American Society of Adaptation Professionals 21 September 2022

Assessing global progress on adaptation

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So how do we measure adaptation?





Differences between measuring mitigation and adaptation

	Mitigation	Adaptation	
Subject of measurement	Physical quantities	Physical, socio- economic	
Objective scale available?	Yes (°C, ppm, tonnes)	No	Challenges for
Unit of measure- ment context dependent?	No	Yes	adaptation metrics!

► No single global universal metric for adaptation progress

A variety of indicators is used for different purposes in the Environment of the Environm

UNEP DT

Adaptation metrics: Perspectives on measuring,

adaptation results

aggregating and comparing

Inputs, outputs and outcomes

Useful to clarify what is being measured:

- Inputs: resources invested in an intervention (time, money, know-how)
- **Outputs:** Products or services resulting from an intervention
- Outcomes: "achieved short-term and medium term effects of an intervention's outputs"

Source: OECD (2002): Glossary of Key Terms in Evaluation and Results Based Management.

https://www.oecd.org/dac/evaluation/glossaryofkeytermsinevaluationandresultsbasedmanagement.htm

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ABC News 🤣 @ABC · 2 T

Hurricane Fiona struck **Puerto Rico** on Sunday, causing major damage, with footage showing the destruction of a **bridge** in the mountain town of Utuado that police say was <u>installed by the National</u> <u>Guard after Hurricane Maria hit in 2017</u>. <u>abcn.ws/</u> <u>3BMDG6a</u>



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Assessing adaptation <u>outcomes</u> – further challenges

Characteristic	Description
Complexity	Climate risks interact with other drivers (e.g., overuse of natural resources, population growth) and with political & economic developments → challenges for attribution
Time horizon	Climate risks increase over time as long as GHG emissions rise → what is effective against current climate risks may be insufficient against future risk levels
Uncertainty	Uncertainty in future GHG emission levels causes uncertainty in projected climate impacts → there'll be a range of risk levels to measure effectiveness against
Maladaptation	Need to account for adverse side effects of adaptation (e.g., more air conditioning powered by fossil fuels = more emissions)
Equity	Need to account for uneven distribution of benefits : adaptation of some groups can be at the expense of others

- ➤ Assessments of adaptation outcomes need to consider who benefits. → Is vulnerability just being shifted from one group to another?
- Effectiveness can vary with different levels of climate risk, e.g., achievements can literally get "washed away" by more intense extreme events.

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See Chapter 17.5.2 Adaptation monitoring, evaluation and learning



Approaches & data sources of potential use for a global assessment

- Global adaptation indicators
- A global adaptation index
- UNEP Adaptation Gap Report
- National adaptation M&E systems
- Global Adaptation Mapping Initiative





Global adaptation indicators

Requirements:

- Relevance to all countries
- Global data availability
- Common measurement standards
- Meaningfulness for adaptation
- Political agreement



IPCC AR6 WGII (2022):

"A set of all-purpose and globally applicable standard indicators that could comprehensively measure adaptation does not exist (high confidence)" (p.17-93)

What about a global adaptation index?

- Construction including indicator selection, weighting, normalisation and data sources have a profound impact on scores
- Ability to guide policy decisions is limited
- See IPCC AR6 WGII Chapter 17.5.2.3 for further references

IPCC climate change

Climate Change 2022 mpacts, Adaptation and Vulnerability Summary tor Policymakers



Chapter 17.5.2 Adaptation monitoring, evaluation and learning





TABLE 3

Adaptation portfolio indicators currently used by international climate funds (selection)

