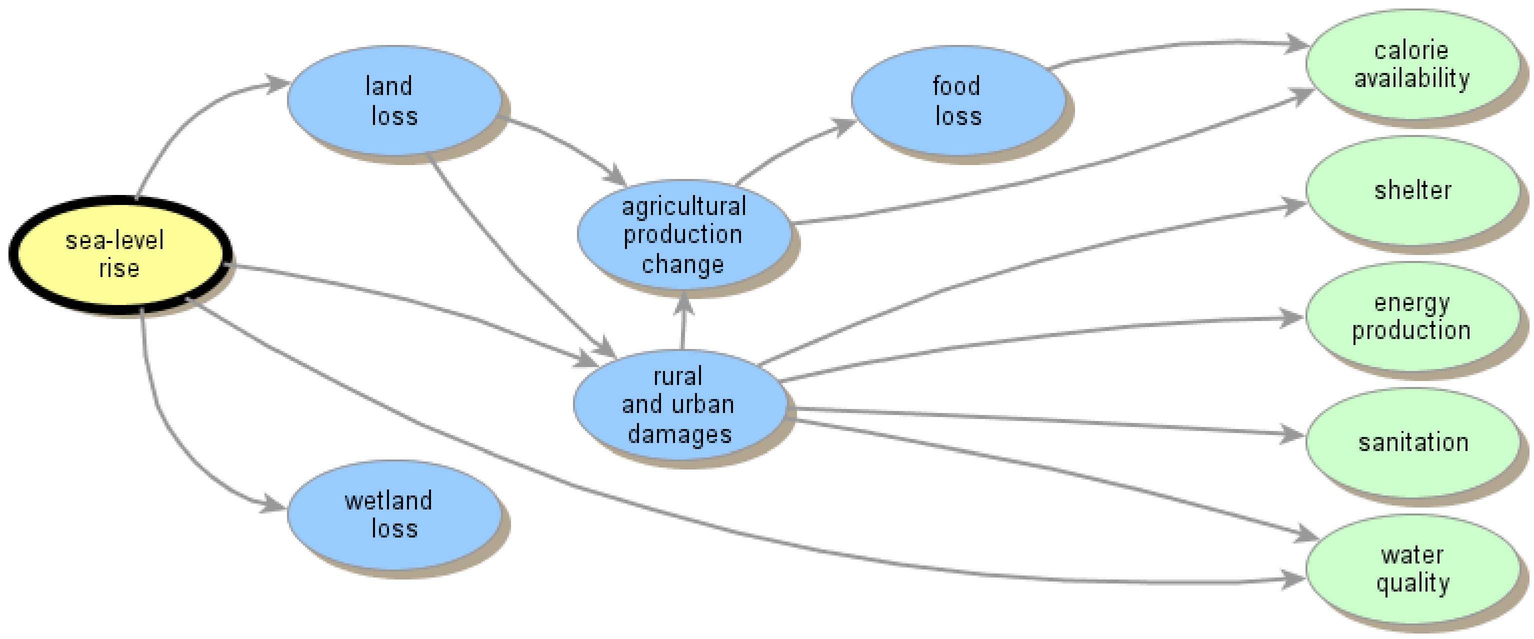
Sea-Level Rise*	***Land Loss***	***Wetland Loss***
Agricultural Production Change	***Rural and Urban Damages***	***impacts upon sanitation***
Food Loss	***impacts upon shelter***	***impacts upon water quality***

The original Impact Chain
(ci:grasp)

you are here: home / impact chains / sea-level rise

Stimulus details: sea-level rise

impact chain for sea-level rise (click any node to view details):



