PROJECTINGSHKODRA

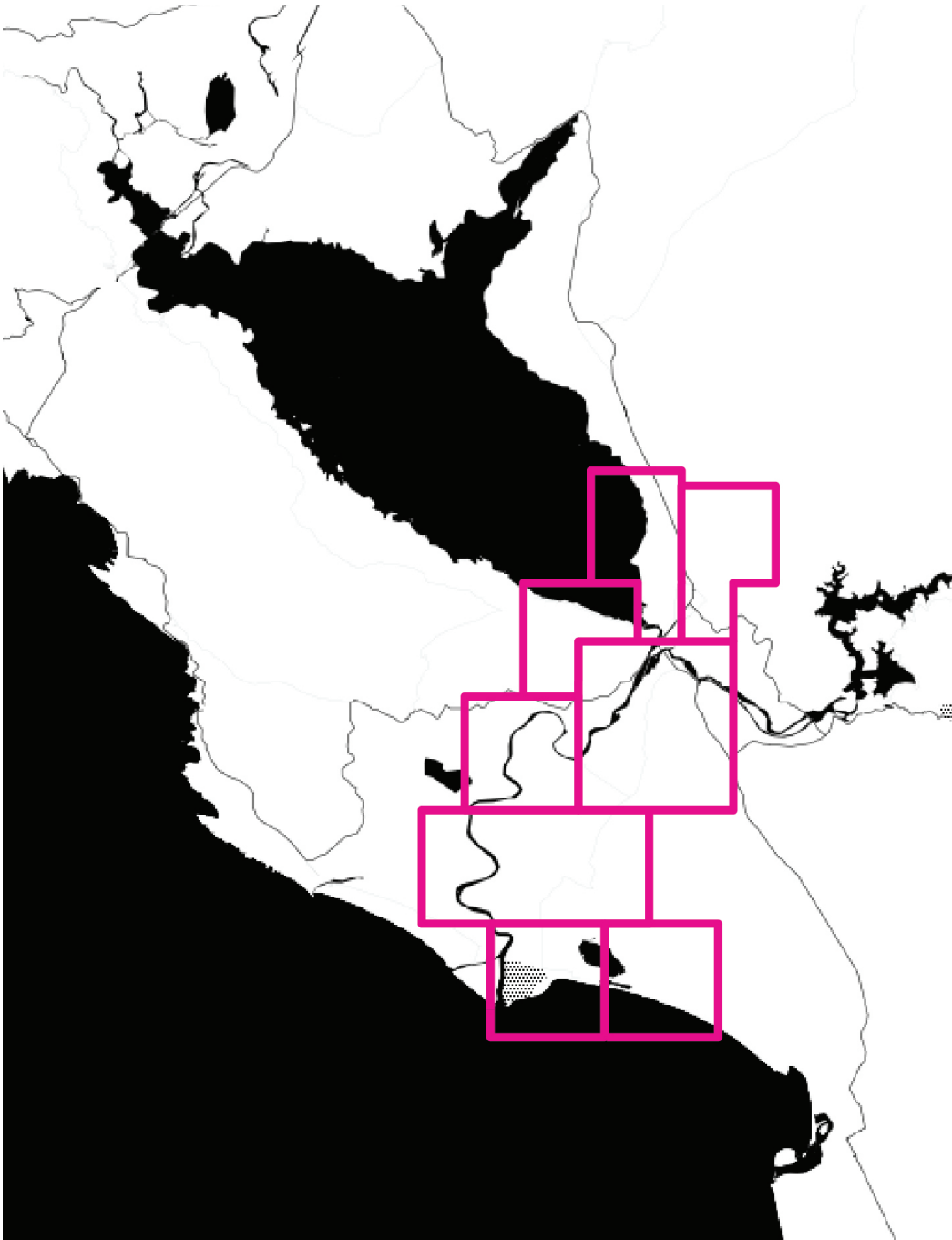
Observatory of the Mediterranean Basin

Projecting Shkodra

Operative fragments between lake, river and sea

A Project of the Joint International PhD Program IDAUP

POLIS University Albania / University of Ferrara Italy



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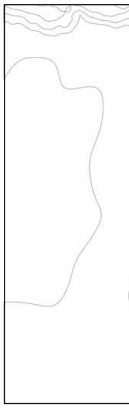

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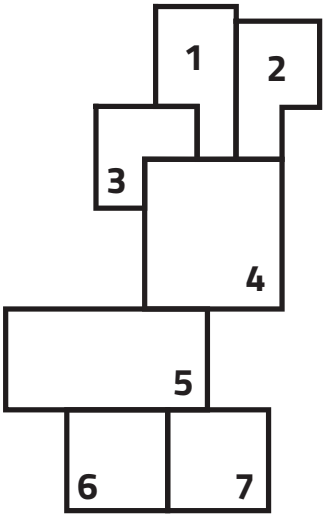

