



The Sustainability Digest

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Innovation 1

The Element Hydrogen to Environmental Rescue

Hydrogen, a chemical element, is increasingly more positively cited in our discussions on zero emissions and zero waste.

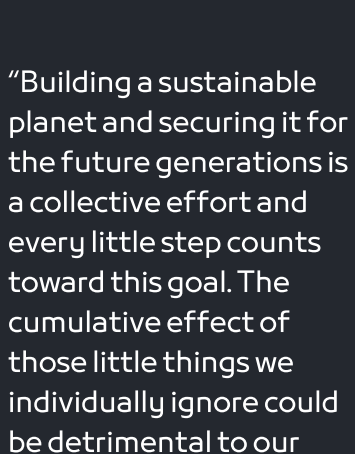
Vehicular emission, particularly from internal combustion engines, is notably an atmospheric source of nitrogen dioxide, carbon dioxide, carbon monoxide, hydrocarbon, formaldehyde, and particulate matter. It has also been linked to several health problems, mostly respiratory. Numerous sources have cited that transportation accounts for up to 20% of total greenhouse gas emission.

The increasing adoption of electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) is a pathway to the elimination or reduction of tailpipe emission. Contrary to the gasoline or diesel internal combustion engines, an EV possesses a battery and an electric motor, while a PHEV uses gasoline and electricity. EVs typically have no tailpipe emission, and if charged with with electricity from renewable sources advance the zero emissions goal.

However, a more recent advancement is hydrogen-powered or fuel cell electric vehicles (FCEVs). Compared to a standard EV, FCEVs generate electricity from the reaction of hydrogen gas and oxygen gas. The oxidation of hydrogen leads to a release and flow of electrons that generate the electricity that drives the motor. Hydrogen itself is not a fuel, but an energy carrier.

FCEVs are still considered less efficient compared to EVs, because of the energy input associated with the electricity generation processes – electrolysis, condensation, transportation, and storage of the hydrogen gas. FCEVs are also currently less attractive in terms of cost compared to EVs. However, with water and heat as the only byproducts of FCEVs, the environmental promises are currently unmatched, as several pollutants are eliminated.

Perhaps as the world pushes to reduce vehicular emissions, research discussions should be centered on resolving the shortcomings of FCEVs. Our journey to sustainability could be achieved with one of the most abundant elements on earth.



Mohamed AlHosani
Chief Sustainability Officer
BEEAH Group

“Building a sustainable planet and securing it for the future generations is a collective effort and every little step counts toward this goal. The cumulative effect of those little things we individually ignore could be detrimental to our environmental sustainability pursuit.”

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Hydrogen

H₂

BEEAH Success Story

BEEAH Tandeef is Going Beyond Waste Collection and Bridging Research, Innovation, and Community Engagement

BEEAH Tandeef is the arm of BEEAH Group dedicated to waste collection, street cleaning, waste tracking and sorting services. Tandeef is known for several innovations in the industry including digital waste management platform, eco-friendly fleet of electric vehicles, automated route optimization, solar-powered smart bins (with built-in community Wi-Fi hotspot), etc.

