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# Incorporating Nature into Climate Action: Charting a Course for the UAE Post-COP28

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## List of Acronyms

Acronym	Meaning		
CBD	Convention on Biological Diversity		
СОР	Conference of the Parties		
EN-WWF	Emirates Nature – World Wildlife Foundation		
GBF	Global Biodiversity Framework		
GDP	Gross Domestic Product		
GFSI	Global Food Security Index		
GHG	greenhouse gas		
GRI	Global Reporting Initiative		
GST	Global Stocktake		
IPCC	Intergovernmental Panel on Climate Change		
LTS	Long Term Strategies		
MPZ	Marine Protected Zones		
NAP	National Adaptation Plans		
NbS	Nature-based Solutions		
NBSAP	National Biodiversity Strategies and Action Plan		
NDC	Nationally Determined Contributions		
SDG	Sustainable Development Goals		
SEEA	System Of Environmental Economic Accounting		
SEEA CF	System Of Environmental Economic Accounting Central Framework		
SEEA EA	System Of Environmental Economic Accounting Ecosystem Accounting		
TNFD	Taskforce on Nature-related Financial Disclosures		
UACA	UAE Alliance for Climate Action		
UNEP FI	United Nations Environment Programme Finance Initiative		
UNEP- WCMC	United Nations Environment Programme World Conservation Monitoring Centre		
UNFCCC	United Nations Framework Convention on Climate Change		
UNSD	United Nations Statistics Division		
WCAS	World Climate Action Summit		

### Summary

- COP28 and the UAE Consensus signalled a clear message on nature's key role in climate change mitigation and adaptation, referencing the Kunming-Montreal Global Biodiversity Framework (GBF) within the outcome text of the first Global Stocktake (GST). Additionally, the positive outcomes of COP28 should contribute towards better integration of nature within Parties' updated Nationally Determined Contributions (NDCs), National Adaptation Plans (NAP) and domestic policies, aligned with National Biodiversity Strategy and Action Plans (NBSAP).
- Effective and efficient inclusion of nature within these documents and national policies will contribute towards meeting the Paris Agreement goal of limiting global warming to 1.5°C above pre-industrial levels. Given its role as the host of COP28, the United Arab Emirates has an opportunity to lead by example by ensuring full alignment between the new NDCs and NBSAPs as well as within its own national policies.
- This Working Paper looks at the rationale for incorporating Nature-based Solutions (NbS) into policies and how, with appropriate design and implementation, they can positively impact both biodiversity and the climate change crisis. It also discusses the criteria for designing and implementing good NbS.
- The paper is organised in three main sections, the first one is on NbS, which are increasingly recognised as a means for tackling climate change and the biodiversity crisis, while being inclusive towards people most affected.
- The second part focuses on natural capital accounting as a tool to support decision-making processes involving nature interventions, NbS being among them. One of the key requirements for the implementation of nature-based and technological solutions for climate change and biodiversity is to have reliable evidence and data. Natural capital accounting can be a useful decision-making tool and data gathering exercise, since it enables to best compare various interventions and secure the best possible outcomes.
- The final section takes a closer look at how well nature is incorporated within the UAE's policy and economy, and it explores the potential of natural capital accounting at the national and subnational level, particularly on matters of food security in the UAE. It also reflects on the fast-developing assessment and reporting on nature in the corporate context.
- In the conclusion section, this paper provides recommendations on a better integration of nature within the international instruments, on the implementation of NbS and on the use of natural capital accounting as a decision-making tool. Some of the recommendations are as follows:
- 1.Countries, including the UAE, should look to better integrate nature into their national and subnational policies such as NDCs, NAPs, long-term strategies and generally across all of society and all of government, as per the outcomes of COP28 and the UAE Consensus.
- 2.NbS interventions should follow the IUCN's definition and prioritise protecting and conserving existing ecosystems before taking action to regenerate ecosystems through natural or assisted recovery, or through the creation of new ecosystems as the final course of action.
- 3.The UAE should consider integrating nature into its economy by creating natural capital accounts following the UN's SEEA EA framework to help with implementation of NbS, management of its natural resources and to enhance its food security. This would help the UAE in positioning itself as a regional leader in nature accounting.

### The Issue

In 2023, an alarming study warned that Earth has now surpassed the safe operating space for 6 out of 9 of the biophysical systems and processes that regulate the state of the planet.<sup>1</sup> Humans are placing pressure on the Earth's systems and are affecting its stability and resilience. Nature was previously able to keep greenhouse gas (GHG) emissions in balance while supporting biodiversity on Earth. As a result of human activities since industrialisation, 25% of plants and animals are now at risk of extinction and by 2100, 47% of natural ecosystems will have decreased in extent and condition.<sup>2</sup>

Ecosystems acting as GHG sinks could become a source of emissions if temperatures continue to rise following current trajectories, throwing them out of balance. The realities of the biodiversity and climate change crisis mean that it is urgent that meaningful and transformative action is taken to tackle these issues jointly and not in silos. This includes transformation within official frameworks such as the Convention on Biological Diversity (CBD) and UNFCCC.<sup>3,4</sup>

COP28 in the UAE signalled a clear message on nature's key role in climate change mitigation and adaptation. The conference referenced the Kunming-Montreal Global Biodiversity Framework (GBF) within the outcome text of the first Global Stocktake (GST).<sup>5</sup> The decision text emphasised "the importance of **conserving, protecting and restoring nature and ecosystems** towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030, and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by conserving biodiversity, while ensuring social and environmental safeguards, **in line with the Kunming-Montreal Global Biodiversity Framework**".