Indicator		Results category
Adaptation Fund		
Number of beneficiaries (direct and indirect)		Output
Number of people trained in climate resilience measures		Output
Early warning systems: number of systems supported and type of support, geographical c	Output or use of output (if operational)	
Assets Produced, Developed, Improved, or Strengthened: absolute number and, where appli- cable, degree of improvement on a 1–5 scale		Output
Meters of coastline protected		Outcome
Hectares of natural habitat restored/preserved		Outcome
Increased income, or avoided decrease in income		Outcome
International Climate Initiative (German Federal Ministry of the Environment (BMU))		
Number of people directly supported by the project to adapt to climate change (disaggregate) by gender)	ated	Output
Number of new or improved policy frameworks developed to address climate change		Output
Number of new or improved institutionalized structures or processes to address climate change		Output
Number of new or improved methodological tools developed to address climate change and conserve biodiversity		Output
Area of ecosystems improved or protected (if adaptation-related)		Outcome
Pilot Program for Climate Resilience (PPCR) (part of the Climate Investment Funds)		
Number of people supported		Output
Number of households, communities, public entities, and businesses using PPCR-supported tools		Use of outputs
Number of development plans or strategies to have integrated climate change (disaggrega	ated	Output
by local, sectoral, and national levels) Number of knowledge products, systems, and studies supported		able continues in he publication)
Number of government officials having received climate resilience training		output

Global climate funds face difficulties finding adaptation indicators

- that are <u>relevant</u> across their portfolio
- That go <u>beyond the output-</u> level

Even where similar indicators are employed, each fund uses its own calculation methods, making data **incomparable** across funds

See the **2019 background paper** to the Global Commission on Adaptation:



https://gca.org/reports/adaptation-metricscurrent-landscape-and-evolving-practices/

Table 1: Comparison of top 20 countries of four vulnerability and risk indices for 2015¹

	ND-GAIN Country Index ⁱⁱⁱ	Global Climate Risk Index ^{iv}	INFORM – Index for Risk Management ^v	World Risk Index ^{vi}	Global vulnerability/risk
1	Central African Republic	Mozambique	Somalia	Vanuatu	indices lead to
2	Chad	Dominica	Central African Republic	Tonga	rankings which
3	Eritrea	Malawi	Afghanistan	Philippines	illustrates how
4	Burundi	India	South Sudan	Guatemala	dependent they are
5	Sudan	Vanuatu	Sudan	Solomon Islands	on the choice of input data and addregation
6	Yemen	Myanmar	Yemen	Bangladesh	method
7	Afghanistan	Bahamas	Iraq	Costa Rica	
8	DR Congo	Ghana	DR Congo	Cambodia	
9	Papua New Guinea	Madagascar	Chad	Papua New Guinea	
10	Mauritania	Chile	Myanmar	El Salvador	
11	Uganda	Pakistan	Mali	Timor-Leste	Climate Change Policy Brief
12	Haiti	Micronesia	Syria	Brunei Darussalam	measured through global indices?
13	Guinea-Bissau	Philippines	Nigeria	Mauritius	This policy brief Vulnerability indices are not appropriate for identifying particularly vulnerable countries
14	Niger	Zimbabwe	Uganda	Nicaragua	The parties that adverses the distribution of the parties of the
15	Congo	Burundi	Ethiopia	Guinea-Bissau	datab pring natata. Da pring ber di kasien di sa maperiaria di savatto y saktiga di hu savatta pring databat pring
16	Liberia	France	Pakistan	Fiji	The data was approximately provide a generation of the strength of the strengt
17	Madagascar	Oman	Kenya	Japan	mitication and an annu mitication of the first historication program. Adaptanciation and notes to readown mitication and and the strength of the matter of the strength
18	Angola	FYR Macedonia	Haiti	Viet nam	coards & edjectivity maximum of the state of
19	Zimbabwe	Italy	Bangladesh	Gambia	schweidelt in chefen dasse, dasse in erstennen in erstennen erstennen in erstennen erstennen in erstennen erst
20	Lesotho	Australia	Niger	Jamaica	
Total	181	134	191	171	https://www.adaptationcommunit

1

https://www.adaptationcommunit <u>v.net/wp</u> content/uploads/2017/09/Policy-Brief Measuring-vulnerabilitythrough-global-indices-GIZ.pdf

Page 9

Explanation: The final row lists the number of countries included by the respective index. Countries in **bold** appear twice among the top 20, countries in **bold** and *italics* appear twice even among the top 10.

