Takada, H. and S. Ogura 2025. Reviving the commons in Japan: restoring land-human relationship for climate-resilient future. Paper presented at the IASC Commons Conference, University of Massachusetts Amherst.

I am a practitioner and a craftsman of civil engineering and traditional Japanese gardens. My practice is rooted in the long lineage of Japanese ancient civil engineering techniques. In essence, it is a regenerative technique based on cohabitation with nature that our ancestors have developed.

Unlike the modern standard civil engineering technique, this does not destroy the environment but cultivates biodiversity and respects the lives of non-human beings. I have been practicing and advocating this principle through various landscapes and civil engineering projects all over Japan.

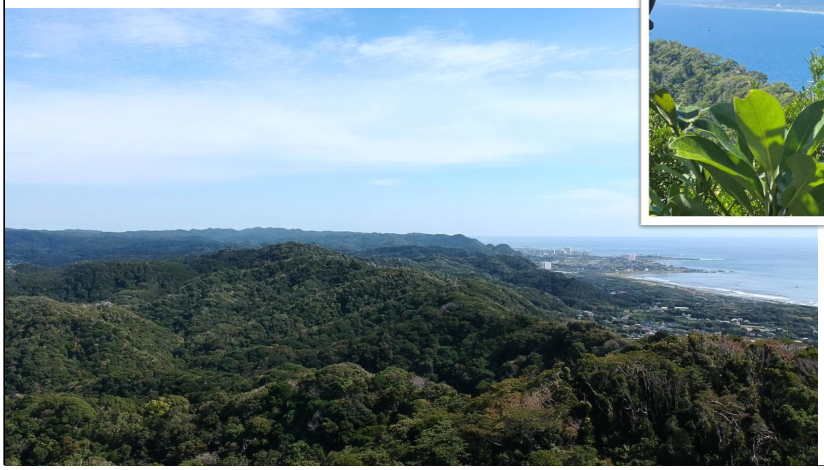
Belowground Ecosystem: Reviving ancient techniques and a forgotten perspective to co-exist with nature (Takada, 2020)

I published a book called “Belowground Ecosystem” in 2020 to explain the basis of this principle. “Below Ground Ecosystem” advocates a way of looking at the ecosystem through the air and water movements in the ground.

This perspective existed in ancient methods in different parts of Japan, passed down from generation to generation. I have been passing on those skills and restoring the deteriorated natural environment.

Awa-Daijingu Forest:

as a place of significance protected by our ancestors



Two years ago, we fund-raised and borrowed money to purchase the 55ha of the forest from the hands of a developer; and we are in the process of creating a system which will allow us to protect and pass on this land to the future generation as Commons.

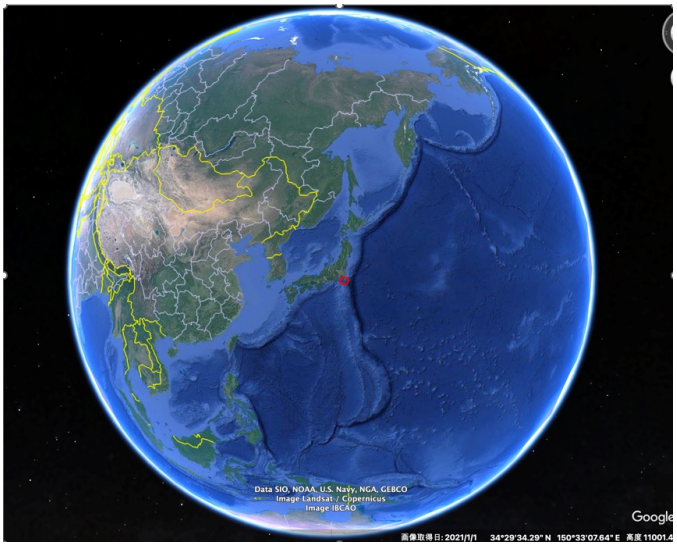
The whole area in this photo is the forest, which used to be a sacred area for Shinto shrine and was protected by the local people for generations.

