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Assessing and Monitoring Climate Resilience

From Theoretical Considerations to Practically Applicable Tools – A Discussion Paper

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Adaptation M&E

Contents

In the past few years, resilience has gained more and more attention in the context of climate change adaptation, disaster risk reduction and development cooperation in general. Not least the fact that building resilience is a key objective of the ongoing negotiations on the post-2015 development agenda, the post-2015 framework for disaster risk reduction as well as the 2015 climate agreement, demonstrates its considerable political momentum. It is regarded as a new perspective on how to analyse and plan for the effects of shocks and stresses that threaten development progress (FSIN, 2014). Thus, resilience can contribute to bridging the gaps between the fields of climate change adaptation and disaster risk reduction, as well as poverty reduction and sustainable development in general.

A multitude of strategies, programmes and projects targeting resilience have recently emerged. Furthermore, in order to monitor their adaptation efforts towards building climate resilience, several countries are currently establishing national Monitoring & Evaluation (M&E) systems. Consequently, there is a growing need for concepts and approaches assessing and monitoring progress in achieving resilience on national, sub-national and regional level. Due to the lack of a common understanding and practical guidelines, however, a great number of interpretations exist on what exactly resilience means and how it can be assessed.

This **discussion paper** suggests an approach to assess and monitor climate resilience on national level. It pursues this goal by developing a generic climate resilience framework and proposing two complementary assessment tools, which have yet to be field-tested. These tools may be used separately or in a combination, and can be flexibly adjusted to country-specific circumstances. The discussion paper mainly targets policy-makers and practitioners working in the field of climate change, disaster risk reduction and sustainable development. It therefore focusses on a pragmatic approach on how to assess climate resilience instead of entering into the scientific debate.

The Resilience Perspective

Resilience is applied very differently in various disciplines. From a climate change perspective, an integrated social-ecological understanding of resilience is most appropriate. Following this line of thought, our environment is constituted by social-ecological systems (SES), which encompass five main dimensions: a social, ecological, economic, physical and an institutional dimension. The concept of resilience considers systems on various levels (e.g. households, communities, countries) as well as the interdependencies between these systems. Moreover, it regards risk, uncertainty and change as normal features of every SES.

In the broadest sense, resilience can be understood as the ability of a SES to deal with shocks and stresses. This ability depends on the capacities to absorb, adapt to and transform in the face of stressors threatening the system. Hence, it does not only include the responsive capacity to already known threats but also considers innovation, learning and anticipation to be prepared for projected impacts of a changing climate. Resilience possesses major commonalities with the concept of vulnerability. However, there is no consensus yet on the exact relationship between the two terms (Box 1).

Although often used in the context of adaptation, the resilience perspective is not confined to the impacts of climate change. To the contrary, it considers a broad variety of disturbances (e.g. political or economic crises, violent conflicts, geophysical extreme events) as well as their effects on SES. ‘Climate resilience’ is thus a specific form of resilience, namely the ability to deal with climatic shocks and stresses.

Box 1 Resilience and vulnerability

Due to the multitude of definitions of both resilience and vulnerability, their mutual relationship is highly debated. A practical approach is to understand resilience and vulnerability as two distinct but overlapping concepts with a negative correlation. This means that systems with high resilience usually exhibit low vulnerability and vice versa.

Understanding Climate Resilience

In order to assess and monitor climate resilience in practice, a better understanding and clear definition of the term is needed. Due to the complexity and multiple interpretations of resilience theory, however, there is still no consensus on factors leading to climate resilience and variables that should be used in order to assess and quantify progress in becoming more resilient. Against this backdrop, a practice-oriented explanation of central pillars of resilience is provided below. These pillars constitute the basis for assessing and monitoring climate resilience.

Building on the general considerations stated above, **climate resilience** is defined as

» *the ability of social-ecological systems to absorb and recover from climatic shocks and stresses, whilst positively adapting and transforming their structures and means for living in the face of long-term change and uncertainty.* «

(adapted from Mitchell, 2013)

Climate resilience thus is a combination of absorptive, adaptive and transformative **capacities**, which can be delineated according to the responses to climatic shocks and stresses they facilitate:

- **Absorptive capacity:** Ability of a system to prepare for, mitigate or recover from the impacts of negative events using predetermined coping responses in order to preserve and restore essential basic structures and functions (e.g. human life, housing, productive assets) (Béné et al., 2012, Cutter et al., 2008).

  Examples: *Early warning systems, savings, weather insurance schemes, trained disaster risk reduction teams, dyke systems in flood-prone areas (climate hazard-specific).*

- **Adaptive capacity:** Ability of a system to adjust, modify or change its characteristics and actions in order to better respond to existing and anticipated future climatic shocks and stresses and to take advantage of opportunities (Béné et al., 2012, Brooks, 2003, IPCC, 2012).

