BEEAH ENVIRONMENT SERVICES

The Sustainability Digest

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"Welcome to the inaugural issue of our newsletter.

We hope these stories have been informative and will inspire you to join us in our journey towards a sustainable future."

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Innovation 1

Realizing a Circular Economy: The Role of Technology

Increasing population, industrialization, urbanization, and agricultural production all have one thing in common – waste generation. The World Bank's projection of annual waste generation approaching 3.88 billion tonnes by 2050, depicts future environmental doom if measures are not implemented. This justifies the discussion on circular economy and the need for a shift from our current comfort zone of linear economy.

In a linear economy, commonly characterized by "take, make, and waste", resources are turned into products, and then eventually wastes. Circular economy on the other hand is characterized by "make, use, reuse, repair, refurbish, and recycle", leading to waste reduction or elimination.

In what key areas should we concentrate technological innovations in our pursuit of a circular economy? A fair guess would include the following:

Circular Product Designs
Transitioning to a circular economy entails adopting technologies and scientific expertise to design products from the onset that fit the circular model as characterized above.

Waste to Energy
The conversion of wastes to electricity, heat, and fuel is a process highly driven by technology. Innovations on incineration, gasification, pyrolysis, and anaerobic digestion technologies are critical in this pursuit.

Regenerative Agriculture
Innovations to facilitate the incorporation of agricultural waste into farm operations, and biotechnology to help maximize natural plant and soil potentials, would reduce waste, sequester carbon, and improve soil health.

Carbon Capture
With carbon dioxide highly implicated in the climate change crisis, carbon capture and storage technologies on capturing the gas before emission into the atmosphere, safely transporting it, and storing/sequestering in geological formations are paramount.

Renewable Energy
The growing shift to renewable energy – energy from sunlight, wind, plant biomass, flowing water, etc. – is undeniably vital to our pursuit of a circular economy and highly technologically driven.

Thus, it is evident that our ride to a circular economy will be technologically driven.

BEEAH Success Story

BEEAH MRF is Leading the Drive for Zero-waste Future

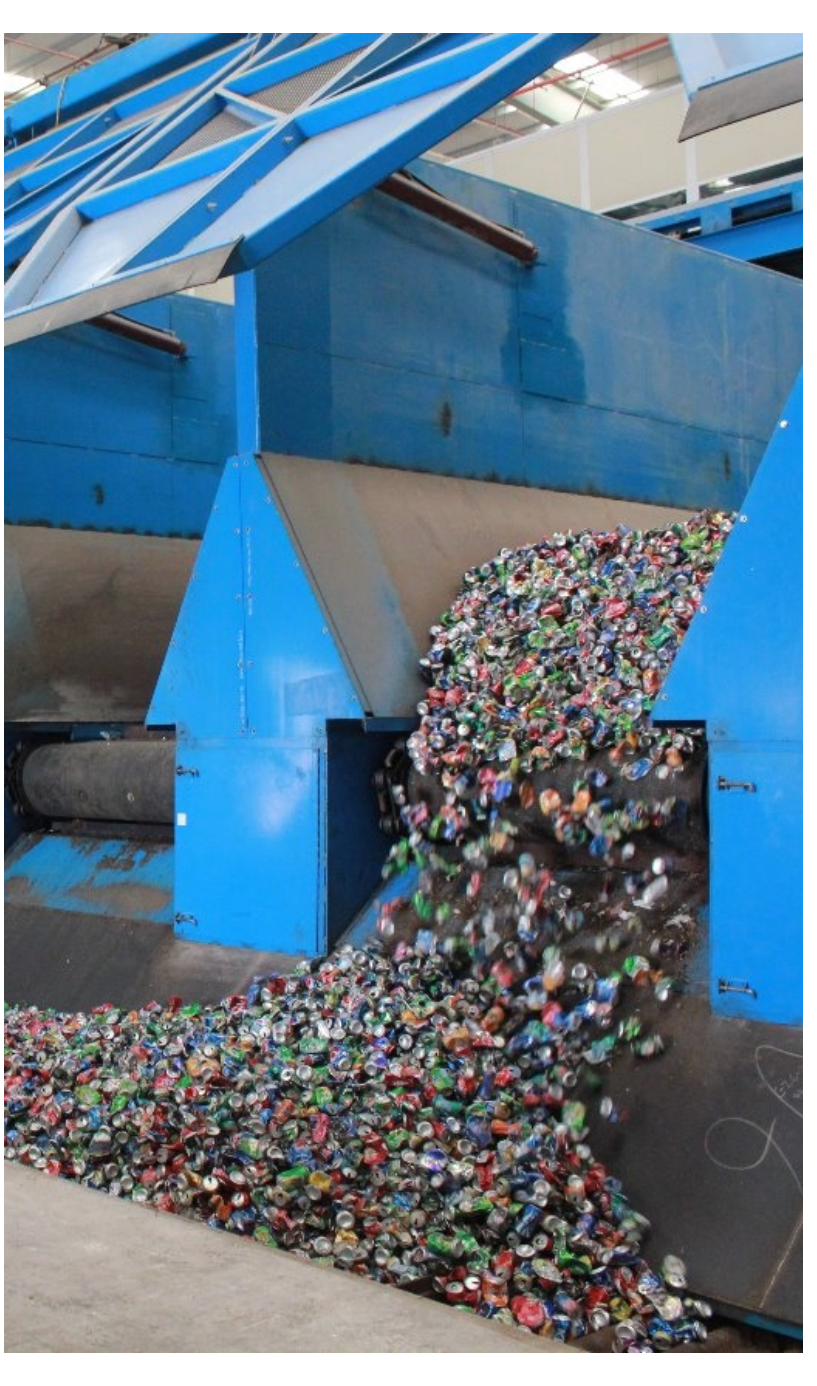
Perhaps, one of the most glaring self-destructive acts facing mankind is failing to decide the "fate" of our "waste". The interactive effects of climate change and poor waste management could be catastrophic. Thus, innovations in waste management are critical in building a sustainable future and integral in our pursuit for a circular economy.

