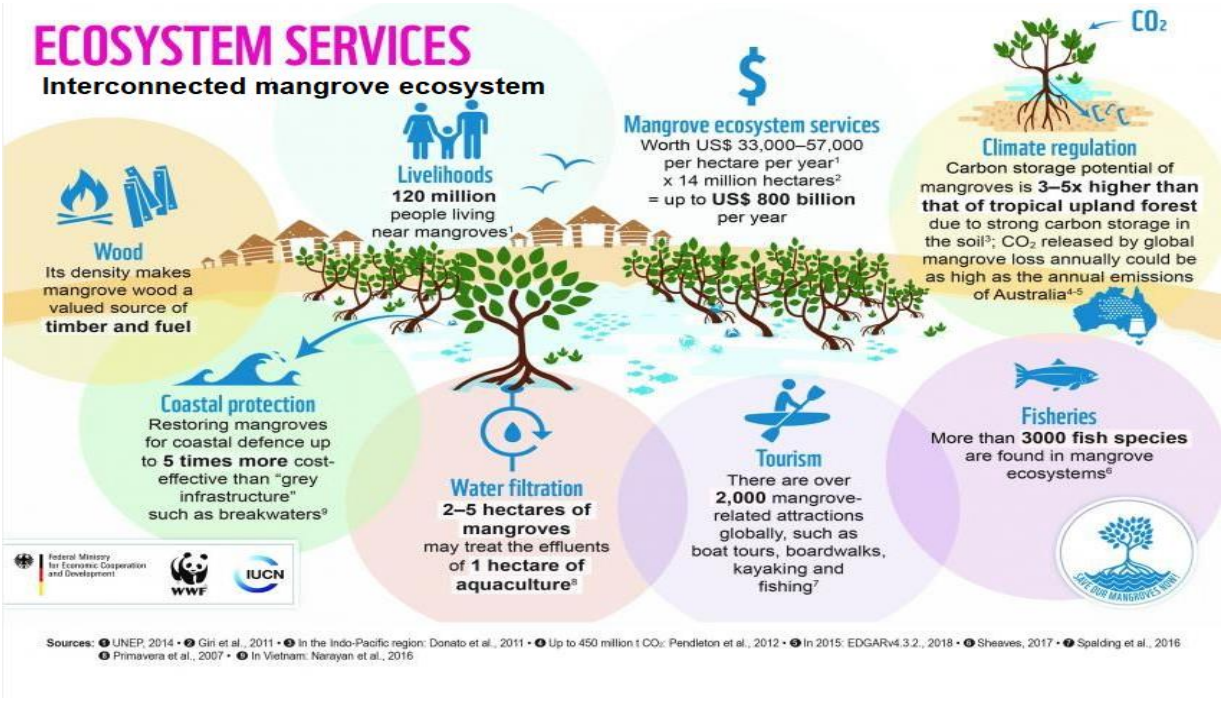
BIRA

BIODIVERSITY INVESTMENT RATING AGENCY

KEY DESIGN PRINCIPLES AND UNANSWERED QUESTIONS IN CREATING BIODIVERSITY AND ECOSYSTEM MEASUREMENT TOOLS FOR INVESTORS

Biodiversity and ecosystems measurement is a process, not an end result. Meaning, there is no "perfect" way to measure the quantity and diversity of life on Earth. There are many ways to do it, each with its own advantages and disadvantages. Biodiversity and ecosystem measurement for investors is complicated further by the need to consider opportunities, dependencies, and the impacts of natural capital on financial returns. These measurements need to consider the interconnectedness nature of biodiversity and ecosystems, which have implications on costs and revenues. For instance, a study by the WWF and IUCN found that interconnected ecosystem services have a total potential worth of US$ 33,000 to 57,000 per hectare per year, highlighting the importance of this ecosystem on investments in mangrove locations.[1] Developing measurement framework and tools that meet investor needs and considerations, will support informed investments in assets that improve outcomes, reducing the biodiversity funding gap.

