

Global Basic Observation Network at the UNFCCC

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*This advice is provided in response to **Query 57/23***

Context:

The World Meteorological Organization (WMO) has set up the "Global Basic Observation Network" (GBON) by Resolution 34 cg-18. This is a mandate to Members 'to acquire and internationally exchange the most essential surface-based observational data at a minimum level of spatial resolution and time interval.' The network is an essential observation tool that aims to cover all regions, including those where data is less available and that are some of the most vulnerable to climate change and its impacts. To provide technical and financial assistance to implement the GBON in LDCs and SIDS, WMO Members requested the UN Secretary General to create a Systematic Observations Financing Facility (SOFF). The creation of the SOFF, a UN Multi-Partner Trust Fund, was announced at COP 26. A party wishes to explore if and how GBON could be recognised or brought into the UNFCCC process, suggesting potential avenues, such as the adaptation-related GST outcomes or other negotiation streams.

Query:

Please could you identify where/how the UNFCCC process currently mentions/recognises or incorporates GBON and provide possible entry points for it to be further recognised/more formally incorporated?

Advice

Summary

The WMO established in 1992 the Global Climate Observing System (GCOS), a programme on global observational requirements. In 2022, responding to an UNFCCC invitation, the WMO launched an implementation plan with an aim to fill in observation gaps and availability. The plan refers to the Global Basic Observing Network as an instrument to contribute to that aim. The WMO has called for the UNFCCC to support GBON (I). There is significant alignment between GBON and the UNFCCC, as this observational goal supports the implementation of Article 5 of the Convention and Article 7 of the Paris Agreement, among other provisions in the treaties and COP decisions. Additionally, COP has welcomed and supported GCOS during COP 27 (II). Possible COP 28 agenda items to promote further alignment are RSO and the GST (III).

I. Context: The Global Climate Observing System (GCOS) and Global Basic Observing Network (GBON)

The Global Climate Observing System (GCOS) is a WMO programme established in 1992. It is the authoritative source of information and advice on global climate observational system requirements to inform processes and stakeholders, such as the UNFCCC, WMO, IPCC and the global mitigation and adaptation communities.¹ In 2022 and responding to an invitation by the UNFCCC², the WMO launched the 2022 GCOS implementation plan, to achieve effective and sustained observation across the globe, that is free and accessible to all. The Plan provides actions to meet and improve observing requirements and proposes actions and means to measure progress. One of the main priorities of the implementation plan is to fill observation gaps and improve data availability.³ Moreover, these gaps in observation were determined based on inputs from the UNFCCC process, amongst them, IPCC reports and Parties' submissions to the UNFCCC.⁴ The plan, therefore, is responding at least in part, to UNFCCC processes and implementation.

One of the main instruments set out in the plan is 'GBON', a 'Global Basic Observing Network', which has been described as a new approach in which the basic surface-based observing network is designed, defined and monitored at the global level. The expectation is that once implemented, GBON will improve the availability of the most essential surface-based data, which will have a direct positive impact on the quality of weather forecasts, thus helping improve the safety and well-being of citizens throughout the world. GBON sets an 'obligation and clear requirement for all WMO Members to acquire and internationally exchange the most essential surface-based observational data at a minimum level of spatial resolution and time interval.' The network is an essential observation tool that aims to cover all regions, including those where data is less available and that are some of the most vulnerable to climate change and its impacts. To provide technical and financial assistance to implement the GBON in LDCs and SIDS, WMO Members requested the UN Secretary General to create a Systematic Observations Financing Facility (SOFF), associated to GBON.

The WMO published materials in relation to GSCO and GBON containing several references to the UNFCCC, as already noted. A recent note by the WMO Secretariat describes how GBON and SOFF are set up responding to UNFCCC COP 26's ambition and science targets, framing them as tools to meet 'the Systematic Observation objectives under the Paris Agreement.' The same note establishes that **the support from UNFCCC Parties will be necessary for GBON and SOFF to materialize.**⁵ It is not clear from their published materials whether the GBON is seeking to be fully incorporated into the UNFCCC, as a goal of the process, or some other form of coordination and support is expected.

