

# Stitches

*Aditya Athreya Rao*



Courtesy of the Freer gallery, Smithsonian  
Institution, Washington DC

Blending landscape fabric through the golden threads of spatial identity in San Riku coastline, Otsuchi, Iwate, Japan.















reaction?



Seawall construction at Rikuzentakata looking toward the bay. The mound visible in the foreground is the site for future pine forest revegetation. Image: Hayden Matliff.





25m!











**NHK WORLD**  
JAPAN

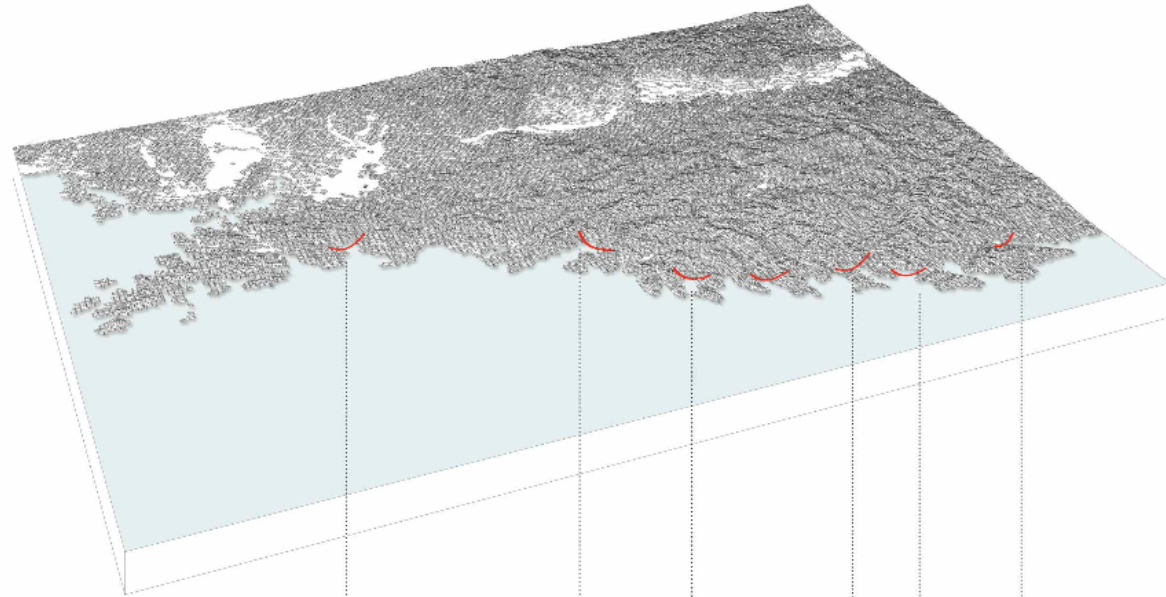
Hurry home to me.





**Japan, Iwate, March 2011**

15,896 deaths,  
6,157 injured,  
2,537 people missing



**Minami Sanriku**  
13,380 people

**Kesennuma**  
85,367 people

**Kamaishi**  
34,505 people

**Otsuchi**  
12,176 people

**Miyako**  
54,573 people

**Rihuzentakata**  
24,709 people



**The coast of Iwate Prefecture**

12 municipalities

(5 cities, 4 towns, 3 villages)

Area: 4,946 km<sup>2</sup>  
Population: 2,40,000

**Local Industries**

Along with a booming fishing industry, an abundant sea, our coast is home to businesses focusing on precision machinery, steel manufacturing, and connector-related industries.

The town faced problems before the tsunami. It is important to recognise these.



**Diagrammatic Problem Statement**

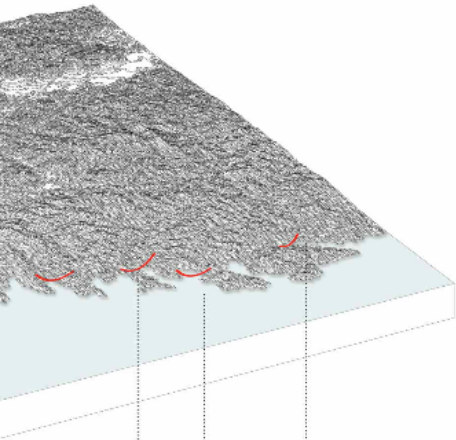


**Before Tsunami**

L1 / L2



Hu  
De  
Re  
Mi



### The coast of Iwate Prefecture

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**Miyako**  
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### Identity



Damage Districts	Est. 2012	Damage value of capital	Damage per capita	GDP per capita	% of Damage cost to GDP
<b>Iwate</b>	25,399	764	3.2%	4250	10 year worth
Count	7,464	3,705	<b>47.3%</b>		
Total	18,010	4,270			
<b>Miyagi</b>	31,443	1,635	5.1%	8,302	6.8% year worth
Count	7,379	4,727	<b>63.5%</b>		
Total	24,064	6,462			
<b>Fuku-shima</b>	34,354	1,270	3.7%	7,229	5.1% year worth
Count	12,011	1,862	<b>15.5%</b>		
Grand Total	90,994	3,702	4.1%		

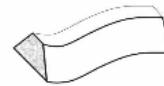
Property damage	Change in Population
House destroyed - 3,029	15,941 → 15,732
Damaged houses - 790	20% decrease in population

Population	1980	2011
1000	24,000	1,000 @ 25%
10000	240,000	10,000 @ 25%
100000	2,400,000	1,000,000 @ 25%

**Cost of building post tsunami -**  
1.5x more higher than pre-tsunami

#### Cost Benefit of Engineering solutions



### Diagrammatic Problem Statement



Before Tsunami

L1/L2



After Tsunami

#### Human Casualties

Deceased	1234
Related Deaths	47
Missing	437

**Budget vs time -**  
\$55,700,000 to \$550,000,000

25% loss of population in tsunami  
**1980 - 21,292** people  
**2011 - 15,276** people  
**2045 - 6220** people

Aging population



Mono flow economy



**50%** population - working category  
 Average income -  
**< \$5000** than Iwate average

**7 Years** (unfinished)

- 2 month Reconstruction Plan  
 - 2 year Recovery phase  
 - 3 year Revitalization phase  
 - 1 year Expansion phase (delayed)

Time for Reconstruction



Identity



- Depopulation  
 - Lack of identity to Urban structure  
 - All amenities in place, but lack of citizens recognizing it as their structure  
 - No public, recreational and creative spaces

Lack of an ecological overview



Identity can be found in its landscape, streets, people and life and not in built works.

Population	15,276	11,732
<15 yo	1,749 (11%)	1,156 (9.8%)
Productive age	8,579 (56%)	6,462 (55%)
>65 yo	4,948 (32%)	4,114 (35%)

- Cost of building post tsunami -  
1.5~2times higher than pre-Tsunami

### Cost Benefit of Engineering solutions



### Mono flow economy



### Identity



ement



**Budget vs time -**  
\$55,700,000 to \$550,000,000

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### After Tsunami

**In Casualties**

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Missing	437

### Aging population



### Time for Reconstruction

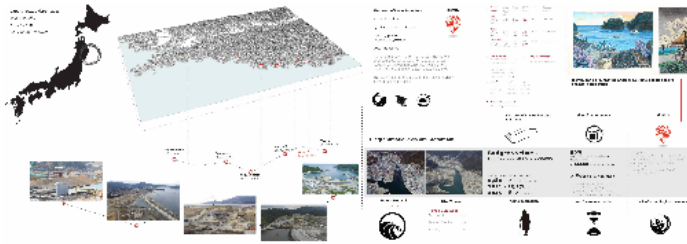


### Lack of an ecological overview



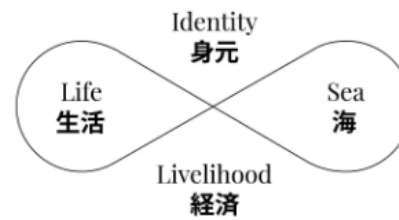


# The Situation

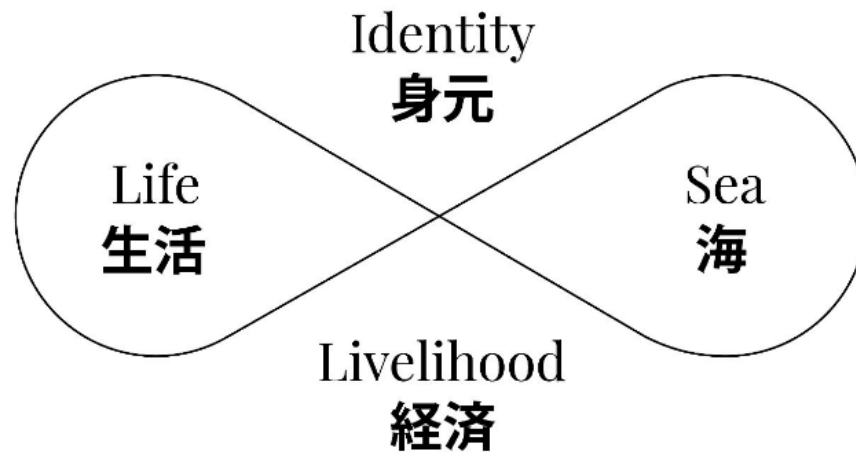




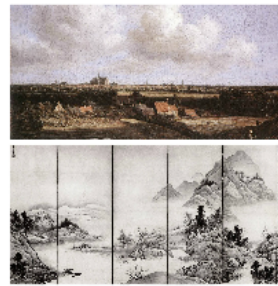
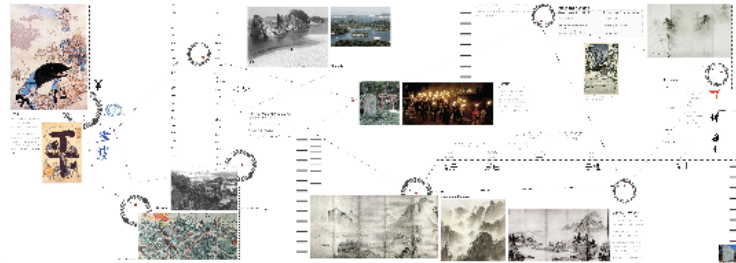
# Theoretical Framework







# Contextual History



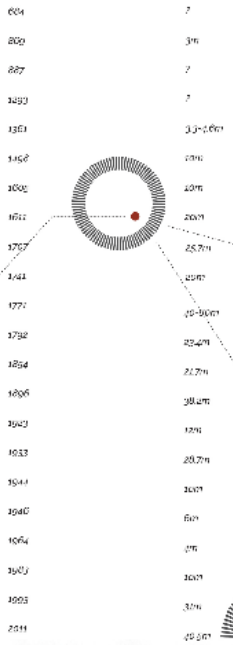


**Myth**  
The origin of the word 'Tsuji' is said to be related to the Japanese word 'tsuji' (toji), which means 'gate' or 'threshold'. This is because the word 'tsuji' is also used to refer to the 'tsuji' (gate) of a shrine. The word 'tsuji' is also used to refer to the 'tsuji' (gate) of a shrine.



津波

¥



サンリク



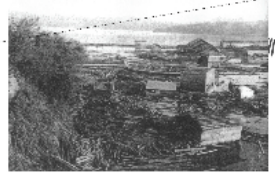
Character

'The First Thing in the Morning'  
by Takuocho Ishikawa  
An article about a homeless old man  
Miyazaki to leave  
Takuocho Ishikawa's story

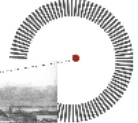
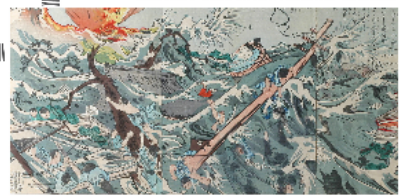


Memory

There are many memories of the festival. The festival is held every year. The festival is held every year. The festival is held every year. The festival is held every year.