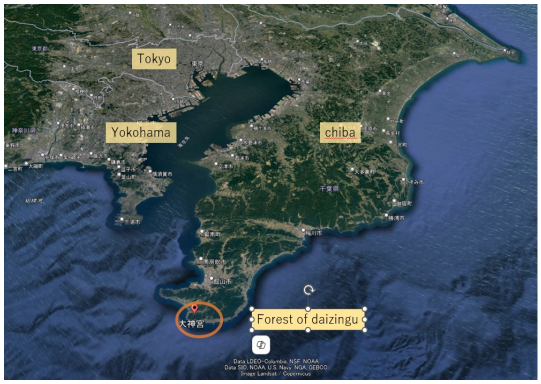
The name of this location is called Daijingu, which literally means A Residence of the Great deities. In this presentation, we will share why we are trying to protect this forest as commons.

The Daijingu Foreist has been a place of significance for our ancestors for centuries. It became a sacred forest of Awa Shinto Shrine around 2600 years ago.

The sacred body of the shrine is the rock that emerges from the rear of the shrine.

The water that seeped out of the rock was considered as water of the gods, and had been an important water source for the communities.

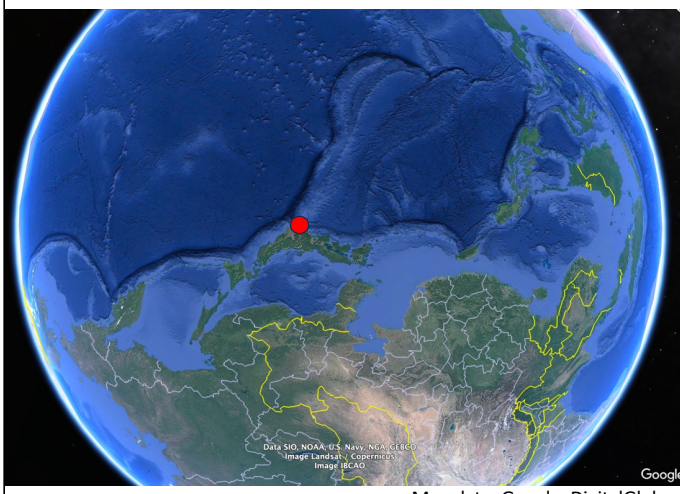




Map data: Google, DigitalGlobe

Daijingu Forest is located in the middle of Honshu island, at the southern end of Boso Peninsula, stretching out into the Pacific Ocean.

Many archaeological remains have been found, which trace the evidence of human travels and cultural influence from Oceanian communities.



Map data: Google, DigitalGlobe

By looking at the world map upside down, it becomes clear why the influence from beyond the sea arrived earlier at this particular place, compared to the rest of the Japanese archipelago.

As it's the furthest eastern tip of the peninsula, this place has held cultural and geological significance since ancient times.

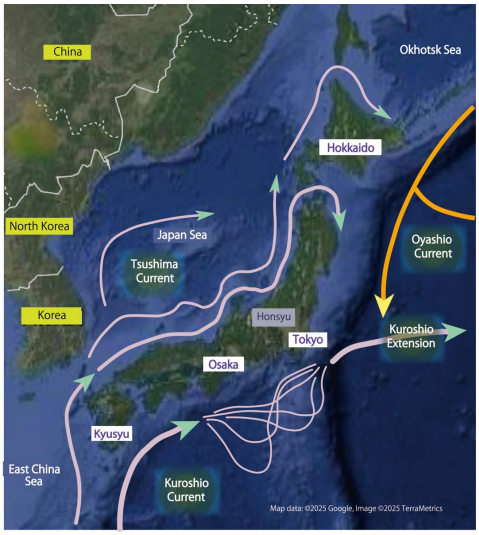


Figure created by Yumi Kurushima

The productivity of the land and the sea that nurtures abundant water source and rich biodiversity has been fundamental to human life and cultural activities.

The Daijingu forest is such a place. First, it is a place where warm and cold sea currents meet, which fosters a diverse marine ecosystem. This diversity also originates from the forest. A recent scientific study shows that water that filters through the rich humus layer of a forest ground carries important organic nutrients into the ocean.