Moreover, in the context of their 2022 Implementation Plan, GCOS recently organized its second Climate Observation Conference in Darmstadt, Germany (17-19 October 2022). The conference agreed a formal statement that goes a step further, calling for the establishment of a global goal on observation under the UNFCCC. This global goal on observation should guide the "action-oriented framework for observation" necessary to provide a sustainably funded long-term global observing

¹ [GCOS Implementation plan](#), p. 10.

² Idem, p.13

³ Idem, p. 13.

⁴ Idem, p. 13.

⁵ Earth Observation Day WMO Bulletin, March 2023. GLOBAL BASIC OBSERVING NETWORK (GBON) AND SYSTEMATIC OBSERVATIONS FINANCING FACILITY (SOFF) Meeting the Systematic Observation objectives under the Paris Agreement: <https://unfccc.int/sites/default/files/resource/Earth%20Information%20Day%20GBON-SOFF%20rev1.pdf>

system to underpin mitigation and adaptation action and reporting, and assist recognition, understanding and coordination of activities by international, regional and national stakeholders. Adoption of GBON as an observation goal within the UNFCCC or coordination with GBON could be a way for the UNFCCC to respond to this call.

GBON is associated with SOFF, the Systematic Observations Financing Facility, which is a UN Multi-Partner Trust Fund co-created by WMO, UNDP and UNEP to provide long-term financial and technical assistance to support countries with the most severe gaps and shortfalls in observation in the implementation of GBON commitments. This support is currently only extended to LDCs and SIDS. This financial mechanism accompanies GBON, however, it is independent from it.

SOFF is also a foundational element and delivery mechanism of the UN Secretary General's Early Warnings for All Initiative. Currently, collaboration between SOFF and the UNFCCC is mainly financial, through the Green Climate Fund, given the fund's alignment with the Early Warning System initiative.⁶

Nonetheless, there are plenty of opportunities for closer alignment between the UNFCCC and GBON and/or between UNFCCC and GBON and SOFF.

II. Alignment of GBON with the Convention and Paris Agreement

There are various provisions in the Convention and in the Paris Agreement that could sustain a recognition of GBON and/or SOFF by the UNFCCC.

1) Obligation to promote and cooperate in research and systematic observation in the Convention

Article 4.1 g) of the Convention calls on all parties to '**promote and cooperate** in scientific, technological, technical, socio-economic and other research, **systematic observation and development of data archives related to the climate system** and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;'

Article 5 further develops implementation of this commitment and establishes that parties shall:

'(a) Support and further develop, as appropriate, international and intergovernmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort;'

Recognition and support for GBON would align with the abovementioned commitment as it is an instrument for data collection and systematic observation. Furthermore, and given the overlap between UNFCCC and WMO parties, bringing GBON to the UNFCCC would significantly contribute to avoiding duplication of efforts, as mandated by the Convention.

Article 5.b) and 5.c) make additional calls to support these international efforts to strengthen systematic observation in developing countries, and to take into account the particular concerns and needs of developing countries and 'cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above.'

Given that the emphasis of GBON is precisely to achieve some basic uniformity in the observation availability and exchange across regions and countries, it is in line with the mandates described above. According to the WMO Global Basic Observing Network Global Gap Analysis 2022, the Pacific,

⁶ [Early Warnings for All Executive Action Plan](#), p. 42

Caribbean and Sub-Saharan Africa are areas with significant data gaps.⁷ Out of the 26 countries assessed, 17 have less than 25% of the required GBON infrastructure. This group of countries represents about 40% of the total GBON gap, evidencing that developing countries need support to implement their commitments under GBON, which is why the WMO developed SOFF associated to GBON to support the mechanism implementation in developing countries, particularly LDCs and SIDS, at least initially, which again aligns with Article 5.c)'s call for supporting and considering the particular needs and concerns of developing countries. In addition, other means of implementation under the UNFCCC could potentially be directed at supporting GBON implementation where SOFF is not available or cooperating in supporting these financial efforts.

2) Duty to use best available science.

The Paris Agreement directly acknowledges that adaptation and mitigation should be based on and guided by the "best available science" and recognizes the need to strengthen scientific knowledge of climate, including the systematic observation of the climate system for enhancing work on adaptation (Article 7.c). According to the WMO, relatively little has been done to define who is responsible for this and the uncertainty as to what governments, funding entities and the scientific community will need to do to be able to deliver the best available science and systematic observation of the climate system is an area that exemplifies the consequences of this lack of clarity.⁸ The Sharm-El Sheikh Implementation Plan's (COP27 key outcome) welcoming of the 2022 GCOS and invitation to parties to implement it is seen as progress in regards to attaining the best available science.⁹

3) Observation is needed for compliance with Paris Agreement collective and individual commitments.