Figure 1: Interconnected mangrove ecosystem and services



There are several frameworks and tools that are used by investors in an attempt at measuring outcomes, but gaps remain due to the complexity of the ask. Our engagement with over 30 investors and experts on biodiversity and ecosystem measurement tools led to identifying key challenges that investors have in utilizing these existing frameworks. Given these challenges, investors identified the need for improved credibility, applicability, usability, and affordable rigor for biodiversity and ecosystem measurement tools, as highlighted in the figure below.

[1] IUCN, mangroves and coastal ecosystems, 2017

Figure 2: Investor needs for biodiversity and ecosystem measurement tools

Investor need	Description
CREDIBILITY	Frameworks and tools that provide an accurate measure of the biodiversity footprint to avoid greenwashing accusations, a key challenge for investors given the lack of a standardized approach to biodiversity measurements
APPLICABILITY	Frameworks and tools able to measure impact across sectors and locations, to assess portfolio impact across different assets. This is particularly key for the Global South (i.e., Africa) as most frameworks are developed for the Global North
USABILITY	Frameworks and tools that are simple to understand and use (including a clear reporting/ rating of impact) given challenges with lengthy and technical frameworks
AFFORDABLE RIGOUR	Frameworks and tools that balance the need to obtain accurate data for credibility and the cost/ effort to collect data for the assessment. This is key in data-scarce areas, with high costs affecting the competitiveness of investments

A further assessment of investor needs led to the development of eight design principles that offer advice for anyone trying to build measurement tools for investors; and unanswered questions that developers should consider. Each of these design principles and questions will help developers create more effective tools that solve challenges and meet the needs of investors.

1. **Focusing assessments on indicator species versus a suite of metrics misses the complexity and full spectrum of biodiversity, limiting credibility**. There is a validated focus on tracking indicator species as the Earth is undergoing its sixth mass extinction event[2]. For instance, the Species Threat Abatement and Restoration (STAR) framework focuses on reducing species extinction risk based on the IUCN Red List of Threatened Species. But a species-only focus ignores other aspects of biodiversity that may as crucial such as phylogeny (genetic difference), abundance (impacted by species richness), and ecosystem function. In addition, measuring species richness and preventing extinction alone will lead to a focus on "firefighting interventions" rather than supporting holistic interventions needed to restore ecosystems. As such, an approach that uses a jigsaw of metrics that are distinct but fit together, in assessing outcomes will provide a more holistic view of outcomes. A "jigsaw" approach factors the site-specific nature of outcomes, by providing a strong rationale for the choice of metrics based on the specific ecosystem. This approach provides a more holistic assessment of ecosystem integrity as it highlights the key pieces (metrics), where pieces are missing or not fully developed, how they relate to one another, and how the other pieces could be added to the jigsaw for additional measures. In addition, taking a value-based approach in selecting the suite of metrics to track is key in ensuring linkages between biodiversity and ecosystem outcomes and the bottom line for investors. A value-based approach would ensure the selection of relevant metrics that have linkages or dependencies with investment revenue, i.e., tracking bird functional diversity at a park with active bird watching.

   When assessing biodiversity and ecosystems through a jigsaw of multiple metrics, a key unanswered question is the selection and weighting of the different metrics in developing a rating. Over time, the science of designing the pieces of the ecosystem jigsaw has improved and is currently available. But there is currently no clear scientific research that clearly defines the relative importance of different metrics i.e., is "water pollution" as a metric more important than "soil pollution"? Developers such as the Wallacea Trust working

[2] Dr. Gareth Parry, Bioabundance and biodiversity, 2022

group on biodiversity credits and Ecosulis have taken a site-specific approach in selecting metrics to assess based on the land system and conservation objectives within the ecoregion. Without this science, developers assume equal weighting across metrics as connected drivers of ecosystem integrity. This assumption may under/overstate the role of key metrics that have more of an influence in one context over another. For instance, species richness in an area with high extinction risk may be more important than landscape connectivity. As more knowledge and research are generated through assessments conducted in different contexts, developers need to track results and adjust their data (and assumption of importance) to develop more rigorous frameworks and tools for biodiversity and ecosystem measurements.

