



The Higher Ground Foundation
- stand up to climate change



جامعة محمد السادس
متعددة التخصصات التقنية
MOHAMED VI POLYTECHNIC UNIVERSITY
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Session 5

Adaptation Metrics: Concept, Methodologies, Processes, Mechanisms and Standards

Karl Schultz, Executive Chairman
The Higher Ground Foundation

ADVANCED COURSES/TUTORIALS

on Adaptation Metrics and Techniques
for Agriculture and Water, October 24-25, 2018

Within the framework of the International Conference on
"Adaptation Metrics for Agriculture, Water and Resilient Cities"

UM6P - Benguerir, Morocco



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Session Outline

1. Why adaptation metrics?
2. Adaptation metrics context
3. “Systems” and adaptation
4. Measuring adaptation in systems
5. Metrics criteria
6. Technical tools for metrics
7. Approaches to metrics
8. Where are adaptation metrics heading?



I. Why adaptation metrics?

Ensuring effectiveness of actions for:

- ☐ Target setting
 - ☐ Policies
 - ☐ Programs
 - ☐ International reporting (NDCs, National Communications)
- ☐ Planning and design
 - ☐ How will investments and other measures be impacted by exposure to climate change?
- ☐ Monitoring and Evaluation (M&E)
 - ☐ For program and project accountability
 - ☐ To understand what works and how
- ☐ Finance
 - ☐ Consider and measure physical risks of climate change on assets and investments, how investments and risk management mitigate these risks
 - ☐ Potential for certifying metrics, pricing and transferring



II. Adaptation metrics context

Adaptation metrics should be a “big deal” now

- ☐ No results target in Paris agreement
 - ☐ Paris goals financial – money spent
- ☐ No system in place to “measure” adaptation
 - ☐ No agreed-upon standard: standards are at the level of agencies and sometimes only project-level
 - ☐ Context is king – but does this diminish accountability?
 - ☐ Funders are reluctant to support projects if results are not demonstrable
- ☐ Local actions with largely local benefits – challenges in standardizing
- ☐ Adaptation needs to consider time and confidence:
 - ☐ Resilience outcomes (as opposed to outputs) are often difficult/impossible to measure during project implementation periods
 - ☐ Current and future impacts different
 - ☐ Considerable uncertainties
- ☐ Adaptation is undertaken in complex systems



III. Systems and adaptation

What does “system” mean and how does this relate to metrics?

- ☐ System: “a regularly interacting or interdependent group of items forming a unified whole” [Merriam-Webster Dictionary]
- ☐ Systems and adaptation – complexities but importance to count all the below when considering adaptation impacts:
 - ☐ Bio-physical
 - ☐ Economic
 - ☐ Social/Cultural
 - ☐ +Interaction between each
- ☐ Questions of setting boundary, and of “leakage”
- ☐ Questions of Scale – individual, a local community or a nation?
 - ☐ All may count as a system, but complexities, way vulnerabilities and adaptations are made manifest and and what we choose to count will be very different



IV. Measuring adaptation in systems

Different value and meaning attributable depending on type of metric

☐ Indicators

- ☐ Value of specific variables (e.g., health, flood events, number served “wellbeing”, “resilience factors”) hoped to be achieved through adaptation

☐ Indices

- ☐ Set of related indicators to compare performance across similar projects or programs

☐ Standards

- ☐ Set of related indicators, benchmarks or indices providing meaningful performance information



All of above may address (*or claim to*) activities/inputs, outputs, outcomes, and impacts.