These forest-based organic matters, such as Fulvic and Humic acids pour out from the ocean bedrock and help filter and purify the seawater. This creates a fertile environment which fosters juvenile fish and seaweed. Located at the meeting point of warm and cold sea currents, Daijingu Forest has played a crucial role in maintaining a finite balance of the ocean ecosystem.

A corner of the exposed megalithic group on the top of the mountain of Awa-Daijingu Forest

Coast at the foot of the mountain

Geological structure of Awa-Daijingu forest is also fundamental to the diversity of the marine ecosystem. It sits at the meeting point of 4 different seismic plates with one of the most frequent seismic activities in the world. Within the last 300 years, the land has risen almost 6m.

The picture to the left is a part of the rock formation at the peak of Awa-Daijingu Forest, and the photo on the right shows the rock formation at the adjacent beach.

We can see that both are sedimentary rocks, formed from the seafloor, meaning the rock formation spans from the sea, all the way up to the top of the mountain.

The rainwater has been seeping through the cracks of the rock formation from the top of the forest to the bottom of the ocean. This connectedness has formed a rich marine ecosystem.

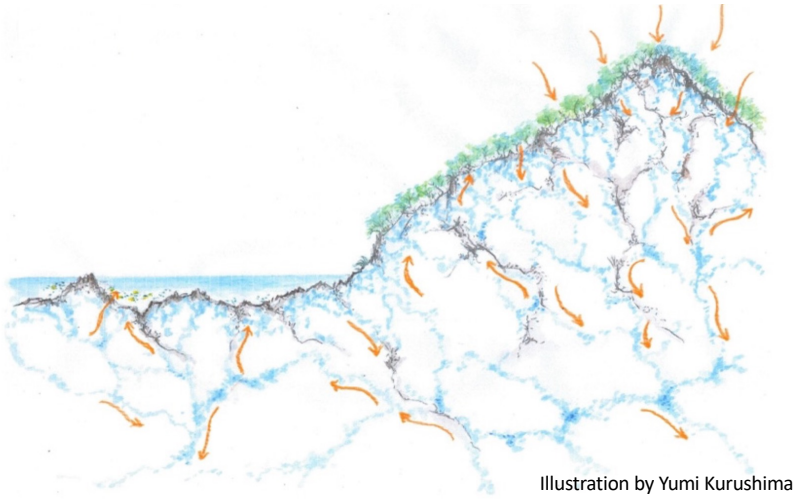
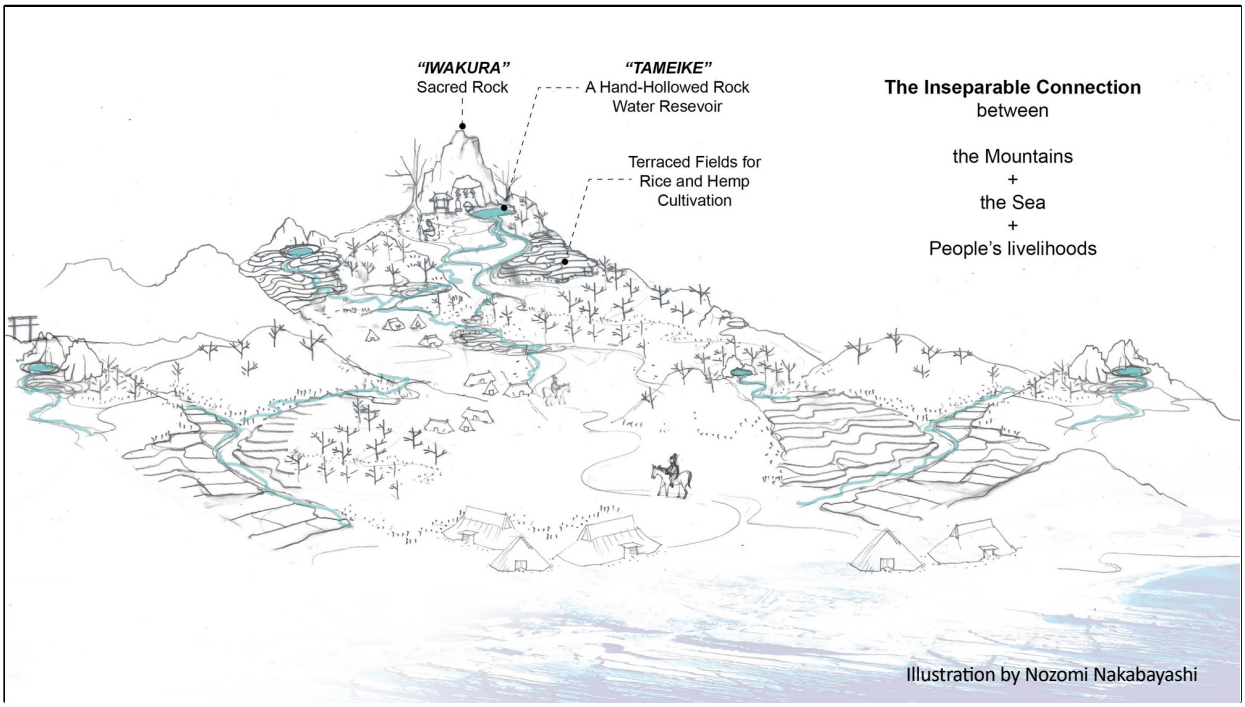