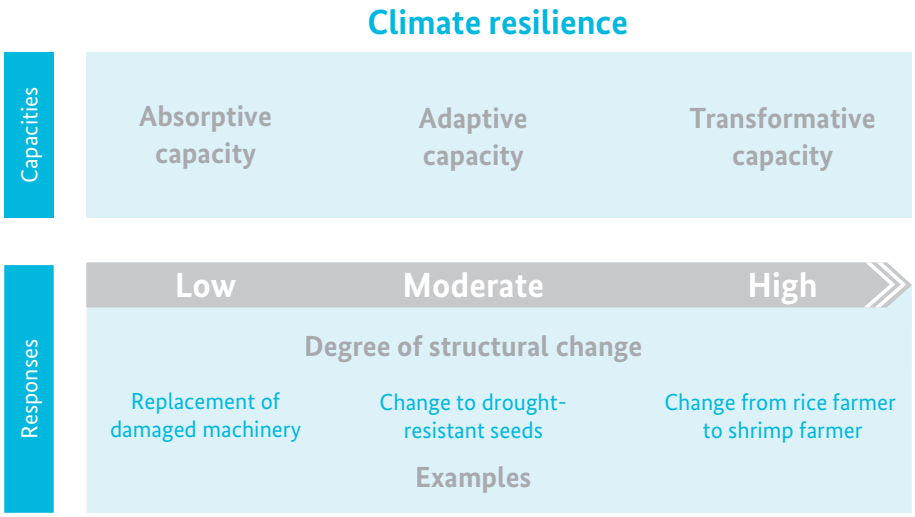
  Examples: *Adjusted planting behaviour, climate change-related information and education events, improved natural resource management, diversification of early warning systems to reach a broader network of actors.*

- **Transformative capacity:** Ability of a system to fundamentally change its characteristics and actions when the existing conditions become untenable in the face of climatic shocks and stresses (Béné et al., 2012, Walker et al., 2004).

  Examples: *Livelihood transformation (e.g. from rice farmer to shrimp farmer), migration from rural to urban areas, change from fossil energy system to renewable energies.*

Although differentiating the three capacities is useful for analytical purposes, in reality they fall along a **continuum** and jointly facilitate different types of responses that range from a low to a high degree of structural change (Figure 1). Climate resilience depends on the **combination** of these capacities as different types and intensities of climatic shocks and stresses require different responses. Thus, for instance, a SES with a high level of absorptive capacity but virtually inexistent adaptive and transformative capacities cannot be regarded as climate-resilient. An example for such a system would be a farmer's village, whose inhabitants have weather insurance schemes in place but are not able or willing to adjust their planting behaviour or diversify their sources of income despite persistent and increasing water scarcity.

Figure 1 **Climate resilience, capacities & responses**



Source: Adjusted from Béné et al., 2012

Owing to the holistic nature of the resilience approach, the three capacities are regarded as essentially multi-dimensional. For this reason, it is possible to subdivide each capacity into the five dimensions that constitute a SES, namely the social, ecological, economic, physical and institutional dimension:

- The **social dimension** primarily refers to characteristics such as health, education and food security. Moreover, due to their important role in dealing with climatic shocks and stresses, it also encompasses the prevalence of social networks as well as similar system-wide aspects.

- The **ecological dimension** particularly addresses the diversity and state of the natural environment. These factors (e.g. biodiversity, deforestation rate) determine not only the ecosystem's own ability to adapt to a changing climate but also the functioning of certain ecosystem services on which human beings critically depend (e.g. drinking water, fresh air).

- The **economic dimension** comprises the economic activities within a SES as well as the availability and distribution of financial assets and other endowments, which may fulfil a variety of purposes. Savings can, for instance, be used to repair productive goods damaged by a climatic hazard (restore basic functions) or to finance adjustments in planting behaviour (incremental structural change).

- The **physical dimension** mainly focusses on physical infrastructure such as housing, transport infrastructure, communication networks or health facilities. Their operability particularly during and after the occurrence of extreme events (e.g. main roads being passable after a storm surge) but also in the face of slow onset hazards (e.g. houses on stilts being habitable despite sea level rise) has a great influence on the overall climate resilience of the SES.

- Finally, effective governance and institutions as well as participation on various levels are central

aspects that fall under the **institutional dimension**. They largely determine how the process of building climate resilience is managed within a SES and how different perceptions and objectives are harmonised.

Combining the three capacities with the five dimensions in a **climate resilience matrix** (Figure 2) represents a useful way of illustrating how multi-faceted the ability of a SES needs to be in order to deal with climatic shocks and stresses. In addition, it provides a good starting point for identifying factors contributing to the climate resilience of a system against observed and projected climate change risks and impacts.

Figure 2 Climate resilience matrix

		Capacities		
		Absorptive	Adaptive	Trans-formative
Dimensions	Social			
	Ecological			
	Economic			
	Physical			
	Institutional			

Source: Own elaboration

Climate resilience, however, is not only about aspects that can be neatly fitted into one of the boxes in the table above. In contrast, cross-cutting issues such as social learning, innovation and anticipation also need to be considered when describing the conditions that enable a SES to deal with climatic shocks and stresses. Thus, what are **key characteristics of a climate-resilient system?**

Although many scientists and development practitioners have tried to answer this question, it is still highly debated which characteristics mainly determine whether a SES is climate-resilient or not. In addition, systems on different levels (e.g. fishermen's village vs. entire coastal region) also need different characteristics to be climate-resilient (Mitchell, 2013). Hence, a generic set of key characteristics cannot focus on one level only (e.g. community level) but needs to be applicable to SES on different levels.

