Challenges for small island developing states in meeting monitoring requirements of the Kunming-Montréal Global Biodiversity Framework

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Abstract

The Kunming Montréal Global Biodiversity Framework adopted by Parties to the Convention on Biological Diversity is an ambitious agreement to halt the decline in the world's biodiversity by 2030 and restore nature by 2050. In order to measure progress towards the Framework's Goals and Targets, a monitoring framework has been established and this includes 26 headline indicators and 71 questions comprising binary indicators that all Parties are expected to report against. There are a further 189 optional indicators. Parties vary enormously in human population size, with 13 Parties having a population of fewer than 100,000 inhabitants and 15 with more than 100 million, affecting their ability to meet reporting needs. Small Island Developing States face particular challenges in availability of data, access to existing data and data management, synthesising and analysing data and reporting. Addressing these challenges requires a high level need to understand and agree on the importance of gathering and managing sufficient data to meet reporting requirements, adopting a unified approach to reporting so that data management and verification is efficient and effective. All of this does need adequate resources, whether nationally or regionally. The establishment of regional and subregional techncial and scientific support centres through the Convention's Technical and Scientific Cooperation Mechanism provides an opportunity to develop realistic, appropriate and sustainable data management and reporting processes.

Introduction

When the Kunming-Montreal Global Biodiversity Framework (KMGBF: CBD 2022a) was adopted at the Convention on Biological Diversity's (CBD) 15th Conference of the Parties (CoP) in December 2022, a monitoring framework (CBD 2022b) was also adopted. This identified Headline, Component and Complementary Indicators to be used for monitoring progress towards the KMGBF's four goals and 23 targets and stated that Binary Indicators would be developed to fill gaps in the monitoring

framework. Parties are now developing their National Biodiversity Strategies and Action Plans (NBSAPs) that will enable them to develop and make national commitments towards the KMGBF's Goals and Targets. Parties will submit National Reports in 2026 and 2029 (CBD 2022c) to report progress towards their NBSAPs. These National Reports should use headline and binary indicators to assess progress, whereas the use of component and complementary indicators is optional. These reporting requirements and the breadth of action for biodiversity that they represent, across 23 targets, have brought into sharp focus the data and knowledge capability of Parties, which vary enormously in their population size (Table 1), and therefore, in their human capacity to meet international commitments, such as the KMGBF. Population sizes range from Niue with a population of 1,670 and Nauru with 12,780 inhabitants to India with 1.429 billion.

Population size	Number of CBD Parties
<100,000	13
<1,000,000	39
<5,000,000	73
<10,000,000	103
<20,000,000	134
> 20,000,000	62
>100,000,000	15

Table 1: Number of Parties to the Convention on Biological Diversity with human populations below or above a range of thresholds. Source: https://www.worlddata.info/alliances/un-united-nations.php. Accessed 1 April 2025.

Many countries, especially Small Islands Developing States (SIDS), lack the institutional infrastructure, legal framework, workforce and financial resources to undertake, and report on, biodiversity conservation initiatives successfully at the scale needed to halt biodiversity loss. Although there is local expertise, it is insufficient to address the wide range of issues in biodiversity conservation that require co-ordinated and sustained attention, as captured by the KMGBF. Data and knowledge management issues are often exacerbated by competing political priorities, and inadequate overarching monitoring frameworks and limited availability of national biodiversity statistics. In the Caribbean, inadequate institutional support for data management systems and appropriate monitoring and evaluation of the implementation of biodiversity MEAs is acknowledged (CARICOM Secretariat 2024). The outcome of the Fourth International Conference on Small Island Developing States *The Antigua and Barbuda Agenda for SIDS (ABAS) – a Renewed Declaration for Resilient Prosperity* stated emphatically that substantial investment was needed to transform access, governance, management and use of data across all sectors to inform policy and decision making so as to build national resilience (UN 2024).

Knowledge and data management and the KMGBF

The CoP15 Decision (15/8) on knowledge management emphasised the critical importance of easy and timely access to quality data, information and knowledge in supporting the effective implementation of the KMGBF (CBD 2022d). It requested continued collaboration with entities working with biodiversity-related data, and provided a range of international examples, such as the United Nations Environment Programme-World Conservation and Monitoring Centre (UNEP-WCMC), the Global Biodiversity Information Facility, the International Union for Conservation of Nature (IUCN), and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, amongst others. There is also an increasing number of platforms designed to make global

datasets on biodiversity readily available and accessible, such as the UN Biodiversity Lab (run by UNDP, UNEP, and the CBD Secretariat), the Biodiversity Knowledge Hub (run by FAO), the Integrated Biodiversity Assessment Tool (run by BirdLife International, Conservation International, the IUCN and UNEP-WCMC) and the Biodiversity Indicators Dashboard (run by NatureServe). However, some of these global datasets have inadequate resolutions for SIDS.