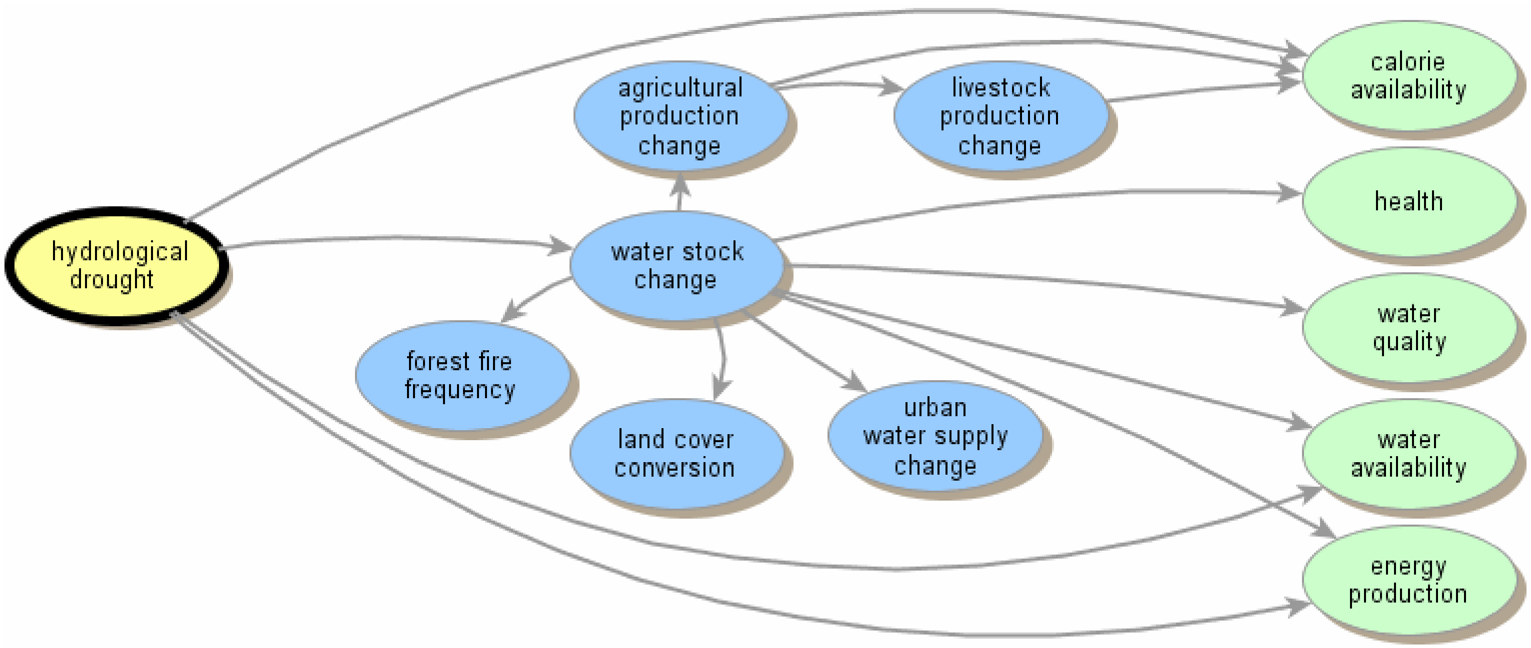
Hydrological Drought*	***Water Stock Change***	***impacts upon energy production***
Forest Fire Frequency	***Agricultural Production Change***	***impacts upon water quality***
Land Cover Conversion	***Urban Water Supply Change***	***Livestock Production Change***
impacts upon calorie availability	***impacts upon health***	***impacts upon water availability***

The original Impact Chain
(ci:grasp)

you are here: home / impact chains / hydrological drought

Stimulus details: hydrological drought

impact chain for hydrological drought (click any node to view details):



2.3 Exercise "Designing scenarios"

Main learning objectives

- Understand that there is always a set of factors that influence decisions. And that all factors have different values that need to be combined.
- Learn about scenarios as a tool to support decision making despite uncertainty and to make underlying frames transparent.
- Understand the different steps leading to the definition of different scenarios.

Further learning objectives

- Systematic decision making enhances ownership.
- Having a choice motivates action.

Terminology

Uncertainty, scenario tool

Link with other modules

Requires

-

Is linked to

- Module 2C

Lays the foundation for

-

Suggestions for running the exercise

Time consideration (min)	*Reading time*	Intro	Exercise	Presentation of results	Reflection	All in all
	0	5	20	15	0	40

Necessary reading	No extra time needed

Intro	- Ask participants to form buzz groups with their neighbours (Balance the groups' size with the amount of time you want to spend. The calculation above is made for 5 buzz groups)
	- Use the pre-prepared board to explain the steps of how to develop scenarios (see ppt)
	  - With the first step (question) ask participants which situations from their professional or private life they can describe in which they had to make a decision that influenced the future, e.g. defining their study subjects after high school or moving house or going on holiday, and note this question on the chart
	  - Explain steps 2 -4 (including the graph belonging to step 4) and ask participants to determine factors and values and find out how they influenced their decision (combination).

Exercise	- Buzz groups discuss the steps 2-4. - They prepare a 2 min presentation to plenary.
Presentation of results	- All buzz groups present their findings in plenary
Reflection	- At the end of Module 2C
Additional info	- You could leave it to each group to define their own example. This will take more time (not included in the calculation above), but could increase the ownership. - For guidance on how we developed the case work scenarios see page 13.
Preparation	- Prepare a board on the steps of how to design scenarios (see ppt) - Have an example of your own ready just in case the group does not come up with an idea

3 Casework Framework[1]

Background

During the training “Integrating CCA into development planning”, participants have the **opportunity to explore the Climate Proofing tool**, being guided through the analytical steps in consecutive learning units (modules). The learning in the modules is based on the Case Method. The underlying case is the fictitious country of Zanadu. Thanks to the fictitious case, participants can concentrate on the analytical steps without being confounded by real lives’ factors, such as their institution’s vested interests, their boss’ personal view on a certain topic, etc.