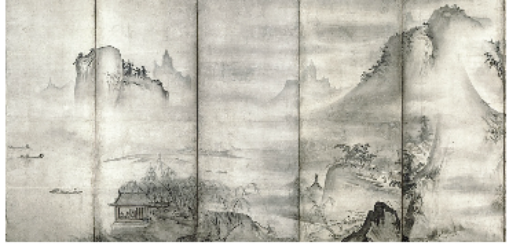
History



風景

景色

Landscape Painting

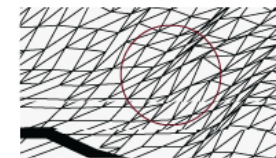
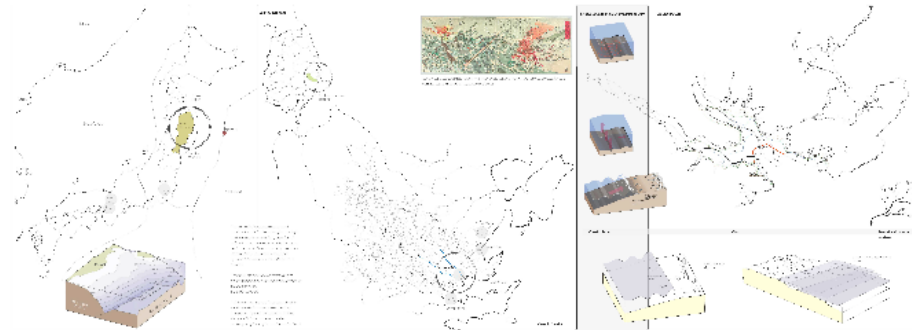




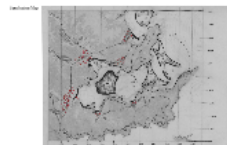
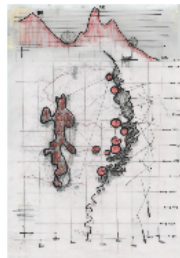




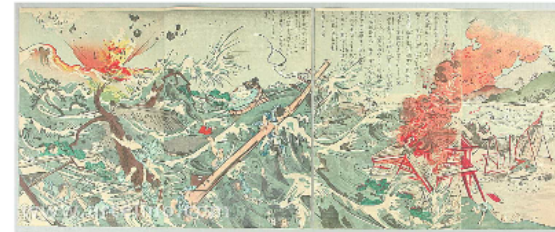
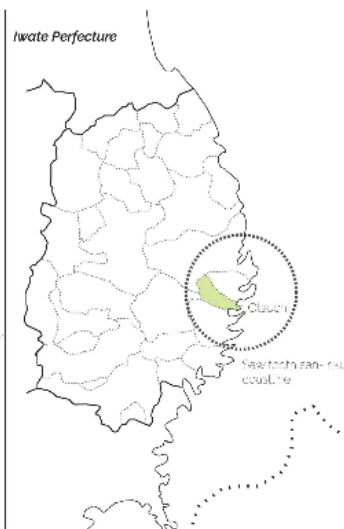
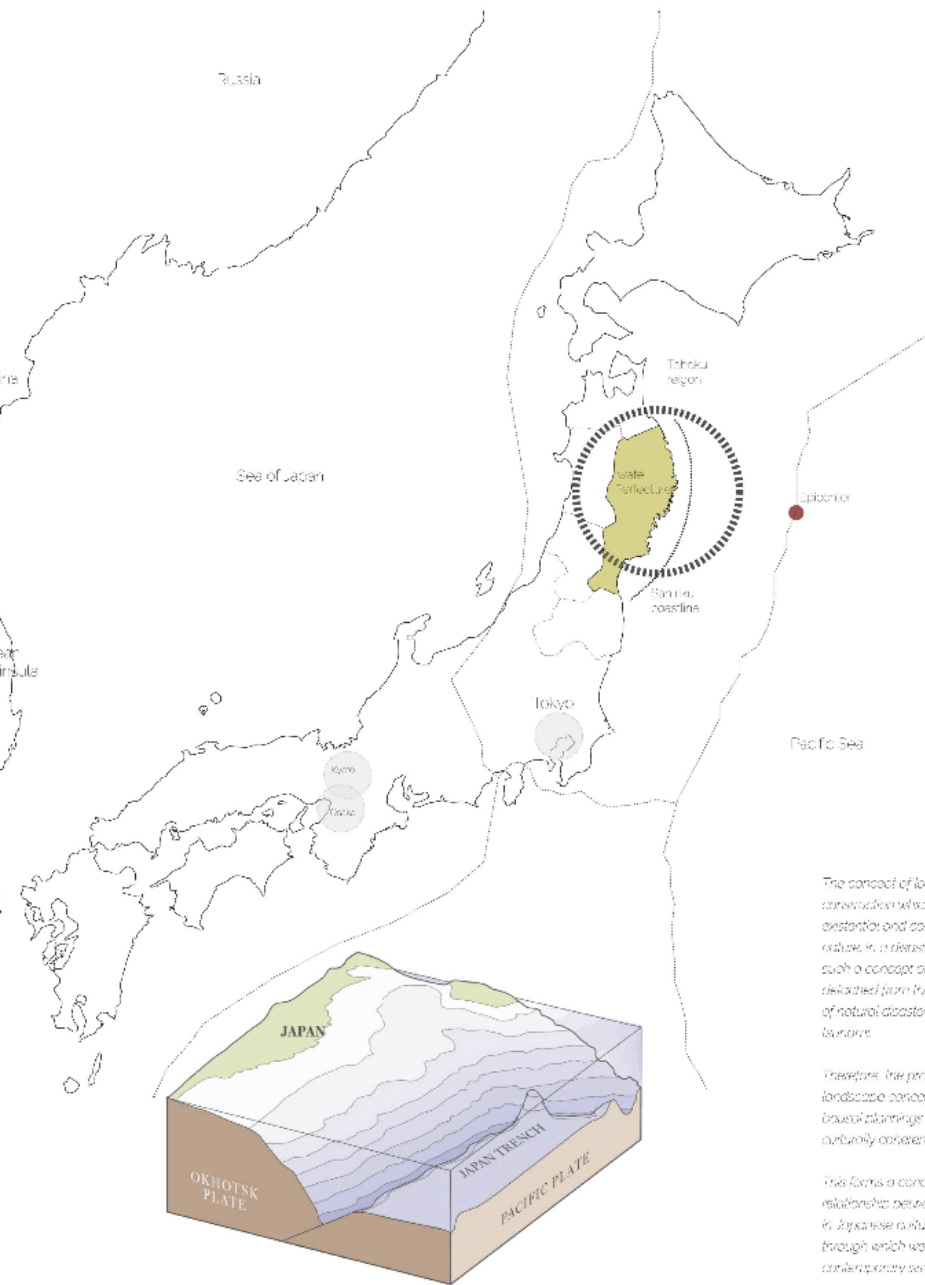
# Site Introduction



Context Map







*Watanabe Kazu Utagawa Hiroshige and others seeking to bring the sudden devastation of Sanriku tsunami to urban Japanese audiences*

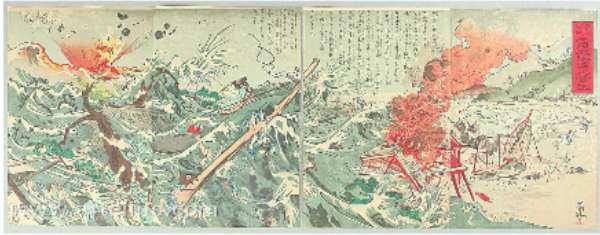
*The concept of landscape is a cultural construction which reflects the given, socially constructed and cosmological perception of nature. In a disaster-prone country like Japan, such a concept of landscape is by no means detached from the frequent occurrence of natural disasters such as earthquake or tsunami.*

*Therefore, the procedural understanding of landscape concept is indispensable for making local planning culturally coherent.*

*This forms a conceptual base regarding the relationship between people and nature in Japanese rural and historical context through which we can reflect on the contemporary issue of tsunami disaster in Japan.*



*Otsuchi Dist.*

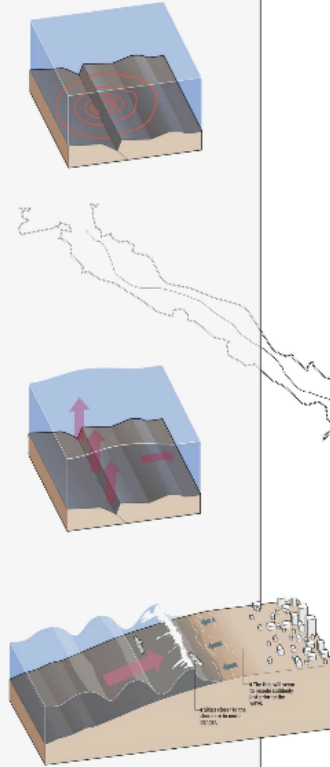


Kōchōrōrōshi Utagawa Kunisada (1797-1842) and other artists seeking to bring the sublime devastation of a Sanriku tsunami to urban Japanese audiences

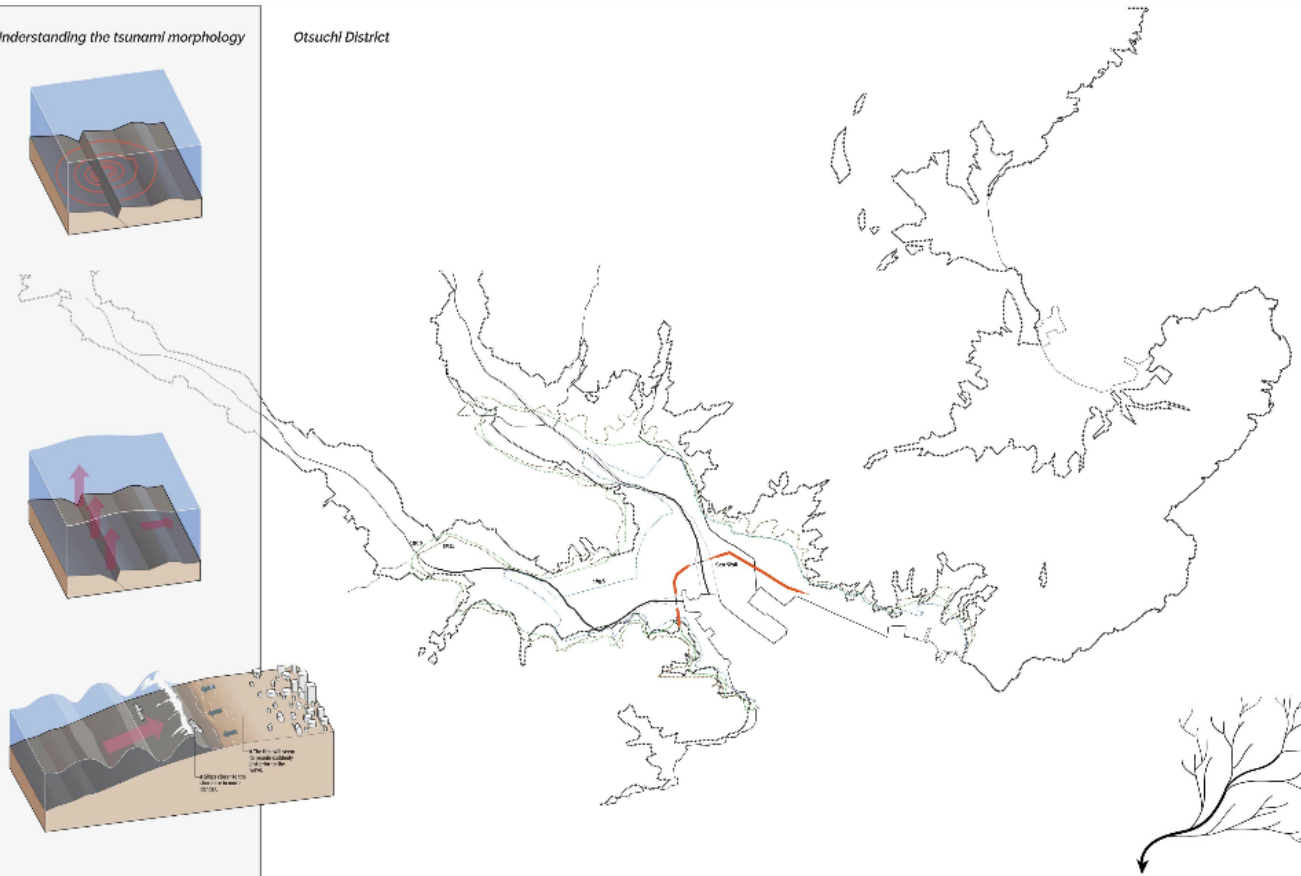


Otsuchi District

Understanding the tsunami morphology



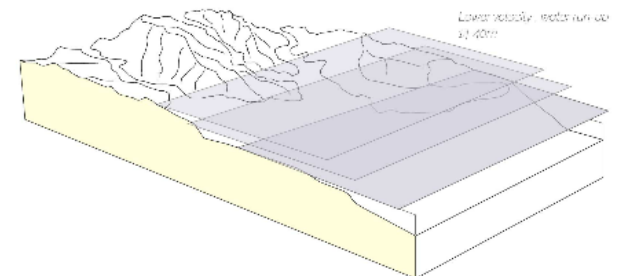
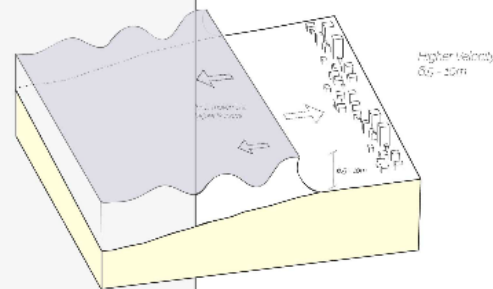
Otsuchi District