2. **Focusing on measuring actual and intended impacts on biodiversity and ecosystem function over generic assessments of commitments** (management agreements) **and processes is key in designing credible frameworks and tools**. Intended impacts are what organizations say they are aiming to achieve, and actual impacts are what they have actually done. Processes and commitments, on the other hand, are the methods and activities used to achieve those impacts respectively. You can use any number of processes or commitments to achieve an impact, which allows these processes to act as a signal for potential outcomes. However, there is no guarantee of impact as the same process may have vastly different outcomes across scenarios. For instance, it is not sufficient to simply assess whether a company is monitoring deforestation, which has no guarantee of impact i.e., a company can monitor deforestation but fail to prevent it. Therefore, the primary lens for framework developers should be that of impact. Particularly when assessing commitments and processes, those assessments need to be linked with intended outcomes. For credibility, assessing intended impacts will need an attribution process that audits these intended outcomes based on the organization's plans.

3. **Measuring intended impacts requires an iterative process of confirming linkages between activities and impact over time to increase the credibility of ratings.** As with other financial metrics, investors need to make investment decisions before results are achieved (e.g., the need to rely on revenue projections for the future). Given this need for making *ex-ante* assessments for investors, framework developers can provide predictive ratings based on linkages between commitments and processes and historically achieved outcomes in similar contexts. To increase the reliability of these predictive ratings, developers need systems to constantly test the relationship between the lead data (indicators looking at future outcomes) and lag data (indicators on achieved results), improving the predictive algorithms. Alongside this confirmation of lead and lag data, an audit is necessary as due diligence to ensure that commitments and processes are followed. Over time, the algorithm will improve with more data from different contexts. In the long run, this will also increase the cost-effectiveness of both measurements and of interventions.

4. **Impacts tend to vary greatly over locations, site-specific assessments are needed to ensure the credibility of ratings**. Some frameworks focus on generalized assessments, which makes it easier to compare across locations but misses the role of context in defining outcomes. For instance, a positive outcome in a tropical rainforest in the Amazon would look different to that of a tropical rainforest in Africa. Thus, these non-site-specific assessments have a high

risk of emphasizing the wrong metrics for an ecosystem. By incorporating context, site-specific assessments increase the credibility and relevance of frameworks. This second principle may limit applications in cases where site-specific assessments cannot be undertaken or are prohibitively expensive, but we need rigorous scientific data on biodiversity and ecosystems to ensure that we are making the right management decisions for different ecosystems.

Selecting a relevant benchmark for site-specific assessments is still a key unanswered question for framework developers. When making a site-specific assessment, a relevant benchmark is needed to act as a reference score, providing more insight into the project's impact. For instance, National Parks have been used as a benchmark for assessments as the biodiversity and ecosystems in parks have remained largely protected over decades. A key challenge in selecting a benchmark is in determining whether it is realistic or aspirational. With national parks, even though they are rich in biodiversity, assuming an investment outside the parks can realize the same level of outcomes may be unrealistic or too costly. In this situation, developers need to ask whether having an aspirational but unrealistic benchmark is helpful to incentivize positive outcomes. In addition, if assessing progress to a local benchmark, how does one compare across a portfolio with different benchmarks?

***The need for site-specific assessments that can be compared across a portfolio is another key question that framework developers need to address*.** There is significant difficulty in comparing outcomes given the potential variability across different assets/ investments. These variables include factors such as sector focus (e.g., tourism versus agriculture), size/area of intervention (e.g., a few acres versus hundreds of thousands of hectares), landscapes (forests versus desert), geographic location (Global North vs. Global South), and the biodiversity intentions(preservation vs. restoration) to name a few. Given these differences, does it make sense to attempt and compare different assets or should the comparison be limited to like-for-like opportunities? If we limit the comparisons, how do investors without in-house expertise in biodiversity and ecosystems choose between investments?