Adaptation Gap Report by UNEP

A global assessment of adaptation progress along three dimensions:

1. Planning

- Scope: National adaptation planning
- Quality of adaptation plans

2. Finance

Multilateral and bilateral adaptation finance

3. Implementation

- Internationally-funded adaptation projects
- Global Adaptation Mapping Initiative
- Actions reported by countries in submissions to UNFCCC
- + Effectiveness (new chapter in 2022)









Global stocktake of human adaptation

Global Adaptation Mapping Initiative (GAMI) \triangleright

- What evidence does the literature contain on \geq implemented adaptation?
- Scope: All journals, 2013-2019 \geq
- Team of 120+ authors
- Found 1.682 articles \geq

Analysis:

- 7 topics (Cities, Food, Health, Oceans, Poverty, Terrestrial \geq ecosystems, Water)
- 7 regions \geq
- Questionnaire (codebook) to analyse each article by multiple researchers
- Entered responses into a database \geq
- Synthesised across topics \geq







nature climate change

(R) Check for updates

A systematic global stocktake of evidence on human adaptation to climate change

Assessing global progress on human adaptation to climate change is an urgent priority. Although the literature on adaptation to climate change is rapidly expanding, little is known about the actual extent of implementation. We systematically screened > 48,000 articles using machine learning methods and a global network of 126 researchers. Our synthesis of the resulting 1,682 articles presents a systematic and comprehensive global stocktake of implemented human adaptation to climate change. Documented adaptations were largely fragmented, local and incremental, with limited evidence of transformational adaptation and negligible evidence of risk reduction outcomes. We identify eight priorities for global adaptation research: assess the effectiveness of adaptation responses, enhance the understanding of limits to adaptation, enable individuals and civil society to adapt, include missing places, scholars and scholarship, understand private sector responses, improve methods for synthesizing different forms of evidence, assess the adaptation at different temperature thresholds, and improve the inclusion of timescale and the dynamics of responses.

increasingly urgent calls for robust, systematic and transparent assessments of adaptation progress, which include the regular stocktake of insights from empirical research13. Understanding if and how adaptation is taking place is critical for decision-making. Assessments of adaptation progress can facilitate the sharing of best practices, identify gaps, support the prioritization of adaptation finance and map evidence across regions and sectors34.

In the absence of systematic, global data on adaptation practices, adaptation actions documented in the academic literature provide a valuable complement to efforts to track adaptation on the ground (see Supplementary File 1 for a background on adaptation tracking and global adaptation mapping). Other studies assessed adaptation planning and policy at the regionale 14, national 15-18 and subnational10-25 levels, using information from national communications24-28, local climate change action plans22,23,27,28, adaptation project proposals20 and peer-reviewed literature20. Systematic approaches to synthesizing these and other types of adaptation evidence are emerging and are crucial for learning about what adaptation measures work, under what conditions, for whom and why^{1,30-34}. However, to date, few syntheses of adaptation actions are documented in the academic literature²⁰⁻³². The literature on climate change adaptation is vast and fast-growing, and spread across disparate academic communities32.35-37. Relatively few of these papers document adaptation actions that have actually taken place, but separating out the studies that report on adaptation actions (rather than, for example, vulnerability assessments or studies that model the potential for actions to address climate change or document the barriers that prevent adaptation) is a monumental task. Moreover, it is impossible to document and capture all-or even a fraction of-adaptation-related activities occurring on the ground. and there are therefore no reltable estimates of what proportion of adaptation activities are documented or reflected in the academic literature (Supplementary File 1). As a result, this knowledge base has remained under-utilized, despite the opportunities it presents to better understand the adaptation activities to date and to inform future responses and research.