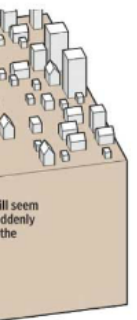
Coastal Plain

Rias

Dendritic Drainage pattern





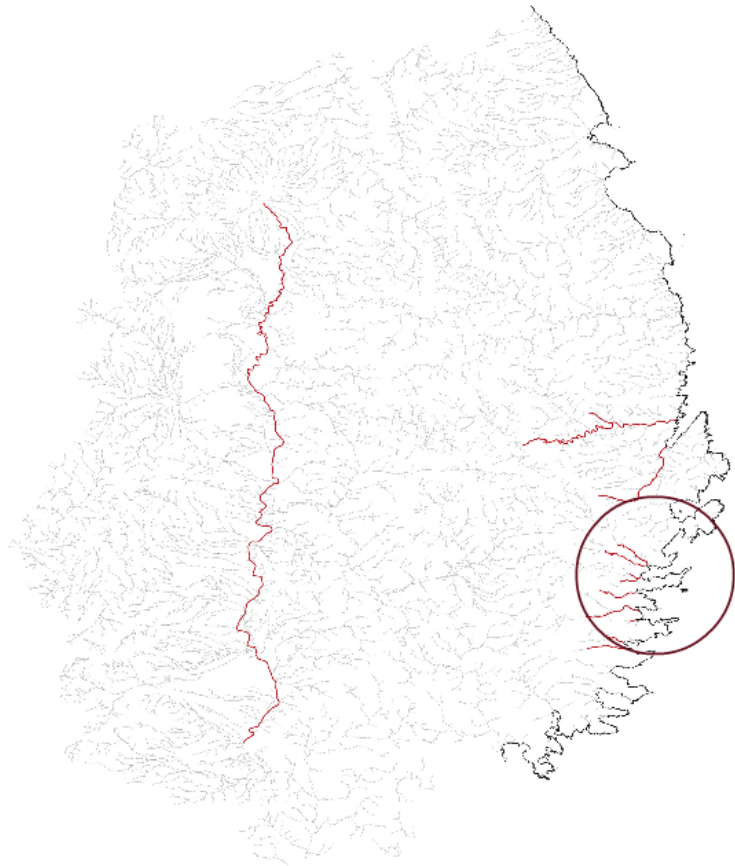


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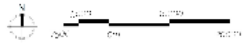


# Perfectural Level

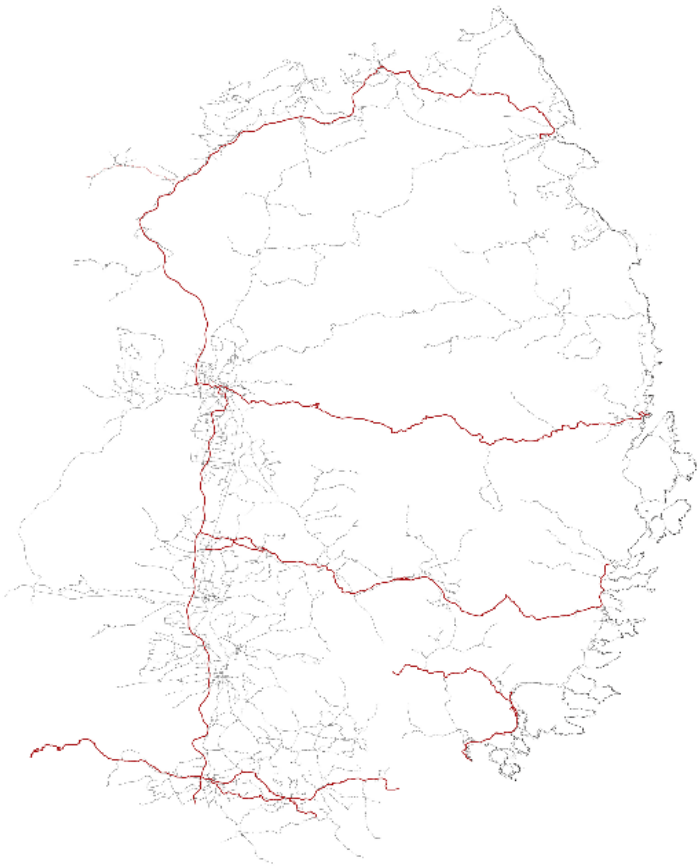
Water System



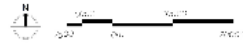
— Water System  
— Water System  
— Water System

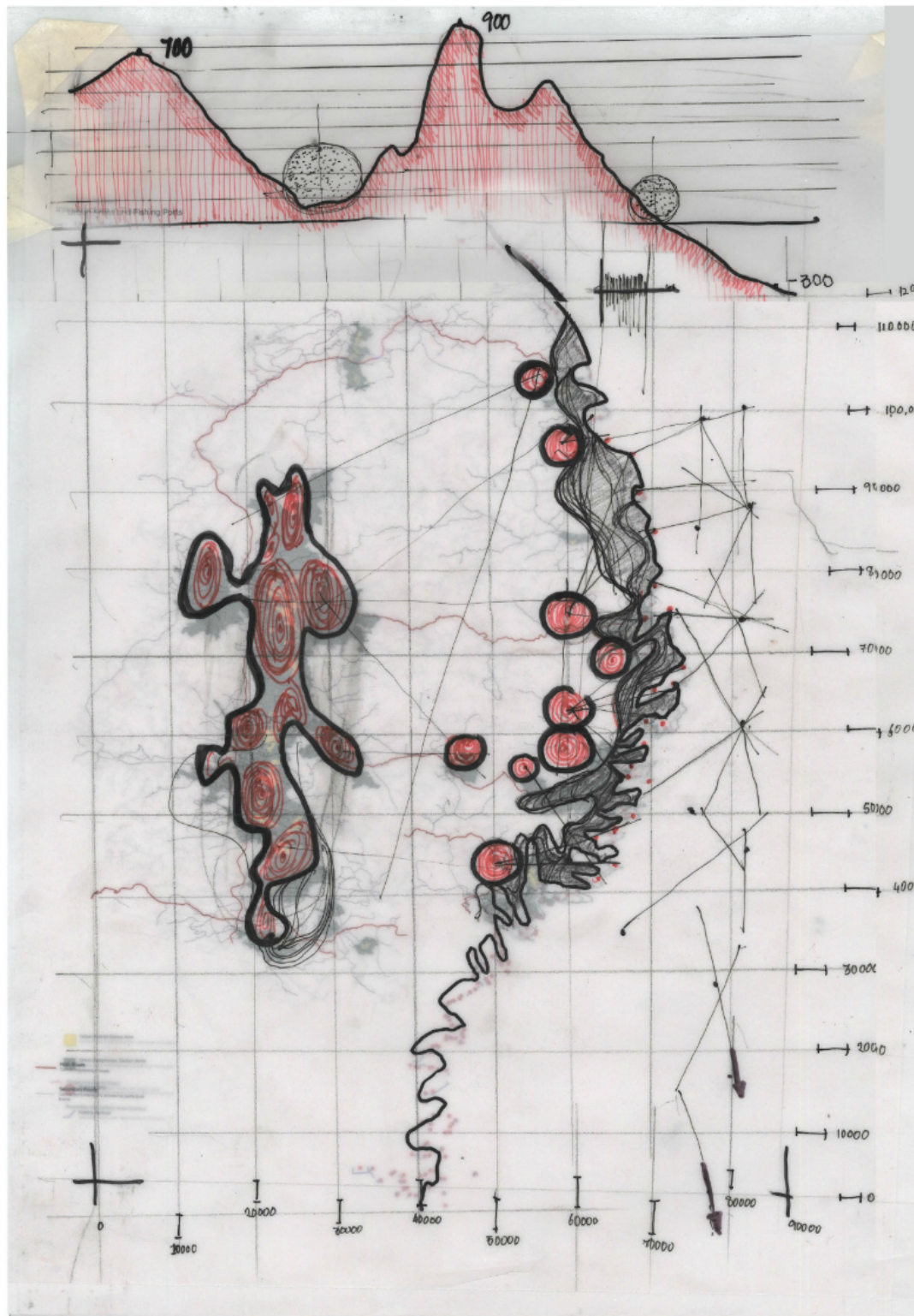


Infrastructure in Transport



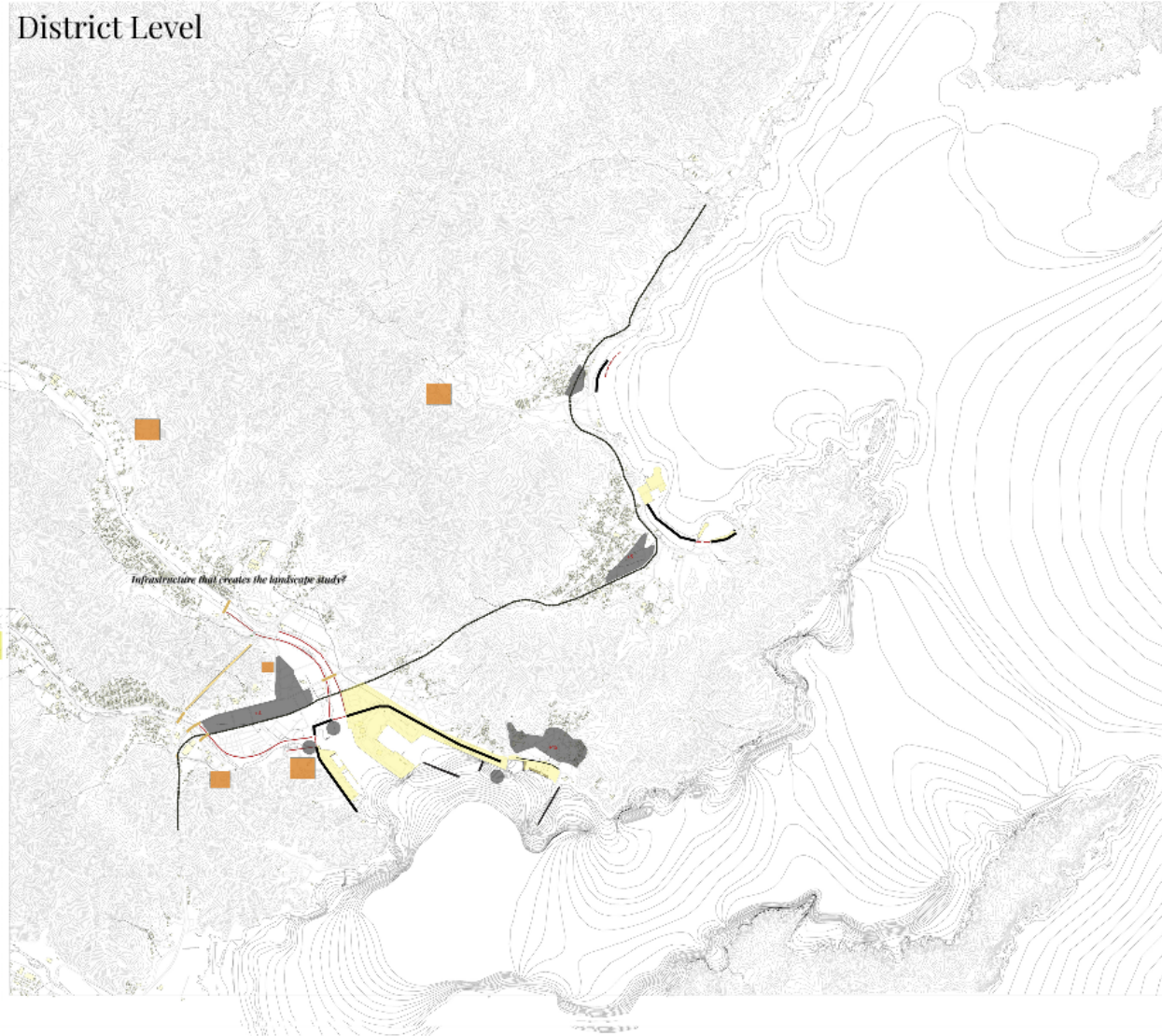
— Infrastructure in Transport  
— Infrastructure in Transport  
— Infrastructure in Transport