Based on a review of numerous resilience concepts, Bahadur et al. (2013) synthesised a set of ten general characteristics of a resilient system. For the approach presented in this discussion paper, certain aspects of this set were revised and simplified, and it was combined with the results from a participatory process to develop a resilience framework in Vanuatu (VCAN, 2013). The resulting eight key characteristics of climate-resilient SES are as follows:

- **Satisfied basic needs:** The population's basic needs such as shelter, sanitation, food, clean water or health care are satisfied.
- **High level of diversity:** Different and partly interrelated forms of diversity exist within the SES such as biological and ecosystem diversity, livelihood diversity and a diverse natural resource base.
- **Effective governance and institutions:** Decentralised, flexible and inclusive organisational structures and policies are in place, which take into account the needs of the whole population including all minority groups.
- **Equitably distributed financial assets:** Financial assets as prerequisites for several strategies to deal with adverse shocks and stresses are available and equitably distributed within the SES.
- **Strong and inclusive social capital:** A high amount of social capital based on mutual trust, norms and social networks exists, which facilitates strong cohesion and cooperation, emergency-support and consensus-building among all actors in the SES.
- **Continuous social learning:** Both individuals and organisations adopt a forward-looking perspective and engage in a continuous process of social learning to be able to anticipate future challenges and act accordingly.

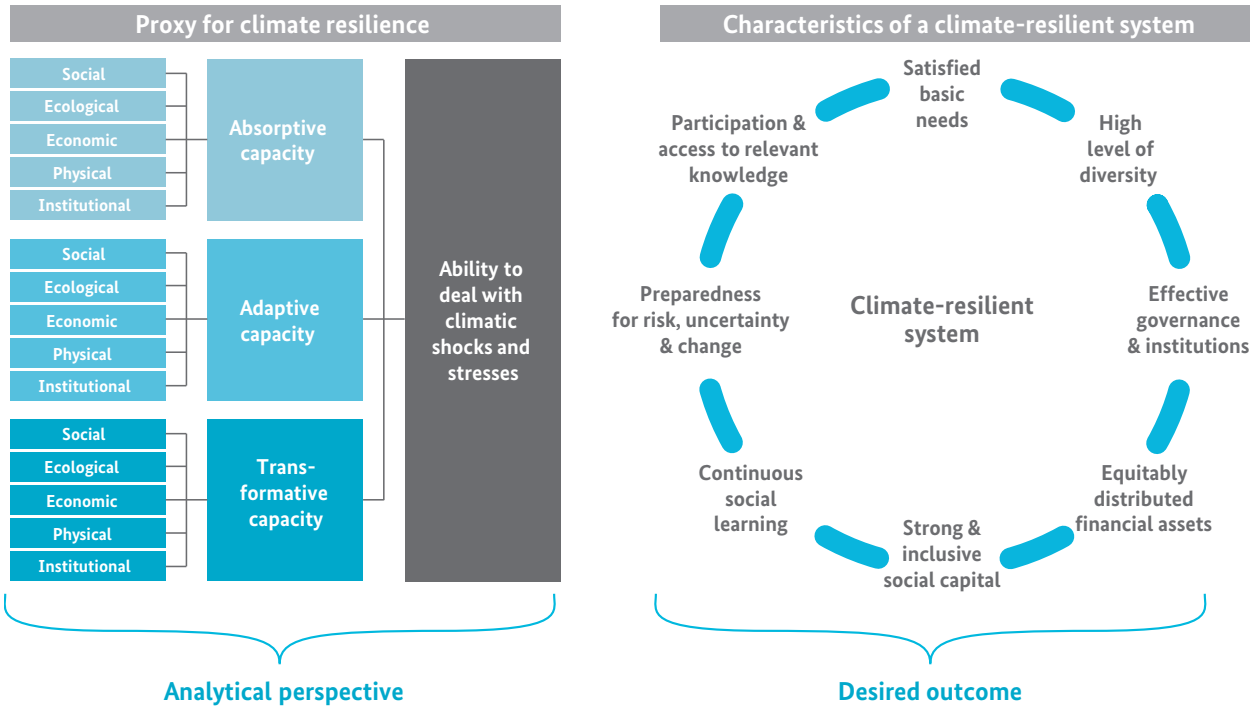
- **Preparedness for risk, uncertainty and change:** The population accepts risk, uncertainty and change as regular elements of their daily lives, acknowledges the need for flexibility in this context, and actively plans for them instead of trying to return to a 'normal' situation.

- **Participation and access to relevant knowledge:** The actions within the SES to deal with shocks and stresses exhibit a high degree of participation and ownership and are based on both traditional and scientific knowledge, which is made widely available to the public.

Containing elements attributable to the dimensions and capacities defined above as well as to several cross-cutting issues, this set of characteristics offers valuable **guidance** for the design of resilience-specific assessment tools. However, the characteristics cannot be directly assessed and the set does not illustrate whether some characteristics are more important than others or how exactly they influence each other. Moreover, in their generic form the characteristics do not explicitly address climate-related risks. Consequently, the characteristics as well as the capacities in each dimension need to be further specified and linked to concrete climatic shocks and stresses when applied to a given country or region.

