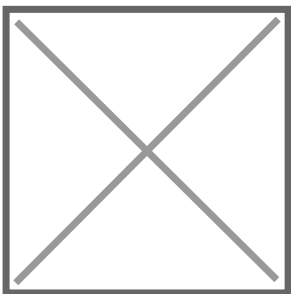


Japan leads way in kelp carbon credits?? Brian Takeda explains why world should follow

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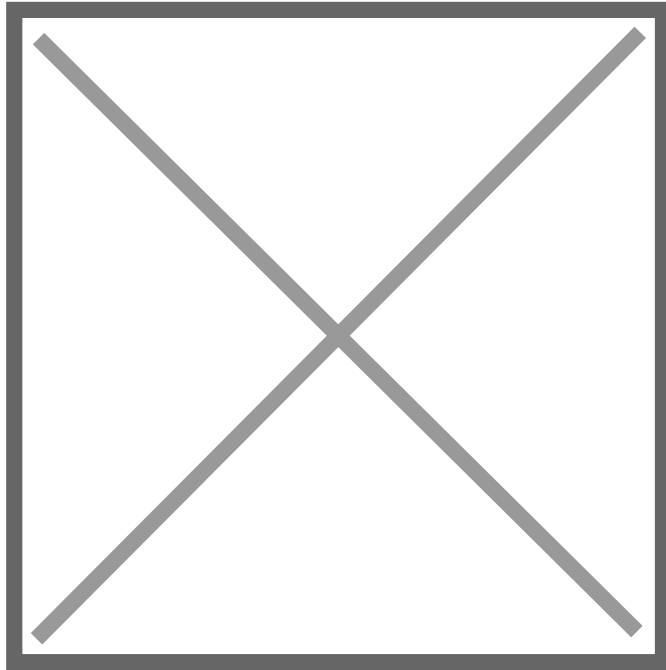
Brian Tsuyoshi Takeda, CEO & Co-Founder of Restorae, Founder, Urchinomics, Secretariat of International Affairs, Japan Blue Economy, Head of Reforestation, Kelp Forest Foundation is a global voice for ocean regeneration, championing kelp forests as vital yet overlooked climate allies. In this exclusive AgroSpectrum interview, he explains how kelp ecosystems deliver biodiversity, food security, coastal resilience, and carbon sequestration—quietly but critically shaping climate futures.



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As Secretariat of International Affairs at the Japan Blue Economy Association, Takeda highlights Japan's pioneering role in integrating kelp forests into blue carbon credits and Paris Agreement reporting. He discusses the credibility of kelp-based sequestration, the challenges of MRV, and the high market value of Japan's J-Blue Credits compared to conventional offsets. Beyond policy and markets, he emphasizes equitable benefit sharing for coastal communities, especially in the Global South, and the need for fair pricing mechanisms. Drawing on his Japanese heritage and global perspective, Takeda envisions kelp forests as central to a just and regenerative blue economy.

Section I: Vision & Strategy



Brian, you're at the intersection of reforestation and regeneration—both on land and under water. What led you to champion kelp forests as a cornerstone of climate action in the marine sphere?

Kelp forests are perhaps one of the most valuable ecosystems we have on our planet, yet are often overlooked because they thrive underwater, outside of our line of sight. When you quantify the incredible benefits kelp forests quietly deliver to us as "ecosystem services", we find that they contribute immensely to biodiversity, coastal resilience, food security and climate change. Equally, when kelp forests suffer, they also suffer quietly, outside of our line of sight. So far, we have lost around half of all our kelp forests around the world, and most of us have no idea that this happened.

When I learned how much kelp forests contribute, and how little attention it is getting, I felt the need to raise its profile and catalyze various solutions to help restore them.

How do you see kelp reforestation fitting into Japan's broader blue economy roadmap and international climate commitments like the Kunming-Montreal Global Biodiversity Framework or the Paris Agreement?