There are many other global level initiatives intended to help make biodiversity data readily available and accessible for those who have reporting commitments and who wish to use data to inform management decisions and policy formulation. Whilst these global datasets and international dashboards have many strengths, the extent to which they support national decision-making and reporting, if at all, is not clear. Furthermore, the over-riding need at a national level is the generation of new data to meet the identified needs for establishing baselines, informing decision-making and reporting, and the human capacity to gather, manage and analyse such data.

The critical need, therefore, that would allow Parties to report progress towards the KMGBF's Goals and Targets meaningfully is access to data at a national scale, which includes generating new data and/or utilising appropriately disaggregated and verified global data. Decision 15/8 promotes the use of relevant digital technologies in improving national capacities for the discovery, collection, analysis, aggregation, storage, accessibility, searchability, visualization and exchange of biodiversity-related data, information and knowledge (paragraph 9e). Given these considerations, it is important to consider, understand and recognise the capability of Parties, especially small island developing states to fulfil reporting requirements.

We consider these challenges, and draw on experience in Antigua and Barbuda, in Grenada, St Lucia and Seychelles to illustrate them. Seychelles, St Lucia, Antigua and Barbuda, Grenada have been Parties to the United Nations Convention of Biological Diversity since 1992, 1993, 1993 and 1994 respectively.

Reporting requirements

National Biodiversity Strategies and Action Plans (NBSAP) are a requirement under Article 6 of the convention and outline each Party's plans for conserving their biodiversity in a sustainable manner. Progress towards the targets identified in these NBSAPs is reported in National Reports that are submitted every four years. Antigua and Barbuda's last NBSAP covered the period 2014-2020, Seychelles 2015-2020, Grenada 2016-2020 and St Lucia 2018-2025. In the first three cases, their conclusion was to coincide with CoP15 and the adoption of a new 'post-20 global biodiversity framework', which was delayed until December 2022 because of the covid pandemic.

Looking ahead, Parties will submit National Reports in 2026 and 2029 that will involve reporting against headline, binary and, as appropriate, other indicators adopted in Decision 15/5. There is a need, therefore, to ensure that appropriate data, and other information, is gathered to allow baselines to be set where needed, and regular reporting against national targets.

Meeting the requirements of international reporting obligations is difficult for a variety of reasons, including increasing reporting requirements, capacity constraints, infrastructure challenges in collecting the data necessary and understanding what can be disaggregated meaningfully from global datasets and dashboards, and what needs to be generated nationally. This is becoming more evident as the scale of reporting increases, for example the KMGBF has 97 Headline and Binary Indicators (Box 1). The reference period for monitoring of the KMGBF is the period from 2011–2020, where data is available and unless otherwise indicated (CBD 2022b).

Box 1: Number of indicators in the KMGBF Monitoring Framework. Sources: CBD (2022b) and CBD (2025)

Headline	26 unique indicators
Binary	71 unique Yes/no or categorical questions
Component	79 unique indicators (optional)
Complementary	110 unique indicators (optional)
Total	286 unique indicators

In addition, there are 68 cases where indicators inform two or more Goals and Targets

Our aim is to determine what data and knowledge management Parties, and in particular small island developing states, need to meet their reporting requirements/obligations under the KMGBF. We do this by: a) considering current capability to provide national level data on key biodiversity measures of the KMGBF; and b) identifying what is needed to make KMGBF reporting coherent, efficient and effective in these states.

Current capability to provide national level data

Availability of data

Data that may contribute to reporting on the KMGBF are gathered by a range of stakeholders including government entities, community-based organizations (CBOs), non-governmental organisations (NGOs) and the private sector. For example, Grenada's Environment Department is working with 37 CBOs across the country's three islands, and a range of biodiversity information is collected by NGOs in all countries. In Antigua and Barbuda, information on species conservation status and invasive species management on offshore islands is collected by the Environmental Awareness Group (Targets 2, 3, 6). In Seychelles, data is collected on biodiversity, especially native species, by organisations overseeing the management of islands. NGOs such as Nature Seychelles, Island Conservation Society, Plant Conservation Action Group, TRASS, GAEA Seychelles, Marine Conservation Society Seychelles and the public trust Seychelles Island Foundation manage these islands on behalf of government and provide regular updates on their biodiversity programmes. In St Lucia, the Saint Lucia National Trust is a key partner in collecting information on species conservation and ecosystem system health, as they manage many sites on the island.