In summary, while the capacities and dimensions defined by the resilience matrix serve as a proxy to assess whether a SES is climate resilient, the characteristics – depending on the country context – guide the specification of dimensions and capacities, and represent the desired outcome of efforts towards building climate resilience. Figure 3 illustrates the resulting **generic climate resilience framework.**

Figure 3 **Generic climate resilience framework**



Source: Own elaboration

Climate Resilience Assessment Tools

The climate resilience framework outlined above represents a suitable basis for the development of different tools to assess climate resilience in practice. These tools may vary with regard to their degree of sophistication, the level they are targeting (e.g. regional, subnational, national) and the costs of implementation (both financial and time resources). This discussion paper presents **two complementary tools,** which aim to facilitate assessing and monitoring climate resilience on national level at relatively low cost: a set of climate resilience indicators and a catalogue of questions for the integration into regular household surveys. Both tools were developed based on the generic conceptual framework as well as globally available data, and are designed such that they are applicable to a broad range of countries. Thus, the tools should be adjusted to country-specific circumstances and information needs, and enriched by nationally available data before being applied in a given country context.

Climate Resilience Indicators

The **climate resilience indicators** intend to enable a quick overview on a country's level of climate resilience by making use of already existent and publicly accessible data. Relevant national-level indicators mainly originate from different global databases such as the World Bank's World Development Indicators or the FAOSTAT database of the Food and Agriculture Organization of the United Nations. In addition, countries are encouraged to integrate adequate indicators from national datasets to account for country-specific climate change impacts and adaptation priorities. Applying such a tool offers particularly three advantages: First, as no primary data has to be gathered only limited financial and time resources are needed to retrieve a set of climate resilience indicators. Second, the vast majority of global databases are regularly updated, which allows for monitoring changes in climate resilience over time. Third, the retrieved data meets certain methodological standards and the methods used to calculate each indicator are generally outlined in detail.

The overall procedure to identify and make use of climate resilience indicators can be divided into three steps: selecting relevant indicators, calculating aggregated index scores, presenting and interpreting results.

Step 1 Selecting relevant indicators

The climate resilience indicators are based on the conceptual framework presented above, building on the assumptions that climate resilience is a multidimensional phenomenon and that a country needs to exhibit absorptive, adaptive and transformative capacities to build climate resilience. Thus, the set of indicators should cover all combinations of capacities and dimensions illustrated in the climate resilience matrix (Figure 2). Consequently, a **minimum number of 15 indicators** should be selected. However, it is advisable to use more than one indicator per combination in order to get a more detailed picture on a country's level of climate resilience.

The selection of indicators is an important task and should involve various relevant stakeholders. The characteristics of climate-resilient systems provide additional guidance in the selection process. However, it may be difficult to choose the most appropriate from the multitude of globally and nationally available indicators and correctly place them into the climate resilience matrix. For this reason, an **initial repository** [1] was developed consisting of exemplary indicators from global databases, with potential indicators for every combination of capacity and dimension. The repository provides a concise rationale for including each indicator, outlines the climate resilience aspect it aims to address, and states the respective data source. Although not being a complete list, it can serve as a helpful guidance for determining relevant indicators.

[1] Available online at: https://gc21.giz.de/ibt/var/app/wp-342deP/1443/wp-content/uploads/filebase/uploads/Assessing_and_Monitoring_Climate_Resilience_-_List_of_Indicators_-_GIZ_2014.pdf

Based on the initial repository, stakeholders should select indicators that best fit to the country's observed and projected climatic risks and impacts, as well as its adaptation and development priorities. Furthermore, as not all of the global indicators can be retrieved for every country, data availability always needs to be checked. In addition, it should be thoroughly assessed if national databases could be used to generate indicators, which more precisely address the country's ability to deal with specific climate change impacts and priorities. Figure 4 illustrates an exemplary selection of national indicators for the case of Mexico. However, this indicator selection is not based on a participatory process but merely represents the result of a rapid assessment to test the practical applicability of the tool.

Figure 4 Exemplary indicator selection for Mexico

		Capacities		
		Absorptive	Adaptive	Trans-formative
Dimensions	Social	Prevalence of undernour-ishment	Combined gross enrol-ment in education	Gender Inequality Index
	Ecological	Biodiversity & Habitat Index	Agriculture Index	Climate and Energy Index
	Economic	Poverty headcount ratio (USD 1.25)	GINI-Index	Research and development expenditure
	Physical	Improved water sources	Roads, paved	Fixed broad-band internet subscribers
	Institutional	Government effectiveness	Corruption Perception Index	Voice and ac-countability

Source: Own elaboration. For further details on the specific indicators please refer to the repository.