Alongside the official outcome text, COP28 also produced a joint statement on climate, nature and people signed by 18 countries, including the UAE, which aims to synergise the Kunming-Montreal Global Biodiversity Framework with the UNFCCC framework.<sup>6</sup> The objective of the statement is to support and encourage synergetic implementation of Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), Long-Term Strategies (LTS) for climate, and National Biodiversity Strategies and Action Plans (NBSAPs).

Another related positive outcome of COP28 was the Mangrove Breakthrough Agenda, which brings together state and non-state actors towards the goal of protecting and restoring 15 million hectares of mangroves by 2030. This has secured endorsements by an additional 21 governments. COP28 also resulted in increased finance for nature with \$186 million announced for nature, forests, mangroves, and oceans. This is in addition to the \$2.5 billion to protect and restore nature which was announced in the early stages of COP28 during the World Climate Action Summit (WCAS).<sup>7</sup>

It is clear that during COP28, advances were made in integrating nature into the climate change agenda. This reflects countries' response to what the Intergovernmental Panel on Climate Change (IPCC) has warned against: continuous disregard for nature will inevitably worsen the effects of climate change and in turn will cause irreparable damages to ecosystems, ultimately affecting human prosperity.

The UAE has supported this transformation with the successful UNFCCC conference that saw meaningful changes in how the nature-climate relationship is perceived, but this momentum needs to continue through other COPs and through national implementation. In this context, the UAE, Azerbaijan and Brazil have announced in early 2024 the COP Presidencies Troika to improve climate change cooperation and scale-up action and implementation of the UAE Consensus to achieve the Paris Agreement goals. COP30, to be hosted by Brazil, will take place in the city of Belem in the Amazon rainforest, which is part of the region facing the highest rates of deforestation in Brazil. COP30 could be crucial for putting nature and indigenous people at the heart of negotiations and therefore continuing the nature and people focused trajectories.

## Nature-based Solutions for climate change, biodiversity and people

Nature-based solutions (NbS) are gaining a lot of traction in policy making on national and international levels, as well as in the private sector, with the promise of providing solutions for climate change mitigation and adaptation and tackling the biodiversity crisis.<sup>8</sup> Nature provides us with the ecosystem service of climate regulation by sequestering carbon from the atmosphere and thus moderating Earth's temperature.

However, climate change modelling suggests that global mean temperatures will continue to rise and Earth's processes and conditions will continue to change if GHG emissions from human activities do not decrease.<sup>9</sup> The greater availability of scientific data supporting this conclusion has led to international communities to form a consensus around the urgency of the problem and to pay more attention to NbS for climate change mitigation and adaptation.

At COP27, within the Sharm el-Sheikh Implementation Plan, the terminology 'Nature-based Solutions' was used for the first time in the context of climate change mitigation and adaptation action within forest ecosystems.<sup>10</sup> One year later nature found a prominent place within the outcome document. In the GST text, under the adaptation section, the decision reads:

"...Encourages the implementation of integrated, multi-sectoral solutions, such as land-use management, sustainable agriculture, resilient food systems, **nature-based solutions and ecosystem-based approaches,..."** 

As it is a relatively new concept <sup>11</sup>, and still not widely implemented <sup>12</sup>, there have not yet been proper assessments of the impact of such interventions.<sup>13</sup> It is important to note that NbS interventions should complement rather than replace other clean energy solutions and decarbonisation efforts.<sup>14</sup>

The IUCN was first to define Nature-based Solutions as "... actions to **protect, sustainably manage, and restore** natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature".<sup>15</sup> As the definition states, the first course of action is to protect existing ecosystems that deliver benefits, then to manage and restore.

It should also not be disregarded in this definition that NbS benefit people in addition to benefiting nature. Besides nature providing a primary source of income for local communities, the benefits of NbS for people include cultural, recreational and health benefits. Some of the health benefits linked to the natural environment and access to green spaces include improved mental health and wellbeing, reduced mortality, lower obesity rates, and better foetal and child health.<sup>16</sup> When these and other benefits of properly executed NbS are added to existing calculations, the positive outcomes are likely to outweigh the costs of implementation and maintenance.<sup>17</sup>

#### Current status of nature positive action within national instruments

The positive outcomes of COP28 should contribute towards better integration of nature by countries within the next round of updated NDCs but also within their NAPs and domestic policies. A new set of updated NDCs are expected to be submitted in 2025, reflecting on the COP28 Global Stocktake outcome.

As it stands, 66% of countries already have commitments to working with ecosystems and to apply NbS within their NDCs, for adaptation, mitigation or for both. <sup>18</sup> However, a detailed study into these NbS for climate change within NDCs revealed that these rarely translate into measurable evidence-based actions and targets, with only 17% of nature related targets being sufficiently robust and quantifiable.<sup>19</sup> This shows that a closer scrutiny of nature-related targets within national instruments is necessary to realise climate change goals and, at the same time, to ensure that action causes no harm for local communities and nature.

#### Designing and implementing NbS

When designing NbS, additional benefits that will arise from the implementation of the solutions should be identified. Decision-makers should not only look at how much carbon will be sequestered. Other potential outcomes should also be considered and measured. Interventions should then be implemented with the aim of maximising multiple benefits for both people and biodiversity. The starting point for any NbS should be defining the desired outcome, rather than 'rebranding' existing interventions into an NbS project, making it an outcome-based intervention.