BEEAH, through one of its subsidiaries, BEEAH Recycling, is at the forefront of the fight for a future of zero waste. The BEEAH Material Recovery Facility (MRF) is astonishingly the third largest facility of its kind in the world and the largest in the Middle East. Using a combination of sorting and recycling techniques comprising of manual and automated operations, MRF processes over 500,000 tonnes of municipal solid waste annually.

How does this happen? In Sharjah, BEEAH is responsible for the collection and processing of household waste. After waste collection by BEEAH, the waste is transported to MRF where a combination of manual and automated techniques (including key technologies such as the optical sorters) are used to process the waste. The process recovers fibers, ferrous and non-ferrous metals, plastics, and other materials which could be redirected to a variety of other applications.

However, this was not originally the case for this facility. Established in 2010, MRF passed through a humble beginning of originally relying on manual approach with about 300 employees working in the facility. This, among other setbacks, implies low recovery rate and large margin of human error, resulting from fatigue and loss of concentration. This substantiated the need to automate the facility, a process that typically involves comprehensive studies on waste composition and volume, as well as the resources needed for the automation.

Today, this state-of-the-art MRF is now attaining above 90% recovery efficiency. This is a giant stride toward a zero-waste future.



Heritage

"لو كل من يأ ونجر، ما تم في الوادي شجر"

"If all of us became carpenters, there would be no trees left in the valley." – Emirati Proverb

This old Emirati proverb exemplifies the importance of sustainable practices. It depicts environmental protection and natural resource conservation as a collective endeavor and not an individual effort.

Prior to the vast technological advancement witnessed in the UAE, the people of this nation lived off this land and its resources. In doing so, they have passed on a heritage of living in a sustainable fashion, from the tools they used to the infrastructure they built.

The proverb also signifies the awareness of the indigenous people, utilizing resources wisely, working collaboratively and not overburdening the environment. It reveals a history of people serving different purposes in their specific roles, preventing the depletion of the environment by avoiding practices such as overharvesting.

This proverb also partly emphasizes the need of being cautious of our individual actions. Those simple acts we may think are insignificant could have significant and negative resultant effects if adopted by everyone. The awareness of this should be a part of our guiding principles in our dealings with the environment and nature.

We can learn from the wisdom that the indigenous people have left behind. We must correctly evaluate our needs, efficiently manage what we have, and work collectively to preserve our natural resources.

Innovation 2

Growing in the Air

Aeroponics – the process of growing food in the air without the use of soil medium – still sounds like a myth to many, even to some agricultural professionals, and understandably so. Why not?