Step 2 Calculating aggregated index scores

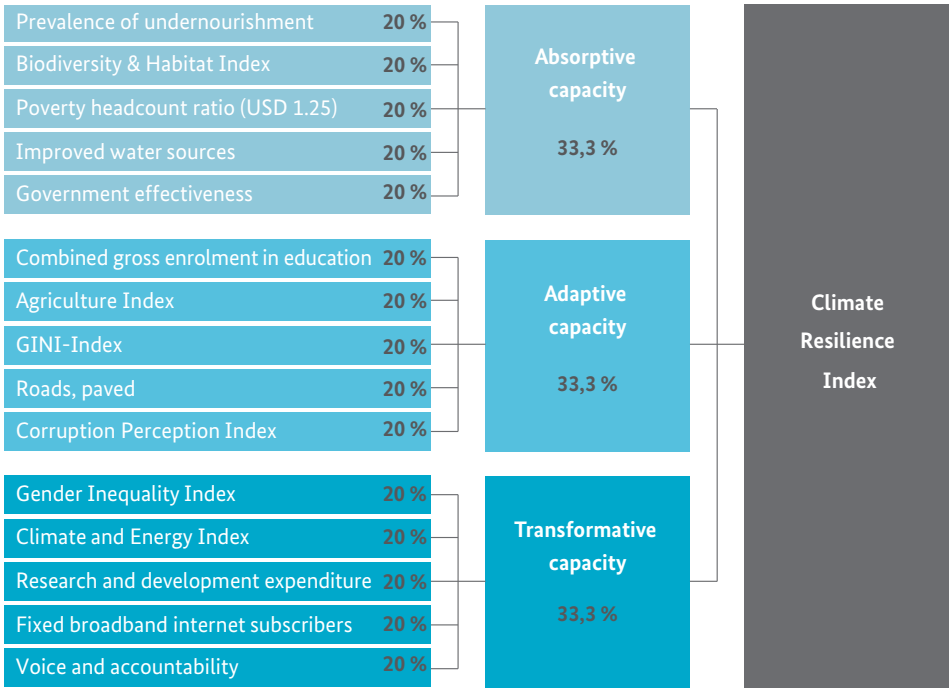
The selected climate resilience indicators may be used in at least three different ways: First, every single indicator may be observed separately to monitor specific climate resilience aspects. Even if indicators are aggregated, this is highly recommended, as it allows identifying why the level of resilience has changed over time. Second, the indicators may be used to calculate aggregated indices for each of the three capacities. Third, these three capacity indices may be further combined to a composite climate resilience index. For each of these applications, the indicators first need to be **normalised** in order to ensure comparability of the respective values. It is beyond the scope of this discussion paper to describe normalisation techniques in detail; however, for reasons of comprehensibility, normalised values should lie between 0 and 100 for all indicators, with 100 being the optimal result in terms of climate resilience [2].

If it is desired to make use of aggregated index values, it has to be decided whether and how to **weight** the different indicators under each capacity as well as whether and how to weight the three capacity indices which jointly build the composite climate resilience index. Although this could also be done by means of statistical analysis (e.g. factor analysis, principal component analysis), relevant stakeholders should be involved in this decision to foster credibility and ownership of results. Taking into account the weights determined on this basis, the scores for the three capacity indices as well as the composite climate resilience index can then be calculated.

In the case of Mexico, equal weights were chosen for both the dimensions and the capacities for simplicity. It may, however, make sense to ascribe a higher importance to some indicators to reflect the adaptation and development priorities of a country (e.g. poverty reduction or food security despite of climate change). Figure 5 displays the components and weights of Mexico's exemplary climate resilience indicators as well as the aggregated indices.

[2] A step-by-step explanation of a widely used normalisation technique can be found in GIZ's recently published 'Vulnerability Sourcebook' (GIZ, 2014).

Figure 5 **Components and weights of Mexico's exemplary climate resilience index**



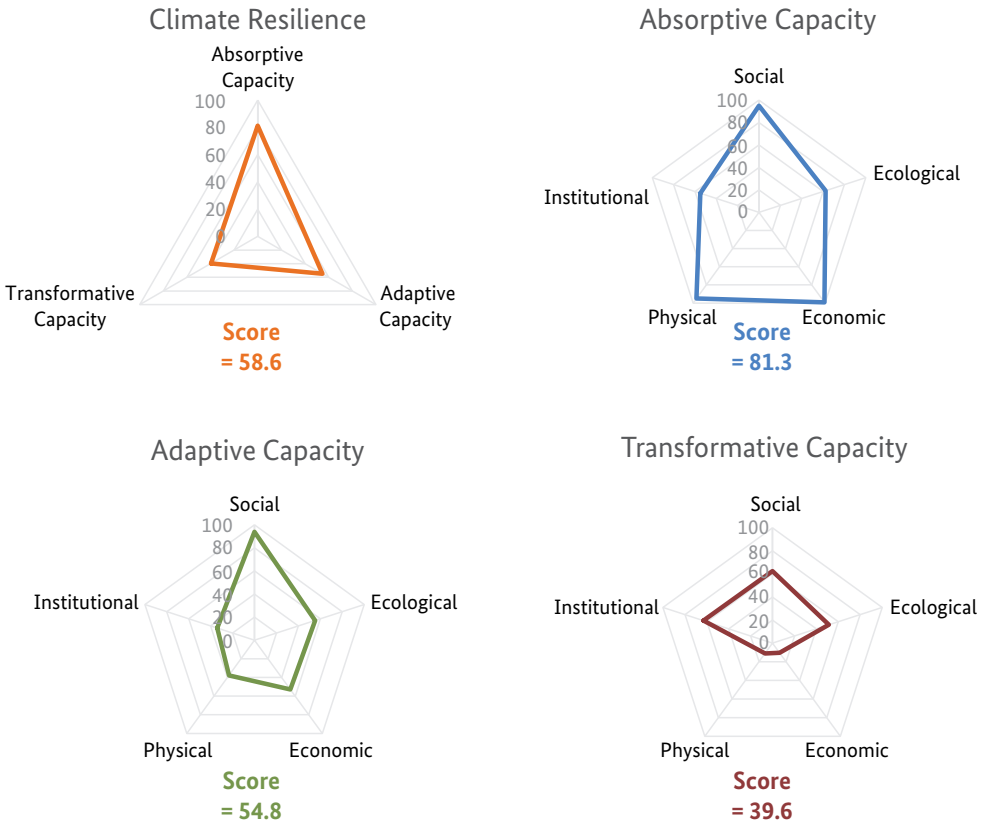
Source: Own elaboration

Step 3 Presenting and interpreting results

Results can also be presented on three levels: on the level of every single indicator or dimension, on capacity level and on the overall climate resilience level. As the required degree of detail always depends on the targeted audience, no clear guidance can be given in this respect. However, merely relying on a single, aggregated index entails the risk of losing valuable information and misinterpreting results. Thus, it is recommended presenting the climate resilience index at least together with the scores of the three capacities upon which it is based. For monitoring purposes, it is moreover highly recommended to look at changes at indicator level.