5. **The data collection for the site-specific impact needs to be cost and time-effective, especially in Africa, for increased applicability**. Data availability is a key challenge in assessing biodiversity outcomes, with 70% of investors citing this as a barrier to investments supporting biodiversity and ecosystems[2]. This is particularly so in Africa, making it hard and expensive to conduct assessments. Most frameworks are also developed focused on resources and context in the Global North, limiting applicability in the Global South. As a result, framework developers need to design tools that are adaptable to different locations. The situation is changing with an increasing number of data providers and the evolution of data collection technology (i.e., remote sensing). In situations where the data is still unavailable or collection is prohibitively expensive, the effective selection of proxy data will be key in ensuring the credibility of ratings. In addition, the time element (frequency) of measurements will be key in ensuring affordability. This frequency of data capture needs to be balanced with investor needs for reliable performance tracking.

[2] Credit Suisse, Unearthing investor action in biodiversity, 2021;

6. **Developers should design frameworks and tools that factor in the cost-return trade-offs involved in assessing and realizing biodiversity and ecosystem outcomes**. In addition to the cost implications for data collection, biodiversity and ecosystem interventions will have a high cost and time burden. This challenge is an issue for companies/ investments that compete with others who don't face the same burden. The high burden for biodiversity and ecosystem assessments and interventions becomes a competitive disadvantage particularly if there is no enforced regulation or market recognition for biodiversity and ecosystem conservation and restoration. As such, measurement tools need to factor in the trade-off between costs and returns in developing their ratings.

7. **Developing simple and clearly communicable rating systems is a key design principle that improves usability**. Highly technical frameworks with complex ratings are difficult for investors to understand, which limits usability. Investors are looking for a simple graded rating system (i.e., A to F) that can provide *ex-ante* and *ex post* ratings. For instance, a grading scale of A to F can represent different outcomes based on progress from the baseline; where A is the most realistic ideal scenario for uplift, B to C represents the different magnitude of positive uplift (B>C), D acts as the baseline, and E through F represents different magnitudes of declines in biodiversity and ecosystems. A key question to answer in this approach would be how one can compare assets with different baselines. Separately, when making an *ex-ante* rating, it is key to factor in implementation risk in the overall rating.

8. **Developers should build in flexibility for the future by adopting design metric architectures that can accommodate advances** in nature-related data, modeling, and analysis. Biodiversity and ecosystem measurements are subject to change over time as science and technology evolve. They also evolve along with our understanding of nature and our ability to measure it. As a result, biodiversity and ecosystem measurement frameworks must allow for future changes and modifications. These changes are not limited to what we measure but the tools for measurement as well. The ability to leverage technology to support measurements will also be key in addressing the high cost and time needed to measure outcomes. For instance, the evolution of remote sensing technology has led to the use of light spectroscopy, which uses a spectrometer to measure the spectra of light reflected in plants, to understand functional diversity and evolutionary history of plants with less time and money needed[3]. Framework developers will need to be aware and plan ahead for changes in their understanding and measurement of biodiversity and ecosystems to remain relevant in the long-term.

In addition to these eight design principles, developers should consider a holistic approach that considers interlinkages of biodiversity, carbon, and socio-economic impacts. Biodiversity and ecosystems measurement frameworks should explore the relation to natural assets such as water and minerals. In addition, linkages with carbon are useful to understand the full impact of activities and provide opportunities for carbon market financing. The socio-economic lives of communities are also greatly affected and affect biodiversity and ecosystems, requiring an integrated assessment

[3] Science Daily, New Technology has bright prospects for understanding plant biodiversity, 2018

for increased credibility. Investors have a desire to incorporate these wider impacts, linking their biodiversity and ecosystem outcomes to key environmental and social targets/ priorities.

The design of frameworks for biodiversity and ecosystem measurement and assessment is a challenge. Deciding on the right approach and methodology is necessary to ensure the required relevance and credibility. This challenge is even greater when trying to meet the needs of investors. That's why these eight design principles are a good starting point for anyone trying to create quality frameworks and measurement tools that are relevant to investors. The sooner we can take their considerations into account, the sooner we will be able to support and build initiatives that are more likely to improve the current state of life in our planet.