In order to facilitate the **transfer of lessons learnt to the participants’ real work life**, the training includes an intermediate step: the application of the analytical steps to selected real cases given by participants.

The discussion of a real case example requires an adequate base of relevant information that needs to be provided by the participants themselves.

> ***!*** *Please note:*
> *Due to time constraints we will not deal with each and every case during the training. The trainers will have to make a* ***selection of up to 4 cases****; the following* ***criteria*** *will be applied:*
> - *The case suggested provides a feasible entry point for CCA-discussions in the given time.*
> - *The information base provided is adequate for the group work.*
> - *The overall set of cases selected is divers, and allows the fellow participants to find a topic of their interest.*

! As a so-called “case giver” you have the **unique opportunity to work on a case that relates directly to your work context**. During the training session, you will, based on the information provided by you, discuss a series of questions together with fellow participants (peer counselling method) that should help you to **get a clearer picture of possible entry points on how you could integrate CCA into your case**.

How to provide a real case

If you are interested in providing a real case for the training session, please do the following:

! Select a relevant topic: Keep in mind that Climate Proofing is best applied when a project/plan/policy is at a turning point (revision, start of a new phase…). Please select a case you are familiar with and have a strong interest in discussing it (e.g. because you are currently dealing with it). When choosing the case, please consider that it should offer a useful learning example for others too (avoid too de-tailed or specific questions). *Examples: The kick-off of a development project on hydropower, a national agriculture strategy being reviewed, a coastal zone development plan being developed*

! Present the right degree of information: The information you present should be sufficiently precise but only as detailed as absolutely necessary to carry out the case work of max. 2 hours. The questions in box 1 below guide the compilation of the information. *The text should not exceed two pages, as your fellow participants will need to digest it in order to be good advisors. You, the resource person, will anyhow be part of the working group and can add more information on demand.*

[1] Prepared by Barbara Fröde-Thierfelder. For questions or comments, please contact bfth@eco-consult.com. My sincere thanks go to Antje Schultheis (www.as-empowerment.de) whose experience was very helpful in putting together this document.

Case information required
Please hand in the following information (2 pages max.):

1. General setting
1.1 What is the case about, title?
1.2 Who are the key stakeholders involved, who decides?
1.3 What is the development goal of the initiative? What are activities and objectives?
1.4 Who is the target group?
2. Description of the current situation in the region
2.1 What are the climatic characteristics? (climate pattern, variability)
2.2 What are factors supporting development?
2.3 What are major development challenges? (socio-economic and environmental vulnerabilities)
3. Outlook – as far as possible
3.1 Relevant information on already experienced/ projected climatic changes for the case's region
3.2 Best guess information on possible effects on the case

Questions to be discussed during casework

The following compilation of questions shall give you an insight into possible discussion topics during casework. The trainers will suggest a selection of questions.

- Are the case's objectives or target group directly threatened by climate change? If yes: how?
- Could the case (target group, objectives and activities) (unintentionally) increase the target group's exposure or sensitivity? If yes: how?
- Could the case (target group, objectives and activities) benefit from climate change? If yes: how?
- What are entry points to secure the development objective despite climate change?
- At the current point in the project/ policy cycle:
    - Which activities could be useful to reduce the target group's vulnerability?
    - Which are the practical implications of the suggestions? (time, information, costs)
    - What are implications on the case giver?

A bit of background on working with peers

! **Peers are colleagues**, i.e. people who have a similar background, who act as mutual supporters.The **relationship is one of equality**. There is no external expert or facilitator coming in. For the case giver, discussing specific questions with peers allows to **tap on their knowledge and experience, and emotional, social or practical help** – and to **explore perspectives to you case you would not have thought about on your own**. For colleagues, peer discussions are an interesting feature of learning more through colleague's cases. Peer support is only effective if it is **based on open communication, empathy and understanding**.

A group should thus comprise no more than 10 colleagues, 5-7 being the ideal case. Within the group of equal peers, **two persons have specific tasks**:

- 1. **The case giver**, who provides the question to be discussed.
- 2. **The facilitator**, who ensures that the discussion can take place in a constructive atmosphere and all colleagues have an opportunity to contribute as they wish: It is up to him/her to choose the facilitation tools appropriate to deal with a specific sub-questions. S/he should engage in open-ended questions and active listening.

Rules of work

! All colleagues should make an effort to

- listen carefully; especially when the case giver explains sth. ask if you understood correctly
- make pointed contributions (no lenghtly lectures) without making directives ("that's how you should act!")
- use the "I"-form ("I think that it would be helpful to" instead of "you should do")
- focus at the questions posed by the case giver (not capture the discussion to solve their own questions)
- appreciate the contributions of peers (no belittling of colleagues who have different opinions)

Steps of a peer discussion on real adaptation cases

The following steps are oriented by the "peer counseling" approach, but adapted to the specific use in the CCA-training context.