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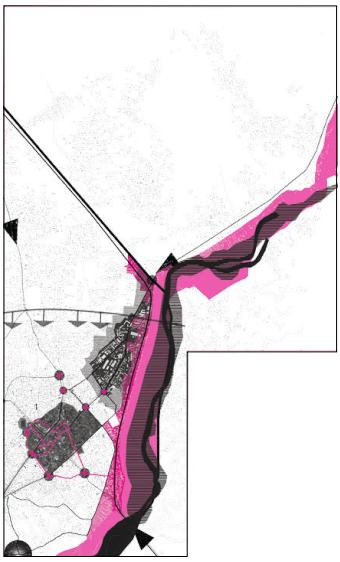
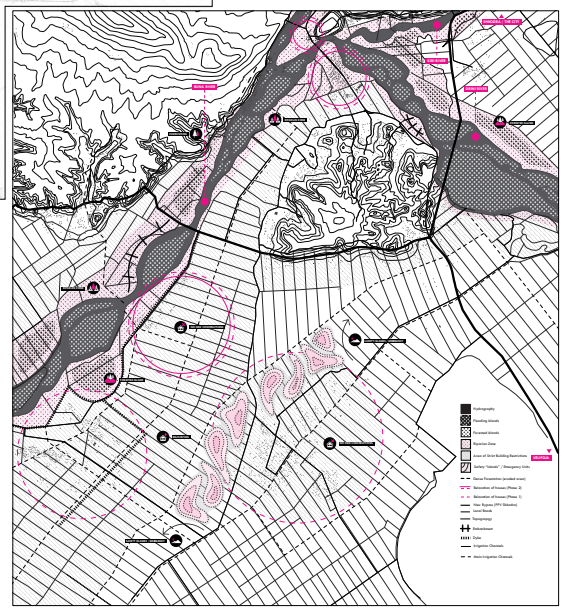
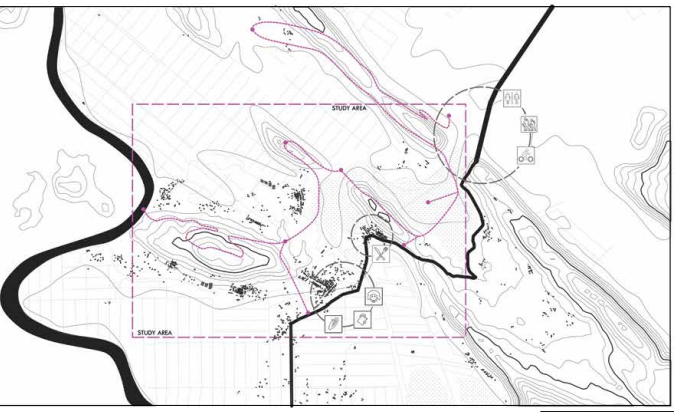
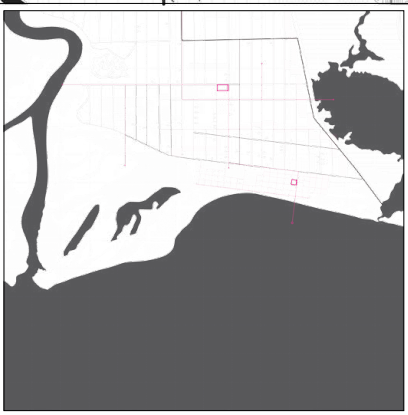
MODELLING THE MARGIN
LEGEND:
Lake vegetation
Water areas
Unoccupied fields
Cultivated fields
Urban areas
LANDSCAPE CONFIGURATION:
Natural situation
Cultivated situation

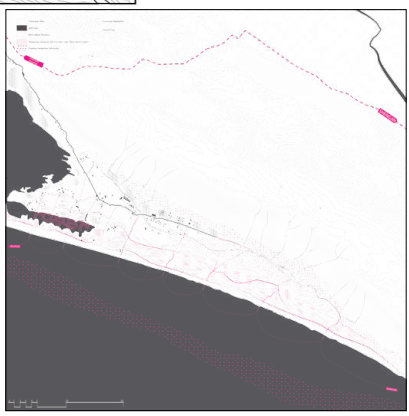


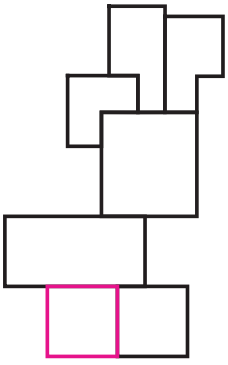
Interventions
Transport line
Tourists areas
Planting areas
Wetlands
Fish farms
Lake-WTP connection
Water canal
Bus stop system
Legend
Urban areas
Green areas
Building areas
Rural areas
Rock fill areas
Rural roads
Groundwater canals
Wetlands
Footpaths
Alos High


Hydrography
Flooding islands
Terrestrial islands
Riparian Zone
Areas of Strict Building Restrictions
Safety "Islands" / Emergency Units
Dacos Prevention (eroded areas)
Reforestation of Ravines (Phase 2)
Reforestation of Ravines (Phase 1)
New Bypass (PTV Dikeder)
Level Marsh
Topography
Embankment
Dyke
Irrigation Channels
Main Irrigation Channels


STUDY AREA
STUDY AREA







6 / Amphibious Devices

Gerdi Papa

The intervention aims to address some of the main issues that the Shkodra sea shore is facing. One side the informal Velipoja is pressuring the still not urbanized part of the sea line. On the other side the area is constantly with floods, destroying the few homes of the locals and also erosion from the sea and land has been a factor to the constant decline of the sea line. Pollution as well as the fact that the area has been declared a protected landscape and is home to rare birds asks for a particular approach.

Amphibious Devices aims to create tools to co-exist operations to preserve the coast through artificial and improve the current conditions. It offers a set of sand dunes and a barrier of reef balls and also the mountain using local vegetation. The wetlands present in the area have been the home of rare species of birds and amphibious devices aims to reinforce the current landscape to create better conditions for the local species to breed and live in the wetlands that can also be nicknamed as "Bird Airport", which in turn can also create a touristic attraction for people who love bird watching.

The last amphibious operation proposed comes in the form of Amphibious Housing. As flooding is well known and common problem in Shkodra, and something that doesn't seem that will be fixed anytime soon, necessity requires for new housing solutions. The proposal presents a tried prototype of a floating house that rises with the water level. The house itself remains undamaged while the platform floats on the rising levels of the waters, being kept balanced by the vertically moving columns. As the Amphibious House is designed to last in emergency situations, where stranded habitants can wait for days for rescue, the house is equipped with solar panels, food storage and a small lifeboat.