One useful way of displaying the results is to employ **radar graphs**. On the one hand, these graphs can be used to illustrate the climate resilience index and its underlying capacity indices jointly in one figure. On the other hand, if a higher degree of detail is desired, the different capacities and their respective dimensions can also be displayed in three separate graphs. Used in combination, these four graphs facilitate a quick overview on various layers of a country's climate resilience. Figure 6 exemplifies this approach for the Mexican country case.

Figure 6 **Visualisation of different layers of Mexico's exemplary climate resilience**



Source: Own elaboration

Due to normalisation of indicators, the scores on all levels of aggregation (dimensions, capacities, overall climate resilience) follow a similar logic: The closer to 100, the higher the level of resilience. However, **interpretation of these results** is less straightforward. A climate resilience index of 100 would, for instance, suggest that a country possesses an optimal ability to deal with climatic shocks and stresses. Yet, this would be the ideal situation and the score will usually lie somewhere between 0 and 100. As it is not possible to determine a generic threshold above which a country can be considered climate-resilient, national stakeholders should decide which scores are still acceptable and which are not. Moreover, instead of determining a single threshold, several degrees of climate resilience could also be defined and assigned to different ranges (e.g. 0–25, 26–50, 51–75, 76–100). While the three capacity index scores can be rated and interpreted accordingly, this is not possible in the case of the dimensions. On this level, interpretation depends on the exact meaning of the indicators used (e.g. 5 % of the population are undernourished; 37.8 % of the total roads are paved).

Limitations

Without neglecting that the climate resilience indicators are a quick and cost-efficient way to get an overview on a country's level of climate resilience, this tool also exhibits two **limitations**: First, many of the indicators from the repository are rather generic, which highlights the need to complement them with adequate indicators from national datasets. Second, as the global databases from which the indicators are retrieved do not focus on resilience in particular, not all of the characteristics of a climate-resilient system are reflected adequately in the repository.

These limitations demonstrate that oversimplified conclusions solely based on the climate resilience indicators should be avoided. A closer look at climate resilience on national level can be provided by complementing already existing secondary data with primary data collected in the given country context.

Catalogue of Questions for Household Surveys

The **catalogue of questions for household surveys** addresses some of the climate resilience indicators' limitations and may be used as a separate tool or in combination with the set of indicators. The main rationale behind this tool is to generate primary data specifically for the purpose of assessing climate resilience, whilst minimising the costs by integrating questions into regular national surveys. Such an approach has the advantage that questions can be designed according to the country-specific circumstances, adaptation and development priorities and information needs. The catalogue of questions can mainly be used for two different purposes: On the one hand, it offers the opportunity to gather information on those resilience characteristics not or only partially covered by global or national datasets (e.g. continuous social learning; preparedness for risk, uncertainty and change). On the other hand, it serves as a means to validate national efforts in climate change adaptation and related development activities (e.g. awareness of national disaster risk management and adaptation strategies, satisfaction with storm-proofed infrastructure).

Procedure

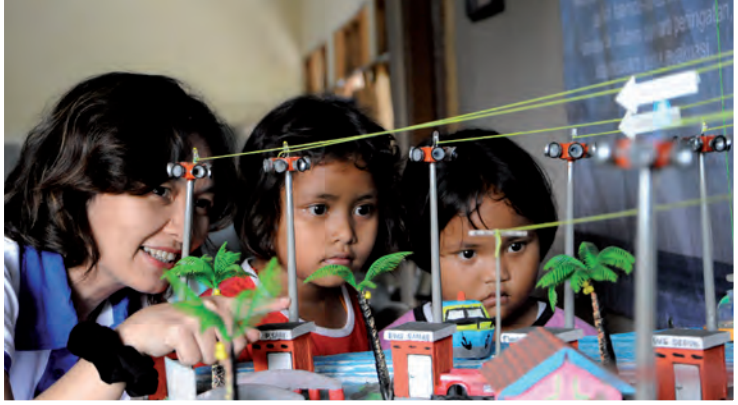
To make use of this tool, the first step is to select or formulate questions addressing country-specific information needs and circumstances most appropriately. It is advisable to use the eight characteristics of a climate-resilient system as general guidance to consider all facets of climate resilience. Moreover, it is useful to organise the questions according to the capacities (absorptive, adaptive, transformative) they are most directly related to.

The **generic catalogue of questions**[3] seeks to assist in the design of country-specific questions to be integrated into national surveys. It contains a variety of questions for all three capacities, which aim at both covering resilience characteristics not included in global and national datasets and validating national adaptation and development efforts. The questions are designed for the application in a quantitative or semi-quantitative survey. However, before being used in practice, they should be modified and/or specified according to the given country context.

