"Hem Till Gården"
"Village Reimagined"

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Examensarbete inom arkitektur, avancerad nivå 30 hp
Degree Project in Architecture, Second Level 30 credits
25 maj 2018
Today, more than 50 percent of people worldwide live in urban areas and the World Health Organization predicts that the urbanization of our planet will continue to increase. Question is how the rural communities will evolve? Will they simply become remains from our past, or will they play a part in our future societies?

Village Reimagined is a case study about the sparsely populated communities in Iceland. Why they are struggling and how the circle of decline could be turned around. The project concluded in a transformation and a reimagination of the small Icelandic village Bíldudalur in the southern parts of the West fjords.
PROBLEM - RURAL DEPOPULATION

World Rural Depopulation

Today, more than 50 percent of people worldwide live in urban areas, and the World Health Organization predicts that the urbanization of our planet will continue to increase. Consequently, the population density in rural areas is decreasing rapidly. We call it “depopulation”, a phenomena threatening the local environmental sustainability. A process that changes the economic, social and political setup of whole regions.

The cycle of decline

During industrialisation, cities start to expand, concentrating the location of industries and services. As a result, labour is drawn from the rural areas. In addition, the new machines, used in the farming sector, encourage further migration. The rural areas are left with less investment and businesses shut down which leads to less employment and services declining. Consequently, people notice the decline and the lower quality of life which leads to further depopulation.

Lack of jobs

One negative aspect of urbanization is the deficit in jobs in the larger cities. When the population is growing rapidly the businesses are not able to produce enough jobs to meet the demand, resulting in unemployment. This causes people to apply for government-funded programs which lead to reduced education and health care. Eventually poverty starts spreading and stunts the economic growth.

Air Pollution

Another negative aspect worth mentioning is the air pollution. Soot, lead, dust and smoke make up particulates in the air that pose a serious threat to our health. Cities, in particular those with a population of more than 8 million inhabitants has a dangerously high concentration of these particulates in the air, which can cause brain damage, learning disabilities and premature death of children.

Threatened Biodiversity

When cities grow, the surrounding natural areas are destroyed. Animals and plants protects water and soil from contamination, absorbs pollutants and stores and recycles nutrients. Urbanization makes it more difficult to access these resources.

Disease

Another negative impacts of urbanization is reduced physical activity as well as unhealthy nutrition. In addition, people immigrating from rural areas are not immune to the same diseases as the city residents, which leads to a higher risk of contracting diseases.
PROBLEM - RURAL DEPOPULATION

World population growth
World population, total (billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
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<tbody>
<tr>
<td>1960</td>
<td>3.0</td>
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<tr>
<td>1965</td>
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<td>2010</td>
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<tr>
<td>2015</td>
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Rural population growth
Rural population (% of world total population)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
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<tbody>
<tr>
<td>1960</td>
<td>65</td>
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<td>2010</td>
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<tr>
<td>2015</td>
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</tbody>
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Population by size of Urban & rural areas
World population 2015

<table>
<thead>
<tr>
<th>Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 - 2500 k</td>
<td>15.2%</td>
</tr>
<tr>
<td>500 - 1000 k</td>
<td>10.7%</td>
</tr>
<tr>
<td>100 - 500 k</td>
<td>4.8%</td>
</tr>
<tr>
<td>500 - 1000 k</td>
<td>3.8%</td>
</tr>
<tr>
<td>5000 - 10000 k</td>
<td>7.9%</td>
</tr>
<tr>
<td>10000 + (Megacity)</td>
<td>46%</td>
</tr>
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</table>