This article presents a comprehensive, systematic and global review of the academic literature that documents implemented is, far fewer papers) from South America, Central and North Africa,

A full list of authors and their affiliations appears at the end of the paper

NATURE CLIMATE CHANGE | VOL 11 | NOVEMBER 2021 | 989-1000 | www.nature.com/hatureclimatechange

"he Paris Agreement commits parties to track climate adapta- human adaptation actions in response to climate change. We tion progress12. In response, there have been consistent and focus on emptrical studies that report observed adaptation-related responses (hereafter referred to as 'responses'), which reflects our aim to capture adaptations with the potential to directly reduce climate risk, and acknowledges that responses do not necessarily lead to reduced risk. In doing so, we focus on a specific subset of adaptation literature that reflects observed and implemented responses rather than processes of decision-making, adaptation governance and planning.

As the volume of literature makes reliable synthesis via conventional assessment methods impossible, we draw on two recent approaches in information science: machine learning3-e and collaborative networks41-44. Machine learning techniques allow us to rapidly sort thousands of documents and capture the breadth of adaptation literature to an extent that would not be feasible using manual methods 32.36.37.39,46.45. We used supervised machine learning to screen 48,816 articles published between 2013 and 2019 and identifled 1,682 articles that met our inclusion criteria (Methods and Extended Data Figs. 1 and 2). We developed a network of 126 global experts in adaptation research to collaboratively and systematically extract information and evidence from these articles, asking: What climate hazards are driving responses? Who is responding? What types of responses are documented? Is adaptation reducing climate change risk? Are adaptations transformational?

Stocktaking global adaptation responses

Academic studies report adaptation responses across all global regions, with the greatest number of papers reporting responses in Asia (35% of articles) and Africa (32%) (Fig. 1 and Table 1). A minority of publications focused on Central and South America (6%) or Small Island States (2%). Reporting in Africa and Asia is dominated by literature from southern and eastern Africa and South Asta, with limited documentation from Central, Western and Northern Africa and from Northern, Central and Western Asta.

Responses were most frequently documented in the context of food and agriculture (close to 66% of all the articles), which was consistent across all regions except for Oceania and Europe, for which health (both) and adaptation in urban areas (Europe) were more prominent (Fig. 1). We found geographical gaps in evidence (that

Global stocktake of national adaptation M&E systems

How many countries are tracking progress?

Two approaches:

Intention-based

Statements of intent about M&E, e.g. in NAPs, NDCs or National Communications



Chapter 3 in the <u>Adaptation</u> <u>Gap Report</u> 2020

Evidence-based

Evidence that NAP M&E is under development or in operation

Examples of **evidence** are:

- Progress or evaluation reports
- Documents outlining the development of NAP M&E systems
- Information from people involved in the development process of the M&E system

	Contents lists availa	able at ScienceDirect	
100	Environmental S	cience and Policy	
ELSEVIER	journal homepage: www	elsevier.com/locate/envsci	
Do governments trac	k the implementation	of national climate change	
adaptation plans? Ar	ı evidence-based globa	l stocktake of monitoring and	
evaluation systems			
Timo Leiter ¹			
Graniham Research Institute on Climate Chang United Kingdon	p and the Environment, London School of Econom	ics and Political Science (LSE), Houghton Street, London WC2A 2AE,	
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Global stocktake of national adaptation M&E systems