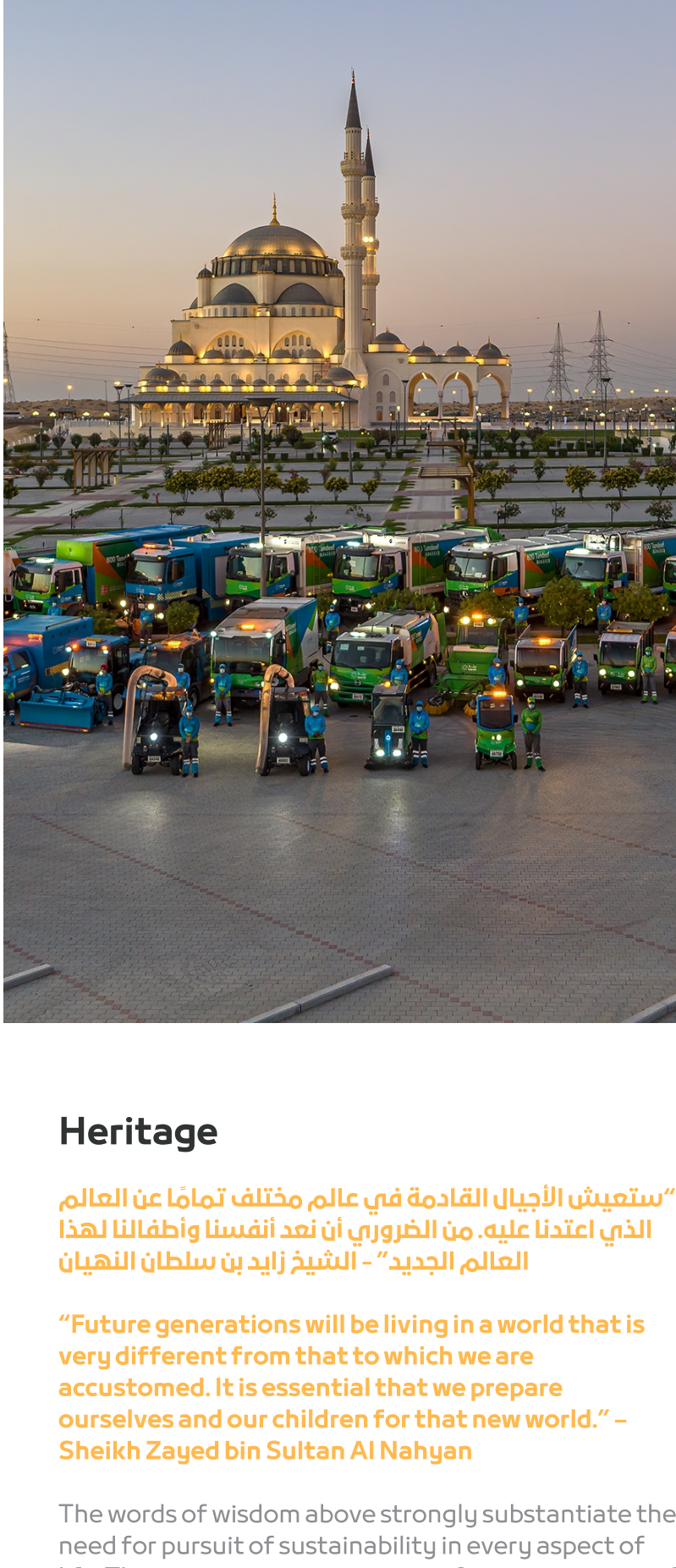
As an integral arm of BEEAH Group with operations beyond the UAE, Tandeef strives for innovation and novel community engagement, conducting community outreach programs to promote a culture of recycling and environmentalism. In doing so, a project launched by Tandeef which started in Al Rahmaniya was aimed at advancing recycling in Sharjah.

The project awareness team held a campaign in neighborhoods of Al Rahmaniya, gave out booklets and educated the residents on the project goals. Each household was provided with two bins, for general and recyclable waste, and further educated on the usage.

Supporting this effort, the BEEAH Consultancy, Research and Innovation (CRI) team is leading a complementary study to gauge the level of engagement within the community to help evaluate the success of the project and provide feedback. The aforementioned project integrated elements of research and community engagement, a unique prowess of BEEAH.

Additionally, BEEAH Tandeef offers residents two different services, the “you call, we haul” service for disposing bulky waste such as furniture and household appliances, and “green and bulky waste collection program” for disposing large volumes of waste, up to 1.5 tonnes.

With operations across UAE, Saudi Arabia, and Egypt, BEEAH Tandeef remains a leader in the region, serving Abu Dhabi, Sharjah, Madinah, and Egypt’s New Administrative Capital, as well as commercial clients such as Dubai Airports, The Emirates Group, Dubai World Trade Centre, Burj Khalifa, Jumeirah Lake Towers, and TECOM Group.



Heritage

“ستعيش الأجيال القادمة في عالم مختلف تماما عن العالم الذي اعتدنا عليه. من الضروري أن نمد أنفسنا ونحافظنا لهذا العالم الجديد” - الشيخ زايد بن سلطان آل نهيان

“Future generations will be living in a world that is very different from that to which we are accustomed. It is essential that we prepare ourselves and our children for that new world.” – Sheikh Zayed bin Sultan Al Nahyan

The years of wisdom above strongly substantiate the need for pursuit of sustainability in every aspect of life. The environment, consisting of its components of land (lithosphere), air (atmosphere), water (hydrosphere), and animals and plants (biosphere), is the foundation of life on earth, and hence, the basis for continuity of life for ourselves and the future generations.