Decisions surrounding NbS implementations also need to be rooted in robust scientific evidence to achieve the best possible outcomes and benefits. Additionally, these decisions need to be designed in partnership with local communities. Post implementation monitoring and evaluation should be part of well-designed NbS to ensure the effectiveness of the interventions. With this in mind, four guiding principles have been suggested to achieve benefits for climate change mitigation and adaptation, biodiversity and people:

A. NbS are not a substitute for mitigation action;

B. NbS involve a wide range of ecosystems on land and in the sea, not just forests;

C. NbS are implemented with the full engagement and consent of Indigenous Peoples and local communities in a way that respects their cultural and ecological rights; and

D. NbS should be explicitly designed to provide measurable benefits for biodiversity.<sup>20</sup>

Embedding these principles into NbS action, will help design NbS that are "robust and resilient" and address both biodiversity and the climate change crisis while being considerate towards nature and people.

When designing an NbS intervention, it is important to respect and understand the complexity of the natural systems involved. For example, NbS does not mean to plant as many trees and plants (this includes mangrove trees) as possible, at indiscriminate locations, as this will likely not deliver the desired results<sup>21</sup>. A good example to consider is tree planting in African savannas. Approximately 100 million hectares of savanna is expected to be afforested by 2030 as part of the AFR100 Initiative, a side initiative of the Bonn Challenge. Savannas are natural ecosystems that already support rich flora and fauna, and serve as carbon sinks. They are not degraded forests. Therefore, afforestation projects in these areas should not be considered as extensive forests, since they are not natural ecosystems in this area. Planting trees in savannas will have negative consequences for these ecosystems and may not reduce carbon at the scale needed.<sup>22</sup>

Another example is a large-scale reforestation project in Cambodia which had an aim to sequester carbon as part of mitigation efforts. Vast areas of native and diverse forest were cleared to be replaced by Acacia monocultures. This had negative consequences for biodiversity in the area and for climate change mitigation goals. It has also surprisingly increased illegal logging in the area due to restricted accesses to local communities.<sup>23</sup> When planting and growing new trees and other plants, ecological factors should be considered alongside societal ones. One consideration is an appropriate location selection for growing trees. It is not useful to degrade an existing ecosystem to create a new one, especially one that is already delivering other services including GHG storage. For a more local context, the UAE's sabkhas are already storing significant amounts of CO<sub>2</sub> and it would have a perverse effect to destroy that ecosystem to create another one. Degradation of the sabkhas ecosystem would likely result in a new source of emissions.

Furthermore, it can take years for a new ecosystem to mature and to start providing the desired benefits and services. The first course of action, as per the NbS definition, should be, whenever possible, to permanently **protect** and conserve existing ecosystems; the second course of action should be to restore degraded ecosystems through natural or assisted regeneration. Only then should the final option to **plant and grow** new trees and plants be considered.

Connectivity of a new ecosystem with the surrounding ecosystems should also be considered, since it is likely to provide a greater delivery of services. Consideration should be given to the type and species of trees and plants to grow. Indigenous flora should be prioritised, since it will be most suitable for the climate and will have the best chances of survival. However, one important thing to note is that the changing climate is likely to have an impact on tree survival and some trees and plants may die-off as a result.<sup>24</sup> Trees and plants that are more resilient to climate change, such as drought resistant varieties, should be planted when possible. Monocultures should be avoided because they are unlikely to contribute towards the biodiversity goal, thus reducing the resilience potential of an ecosystem. Instead, creating a biodiverse ecosystem should be the aim.

Another consideration is the maintenance of trees and plants to ensure a high survival rate. It is not enough to simply plant the seed; the growth to maturity needs to be secured or the effort of planting the seed could be wasted. This includes monitoring and management, which may drive further costs.

To assist and guide policy makers with the implementation of NbS, the IUCN published a set of NbS standards in 2020. The framework (Figure 1) follows eight criteria and 28 indicators that help design appropriate solutions.<sup>25</sup> **Criterion 1** focuses on identifying the societal challenge to which the NbS is a response. **Criterion 2** guides the design of the solution responding to the scale of the issue. **Criteria 3, 4 and 5** correspond to the three pillars of sustainable development – environmentally sustainable, socially equitable and economically viable.

**Criterion 6** addresses the balancing of trade-offs and choices that need to be made to achieve short and longterm gains, and how to ensure that there is a transparent, equitable and inclusive process to determine such trade-offs. **Criterion 7** responds to the need for adaptive management, which facilitates continuous learning about system-wide processes and adapting the NbS according to systemic changes. Finally, **Criterion 8** promotes integration of the concept and actions into policy or regulatory frameworks as well as linking to national targets or international commitments.

Continuous development and promotion of the internationally recognised standards for the implementation of NbS is key. This needs to be coupled with robust scientific research assessing and monitoring the actual implementation of NbS. Together, this will result in well-designed and appropriate NbS interventions, delivering multiple benefits. Some work to assess effectiveness of NbS has been done<sup>26</sup> but more research in this area is needed, especially in arid and hyper arid regions such as the Middle East, which is already heating up faster than any other region.<sup>27</sup> Additionally, it is important to have clarity on existing natural resources and on services and benefits derived from those in order to design the most appropriate NbS.

Figure 1: The eight Criteria that make up the IUCN Global Standard for NbS. Source: IUCN (2020) Global Standard for Nature-based Solutions.



Source: IUCN (2020) Global Standard for Nature-based Solutions.

# The importance of making decisions that benefit the economy, nature and people

To support climate change, biodiversity and developmental goals, an integrated approach is needed. Having reliable environmental evidence ready when creating a new policy or strategy is more likely to result in the environment's consideration in policy-making.<sup>28</sup> This will be especially important as many countries prepare to update their national instruments, such as NDCs and NAPs, to incorporate NbS. For decision-makers to choose which solution (NbS or technological) to implement they need reliable evidence in relation to natural resources and how they contribute towards climate change and biodiversity goals. It is especially useful to know how changes in natural resources' extent and condition might impact economies that rely on them. For example, clean seas and rich coastal ecosystems that attract tourism or sources of natural clean water that are relied upon by many industries.