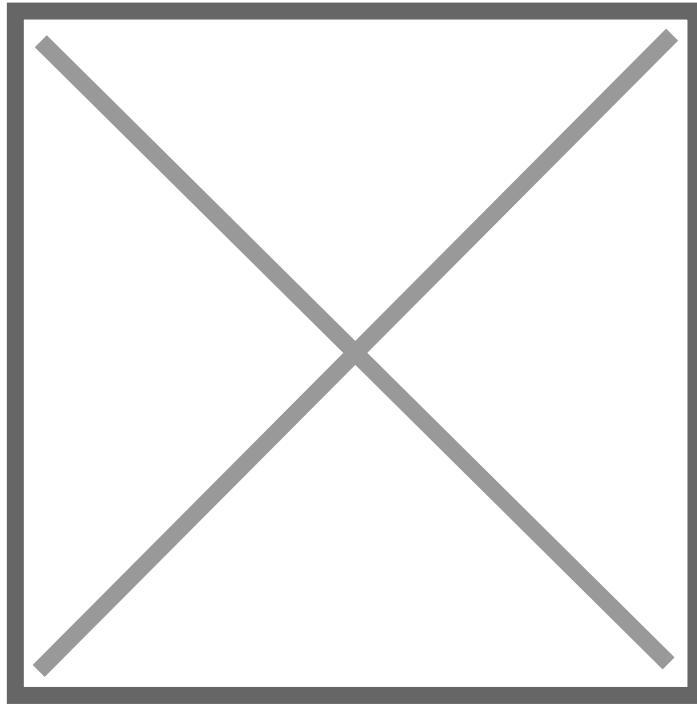
Kelp forest restoration and farmed kelp production already contribute to the country's efforts to decarbonize and improve biodiversity. Japan was the first in the world to recognize wild kelp forests as part of their blue carbon ecosystem, and now includes them as part of their inventory when reporting to the Paris Agreement. The Japan Blue Economy Association, a Ministry of Infrastructure, Land, Transportation and Tourism-approved independent research cooperative, is responsible for Japan's voluntary blue carbon credits, where both wild kelp forests and farmed kelp are eligible for J-Blue Credits, a blue carbon credit that also incorporates other ecosystem services like biodiversity and community benefits.

Unlike terrestrial forests, kelp forests store carbon in biomass for centuries. What makes them a credible, even necessary, part of the blue carbon conversation?

In the Japanese context, kelp forest carbon sequestration is calculated based on the biomass and dissolved organic compounds that end up into the ocean's deep and is sequestered there for centuries or millennia. Terrestrial forests on the other hand often include "above ground" biomass, or the trees themselves, which are prone to deforestation, fires, and other factors that I would say makes them less durable, and do not store it for centuries.

Further, the Japanese approach to assessing carbon sequestration through kelps is based on an annual assessment of the biomass and a pragmatic estimation of how much of said biomass sinks into the deep sea. This means that, one needs to show that kelp is growing each year, to then approximate how much of that is deposited into the deep, in order to generate a credit. By making it an annual process, and only issuing credits when we know the kelp has in fact grown, and will inevitably get deposited into the deep sea, I like to believe it is much more robust and credible than current terrestrial MRV approaches.

Section II: Science & Carbon Markets



There's growing excitement but also skepticism about ocean-based carbon sequestration. What scientific benchmarks or MRV (monitoring, reporting, verification) protocols are being established to validate kelp forests as legitimate carbon sinks?

I am keeping a close eye on what the Republic of Korea will be doing in terms of seaweeds, kelps and their NDCs. What I find interesting about state-led initiatives, is that it effectively trumps all 3rd party approaches we have become dependent on, because it is ultimately the state that reports to the Paris and Kunming-Montreal Agreement. So, the moment Japan's state-led approach is joined by Korea, China and other countries in a similar state-centric way, we will surely see a burst of new interest from around the world.

When it is just one country, it is an exception. When it is two, we can draw a line and start thinking about trajectory. When countries like China join the mix, we start to see a meaningful pattern develop. The question then is, what are other kelp-endowed countries like the UK, Norway, Canada, US, Chile, Argentina, Australia and New Zealand going to do? They too have robust and valuable kelp forests that contribute not just to carbon sequestration, but a myriad of other co-benefits. Perhaps the developments in the East will trigger Western governments to take a more active role in their kelp forests.

Are current voluntary carbon markets structurally ready to accommodate kelp-based credits, or are we still in the proof-of-concept stage? What regulatory bottlenecks or frameworks are you navigating?

Voluntary carbon markets in Japan are ready, as the J-Blue Credits generated from kelp restoration has been in existence for many years now, and they are transacting at significantly higher prices than the rest of the world. Average prices of J-Blue Credits are well over \$ 400/t, which is more than 10x traditional voluntary carbon credits sold around the world.