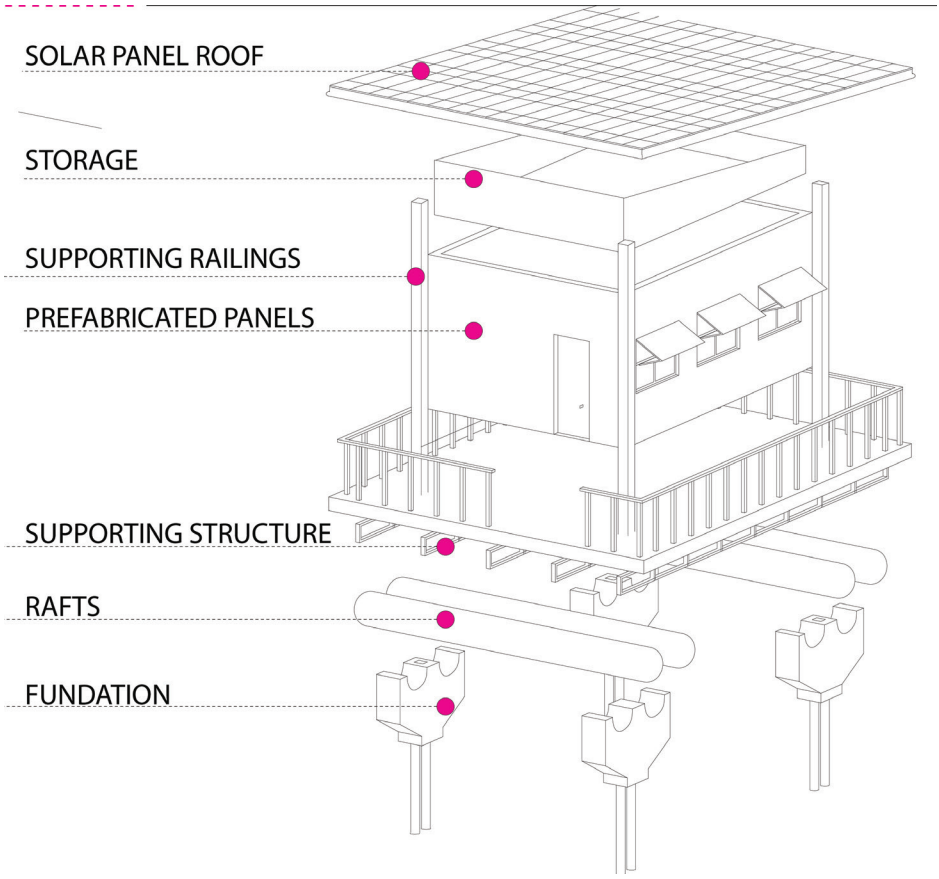


Fig12 / 3D representation of the device designed
source / Gerdi Papa

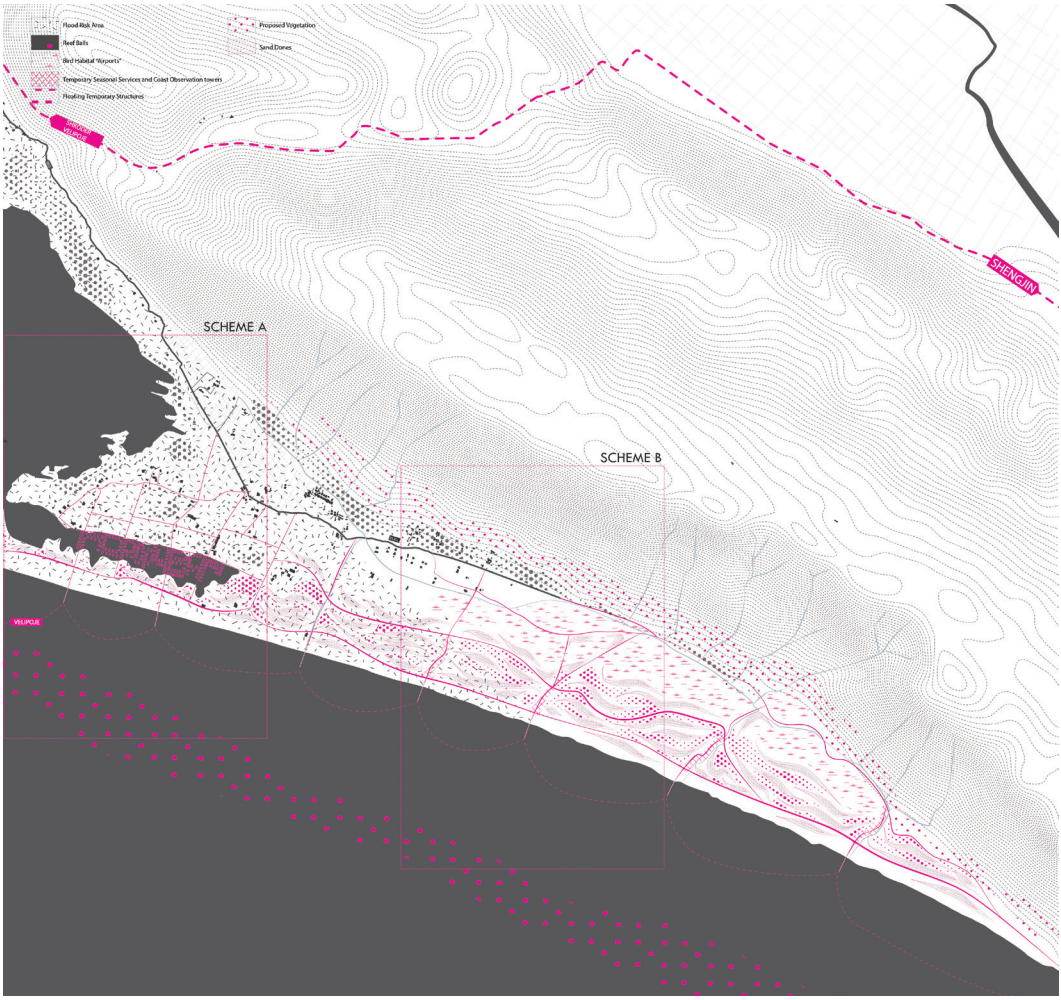