Data collected by ministries and other government entities is typically related to productive sectors (see Box 2).

Box 2: Examples of data collected by a range of government agencies

In Seychelles, the Ministry of Agriculture, Climate Change and Environment, Ministry of Fisheries and Blue Economy and the Seychelles Parks and Garden Authority all contribute towards data collection, in line with their mandates. The Ministry of Agriculture, Climate Change and Environment is the data repository for all environmental datasets include key biodiversity areas, protected areas, important bird areas etc.

In Antigua and Barbuda, relevant data being gathered includes, but is not restricted to: i) quantities and types of pesticide imported and used for both agricultural and domestic purposes (Target 7 (b)) by the Ministry of Agriculture; ii) border inspections of animal and plant (and their products) importation, coordinated by the Veterinary and Livestock and Plant Protection Divisions respectively

(Target 6); c) soil and water testing data by the Department of Analytical Services (Target 7); fish landing data gathered by the Fisheries Division (Target 5); invasive alien species data are collected by government agencies whose economic sectors are affected by the impacts of invasive species (Target 6). Furthermore, the Department of Environment (DOE) undertakes some habitat mapping (e.g. extent of mangroves: Target 1) and oversees Access and Benefits Sharing agreements (Target 13).

In St Lucia, most data is collected by government agencies and parastatal agencies. Where data is collected, it is routine, using established protocols and incorporated into work programmes, that do not change. This means that data collection is not linked to emerging needs for management or current reporting requirements.

Data is often collected on a project-by-project basis in all countries due to limited human and financial resources for ongoing monitoring and collection. This affects the consistency of the data that is available over time and the coverage across issues on which reporting is required. Limited capacity also means that there are very limited means for establishing and implementing methodologies for new data to be collected. The obstacles that affect the ability for SIDS to adequately implement data collection methodologies have a resulting effect in the ability of these Parties to report on the KMGBF targets adequately.

Access to existing data and data management

Within government in each country, there is a range of ministries, each with several units, divisions or departments that gather relevant data, and the number of these subdivisions increases the complexity of liaising directly with data collectors. Having differing data collection methodologies among these subdivisions further increases challenges in standardising data management. For example, in Antigua and Barbuda the Department of Analytical Services, Fisheries Division, Forestry Unit, Agricultural Extension Division and Veterinary & Livestock Division are all subdivisions within the Ministry of Agriculture, all with individualised data collection methods. It could be argued that this is a common structure in most governments, but it is a greater hindrance in SIDS with considerably limited human resources in the government sector to liaise between ministries.

Non-government stakeholders are, sometimes, willing to share the data they have collected, which is a positive step toward promoting collaboration and greater data coverage. There are, however, many cases where NGOs or individuals will share project or annual reports but are reluctant to share raw data as there are no data sharing agreements in place. Even where data is shared, it is often not analysed and reported on and so it does not contribute towards policy or management recommendations, reports or published articles that would make the information publicly available. This is typically because of limited capacity to manage and analyse the data that has been gathered and to then interpret the findings. This lack of capacity is both technological and human. All countries lack central data management units that house and maintain data across a range of KMGBF goals and targets. Antigua and Barbuda has a Data Management Unit in its Environment Department, that contains data on habitat extent Key Biodiversity Areas and protected areas, but Grenada, St Lucia and Seychelles have no data unit. In Saint Lucia, a National Environmental Information system was developed under the *Capacity Building related to Multilateral Environmental Agreements in Africa, Caribbean, and the Pacific Countries* (ACP MEA II: see https://www.acpmeas.com/) project. The intention of the system was to collect environmental data that would be used for reporting to the MEAs that the country is signatory to. In 2017 the system was completed and 17 agencies signed data sharing agreements to contribute data into the system. Personnel from these agencies were also trained in data management practices and data analysis.

There was no consistency in data being fed into the system and many of the individuals trained to operate the system have subsequently moved on to other roles with, or outside, their agencies.