One of the main reasons why I joined the Japan Blue Economy Association as their Secretariat of International Affairs, was because I realized all these precedent-setting events were not being properly shared and communicated with the rest of the world. The language and culture barrier are likely the biggest hurdles for Japan's best practices, learnings and experiences from spreading to other kelp-endowed countries, and accelerating their respective development in the space.

Can you share insights into ongoing pilot projects, especially those demonstrating the sequestration potential, co-benefits (like biodiversity and fisheries recovery), and economic returns of kelp reforestation ?

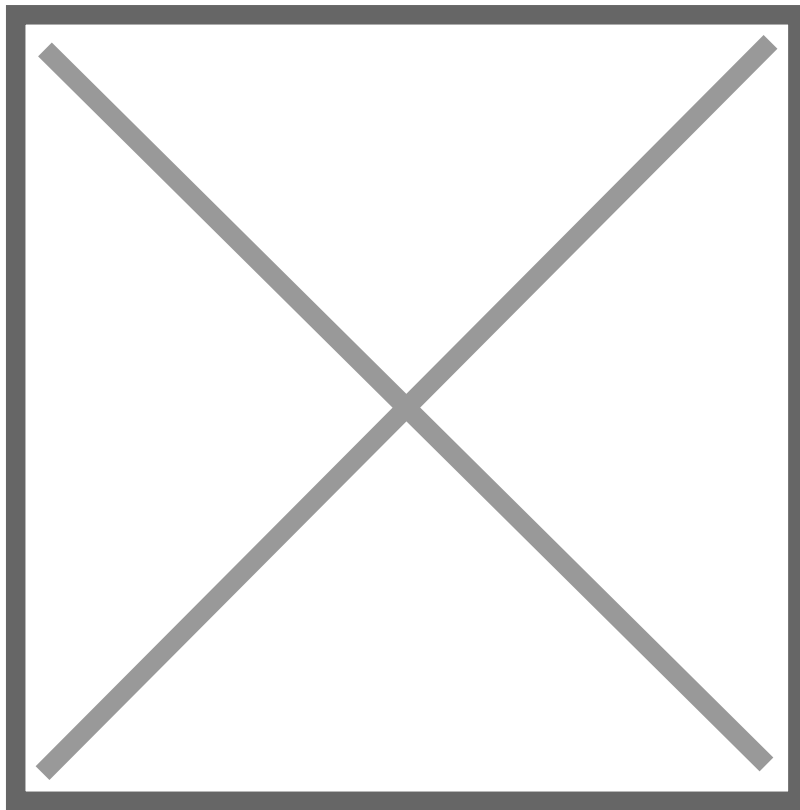
Here are some tangible examples of projects, both pilot and scaling projects, that are already demonstrating sequestration and co-benefits.

In Japan, a suite of progressive pilot and scaling projects is providing robust evidence that kelp reforestation delivers credible carbon sequestration alongside tangible ecological and socio-economic benefits. In Hirono Town (Iwate Prefecture), Sumitomo Corporation and partners restored seaweed beds within the historic Zoshokuko tidal channels—earning the largest issuance yet of J-Blue Credits (3,106.5 t-CO₂e), while channeling proceeds into climate action through a local fisheries council.

Meanwhile, Urchinomics pioneered a circular restoration model in Kunisaki and Nagato by paying divers to remove overgrazing sea urchins, ranching them into premium seafood, and thereby enabling kelp forest recovery. Their efforts secured the world’s first voluntary blue carbon credits for kelp restoration, with scientifically conservative yet verifiable estimates (approximately 1.5 t-CO₂e per hectare, priced at JPY 78,063/t in 2022). At Mashike in Hokkaido, University of Tokyo researchers conducted a five-year field study using iron fertilization—applying steelmaking slag combined with compost along the shoreline—to stimulate biomass growth in *Saccharina japonica*, with fertilized plots demonstrating significantly greater seaweed coverage than control sites.

Complementing these, municipal initiatives—such as eelgrass and seaweed restoration in Osaka’s Hannan City and Oita Prefecture—have produced J-Blue Credit-certified carbon offsets while reinvesting revenues in community education, aquatic habitat regeneration, and local livelihoods. Together, these diverse projects underline a powerful narrative: kelp forests are not only viable as durable blue carbon sinks but also act as engines for biodiversity recovery, fisheries revival, and coastal economic resilience.

