14 LIFE BELOW WATER

STATUS QUO - LIFE BELOW WATER

Achieving Sustainable Seas and Empowering Coastal Communities

What is the Status Quo?

The amount of waste in the sea is high and fisheries are still not completely sustainable. Overfishing must end, fisheries must become certified and energy needs in the maritime economy promoted. Science and data are useful but are barely avaiable.

Appendix

Video 1: The deep ocean

Video 2: From surfing to activism

GOALS AND TARGETS	CONSERVE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT				
Region	World	Sub-Sahara	Eastern Asia	Latin America	Western World
Fish stocks within biologically sustainable levels					
Coverage of protected areas					

Source: United Nations (2022)

Six levels: very high, high, moderate, low, very low, no data

Trend determents (directional): Sustainable progress; Intermediate or no progress; Deterioration

Markus Müller
Chief Investment Officer ESG at Deutsche Bank AG

Our interest in the sea seems innate. In his book, history professor John R. Gillis argues that we are “edge species”, neither land nor aquatic animals, but thriving at the interface between the two. “How” rather than “how much” is key for developing a sustainable blue economy. But with this reliance comes a responsibility: to balance humans’ ever-increasing intensity of demand with the ocean’s resources and ability to regenerate.

INGLOSUS institute for global sustainability

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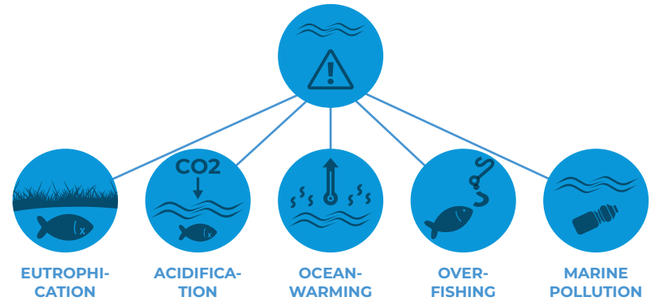
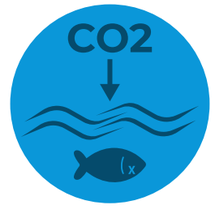
CONSERVE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

OUR OCEANS **THE LARGEST ECOSYSTEM** IN THE WORLD **IS THREATENED**



INCREASING ACIDIFICATION IS THREATENING MARINE LIFE AND **LIMITS THE CAPACITY OF THE OCEANS**

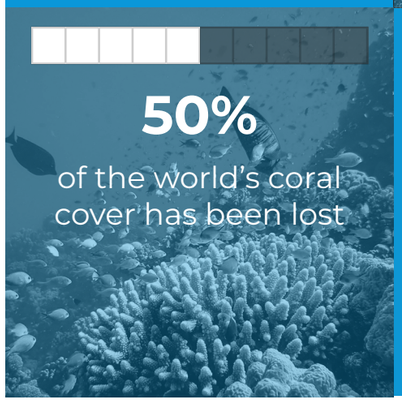


THE OCEAN ABSORBS ABOUT **1/4** OF GLOBAL ANNUAL **CO2 EMISSIONS**

8%
of the world’s oceans are under protection

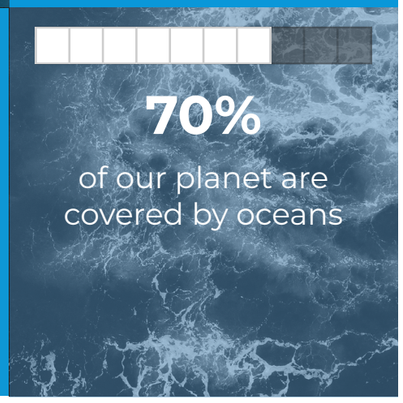
35 - 50%
of mangrove forests are destroyed

30%
of the world’s oceans are to be protected by 2030



50%
of the world’s coral cover has been lost

29%
of all seagrass meadows are destroyeday



70%
of our planet are covered by oceans

1.1 APPENDIX: BRIDGING THE OCEAN FINANCE GAP

A GUEST BLOG BY MARKUS MÜLLER, PUBLISHED AT ECONOMIST IMPACT

Earlier this month I was in Juneau talking to scientists about climate change and degradation of the local marine environment. Rising sea temperatures and ocean acidification due to increases in atmospheric CO2 are reducing phytoplankton levels and threaten to cause multiple species die-offs.

