

AGEDI | THE ABU DHABI GLOBAL ENVIRONMENTAL DATA INITIATIVE

ECOSYSTEM SERVICES **ASSESSMENT**





Background

Coastal habitats provide a myriad of essential ecosystem services; they support fisheries, protect shorelines, provide opportunities for tourism, and are important for cultural heritage and identity. With Abu Dhabi's rapidly developing growth trajectory derived primarily from its rich oil and gas reserves, it is paramount that Abu Dhabi's ecosystems are protected and valued locally, nationally and globally in terms of their wildlife, natural resources and landscape. And, when it comes to decision-making on land use around Abu Dhabi's coastal and marine habitats, a range of factors needs to be considered to ensure that protective directives are enforced.


To this end, in April 2014, the Abu Dhabi Global Environmental Data Initiative (AGEDI) released the results of Phase I of the Abu Dhabi Blue Carbon Demonstration Project bundled with the Ecosystem Services programme. The report provided a first understanding of the full potential of these ecosystems for carbon storage and a wide range of the other benefits they provide.





Following this insightful introduction to these marine ecosystems and their blue carbon storage patterns, AGEDI conducted Phase II of the programme, which comprises further localised contingent valuation of associated blue carbon ecosystems services. The contingent valuation helps identify the Total Economic Value (TEV) of these services, based on the two main categories of use values (meaning actual use of the

environment, such as fishing) and non-use values (which are not associated with actual use, such as an ecosystem or its services). AGEDI's efforts focused on non-use values, with project findings helping to determine compensation fees for associated environmental damage and in highlighting the need for continued protection of these invaluable habitats.



The coastal and marine resources are working hard to provide a range of services to all the visitors, residents and citizens of Abu Dhabi.



Project Overview

Ecosystem services are the natural by-products of healthy, well-functioning environments – they include provisioning for food and water resources, as well as regulating and supporting functions such as flood control, waste management, water balance, climate regulation, and other processes.

The oceans and coasts provide many of these critical yet undervalued services, supporting not only coastal inhabitants but all life on the planet. With such significant human reliance on these services, it is essential to recognise their value before they are lost.

While it is clear that stakeholders are willing to pay for non-use environmental benefits, these benefits are likely to be implicitly treated as zero unless their dollar value is somehow estimated. The contingent valuation method involves directly asking people, via a survey, how much they would be willing to pay for specific environmental services – one of the only ways to monetise non-use values of the environment.

The Contingent Ecosystem Services Assessment for Abu Dhabi is a strategic initiative that measured the value of these services, which will help influence the behaviour of regional leaders. Through education about the environment in coastal marine habitats, and with the understanding that financial compensation may one day be required, these leaders will be able to make informed decisions when it comes to complex land-use that will ultimately lessen negative environmental impact.

In this analysis, the interest is in the amenity values people derive from the coastal and marine resources within the Abu Dhabi Emirate, and specifically for Abu Dhabi city. This has become an important consideration given the rapid rate of economic development, and the fact that the city is being marketed as a destination of choice for the global traveller and business person using amenity values, such as beach and ocean views, recreation and sport opportunities and facilities, as attractions. The consequences of urban growth, however, are an increase in waste, energy and water use. Furthermore, there is active reclamation of the ocean leading to an increase in the canalisation of the coastal area, reducing water flow, and as a result the city has seen an increase in eutrophication and the number of red algae blooms.

"We cherish our environment because it is an integral part of our country, our history and our heritage. On land and in the sea, our forefathers lived and survived in this environment. They were able to do so only because they recognised the need to conserve it, to take from it only what they needed to live and to preserve it for succeeding generations. We are responsible for taking care of our environment and wildlife, protect it and preserve it not only for the sake of our current generation, but also for the sake of our children and grandchildren. It is our duty to be loyal to our ancestors as well as our successors. With God's will, we shall continue to work to protect our environment and our wildlife, as did our forefathers before us. It is a duty, and, if we fail, our children, rightly, will reproach us for squandering an essential part of their inheritance, and of our heritage."

*The Late Sheikh Zayed bin Sultan Al Nahyan,
Founding father of the United Arab Emirates
(February 1998, on the occasion of the Annual Environment Day).*



A total of 103 beach visitor questionnaires were completed from four principle beaches:

1. Al Bateen
2. Corniche
3. Saadiyat
4. Yas beaches



Findings: The US\$824 million Question



For the last four to five decades, urban development in Abu Dhabi has taken place in close proximity to the coast. This is largely due to the accessibility to a wide range of marine-based ecosystem services, such as water supply, recreation, visual amenity, sense of place, waste dilution and assimilation, marine food sources, and water-based transport. The abundance and quality of the ecosystem services supplied have generated high levels of coastal amenity services, such as visual aesthetics, and the ability to market the city as a destination of choice. Much of the hospitality industry and high value residential property has been located immediately adjacent or close to the ocean to access the amenity generated by high levels of ecosystem services supplied by the marine environment. These facilities have been marketed as seaside facilities, offering numerous opportunities to interact or recreate with the marine ecosystem, and attracting a price premium. Given the vision of Abu Dhabi to protect its environment and to continue to offer a quality natural environmental and associated amenity services, there is a perceived entitlement to access a quality marine environment for recreation and other amenity services by the resident, investor and visitor alike.