1. Define roles

In our training setting, the case giver has already been determined. Tasks to be distributed:

- Facilitator - who guides the discussion but who also may contribute
- Secretary - who takes notes on the prepared boards in agreement with the group
- Time keeper - who in agreement with the facilitator makes sure that the process does not get out of the intended schedule.

2. Clarify the working base

- Agree on confidentiality of what is being discussed in your peer group
- Agree on communication rules
- Everybody goes through the written background information
- Colleagues ask questions to the case giver to receive additional background information (don't start working on solutions)
- Together agree on a schedule, the secretary notes it down at a visible spot (as to orient everybody)

3. Discussion – working through the CP steps

Attention: stick to the rules of work!

- The colleagues engage in discussion on the different steps, sub-questions
- The secretary takes notes visible to everybody
- The case giver may chip in clarifying questions/information but should refrain from appraising the different contributions at this point

4. Wrap-up

- The case giver appreciates the contributions; if s/he want s/he can point out especially useful ideas from his/her colleagues

5. Prepare a presentation

An ordinary peer counseling session is held confidentially as it often touches upon personal conflicts. In the training context with a focus on technical issues members of the other peer groups should have the opportunity to learn from your discussion. So please prepare a presentation that gives the necessary background and highlights your most important findings.

- Prepare a presentation to the plenary, based on the secretary's notes
- Select three presenters (and define their order) who will take turns in manning your board at the marketplace.

4 Acting as a Multiplier[2]

Learning objectives

(1) Adaptation to climate change is an incremental change process: we are constantly asked to review current practises and to implement more of them and/or take up additional activities to assure climate-resilient development.

(2) CCA action needs to be taken despite considerable uncertainty.

(3) Change agents require technical as well as the managerial qualifications to initiate and lead the process.

(4) Potentially conflicting objectives, e.g. achieving poverty reduction being also consistent with adaptation and economic growth, need to be reconciled.

(5) Change processes have pros and cons, depending on the perspective of the involved stakeholders – a change agent has to be able to deal with driving as well as restraining forces.

Subtext[3]

(1) Change can only be initiated if the driving factors outnumber the restraining factors.

(2) A change of mind set is required going beyond the integration of additional knowledge.

(3) In order to motivate for change, a change agent has to know how to advocate the change.

(4) Designing and implementing CCA-action requires interdisciplinary collaboration because of the cross-sectoral nature of climate change.

(5) As practical examples on CCA are still limited, innovation and learning from experiences is of particular importance.

Steps to run the module

(1) Introduction to CCA as a change process (see learning objectives above and change formula page

(2) Exercise or recap[4] on the different roles of the participants (see page 30)

(3) Presentation on major capacities for being an effective multiplier (see page 32)

(4) Buzz groups on challenges as multipliers and clustering of answers (for possible answer see 33)

(5) Introduction to the force field analysis: steps and examples (see page 33)

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[2] Prepared by Barbara Fröde-Thierfelder, ECO Consult, based on an outline by Dr Thomas Schwedersky. This advanced module aims to introduce participants with a potential mandate as multipliers into the basic principles and useful tools for taking an active role in promoting adaptation to climate change, which is in fact a change process.

[3] The subtext is what we aim to communicate additionally to the technical content.

[4] In a longer CCA training, we suggest to place the exercise in the introductory sessions day 1 in order to highlight the topic from the beginning.

(6) Compilation of working groups (on participant's own cases): gather suggestions and ask participants to select the case they would like to work on (e.g. placing dots) – maximum 4 working groups!

(7) Group work: peer counselling on selected cases

(8) Presentation of results

(9) Discussion on open questions

Preparation

(1) Some days before the training: Send your participants a welcome email and ask for information on how they perceive their roles as multipliers, what exactly they do, what they want to learn etc.

(2) Well before the session: ask participants to think of a case they would like to discuss with fellow participants in peer counselling. The question should be of strong interest for the case giver and entail some sort of change process.

(3) Introduction to the topic (no additional input available)

(4) Cards for socio-metric exercises (see page 30)

(5) Presentation board on major capacities for multipliers (see page 32)

