Potential North: Anthropogenic Infrastructure in the Extractive Territory

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Greenland may be the next petro-territory. Granted political autonomy from Denmark in 2009, Greenland saw its financial subsidy– which supported resource and infrastructural networks– capped. In response to its growing need to address economic concerns, Greenland is actively exploiting its natural resources, opening mineral mines and promoting oil and gas exploration. A pipeline would be probable infrastructure to transport oil down the coast from the ice-present waters in the north: this pipeline serves as the site for Potential North.

Of the territory's sparse towns and villages, those in the north were most dependent on subsidy for resource networks. Once self-sufficient– living off the land through sustenance hunting and resource gathering– modernization of these towns has introduced contemporary urban elements. These northern settlements now exist in a conflicted state, between a traditional lifestyle and the globally homogenized existence, but without economic viability. Many rely on fishing exports, but are looking for new economic activities– petroleum is a potential future.

Potential North challenges the after-the-fact architectural reaction to infrastructural opportunism by introducing holistic interventions along an oil pipeline developed at the outset of extraction. This project aims not to condemn or suggest alternatives to future petroleum extraction, but presents robust architectural solutions which makes better an uncomfortable inevitability– taking the pipeline as site.

Infrastructure, particularly extractive infrastructure–comprised of both physical ecologies and logistic networks– exists at the intersection of the Humanity / Nature duality, an ever-evolving relationship of human's understanding of it's environment. Urban expansion continually places infrastructure systems in opposition to Natural forces, resulting in a shift of design power from architects and urbanists to engineers. These engineered infrastructures prioritize the pragmatic and specific, often negating social or cultural influences. This project returns that power to the architect by siting opportunities for intervention, synthesizing the technical with the cultural, adding richness in the banal.

The Arctic presents a unique background for the exploration of cultured infrastructure as Arctic oil and gas reserves sit at the edge of extractive feasibility. These extractive frontiers revive certain aspects of American Wild West frontierism– technological ingenuity, societal freedoms, and environmental opportunism- in precipitation of spatial products reacting to their unique environment. These sites offer not only suggestions towards a new Arctic vernacular, but provide an exploratory medium at the intersection of architecture and infrastructure.

Extractive infrastructure works at the scale of global capital, it intersects both Humanity and Nature, yet rarely promotes either in a productive way– solely serving the far-off economic entities of resource consumption. In a territory caught between economic autonomy and natural and cultural exploitation, the seemingly inevitable pipeline infrastructure must be reconsidered to address local concerns. Potential North examines how infrastructure may be utilized to serve more than one public– considering a more holistic design which recognizes the expanded ecological, political, economic and cultural environmental context– to speculate on opportunities producing tangible benefits to the species existing at the interface.

POTENTIAL NORTH

Anthropogenic Infrastructure in the Extractive Territory

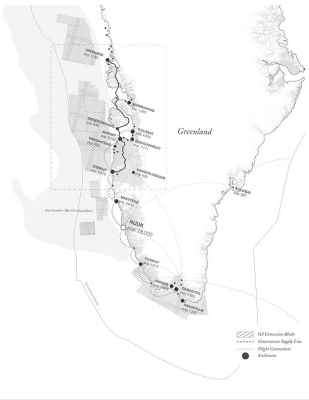
Greenland was granted political autonomy from Denmark in 2009, at which point its financial subsidy– which supported resource and infrastructural networks, mostly in the north of the island– was capped. Since that point, Greenland's growth is increasingly exceeding its economic capacity. To address these rising economic concerns, Greenland is beginning to exploit its natural resources– opening mineral mines and actively promoting oil and gas exploration, particularly off its west coast in the East Canada/ West Greenland Basin. With the discovery of oil fields in the Davis Strait, a pipeline would be probable infrastructure to transport oil down the coast from the ice-present waters near Upernavik and Uummannaq, to the south at Sisimiut, the northernmost ice-free port. This pipeline serves as the site for *Potential North*.

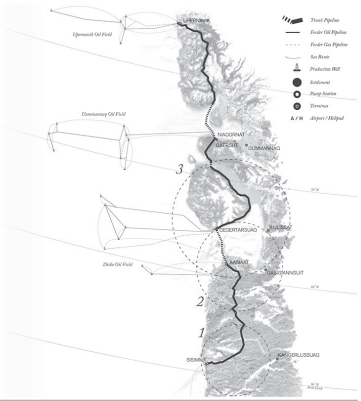
Of Greenland's many sparse towns and villages, those in the north have been most dependent on this subsidy for maintaining resource networks. Once self-sufficient– living off the land through sustenance hunting and resource gathering– modernization of these towns has introduced contemporary urban elements. Economic networks, food supply and communication systems, which to this point have been subsidized by the government, ensured a consistent standard of living in every settlement. Internal conflict exists between these northern villages, who are proud to maintain their traditional way of life, and, those is the south who feel subsidies are simply welfare for hunters who live in contrast to national progress. These northern settlements now exist in a conflicted state, between a traditional lifestyle and the globally homogenized existence, but without economic viability. Many rely on fishing exports, but are looking for new economic activities– although controversial, petroleum is a potential, if not necessary, future.

