IPAM submission to the UAE-Belem Work Programme
March 2024

The International Platform on Adaptation Metrics (IPAM) is the leading network of institutions and teams working in the field of adaptation metrics, launched in May 2020 following prior dialogues initially convened during Morocco's COP22 Presidency. IPAM seeks to compare results and create synergies, as well as advance science, technology, and practice. For this reason, IPAM welcomes the call for inputs in Decision 2/CMA5 and is pleased to submit its views on the two-year work programme on indicators for the Global Goal on Adaptation.

General narrative: The UAE Belem WP ("UBWP") should be a primarily technical and expert-driven process leading to a robust technical review and co-development of indicators, with a view to supporting the delivery of the GGA.

I. Views on the organizational work and structure of the work programme

1. Modalities for stakeholder engagement

- It is key to ensure the inclusion and equitable representation of a diverse group of experts from different regions, especially LDCs, and from different backgrounds, with a strong focus on including women, youth, and indigenous communities— improving upon the Glasgow-Sharm el Sheikh Work Programme.
    - Incorporate the regional weeks to have some regional perspectives captured in the overall UBWP.
    - Workshops should be framed as multi-stakeholder dialogues. In that sense, the WP needs to encourage the involvement of national as well as international experts from organizations, thematic/sectoral experts, policy makers, Monitoring, Evaluation, and Learning (MEL) practitioners, constituted bodies, different observer constituencies, and/or the IPCC/IPBES/IUCN, as well as other stakeholders involved in developing, implementing, or communicating adaptation at different levels.
    - The UBWP should consider having distinct and specific calls for inputs that are conducive (notably by their being issued adequate lengths of time in advance) to a higher engagement of research institutes, adaptation planners, and practitioners, as well as their technical inputs.

2. Procedural considerations for the secretariat

- It is important to communicate and report back in a timely manner while accommodating time zones and providing virtual options.
    - Information dissemination regarding upcoming meetings needs to be earlier and improved, and workshop reports should be published as soon as possible so Parties, observers and non-Party stakeholders can progress on their positions and research work.
    - The UBWP needs to enable the inclusive and transparent participation of all relevant constituencies by giving a minimum of several months of notice, particularly to enable research institutes and other stakeholders to mobilize their special expertise.
    - Financial resources to support expert engagement at meetings and the technical work required as inputs are essential for a fully inclusive and informed process.
- In line with our general narrative, this process should not be organized as a negotiation workshop with party statements. Instead, the WP should prioritize activities such as breakout sessions with guided questions and rapporteurs. In that sense, we suggest organizing the WP into working groups for the identification and development of thematic (paragraph 9 of Decision 2/CMA5) and dimensional (paragraph 10) indicators.

3. Timelines

- Although this process is advertised as a 2-year WP, the work will only begin by the Subsidiary Bodies meeting in June 2024, which leaves us with a year and a half of indicator co-development at best, stressing the need for proper planning, continuity, and inclusion of expertise.
    - Due to the limited time and work density, we recommend 3 formal workshops ahead of COP29 and 4 workshops in 2025, as well as additional efforts and deliverables from “offline” workstream(s) between workshops for developing indicators, which should be based on a transparent, inclusive, expert-driven approach.
    - It is crucial to allow sufficient time between workshops for the offline workstreams and intersessional work to make meaningful progress, with sufficient understanding of the forward work plan trajectory through to COP30. This will ensure that the WP maintains momentum and produces high-quality outputs.
    - See below for a suggested delineation of workshops and their expected outcomes (Section III).
    -