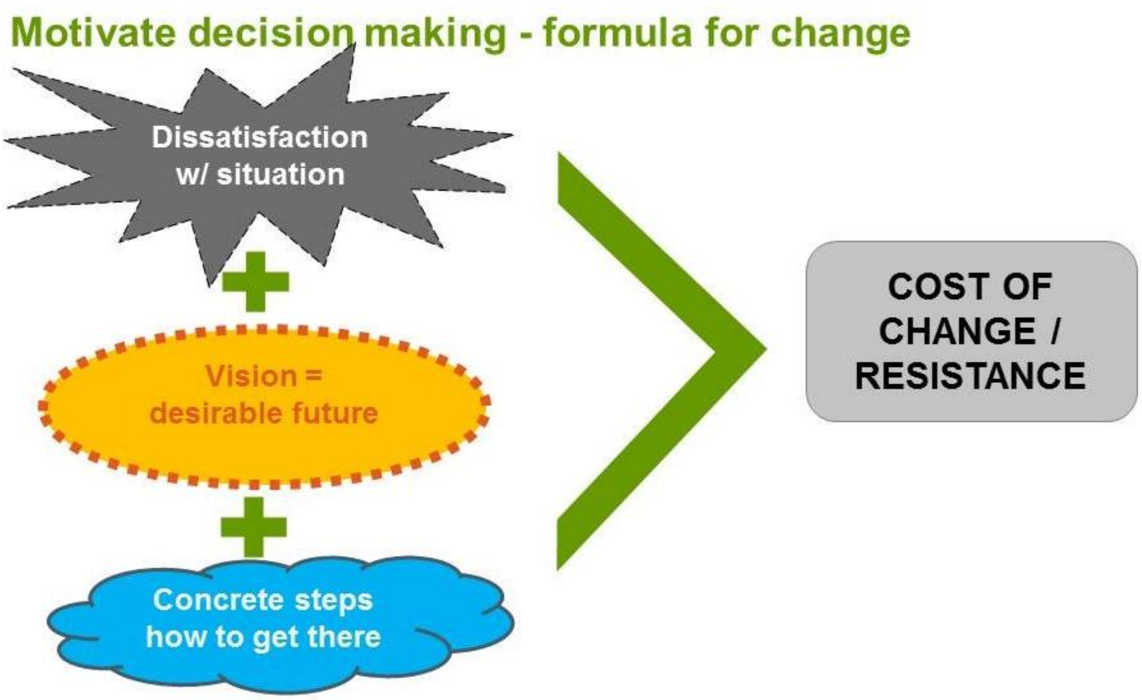
(6) Flipchart on example force field analysis (see page 33)

(7) Flipchart (and one printed handout per person) on steps of force field analysis as well as work description

(8) Boards for group work

Background information for trainers

The change formula



How to work with the graph

- Prepare a flipchart or cards and a board
- Explain that according to this formula change will only be possible if: dissatisfaction with a certain situation is big enough, people have a clear vision of how they want the future to be ("the cathedral we are building"), and what they can do to get there (first steps). These three factors need to be sufficiently strong to outweigh the costs of change (e.g. bad feelings on moving out of your comfort zone, reluctant superiors, financial impacts etc.)
- Look for tangible examples together with participants
- Make sure that people understand, that "doing nothing" also entails costs

Exercise on the different roles of the participants

This step can be done as a socio-metric exercise. Use the following questions and answers or any other you find appropriate from your preparation inquiry.

Question: What is your current role in mainstreaming CCA?
Possible answers:

- Project management support CCA-activity
- Support to CCA- activity as technical expert or trainer
- Implementation of a CCA-activity as local expert
- CCA knowledge required without direct involvement with CCA activity

Question: What is your current role in your institution?
Possible answers:

- CCA champion (somebody with very good technical knowledge but no/little responsibility in terms of institutional change)
- CCA anchor (somebody with very good technical knowledge and some responsibility to root the topic in operations procedures)
- CCA multiplier (somebody with very good technical knowledge and responsibility to inform colleagues about the strategic relevance of the topic)
- CCA change agent (somebody with very good technical knowledge and an institutional mandate to mainstream the topic into the institution)
- I don't feel comfortable with any of these categories

Question: With whom do you work? OR On who do you have influence?
Possible answers:

- Colleagues in my team
- The public administration body in my sector

What is a socio-metric exercise?

A socio-metric exercise (also called disposition) is a widely used a method in systemic organisational development. Relationships and constellations or different views, opinions and backgrounds in a group are made visible. Participants may be asked to position themselves according to a question. With this method the respective features of the group become easily and quickly visible.
Practical hints:

- Prepare possible answers to the question on cards and display on the floor.
- Ask participants to choose the statement they feel most familiar with.
- Walk around and ask people to say a few (!!!) words about their respective position in the disposition.

- Other sector administrations
- Local stakeholders
- Decisions makers
- …

Major capacities for being an effective multiplier/ change agent for CCA

Figure 1: Presentation board on major capacities for being an effective multiplier/ change agent for CCA

How to work with the board

- Prepare cards
- Pin cards vice versa on board
- Reverse cards one by one and explain. Start with one main topic (rose coloured bubble) and explain the according details (blue coloured ovals). For more information on the different topics see next paragraph.

What does a multiplier need in terms of capacities?