For the WMO, the 2022 GSCO implementation plan, of which GBON is a central element, is set up with an aim to address the evolving needs for climate observation, and among them, those that emerge from the implementation of the Paris Agreement, and parties' compliance with their commitments. Many party commitments require observation to be adequately addressed. We set out the more pertinent ones below:

- Under the GST process parties assess collective progress on the implementation of the Paris Agreement (Article 14.1), which requires adequate data to which GBON could contribute.
- For national decision-making directed to implementing the Paris Agreement, including plans and policies in mitigation and adaptation.
- Addressing knowledge gaps that act as barriers for implementation of the Paris Agreement.¹⁰
- Parties report on research and systematic observation to the secretariat via their National Communications. Since the 193 parties to the WMO have agreed on a binding commitment to the international exchange of observations under GBON, their progress in implementing GBON should be a central element of their report on research and systematic observation under the UNFCCC.
- The Global Goal on Adaptation is aimed at increasing the ability to adapt to adverse impacts of climate change and foster climate resilience. GBON documents stress the link between this tool and addressing adaptation, including through strengthening early warning systems. Indeed, the Early Warning for All Strategic Report 2023-2027 by the WMO indicates 'Closing the gap on the Global Basic Observing System (GBON) is an essential step for supporting Early

⁷ Idem, p. 25

⁸ WMO 'Pathway to strengthen Systematic Observation of the Climate System and Early Warnings for All', December 2022. <https://public-old.wmo.int/en/resources/meteoworld/pathway-strengthen-systematic-observation-of-climate-system-and-early-warnings>

⁹ Idem.

¹⁰ GSCO 2022 implementation plan pp. 15-16.

Warnings for All, measured through a global indicator of change, including specific sub-indicators for SIDS and LDCs to ensure that priority gaps are closed.’¹¹

- The importance of Early Warning Systems also for Loss and Damage is recognised as an area of cooperation under Article 8.4 of the Paris Agreement, to which GBON contributes.

Therefore, it could be argued that GBON is a tool that is either required or that would support significantly parties collective and individual commitments to achieve implementation of the Paris Agreement’s objectives.

4) GBON alignment with other provisions

In addition to the above, there are other provisions in the Paris Agreement which GBON could arguably be linked with, particularly technology transfer (PA art 10), capacity-building (PA art 11) and enhancing public access to information about climate change (PA art 12).

5) Relevant COP decisions

The role of observation in promoting mitigation and adaptation action, as well as addressing loss and damage, has been recognised by parties in the UNFCCC process. COP 27 Sharm-El Sheik Implementation Plan ‘emphasizes the need to address existing gaps in the global climate observing system, particularly in developing countries, and recognizes that one third of the world, including sixty per cent of Africa, does not have access to early warning and climate information services.’¹² Therefore, the COP calls to enhance coordination activities by the systematic observation community, aiming to provide climate information for mitigation, adaptation and early warning systems, as well as information to enable understanding of adaptation limits and of attribution of extreme events.

Similar statements are contained in Decision 22/CP.27 on ‘Implementation of the Global Observation System’ that again emphasizes the need to address systematic observation gaps, particularly in developing countries and for ocean, mountain, desert and polar regions and the cryosphere, in order to improve understanding of climate change. The parties welcomed the ‘2022 Global Climate Observing System Implementation Plan’ (2022 GCOS implementation plan) and the ‘2022 Global Climate Observing System essential climate variables requirements’, both developed by the WMO to contribute to close that gap. Parties are then encouraged to work towards the implementation of the plan.