From an environmental perspective, adhering to the course of preparing ourselves and our children for the new world entails adoption of sustainable and preferably regenerative environmental practices to leave the planet better than we found it. Preservation of biodiversity, protection of animals and plants from extinction, protection of marine life, and conservation of natural resources are integral to sustainability and most importantly, continuity of life on earth

We should strive to avoid activities detrimental to the existence of life (plants and animals) on our planet – a stride toward building a foundation for the future. Human activities such as poaching, overfishing, illegal wildlife trade, use of chemicals, population growth, and high consumption by humans are implicated in animal and plant extinction, while illegal activities of the fishing industry are cited for the destruction of marine life.

To create that sustainable foundation for the future generations, the drive for a circular economy, zero or reduced waste, and net zero is paramount. Advancing circular products should be focused on advancing circular product designs, conversion of waste to energy, renewable energy, carbon capture and sequestration, and regenerative agriculture.

In the UAE, advancement in waste to energy, recycling, waste management, renewable energy, and sustainable transportation as exemplified by the BEEAH Group are pathways to creating a sustainable environment, one that serves as a foundation for the future generations. However, the tasks embodied in the quote above is a collective effort and every individual is responsible.

Innovation 2

Artificial Intelligence in Agriculture Could Drive Environmental Sustainability

Agricultural operations have been cited as a major source of environmental pollutants, and their implications on the environment and human health have been extensively discussed among scientists.

Practices such as utilization and/or handling of animal manures, biosolids, post-harvest crop residues, and agricultural chemicals, as well as irrigation and tillage operations have all been cited as practices with negative environmental and health implications. These implications are even currently compounded by the effects of climate change. Although agriculture is a victim of climate change, it is also a cause.

Environmental (air, soil, and water) contamination by nutrients, heavy metals, pesticides, pathogens; and air contamination by noxious gases, pathogens, and particulate matters have all been traced to agricultural sources¹. Health implications associated with the aforementioned contaminants include neurological, reproductive, and cardiovascular defects and risks, as well as cancers and other diseases of the skin, lungs, kidney, and liver².

It is evident that our journey to building a sustainable planet will be technologically mediated. The growth in artificial intelligence (AI) has been felt in almost every aspect of life. AI is the simulation of human intelligence by machine, by analyzing a large amount of data for correlations and patterns and using these to make future predictions. The large volumes of data generated from agricultural and environmental research are pivotal to AI success in agriculture.

AI applications to agriculture, in areas relevant to environmental sustainability, have been evident in the monitoring of soil condition (including moisture, compaction, and temperature), precise pest control to cut down on pesticide use, identification of carbon sinks, identification of pollution prone agricultural facilities, prediction of soil nutrient availability and plant needs over time, etc.

Given the above, it is evident that AI could be instrumental in curbing the environmental pollutant load contributed by agriculture, maximizing yield, reducing production cost, and promoting sustainability.



1 Udeigwe, T. K., Teboh, J. M., Eze, P. N., Skitstegha, M. H., Kumar, V., Hendrix, J., ... & Kandakji, T. (2015). Implications of leading crop production practices on environmental quality and human health. Journal of Environmental Management, 151, 267- 275.

2 Udeigwe, T. K., Teboh, J. M., Eze, P. N., Skitstegha, M. H., Kumar, V., Hendrix, J., ... & Kandakji, T. (2015). Implications of leading crop production practices on environmental quality and human health. Journal of Environmental Management, 151, 267- 275.

Community

Gardening Beyond Fresh Vegetables

The journey to a circular economy, a type characterized by waste reduction or elimination through reusing, repairing, refurbishing, and recycling of materials, is only attainable with a collective effort. Every single step counts toward this goal and every individual has the potential to contribute.