This isn't just a problem for the Gulf of Alaska. Around the world the ocean is in trouble, and fixing it will take a lot of money. We can't know exactly how much, as the extent and nature of the ocean's problems are still unclear. Estimates exist, however,

Such enormous headline numbers are useful because they illustrate the size and seriousness of the problem. But I worry that they can also make us think a solution is so far out of sight as to be impossible. We mustn't fall into this thinking about the ocean - the consequences of inaction for many individual communities and the planet would be catastrophic. My experiences in Alaska reminded me that nature and the economy are ultimately inseparable: ignore the first, and we destroy the second.

We also shouldn't assume that the solution requires all-new finance. Rerouting existing resources will be key here, as we all find the best way to transition to a more sustainable economic model. I believe that the global financial system has the capability to deliver what's needed. Let's put this in perspective: we are already funnelling very large amounts of money to meet environmental objectives in other areas. For example, UNCTAD estimates that in 2022 developing economies received US$544bn in renewable-energy investments alone.

So why is ocean finance struggling to deliver?

One reason is that ocean-conservation projects are varied, often run across multiple sectors and offer very different sorts of return. For example, there may be very significant long-term returns, but these may be delivered over varying time periods even within individual projects. All this can make financial returns difficult to aggregate and measure. Another factor that makes it harder to predict returns with certainty is our incomplete understanding of natural ocean processes. For example, as I learned in Juneau, the complex role of whales in the carbon cycle is only now starting to be understood.

But returns are not the only key metric we must consider. A second one is the cost of capital (which is, in part, also a proxy for risk).

> One study suggests that meeting UN Sustainable Development Goal 14 (Ocean use and conservation) by 2030 will require an investment of over US$175bn each year, and the figure could well be much higher.

This is important because even if returns may stay uncertain for parts of ocean finance, we can have an impact on capital costs. This can be done in two interrelated ways: encouraging new capital markets and developing new investor partnerships.

Let's take some lessons from other sectors. The biggest one is that projects which rely only on domestic investment have a high cost of capital. Bring in other parties and this cost falls sharply. UNCTAD, again looking at renewable energy, found that bringing in international investors lowers the cost of capital by 8%. Add in multilateral development banks and the cost falls by 10%; put in international public/private partnerships too and the cost of capital can fall by more than 30%.

I don't believe that partnerships and new forms of blended finance will solve all the problems around ocean finance. But all savings on the costs of capital help, even if they aren't as big as those I've described for renewable energy. Even small savings on the costs of capital can make many new oceanfinance investments viable and help us better match financial tools with environmental and economic goals.

The blue economy already accounts for around 2.5% of global gross value added - and for some individual economies it is proportionately much more important. It is already possible to identify many areas where increased finance will make a major difference to ocean conservation and thus to planetary well-being, and others will surely appear. We can't ignore ocean finance. We just need to think big and deep—like the ocean itself.

14 LIFE BELOW WATER

1.2 FROM SURFING TO ACTIVISM: A PERSONAL JOURNEY TO SAVE OUR OCEANS.

WRITTEN BY RICHARD CEDANO

I grew up surfing in Northern Peru, and ever since then have always felt a strong affiliation for the ocean:Thalassophilia, as they call it. It was during the 1983 El Niño event that I learned first hand the devastating effect just a couple of degrees of change in water temperature can have on the environment. The term El Niño was coined on the same beaches where I learned to surf and prepare ceviche, the flagship dish of Peru. The name came from local fishermen who observed how this warmer than usual marine current gets closer to shore, a phenomenon typically occurring during Christmas day.