Still surrounded with questions, sentiments, and doubts, the basic principles behind aeroponics have been dated back to many decades. Typically, plants are suspended in the air in an enclosed space and the plant roots (and lower stem) treated (sprayed) with a nutrient-rich mist[1]. This contrasts our conventional crop production technique – planting and maintaining crops in open soil-based fields.

Since soil is a non-renewable resource and arable land is shrinking with increasing population and urbanization, one of the obvious benefits of aeroponics is its role in meeting the food demand of the growing population. With applications still growing, aeroponics has been used to effectively grow edible crops such as broccoli, basil, kale, amaranth, radish, cabbage, spinach, lettuce, etc., under a healthier, disease free, and more water and nutrient efficient setting.

The enhanced monitoring of plant and its environment, ability to meter water and nutrient, better visual assessment and access to plant parts, and better interface for data collection, extend aeroponic application to the field of research. Aeroponics has also been explored for spaceflight plant growth, a potential for producing food in space as we constantly explore beyond the earth.

To an environmentalist, aeroponics goes beyond food. Agriculture is noted as a waste generating practice with documented environmental and human health implications. Aeroponics, a system with no nutrient and water loss (runoff), reduced disease incidence, and reduced carbon dioxide footprint obviously bears the tag of innovative and environmentally friendly.

With the increasing global focus on building a sustainable environment and future, how much does aeroponics factor into our discussions on climate change, circular economy, and net zero?

Community

A Local Sustainable Farm, Run by a BEEAH Employee

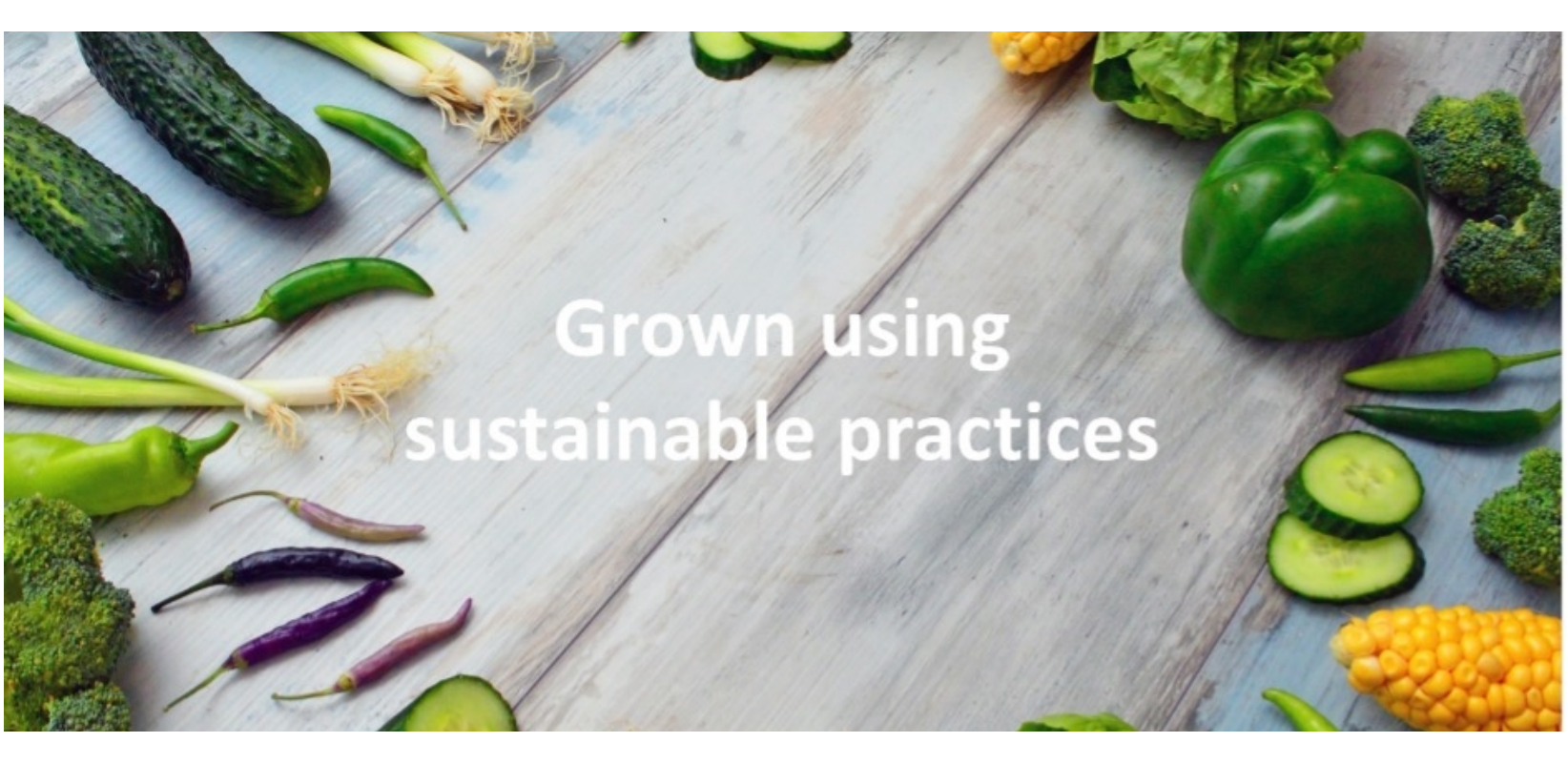
Are you leading by example in our journey to a sustainable future? By day, Hassan Al Ali is a BEEAH employee in environmental consulting, working to help other companies and public entities implement environmentally sound solutions. In his spare time, he is actively working to minimize his carbon footprint.