II. Recommendations on the technical work approach [Substance of the WP]

- The objective of the technical work is to establish a comprehensive, complementary, yet succinct set of metrics to monitor progress towards the GGA, ensuring that the required effort is consistent with the abilities and resources of all involved parties.
- Indicators (whether existing metrics from other frameworks or proposed new metrics) should be evaluated based on a variety of criteria, including: (i) their relevance to climate change adaptation; (ii) significance for impact and outcomes (in line with the GGA targets); (iii) broad applicability (in different contexts); (iv) potential for scaling usage (including existing practice/deployment and cost-effectiveness); (v) ability to be aggregated; and (vi) comparability. Commonly reported metrics typically assess the resources dedicated to adaptation (inputs) rather than the effects of these efforts (outcomes), the reason being that 'input-type' indicators are easier to quantify than 'outcome-type' indicators. However, it is critical that the WP prioritize outcome-based indicators and identify the necessary methodologies and resources to evaluate and report them.
- The technical work should develop a systematic and transparent process for assessing the relative strengths and weaknesses of adaptation indicators (noting the above). In that regard, IPAM formed an ad hoc working group supporting this submission to develop an indicative understanding of such a proposed systematic assessment process. The proposed approach (detailed for one indicator in the annex) allows for a systematic assessment of adaptation indicators supporting adaptation targets of the UAE Framework for Global Climate Resilience.
    - The IPAM ad hoc working group, with expertise in agriculture and water, applied three criteria proposed in the IPAM Statement on Adaptation Metrics for Global Goals to assess the relative strengths and weaknesses of a possible agriculture adaptation indicator. The indicator was economic water productivity (EWP), and the team assessed whether this indicator 1) provides information on climate change adaptation; 2) is widely applicable; and 3) is scalable, comparable, and aggregable. The qualitative assessment identified how well EWP met the criteria and gave scores of high, medium, and low.
    - This approach could be used by subject-matter experts to examine a number of possible indicators for individual GGA targets.

    - A basket of indicators may be needed for many of the targets, and the basket should be evaluated as to whether it sufficiently covers the breadth of goals in each GGA target without imposing undue monitoring and reporting burdens and with flexibility in the deployment of indicators based on parties' capacities
    - This IPAM submission further details the working group's experience and lessons learned in the annex.
- The UBWP needs to strive for coherence between reporting demands and avoid duplication of work by leveraging existing indicators wherever possible in line with the WP's mandate of "identifying and, as needed, developing indicators and potential quantified elements for those targets" (para. 39).
    - This process therefore needs to look at existing reporting frameworks and identify indicators that were developed under the Sustainable Development Goals and the Sendai Framework. Furthermore, UN specialized agencies such as the FAO, WMO, and WHO, among others, should provide useful inputs.
    - It is also important, in this process, to promote open databases for data analysis and use existing databases for the indicators. Sensitivity to national or subnational data privacy needs to be balanced with the importance of transparency and availability benefits for the public good.

III. Suggested workshop topics and expected outcomes: timeline breakdown, participant mix, work definition, offline assignments, deliverables

Workshop 1 (15-17 May 2024)

The first workshop should provide guidance to the UBWP's work plan by facilitating a consensus on the views on organizational work and identifying a way forward. The workshop should lead to:

1. Discussing overarching planning of the programme and overlaps between thematic subjects and adaptation policy cycle phases,
2. Breaking down the programme's work into thematic (para. 9) and dimensional (para. 10) while establishing focused working groups for each, each with a mix of technical stakeholders to define the criteria for indicators and the scope of the baskets of indicators for each thematic and dimensional target,
3. Identifying the scope of each working group's indicators' review.

Due to the WP's short timeline for identifying and, as needed, developing indicators and potential quantified elements for GGA targets, we suggest setting up a community of practice/taskgroup composed of technical experts based on the criteria outlined in Section I to lead an offline workstream for indicator/sourcing identification, reviewing, and development. In that sense, the first workshop should aim to define and assign the offline workstream's tasks, its rapporteur(s), its deadlines, etc.

Workshop 2 Date TBD: End of July-August 2024

- Further to the need for 'baskets' of indicators for each target, presentation of a listing of indicators and sourcing as a product of intersessional work led by the offline task group.
- Parties, experts, and other stakeholders review the relevance and data intensity of the list of comprehensive and non-redundant indicators.
- **Expected outcome:** A refined list of indicators is classified into four tiers: a) readily available (e.g., from other reporting requirements); b) easily estimated with available data; c) can be estimated with moderate effort/data collection; d) can be estimated with significant effort/data collection.[1]

Workshop 3 Date TBD: End of September 2024

- Presentation of a list of indicator categories/baskets laid out into different tiers that require different levels of technical and financial capacities.
- **Expected outcomes:**
    - Identification of resources (financial and technical) needed by developing countries to meet reporting requirements;
    - Development of a mechanism/expert-led process to identify a maximum number of indicators from already estimated indicators, global databases, etc.
    - A dedicated portal/database with constraints on themes and format to allow comparability and consistency should be considered.

Workshop 4 Date TBD: Early 2025

- A workshop dedicated to capacity building, experience-sharing, and case studies on indicator development using global data bases, remote sensing, and AI (in groups broken down into thematic areas).

[1] Cf. Section IV on additional remarks in regards to the tier classification and incentive regime.

- **Expected outcome:** enhanced capacity for innovative indicator development methods.