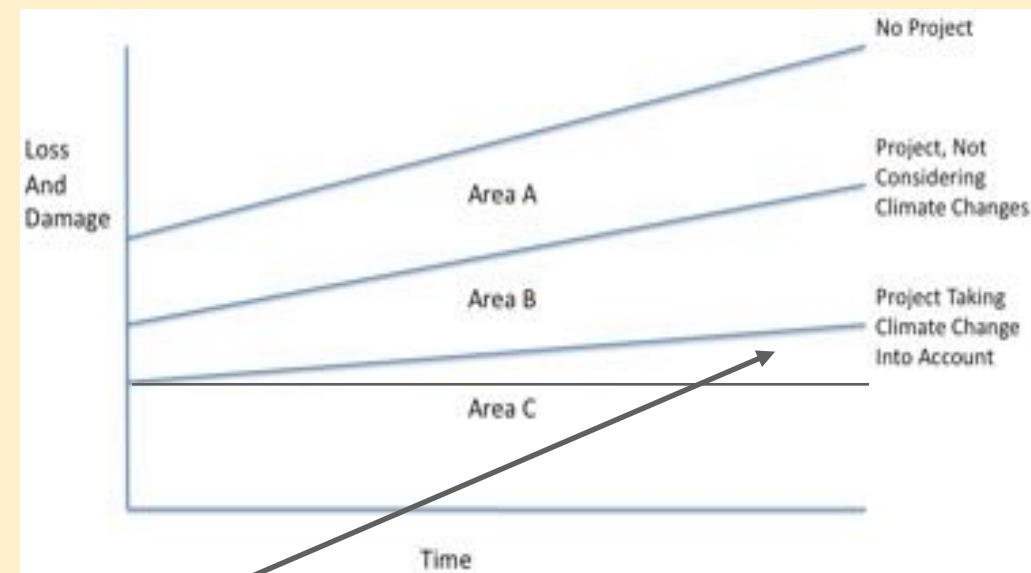


IV. Measuring adaptation in systems: baselines?

Adaptation against what?

- ☐ Water provision – without “a project”
 - ☐ Not considering climate change, or
 - ☐ Considering climate change
- ☐ A “water project”
 - ☐ That reduces loss/damage, even if it doesn’t look at climate changes
- ☐ A “water project, with specific climate adaptations”
 - ☐ Looks at current “deficits”
 - ☐ Looks at climate change, and addresses these changes

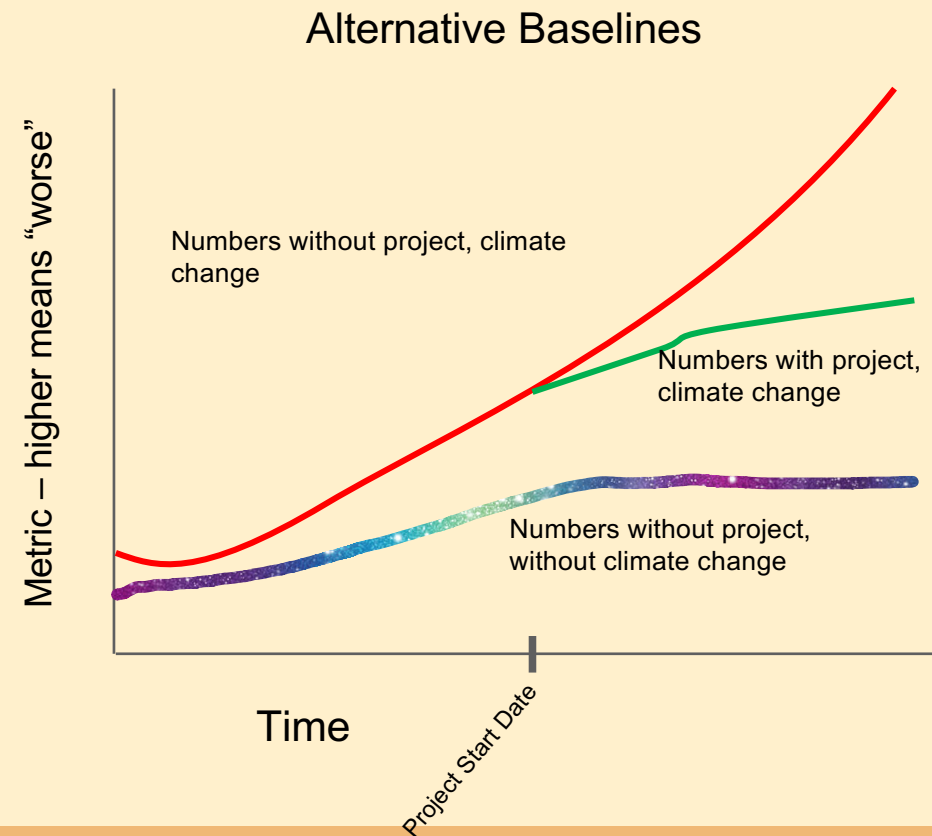
Alternative Baselines



IV. Baselines: extra-climatic changes and time

Adaptation against what?

- ☐ Other variables impacting metrics:
 - ☐ Demographic: population, aging, fertility
 - ☐ Economic: growth/decline, changes in economic inputs/outputs
 - ☐ Environmental/Natural Resource:
- ☐ Historical climate change
 - ☐ Can we establish how much metrics impacted - already?
 - ☐ Do we count these and the avoided impacts?
- ☐ Loss and damage – what can't be avoided?
- ☐ What assumptions about the future?
Emissions scenario, modeling uncertainties