One of his major efforts towards this is his sustainable farm. "I want to prove we can all reduce our carbon dioxide footprint by implementing simple solutions," Al Ali explained. Working towards zero waste, he composts his organic waste to make fertilizer, which is then used to grow more crops.

Inspired by emission-free renewable energy, Al Ali is transforming his farm to run completely on power generated from solar panels and wind turbines. So far, his setup produces 5 kW of power, which is enough to meet the farm's lighting requirements, and power pumps and coolers.

Currently, Al Ali is exploring ways for a more sustainable air conditioning, including storing excess energy from his power setup in high-quality batteries. Sharing the reason behind his commitment, Al Ali said: "It's not enough to preach about environmental protection. It's time we practiced what we preach."

By these simple acts, Al Ali is using simple scientific principles and technology to contribute to our drive to a circular economy as he recycles (organic waste to fertilizer), sequesters carbon, practices regenerative agriculture, and uses renewable energy.



Movie Review

Seaspiracy

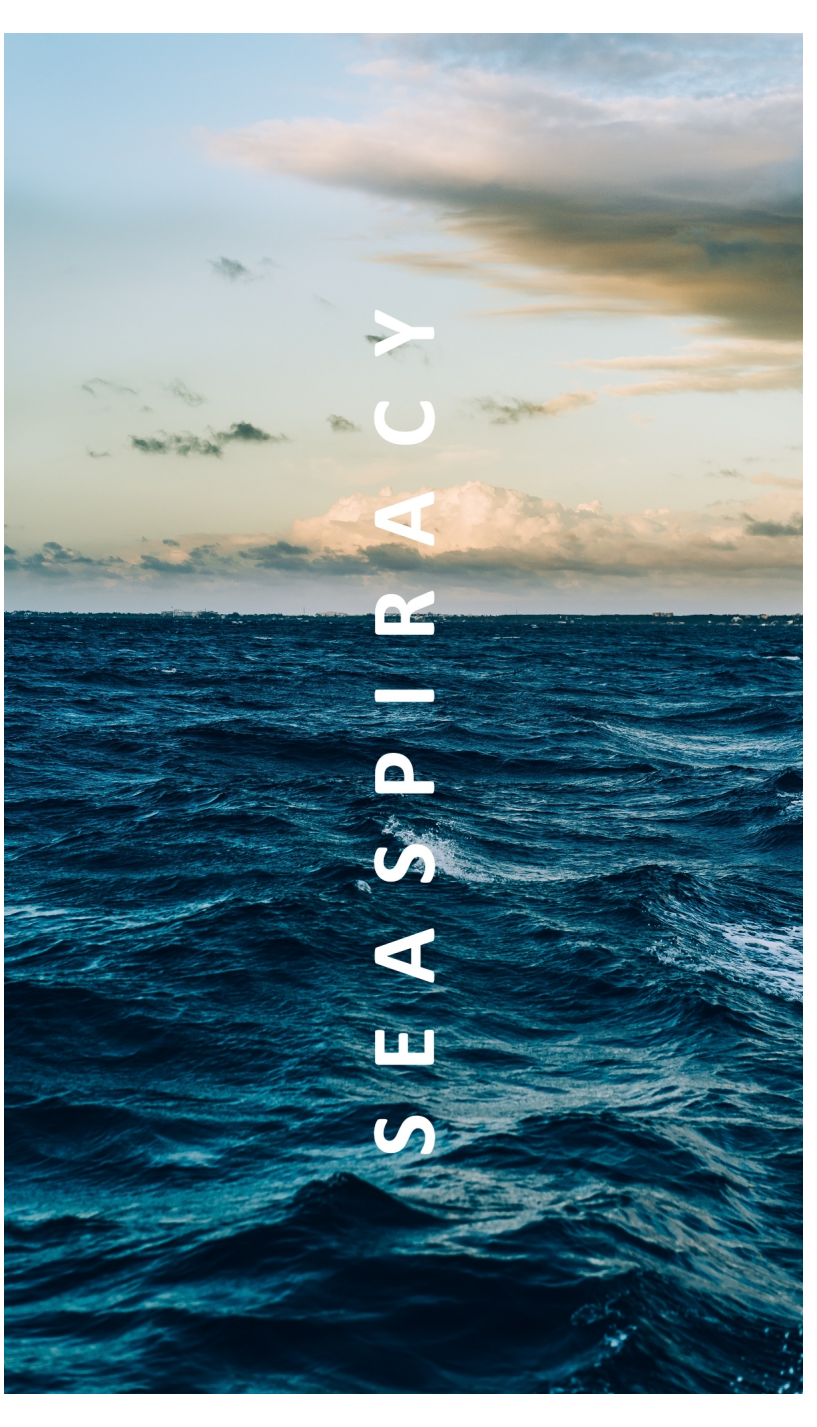
Directed by Ali Tabrizi, "Seaspiracy" is a documentary film that explores the impact of human activities on marine life, further exposing the environmental consequences of illegal fishing business. This highly educational film highlights the significance of the ocean which is home to about 80% of all life on earth.