Workshop 5 Date TBD: May 2025

- Invite presentations of country-level indicators by parties' technical experts and other national and local stakeholders to further inform the community of practice's scope of indicator review.
- Development of the long-term capacities of the 'community of practice' to sustain learning, collaboration, and good practice sharing in the different thematic areas of the UAE Framework for Global Climate Resilience.
- **Expected outcome:** strengthened and consolidated technical community of practice.

Workshop 6 Date TBD: July 2025

- Prior to workshop 6, the selected baskets of indicators for the targets should be made open to review by parties, experts, and other stakeholders, requesting final feedback with an expected review time of 45–60 days from the call.
- This workshop is the last chance to address the issues raised and finalize the pool of indicators.
- Expected outcomes: finalized list of indicator options incorporating expert feedback.

Workshop 7 Date: TBD, September

- This would be an opportunity for the technical experts involved in the UBWP to provide a handover of the outputs to decision-makers prior to COP 30 and a formal agreement on the selected indicators. It would entail briefing on work, sharing of indicators, analysis of indicator options and their expected benefits and drawbacks, and recommendations for technical follow-up by the community of practice articulated in Workshop 5.

IV. Additional reflections

- Consider setting up an incentive regime—related to the provision of means of implementation—associated with enhancing reporting capacity and quality of indicators used.

- While a ‘basket of indicators’ is warranted for each target, there are differentiated capacities for parties related to accessing data and deploying indicators. As such, there is a need for differentiated indicators and their corresponding use in setting national adaptation targets and understanding the outcomes of adaptation policies, plans, and investments.
- Enhancing the capacities of parties to deploy indicators that enhance confidence in adaptation outcomes (reduced vulnerability to climate change and enhanced adaptive capacities) is a crucial priority. Incentives for parties to deploy the most relevant indicators should be encouraged. This entails (1) providing financial and technical resources to enhance indicators and data capacities; (2) providing international resources for well-articulated adaptation needs for all countries; and (3) enhancing flexibility for parties that deploy indicators and analyses that support policies, plans, and investments that can justify their adaptive benefits and ensure minimal risk of maladaptive outcomes.
- In other words, every party shall be resourced for adaptation and indicators/data capacity building as needed, but those deploying more and higher-tier indicators have more flexibility in triggering resources owing to enhanced confidence in adaptation outcomes as a result of more sophisticated indicators and reporting.

ANNEX:
Assessing Indicators for Use in Evaluating Progress Toward Meeting GGAs: Proof of Concept

Introduction

IPAM is contributing to the UNFCCC Belem process by applying the criteria from its 2023 Statement on Adaptation Metrics for Global Goals to assess the relative strengths and weaknesses of indicators that could be used by the UNFCCC to assess progress in future Global Stocktakes. This could support meeting the 11 targets for the Global Goal on Adaptation (GGA) under the United Arab Emirates (UAE) Framework for Global Climate Resilience, which identifies 11 targets for the Global Goal on Adaptation (GGA). The proposed analytical approach could be employed by the UNFCCC to evaluate and assess any potential indicators of the UAE Framework's targets.

In this exercise, IPAM identifies three proposed criteria that indicators should meet to be widely useful in assessing adaptation progress. The criteria are:

1. **Identification with Climate Change Adaptation**. This means that the indicator can demonstrate adaptation progress consistent with targets.
2. **Widely Applicable.** The indicator should be useful around the world. Additionally, data to support the indicator should be readily and widely available, and all countries must have sufficient capacity to collect required data and report on the indicator.
3. **Scalable, Comparable, and Aggregable.** The indicator should be useful across both geographic and temporal dimensions. This means the indicator can be applied in different countries and can show change over time. It should enable results to be compared across different locations and over time. Finally, it is also desirable for indicators to be able to be designed in a way that they can be combined at different geographic scales, ranging from sub-national to national, subcontinental to continental, and, ultimately, global.

The assessment process analysis also covers the extent to which individual indicators cover the breadth of individual GGA targets. After considering a number of possible

candidates for indicators on agriculture, the IPAM working group chose 'economic water use productivity' (EWP) as an example of proof of concept to illustrate how to assess potential indicators based on how well they meet the three criteria previously discussed.

The EWP indicator was not necessarily selected because IPAM thinks it is the best indicator that can show whether progress is being made on agriculture adaptation. Instead, it was selected to demonstrate proof of concept.