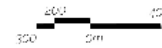




# District Level

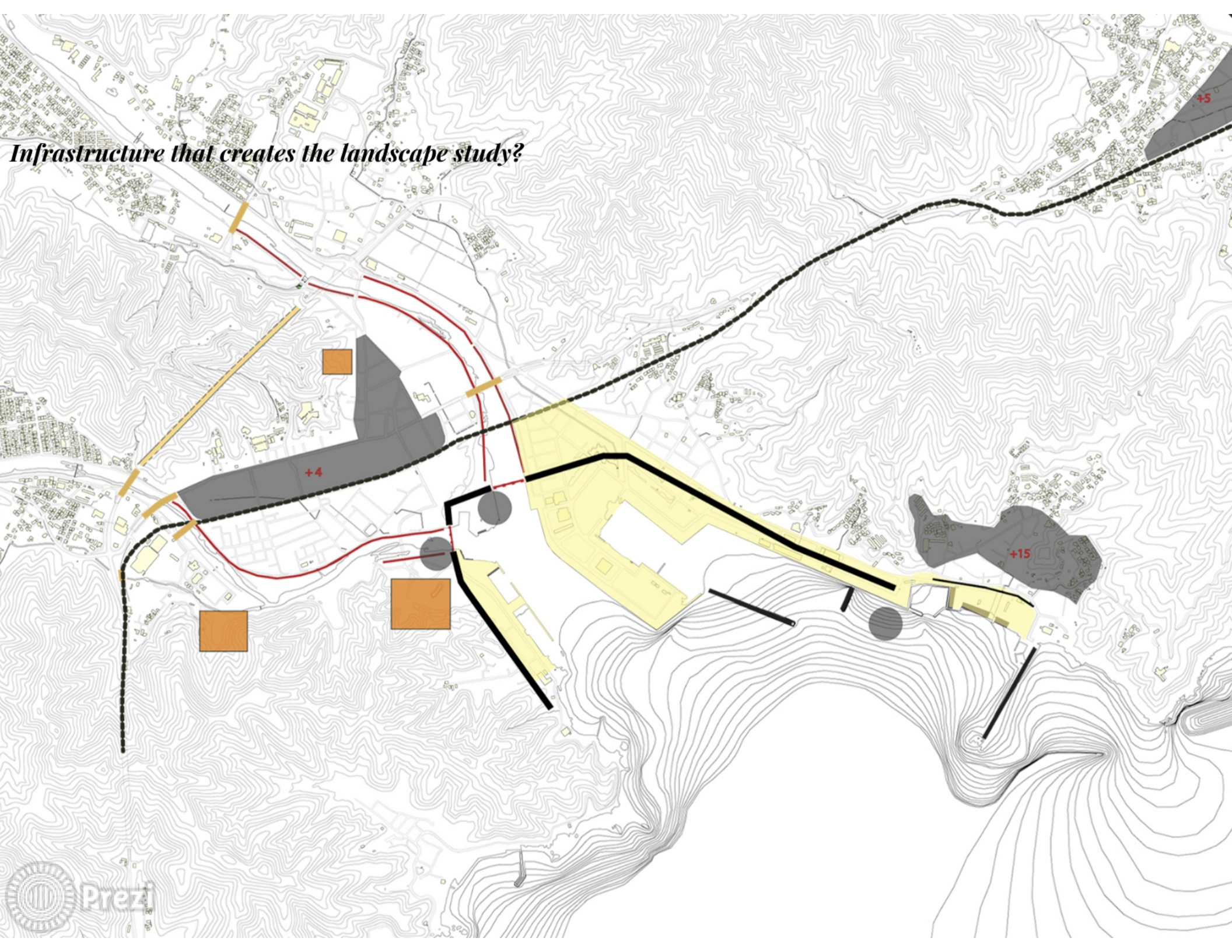


Large scale Infrastructure  
City scale



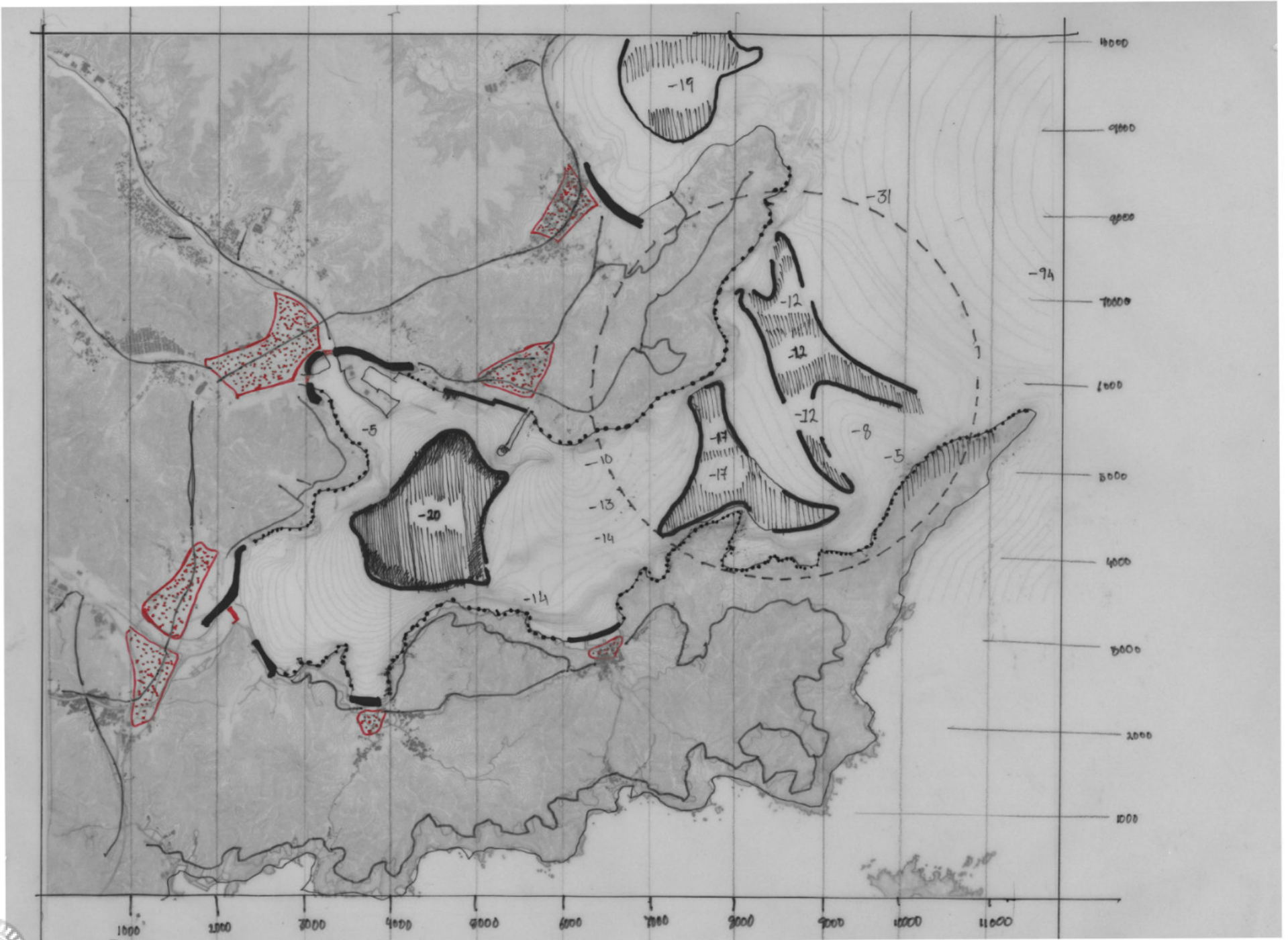


*Infrastructure that creates the landscape study?*





map



The site's  
Landscape Morphology

Mountainous Pine forests

Rias/Estuaries

Bay Mouth

Outside Bay Mouth

Deposited flatlands and fishing villages

Wetland habitats

View of the bay mouth

View of the bay mouth

View of the bay mouth

View of the bay

View of the bay

View of the bay

View of the bay

View of the bay

View of the bay

View of the bay

View of the bay

View of the bay









*Oryza Sativa*  
and Paddy fields



Seagrass *Phyllospadix*  
*iwatensis*



*Oryza Sativa*



Hijiki Sea Weed



*Pinus Densiflora*



*Cryptomeria japonica*  
Chaemycy  
Chaemycy  
plantation



*Phytolacca*  
*Korsakowii*



*Penthorum chinense*

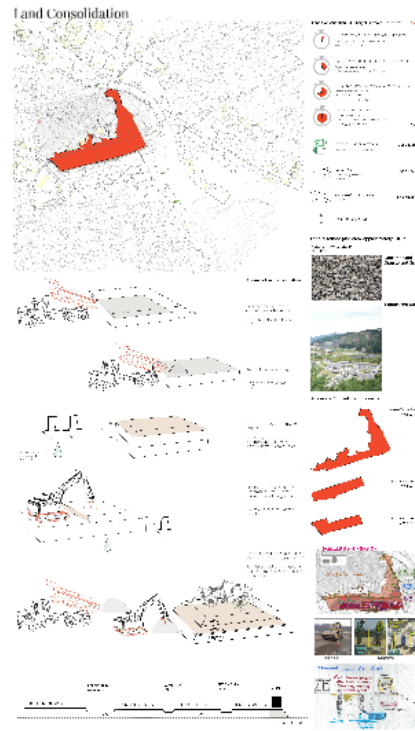
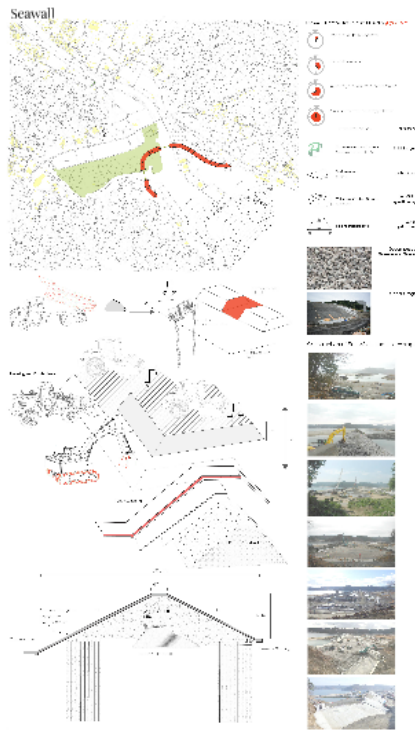