VI. Some technical tools for assessing adaptations

Tool	Description	Applicability
Cost-benefit analysis	Approach to calculate and compare benefits and costs of adaptation in specific situation. Assigns a monetary value to alternatives.	When economic data (including non-financial like time value out of market) is available and is viewed as encompassing much of the value of alternatives
Cost-effectiveness analysis	Compares the relative costs and outcomes (effects) of alternative adaptations. Expressed as a ratio, not monetized value.	Uses a variety of factors besides monetized value. Often used in health sector: years of life, quality adjusted life years (QALY).
Risk analysis	Analysis of impacts of CC and responses – esp. losses or gains: consequences x probability	Disaster risk management, but also can integrate “adaptation – dynamic socio-economic aspects” – considering alternative futures
Multi-criteria analysis	Use multiple objectives/indicators associated with adaptations	When not possible to evaluate in monetary terms, and integrating stakeholder perspectives



VII. Alternative measurement/evaluation approaches

Many approaches are guided by the intended use

A. “M & E” approaches

Used for programs that need to understand and/or show results of implemented projects – or the program itself. Examples:

- ❑ Developmental Approach: Tracking adaptation and measuring development TAMD (IIED)
- ❑ National Adaptation Plans (NAP): PEG M&E Tool
- ❑ Adaptation Fund/GCF: fund-specific requirements

The Adaptation M&E Navigator: Matching specific M&E purposes to relevant M&E approaches

#	Specific purpose	M&E approach	General purpose	Focus on processes or outcomes	Complexity	Subjectivity	Experience
1	Monitoring the integration of adaptation into planning (mainstreaming)	Qualitative assessment based on interviews	Learning	P	L-M	H	M
		Quantitative or qualitative indicators	Management, Accountability	P	L-M	L-M	M
2	Monitoring the implementation of adaptation programmes, projects or actions	Defining and monitoring activities and outputs	Management, Accountability	P	L	L	H
3	Monitoring the implementation of the National Adaptation Plan process	Defining and monitoring milestones in the NAP process	Management, Accountability	P	L	L-M	L
4	Tracking adaptation activities at national or sub-national level	Database of adaptation activities	Management, Knowledge sharing	P	L-M	M	L-M
5	Assessing the results of adaptation projects or actions	On an ongoing or repeated basis	Qualitative assessment involving beneficiaries	P/O	L-M	H	M
			Theory of change with adaptation-specific indicators	P/O	M	L-M	M
			Repeated vulnerability assessments	See specific purpose #7			
		At a certain point in time, typically after completion	Impact evaluation	O	H	L	L
			Assessing avoided economic losses and health benefits	O	H	L	L
6	Assessing the results of a programme or portfolio of adaptation projects	Project-specific indicators informing a synthesis of portfolio results	Accountability	P/O	M	M	L
		Standard indicators for every project to enable aggregation	Accountability	P/O	M	L-M	M
7	Assessing whether vulnerability has been reduced as a result of adaptation programmes, projects or actions	Measuring vulnerability with indicators as part of a results-based monitoring system	Management, Accountability	O	M	L-M	M
		Repeated vulnerability assessments	Simple	O	L	H	M-H
			Data intensive	O	M-H	L-M	L
8	Assessing progress towards adaptation at national level	Qualitative assessment without indicators	Learning, Management, Knowledge-sharing		L-M	M-H	L
		Indicator-based assessment	Trend indicators	P/O	M	L	L-M
			Based on assumptions about how activities lead to outcomes	P/O	M-H	L-M	L-M
			Household level questions as part of national census surveys	O	M-H	H	L

Explanation: L = Low, L-M = Low to Medium, M = Medium, M-H = Medium to High, H = High; P = Process, O = Outcome, P/O = Process and/or Outcome

The Adaptation M&E Navigator was developed by GIZ GmbH on behalf of BMZ. The online version is available on www.AdaptationCommunity.net under "Monitoring & Evaluation". A technical description is available in the book "Evaluating Climate Change Action for Sustainable Development (January 2017, Chapter 18, available for free download by Springer Publishing).