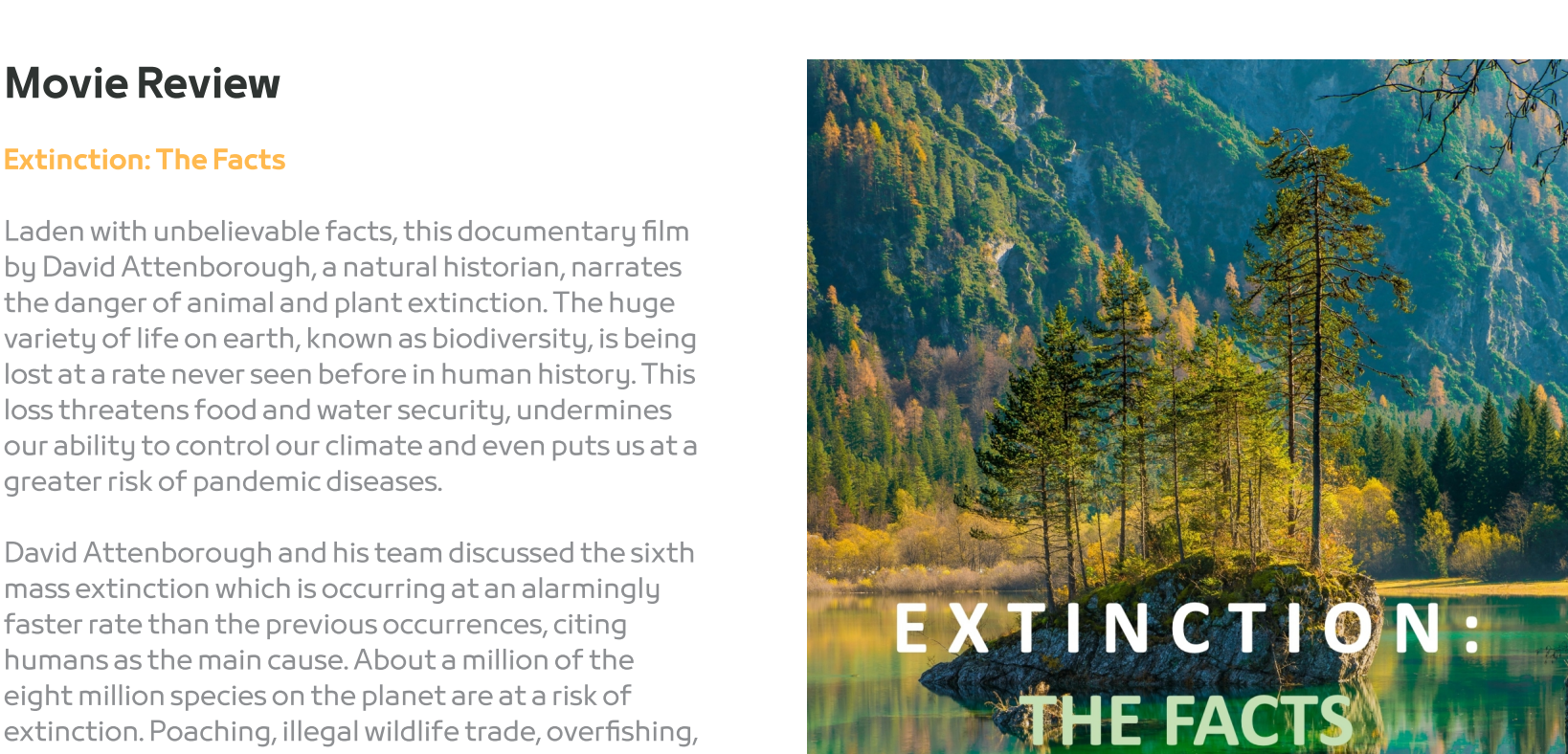
Bearing the above in mind, Brigadier General Jamal Fadhil Butti Al-Abdoul, Director of the Identity and Nationality Department – Emirate of Sharjah, has made a conscious effort to be a steward of the environment, through just a small garden. Taking gradual steps, Brigadier General Al-Abdoul started with growing tomatoes and chili peppers. He then proceeded, after a learning curve, to grow bell peppers, broccoli, cabbage, carrot, coriander, eggplant, potato, and kale.

The environmental benefits of Brigadier General Al-Abdoul’s decision to own a garden are enormous. He took an environmentally conscious step of composting leftovers from dinner into a source of nutrients for the crops. This act reduces the dependence on chemical fertilizers, some of which are salts and contain impurities that could be detrimental to soil health. Runoff of nutrients from chemical fertilizer sources is cited as a cause of water quality impairment. Thus, this simple act of composting protects the environment.

Reusing and repurposing of materials are keys to reducing waste and are integral in our drive for a circular economy. Brigadier General Al-Abdoul also uses minimal packaging in his production, further contributing to waste reduction.