Illustration by Yumi Kurushima

Our ancestors have understood the importance of the rocks of the mountains and the forest for survival and prosperity of human lives,

and these megalithic rock formation and the surrounding forest have been worshiped as the body of the nature deities.

These sacred rocks are called `Iwakura` and worship rituals have been performed since at least several thousand years ago.



Securing water source is crucial for human livelihood. There are many `Iwakura` at the top of Awa-Daijingu Forest and we can still see the remains of where the water has sprung out from.

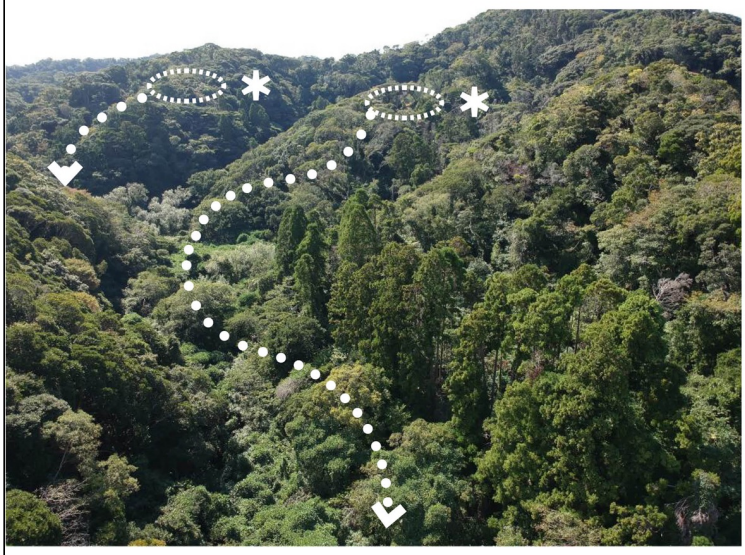
By carving into `Iwakura`, our ancestors have created a natural water reservoir, combined with rainwater and the natural spring water.

These water reservoirs enabled irrigated terraced fields for rice and hemp cultivation even close to the top of the mountain.

This is one example of Iwakura, sacred rock in Japan. Sadly, many mountains have dried out and water has ceased to spring out in many areas of Japan.

But here, there is still clear water which springs out from the cracks of the rock at the top of the mountain. This Iwakura has been considered a sacred rock of the local shrine, and it has been protected along with the surrounding forests including mosses.

Our ancestors have understood that if you cut down the trees, these sacred rocks will dry out, so as the water source. This is why they protected a forest, surrounding the rock formation at the top of the mountain as commons.



* **Hand hollowed water reservoir**
(Carved out of stone)

Dotted dash indicates a valley where there would have been terraced agricultural fiedls
(Now, overgrown with trees)

The picture on the right is a remnant of an old water reservoir. If you carve into these rocks, internal water pressure will be released and water will spring out from the cracks.