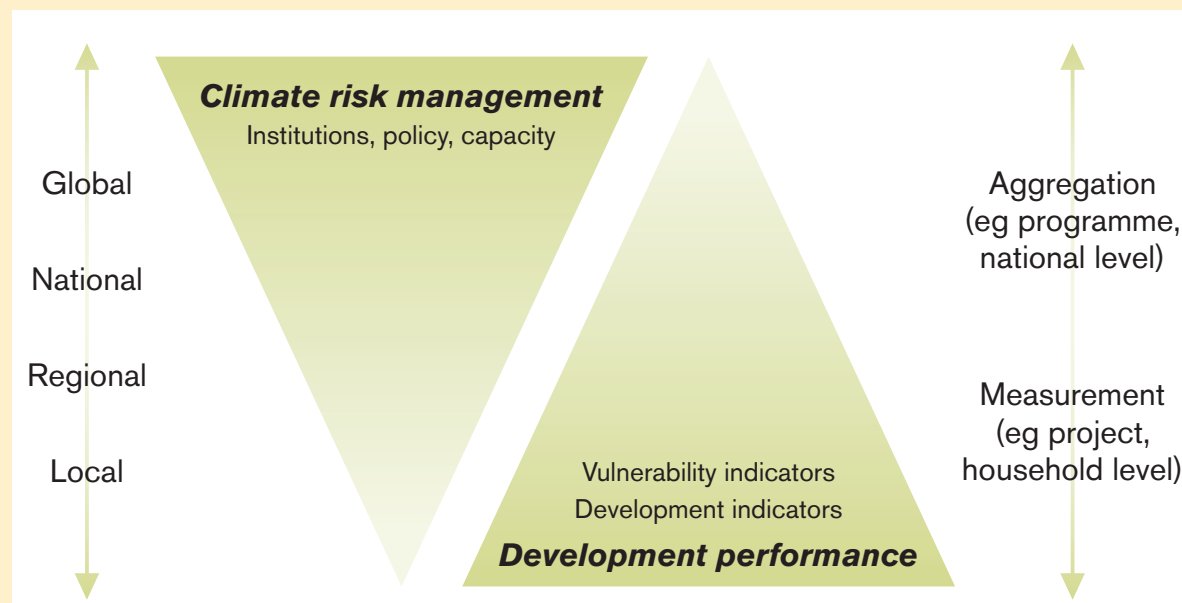
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VII (cont.): “M&E” Approaches

Tracking adaptation and measuring development (TAMD)

- ❑ Developed by International Institute of Environment and Development (IIED)
- ❑ Its purpose:
 - ❑ Evaluate climate risk management at international, national and sub-national scales
 - ❑ Assess if development outcomes enhance local climate resilience, can it aggregate at larger scale



TAMD Framework (IIED, 2011)

VII (cont.): “M&E” Approaches

TAMD Application: Indicators, Activities

☐ Indicators:

- ☐ Climate Risk Management (Process/Mechanisms)
- ☐ Resilience (Categorical (L,M,H), Binary (Y/N), and Continuous (Numbers))
- ☐ Wellbeing (costs, poverty, nutrition, health)
- ☐ Climate (Duration of dry episodes, maximum rainfall intensity)



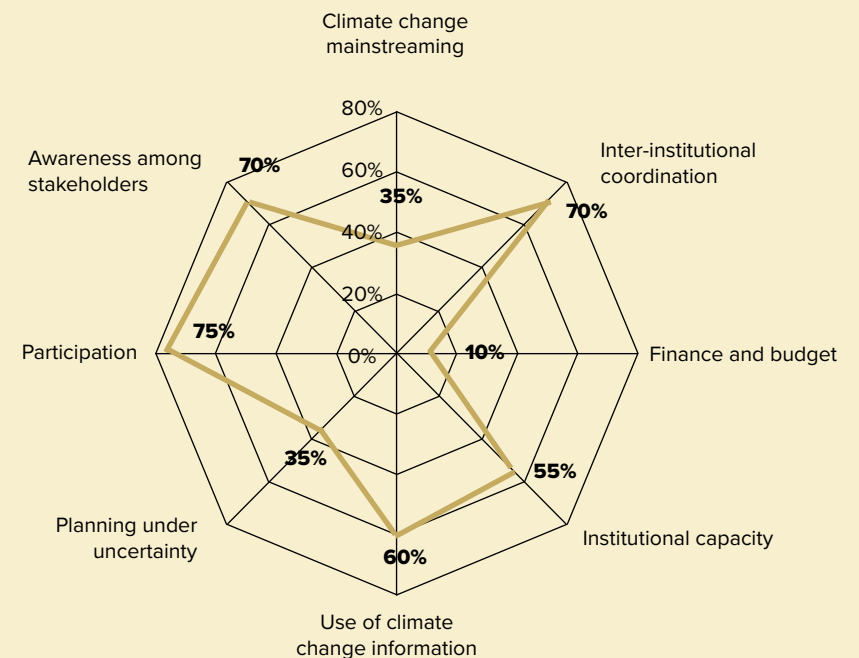
VII (cont.): “M&E” Approaches

TAMD Application: Activities

Assessing how framework could be used with national systems, integrated into climate funds

- Example: Mozambique Local Adaptation Plans
 - Includes risk management capacities
 - Identify context appropriate indicators fitting with the “theory of change”

Figure 3. District of Guijá: institutional scorecard results (Artur et al., 2014, p. 33)



Source: Governo de Guijá (2014)