Hijiki Sea Weed  
Kombu Sea Weed



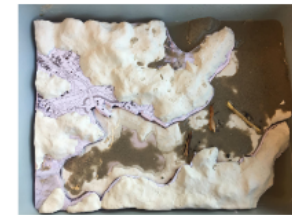
Field Weed communities

# Tectonic Analysis



Re-evaluate the materials

Using the materials generate three

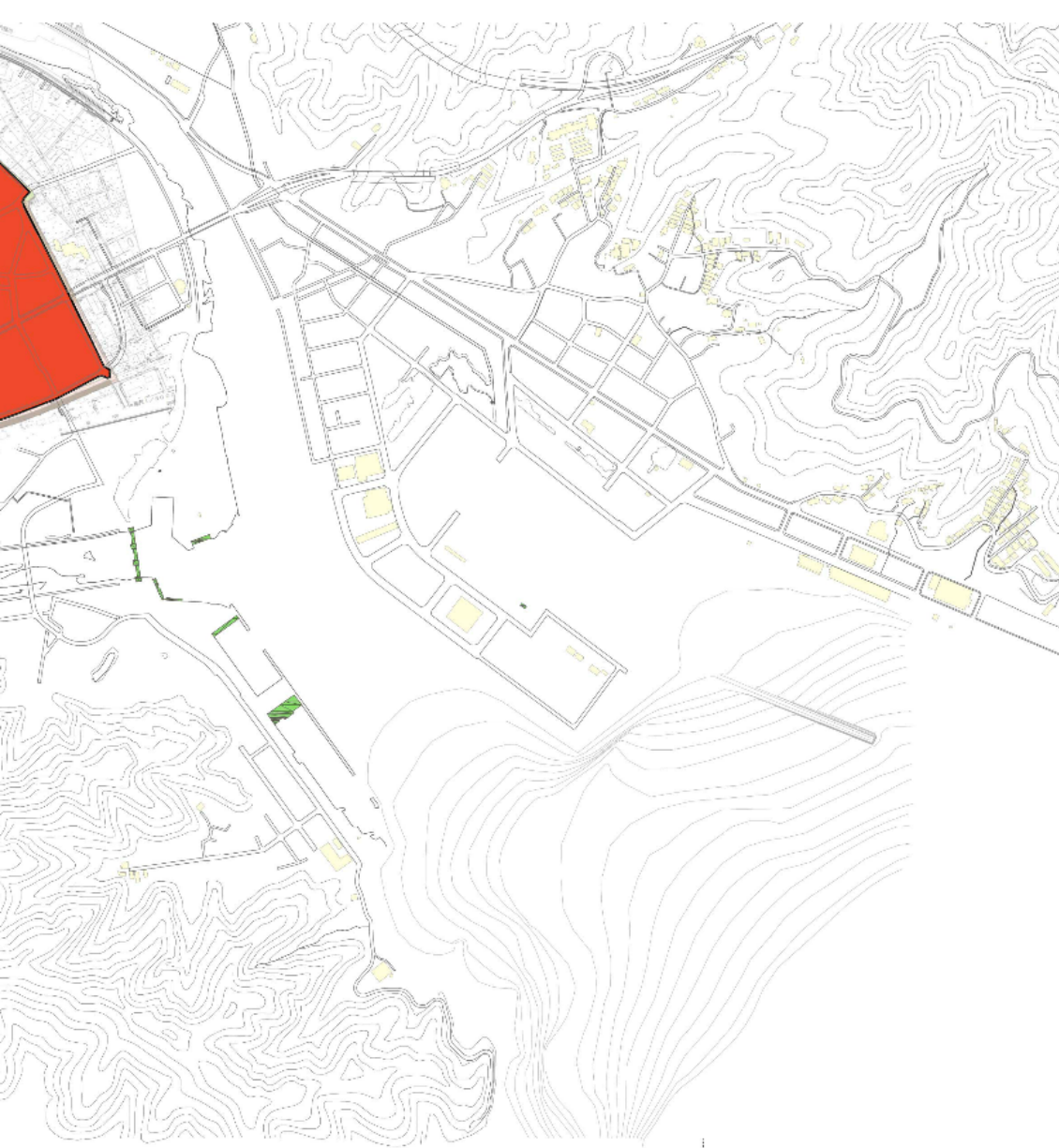


Types of form









Second layer of 2 m - 1 month  
 Embankment - 1 month  
 Consolidation time - 6 months



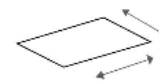
Embankment removal  
 Embankment Removal - 1 month  
 Construction of roads and structures - 3 months  
 Liquefaction period

**5 years**



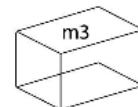
Expense - Approximately  
 Cost as per euros - 102 million Euro

**13.1 billion yen**



Surface Area -  
 Divided into 3 parcels of  
 Hectares

**33.2 hectares**



Volume of Crushed Gravel -  
 cubic meters

**1.32 Million m3**



Height of Raised level

**4 m**

**Land purchase plan area: approximately 8.0 ha**

Heisei 24 - Heisei era 34  
 2012-2018



**Decomposed  
 Granite and Gravel**

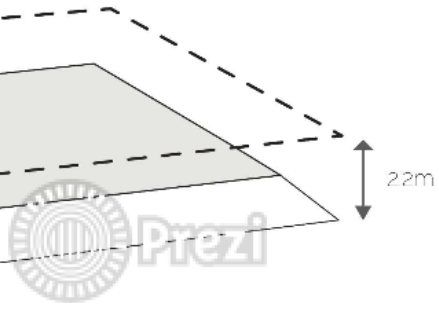


**Source and Usage**

**Process of Land consolidation-**

Decomposed Granite and  
 crushed rock with fine sand

Location of resource: Otsuchi  
 hills?



## Re evaluating the materials

**1.1 km** of Sea wall (varying width)  
**0.8 million cubic meter** of granite dust unused  
**20.5 hectares** of area of land used