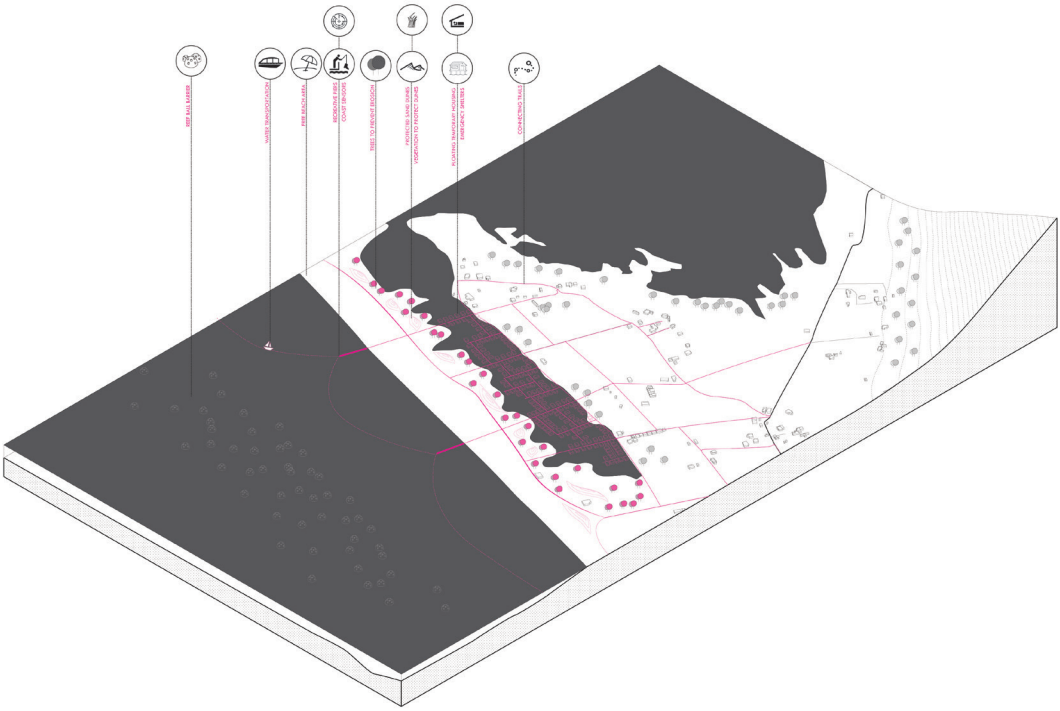
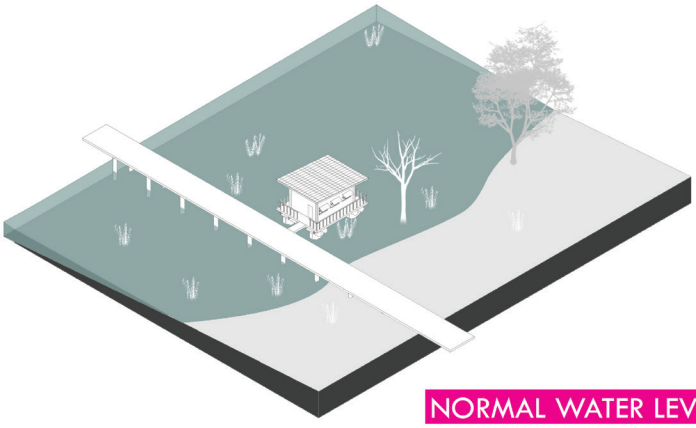
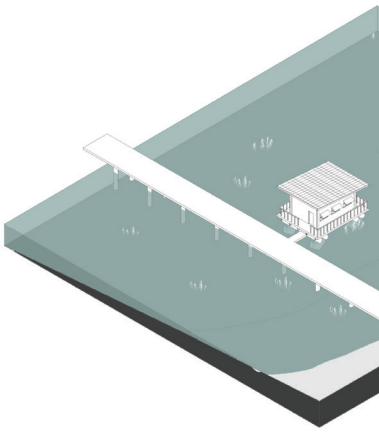