Section III: Geopolitics & Ocean Equity



Kelp thrives in temperate oceans across East Asia, the Americas, and beyond. Do you see a risk of blue carbon becoming a resource race, especially as high-integrity credits become scarce?

That is an interesting question. Firstly, I think your point of geography is quite important. Kelp is quite unique because unlike mangroves and corals, they tend to grow in the countries where emissions and biodiversity loss are highest. This means that

high emitting countries can begin reversing this trend within their own Exclusive Economic Zone, as kelps grow 100 per cent within it. So in that sense, I can see how restoring kelp forests can quickly become a “low hanging fruit” for those countries that have them, and can quickly scale up restoration efforts.

Secondly, as for your comment about a resource race, I do think that due to the scarcity of high-integrity credits, there will be a massive supply shortage, but that would apply for all types, not just ocean-based ones. However, for those ocean-faring companies that would prefer to inset within their marine supply chain, versus offsetting on terrestrial initiatives, I think the supply would be even more limited, as supply is already incredibly constrained today.

This is where I believe well-structured frameworks and markets will play their role. As demand continues to grow for marine solutions, the lack of supply will drive a new cohort of new entrants that will develop new ways to restore marine ecosystems.

Markets like Japan that have mechanisms like J-Blue Credits will see more innovative solutions developing, simply because they have a state-approved, predictable framework to work within. This can then lead to exciting collaborations between major corporates, funders on one side, and innovative start-ups and community led initiatives on the other, like we already see today. Governments that do not provide such a framework will make it riskier for corporates and investors to contribute, limiting the market pressures to spur on exciting, and much needed innovation.

How can we ensure that coastal communities, particularly in the Global South, are not just carbon custodians but equitable beneficiaries in emerging kelp carbon markets?

This is one of the most important points I would like to highlight in this interview.

After having met many mangrove restoration practitioners from the Global South and Small Island Developing States and learning about their challenges, I am firmly convinced that equitable benefit sharing must be the cornerstone of future kelp carbon markets.

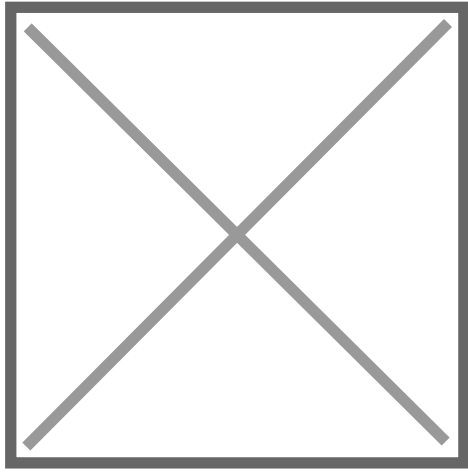
In Japan, where the communities themselves often own and operate the restoration projects, they retain most of the \$ 400/t (average) credit value upon selling it to a mission-aligned corporates. However, I have since learned that, even some of the best mangrove projects in Africa are only getting \$ 20-30 \$/t, of which the initial funders, market makers and brokers, certifying bodies all take their cut, leaving at most, 30 per cent of the credit value for the communities.

I would thus like to take this opportunity to address the elephant in the room. Pricing. Europe’s carbon taxes per ton of CO₂e released is between 50 to 120 EUR, with the Norwegian government aiming to set it to EUR 170 (2000NOK/ton CO₂e) by 2030. The IMO’s penalty fee for exceeding allocated emissions is \$ 380/t. Japan’s J-Blue Credits are being traded at an average of over \$ 400/t. The Global North is clearly in triple digit territory when it comes to “costing” the release of CO₂.

However, high-integrity, high-value, co-benefits generating, community-led blue carbon projects in the Global South only achieve \$ 30/ton for the same 1t of CO₂e sequestered, and the communities that make it all happen only get \$ 9/ton of this. Value seems to be disproportionately captured by the emitters and buyers in the North by depressing the purchase prices of the credits generated in the South.