High energy and other resource consumption are also liabilities of conventional modern-day crop production which Brigadier General Al-Abdoul averted with his small but productive garden. Mechanized commercial farming uses energy at every step, from tillage to transportation of produce.

By these simple acts above, Brigadier General Al-Abdoul is recycling, reusing, conserving resources, protecting the environment and at the same time growing fresher and tastier food in the cleanest way.



Movie Review

Extinction: The Facts

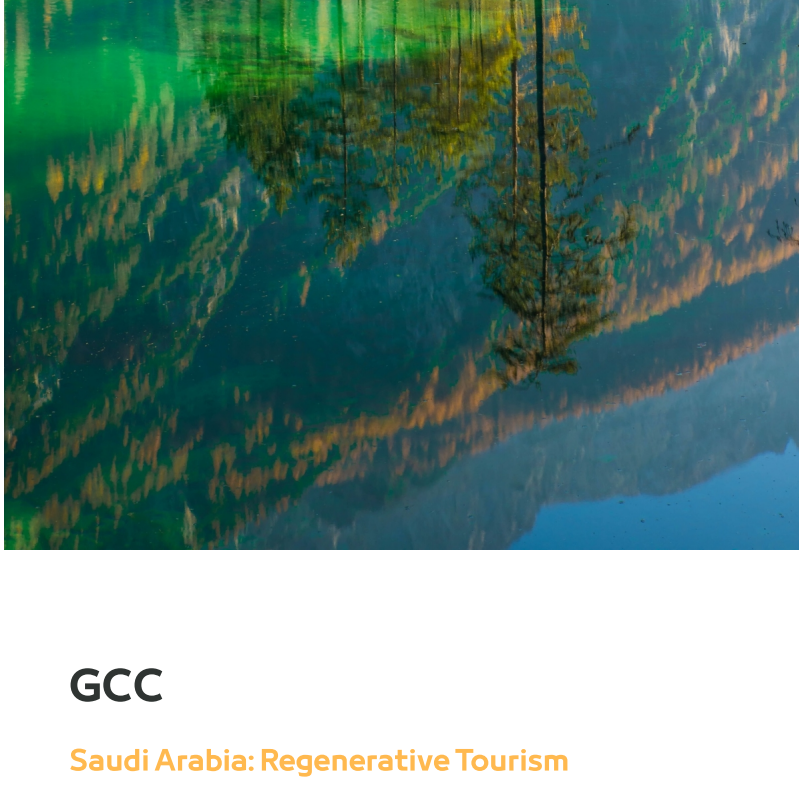
Laden with unbelievable facts, this documentary film by David Attenborough, a natural historian, narrates the danger of animal and plant extinction. The huge variety of life on earth, known as biodiversity, is being lost at a rate never seen before in human history. This loss threatens food and water security, undermines our ability to control our climate and even puts us at a greater risk of pandemic diseases.

David Attenborough and his team discussed the sixth mass extinction which is occurring at an alarmingly faster rate than the previous occurrences, citing humans as the main cause. About a million of the eight million species on the planet are at a risk of extinction. Poaching, illegal wildlife trade, overfishing, population growth, human use of chemicals, and human material consumption which was considered a more potent threat and higher in developed countries, were all cited as drivers.

Unfortunately, experts have warned that most countries still fail to acknowledge animal and plant extinction and have also failed to meet international agreements. Climate change is also causing animals to move their habitats in response to temperature changes until they are no longer able to survive in their conditions.

On the COVID-19 experience, experts assert that the invasion of wildlife habitat is increasing the likelihood of novel diseases and infections, and the current human activities increases the likelihood of more pandemics. Evidently, several activities tied to meeting the needs of humans are culprits, particularly as we make insufficient effort to protect the natural environment.

Suggested pathways to alleviating the danger of animal and plant extinction include advancement in building technologies, reduction of food waste, shifting to renewable energy, adoption of land conservation practices, and sustainable meat and dairy production, which was strongly advocated. Mankind is on the path to self-destruction if our current trend continues.