In a next step, it has to be decided **how the households will be appraised**. In principal, there are more than enough questions available to conduct a survey that exclusively focusses on climate resilience. Yet, integrating a limited number of questions in regular, representative household surveys (e.g. Household Income and Expenditure Survey) offers particularly two advantages: First, building on already existing surveys avoids creating parallel structures and saves considerable financial and time resources. Second, data generated on a representative and regular basis can be used to create new, resilience-specific indicators providing a country-specific picture of the level of resilience. Thus, countries are encouraged to always consider the possibility of integrating climate resilience questions into existing household surveys.

If a country decides to follow this approach, a limited number of **questions need to be selected.** Given that most regular household surveys are already lengthy, no more than ten to fifteen additional questions should be included. Due to this limitation, the selection process can be difficult and should involve various stakeholders. Box 2 shows an exemplary selection of questions, which could be included in a household survey.

[3] Available online at: https://gc21.giz.de/ibt/var/app/wp-342deP/1443/wp-content/uploads/filebase/uploads/Assessing_and_Monitoring_Climate_Resilience_-_Catalogue_of_Questions_-_GIZ_2014.pdf



Box 2 Exemplary selection of questions for household surveys [4]

Absorptive capacity

- Where do you get information on climate-related impacts and their consequences (e.g. TV, radio, local authorities)?
- How would you rate your economic recovery potential (e.g. through savings, financial support from social networks, insurances) in the face of negative impacts?
- What do you think about the quality of the following facilities that are provided by the government (e.g. early warning systems, emergency shelters, road network)?

Adaptive capacity

- Have you observed ecological changes in your region during the last five years (e.g. forests, soil fertility, coral reefs)?
- How would you rate modifications and adjustments towards climate change adaptation within your region related to physical infrastructure?
- What do you think about the government's performance in terms of climate change adaptation?

Transformative capacity

- How would you rate your ability to fundamentally change your sources of income, if needed?
- Have members of your family migrated permanently (e.g. moved to another village, the district capital, abroad) due to negative impacts of climate change?
- Do you receive electricity from renewable energy sources (e.g. solar home system, micro hydro powerplant)?

[4] In household surveys, many of these questions could be asked in a semi-quantitative or quantitative way, using scales (e.g. from 1 to 5) and predefined categories for the answers.

Presentation and interpretation of results always depends on the selected questions and on the established procedures within the national entity responsible for the survey. Every country should thus independently decide how to communicate the information on climate resilience gathered through regular household surveys. However, if the catalogue of questions is to be used in combination with the climate resilience indicators, relevant questions need to be assigned to combinations of capacities and dimensions, and the respective results need to be normalised.

Limitations

The catalogue of questions for household surveys also exhibits a few **limitations**. First, due to the limited number of questions which may be included in regular household surveys, not all facets of climate resilience can be addressed. Second, if it is intended to compare results over time, the climate resilience-related questions in the survey must not be altered between two survey rounds. This means that the tool becomes less flexible after the initial selection of questions. Third, while the catalogue of questions as a standalone tool facilitates addressing cross-cutting issues, it remains challenging to place the respective results in the climate resilience matrix.

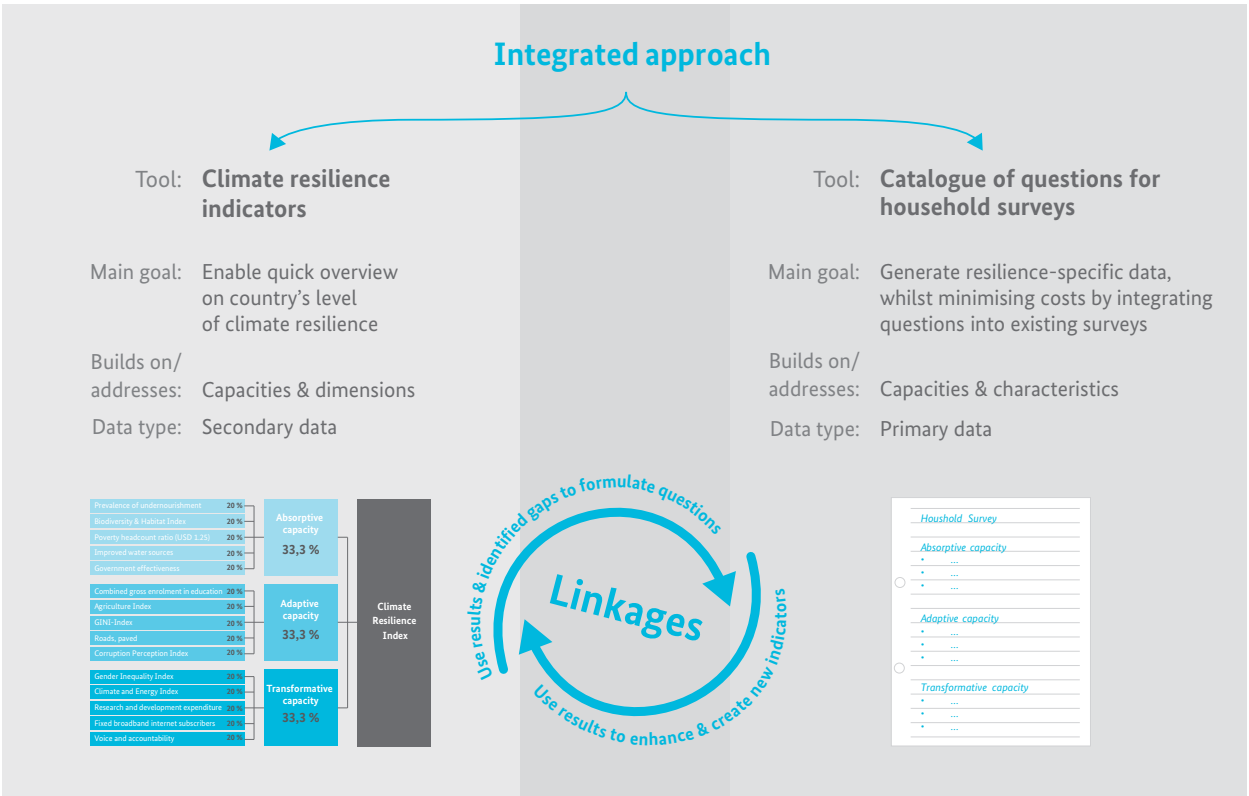
However, users should keep in mind that the conceptual framework, on which the set of indicators and the catalogue of questions build upon, primarily serves as general guidance in order to cover the most important aspects of climate resilience. In order to develop a meaningful tool to assess and monitor climate resilience on national level, it is most important that