Development phase				Application	
Early stage: 6	Stalled prior to 2015: 6	Advanced: 22	Approved: 5	NAP progress report published: 23*	NAP evaluation published: 15
Benin, Cook Islands, Jordan, Paraguay, Sri Lanka, Uganda	Australia, Mongolia, Nepal, Poland, Tanzania, Tunisia	Albania, Bulgaria, Cameroon, Canada, Colombia, Ethiopia, Fiji, Grenada, Ireland, Moldova, Morocco, Mozambique, Nauru, Peru, Rwanda, Senegal, St. Vincent and the Grenadines, Suriname, Thailand, Togo, Tonga, Vietnam	Finland, Indonesia, Philippines, St. Lucia, Turkey	Austria, Belgium (Flanders), Brazil, Burkina Faso, Cambodia, Chile, Cyprus, France, Germany, Japan, Kenya, Kiribati, Lithuania, Mexico, Netherlands (Delta Programme), Norway, Portugal, Slovakia, Spain, South Africa, South Korea, Switzerland, United Kingdom *+ Sweden + Costa Rica = 25	Belgium, Cambodia, Chile, Czech Republic, Finland, France, Germany, Ireland, Mexico, Netherlands, Philippines, South Korea, Spain, Switzerland, United Kingdom
			, .,	As of 1 Aug	ust 2021

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If a country is missing, please email: <u>T.L.Leiter@lse.ac.uk</u>

See Table 3 →



[START CROSS-CHAPTER BOX PROGRESS HERE]

Cross-Chapter Box PROGRESS: Approaches and Challenges to Assess Adaptation Progress at the Global Level

Authors: Matthias Garschagen, Timo Leiter, Robbert Biesbroek, Alexandre K. Magnan, Diana Reckien, Mark New, Lea Berrang-Ford, So Min Cheong, Lisa Schipper, Robert Lempert

This Cross-Chapter Box responds to a growing demand for assessing global climate change adaptation progress, which currently faces the challenge of lacking consensus on how adaptation progress at this level can be tracked (*high confidence*). The box therefore assesses the rationale and methodological approaches for understanding adaptation progress globally across sectors and regions. It discusses <u>strengths and</u> weaknesses of existing approaches and sources of information, with a <u>view towards informing the first</u> Global Stocktake of the Paris Agreement in 2023.

> Climate Change 2022 Impacts, Adaptation and Vulnerability Summary for Policymakers



IPCC AR5 WGII Chapter 17.5

Approach / Data source	Potential added-value	Limitations	
Systematic assessment of adaptation responses reported in academic literature (e.g. systematic reviews, evidence synthesis, meta-analysis, large-n comparative studies) <u>Examples:</u> Berrang-Ford, 2011 #188}, Global Adaptation Mapping Initiative (Berrang- Ford et al., 2021)	Provides an indication of the status, trends and gaps in adaptation responses	Not a representative sample; biased towards responses published in scientific literature; excludes grey literature; some topics and regions not well covered; challenges in terms of comparability and aggregation; inconsistency in definitions and use of concepts; English language bias	
Self-reported progress documents by countries (e.g. National Communications, Biennial Transparency Reports or domestic progress and evaluation) <u>Examples:</u> (Gagnon-Lebrun and Agrawala, 2007; Lesnikowski et al., 2015; Lesnikowski et al., 2016; Leiter, 2021a)	Context-specific information; official government documents enable assessments of national progress	May only be available every few years; content is sensitive to political and policy changes; possible bias towards positive examples; challenges in terms of comparability and aggregation; inconsistency in definitions and use of concepts	Chapter 17.5 ipcc utterreterent a contract to the contract Climate Change 2022 Impacts, Adaptation and Vulnerability
Self-reported information from the private sector (e.g. information on actions taken in response to climate risks within the context of climate-related financial disclosure or in company reports). Examples: (Committee on Climate Change, 2017; Street and Jude, 2019; UNFCCC, 2021),	Provides an indication of the status, trends and gaps in adaptation responses by the private sector; complements information published in the scientific literature; could enable better understanding of supply chain risks	Sample biased towards larger companies; challenges in terms of comparability and aggregation; potential inconsistencies in definitions and use of concepts	Summary for Policymakers

Table Cross-Chapter Box PROGRESS.1: Key approaches and data sources used for global adaptation assessments.