Many countries have recently recognised the importance of sustainably managing their natural resources for their economies and have incorporated this into their policies and decision-making. Perhaps the best-known example is Costa Rica and its payment for environmental services programme. The programme was initiated in 1997 following a sharp decline in Costa Rica's forest cover as a result of harmful incentives and policies.<sup>29</sup> The country has managed to reverse deforestation and today 60% of its land is under tree cover, 25% of land is protected and 30% of marine ecosystems are protected.<sup>30</sup>

Farmers and landowners are financially rewarded for delivering environmental services such as carbon sequestration, biodiversity protection, water regulation and landscape beauty. As a result of the policies that conserve biodiversity, Costa Rica has developed its tourism sector, attracting nature enthusiasts from around the globe. Today, tourism is a significant contributor to Costa Rica's economy, contributing up to 8.2% to its GDP and providing the most significant source of foreign exchange in the country.<sup>31</sup> Costa Rica stands out as one of the few countries in Latin America that has a comprehensive legal framework and climate change and biodiversity policies, including a commitment to net zero by 2050. Inclusion of nature in policy and economic thinking can benefit the environment and people while also boosting the economy, securing its sustainability for the future.

#### Nature as one of the five capitals

Nature can be seen as one of the capitals, which can be divided into 5 types: human capital (people's health, knowledge, skills...) financial capital (shares, bonds, banknotes...), manufactured capital (tools, machines and buildings...), social capital (families, communities, businesses, schools...) and natural capital.<sup>32</sup> These five capitals combined make up our wealth and the wealth of a nation. Natural capital often underpins and produces the other four capitals by providing us with goods and services upon which our wellbeing depends.

Defining natural capital has not been a straightforward undertaking and there are still various definitions in use.<sup>33,34,35</sup> The UN has adopted the following definition developed by Capitals Coalition: "Natural capital is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people." Figure 2 explains the relationship between natural capital, ecosystem services and goods and benefits, providing examples.

#### Figure 2 Illustration of relationship between natural capital, ecosystem services and goods and benefits.



#### Accounting for natural capital

Despite economic success often depending on natural capital, most countries do not include it in their main measure of economic performance, Gross Domestic Product (GDP). Therefore, GDP does not represent the full picture of a nation's wealth. The inclusion of natural capital into national accounting systems would not only provide a clearer picture of a country's wealth but also make a better case for investing in natural capital.<sup>37</sup> The Economics of Biodiversity: The Dasgupta Review points out that "…we – and our economies – are 'embedded' within nature, not external to it".<sup>38</sup> This is why it is beneficial to mainstream natural capital within decision making in international discussions such as UNFCCC and within the private sector. This is to ensure that nature is recognised as a vital component that supports economies and livelihoods. Furthermore, the maintenance of existing natural capital is important to ensure the sustainable and continuous delivery of the goods and services it provides.

This is where accounting for natural capital is useful. Statistical accounts provide valuable information that supports policy and decision making. Accounts can give an idea about the extent, condition of ecosystems, ecosystem services derived from the assets, and the value estimates of associated assets. The monetary part of the accounts, although not mandatory, is important as there are finite resources for NbS and environmental improvements. Therefore, the resources should be allocated in such a way to allow for the most efficient projects delivering highest (and most diverse) benefits. Accounting also helps shine a light on benefits, other than the usual narrow list (oil, water, timber), which are often overlooked and undervalued such as recreational and health benefits.<sup>39</sup>

It is important to note that the idea behind the monetary account is not to put a price on nature to then give people a right to destroy it for a certain cost. It is instead to help decision-makers better understand the trade-offs of interventions. The monetary value of a natural asset should not be the only reason to preserve it, as estimates may not be accurate due to lack of reliable data and since all the aggregate benefits may not be captured.

It is useful to understand that accounts do have their limitations. Investment in natural assets can deliver benefits over a very long term that may not be easily captured in annual accounts. Some assets hold intrinsic value to people as they are part of their cultural heritage and part of a country's identity. It is very hard to put an estimate on services such as these, since they are not easily measurable. The UAE for example is proud of its heritage and culture, which translates into its efforts to preserve some of those traditions such as the traditional falaj irrigation system, or recovering the Arabian Oryx back to the wild.

Accounts can be created both at a national level (which is particularly important for larger scale planning and designing nation-wide policies) and at a smaller scale (subnational or corporate accounting). Furthermore, adopting a more holistic approach to managing natural resources allows decision-makers to look beyond borders and potentially creates an opportunity for cooperation and open dialogs. Adding more detail and context to the natural stocks and flows of benefits created by those transboundary ecosystems could help make the case for enhanced regional cooperation.

#### The System of Environmental Economic Accounting framework

The best-known ecosystem accounting framework used worldwide, developed by the United Nations Statistics Division, is called System of Environmental Economic Accounting (SEEA). It consists of 2 different frameworks: Central Framework (SEEA CF) and Ecosystem Accounting (SEEA EA).<sup>40</sup> The SEEA CF is used to measure the environment and its relation to the economy. More specifically it measures productive natural assets like water, timber, fish, minerals and energy and their flows back into the environment.<sup>41</sup> The SEEA EA framework, on the other hand, tracks changes in ecosystem assets, linking those changes to economic and other human activities. The focus in this paper is on the SEEA EA framework, as it takes a systems approach to nature accounting and includes wider benefits which are not usually covered by SEEA CF.