World's megacities population 2025
Prognosis population 2025

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>24 m</td>
</tr>
<tr>
<td>Tokyo</td>
<td>39 m</td>
</tr>
<tr>
<td>Beijing</td>
<td>23 m</td>
</tr>
<tr>
<td>Delhi</td>
<td>33 m</td>
</tr>
<tr>
<td>Calcutta</td>
<td>19 m</td>
</tr>
<tr>
<td>Dhaka</td>
<td>32 m</td>
</tr>
<tr>
<td>Karachi</td>
<td>20 m</td>
</tr>
<tr>
<td>Mumbai</td>
<td>27 m</td>
</tr>
<tr>
<td>Seoul</td>
<td>26 m</td>
</tr>
<tr>
<td>São Paulo</td>
<td>16 m</td>
</tr>
<tr>
<td>Rio de Janeiro</td>
<td>14 m</td>
</tr>
<tr>
<td>São Paulo</td>
<td>16 m</td>
</tr>
<tr>
<td>Indian</td>
<td>14 m</td>
</tr>
</tbody>
</table>

Urban vs Rural
Urban population (percent of total) 54%

Megacities - Unsustainable linear systems
Inputs and outputs from megacities

- Food goods
- Non renewable energy
- People
- Waste
- Air pollution
- Goods, Sprawl
- Crime
- Disease
Rural Depopulation - Iceland

Iceland is located in the North Atlantic Ocean and was the last country to be settled in Europe when emigrants from Scandinavia and the British Isles first came to live on the island in the ninth century.

Iceland is currently counted as the eight most urban countries in the world with 94 percent of the population living in urban areas. Although, the island itself is not densely populated. Only 282,000 inhabitants live on an island of 103,000 km² making the average population density not more than 2.7 inhabitants per km². Although, about 74% of the country in uninhabited, consisting of glaciers and wasteland.

The Icelandic population is mainly distributed along the coastline. However, those villages are sparsely populated. 62% of the population lives in the capital, Reykjavík and the migration tendencies from the rural areas to the capital region are continuing.

The towns in the rural areas are mainly from the 20th century, when people followed the location patterns of the fishing industry and consequently the migration patterns of the fish. For example the West fjords, shown in the diagram to the right.

Today, fisheries are no longer necessarily based close to the catching areas. Trawlers can sail longer distances and the loss of harbour-related industries has for many small fishing towns, meant the loss of their economic livelihood, resulting in depopulation. At the same time Iceland is struggling with its spatial conditions.

On one hand, Iceland is too big.
Since the Icelandic population is distributes unevenly over the country, large areas remain unpopulated which causes distances to infrastructure and services. Consequently, migration tendencies towards the urbanized centres are inevitable.

On the other hand, Iceland is too small.
Distances between the urban and the rural areas are not long enough to enable regional development. Instead, the rural population visits the urban centers regularly to purchase or use services which weaken the rural communities.
Rural Depopulation - Fishing Industry

For centuries, the rich marine system off Iceland has supported the long human utilization of marine resources, such as fishing, whaling and seal hunting. In the 19th century, fish stations developed as seasonal farm workers stayed closer to the riches fishing grounds for a longer period during the year. In the beginning of the 20th century, the Icelandic fishermen operated their own, larger vessels with engines, resulting in a major increase of catch. By 1930, 23% of the Icelandic work force was involved in the fishing industry. After Iceland gained independence in 1944, the development of the fishing industry became a top priority of the growing nation. Ever since, the Icelandic fisheries have always been a matter of national interest.

However, in 1984, due to overfishing, the Individual Transferable Quota System (ITQ) was introduced. A system, originally intended to be an experiment, was made permanent by the Icelandic Parliament in 1990. The fishing quota was split up amongst the boat owners based on their fishing records during the previous years. Since the quotas were transferable, able to sell, a “fishing stock market” was quickly created.

As a result, larger Icelandic companies started to buy quotas, causing small fishing towns to shut down as the primary employment option disappeared.

Consequently, the main cause of migration is the loss of jobs in the fishing industries in the rural communities. The link can be seen in the diagram to the right, the correlation between the amount of catch of fish and the population development in the region are linked.