Fig13 / Masterplan of the fragment n°6
source / Gerdi Papa







NORMAL WATER LEVEL

THROUGH NORMAL WATER LEVELS THE RAFTS SIT ON THE BUILDING FUNDATIONS

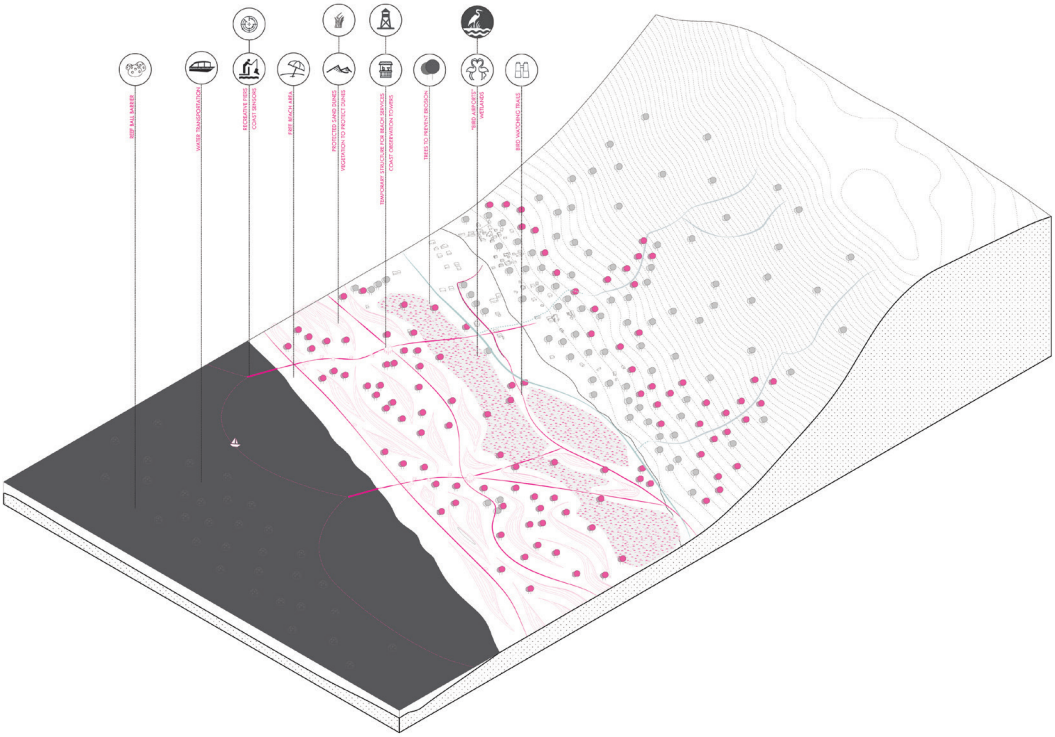
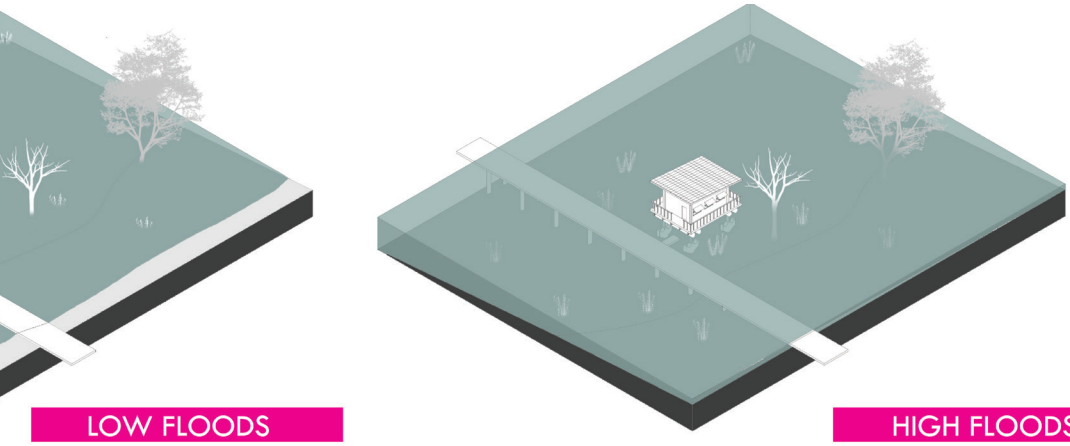


Fig 14a / 3D sections of the project area
source / Gerdi Papa



LOW FLOODS

THE AMPHIBIOUS HOUSE ADAPTS TO RISING LEVEL OF THE WATER. THE RAFTS LIFT THE SUPPORTING COLUMNS, LIFTING THE HOUSE ITSELF

HIGH FLOODS

HIGH FLOODS MAKE THE HOUSE COMPLETELY FLOAT BUT STILL BE ANCHORED TO THE FUNDATIONS. HOUSES HAVE ENOUGH STORAGE TO LAST FOR DAYS UNTIL HELP CAN ARRIVE.

Fig 14b / Project scenarios
source / Gerdi Papa

Amphibious Devices / Interventions that adapt to land and water in the protected area of Bask-Rrjoll, Shkodra

keywords / amphibious devices, small intervention, protected landscape

Gerdi Papa
PhD researcher / POLIS University, Tirana

Abstract

Albania went through an unprecedented population movement that followed the change of regime after 1990. A movement that manifested itself both internally and internationally, it had a huge impact on Albanian cities and territory. What is known today commonly as the informal settlements, those buildings came as a result of lack of control by the local authorities which were unable to either stop or direct development and the need for housing that followed the movement. This meant that the landscape and territory suddenly became overrun by self-built homes or business that changed the urban, rural and natural landscape. Many of these developments where pulled by the western cost which offered the possibility for a quick return in tourism. The protected landscape of Bune-Velipoja and in particular the area of Bask-Rjoll have become a hotspot also for the agricultural possibilities offered, thus starting the first settlements that would go and change the landscape itself. The result of human behavior and interaction in landscape has caused damage to its biodiversity and flora and fauna. By understanding how the population movement have affected the settling and quality of the landscape, the aim of this paper is to propose seemingly disconnected interventions that aim at preserving landscape, flood resilience, coastal erosion prevention and emphasizing the qualities of the landscape in order to re-evaluate the landscape as a touristic attraction. By including communities and giving them a sense of belonging to the landscape these preservations processes can become regenerative tools.

Introduction: the where and the why?