The SEEA EA framework was launched in 2021 and it comprises of five accounts:

- 1. ecosystem extent (accounts record the total area of each ecosystem),
- 2. ecosystem condition (accounts record the condition of ecosystem assets in terms of selected characteristics at specific points in time),
- 3. & 4. ecosystem services flow (monetary and physical accounts record the supply of ecosystem services by ecosystem assets and the use of those services by economic units) and
- 5. monetary ecosystem asset (accounts record information on stocks and changes in stocks of ecosystem assets).

#### Box 1 Countries accounting for nature using SEEA EA system

According to the United Nations Statistics Division (UNSD), 41 countries have adopted the SEEA EA framework since its launch in 2021. Most common accounts compiled by these countries are extent accounts, condition accounts and physical ecosystem accounts.<sup>42</sup> Figure 3 illustrates the map of countries using the SEEA AE framework, reference year 2023. In the latest UNSD Global assessment, further 30 countries have indicated adoption of the SEEA EA framework.

## Figure 3 Map of countries implementing SEEA EA framework including thematic accounts, Source UNSD



The United Kingdom has perhaps the most comprehensive work done on its national natural capital accounts, with the aim of better understanding its inclusive wealth. Its Office for National Statistics updates the accounts each year with new data. It follows the UN's SEEA EA guidelines and includes valuation for three different types of ecosystem services: provisioning, regulating and cultural. At the most recent update in 2023, reflecting the year 2021, the accounts have estimated that the total asset value of the ecosystem services included in the accounts is approximately \$1.8 trillion.<sup>43</sup> Cultural services generated the highest value at 61%. This was followed by provisioning services at 32% and regulating at 7% of the total asset value. The accounts have also included health benefits from recreation and valued them at \$560 billion, making them the largest contributor to total asset value. Relevant to climate change mitigation, the accounts have estimated that nature has removed 1,335,686 tonnes of air pollution with an annual value of approximately \$3 billion.

India started its environmental accounting journey in 2011 under the mandate of the National Statistical Office. In 2018 the office published its first environment accounts and it has continued to expand the work since. Today the country has several accounts published covering different topics and different themes. Some topics include land use, land cover, land degradation, wetland accounts, soil nutrient, water quality, forest condition, nature-based tourism, soil erosion prevention, carbon retention accounts.<sup>44</sup>

Other examples on how countries have used SEEA EA include South Africa, which used the framework to create the national river ecosystem account to inform its National Water and Sanitation Master Plan<sup>45</sup>, and the Netherlands, which used the Framework to shape its peatland policy.<sup>46</sup> The number of these country-based examples and uses is expanding with each year as countries recognise the importance of the environment for well-functioning economies and societies. At present, no Arab states have completed this work and the UAE could position itself as a pioneer if it were to be the first in the Arab region to create natural capital national accounts.

The framework features provisioning, regulating and cultural services and can be used to demonstrate how these services contribute towards the economy (see Figure 2 for examples of the different types of services). The framework allows for accounting for different themes such as climate change, biodiversity, oceans, urban and habitat. It relies largely on visual representation of the accounts in the form of maps and tables. Creating account maps allows for various data to be represented at different scales, making it user-friendly. A great benefit of compiling a suite of these accounts is to have that "policy-ready evidence".<sup>47</sup>

## Incorporating nature in the UAE's policy and economy

The UAE has a longstanding relationship with its natural environment, from pearling and fishing, to the deserts and traditional grazing practices in the rangelands. By hosting COP28, the UAE took a major step on to the world stage in relation to climate change and environmental policies. Building on this momentum, now is the opportune time to advance the nature agenda by ensuring its integration within domestic strategies, policies and national instruments for the long-term benefit of Emiratis and residents.

#### Overview of the current state of the nature inclusion in the UAE's NDC

The UAE submitted its third update to its second NDC in 2023 just before COP28. The document mentions alignment with the Sustainable Development Goals (SDGs). Given the UAE Consensus outcome at COP28, the UAE could benefit from adding a section within its new NDC, acknowledging the work towards an alignment with the Global Biodiversity Framework. Nature, NbS and environment are mentioned in both mitigation and adaptation sections with varying prominence.

#### Mitigation

When it comes to mitigation there is little mention of the role of nature-based solutions. The UAE's National Blue Carbon Project, mostly focusing on mangrove ecosystems, is listed as an intervention for crosscutting action. However, within the UAE context, other ecosystems besides mangroves are worth considering for mitigation action as per the Table 1.

The table shows the results from a study of the UAE that examines the carbon stocks (both soil and plant carbon) of various coastal ecosystems across 58 sites. This study showed that the biggest carbon stocks are within mature mangrove forests, followed by microbial mats and coastal sabkhas<sup>48</sup>. It is worth noting that planted mangroves have significantly less carbon stock than mature mangroves which makes a case for protecting existing mangrove ecosystems as a first course of action, followed by planting new ones. Another recent study covering two sites in the UAE (Khor Faridah in Abu Dhabi and the Umm Al Quwain lagoon) showed that there is a variability between two sites when it comes to the ability of different systems to store CO<sub>2</sub>. Another relevant finding from this study was that connectivity between habitats results in higher CO<sub>2</sub> storage, illustrating the importance of maintaining well connected habitats.

The UAE's sabkhas are coastal mudflats that bear no vegetation, some dating back as far as 7000 years. Despite the lack of vegetation, sabkhas store a significant amount of CO<sub>2</sub>.<sup>49</sup> If disturbed and degraded, this ecosystem can release CO<sub>2</sub> into the atmosphere. Although the UAE is not the only country that features this ecosystem, it does hold the highest percentage of sabkha area per country. It is also important to note that this ecosystem contains a dynamic and diverse microbiological ecosystem that includes halophilic (salt-loving) bacteria with potential application and use in bio saline agriculture.<sup>50</sup> Cyanobacterial mats (or simply microbial mats) are dynamic layered microbial communities<sup>51</sup> and are similar ecosystems to sabkhas in that they also have the ability to store significant amounts of carbon and bear no vegetation.