indicators and weights are defined with care and in a participatory process. Further, they have to be chosen according to a country's information needs as well as adaptation and development priorities.

An Integrated Approach

Both the climate resilience indicators and the catalogue of questions for household surveys may be applied as stand-alone tools. However, the preceding sections have also highlighted that several linkages and complementarities between the two tools exist, which can be used to offset the limitations of either tool. In particular, the results and identified gaps from the climate resilience indicators may serve as a starting point for selecting, formulating or prioritizing questions to be integrated in regular household surveys. Additionally, the results of these household surveys may be applied to enhance some of the climate resilience indicators or complement them with new ones, which better reflect the country-specific information needs as well as adaptation and development priorities. Against this backdrop, countries should always consider the possibility to use both tools in the form of an integrated approach, which produces a better picture of their level of climate resilience. Figure 7 summarises this integrated approach to assess and monitor climate resilience on national level.

Figure 7 **Integrated approach to assess and monitor climate resilience**



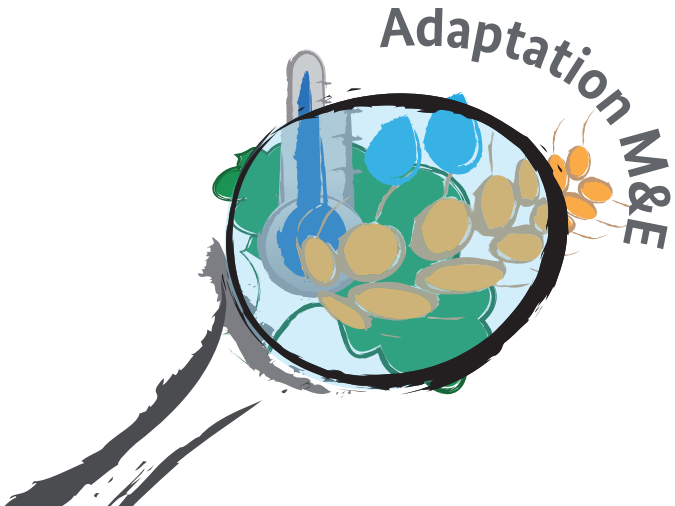
Source: Own elaboration

Key Messages

In summary, this discussion paper highlights the following:

- Against the background of increasing efforts to enhance climate resilience, there is a growing need for approaches assessing and monitoring a country's progress in building resilience.
- Climate resilience is a multidimensional concept and depends on a combination of absorptive, adaptive and transformative capacities.
- The climate resilience indicators facilitate a quick overview on a country's level of climate resilience at relatively low cost by making use of publicly accessible national-level data.
- These indicators can be complemented by integrating questions into household surveys in order to generate country-specific primary data on climate resilience.
- Although both tools have certain limitations, they represent a valuable first step towards assessing and monitoring climate resilience at national level.

The **challenge ahead** is to test and adjust the tools to different country contexts and gather first experience on their practical application within the context of assessing and monitoring climate resilience.



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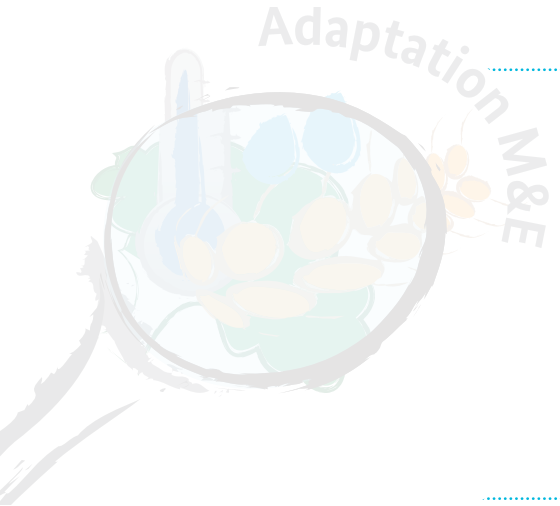
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