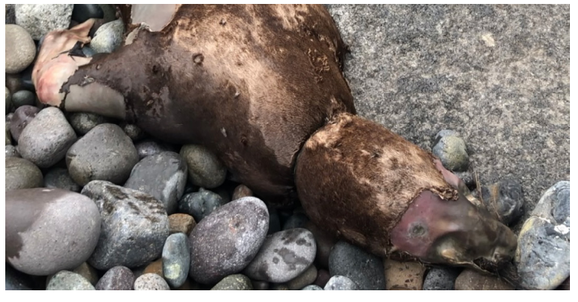
Richard Cedano
Surfer and Environmental Activist in Peru

Some of the most notable consequences on the environment are heavy rains, floods, and waterborne diseases. I had the personal misfortune of losing a half sister, and almost died myself to Cholera. Now, as an adult without a formal degree, I've done my research and discovered the causes of that Niño event that shaped my life. It's how I understand the oceans are dying due to mankind's desire for perpetual growth and exploitation of finite resources. I've been a personal witness to changes in the oceans since the El Niño event. I saw how a whole generation of sea lion pups died stranded on our beaches due to malnourishment, and realized it signals the last ceviche I'll taste is likely just around the corner.

The love I have for the ocean is what motivates me to be a voice in the surfing community, advocating for the preservation of our oceans, and by extension - the planet in its entirety. I implore everyone to join forces and do more to protect the environment, it's the only way our future generations will be able to enjoy the simple pleasures brought to us by the oceans and nature as a whole.

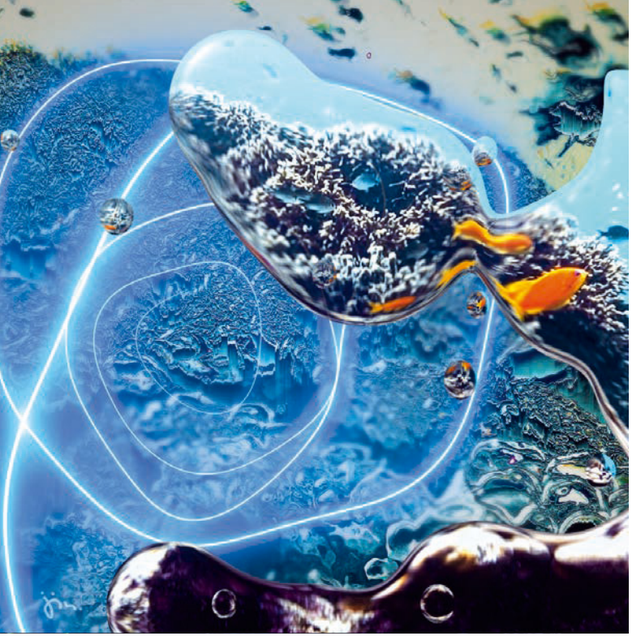
I firmly believe that one of the best ways to facilitate change is through education and raising awareness. Art is a powerful tool when it comes to inspiring people to take an interest in making a difference, which is exactly why I decided a few years ago to write a sci-fi graphic novel with an environmental message. Since then, various people have got involved in the project with the goal of getting it published, which is why now more than ever we need financial help in order to see it through to completion.

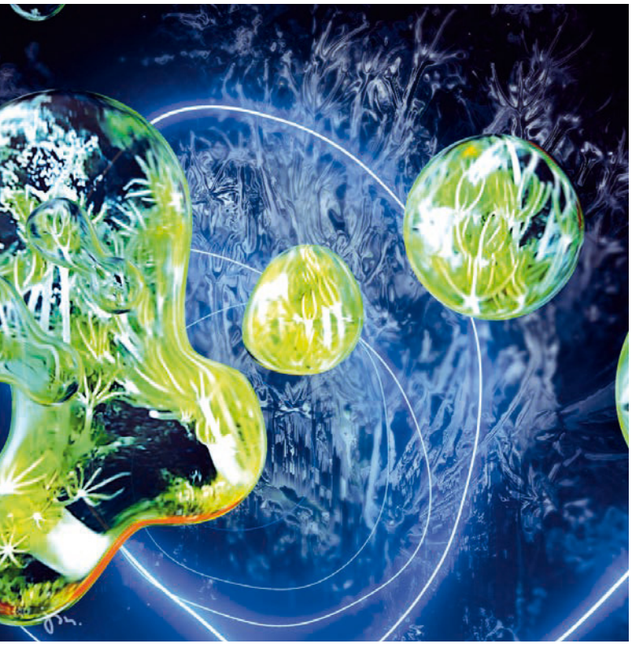
To see more about my activism, visit my Facebook page: Surfers for Science.