- **Communication**: being proactive, adaptive and focused, being convincing, being a good listener, being a good questioner
- **Self-knowledge**: being self-reflective as a means to organize one's own learning process. This also means to have an eye on the level of consistency in one's behavior.
- **Strategic thinking**: define your strategy, ideally together with like-minded people and reflect on how effective it is.
- **Awareness creation**: making visible and tangible what climate change means as a starting point for motivating for action, use a variety of methods of awareness raising (training, meetings and workshops, personal communication, exposure, case studies, concise thematic papers)
- **Sharing knowledge and experiences:** invite others to share their experiences and share your own experiences in order to distill new learning messages. This should go together with an attitude of curiosity and inquiry.
- **Building alliances and partnerships** (internal (learning groups) and external (CCA-practitioner network): joining hands with others within and outside the organization plays a key role in multiplication.
- **Enhancing individual and organizational learning**: using different means from face-to-face dialogue to workshops and conferences while searching continuity instead of single events with little impact.
- **Enabling institutional conditions**, such as a clear mandate, support from his/ her superiors, an institution willing to learn and change, etc.

Discussion on challenges

Selection of challenges a multiplier is facing

- **Finding the appropriate balance between different types of multiplication action**, e.g. awareness creation and concrete CCA-action. Good strategizing on what action to take and on how to combine different types of action therefore becomes crucial.
- **Convincing people**: there are a lot of factors making it challenging to convince colleagues, superiors or people in other organizations about the necessity to take CCA-action. Attitudes of neglecting and ignorance, rigidness in thought processes, fixed ways of working and bureaucratic attitudes are some of these factors coming into play.
- **Mobilizing action on the community level**: communities may have other development priorities, e.g. land rights, increased income or improvement of social and material infrastructure. While they know very well the local climate conditions they lack understanding of climate change dynamics on higher levels.
- **Weak learning culture**: often organizations are not very flexible in terms of unlearning common and long-established practices and learning new ways of thinking and acting.
- **Lack of support from decision-makers**: decision-makers may have a business-as-usual-mentality or follow a reactive rather than a proactive strategy in dealing with the impacts of climate change.

Introduction to the force field analysis

Why do a force field analysis?

- It helps to identify the forces which support the achievement of the desired state change (driving forces) and those which act against the change (restraining forces).
- It helps to identify ways in which driving forces can be strengthened.
- It allows identifying ways of reducing or overcoming the restraining forces.

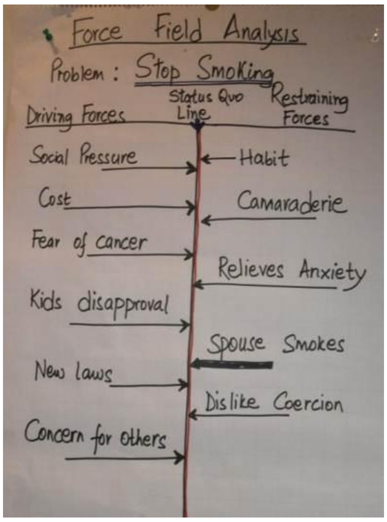
Steps for doing the force field analysis

1. Define a topic that has a clear change aspect, i.e. a certain objective you want to achieve
2. List the driving forces in the left column.
3. List the restraining forces in the right column.
4. Identify which forces (driving or restraining) are more important than others. Visualize their importance through thinner or thicker arrows.
5. Identify ways in which you can strengthen the driving forces. Start from the most important ones.
6. Identify ways in which you can weaken the restraining forces. Start from the most important ones.
7. Check the balance between the driving and the restraining forces.

Instructions for group work

1. Visualize the question (change project)
2. The resource person should give a short introduction to his/ her work context
3. If necessary reformulate the question
4. The group members ask constructive questions in order to facilitate the case givers process of force field analysis step by set (see above), they keep in mind the interlinkedness of factors
5. One group member assists the case giver and documents the discussion

Example: Giving Up Smoking



The **example** shows that the force field analysis can also be applied in the personal context. It also shows that driving and restraining forces are not anonymous forces coming into play but forces related to how individuals or groups are acting. From this perspective it becomes evident that strengthening the driving forces – being the most natural approach for trying to reach the desired state – is not a neutral option because it may cause an unintentional strengthening of the restraining forces. Let's take the example of that man who wants to stop smoking: if he tries to enforce the driving forces he should be prepared that his wife will not wait for things happening but she will react which means that her influence as a restraining force will become stronger. So, it is always useful to also look, in a pro-active manner, on how the restraining forces can be weakened which in this case would mean for that man to be brave enough to try to convince his wife for making 'stop smoking' a joint venture.