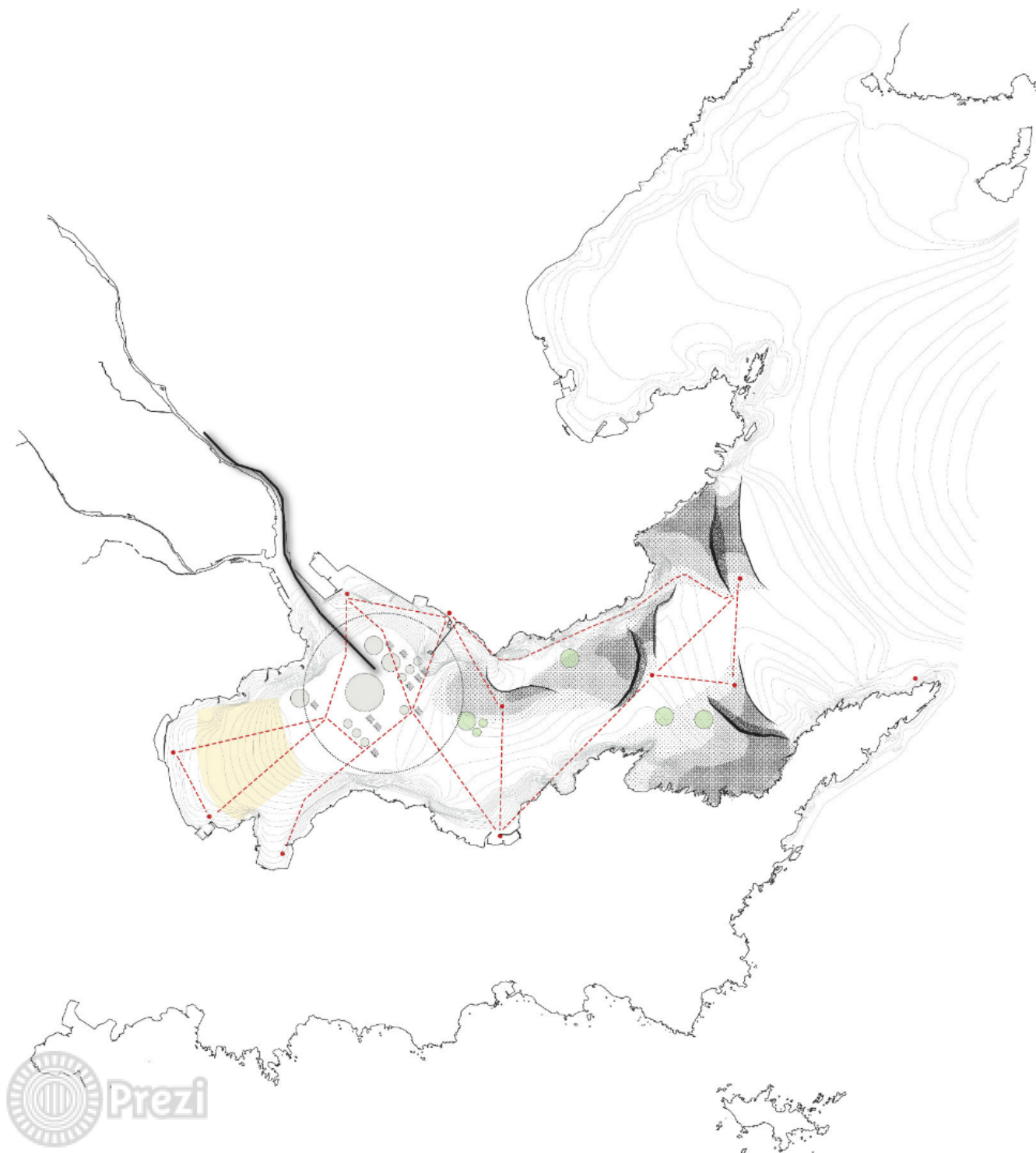
2018





Using the materials to create

Landscape



Testing the theory

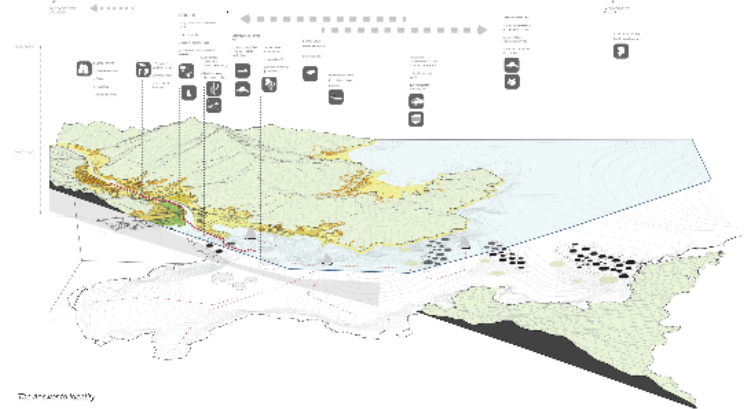


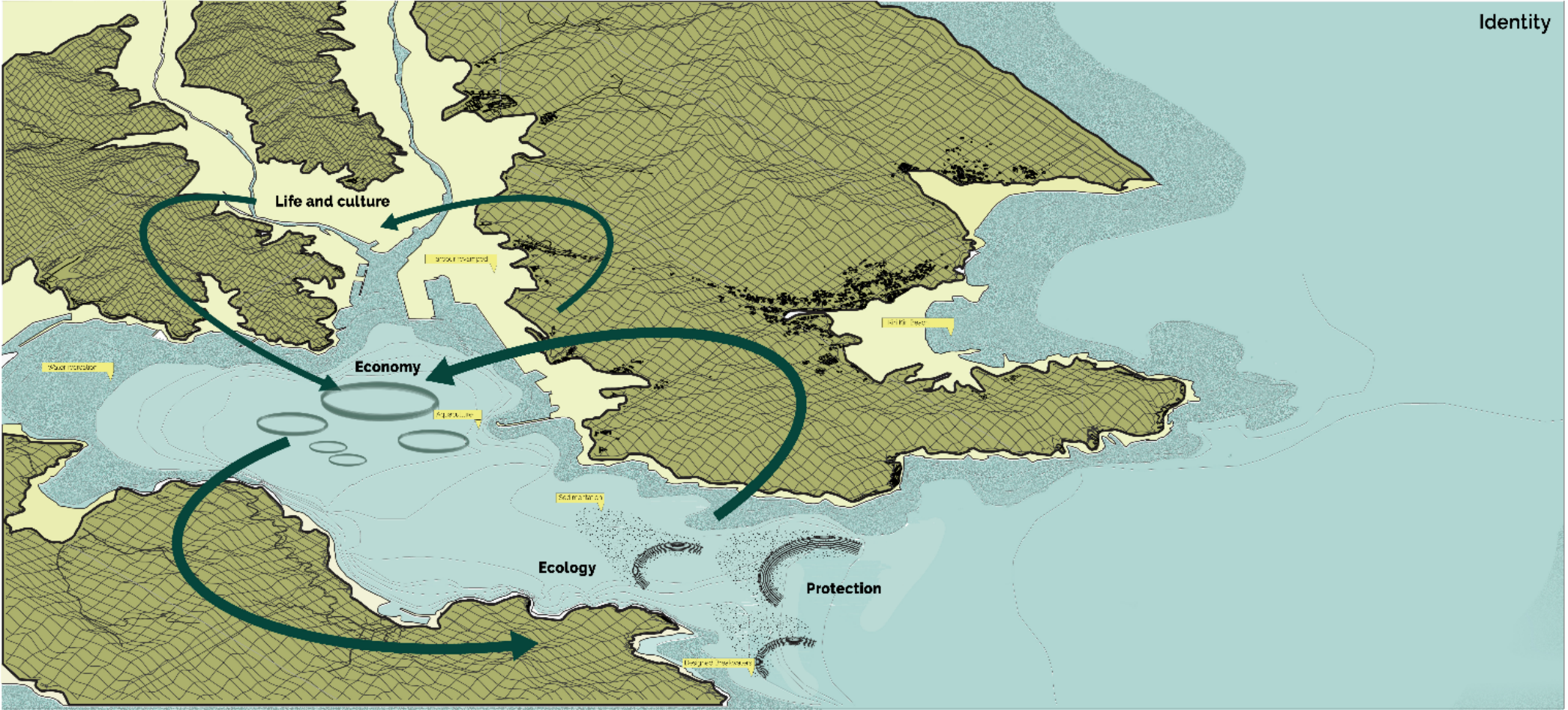


# Concept



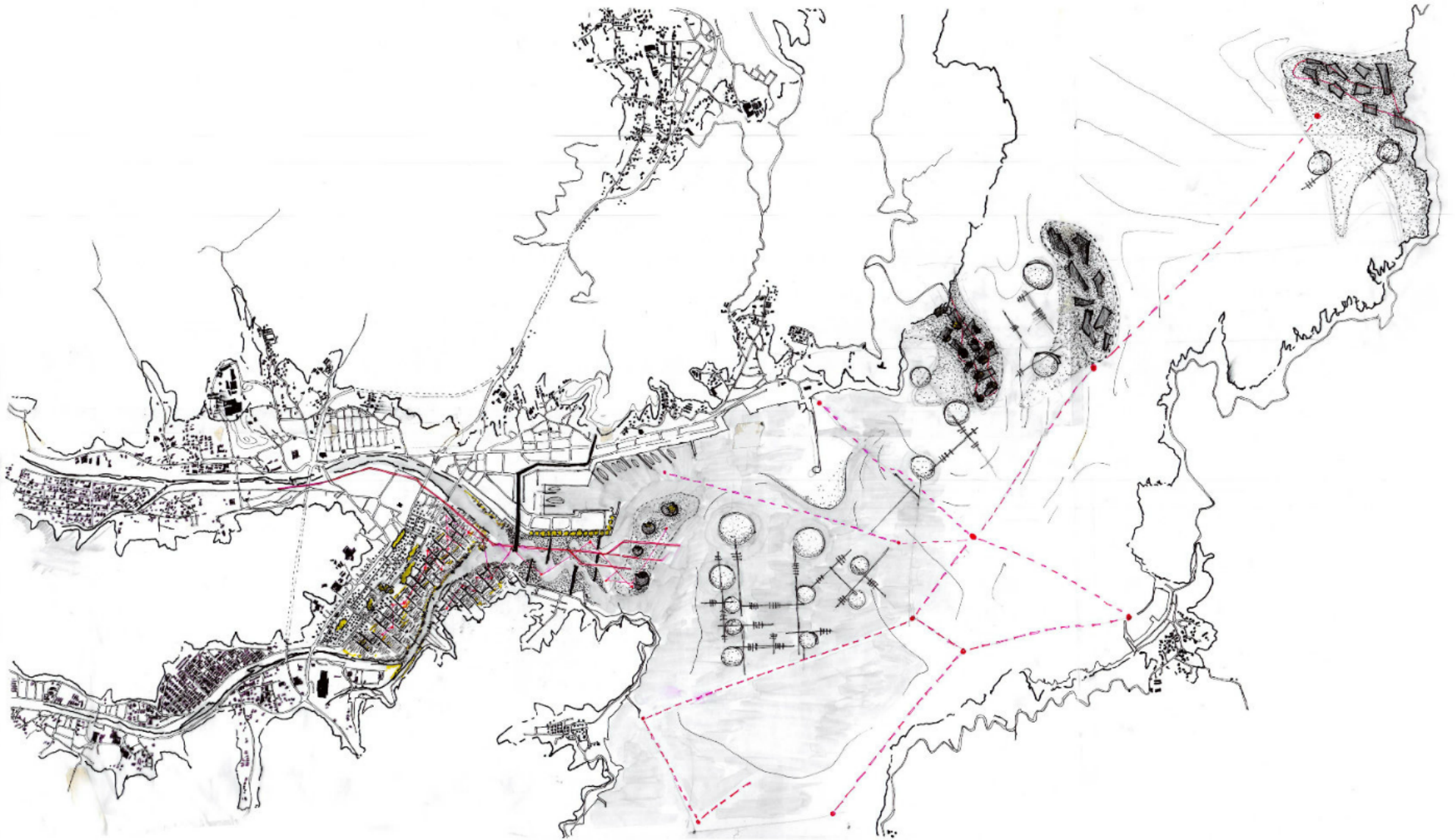
Adapting a new intervention





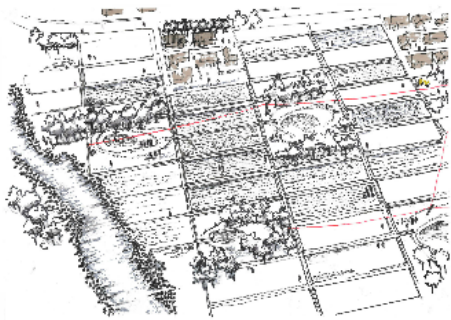




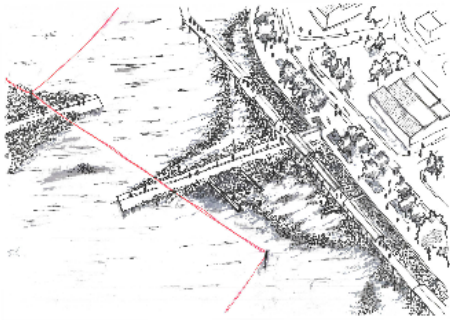




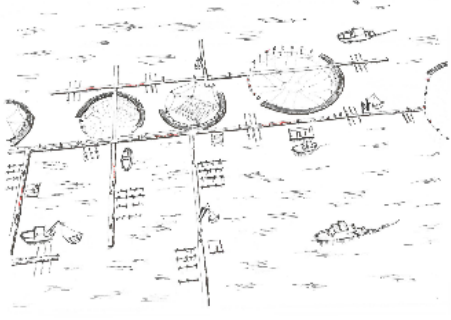
# Design



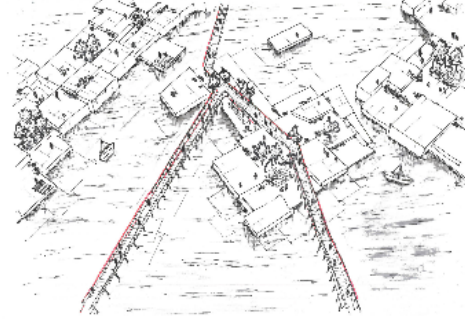
Agricultural Landscape



Adaptive Intermediate

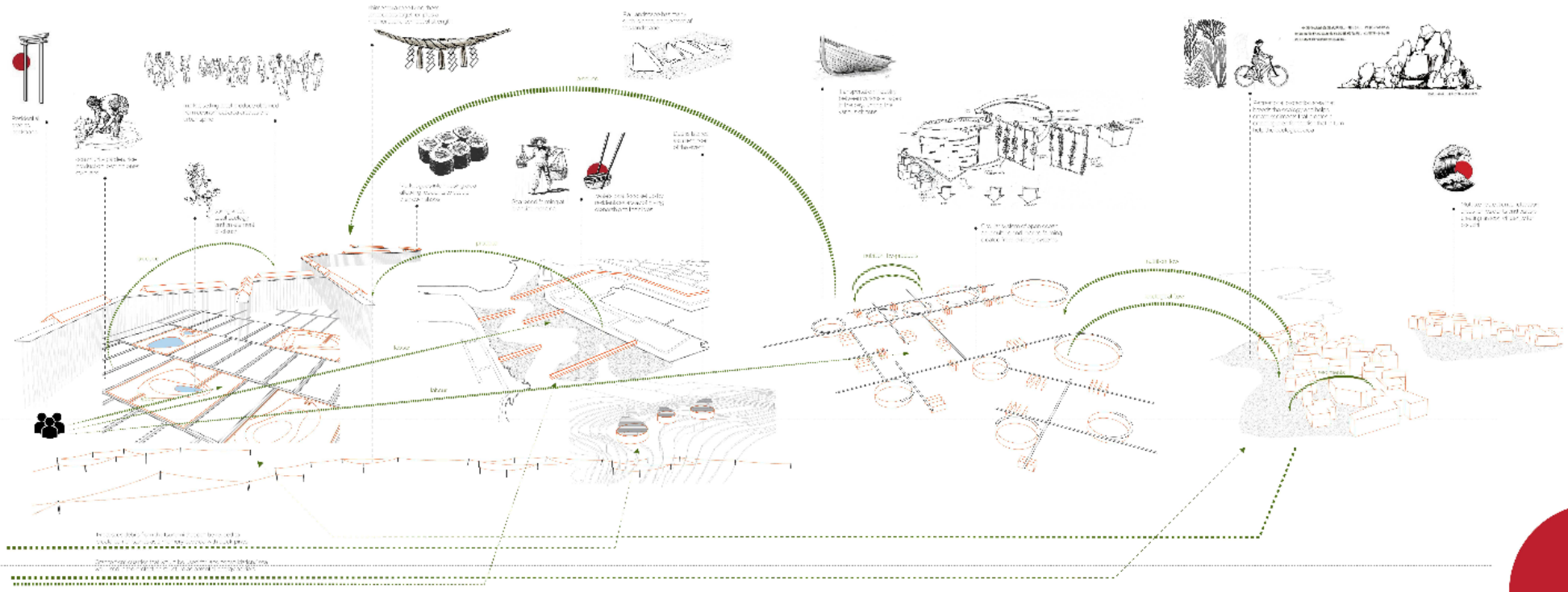


Economical Landscape



Protection Landscape

Identity  
Activity  
Form  
Design Elements  
Materials



# Agricultural Landscape

# Adaptive Intermediate

# Econ

Identity  
(illustrated in the image as an element of the whole)