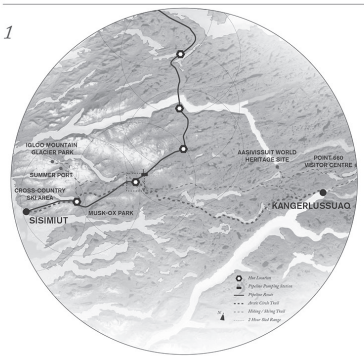
Climate change only complicates the situation– the thinning of sea ice broadens the shoulder season where ice is too thin to travel on, but too thick for a personal watercraft to break. Hunting on land is increasingly troubled as traditional weather patterns– important cultural knowledge passed on from elder hunters to the next generation– are changing quickly and now unpredictable, making hunting more hazardous and altering historic migratory herd patterns.

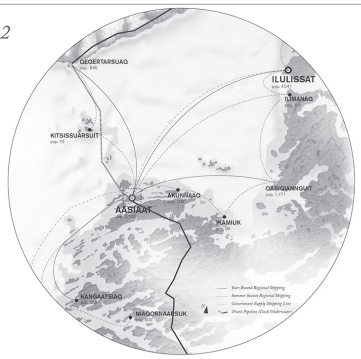
While hunting and fishing are the predominant and preferred means of sustenance, modernization has also introduced a reliance on store bought food, as well as southern-grown fruits and vegetables. These new staples must be shipped from the south of the island, and since the government shipping line has cut back its delivery capacity, from twice a week to only once, scarcity is looming. While food is available now, it is only set to increase in price like many other Arctic settlements.

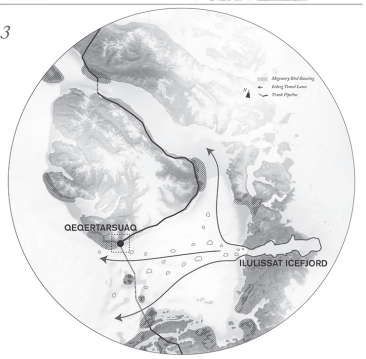
Caught between economic autonomy and natural and cultural exploitation, the inevitable pipeline infrastructure must be reconsidered to address local concerns. Through the implementation of three interventions, at three sites along the pipeline, *Potential North* explores opportunities for localized micro-economies– traditional, natural, and global– in the presence of mega-infrastructure.











NETWORKED HUTS [active node]

Refuge / Cultural Knowledge Network

The pipeline serves as a linear network, a connection to energy, communication and water, traversing the remote hinterlands. At the line terminus, the town of Sisimiut is an active site for outdoor activity. The area is also traditional territory for hunters who hunt reindeer and musk ox for both sustenance and to be sold to tourists at markets in town.
In response to the connectivity available throughout its active territory, a network of huts are deployed along the line. Prefabricated units are airlifted into the field and connected to the pipeline– providing ISPS, thermal, electrical, and water connection. Constructed of durable wood interiors and a visible, protective thermal shell, enclosed are small beds, seating, and tables for repairing equipment. Outside the hut are concrete storage units for equipment and hunted game, which also act as snow barriers, clearing areas for snowmobile parking.
In addition to providing a refuge in new, unprecedented weather patterns, the network provides a departure point for expeditions into the wilderness. Hunters can communicate through GPS– trading weather information, herd movement and travel routes. The network amplifies new and traditional knowledge transmission in the face of climate change and technological evolution.

HARVESTED COMMUNITY [passive node]

Greenhouse / Community Gathering

At the entrance to Disko Bay, Aasiaat is a key stop on the dwindling government supply line and distribution point for many small towns located within the bay.
The pipeline, an intense emitter of energy, has the ability to change the adjacent ecologies along it's length.
On a bedrock island with no arable land and conditions too cold to naturally grow fruits and vegetables, the thermal capacity of the pipeline precipitates a collection of greenhouses in the town. Each greenhouse connects to the pipeline with a heat exchange mechanism collecting the waste thermal energy from the pipeline, drawing this excess heat into each greenhouse so the thermal losses are comparable with the naturally occuring losses along the pipeline.
The structure itself creates an elevated promenade connecting new public spaces forming from the roofs of the storage facilities below. In the winter, the heated promenade provides an activated public gathering forum, where the large greenhouse domes, lit with LED lights provide an illuminated center for community activity during the months of perpetual darkness.
The pipeline presence not only creates independence for a town, but fosters a heart for community energy.

NESTED ECONOMY [passive skin]

Duck Farm / Arctic Research Lab

Qeqertarsuaq, home to the Danish High Arctic Research Station, is sited as the line's northern crossing point at Disko Bay. It's exposed location in turn receives a high volume of iceberg traffic. As such, a large cage is constructed to protect the fragile pipeline from near-shore floes.
Disko Bay is also home to migratory birds– in particular the Eider Ducks, which seasonally inhabits the region to roost over the summer. Eider Ducks grow a particularly soft down which is shed naturally– one of the rarest to be collected and lucrative on a small scale.
In response to the rigid infrastructure, the frame is coated in a synthetic, soft skin for Eider down farming– a constructed field that roosts Eider Ducks in the summer and gathers snow to insulate the interior for passive human occupation in the winter.
Nestled within are Arctic research labs, connected to both land and sea, and facilities for processing Eider down.
The extrusion is a new ecology– not natural, but not entirely constructed either. It remains to weather: grow moss, reeds, lichen, mollusks, and host ducks as they return with each season. Data continues to remain harvested– climate change painstakingly recorded through scientific observation and evident on the evolving façade.