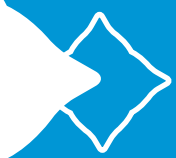
This analysis estimates that the amenity which the coastal and marine resources supply in Abu Dhabi are worth some US\$141 million to only 15 Abu Dhabi hotels per year equalling a net present value of between US\$1.3 billion and US\$2.1 billion over 13 years, the average period before major refurbishment is expected. In addition, the coastal and marine resources were calculated to supply a value of US\$683 million to beach users per year. This conservative number, assuming only 4.2% of the residents of Abu Dhabi visit the beaches, is almost five-fold the effect on the hotels.

The total impact is estimated to be US\$824 million per annum. The residential estate market and commercial properties could also experience significant losses, but these could not be estimated.

The amenity services that the marine ecosystems supply is, however, not assured. The increasing incidence of HAB points to declining marine ecological functionality, paralleled by shrinking coral reefs and sea grass beds. Should the current trend in marine degradation continue,

Hotels indicated that they will require compensation between about US\$113 million and US\$141 million per year, or 35% of average turnover. This equates to an average NPV of between US\$1.3 billion and US\$2.1 billion assuming a discount rate of 5% and -2% respectively over the expected average life expectancy of 13 years.





large scale losses of coastal amenity could be experienced. Beach-front hotels anticipate a 30% to 35% decline in turnover, and beach users anticipate a significant loss in wellbeing, reaching values up to 190% of their annual income for the poorer residents, should beach amenity services be lost. Understanding the implications of red tides has helped to understand the implications of losing the functional marine ecosystems associated with Abu Dhabi. The effects of red tides are a proxy for the loss of ecosystem services which generate recreational and general coastal amenity. By measuring the costs of red tides, we are able to show the value of marine ecosystems and their services.

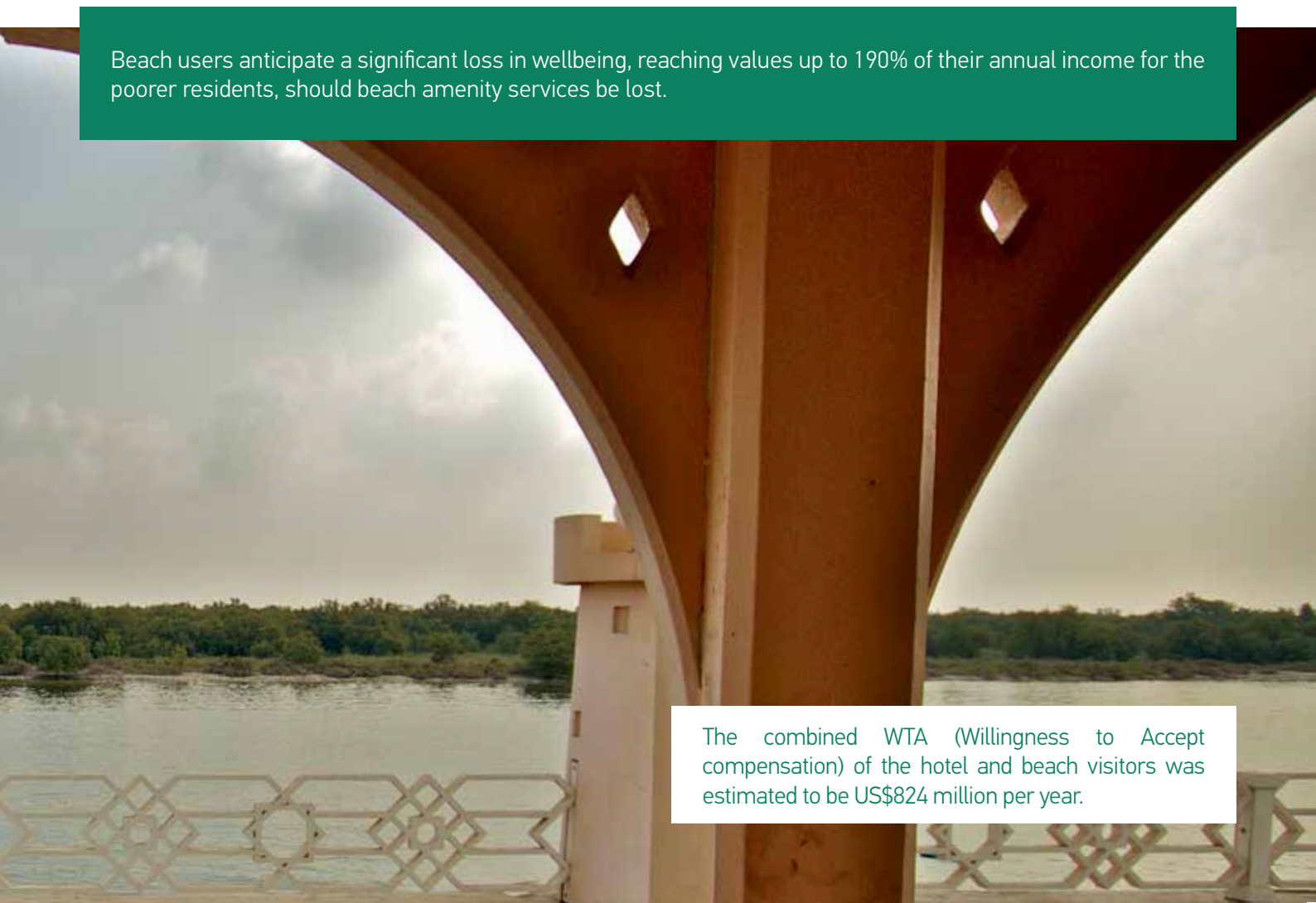
Importantly, a decline in coastal amenity, due to a declining marine ecology, would not only have costs to the current users and hospitality industry, but potentially would seriously constrain the future growth of the hospitality industry and the attractiveness of the iconic developments. These likely losses could negatively affect Abu Dhabi's global image and tourist economy, and urgent remedial action would be prudent. The anticipated