VII (cont.): “M&E” Approaches

Metrics for National Adaptation Plans (NAPs)

TABLE 3D. SUGGESTED STEPS AND INDICATIVE ACTIVITIES FOR ELEMENT D ON REPORTING, MONITORING AND REVIEW OF THE NAP PROCESS

Steps	Indicative activities
Element D. Reporting, monitoring and review	
1. Monitoring the NAP process	<ol style="list-style-type: none"> Identify (few) areas of the NAP process that will be evaluated through qualitative and quantitative performance measures as part of an assessment of effectiveness of, and progress and gaps in, the NAP process For the areas identified for evaluation, define metrics for documenting progress, measuring and communicating levels of effectiveness and assessing gaps Collect information on the metrics, throughout the NAP process
2. Reviewing the NAP process to assess progress, effectiveness and gaps	<ol style="list-style-type: none"> Compile and synthesize information from new assessments and emerging science, as well as the results and outcomes from adaptation activities being implemented, to support the review and update of the NAPs and related outputs Review, on a regular basis, activities undertaken as part of the NAP process by evaluating the information and metrics collected as part of the monitoring of the process
3. Iteratively updating the national adaptation plans	<ol style="list-style-type: none"> Update the national adaptation plans, and related documentation, at a frequency specified in the national mandate, framework or strategy for the NAP process, by repeating selected steps as appropriate Work towards aligning the production of updates to the NAPs with relevant national development plans
4. Outreach on the NAP process and reporting on progress and effectiveness	<ol style="list-style-type: none"> Disseminate the NAP documents and related outputs to the UNFCCC secretariat and to other relevant stakeholders, as these become available Provide information in national communications on progress in and effectiveness of the NAP process

- *Process metrics:* to assess leadership and to measure courses of action to achieve a goal. Metrics include the presence of leadership for each activity, a functioning peer-review process involving all stakeholders, participatory input into planning, the use of benchmarks where appropriate, and appropriate events and activities;
- *Input metrics:* to measure tangible quantities put into a process to achieve a goal. Metrics include sufficient expertise and knowledge to support the work, a sufficient level of commitment of resources, and the degree to which activities build on existing resources and products;
- *Output metrics:* to measure the products and services delivered, new skills and knowledge developed;
- *Outcome metrics or results-based metrics:* to measure results that stem directly from the actions of the programme and the influence that participants or activities have outside the programme (unintended outcomes). Metrics include improved adaptive capacity and economic or development impacts, the capacity to make better adaptation decisions, and the integration of climate change concerns into planning and development processes;
- *Impact metrics:* to measure the long-term consequences of outcomes, such as contributions towards future decisions, tangible societal benefits, a resilient society, and transformed social and economic systems that are well-adjusted to a changing climate. Some impacts would be unexpected. These may only be measurable long after a project is over.



VII (cont.): “M&E” Approaches

Metrics for National Adaptation Plans (NAPs)

LEAST DEVELOPED COUNTRIES EXPERT GROUP

Monitoring and assessing progress, effectiveness and gaps under the process to formulate and implement National Adaptation Plans: The PEG M&E tool



http://www4.unfccc.int/nap/Documents%20NAP/50301_04_UNFCCC_Monitoring_Tool.pdf



United Nations
Framework Convention on
Climate Change

LDC EXPERT GROUP 2015



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VII (cont.): “M&E” Approaches

Indicators for National Adaptation Plans (NAPs)

Figure 11: Kenya's Adaptation theory of change

ADAPTATION INDICATORS		
National	Sector	County
<ul style="list-style-type: none"> Human development index Percentage of climate related national loss and damage in the public and private sectors Population living below the poverty line National vulnerability index 	<ul style="list-style-type: none"> Number of sectors planning, budgeting and implementing climate change adaptation actions National and county performance contracting systems integrating climate change adaptation targets Amount of loss and damage from climate hazards per sector Amount of private sector financing for adaptation 	<ul style="list-style-type: none"> Number of counties that have integrated climate change adaptation in their GDPs Number of counties budgeting and implementing adaptation programmes No of national and county level programmes/projects incorporating ecosystem-based adaptation and community-based adaptation approaches Number of households with timely access to climate information Number of infrastructure development cases/application using climate smart designs (energy, ICT, transport) Number of people reached through climate change adaptation public awareness campaigns Number of public servants trained on climate change adaptation Number of functional climate change coordination structures Percentage of population requiring humanitarian assistance