Albania faced one of the biggest population movements in its history after the 1990s where the fall of the communist regime also meant that ban on free movement was lifted. The pressure of building up to this moment, alongside with the economic and political situation in Albania paved the way for much of the demographic movements. Movement was largely focused from the impoverished areas to the western lowlands which were also dictated by social and economic factors. 'The Albanian population was redistributed and concentrated mainly in urban and rural areas of the Western Lowlands, while Albania's mountainous areas experienced significant population reductions.' (Kopliku, Dibra, Krymbi, 2015, pp 255). Of course this movement was accompanied by an uncontrolled urban sprawl due to the lack of government control and regulations. The need for housing in a market where land ownership was prohibited before meant that there was no one to buy land from. This alongside the lack of control from the authorities meant that the sprawl would have an impact on the landscape. "Rural-urban migration turned into one of the main phenomena of Shkodra society after 1990 that took off as a result of the interaction of many actors, among them the change of economic structure and the allowance of the freedom of people to move. The urban and rural landscape became dynamic and changed in a short period of time, but in different ways" (Kopliku, Dibra, Krymbi, 2015,

Fig1 / Shkodra sprawl in the western lowlands source / Google Earth

pp 254) Change meant also that areas which were rarely built like the Velipoja became hotspots not only for habitation reasons but also economic. A very fast development of this region alongside a fragile market pushed development to move over the Viluni Lagoon and into the protected landscape area of Bask-Rjoll. A first degree protected area that is also home to a large scope variety of wild flora and fauna and domesticated farm animals. A biodiversity shared between the area itself and the Viluni Lagoon, it is home to at least 183 species of birds and many more inscents, plants, fish etc. as stated by the Municipality of Shkodra – Biodiversity Protection Plan (Municipality of Shkodra, 2017).

This specific situations asks for a delicate approach to the matter. On one side the area is a protected landscape, on the other side current developments and touristic services have spread over to Bask-Rjoll from the Velipoja region. It must also be noted that the biodiversity of the area was also highly damaged due to waste and building waste being badly managed

Fig2 / Shkodra during the flooding (2010)
source / photo by Edmond Hoxha

by the authorities. On top of the touristic services, some people have made their homes closer to the hill who is in danger of landslides due to deforestation. Closer to the Viluni lagoon flooding has become a recurring problem mostly being caused by damaged infrastructure due to uncontrolled sprawl. A common argument used is connected to the presence and impact that humans had on the landscape and that these areas should be heavens without humans.

'Protected landscapes are cultural landscapes that have co-evolved with the human societies inhabiting them. They are protected areas based on the interactions of people and nature over time. Living examples of cultural heritage, these landscapes are rich in biological diversity and other natural values not in spite of but rather because of the presence of people. It follows that their future relies on sustaining people's relationship to the land and its resources.' (Brown, Mitchell, Baresford, 2005)

So that relations between humans and landscape become vital to the sustainable development of the landscape and its preservation. And although it may face different challenges, answering those challenges in ways that will regenerate and protect the landscape and create a touristic attraction and possible revenue is the approach of this paper. Creating possibilities for habitants to create a connection to the environment. This paper tries to propose solutions, nicknamed amphibious devices' that would adapt to the specific landscape conditions of in between land and water in order to kick start preservation processes in the protected area of Bask-Rjoll. By understanding the reason of the population movement to this new area and creating solutions that would give them a sense of belonging to the landscape, amphibious devices aims to propose lightweight small interventions.

The Context: Shkodra the northern capital and its expansion

Shkodra is certainly one of the most influential cities of Albania, as well as the northern center of the country. Through the years it has established itself as one of the most important centers, which has led to cultural exchange with neighboring centers as well as, and more importantly, to Shkodra being one of the most diverse cities in Albania when it comes to architectural heritage and culture. Its geographical position, closeness to the sea as well as the Shkodra Lake, have given the city a greater importance in the region. The proximity it had with Italian port cities but also the land routes to important settlements made it a focal point for the whole region. The 2015 territorial reform changed Shkodra's borders to include different areas like the touristic beach of Velipoja on the west, and a number of smaller communes in the east thus greatly increasing the number of inhabitants and terrain under the control of Municipality.

Over the past 15 years, about 20 percent of adults have moved internally. This means that about 450,000 individuals currently reside in a place different from

where they were in 1990. (World Bank, 2007) If we take into account all movers since their birth, than approximately 1 in 3 Albanians has moved internally and is not living somewhere else than where he was living in 1990. Prior to that year, any kind of migration was tightly regulated and prohibited by the communist government and was virtually non-existing. As the trends studied by the World Bank in their 2007 report show, this migration had its peak between 1990 and 1998 which is correlated to the fall of the pyramid scheme. Internal migration in this case was used as a coping strategy towards the shock caused by the collapse. Since 1990 the majority of internal migrations comes from rural areas not surprisingly. About 2 in 3 migrants (65.3 percent or 291,000 individuals) have moved from rural areas, even though rural population was about 56 percent and falling (it stood at 52 percent in 2005) during the period (World Bank, 2007) However, surprisingly, about 40 percent of those individuals have relocated within rural areas, often across regions. Although central Albania was the most preferred region for migration, in general the western lowlands had the biggest internal population movement with population from mountainous deciding to move to more friendly territories.

The geographical position of the city situated in a lowland beside the Shkodra Lake and surrounded in the north with mountainous area has played an important role in shaping the factors for the population movements in the region. Its hydrography is a delicate one as it is in the intersection of the rivers Drin, Krin and Buna and the Shkodra Lake. This gives the topography a quite particular relationship between land and water. Access to the rivers and sea as well closeness to the city of Ulcinj across the Montenegro border shows the strategic position that the city holds in the region. 'This favorable set piece has always determined the early fate of Shkodra as the socio-economic and political center of the northern Albania' (Kopliku, Dibra, Krymbi, 2015 pp 254). The role as a host city for the permanent or temporary settlers from the surrounding areas was overshadowed during the communist regime because of the ban to the free movement. 'This role was revived after 1990 when the city of Shkodra, as in earlier historical periods, became the main destination of the arrival of internal migrants from rural areas from the north of Albania' (Bërxholi, 2000).
Although after the fall of the communist regime in the 1990, Albania faced one of its greatest challenges and biggest internal and external migrations ever. The new unexperienced governmental structures as well as the desire of an oppressed population resulted in over 400,000 self-built settlements being built in uncontrolled areas (Ministry of Urban Development, 2014). The population was redistributed and concentrated mainly in urban and rural areas of the Western Lowlands, while Albania's mountainous areas experienced significant population reductions. "During the transition period the population of the District of Shkodra fell by 10.1% being in the category of Albania districts that experienced the lowest number of decreases" (ETF, 2007). As of 2011, after seeing an increase in the first decades, the population of Shkodra and the national trend saw a decrease coming mainly from mass immigration as well as a lower birth to death ratio than previous years which had a huge impact in the population not only in a national scale but also in the population distribution within its borders.