I believe there should be a price correcting mechanism, like the indexing of the carbon credit prices to the carbon taxes faced by the buyers in the Global North. By indexing, and ensuring that the indexed premium goes to the communities, we narrow the gap by raising prices closer to the buyer’s cost of releasing CO₂, while ensuring that communities properly and equitably benefit.

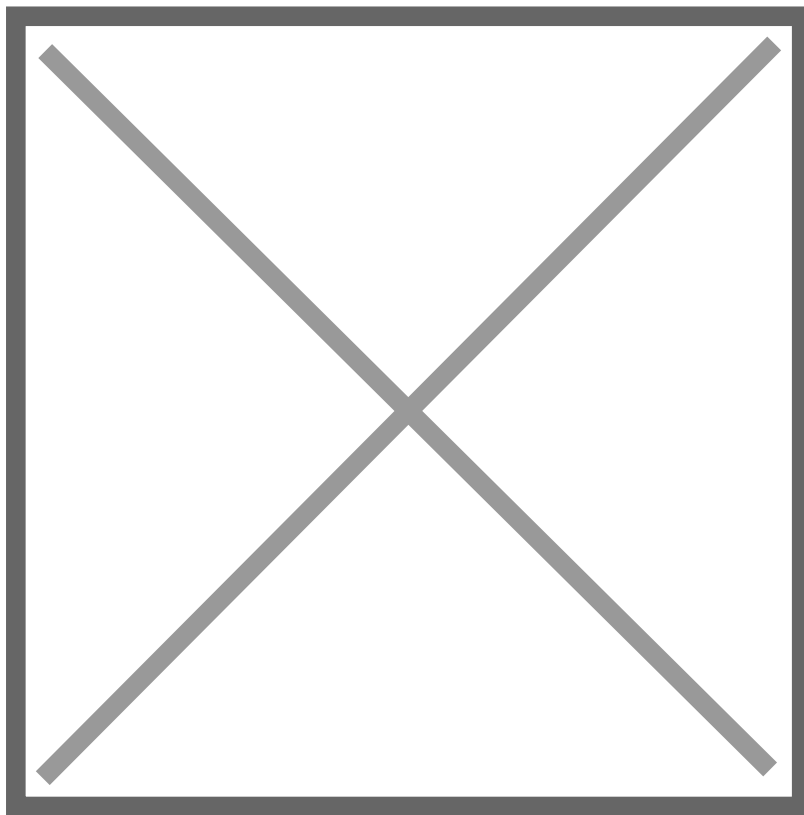
Section IV: Innovation, Investment, and the Future



Is there scope to integrate kelp reforestation with other ocean-based climate strategies—such as regenerative aquaculture, artificial reefs, or marine permaculture—for compounded climate and livelihood gains?

Absolutely. It may also prove to be one of the fastest, most scalable and cost effective ways to improve marine biodiversity, coastal resilience and carbon sequestration. This is simply because kelps are incredibly resilient and can opportunistically recolonize very fast if we give them the right conditions to do so. And we can do this two ways. We can a) reduce the pressures preventing kelps from recovering and/or b) help kelp forests recover faster using artificial reefs, marine permaculture etc. I think the answer will likely be a combination of everything will be most effective, rather than one or the other.

Section V: Personal & Philosophical



You’ve spoken about environmental responsibility rooted in cultural and intergenerational wisdom. How does your heritage influence your vision for restoring underwater ecosystems?

Perhaps it is the Japanese, collectivist, Buddhist-Shinto part of me, but I do believe our stakeholders are not just those that are present with us today, but also those of our past and future, and beyond the narrow definition of humanity. As temporary inhabitants of this planet, I feel it is our duty to find greater balance between our stakeholders (past, present and future, as well as human and non-human), rather than tip it even more in favor of humanity, today.

What gives you hope that kelp forestsâ??often invisible and undervaluedâ??can finally capture the worldâ??s attention as vital climate allies?

I think kelp forests will truly gain the attention it deserves when more people understand the incredible power kelps and seaweeds hold, and how kelp forests are interconnected with life in the ocean. And we are seeing a growing awareness shift amongst the general population in some countries. In Norway for example, kelp forests are finally being talked about in the parliament, and how government, private industry and NGOs are now working together to create a holistic plan for kelp forest restoration. We still have a long way to go though, so I will continue to spread the word however I can so that we can build even more momentum to conserve and restore these precious ecosystems we have along our coasts.

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