In addition to the welcoming of the GCOS implementation plan by UNFCCC parties during COP 27 in 2022, there has been some recognition within the UNFCCC of GBON as a mechanism that aligns with the objective of the Convention and the Paris Agreement in relation to research and observation needs. The SBSTA 52-55 ‘welcomed the outcomes of the extraordinary session of the World Meteorological Congress, particularly resolution 1 on the WMO unified data policy, resolution 2 on the Global Basic Observation Network and resolution 3 on the Systematic Observation Financing Facility, and encouraged Parties and relevant organizations to support the Facility in order to enhance and sustain implementation of the Global Basic Observation Network in developing countries, including the LDCs and SIDS.’¹³

III. Possible entry points for GBON at COP 28

The COP agenda item Research and Systematic Observation (RSO) stresses the role of IPCC in providing this data. Given that, during COP 27, parties recognised and welcomed GSCO, a follow up action in this negotiation stream could be the explicit recognition of GBON, as a tool to deliver on parties’ obligation

¹¹ [Early Warnings for All Executive Action Plan](#).

¹² Decision 1/CP.27, para.26

¹³ SBSTA 52-55, paragraph 71.

to promote and cooperate in research and systematic observation established under articles 4.1g) and 5 of the Convention, as noted in the section above.

A second stream would be the GST (CMA agenda item) particularly in adaptation and loss and damage where many parties have stressed the need to close observation gaps as a forward-looking element, and acknowledged the significant barrier this gap entails to adaptation efforts. Indeed, the Secretariat Synthesis Report 'Views on the elements for the consideration of outputs component of the first global stocktake' from October 2023 highlights as a possible element on the forward-looking element for adaptation the following:

*'151. Recognize the critical role of climate information and services coupled with early warning systems and support efforts towards universal coverage of early warning systems and access to climate information and services by 2027. **Further provide universal climate service coverage for priority climate-sensitive sectors** like agriculture, food security, health, disaster risk reduction, energy, and water by 2030. **Recognise that quality observations, monitoring and forecasting are key to decision making and long-term action, understanding climate risks and vulnerabilities.**'(p.18)*

Under L&D, a possible forward-looking element related to technology transfer also highlights observation needs:

'410. Urge enhanced technology transfer and cooperation from developed countries to developing countries, including on disaster early warning, forecasts and intelligent observation, to improve the capabilities of developing countries in fast tracking, accurate locating and multi-dimensional observation of meteorological disasters with enhanced precision; on comprehensive assessment of post-disaster losses and risks of secondary disasters, and establishment of information platforms for emergency supplies and disaster relief supplies reserves; on satellite remote sensing, as well as disaster risk assessment of unportable cultural relics in extreme weather events, and post-disaster repair and restoration of cultural relics, etc. to minimize the non-economic losses.'

These paragraphs have been presented only as examples, since there are many other submissions highlighting the importance of observation for these two pillars, which are captured in the Secretariat report.

Moreover, the informal note by the Chairs capturing some of the elements to be developed in the first GST after the high-level workshop in Abu-Dhabi (November 2023) also considers observation. The document offers only bullet points, but among them it is worth noting under Adaptation as a backward-looking element that the draft decision:

'Note the challenges encountered, including gaps in observation, monitoring, NAP implementation and support/finance'

The same document notes under 'Opportunities, responses for transformative action building on good practices, including: Climate information and services- close observation gap and EWS (universal coverage)'

When considering the observation gaps, GBON could be introduced so as to make these commitments more specific and associate them with a goal.

Similarly, and also within the GST, GBON could be introduced in the discussion regarding best available science as a cross-cutting issue or in the preambular section. There are multiple references in parties' submissions to the GST and in the GST draft decision structure to best available science,¹⁴ particularly

¹⁴ Secretariat Synthesis Report 'Views on the elements for the consideration of outputs component of the first global stocktake' from October 2023

in the preamble and cross-cutting issues, a topic that has also been emphasized during the negotiations.¹⁵ Given the explicit links within WMO documents to GSCO Implementation Plan 2022 responding to the need for best available science for the Paris Agreement (see section II n.2. of this advice), as well as the welcoming of the GSCO Implementation Plan by COP 27, GBON could be introduced when discussing the importance and need for best available science in implementing the Paris Agreement as part of the GST.

Thirdly, another potential negotiation stream could be within adaptation, either through the Global Goal on Adaptation (CMA agenda item) discussion as per the relevance of observation in measuring adaptation, or for NAPs (COP agenda item).

We consider these as the most likely negotiation streams where GBON could be introduced. However, negotiations touching on any of the provisions detailed in section II could also be potential entry points.

¹⁵ Intersessional.