Seagrasses and salt marshes also have potential for carbon sequestration and storage. Interestingly, although with relatively low carbon stock values per hectare, seagrasses have the widest distribution of all coastal ecosystems and collectively stock the largest amounts of carbon in the UAE. In addition to mitigation potential, it is important to note that seagrass ecosystems are also a habitat for dugong populations, which are listed as endangered in the UAE, making an even stronger case for their protection. All of these coastal ecosystems could be considered for inclusion in the national and subnational policies for mitigation, in addition to mangroves.

Table 1 Carbon stocks across 58 sites in coastal ecosystems in the UAE. Table adapted from Schile, L.M
et al (2017)

Ecosystem type	Total Carbon Stock (median values) in MgC/ha	
Mature Mangroves	189.4	
Microbial (cyanobacterial) Mats	153.6	
Coastal Sabkhas	90.4	
Planted Mangroves	88.2	
Salt Marshes	73.6	
Sea Grass	51.6	

#### Adaptation

The adaptation section of the UAE's NDC document reflects in more detail the role of the environment, specifically how "loss of biodiversity and ecosystems is [a] high-risk impact of climate crisis". In addition to above-mentioned coastal ecosystems, the NDC document also identifies reef-building corals as another ecosystem relevant to adaptation.

The document also identifies coral bleaching as an adaptation risk, as these ecosystems have the potential to protect the shoreline, to reduce the impact of waves, and are important habitats for marine life, contributing to marine biodiversity. Almost half of coral reef species present in the UAE (for which assessment data was available) are threatened due to pollution, urban and industrial development, tourism and warming related to climate change.<sup>52</sup>

The UAE has established Marine Protected Zones (MPZ) to combat these issues but further monitoring and data collection are necessary to assess the success of MPZs. 12% of the UAE's territorial waters are currently protected, which exceeds the CBD agreed target (Aichi Target 11<sup>53</sup>) to protect 10% of coastal and marine areas by 2020.<sup>54</sup> The new target, according to the framework, is 30% protection of coastal and marine areas by 2030 (Target 3).<sup>55</sup>

#### Box 2 Some examples of NbS relevant for arid and hyper-arid regions

Large multilateral events such as UNFCCC COP often come with a plethora of pledges and announcements both by governments and non-state actors. Some of these are directly in relation to NbS and climate change, with a focus on increasing tree cover. This has limited relevance to countries that don't naturally grow dense forests due to water scarcity and soil scarcity. Other ecosystems and solutions are often underrepresented, leading to limited data and evidence on potential NbS, especially in arid areas such as the Middle East.

One NbS involving a tree growing project operating in a dry and resource scarce region is the Restoration of the Great Green Wall project in the Sahel region of Africa.<sup>56</sup> The goal of the project is to restore 100 million hectares of degraded land by planting trees which have commercial potential (e.g. baobab, moringa, shea and acacia). The project, supported by the World Economic Forum and Trillion Trees Platform, is committed to delivering environmental, social and economic benefits.

Problem	Mitigation or adaptation	NbS Intervention	Ecosystem
Coastal erosion, sea level rise, storms and waves and coastal flooding	Adaptation	Creating nature-based coastal defence	Coral reefs, saltmarshes, mangroves, seagrasses
Coastal CO <sub>2</sub> sequestration	Mitigation	Protecting and restoring natural ecosystems	Mangroves, seagrasses, sabkhas, saltmarshes, mudflats, microbial mats
Urban heat	Adaptation	Creating canopy and green spaces to reduce temperature	Urban native forest and plants
Flash floods in urban areas	Adaptation	Creating green spaces such as parks in urban areas to collect excess water	Urban parks and green spaces
Farming in water and soil scarce region, food security, terrestrial CO <sub>2</sub> sequestration	Crosscutting	Conservation agriculture (such as regenerative agriculture), agroforestry and water management	Agricultural land
Loss of biodiversity in rangelands	Crosscutting	Putting policies in place to limit access to rangelands	Rangelands ecosystems

Table 2 lists some of the other potential NbS for the UAE and the Middle East region

This list is not exhaustive. As per the table, more ecosystems should be considered as part of mitigation and adaptation solutions in the Middle East region.

Apart from the coast, the document mentions the Ghaf tree and date palm tree as key species well adapted to arid conditions and with the ability to sequester and store carbon .<sup>57</sup> The Ghaf tree is the UAE's national tree and felling the tree is prohibited by law, which contributes to their prevalence across the country.

In addition to updating their NDC, countries are expected to update their National Biodiversity Strategies and Action Plans by late 2024 to reflect the new biodiversity framework. The UAE is one of the signatories to the Convention on Biological Diversity, which it ratified in 2000, and will be expected to update its biodiversity plans. The UAE published its National Biodiversity Strategy in 2014 and, in addition, has in place the National Strategy to Combat Desertification and the Strategy for Sustainability of the Marine and Coastal Environment. It is a timely moment to align national instruments, ensuring they complement each other.

It is not adequate to include nature-related targets and measures for climate change mitigation and/or adaptation within national instruments if other climate change measures in turn cause harm to nature. There is a concern that some actions for climate change have the potential to cause harm to nature and people's livelihoods. One example is mining for critical minerals to be used for green infrastructure, including production of wind-power turbines, photovoltaic panels and lithium batteries for electric vehicles.