'In many cities the majority of new immigrants, were originally placed in the suburbs, not in the traditional areas of the inner city, dominating and transforming the landscape of its outer quarters. This trend is also confirmed for Shkodra, especially in the early years of transition.' (Kopliku, Dibra, Krymbi, 2015 pp 260) Uncontrolled building meant that often people would damage natural systems and infrastructure unconsciously. So the natural ability of the land to mitigate floods became less effective which brought the famous floods problems discussed further down. As figure 1 shows the landscape and agricultural lands have been impacted tremendously by the uncontrolled sprawl. The population was mainly aiming for the most western areas, like the Velipoja and Shengjin area and the corridors in between where the most favorable land was. The ability to get an economic return due to the tourism meant that there was much more of a rush for everyone to build there.

SELF-CONSTRUCTION: the uncontrolled urban sprawl and its effects on the territory

'In the summer of 2000, it seemed that half of Albania was building itself a house' (Nicholson, 2001, pg 39). Land usage changed its character mainly due to the peripheral regions being under the biggest pressure to change and accommodate the new densification. Uncontrolled building led to a lower quality of environments for these new rural neighborhoods as

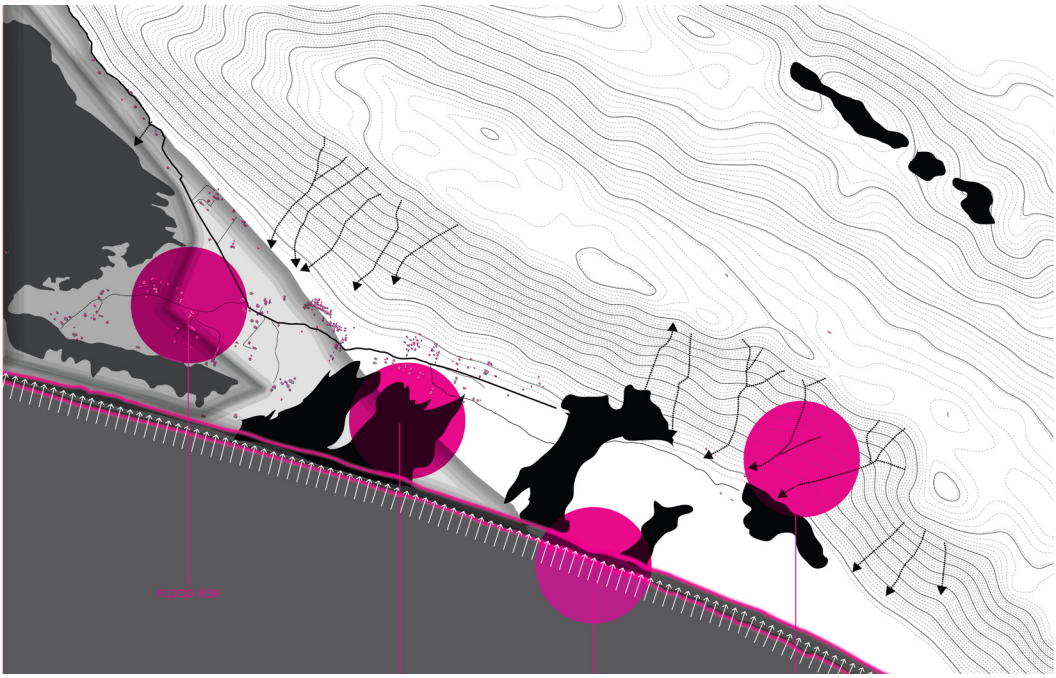


Fig3 / Map of the risks of the area, done during the workshop source / the author

well as creating urban sprawl. The land usage changed character resulted from the pressure mainly on peripheral areas leading to densification, reducing quality of these neighborhood environments as well as the urban sprawl. Although the population of city of Shkodër has declined, the population of the Municipality of Shkoder has increased because it has been subject of an intensive and fast urbanization. The specific weight of urban population grew from 34,9% in 1990, to 37,4% in 2001 and then to 44,3% in 2011 (CENSUS, 1990, 2001, 2011). The informality and sprawl that became part of Shkoder and Albania after 1990 were mainly because of multiple causes, like an increasing demand for residence, a growing demand for better quality housing, the inability of the government to provide either of those as well as the lack of control that the government had over the territory.

The new borders of Shkoder gave the municipality of Shkodra both new opportunities and challenges to face. This new municipality area faces the dangers of floods and coastal erosions. The Rivers Kir and Gjader and their sedentary composition, continuous rains for a number of days, snow melting in the Alps' region, Shkodra lake that discharges water on the Buna River as well as not complying the territorial capacities due to bad management have led to disastrous floods such as the one in figure 2. Uncontrolled building and interventions have led and opened the way to flooding problems, mainly originating by, among other causes, deforestation, interventions to the river basins, building in high-risk areas, deforestation, damaged drainage systems etc. Other threats come from the sea, were coastal erosion has been a problem that all the coast of Albania is facing. All these have Coastal erosion as well as rising sea levels are now part of Shkodra's worries in incorporating the touristic area of Velipoja which includes a medium-high density touristic area which is mainly composed of informal buildings as well as a protected landscape of Baks-Rjoll which is located south of Velipoja. The area was not immune to the uncontrolled building period in Albania, alas also being a touristic area thus giving economic advantage to whomever could build first.
As the Municipality of Shkoder continues to grow and tries to fix its past mistakes, the challenges it faces in terms of landscape preservation as well as preparing a disaster resilient municipality for the coming years have laid the work for it. In a world where climate change, rising sea levels, floods, and other natural disasters are becoming more and more common and easier to predict, it is only normal to pretend a society that can adapt to the challenges. On top of all that, working on protected landscapes raises new challenges on its own.