The film reveals the startling facts of how the dolphins and whales fertilize the tiny marine plants, called phytoplankton, that are critical to oxygen production in the ocean. The ocean generates up to 80% of the earth's oxygen. Thus, in a world concerned about carbon sequestration and climate change, protecting these creatures means protecting the entire planet, because if they die, the oceans die and so would we.

With news of whales being washed up on the beaches with stomachs filled with plastics, Ali was pushed to confront the tragic fact of human activities becoming extremely destructive to marine life. Plastic was invading every corner of the world's seas, with huge floating garbage patches accumulating in the middle of the ocean – the Great Pacific Garbage Patch. Ali strives to stop the world from utilizing single-use plastics, a mission tied to our present pursuit of a circular economy.

Interviews with marine scientists and others reveal that commercial fishing is far more damaging than plastic and oil pollution. Professor Callum Roberts, a marine scientist, explains that the fishing industry destroyed more marine life in a day than the Deepwater Horizon oil spill in the Gulf of Mexico did in months. It was also projected that if the current fishing trend continues, countries will virtually see empty oceans by 2048.

"Most of the positive and negative things that bring about change in human civilization start with someone, some "ONE". And no one can do everything, but everyone can do something" – Sylvia Earle



GCC

Saudi Arabia: NEOM

Have you heard about the new sustainable city in Saudi Arabia? Earlier this year, the Kingdom announced its latest sustainability project - "The Line".

Located in Neom, northwest of Saudi Arabia, The Line will host one million residents. It is a 170-km long urban development that will be 100% powered by renewable energy and hydrogen-based generators. It aims to have a human-centric design, which means it will be built around people's needs and nature rather than cars and roads.

Walkways will be the main mode of connectivity in the development, with all essential facilities within a five-minute walking distance. High-speed mass transportation will also be available for people to move between communities from one end of the development to the other.

The Line aims to set an example of how regenerative development can be the way for the future. It seeks to preserve 95% of the environment by integrating the communities around nature. Construction activity will be limited to meeting the standards of a circular carbon economy.

Neom is also a cognitive city, incorporating AI in its infrastructure. It will enable data collection from around the community, allowing for analysis and adjustment of the urban development according to the interaction of the communities and residents with their surroundings.

Tip of the Month

Use a Reusable Water Bottle

With this little action, you can decrease your carbon footprint, contribute to decreasing the demand for plastic bottles, and ultimately help lower energy consumption and carbon emissions from plastic bottle production.

Picture of the Month