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5 Glossary of statistical terms[5]

Average

The average is the statistical summary of a group of numbers. The three main types of average are:

- the mean
- the median
- the mode or modus

In common usage, the term 'average' mostly refers to the **arithmetic mean** which is the sum of all the values in a list divided by the number of items in the list. *For example, if we have the two values, five and seven, then their arithmetic average is: 5 + 7 / 2 = 6.*
In contrast, the **median** is the middle value in a group of numbers ranked in order of size. In other words, 50% of the scores fall above and 50% fall below the median.
For example, to find the median of three numbers, 6, 1 and 8:

1. *put them in ascending order, i.e. 1, 6 and 8;*
2. *the middle number is 6: the median is 6.*

The **mode** refers to the number in a set of numbers that occurs most often. *For example, to find the mode of the following set of numbers 1, 3, 5, 8, 5, 3, 5,*

1. *put them in ascending order: 1, 3, 3, 5, 5, 5, 8.*
2. *the number that occurs the most often (three times) is 5, so the mode is 5.*

Extreme values

The extrema of a set of elements are the maximum (greatest) and minimum (least) element in the set. *For example, of the following five numbers 2, 3, 6, 9, and 11 the maximum is 11 while the minimum is 2.*

Trend

If data show underlying changes over time that point in the same direction, we refer to these changes as a trend. The simplest type of change is a linear (straight line) trend, which indicates a continuous increase or decrease over time. The net effect of increasing greenhouse-gas concentrations and other human-induced factors, for example, is expected to cause warming at the Earth’s surface and in the troposphere and cooling in the stratosphere. In this case, warming corresponds to a positive (or increasing) linear trend, while cooling corresponds to a negative (or decreasing) trend. Used appropriately, linear trends provide the simplest and most convenient way to describe the overall change over time in a data set, and are widely used.
The figure below depicts examples of temperature time series with best-fit (least squares) linear trends (Upper graph: global-mean surface temperature from the UKMO Hadley Centre/Climatic Research Unit data set (HadCRUT2v); and lower graph: global-mean MSU channel four data (T4) for the lower stratosphere from the University of Alabama at Huntsville (UAH)).
Note the much larger temperature scale on the lower panel. Temperature changes are expressed as anomalies relative to the 1979 to 1999 mean. Dates for the eruptions of El Chichón and Mt. Pinatubo are shown by vertical lines. El Niños are shown by the shaded areas.

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[5] Marion Hergarten, ECO Consult

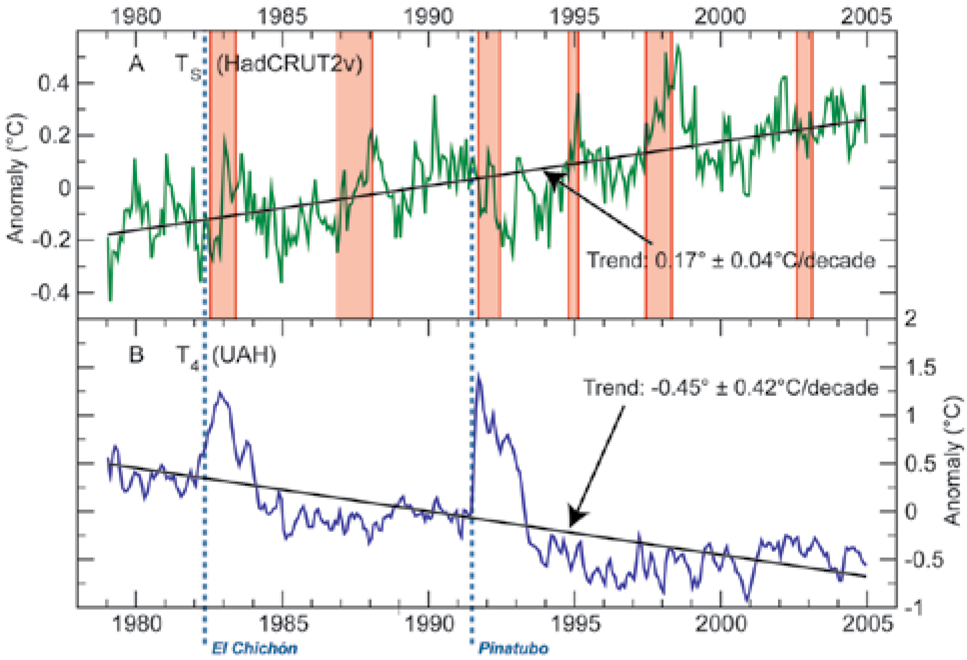

Figure 1 Examples of temperature time series with best-fit (least squares) linear trends (Source: Wigley, 2006)

Significance

There is a statistical method of testing the likelihood that an observed difference is simply due to chance. The factors included in the analysis are the extent of the difference, and the number of observations. For instance, even when a difference seems big, if the number of cases is small, you may not be able to say with confidence that the difference is due to anything other than chance. On the other hand, with very large samples, even differences that seem small may be statistically significant.
In the example of tossing a coin, the expected value is 50% heads, and 50% tails. If you toss a coin four times, and get 3 heads and 1 tail, this difference would not be statistically significant - even though it is 25% different from what you would expect. The difference is interpreted as being due to chance. If you tossed a coin 100,000 times, and 75% were heads and 25% were tails, the difference from the expected value would be statistically significant (and you would be justified in being suspicious of the coin).
The so-called “p value” is a measure of statistical significance. A p value of 0.05 means that there is a 5% chance that the difference is due to chance, and a p value of 0.01 means that there is a 1% chance that the difference is due to chance.