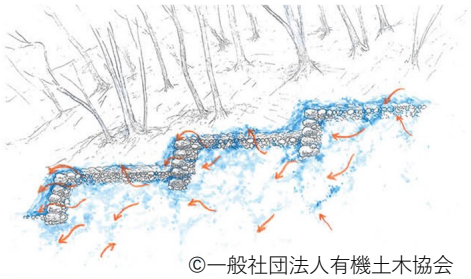
If you secure a water source at the top of the mountain, hunter-gatherer communities can live in the mountains without going down to the sea. It also enables rice cultivation at the top of the mountain.

Left: Water springs out from the chiseled hollowed-out rock
Right: Water pours out from the above. Hand-carved water channel carries the water down towards the the terraced rice fields below

The water reservoir at the top of the mountain also served as a key water source, not only for the people and the cattle, but also for wild animals. The ancient techniques always shared the resources with non-human beings.

A modern dam construction
Purpose: Prevention of soil erosion
Method used: Modern standard civil engineering technique

A stepped sluice structure
Purpose: Prevention of soil erosion
Method used: Civil engineering method based on ancient technique



As one example, I will talk about a modern dam created for the prevention of soil erosion in the mountains. The concrete retaining wall, although it tries to stop erosion, it in turn, cuts out below ground water movements. This causes slaking of the bedrock of the mountain and contributes to future risk of further environmental disaster. It leaves a negative impact.

On the other hand, the photo and the illustration on the right show a stepped sluice structure for soil erosion prevention, along a sloped mountain site, constructed with the ancient civil engineering technique. Instead of creating a mega structure, it follows the contour of the river. By staggering a series of small drystone steps, the structure functions to calm down the speed of water and debris. At the same time, the cavity in the dry stone circulates the movements of the below ground water stream. This helps circulate and promote the heathy movement of the river and the sea environment.

The civil engineering that I practice and advocate is rooted in ancient techniques. The Japanese ancient civil engineering technique places importance on the air and water permeability and movement below ground. The materials come from the nature, for example, unpeeled round logs, stones, tree branches and fallen leaves. Inclusion of these natural materials synthesizes with the root structure of the trees, and over time regulates the water movements below ground. The structure becomes part of nature and helps the nature to thrive.

On the other hand, the modern standard civil engineering technique prioritizes structural strength and lacks this point of view of water and air permeability, and tries to eliminate the below ground water movements when considered unnecessary. The material used is all synthetic materials, such as concrete and steel, most of which are non-site specific standardized prefabricated products. This approach brings environmental destruction and potential hazard of man-made environmental disasters. It deprives the earth of fertility.

My intention is to not negate entirely the modern standard civil engineering method. I believe it is possible to improve on the method if we can identify the part of the structure, which causes damage to the environment.

This picture is one of our projects. It shows the foundation we have built to support a heavy concrete retaining wall. With a typical standard civil engineering practice, the foundation would have been a poured in-situ concrete, which would have compacted the soil below and impeded on the below ground water movements.

Here, instead, we are using timber pile foundation combined with layers of stone sub-base, sandwiched with dried leaves and charcoal. The stones are of a particular size, which allows water to permeate through and create spaces for the tree roots to grow and act as one unified foundation system.

The ancient civil engineering method enables dancing with nature, and provides solutions for the current environmental issues and supports climate resilience. Retaining of air and water permeability allows the tree roots to thrive, and over time, it regenerates a healthy and fertile below ground ecosystem.

Considering that our ancestors constructed these without the help of modern machinery, it may actually be quite a simple task to restore the healthy forest. It is necessary for us to learn from the traces the ancestors have left on the Daijingu Forest, and revive the techniques and the principles.

Currently, we have lost sight of the true value of the earth by prioritizing land value, purely from economic point of view. And we are losing the wisdom and the technique to protect the land, which has the indefinite potential to support the human and non-human lives.

Thankfully, the science has finally caught on to realize what our ancestors and Indigenous People have understood as common sense. We want to continue to research and implement ways that will allow us to protect and pass on this important place as commons to the future generations.

Hiroomi Takada info.takadazouen@gmail.com
Saori Ogura saoriogura16@gmail.com

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