For example the village Bíldudalur, had a 37% population decrease, and a 93% loss of its total catch of fish in the past 25 years.
TRIP TO ICELAND

Day 1
- The Southcoast -
I visited the Iceland school of architecture and talked to the students and their teachers. 08.00 Tourism road trip along the Southcoast.

Day 2
- Reykjavik -
Reykjavik city tour. Visit to Studio Granda Architects and talked to Steve Christer about the rural communities in Iceland.

Day 3
- Akranes -
Trip to Akranes, an old fishing town in the north. The city has experienced a population decrease during the last couple of years.
POTENTIALS
Matilda Lundmark - Thesis Project 2018 - Studio 4
World's Richest Fishing Grounds

One of the world's richest fishing grounds are situated around the coast of Iceland. As a result, you find almost all the Icelandic towns and villages out by the shore.

It is believed to be likely that fish farming will provide the world two thirds of seafood around 2030. Conventional fisheries are considered to have reached their peak while the global demand continues to expand. Fish farming is a rapidly growing profession and Iceland is no exception.

It is reported that environmental conditions for fish farming in the West fjords have greatly improved in the last few years, as ocean temperature have raised.

In addition, there are many ways to keep the industry environmentally responsible. One possibility is to connect the fish farm to greenhouses where vegetables and plants would clean the water from the fishing pools and in turn receive nutrition to grow. The sea water based fish farms would instead be connected to seaweed farming, which can be harvested and made into fish pellets.

Energy

The other potential that I've been looking at is energy. Iceland's advantage lies in the islands geography and location, right in the middle of a volcanic hot zone, which makes it possible to harness geothermal energy that produces electricity without emitting any greenhouse gasses. The waste heat could be used for melting snow, greenhouses and industrial food processing, such as fish farming.

Tourism

During the last couple of years, Iceland has become a popular year-round destination, and the number of tourists has more than doubled. The beautiful, dramatic island has become well known for its northern lights and unique landscape. The sudden growth has strengthen tourism’s important economic role.
POTENTIALS - ENERGY

Geothermal Energy Cycle
From powerplant station to urban village

Cold water  High- and low temp. wells

Process Plant

HOUSING

Greenhouse
Snow melt

Fish Farm
The Atlantic Salmon Life - Production Cycle

**POTENTIALS**

- **Hatchery/Nursery**
- **Fresh Water Rearing**
- **Transport Cages to Sea**
  - Growth phase 14-24 month
- **Processing Plant**
- **Collecting Cages**
Environmentally Responsible Aquaculture

- Greenhouse Farming
- Seaweed Farming
TERRITORIAL SYSTEMS
SOLUTION
TERRITORIAL SYSTEMS

SYSTEM 1. INDUSTRIES. STEP 1
Hatchery/Nursery

SYSTEM 1. INDUSTRIES. STEP 2
Fresh Water Rearing

SYSTEM 1. INDUSTRIES. STEP 3
Transport Cages to Sea

SYSTEM 1. INDUSTRIES. STEP 4
Collecting & Processing Plant
SYSTEM 1. INDUSTRIES. STEP 5
Feedmill & Market

SYSTEM 1. INDUSTRIES. STEP 6
Processing Plant

SYSTEM 2. TOURISM TODAY
Hiking trails/ Westfjord drive

SYSTEM 2. TOURISM TOMORROW
Hiking trails/ Via ferrata / Boattours/ Westfjord drive
Three is the Magic Number

In the West fjord region you will find around 12 villages. In order to visit all of them tourists usually take the main road, the Westfjord drive. The area is mainly made up a large plateau and therefore the villages are located on the shore. The towns are mainly from the 20th century and came to existence because of the enormously fertile fishing grounds in the fjords.