Numerically, EWP is defined as the ratio of the net benefit (e.g., crop yields, net value, nutrition (calorific), food, income, and livelihood) from the agricultural system (including crop, livestock, fishery, and forestry) to the amount of water used (available through irrigation or precipitation) to produce the benefit. The **numerator** can be the net value of the output (based on the yield and the input costs, including the cost of irrigation water if used), nutrition, job, welfare, and environmental benefits. The **denominator** is the amount of water used expressed in a common unit of measure (e.g., m3 or KL) (Molden et al., 2010; Foley et al., 2020).

EWP is a measure of economic efficiency (value of agricultural output) compared to the use of a scarce resource, water. Thus, it is a measure of supply or production efficiency but is not a measure of the adequacy of production or distribution of food. A higher EWP economic water productivity ratio signifies more effective utilization of water resources. This is vital for ensuring food security, fostering economic growth, and promoting environmental sustainability.

Criterion 1: Identification with Climate Change Adaptation

The evidence of significant impacts from recent and future climate trends (e.g., combined effects of temperature and precipitation, increased extreme events) and shifts in climate envelopes on crop yields is now well established. This is important because an estimated 1.2 billion people live in areas where agriculture faces severe water shortages (FAO, 2020). Globally, 23% of land is under irrigated agriculture, which supports about 40% of the food supply. Nearly 60% of irrigated cropland is highly water-stressed (Caretta et al., 2022). Water-related hazards such as drought or floods combined with limited access to irrigation water have been the major drivers of agricultural yield loss, with mean climate and climate extremes accounting for 20–49% of yield anomalies (Vogel et al., 2019).

On this basis, it is evident that climate change is likely to contribute to extreme shortages of irrigation water in many areas in the absence of any adaptive measures (e.g., Dai, 2022), which will be captured in a decline of EWP. Among water-related adaptation practices in agriculture, the most widely used and documented approaches include water and soil conservation measures such as reduced tillage, contour ridges or mulching, crop diversification, improved agronomic practices, more efficient irrigation technologies, planting schedules, crop varieties, application of fertilizer, livelihood diversification, and social protection measures such as crop insurance. These measures increase resilience and enhance adaptive capacity in terms of increases in incomes and yields and water-related outcomes (e.g., water saving and positive ecological and socio-cultural benefits) and will lead to an increase in EWP.

In addition to factors directly impacted by changes in climate (e.g., temperature and precipitation), the value of EWP depends on other aspects such as market price fluctuations, soil type and quality (water retaining capacity and fertility), variability in irrigation water availability, and agronomic practices, including the application of fertilizers and pesticide use. Because EWP is sensitive to changes in these factors, it further provides an opportunity to assess the adequacy of the water-related adaptation intervention.

EWP's sensitivity to fluctuations in price (when expressed in monetary terms) is particularly significant because these can also be affected by non-climate factors. Price fluctuations may be due to several exogenous factors, mainly affecting input costs. Societal changes, which may or may not be related to climate, can change the demand for and supply of water and the value of agricultural production. These factors may serve as limitations in measuring the effectiveness of adaptation intervention. An EWP indicator definition having nutrition (calorific values), job, welfare, and environmental benefits as numerators avoids such limitations.

Criterion 2: Widely Applicable

EWP serves as a proxy for tracking progress in addressing water-related climate change-induced water availability challenges. As changes in precipitation leading to droughts and lower water availability are anticipated across much of the arable world, this is a widely applicable indicator. EWP, particularly when measured in $/m3, is applicable across various scales of analysis, including individual farms, regions, or entire nations. The productivity of cash crops can be readily tracked through the market value of production. The volume of production can also be tracked. EWP may be less applicable in the following contexts: where water scarcity (including supply,

transportation, distribution, and equity concerns taken into account) is not a current or projected concern. However, even in circumstances with higher average water availability, there is relevance to the applicability of EWP, as less efficient water productivity may have negative implications (e.g., ecosystem services that cannot easily be quantified in monetary terms). This, in particular, is relevant if there are water exports or imports that supply other regions with water scarcity.

The application of EWP may be more limited where data on crop productivity, value, and distribution are not available or are sufficiently granular to take into account geographic or temporal water variability. This may be a significant limitation to the use of EWP because these circumstances are exactly where the water productivity issues (and their wider socio-economic impacts) are likely to be of most significance. However, satellite-based remote-sensing data for the numerator and the denominator at various spatial and temporal levels has enabled comparing the EWP at regional and global levels. Further concerns may be found regarding the impact EWP has on economically heterogeneous farming populations and crops and the corresponding variability in water availability and access to efficient water productivity. If, for instance, large-scale commodity crop production has high economic water productivity and smallholder farms have low water productivity, the socio-economic impacts and levels of vulnerability and adaptive capacities will be less clearly understood. More disaggregated economic water productivity data may overcome these concerns.