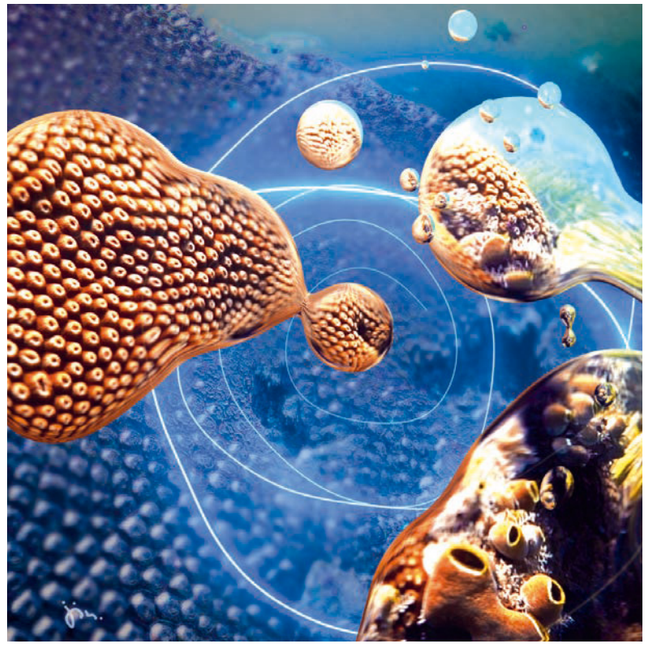


Dead Sea Lion at the coast of Lima

Richard Cenano surging on the coast of Lima, Peru







Bei „Stepping beyond your bubble“ hat jink.one sich von Fotografien und Filmclips der Unterwasserwelt des Mafia Island Marine Park zu einzigartigen Videoinstallationen inspirieren lassen. Sie zeigen die Schönheit und Vielfalt intakter Korallenriffe, ihre Farben, ihre Lebendigkeit. Doch dazwischen blitzt der tote Meeresboden auf, grau und abgestorben. **Foto: © jink.one**

EVERYDAY FUTURE – More than Hope – Help!
We can all make a difference – by changing consciousness – “Stepping beyond your bubble” – and by supporting valuable projects like Ropes of Hope. Under the QR code you can donate to Ropes of Hope through the art campaign of jink.one:

ROPES OF HOPE

A (digital) glimmer of hope for the sea and humanity

This story tells how a coral project on Tanzania’s coast using local fishing communities, environmental DNA and artificial intelligence is saving marine biodiversity - and how the Bookbridge Initiative is supporting this project with innovative methods and NFTs.

By Christoph Santner (Translated from German)

If corals had a voice, they would scream loudly! Because they are increasingly suffering from life-threatening stress: dramatic warming of the oceans, pollution of the seas and brutal fishing methods are their existential threat. The science magazine One Earth recently published a study showing that more than half of the Earth’s coral reefs have disappeared since the 1950s. And although coral reefs only make up 0.2 percent of the ocean area, they are home to at least 25 percent of all marine animals, according to the UNEP (United Nations Environment Program) International Coral Reef Initiative. If the coral reefs die, the symbiotic connections with algae, fish, crabs, sponges and various other creatures will also be destroyed once and for all. Valuable biodiversity, which provides people on the coasts with food and often a livelihood through tourism, is being lost. And the process is accelerating. Coral bleaching is spreading worldwide and only the skeletons of these marine animals remain.