GCC

Saudi Arabia: Regenerative Tourism

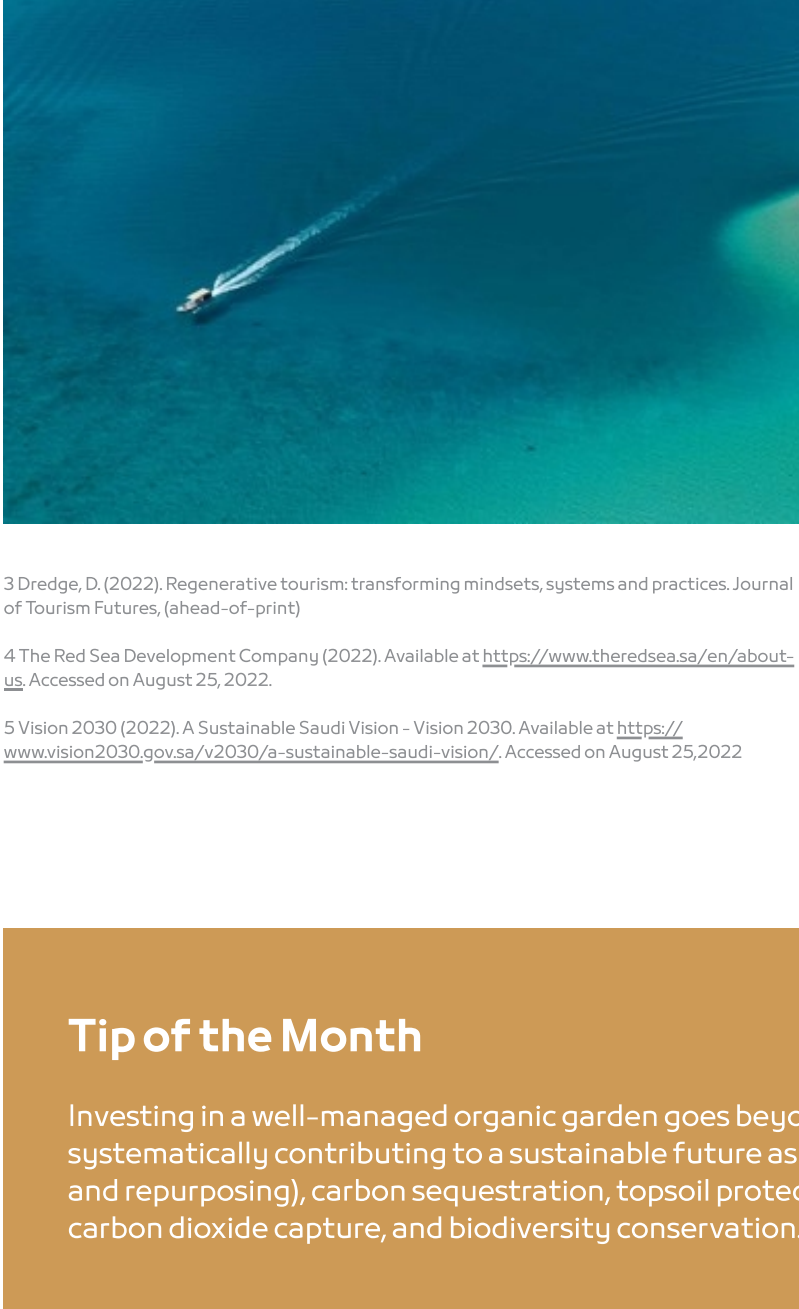
Staying committed to leaving a safer planet for the future generations entails incorporating elements of sustainability in every-day activities. This is exemplified in Saudi Arabia’s commitment to creating a regenerative tourism experience.

The term “regenerate” is synonymous to rejuvenate, renew, revive, restore, reinvigorate, etc. Applied to tourism, regenerative tourism aims to ensure that tourism reinvest in people, places, and nature³, with the goal of having long-term positive social and ecological effects. Regenerative tourism has also been viewed as that will take more than just a mere maintenance mindset, but a regenerative stance to leave a healthy planet for the future generations.

Saudi Arabia is pioneering perhaps the most inspiring regenerative tourism initiative, the Red Sea Project. This regenerative tourism destination is along Saudi Arabia’s west coast, and one of three mega-projects announced by HRH Crown Prince Mohammad bin Salman bin Abdulaziz Al-Saud in 2017⁴.

Saudi Arabia’s Vision 2030 embodies an innovative, transformative, and ambitious plan to unlock the kingdom’s potential and create a pathway to the future, for the benefit of the future generations. The Red Sea Project will be powered by 100% renewable energy, and less than 1% of the total project area of 28,000 km² is being developed. The project is meant to preserve and enhance the Saudi’s pristine Red Sea coast, home to rare species of coral and fish⁵.