Criterion 3: Scalable, Comparable, and Aggregable

The EWP indicator can facilitate comparisons and evaluations of water use efficiency in generating economic returns across diverse contexts, irrespective of the scale or extent of the water management system under scrutiny (thus, it is scalable). However, the indicator solely reflects the efficiency of water use within each location, not the effectiveness of its use. Due to variations in economic structures among nations, EWP will need to be used judiciously, taking into account a country's specific sectoral activities and natural resource endowments.
EWP can also be used to measure change over time at a specific location. As noted above, changes in value can be the result of climate and non-climate factors. Where there is commonality in terms of the agro-climatic conditions, including climate, soil type, and crop type, the indicator could be used to measure, compare, and potentially even aggregate EWP spatially and at different scales ranging from farm level to regional, national, and global scales (Hoover et al., 2023; Foley et al., 2020).

The indicator is also key to the concept of 'virtual water' as it informs about the effectiveness of water-related adaptation interventions related to trade, such as growing crops in water-endowed geographical areas at lower cost (having a higher EWP) and trading them to places with water scarcity (lower EWP). The indicator could be used for decisions at different scales and geographical locations based on the similarity of measures and policies for climate-resilient agriculture production that would support resilience in terms of income, yield, and water savings with associated benefits.

Water productivity is influenced by several factors, including the type of water usage, market prices, environmental and social costs and benefits, as well as spatial and temporal fluctuations in water availability and demand. To make EWS comparable and aggregable, the monetary values can be adjusted (by using real or GDP/capita adjusted values). On the whole, EWP is not easily aggregable and comparable; caution should be exercised when aggregating and comparing water productivity in two different contexts. Nonetheless, it remains a valuable tool for assessing progress towards adaptation by examining trends in economic water productivity rather than relying solely on absolute values or by comparing the economic water productivity of a specific crop (in kg/m3 this time) between areas with comparable levels of water availability.

Analysis

In summary, we find that EWP is sensitive to climate factors as well as non-climate factors. It is widely applicable and is an 'outcome indicator' that can capture both climate change impacts and the effect of adaptation efforts. However, differences in environmental conditions and data availability limit its applicability to some degree. It will be challenging to use EWP to make comparisons across different locations, and the indicator should not be aggregated. Comparisons are only meaningful when a single crop is considered to have similar climate conditions. We applied a subjective scoring system of high, medium, and low for each criterion. Such scoring can make it much easier to assess the relative strengths and weaknesses of many candidate indicators. The consensus is that the EWP is:

- High on Criterion 1: Identification with Climate Change Adaptation;
- High on Criterion 2: Widely Applicable; and
- Medium on Criterion 3: Scalable, Comparable, and Aggregable.

We also examined the extent to which EWP provides information relevant to the UAE Framework's agriculture-related target: "Attaining climate-resilient food and

agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all." This target addresses how food is produced and whether its production and distribution are adequate to meet human needs.

The agriculture target implies that production will withstand climate impacts on agriculture. Climate change will affect water availability, water use for agriculture, and yields. Thus, both the numerator (the value of agriculture output) and the denominator (water supply) will be affected by climate. The GGA target also mentions achieving a level of sustainable and regenerative agriculture production. The adequacy of water supplies will be a key factor in reaching this target, as will the capacity of agriculture to make efficient and sustainable use of available water supplies.

The indicator provides some, but not all, of the information needed to help assess the supply component of the agriculture GGA. Information on the use of all inputs and the sustainability of production will be needed. The indicator provides no information on the adequacy and distribution of food supplies. In our judgment, no single agriculture indicator can provide information to cover all the objectives in the GGA. Multiple indicators will be needed to fully assess progress towards meeting the goal.

Assessment of the "Proof of Concept"

We assessed EWP based on three criteria proposed by IPAM for examining the attributes adaptation indicators should have. We found the exercise of examining the strengths and weaknesses of EWP with regard to the criteria to be relatively straightforward. The process would work best if subject matter experts with experience applying indicators in their area of expertise and data availability were involved in the assessment.

We found scoring to be somewhat subjective and, to some extent, arbitrary. The working group disagreed about what scores to give EWP for each criterion but was able to reach a consensus. While scoring may be quite useful in assessing the relative strengths and weaknesses of different indicators, those applying scores and using results should recognize how subjective the process of scoring can be.