increases in water, brine and thermal pollution as the city grows, imply a further decline in coastal amenity combined with a doubling in demand for the same services, with a serious decline in services per capita.

A well-managed coastline that would provide quality marine and coastal resources around Abu Dhabi and would act as a safeguard against the prevalence of red tide or harmful algal blooms is therefore important to protect both the economic revenues from tourism and beach leisure activities, as well as to secure the image of Abu Dhabi. The latter is especially important given the drive to market Abu Dhabi as a global destination of choice for international and predominantly high value visitors. Abu Dhabi has therefore become iconic, leading to rapid expansion and top-end development, including the ongoing developments.

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The combined WTA (Willingness to Accept compensation) of the hotel and beach visitors was estimated to be US\$824 million per year.





The plausible implications of the findings could include:

Short-term

- The sector-wide impact could include a decline in sector revenue, resulting in a contraction of the hospitality and related economic sectors as well as impacts on the credibility of the marketing image of Abu Dhabi as a destination of choice

Future/Medium to Long-term

- The anticipated growth of the sector could be inhibited
- An Emirate-wide impact could be expected as a result of the knock-on effects

For Tourists and Residents

- The magnitude of the loss of complete access is between 14 and 19 times higher than the offset requirement for tourists and between 9 and 12 times higher for residents
- A system-wide impact is perceived to have severe well-being implications
- A quality beach is an expectation
- The impact on poorer households is higher and require more compensation for offsetting their costs
- Affluent households are impacted more by the total loss of access
- The willingness to contribute to restoration is low for residents but higher than tourists
- Residents see beach recreation as a critical element to their well-being





Future Considerations

As part of the Project, a final feedback workshop was held to present the results to participants. The workshop asked the two principal stakeholder groups present (public sector policy specialists and private sector hotel managers) questions relating to:

- What were the lessons learned?
- What are the priority actions for the future?
- What can you do to help the process?

To move forward, the following three-stage approach is recommended:

- Assess the priority services that deliver the Western Region's food security and biodiversity assets through a participatory modelling workshop
- Use Priority Focus Areas from the Regional Biodiversity Assessment project (AGEDI 2013) as a basis to run ECO-FUTURES participatory modelling workshops at a national level and develop priority contingent valuation research projects

- Develop a better understanding of the revenue loss in relation to likely mitigation and restoration costs
- Replicate the amenity valuation research, in particular for Dubai and other Emirates and possibly within the wider Arabian Gulf region
- Inform an options analysis based on a review by coastal biodiversity experts of current habitat resources and habitat condition within the Abu Dhabi area, coupled with a better understanding of the drivers of habitat loss and deterioration, and the likely costs of an implementation programme

All next steps will be facilitated by enhanced cross-sector working between biodiversity, policy, and planning experts.





FOR MORE INFORMATION

For more information, download any of AGEDI reports, including the full Ecosystem Services technical report, visit www.AGEDI.org or contact: BlueCarbon-EcosystemServices@ead.ae



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What is AGEDI?

Under the guidance and patronage of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the United Arab Emirates, the Abu Dhabi Global Environmental Data Initiative (AGEDI) was formed in 2002 to address responses to the critical need for readily accessible accurate environmental data and information for all those who need it.

With the Arab region as a priority area of focus, AGEDI facilitates access to quality environmental data that equips policy-makers with actionable, timely information to inform and guide critical decisions towards a sustainable future.

AGEDI is supported by Environment Agency - Abu Dhabi (EAD) on a local level, and supported by the United Nations Environment Programme (UNEP) regionally and internationally.



an initiative of



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