Uncertainty

The term uncertainty expresses the degree to which a value (e.g., the future state of the climate system) is unknown. It can result from (1) lack of information, (2) disagreement about what is known and (3) what is even knowable.
Uncertainty (1) and (2) can have many types of sources: lack of information, quality of data, quantifiable errors in the data, ambiguously defined concepts or terminology, projections of human behaviour. It can be described by quantitative measures, for example, a range of values calculated by various models, or by qualitative statements, for example, reflecting the judgement of a team of experts.
Uncertainty (3) is called inherent uncertainty as no research on Earth can offer very confident results to questions such as how the Earth’s system will respond to feedback effects, how human systems can cope with changes, etc..

Likelihood

Table 1. Likelihood Scale	
Term*	**Likelihood of the Outcome**
Virtually certain	99-100% probability
Very likely	90-100% probability
Likely	66-100% probability
About as likely as not	33 to 66% probability
Unlikely	0-33% probability
Very unlikely	0-10% probability
Exceptionally unlikely	0-1% probability

Table 1 IPCC standard terminology for likelihood scales (Source: IPCC , 2005)

In IPCC reports, the likelihood of an occurrence, an outcome or a result is expressed using a standard terminology as defined in the adjacent table. It provides calibrated language for quantifying uncertainty. It can be used to express a probabilistic estimate of the occurrence of a single event or of an outcome (e.g., a climate parameter, observed trend, or projected change lying in a given range). In other words it is used as a general depiction of probability or frequency and can be expressed qualitatively or quantitatively. Likelihood may be based on statistical or modelling analyses, elicitation of expert views, or other quantitative analyses.

Probability

In statistical terms, a probability is attached to a random event. There are different ways in which probability can be interpreted. One interpretation considers a probability as having the nature of a relative frequency (i.e. the proportion of years in which an extreme weather event occurs, e.g. the so-called centennial flood is a flood event of an extent that happens only once in 100 years). Probabilities may also be expressed in percentage terms (there is a 50% chance of rain tomorrow).
Mathematically, probability and likelihood are directly related to each other but there is a difference in what they represent. For probabilities, the parameters of a variable's probability density function (PDF) are known and the data are unobserved. For likelihoods, the data are observed and the parameter values are unknown.

Confidence

The term 'confidence' is used to express trust in a measurement or estimate. It has to be noted that the fact of having confidence in estimates does not make those estimates more accurate or precise. However, it helps to establish a consensus regarding whether the data can be applied to solve a problem. The level of confidence in the correctness of a result is expressed in the IPCC context, using a standard terminology depicted in the adjacent table.

Terminology	**Degree of confidence in being correct**
Very high confidence	At least 9 out of 10 chance of being correct (≥90%)
High confidence	About 8 out of 10 chance (≈ 80%)
Medium confidence	About 5 out of 10 chance (≈ 50%)
Low confidence	About 2 out of 10 chance (≈ 20%)
Very low confidence	Less than 1 out of 10 chance (< 10%)

Table 2: Quantitatively calibrated levels of confidence (Source: IPCC, 2005)

It synthesises judgements about the validity of findings as determined through evaluation of evidence and agreement. The figure below depicts summary statements for evidence and agreement and their relationship to confidence. Confidence increases towards the top-right corner as indicated by the increasing strength of shading. Generally, **evidence is considered to be most robust when there are multiple, consistent independent lines of high-quality evidence**.
The usage of confidence explained above differs substantially from the statistical usage in the term confidence interval. A confidence interval is the range in which it is expected that the true value of a parameter lies. The level of belief is expressed by the probability, whose value is related to the size of the interval. Confidence intervals are one way to express uncertainty.

High agreement Limited evidence	*High agreement Medium evidence*	*High agreement Robust evidence*
Medium agreement Limited evidence	*Medium agreement Medium evidence*	*Medium agreement Robust evidence*
Low agreement Limited evidence	*Low agreement Medium evidence*	*Low agreement Robust evidence*

Agreement ↑

Evidence (type, amount, quality, consistency) →

Confidence Scale

Table 3 Depiction of evidence and agreement statements and their relationship to confidence (Source. IPCC, 2005)

In practice, a confidence interval is defined by a probability value, say 95%, and confidence limits on either side of the mean value x. In this case the confidence limits L1 and L2 would be calculated from the PDF (probability density function) such that there was a 95% chance of the true value of the quantity being estimated by x lying between L1 and L2.
Example: 'An emission is between 90 and 100 kt with a probability of 95%.' Such a statement can be provided when the confidence interval is calculated.

The above glossary has been adapted from the following sources:

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