Synthesising and analysing data and reporting/publishing

The Departments of Environment in Antigua and Barbuda, Grenada and Seychelles, and the Department for Sustainable Development in St Lucia, have the mandate for reporting under their biodiversity-related multilateral environmental agreements. These departments are the focal points for reporting on the three Rio Conventions so there is a centralised approach, in principle, allowing for more efficient internal data sharing. The departments are responsible for compiling data which may come from different actors within government and across society, but there remain limitations in those areas where data is not being collected at all. This centralised mandate is a theoretical benefit when considering reporting requirements under the KMGBF. At present, however, for all the reasons identified above there are not yet the routine and efficient processes for sharing data in place, even where data is being collected already. In St Lucia, for example, the limited data that is available is not aligned with international reporting requirements. This will mean that reporting, for example, through CBD National Reports will require consultants to gather information on targets and accepting that at present there are no baselines against which to assess change.

What is needed to make reporting coherent, efficient and effective?

A clear understanding of what data is required and how often it should be collected is fundamental to reporting appropriately on each of the biodiversity goals and targets. All four Parties are in the process of aligning their national biodiversity targets to those of the KMGBF, and producing NBSAPs. The process of this alignment will clarify what indicators will be needed and therefore what data should be collected to monitor progress towards the biodiversity goals and targets. It is likely that gaps in existing data generation will be identified. Seychelles is also undertaking a biodiversity assessment, which will provide datasets on a range of indicator species and threatened species and an understanding of gaps in datasets, especially for threatened species, that will need to be updated. This assessment is drawing upon the KMGBF's monitoring framework to understand data needs and reporting gaps.

The implementation, reporting and evaluation of the KMGBF is to be underpinned by agreed 'Considerations' (CBD 2022a: Section C). These include the importance of taking a *whole-of-government and whole-of-society approach* to implementing the Framework, and the need for *collective effort towards the targets*, amongst others. Both of these make clear that data gathering, management and reporting should not fall on one part of government. This reporting has traditionally fallen on Environment Departments, which in SIDS may consist of fewer than five individuals. Whilst this is appropriate from an oversight, co-ordination and collation role, the diversity of data needed, and the roles of other entities, both within and outside government, in gathering data, mean that the broader burden of reporting has to be formalised across government and beyond.

Small island developing states often rely on a whole-of-society approach to biodiversity conservation and monitoring and reporting because of the limited capacity within government. Facilitating stakeholder engagement and consensus building on data collection requirements and methodologies will enhance the inclusivity of data collection efforts. Therefore, in order to build capacity for filling gaps in biodiversity data gathering across society, it is important to focus on establishing standardised and easy-to-use data collection formats that can accommodate various stakeholders wherever possible. In order to ensure the accuracy and honesty of the reported data, it

is essential to establish robust means of verification among all stakeholders. This involves vetting the data through reliable processes to confirm its accuracy. Developing and implementing a standard and easy-to-use data collection format that accommodates various stakeholders such as fishers, farmers, and community-based organizations will facilitate more complete data gathering. Putting this into practice requires the following four steps.

Understanding and agreeing the need

National indicators will have to align with the KMGBF indicators and so this will inform how local data is collected and used to report. In the case of Goal A, Target 6 and Target 7 of the KMGBF and its monitoring framework (CBD 2022a, CBD 2022b), this alignment will see a gradient of difficulty for meeting reporting requirements, particularly within the designated timelines (see Box 3). In some cases, there may be a need to develop alternative indicators to address reporting needs.

Box 3: Examples of structural challenges in gathering data for KMGBF reporting against headline indicators

Target 6, Headline Indicator 6.1 - For most species, there is an inability to track the rate of invasive alien species establishment. Antigua and Barbuda's Plant Protection Unit does limited tracking on a handful of IAS, collecting data on a small cross section but a comprehensive list is not available. Similarly, Seychelles does not have data on invasive alien species.

Target 7, Headline Indicator 7.2 - The ability to test the pesticide concentration in soils requires consistent soil sampling and testing. In both Antigua and Barbuda and Seychelles, these samples would have to be exported for testing, significantly increasing costs.

It is critical that the need is agreed by all of government and is seen as a high priority so that it becomes 'business-as-usual. This is partly to be consistent with the whole-of-government approach that underpins the KMGBF, but perhaps more fundamentally because this will be necessary to see through the establishment of a viable and fully functioning data management system. This could learn from challenges such as those faced during the ACP MEAs II capacity building project, which, as noted above, was supposed to establish a data repository in St Lucia. Despite 17 agencies signing an agreement and agreeing protocols, data has not yet been shared.