← Kenya
Togo →

Tableau 7 : Indicateurs du processus par domaine d'observation

Domaine d'observation	Objectif du domaine d'observation	Indicateurs
Intégration	Assurer l'intégration de l'ACC dans la planification des politiques, stratégies et projets/programmes de développement	<ul style="list-style-type: none"> Le nombre de politiques/stratégies intégrant l'ACC entre 2017 et 2021. La proportion de projets intégrant les ACC dans les plans de développement entre 2017 et 2021.
Portage	Renforcer l'appropriation des questions de l'ACC par les responsables politiques, administratifs et techniques.	<ul style="list-style-type: none"> Le nombre de cadres de concertation opérationnels sur l'intégration des ACC au Togo entre 2017 et 2021. Le nombre d'institutions engagées dans le processus à différents niveaux : <ul style="list-style-type: none"> National: X en 2017 à Y en 2021 ; Régional: X en 2017 à Y en 2021 ; Local: X en 2017 à Y en 2021.
Financement	Assurer l'accroissement durable et efficace des financements pour la mise en œuvre des actions et mesures d'ACC	<ul style="list-style-type: none"> La proportion du budget affecté à l'ACC dans les plans de développement au niveau national a passé de X% en 2017 à Y% en 2021. Volumes des financements extérieurs mobilisés pour ACC en 2017 et 2021
Communication	Améliorer la communication sur le processus PNA	<ul style="list-style-type: none"> Le nombre de rapports produits sur les ACC a augmenté de X% entre 2017 et 2021. Le nombre de séances de communication animées sur le PNA a passé de X en 2017 à Y en 2021.
Diffusion des données sur les changements climatiques	Assurer la diffusion des données et informations sur le processus PNA	<ul style="list-style-type: none"> La fréquence de la diffusion des données sur les actions et mesures d'ACC a augmenté de X% de 2017 à 2021.
Capacités des acteurs	Améliorer les capacités institutionnelles et techniques permettant de conduire des mesures	<ul style="list-style-type: none"> La proportion de documents de planification (secteurs) à différents niveaux qui intègrent les ACC: <ul style="list-style-type: none"> National a passé de X% en 2017 à Y% en 2021; Régional a passé de X% en 2017 à Y% en 2021; Local a passé de X% en 2017 à Y% en 2021. Nombre de cadres formés en intégration de l'ACC entre 2017 et 2021
Mise en œuvre des actions prioritaires	Améliorer la planification et la mise en œuvre d'actions prioritaires.	<ul style="list-style-type: none"> Le nombre d'actions d'ACC planifiées et financées a passé de X en 2017 à Y en 2021. Le nombre de projets identifiés dans le cadre du PNACC mis en œuvre. La proportion des projets intégrant l'ACC pris en compte dans le PIP a passé de X% en 2017 à Y% en 2021

VII (cont.): “M&E” Approaches

Adaptation Fund

Fund Outcome Indicator Units
<p>1. Generation of relevant data, Stakeholders, and Timeliness</p> <p>2.1. Include both qualitative and quantitative measures of capacity level within targeted institutions</p> <p>2.2. Number (men and women and other vulnerable groups)</p> <p>3.1. Use scale from 1 to 5: 5: Fully aware 4: Mostly aware 3: Partially aware 2: Partially not aware 1: Aware of neither predicted adverse impacts of climate change nor of appropriate responses</p> <p>3.2. Use scale from 1 to 5: 5: All 4: Almost all 3: Half 2: Some 1: None</p> <p>4.1. Summarize in an overall scale (1-5): 5: Highly responsive (All defined elements) 4: Mostly responsive (Most defined elements) 3: Moderately responsive (Some defined elements) 2: Partially responsive (Lacks most elements) 1: Non responsive (Lacks all elements)</p> <p>4.2. Summarize in an overall scale (1-5): 5: Fully improved 4: Mostly Improved 3: Moderately improved 2: Somewhat improved 1: Not improved</p> <p>5. Depends on the targeted natural asset:</p> <p><i>Biological (species):</i> measure through changes in population numbers (dynamics, structure, etc.)</p> <p><i>Land:</i> measure changes in hectares. Baseline data will be necessary to estimate the change. Supporting indicators baseline and target (as well as contextual information) are needed such as the following: Farmers adopting recommended technologies, Ha. of land improved, Average deforestation rate Etc.</p> <p>Use scale from 1 to 5: 5: Very effective (All elements are present) 4: Effective (Most elements are present) 3: Moderately effective (Some elements are present) 2: Partially effective (Most elements are not present) 1: Ineffective (No elements are present)</p> <p>6.1. Summarize in an overall scale (1-5): 5: Very high improvement 4: High improvement 3: Moderate improvement 2: Limited improvement 1: No improvement</p> <p>6.2. Household income by source of livelihood in project area (USD) prior and post project intervention</p> <p>7. Summarize in an overall scale (1-5): 5: All (Fully integrated) 4: Most 3: Some 2: Most not integrated 1: None</p>
Fund Output Indicator Units
<p>1.1. Number, sector(s) and level(s) of projects or interventions in separate fields of monitoring plan</p> <p>1.2. Number</p> <p>2.1.1. Number of staff (male/female) of targeted institutions: a. Obtain baseline information: total number of staff from targeted institutions b. Define target</p> <p>2.1.2. Number of staff (male/female) of targeted institutions: a. Obtain baseline information: total number of staff from targeted institutions b. Define target: needs to be defined by project proponents</p> <p>2.2.1. <i>Quantitative:</i> Percentage (includes women - and other vulnerable groups - and men).</p> <p><i>Qualitative:</i> Adequacy: include direct analysis of major areas; adequacy/effectiveness of systems or analysis of perceptions of populations and institutions.</p> <p>2.2.2. Number (broken down by gender and, if possible, by vulnerable groups defined in the area of intervention) of people</p> <p>3.1. Number and type (in separate columns) at local level.</p> <p>3.2. Number</p> <p>4.1. Number and type</p> <p>4.2. Number and type (entered in separate columns)</p> <p>5. Number of interventions by type of natural asset and intervention</p> <p>6.1. Number and type (in separate columns of monitoring plan)</p> <p>6.2. Income sources per household; description of income source and number of households.</p> <p>7.1. Number/Sector</p> <p>7.2. Number, Effectiveness (see previous indicator) through enforcement level.</p>