Hope hangs by a thread

But there are flagship projects that bring hope and inspire, such as ‘The Ropes of Hope,’ an ambitious program along the East African coast spearheaded by a motivated team led by molecular biologist Dr. Jean de Villiers and his wife, Dr. Anne de Villiers. Their motto is visionary thinking - acting locally. Anne, who studied tropical agriculture and has been involved in African sustainability projects for decades, and her husband Jean, are committed to serving people, corals, the ocean, and biodiversity. Thirty years ago, they settled on the small East African island of Chole, nestled in the heart of the Tanzanian Mafia Island Marine Park (which has nothing to do with organized crime, of course). There, they launched a development initiative that includes an award-winning eco-tourism project featuring enchanting treehouses. The aim has always been to synergize ecology, education, and create new job opportunities. Their efforts were crowned with numerous successes, but then came Covid, causing a complete collapse of tourism. The government, concerned about the thousands of employees suddenly unemployed in the country’s beachfront hotels, lifted the maritime protection zones and allowed unrestricted fishing. Soon, ships with trawl nets appeared, resulting in devastating consequences for endangered fish species and, especially, the coral reefs, which were significantly decimated in a short period. Anne and Jean could not stand idly by.

Corals grow on thick ropes

Jean learned about establishing coral gardens on ropes in the seawater through a pioneering project called Nature Seychelles. Corals reproduce when replanted on ropes at the right depth, allowing them the proper level of sunlight and considering ocean movements due to tides. Moreover, specific cleaner fish, in a symbiotic relationship, are necessary nearby to rid the corals of parasites and dead tissue.
To expedite coral cultivation, 'The Ropes of Hope' has trained numerous local underwater gardeners. They are constructing an expanding network of coral ropes, propagating various coral species to maintain genetic diversity. So far, over 15,000 corals have flourished. Additionally, more jobs have been created: women on the island produce ropes from coconut fibers, earning income through the initiative. Supporting the project, young marine biologists are always on-site, conducting their research. For instance, molecular biologist Nicole Schröter from the University of Oldenburg's oceanographic institute collaborates with Jean de Villiers, a partnership spanning years. Originally from South Africa, Jean studied not only in Cape Town but also in the USA and at the TU Berlin before completing his dissertation at the prestigious ETH Zurich. He continues to engage in scientific exchange with these institutions. "Understanding the complete functioning of an entire coral reef ecosystem is still largely unknown," acknowledges Jean de Villiers. A coral reef harbors more biodiversity than any other ecosystem, even surpassing rainforests. Therefore, de Villiers finds it puzzling that the budget allocated to NASA in the United States is more than a hundred times that of the NOAA, the National Oceanic and Atmospheric Administration. "We send rockets to Mars, yet we have no idea what else lies hidden in the depths of the oceans!" he exclaims.

The Intelligence of Nature
The current imperative for dedicated scientists is to explore and comprehend what's known as Environmental DNA (eDNA). Regularly, water samples are sent to London to be analyzed by Nature Metrics. This analytical institute has set an ambitious goal: "Access nature's intelligence." They examine the incredible abundance of genetic material floating within these samples. On one hand, they find the eDNA of long-extinct marine animals. On the other hand, there are "cryptic species," currently existing but not yet discovered because they hide in the caves of coral reefs or bury themselves in the sand. Artificial intelligence analyzes and sequences the massive volumes of eDNA, tagging them with barcodes to enable comparisons. Through the analysis of regularly submitted samples, "The Ropes of Hope" observes changes in biodiversity. Moreover, de Villiers is currently exploring another application of AI: akin to detailed photos of the Earth taken from satellites, underwater robots can now capture and assemble thousands of individual images of live coral reefs, creating precise photographic 3D maps through a method called photogrammetry. If done regularly, KI-based comparisons can precisely determine where, how, and when damages occur. The quicker the diagnosis, the faster the healing process. Nicole Schröter also affirms this, as she knows from experience "how heart-wrenching it is to witness the destruction of coral reefs due to trawling nets on one hand and global warming on the other." Countering this with

Coconut fiber ropes, dedicated conservationists, divers, block-chain, and AI are working to-gether to rebuild destroyed coral reefs. This has positive effects on the living conditions of the locals and promotes biodiversity in the sea. **Foto: © Ropes of Hope**

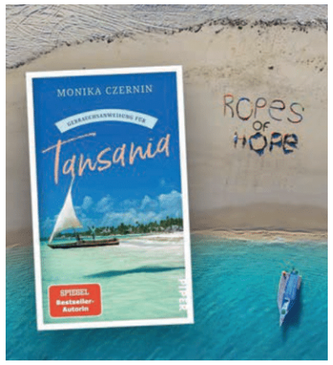
scientifically backed coral reforestation is seen as a significant task by the molecular biologist.