Activity

Processes

Design Elements

Materials



Residental area as backbone



community garden: food production, owning area over land



market selling local produce obtained from community area and outside urban spine



spring wells, local ecology and an element of obscurity

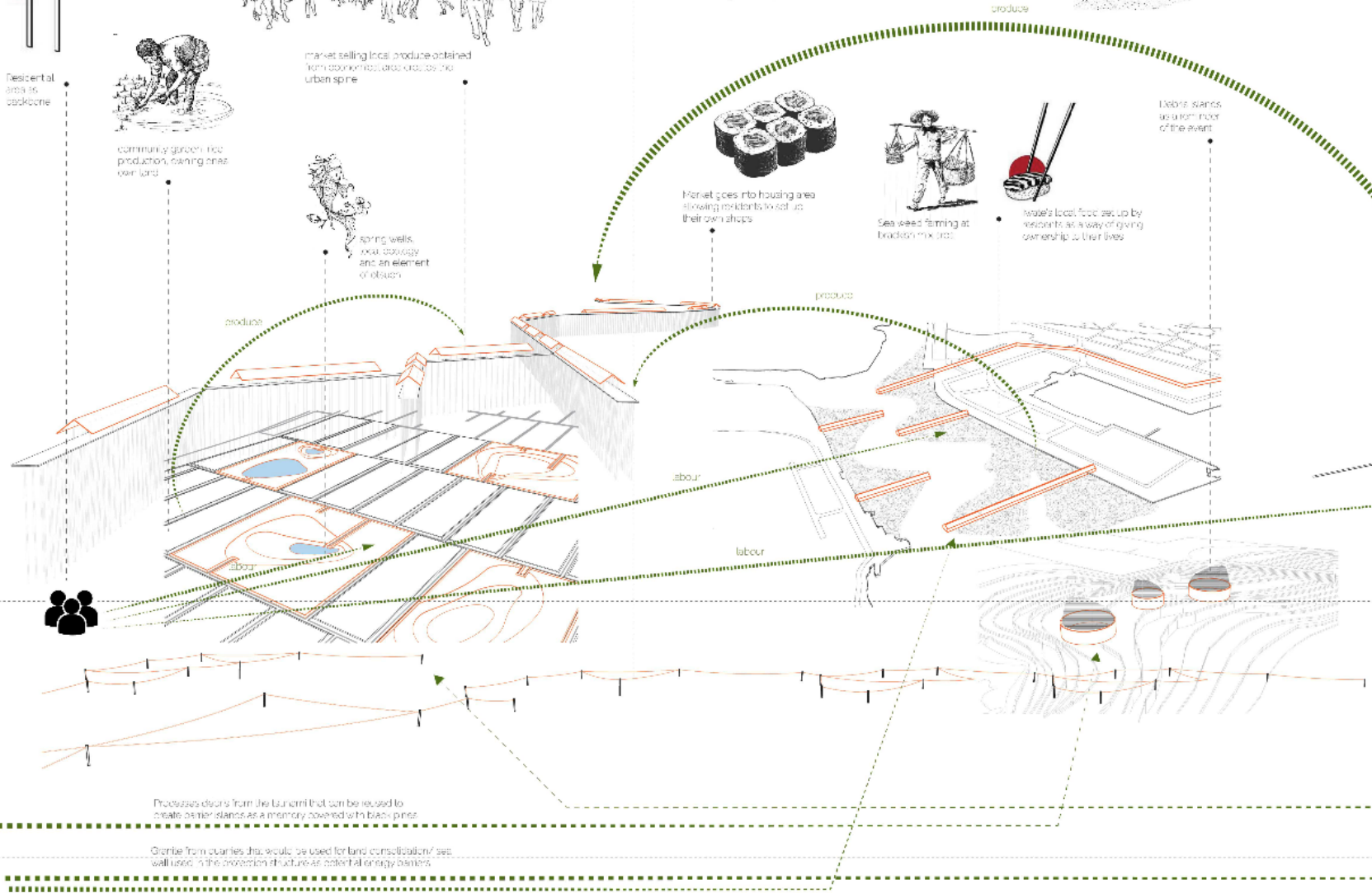
shimenawa rope tying these landscapes together, plus a memorial and symbol of strength



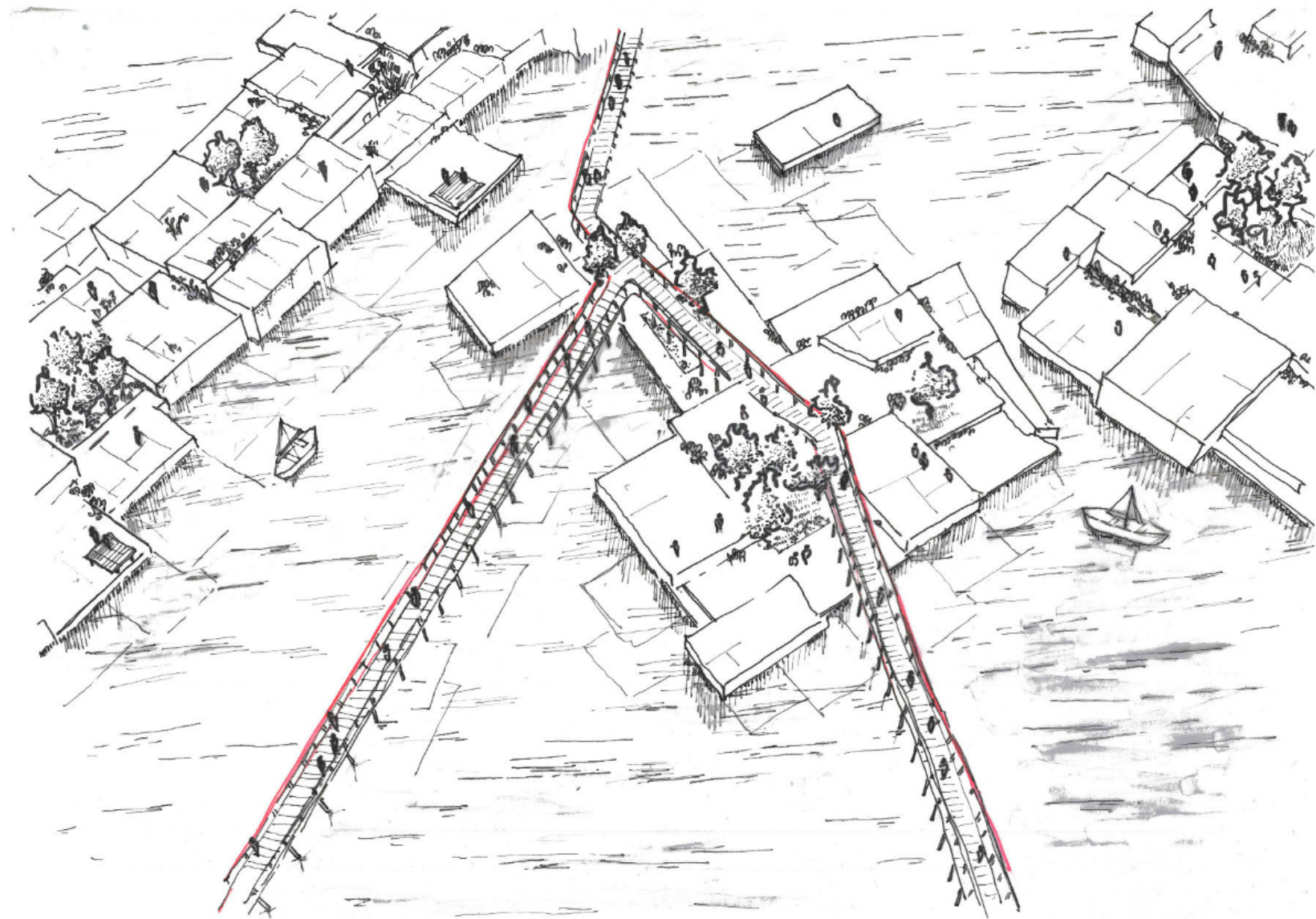
Ru Landscape has many such islands, an element of this embrace



transcript of industry between various stages in the bay, uniting the various islands



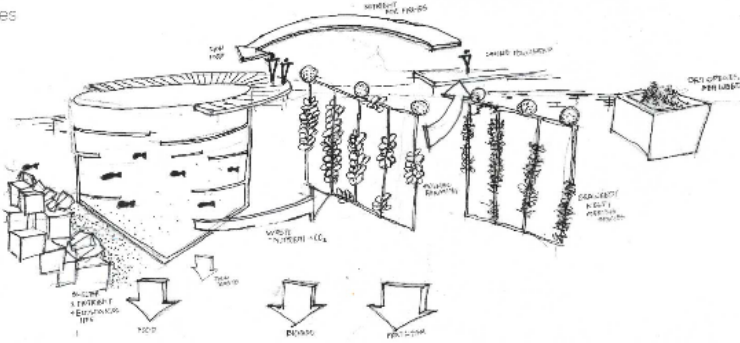




## Protection Landscape

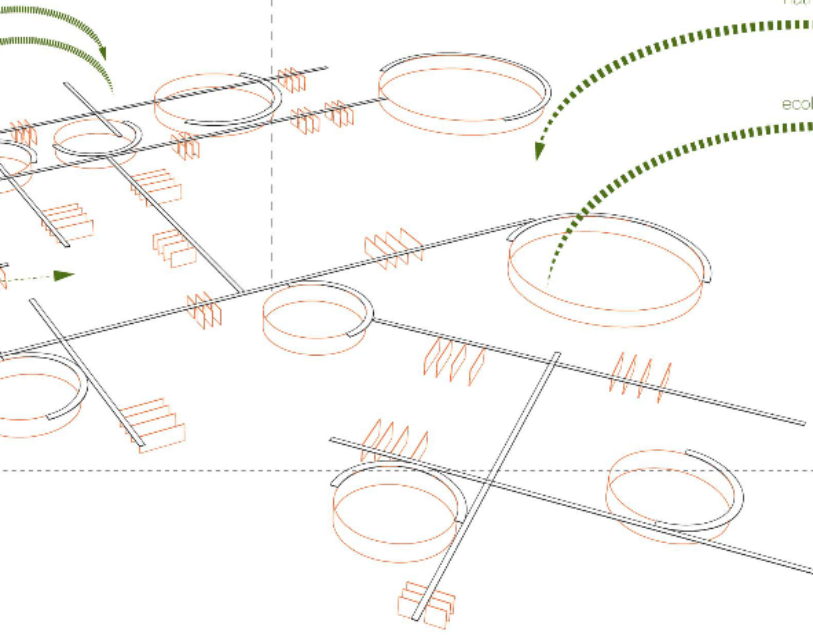


Industry  
Villages  
the



- Circular system of open ocean aquaculture and marine farming created from existing systems

by-products



可通过白浪的形式来表现。



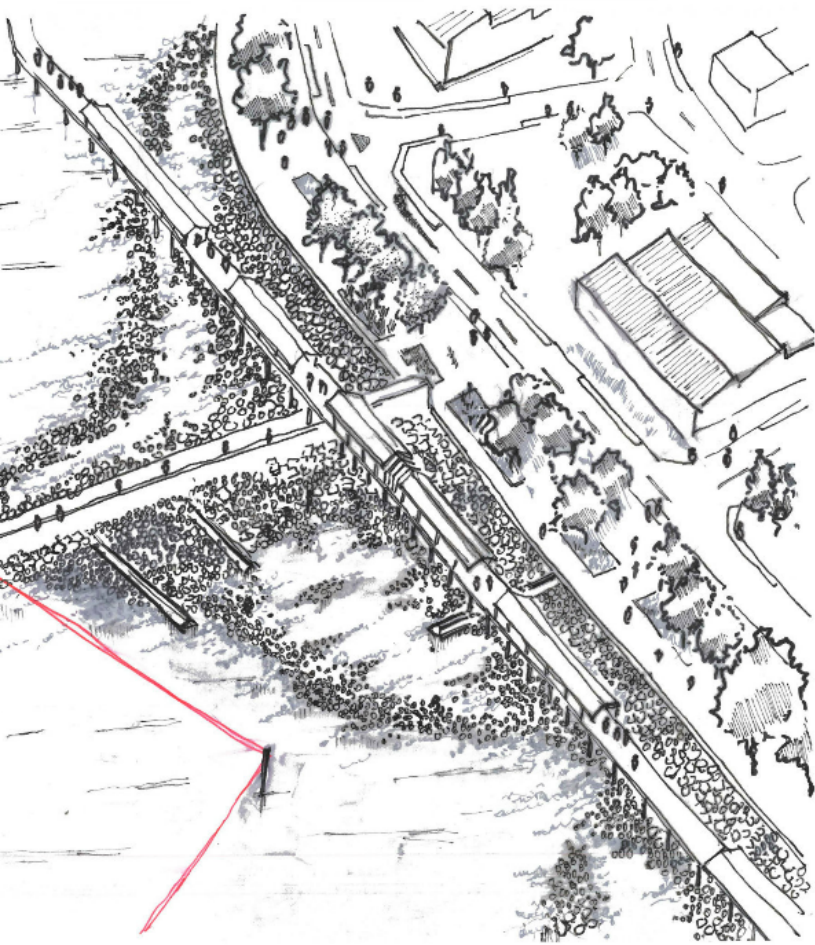
空、浪、礁、综合中国山水画的意境。

- Recreational, protection area that breeds the ecology and helps create sediments that creates a breeding area for the fish that in turn help the ecological area