Bíldudalur, Tálknafjörður and Patreksfjörður are three villages situated along the coast in the southern part of the West Fjords. In my project I have worked with territorial systems, connecting these villages to make them stronger and more resilient using two of the potentials, the Fishing Industry and Tourism.
Average rainy days (rain/snow) Iceland 2016

Climate - Rainy Days

Climate - Sunhours

Average monthly sunhours, Iceland 2016

Climate - Wind

Average wind speed, Iceland 2016

Visitors by Season

Visitors by season, Iceland % (2016)

Overnight Stays

Overnight stays countryside (2016)
URBAN VILLAGE SYSTEMS
SOLUTION
ARCHITECTURE CONCEPT

- INDUSTRY
- VILLAGE
- GREENHOUSE
- SEAWEED
- FOOD PROCESSING
- WASTE HEAT
- ENERGY
- RENTED ROOMS
- TOURISM
- INDUSTRY
Components

Layer 1:
The first level consists of the indoor fish farm, the fishing pools, the processing plant, where the fish is being harvested, the marketplace, seaweed, offcuts and food processing and public buildings such as the pool house and the inconvenient store.

New roads connected to the industries are added, leading down towards the sea. The new hiking trails are connected through a bridge, stretching across Arnarfjörður to the other side. The tourist would now be able to enter the village more dramatically, and experience the village, the fish farm and the beautiful views of the landscape from the bridge.

Level 2:
The second level consists of living units and green gardens, covered by a glass roof. The greenhouses create a micro-climate with an average temperature of 17 degrees. Though most areas are within these greenhouses, some spaces are outdoors. In addition, the steep landscape makes the level well connected to the ground level in the back.

To create a certain density the living units are placed closed together. Although, each unit has its own semi-private garden.

The flow of people is concentrated to the central square and marketplace, where you find most stairs and connections between the different layers.

Numbers of inhabitants: 350
Employment: Fishing industry (50 people),
food processing, tourism, marketplace, services.
Tourists visiting: 150/day in average
Percentage overnight stays high season: 30 %
URBAN VILLAGE - LAYER 1

Fish Farm - Fresh Water Rearing

Fish Farm - Processing plant

Processing Vegetables, Offcuts and Seaweed

Public Buildings / Services
UBRAN VILLAGE - BLOCK

TOURISM

VILLAGE

INDUSTRY / LANDSCAPE

BLOCK

GREENHOUSE

PILLARS
Block & Interlaced Levels

The typical block consists of a first level, the industries, and the village level on top. Although the landscape between them is thick enough to contain both constructural elements and garden earth the two layers are sometimes interlaced. The connection between the ground level (the old village) and the new urban village is shown in the picture to the right.

The first level is heavy and is mainly made up by concrete. The second level is light and the houses are made of wood and a light steel construction. The landscape between them follows the natural landscape underneath and escalates towards the mountain. The few steps, spread out through the village, divide the village into smaller blocks and semi-private gardens.

Roof Landscape & Flexibility

The greenhouse roof is divided into smaller units to make the village more flexible. Some of the glass walls are either able to move or be removed during warmer periods, creating pergolas and outdoor spaces.
SITE PLAN

Autonomous cages ready to be harvested

MARKETPLACE

TOWARDS ÍSAFJÖRDUR
Boat tours - Tourism
Export - Sea cages
TODAY
INHABITANTS: 210
TOMORROW INDUSTRIES CONNECTED TO THE VILLAGE
NEAR FUTURE
INDUSTRIES GROWING
GREENHOUSE VILLAGE CREATED
FUTURE
URBAN VILLAGE LEVEL 1
INHABITANTS: 350
SECTION BÍLDUDALUR

Not to scale
URBAN VILLAGE SYSTEMS - ENERGY

LIBRARY

STAFF ROOM

MELTING SNOW

FISH POOLS
50 C

HOUSING
100 C
URBAN VILLAGE SYSTEMS - TOURISM

A TOURIST ATTRACTION

ADVENTUROUS HIKING TRAILS

NATURAL VENTILATION

SOLARPANELS 48°

RENTED ATTIC

TÁLKNAFJÖRDUR
PRESENTATION

4 printouts, 1050 mm x 1700 mm