Thinking globally, acting locally
However, as Jean and Anne de Villiers know from years of experience, all their projects can only succeed when closely linked to local communities. Therefore, "The Ropes of Hope" has founded the "Coral Conservation Club." Starting from secondary education, children on the islands now follow a specialized curriculum that aims to empower them to become conservationists or even pursue marine biology, with scholarships for the most promising students. "Thus, the Coral Conservation Club becomes the headquarters for coral conservation advocacy," de Villiers smiles. Because the children not only learn the necessary theory and English, as their native language is Swahili, but also practical skills like swimming (which most cannot do), snorkeling, collecting water samples, and more. The hope is that a new generation will emerge, knowledgeable about the significance of coral reefs and thus committed to protecting them. The eldest on the islands still remember a time when the coral reefs were healthier, more colorful, and more diverse. To ensure their knowledge is not lost, they are now being interviewed by 'The Ropes of Hope' and involved as storytellers for the children.

Next Level Storytelling
Bestselling author and filmmaker Monika Czernin researched for her new book "Gebrauchsanweisung für Tansania" in Chole in 2020. She witnessed how existential the Corona crisis was for many people, but also how much help and solidarity this situation unleashed among the people in Tanzania. She witnessed the first steps of "The Ropes of Hope," Jean and Anne de Villiers' response to the crisis, aimed at halting the distress and coral degradation. Czernin has known Chole and the projects of Jean and Anne de Villiers for many years, witnessing how sustainably - both ecologically and socially - the couple advances development on the islands and how well they integrate with the communities. Hence, she moved beyond the role of an observer, realizing that this project requires more publicity and financial support to succeed. Just as "The Ropes of Hope" charted new paths, Czernin did the same: together with Melissa Müller, a successful author, she initiated the author

“Biodiversity is the ultimate wealth we have available on our planet. Biodiversity is the universal currency of the future!”

Jean de Villiers



Instructions for use for Tanzania
Monika Czernin
224 pages, flex cover with flaps
€ 16.00 [D], € 16.50 [A]
Foto: © Monika Czernin

and artist collective, bookbridge, to merge books with the new digital capabilities of Web3 and blockchain technology. “In the analog world, we like to build bridges between traditional readers and crypto-natives, reminding them how much they have in common. In the digital web3 context, a bridge is a protocol that connects blockchain systems, allowing users from one system to send assets and information to another,” explains Czernin enthusiastically about her project. She adds, “It’s about getting closer to each other and communicating!” Currently, the Tanzania book and the story of “The Ropes of Hope” are being made accessible to a young reader community through bookbridge. The project is listed on Creatokia, the first platform for “Next Level Storytelling” in Germany. This platform offers artists, musicians, authors, and publishers opportunities through Web3 to enhance interaction with their fans, create new forms of dynamic and interactive digital products, and attractive options for marketing their artworks.

Digital Unique Pieces as Collectibles and Sponsorship

With the stunning digital collectibles by the artist jink.one, anyone can now support “The Ropes of Hope” through Creatokia and simultaneously receive a digital artwork. Each of these pieces is created from underwater photos and films of the Mafia Island Marine Park. They are impressive series of digital images and video sequences that artistically reinterpret the mystical array of colors and the underwater world of the reef. The digital collectibles can also be rented and traded as Non-Fungible Tokens (NFTs) on the Ethereum Blockchain. This allows coral enthusiasts to continue admiring and acquiring the digital artworks on Creatokia, contributing tangibly to the rescue of the reefs. The aim is to restore and make the beauty of this underwater world experiential for future generations. “Biodiversity is the ultimate wealth we have available on our planet. Biodiversity is the universal currency of the future,” Jean de Villiers believes wholeheartedly.

theropesofhope.com, bookbridge.xyz

www.creatokia.com/en/page/bookbridge/tansaniadigital

CHRISTOPH SANTNER
is a long-time author, speaker and consultant on innovation topics. Since 2009, he has been writing for forum Nachhaltige Wirtschaften, among other things on digitalization and artificial intelligence in sustainability.