Poorly managed resource extraction can lead to environmental and social issues such as deforestation, contamination of ground and surface water, sinkholes, biodiversity decline, competition of resources and loss of primary income source for local populations. So far critical minerals are mostly mined in Democratic Republic of Congo (cobalt), Indonesia (nickel), China (graphite and rare earth minerals), Australia (lithium and rare earth minerals) and Chile (lithium).<sup>58</sup> As the market of these commodities continues to develop and grow, inevitably new mines will emerge. It will be critical for the world to address these risks and trade-offs, accompanied by legislation that protects local communities and the environment.

The UAE, like other countries, will need to address these dilemmas and ensure full alignment between the new NDCs and NBSAPs. To address the required urgency and ensure efficiencies when deciding on action for climate change and biodiversity, various options should be assessed and weighed to avoid harming nature or increasing emissions. Options (be it technological or nature-based) for tackling both of these problems simultaneously exist, but solutions should provide tangible benefits without harming people or biodiversity.

#### The case for natural capital accounting in the UAE

The next round of the UAE's NDCs will be reflecting its own domestic and subnational policies. Existing policies will be updated and new ones created as a result of the direction of global climate change policies. Creating natural capital accounts could be used as a tool to inform policy decisions and directions in line with global climate change and biodiversity policies. At the moment, the UAE's National Account Statistics does not incorporate data on natural resources and these are not reflected in its GDP.<sup>59</sup> The statistical data in National Account Statistics on natural resources (publicly available) is limited to protected areas (extent), agricultural activity and ground water usage.

The UAE has initiated the Smart Map on Natural Capital of the UAE. Emirates Nature-WWF has worked on creating ecosystem accounts mostly focusing on coastal ecosystems and has produced the first maps of coastal ecosystems for the North-Western region, with the aim of supporting decision-making and informing management relating to these ecosystems.<sup>60</sup> These interactive maps show the distribution and extent of coastal habitats and describe their condition. Importantly, maps and databases provide a baseline for future monitoring of these ecosystems. These maps should be expanded to encompass all of the UAE's coastal habitats, deeper waters and terrestrial

ecosystems to provide an overall picture of the UAE's natural resources distribution and extent. In addition, further information on ecosystem services could be added to these maps, for example,  $CO_2e$  sequestration abilities of various mapped habitats, recreation information and adaptation related services.

For the UAE to further develop such accounts, data gaps in the baseline for ecosystem assessment need to be addressed. This includes collecting relevant data and knowledge, working with local communities and setting up monitoring systems where necessary. It is beneficial for this data to be publicly available so it can be used in the planning stages of any future development, to improve local scientific research and to educate the public, among other reasons.

The Abu Dhabi Environment Agency publishes yearly reports on terrestrial and marine biodiversity, groundwater and air quality using data gathered through surveys and monitoring covering the largest Emirate in the UAE, Abu Dhabi.<sup>61</sup> Having this level of information on natural resources ready at a national level, and especially in the form of user-friendly maps, can help with designing future policies and regulations in line with international treaties such as the Paris Agreement and Global Biodiversity Framework.<sup>62</sup>

#### Potential for natural capital accounting for improving food security in the UAE

The goal for the UAE as per its Food Strategy is to increase domestic production by 15%. To help the country achieve that, the focus should be on protecting and improving the natural assets which domestic food production relies on. To protect domestic food production from climate change, it is important to understand which natural capital assets, processes and related ecosystem services are relevant.

Identifying these factors is not enough; they should also be fully described. For example, accounts and maps of sea habitats, soil, water and biodiversity could be created that contain information on the extent of each of these assets, their condition and services derived that specifically support food production.

This information can then be used to model different types of risks and impacts, including climate change, land use change and pollution, all of which may potentially affect future domestic food production. Some of the work on terrestrial natural capital mapping has already been done in the UAE, specifically on soil and hydrology. There is a comprehensive map of UAE soils available at the Emirates Soil Museum website<sup>63</sup> and the Abu Dhabi Soil Quality Monitoring Programme.

However, this work needs to continue to add more detail on the condition of soils and to track changes in soil condition (including soil carbon fluxes) and changes in extent, covering all the Emirates. Similarly, the UAE has recently developed a hydrogeological map that contains information such as groundwater well locations, geology, geomorphology, dams, springs, groundwater quality, and meteorological data.<sup>64</sup> The intent of these maps is to manage water resources more efficiently. Having these information resources in one place could encourage more sustainable decision making.

Another reason to consider creating natural capital accounts is that the SEEA accounting framework is one of the indicators within the Global Food Security Index (GFSI) contributing to countries' food security rankings. Although the UAE ranks relatively high on the index, especially considering the scarcity of its natural resources, one area where it can improve its ranking is the political commitment to the adaptation indicator which falls under the sustainability and adaptation composite indicator.<sup>65</sup> Within this group of indicators is the indicator Environmental – economic implementation – an assessment on the status and implementation of the SEEA. More than half of countries participating in the Index have fulfilled this criterion and it could be beneficial for the UAE to implement SEEA as well.

Now is the time to start addressing resource scarcity for food production before climate change worsens the situation where, in a business-as-usual emissions scenario, the UAE could face prolonged extreme temperatures and droughts. In order to achieve its ambitious targets for increasing domestic food production, the UAE needs to increase the availability of natural resources using NbS, which are likely to provide additional benefits. This mainly means increasing the extent of arable soils, including tackling high salinity and protecting and increasing groundwater stocks, as well as protecting the UAE's seas to support the fishing industry.

#### The role of the private sector in enhancing nature

The latest World Economic Forum Global Risks Report 2024 lists environmental risks such as extreme weather events, biodiversity loss and ecosystem collapse, pollution, critical change to earth systems, and natural resource shortages in the top 10 risks over the next 10 years<sup>66</sup>. Business involvement with global climate change and biodiversity policies has been more prominent in recent years.