Going beyond sustainability, this luxury tourism project, in addition to being an innovative environmental conservation initiative, boasts as a revenue generation source for the Kingdom as millions of tourists will be attracted. Thus, the initiative could serve as a model example of where sustainability and profitability intersect. Perhaps one of the most important messages conveyed by this initiative is that it will take more than just a mere maintenance mindset, but a regenerative stance to leave a healthy planet for the future generations.



3 Dredge, D. (2022). Regenerative tourism: transforming mindsets, systems and practices. Journal of Tourism Futures, (ahead-of-print).
4 The Red Sea Development Company (2022). Available at <https://www.theredseasae.com/about-us>. Accessed on August 25, 2022.
5 Vision 2030 (2022). A Sustainable Saudi Vision - Vision 2030. Available at <https://www.vision2030.gov.sa/v2030/a-sustainable-saudi-vision/>. Accessed on August 25, 2022.

Tip of the Month

Investing in a well-managed organic garden goes beyond the production of fresh vegetables. You are systematically contributing to a sustainable future as you engage in waste management (through recycling and repurposing), carbon sequestration, topsoil protection, soil microbe conservation, soil water retention, carbon dioxide capture, and biodiversity conservation.

Picture of the Month

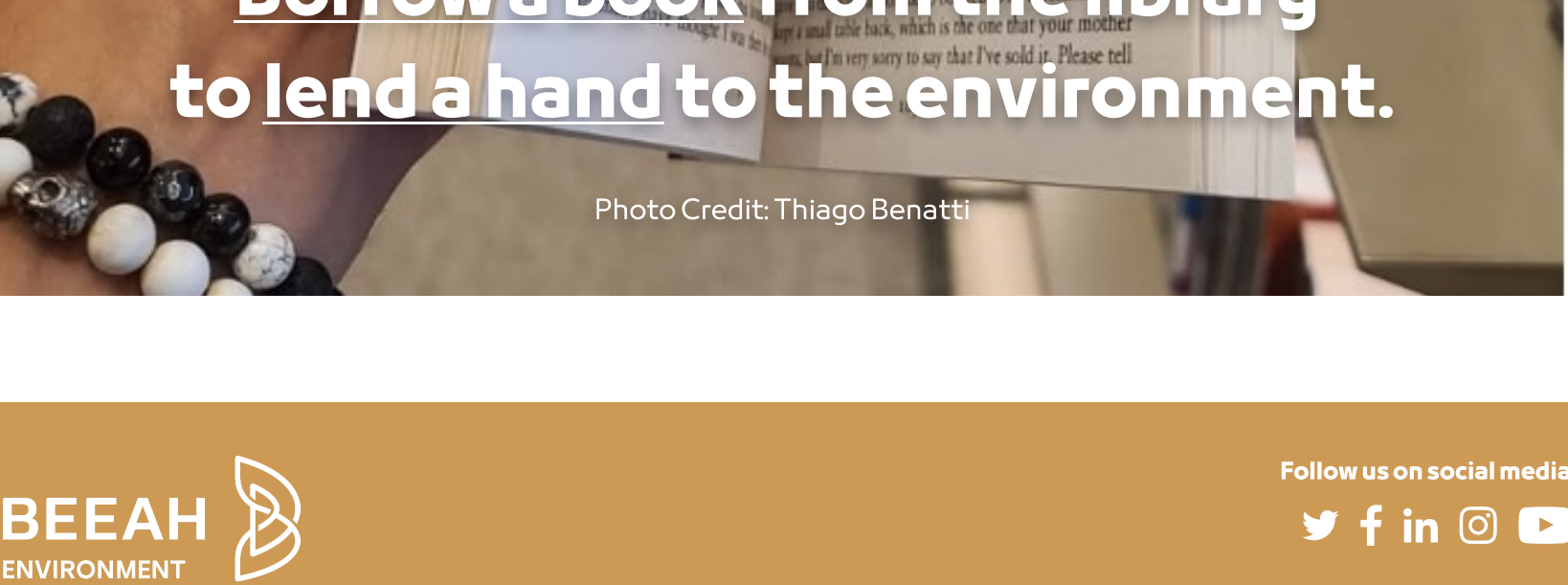


Photo Credit: Thiago Benatti