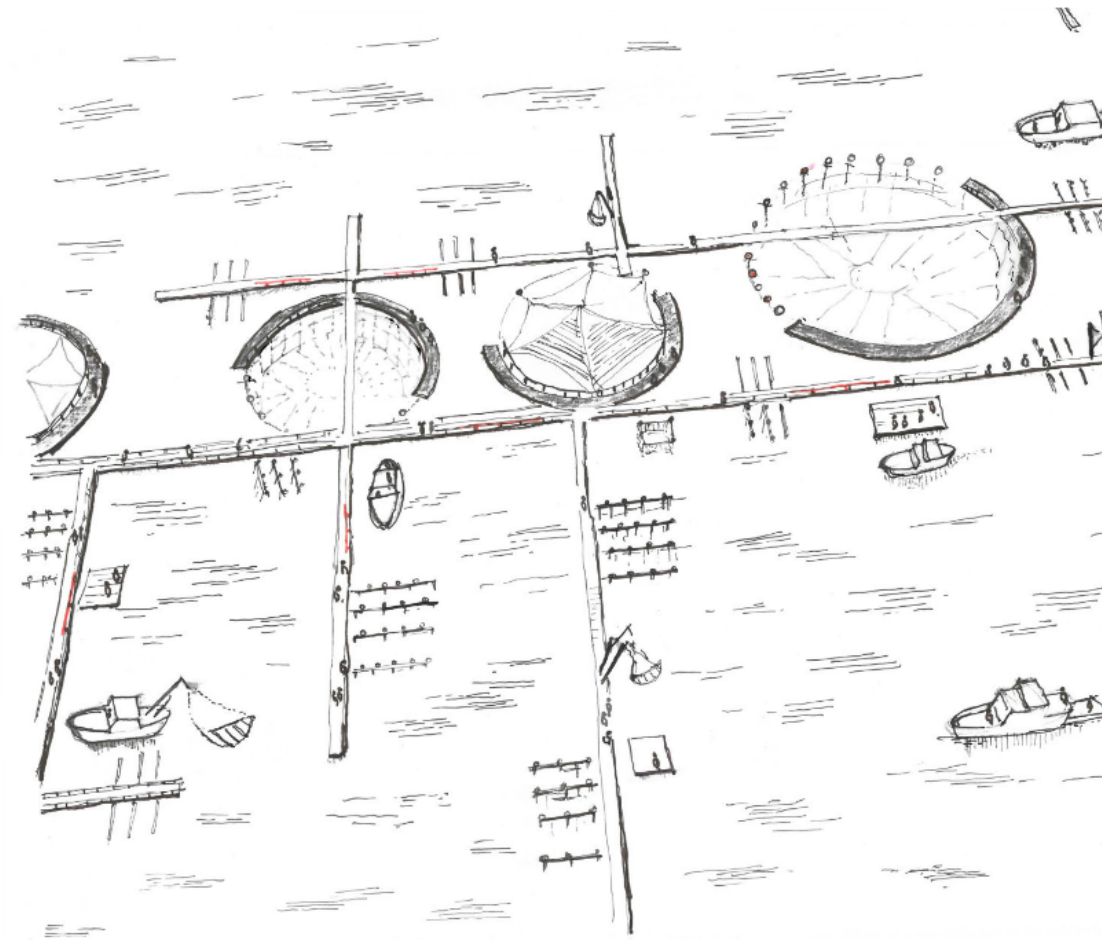


- Multiple recreational, reflection areas for residents and visitors creating an icon of identity for osuchi





Optive Intermediate



Economical Landscape



Ria Landscape has many such islands, an element of this landscape



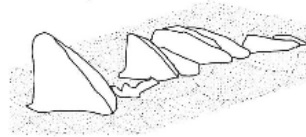
# Adaptive Intermediate

# Economical Landscape

shimenawa rope tying these landscapes together, plus a memorial, and symbol of strength



Ria Landscape has many such islands, an element of this landscape



produce



Market goes into housing area allowing residents to set up their own shops



See weed farming at brackish mix area



Iwate's local food set up by residents as a way of giving ownership to their lives

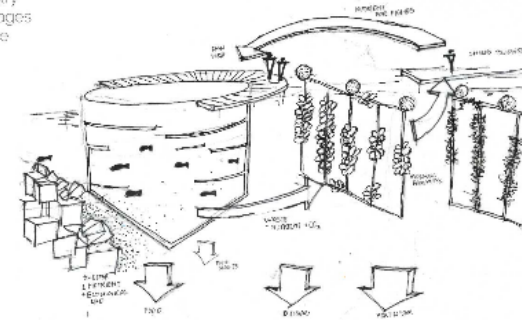
Debris islands as a reminder of the event

produce

labour

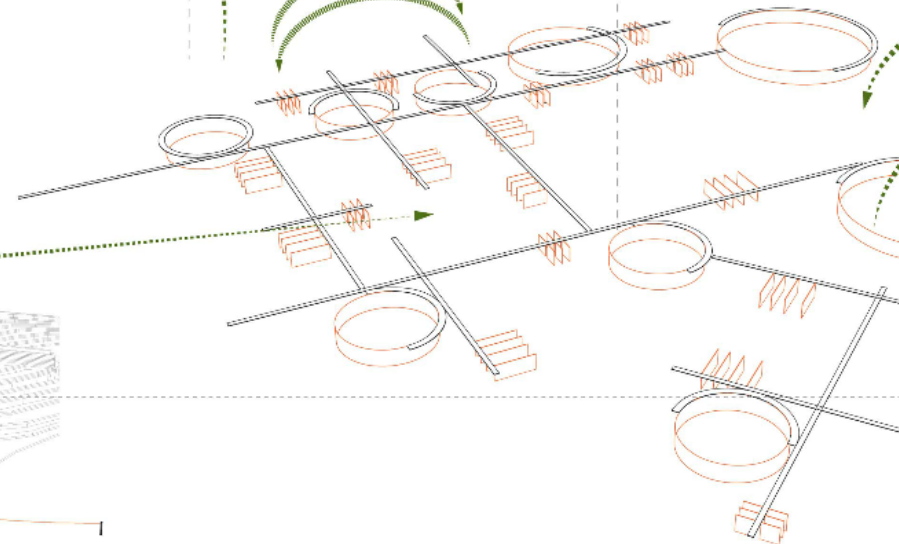
labour

Transportation industry between various villages in the bay, uniting the various citizens



Circular system of open ocean aquaculture and marine farming created from existing systems

nutrition, by products





Agricultural Landscape



Activity

Processes

Design Elements

Residential area as backbone



community garden, rice production, owning ones own land

market selling local produce obtained from economical area creates the urban spine

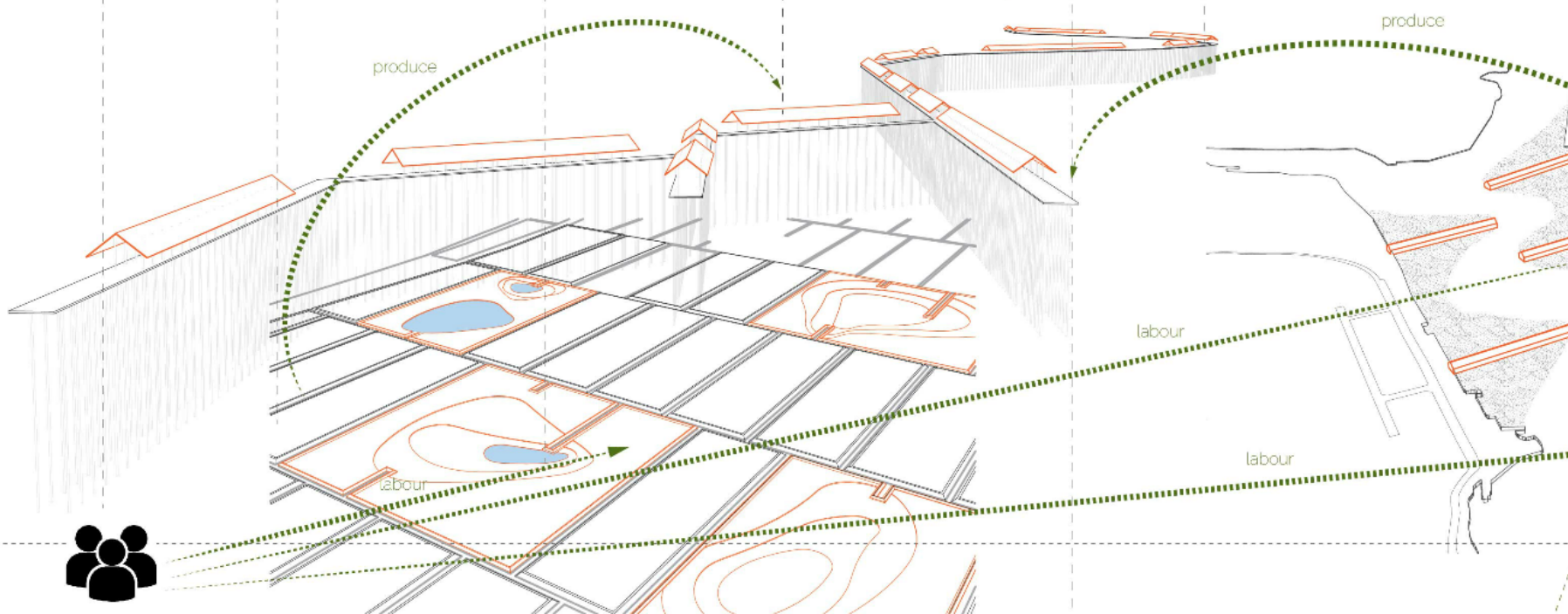


spring wells, local ecology and an element of otsuchi

Market goes into housing area allowing residents to set up their own shops



Sea weed brackish m...



produce

produce

labour

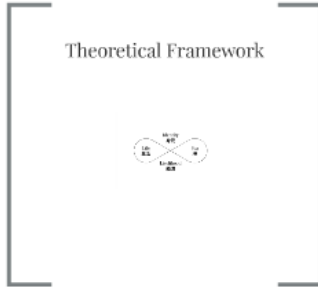
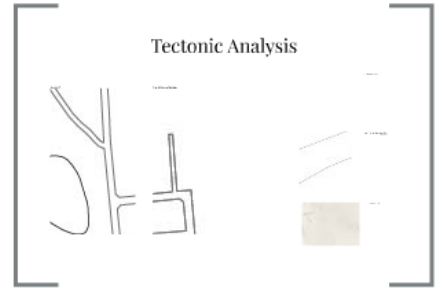
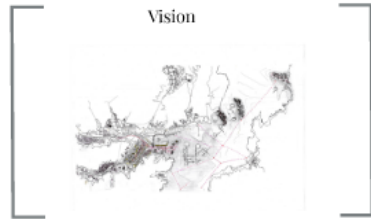
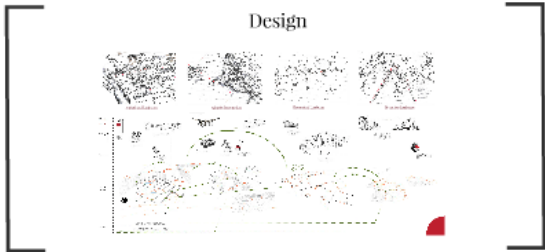
labour

labour

Processes debris from the tsunami that can be reused to create barrier islands as a memory covered with black pines

Granite from quarries that would be used for land consolidation/ sea wall used in the protection structure as potential enemy barriers







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