The Marrakesh Partnership launched at COP22 in 2016 has a goal of bringing together party and non-party stakeholders to accelerate the implementation of the Paris Agreement and business is a key part of that partnership. The Partnership recognises the role of nature and calls for action for nature and land use, oceans and water. Furthermore, a global coalition, Business for Nature, comprising more than 85 organisations and companies, is looking to achieve a nature-positive economy by 2030. The coalition works with governments to help embed business into NBSAPs and policies amongst other actions.

Domestically, in partnership with EN-WWF, the UAE has launched the UACA (UAE Alliance for Climate Action) initiative which brings together non-state actors with the aim of achieving the Paris Agreement by setting science-based targets.<sup>67</sup> The focus of the initiative is environmental, economic and social system transformation. The partnership started in late 2023 so is still in its early stages but currently counts over 40 members.

Businesses and financial institutions are increasingly assessing the impact of their activities on nature and the risks nature poses for their business. The Kunming-Montreal Global Biodiversity Framework target 15 asks for businesses to assess, disclose and reduce biodiversity-related risks and negative impacts.<sup>68</sup> COP28 saw the presence of reporting standards representatives such as Taskforce on Nature-related Financial Disclosures (TNFD) and European Sustainability Reporting Standards, Global Resources Initiative (GRI) highlighting the importance of businesses accounting for nature. Businesses are becoming increasingly aware of their relationship with nature and the need to manage risks from this. As a result, businesses are taking action.

The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and the United Nations Environment Programme Finance Initiative (UNEP FI) published in early 2024 a review of six different assessment and disclosure approaches relevant for the private sector.<sup>69</sup> The review showed that there is an increasing alignment between different approaches but further consolidation is necessary. It also reflects on the regulatory direction the standards and frameworks are going towards. As of 2024, the European Union has a directive in place that requires businesses in member states to disclose their impacts on nature. Other countries such as the United States, the United Kingdom, Japan and South Africa are working towards introducing regulation, switching from voluntary to mandatory disclosures for businesses.

It is clear that the private sector is also taking action towards aligning action for nature and climate change and this area will continue to develop via stronger regulation, reporting and disclosure.

## **Conclusions and recommendations**

The goods and benefits provided by nature are known to improve the daily lives of people and communities. Our economies depend on natural resources and assets, and yet, this is rarely accounted for in measures of economic performance, such as GDP, or wider policies. Having a good understanding of the extent and condition of, and changes to, our natural resources is crucial for appropriately managing them and ensuring they continue to exist for future generations. Creating a comprehensive inventory of natural assets and related services delivered by our ecosystems in the form of easy-to-use maps and datasets can help with designing better policies. Natural capital accounting using the UN's SEEA EA framework could be a useful tool to mainstream nature into policy and decision making at the national and subnational level.

It will be particularly important to have good data access related to natural resources when updating the climate change and biodiversity national instruments such as NDCs, NAPs and NBSAP as required by UNFCCC and CBD. Given the COP28 outcomes, where nature held a more prominent place and parties called for better alignment between CBD and UNFCCC, it is reasonable to expect NbS to feature more within these instruments. Appropriate design and monitoring of implemented NbS intervention will be crucial in meeting the Paris goals as well as designing solutions which are suitable for arid and hyper arid regions, such as the UAE and the wider Middle East region.

With that in mind this paper recommends the following:

#### A. Integration of nature into national instruments following COP28

- 1. Countries, including the UAE, should look to better integrate nature into their national and subnational policies such as NDCs, NAPs, long-term strategies and generally across all of society and government as per the outcomes of COP28 and the UAE Consensus.
- 2. Nature-related targets in these instruments and policies should be SMART specific, measurable, achievable, relevant, and time-bound as well as being deep-rooted in science.
- 3. The UAE should continue promoting greater inclusion of nature within the UNFCCC process through the new COP Presidencies Troika, ensuring continuation of a high ambition for the role of nature.

## B. Designing effective and efficient Nature-based Solutions (NbS) for climate change, biodiversity and people

- 4. NbS are not there to replace other technological solutions to climate change but to compliment them. The most efficient solution for meeting the Paris Agreement is still a rapid phase-out of fossil fuels.
- 5. NbS intervention should follow the IUCN's definition and as a first course of action protect and conserve existing ecosystems, then regenerate by allowing ecosystems to recover naturally or with assistance, and then as a final course of action, create new ecosystems.
- 6. When deciding on NbS, countries should look beyond tree planting and consider other ecosystems including the

additional benefits and services they can provide, especially for local peoples. For the UAE, this means giving consideration to other ecosystems such as sabkhas, microbial mats and sea grasses as well as deeper sea and terrestrial ecosystems. Countries in the Middle East region should work together to formulate NbS suitable to this region, which is highly sensitive to the changing climate.

7. When designing NbS, ecological complexities of ecosystems should be respected and taken into account. Continuous monitoring of implemented interventions should be part of the exercise to ensure efficiencies and effectiveness of the solution.

#### C. Accounting for nature

- 8. The UAE should consider integrating nature into its economy by creating natural capital accounts following the UN's SEEA EA framework to help with implementation of NbS, management of its natural resources, and to enhance food security. This would help the UAE position itself as a regional leader in nature accounting.
- 9. As a starting point, identifying data gaps to create such accounts should be a priority, followed by a data collection exercise and collating data into accounts. Additionally, map building of the work already done for the Smart Map on Natural Capital of the UAE project should be completed.
- 10. The UAE should consider stronger regulation of private sector reporting on nature related impacts.

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