44 Assessment of existing approaches to assess adaptation progress at the global level

Only few global assessments of adaptation progress across sectors have been undertaken to date (*high* 46 *confidence*). They focus, for example, on whether countries have progressed their adaptation policies and 47 actions over time (Lesnikowski et al., 2015; Nachmany et al., 2019b), the extent of implemented adaptation 48 globally (Leiter, 2021a; Leiter, 2021b), and the type and actors of responses (Berrang-Ford et al., 2021), 49 evidence for reduced vulnerability to climate-related hazards (Formetta and Feyen, 2019; UNDRR, 2019) or 50 adaptation planning in cities across the globe (Araos et al., 2016a; Reckien et al., 2018a; Olazabal et al., 51 2019a). Each of these assessments draw on different approaches and data, and all have particular potential 52 53 but also limitations (Table Cross-Chapter Box PROGRESS.1) (*high confidence*). The application of differing approaches shows that there is no single 'best' approach or data source to assess global progress on 54 adaptation (high confidence). Existing global assessments have provided valuable insights into the extent and 55 types of responses and their level of planning and implementation (16.3.2.4). They do, however, not provide 56 comprehensive and robust answers so far on whether climate risk and vulnerability have been reduced 57

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(Berrang-Ford et al., 2021) (*high confidence*).
 data on climate risk levels, policy measures, i
 is currently regarded the most robust approacl
 agreement).

Conclusion:

"the **combination** of different approaches will provide a **more comprehensive picture** of global adaptation progress than is currently available from individual approaches (*low evidence, high agreement*)." (p.17-99)

Conclusion

- > No single approach / data source on global adaptation
- > Set of global adaptation indicators:
 - > What purpose / what exactly should they inform?
 - > Data availability, methods and political agreement

> Pragmatic approaches:

- Available information on relevant dimensions (approach of the Adaptation Gap Report)
- Information from national adaptation progress reports
- Information from civil society and professional organisations
- Comprehensive picture of global adaptation only possible through a combination of approaches

Chapter 17.5



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Publications



ResearchGate: Timo Leiter





Pitfalls and potential of measuring climate change adaptation through adaptation metrics







Linking Monitoring and Evaluation of Adaptation to Climate Change Across Scales: Avenues and Practical Approaches

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Timo Leiter





human adaptation to climate change

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to better understand the adaptation activities to date and to in future responses and research.

This article presents a comprehensive, systematic and g review of the academic literature that documents implem

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Adaptation made to measure

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Monitoring & evaluatio

ANALYSIS

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Global environmental agreement-making: Upping the methodological and ethical stakes of studying negotiations

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Leading evaluation practitioners were asked about lessons from the recent 26th Conference of the Parties (COP26) for evaluation practice. Contributors emphasize the importance of evaluating equity between rich and poor countries and other forms of climate injustice. The role of the evaluation is questioned: what can evaluation be expected to do on its own and what requires collaboration across disciplines, professions and civil soriety - and across generations? Contributors discuss the implications of the post-Glasgow climate 'pact' for the continued relevance of ovaluation. Should evaluators advocate for the marginalized and become activists on behalf of sustainability and climate justice - as well as advocates of evidence? Accountability-driven and evidence-based evaluation is needed to assess the effectiveness of investments in adaptation and mitigation. Causal pathways in different settings and 'theories

of no-change' are needed to understand gaps between stakeholder promises and delivery. Evaluators should measure unintended consequences and what is often left unmeasured, and be sensitive to failure and unanticipated effects of funded actions. Evaluation timescales and units of analysis beyond particular programmes are needed to evaluate the complexities of climate change, sustainability and to take account of natural systems. The implications for evaluation commissioning and funding are discussed as well as the role of evaluation in programme-design and implementation

Keywords

Abstract

adaptation and mitigation effectiveness, building evaluation alliances, climate injustice, holism and natural systems, timescales and sustainability, transforming evaluation practice









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