Approach

An agreed whole-of-government and whole-of-society approach to reporting is critical and should cover all steps in data gathering and management. Its purpose should be to ensure that appropriate data are available for reporting and make clear which entity has responsibility for gathering data, either by generating new data from within the country, or through the disaggregation and/or verification of data held elsewhere. One coordination mechanism could be a national technical working group dedicated to drawing together existing data collected by different organisations for reporting purposes, identifying data gaps and finding ways to fill these gaps. In cases where several agencies will be collecting data relevant to particular indicators, it is critical that approaches and protocols are agreed to ensure data are gathered cost-effectively and meet reporting requirements. These data collection approaches should be made mandatory and make clear the scope of data collection, human resources necessary (including training requirements and oversight), standardised field protocols, frequency of data collection and where and how the data will be stored and managed. There are some efforts underway. For example, Seychelles' Nature Reserves and

Conservancy Act 2022 (Government of the Seychelles 2022) allows permits to be issued for the conduct of scientific research in protected areas. The country also has standardised data collection protocols for marine turtle, seabird, seagrass and coral reef monitoring. Recently, the Seychelles Ocean Research Agenda was finalised and one of its main objectives is to determine priority research areas for Seychelles in line with existing and emerging strategies & policies.

Data management and verification

Establishment of an appropriate data management process is needed to ensure the quality and appropriateness of the data. It is important that people with the necessary expertise oversee this, whether as part of an overall national technical working group as suggested above, or a dedicated scientific working group tasked with quality assurance. Examples of need may include ground truthing of data collected via remote sensing, appropriate analyses of field data, or the verification of data that has been disaggregated from international sources, such as on threatened species from the global IUCN Red List (see IUCN 2025). This data management process should also ensure consistency in data collection, both between different data gatherers and also between years, as consistency in data generation is critical to detecting genuine change.

Provision of adequate resources

Small island developing states often lack adequate funding to complete activities required to fulfil obligations to international agreements such as the KMGBF. Therefore, assignment of appropriate human and financial resources to ensure that data collection, management and analysis is adequate to meet reporting requirements, both nationally and internationally should be reviewed. This is critical at all levels from the collection of data in the field (e.g. from fishers, farmers and community-based organisations) through management and verification of data and appropriate analysis and reporting to ensuring adequate oversight of the whole process. Particular needs include, but are not restricted to, technical staff to collect, review, and compile data, identify where there are gaps at present and fill them, as well as investment in suitable systems to house and analyse raw data, which allow for efficient access to data and effective reporting. At a more strategic level, and to ensure that reporting requirements are being fulfilled, appropriate personnel are necessary to ensure that inter-agency data sharing agreements are in place where needed, as well as processes in place to demonstrate the value of an effective data and knowledge management system so that funding is maintained. Finally, so much effort is spent using existing resources to meet reporting needs, that there is no opportunity to look ahead and consider, strategically, where new technologies and innovative ways of working could transform data collection, management and reporting. Long-term and equitable collaborations with international institutions and regional centres to collect and analyse data that are of relevance and importance to these four countries could make a substantial difference in addressing the common challenges that they, and other SIDS, face.

Conclusions

SIDS lack the capacity to meet current biodiversity-related reporting requirements, whether for international agreements or for national policy and management processes. This has been brought into sharp focus by the scale of reporting required by the monitoring framework of the KMGBF. These small states face considerable challenges at each stage of the process from gathering necessary data, and accessing and managing other data that are typically provided by a range of sources, then curating all data holdings over time through to analysing and reporting. This lack of capacity also means that locally gathered and held data are rarely made public through publication

in appropriate formats (ie in the scientific literature or through government reports). As a consequence, national capability and expertise, where it does exist, is not recognised widely either for its biodiversity conservation work, or the information and data gathered.

At COP15, the Parties to the CBD agreed to establish a network of regional and subregional technical and scientific support centres, alongside a global co-ordinating unit (CBD 2022d). These centres have now been identified (see CBD 2025) and are becoming operational, providing an opportunity to develop robust and practical ways of working that are sustainable in the long-term. Importantly, the core functions include, *inter alia*, working on a demand-driven basis, exploring joint programmes and/or ventures, providing Parties, especially developing country Parties, with access to information on opportunities for co-operation, mobilising resources and facilitating access to, and use of, available scientific knowledge, information and data (CBD 2025).

This provides the mechanism to address a range of key technical issues identified here and to develop innovative ways of generating new data, accessing relevant data already held elsewhere and then managing and storing data, before synthesising, analysing and reporting.

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