Adaptation Fund Impact Indicator “Increased income, or avoided decrease in income”				
Date of Report				
Project Title				
Country				
Implementing Agency				
Project Duration				
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Income Source ⁸ (name)				
Income Source				
Income level (USD)				
Number of households (total number in the project area)				
(report for each project component)				



VII (cont.): “M&E” Approaches

Green Climate Fund

Green Climate Fund Adaptation Indicators

Criterion	Definition	Coverage area	Activity-specific sub-criteria	Indicative indicators (or assessment factors)
Impact potential (continued)	Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas (continued)	Adaptation impact	Contribution to increased climate-resilient sustainable development	<ul style="list-style-type: none"> Expected total number of direct and indirect beneficiaries, (reduced vulnerability or increased resilience); number of beneficiaries relative to total population (PMF-A Core 1), particularly the most vulnerable groups Degree to which the activity avoids lock-in of long-lived, climate-vulnerable infrastructure Expected reduction in vulnerability by enhancing adaptive capacity and resilience for populations affected by the proposed activity, focusing particularly on the most vulnerable population groups and applying a gender-sensitive approach Expected strengthening of institutional and regulatory systems for climate-responsive planning and development (PMF-A 5.0 and related indicator/s) Expected increase in generation and use of climate information in decision-making (PMF-A 6.0 and related indicator/s) Expected strengthening of adaptive capacity and reduced exposure to climate risks (PMF-A 7.0 and related indicator/s) Expected strengthening of awareness of climate threats and risk reduction processes (PMF-A 8.0 and related indicator/s) <p>and/or</p> <ul style="list-style-type: none"> Other relevant indicative assessment factors, taking into account the Fund's objectives, priorities and result areas, as appropriate on a case-by-case basis



VII. Alternative measurement/evaluation approaches

B. Financial instruments

Used to understand investment risks and impacts – often beyond financial value but to assign value to investments or their underlying climate resilience. Examples:

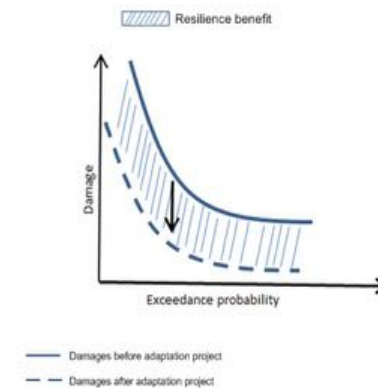
- ❑ Green Bond Assessment - Standard and Poors rating agency
 - ❑ Use climate impact cost-benefit analysis to derive “resilience benefit” and an “adaptation score”
- ❑ Adaptation Benefit Unit (ABU) – African Development Bank
 - ❑ Not a metric, but rather framework with metrics sector specific, price based on cost

Assessing Resilience Benefit: Definitions

Resilience Benefit is the estimated reductions in the expected damages that the project aims to achieve

Resilience Benefit Ratio =

Resilience Benefit/ GB Financing



S&P Global



VII. Alternative measurement/evaluation approaches

C. “Universal” metrics:

Aim is to create unit/approach to compare across sectors/project types Two exist:

- ☐ Saved Wealth/Saved Health (Perspectives GMBH)
 - ☐ Uses economic, health and qualitative environmental indicators. “Multi-criteria” – without aggregation: no single unit.
- ☐ Index of Usefulness of Practices for Adaptation to climate change (IUPA)
- ☐ Vulnerability Reduction Credit (VRC™) (Higher Ground Foundation)



https://www.adaptationcommunity.net/?wpfb_dl=139



VII (cont.): “Universal Metrics

- ❑ Index of Usefulness of Practices for Adaptation to climate change (IUPA)
 - ❑ Uses multi-criteria analysis and expert judgements
 - ❑ Weighting on case by case basis...
 - ❑ Purpose is primarily for planning, before projects have been implemented
 - ❑ How does view of climate changes fit in IUPA? How do pathways approaches fit with it?

IUPA: a tool for the evaluation of the general usefulness of practices for adaptation to climate change and variability

P. Debels · C. Szlafsztein · P. Aldunce · C. Neri · Y. Carvajal · M. Quintero-Angel · A. Celis · A. Bezanilla · D. Martínez

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Nat Hazards (2009) 50:211–233

Table 2 General suggestions for weight factor values for the different evaluation criteria: mean values, standard deviations and variable classification based on a sample of eight opinions

Variables	Average weight factor	Standard deviation	Variable class
Accomplishment of the objectives	8.3	1.0	A
Implementation time	6.8	0.7	A
Total cost	6.6	1.3	A
Robustness and/or flexibility	8.9	0.8	A
Level of autonomy	7.1	1.5	A
Proportion of beneficiaries	7.1	1.6	A
Continuity in time	7.8	0.9	A
Level of resilience	8.4	1.2	A
Integration	7.5	1.4	A
Participation of target population	8.5	1.1	A
Attention to most vulnerable groups	7.9	1.2	B
Level of environmental protection	6.8	1.0	B
Repeatability	5.6	1.8	B
Incorporation of local/traditional knowledge	6.0	1.9	B



VII (cont.): “Universal Metrics

❑ Vulnerability Reduction Credit (VRC™) (Higher Ground Foundation)

- ❑ Avoided impact costs and per capita income unit, guided by a VRC Standard Framework



Using Impact Cost Analysis to Create a “Universal” Metric

$$\text{Number of VRCs} = \frac{(\text{AIC} \times \text{IEF})}{€50}$$

Arrows point from the components of the formula to their definitions: AIC to 'Avoided Impact Cost', IEF to 'Income Equalization Factor', and the denominator '€50' to 'Nominal Value'.



VRC Project Development Cycle



1



VIII. Technical applications for adaptation metrics

Earth Observation, Modeling Outputs Data Portals:

- ❑ Integrate data portals like Global Earth Observation System of Systems (GEOSS) to meet data/analytical output needs of project developers to prepare project documents for validation/registration
- ❑ Combine Internet of Things (IoT) with portals where viable for weather observational data management/project monitoring and verification

Big Data Analytics:

- ❑ Use for metrics/indices methodology and metric quantification



VIII. Technical applications for adaptation metrics

Internet of Things (IoT):

- ❑ For project monitoring and verification, tracking metrics data through reporting (possibly transaction) chains
- ❑ Becoming more applicable as smart phones/devices expand coverage and price declines

Distributed Ledger (e.g. Blockchain):

- ❑ Potential for both inputs to metrics/indices (especially if commodities) and for use in secure, distributed, transparent transmission (possibly transaction/exchange) data
- ❑ May enhance efficiency and funding transparency – e.g. for local govt. funding

VIII. Conclusion: where are adaptation metrics heading?

A host of inter-related drivers of adaptation metrics developments

- ❑ Policies (international, national, corporate)
- ❑ Standards (ISO, TCFD, ResilienceIntel, etc.)
- ❑ Business opportunities
- ❑ Science/Technology
- ❑ Social movements
- ❑ Your thoughts?

Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.

Margaret Mead



Selected online resources

- ❑ <http://www.unepdtu.org/newsbase/2018/03/new-publication-on-adaptation-metrics-released?id=2ee1a180-9012-47a2-a50a-d5316246a814>
- ❑ <https://www.adaptationcommunity.net/monitoring-evaluation/>
- ❑ <https://www.adaptationcommunity.net/wp-content/uploads/2017/05/Adaptation-ME-Navigator-Overview-Table-for-AdaptationCommunity-2017.jpg>
- ❑ <https://www.iied.org/tracking-adaptation-measuring-development-tamd>
- ❑ <https://ukcip.ouce.ox.ac.uk/wp-content/PDFs/MandE-Guidance-Note2.pdf>



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