PROTECTED AREA OF BAKS-RRJOLL: the study area

The Bask-Rrjoll area was declared as part of the "Buna River-Velipoje" protected landscape in accordance to law nr.8906, date 6.6.2002, "For protected areas" and a first degree protected area. This includes

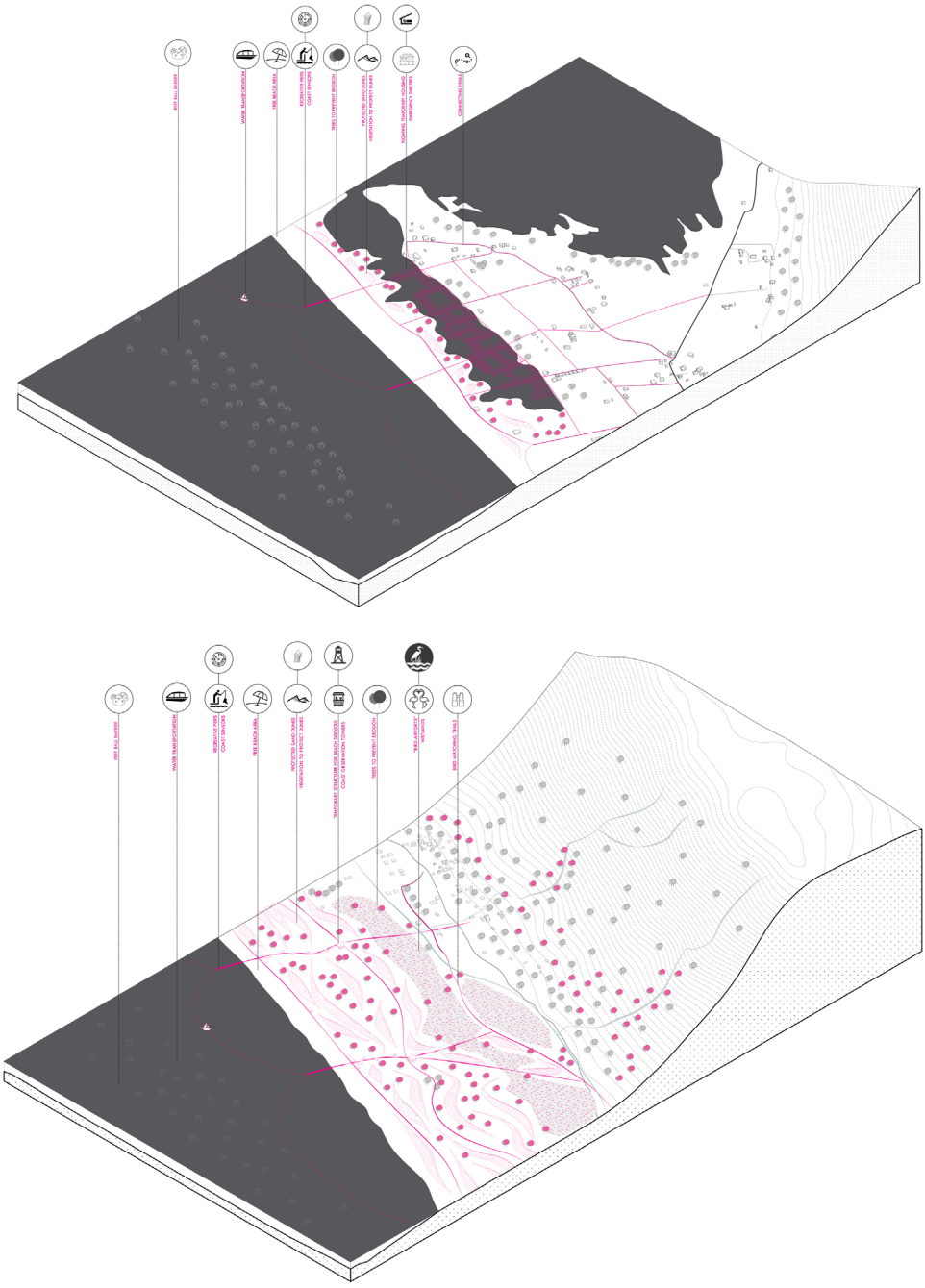


Fig4 / General overview of the interventions
source / the author

Viluni Lagoon, 300m south-east of the shoreline and up to 327m to the Kolaj mountain. And although protected by law, the area of Velipoja and Bask-Rjoll are one of the areas mostly influenced by the uncontrolled growth and sprawl of the 1990s. While Velipoja has established itself as one of the fastest growing touristic areas in Albania, Bask-Rjoll is showing a tendency towards touristic development which must co-exist with both the opportunities and challenges that it offers.

Biodiversity is one of the strong points of the area, offering medicinal plants like sage as well as grass and tree types growing in the swamp area, and rare birds compose just part of the biodiversity of the area. 'During the last two decades, uncontrolled human activities have resulted in a biodiversity loss, where a few species are headed towards extinction. The biological diversity of the area includes all plant and animal life, along with all genes and ecosystem it contains. (Bejko 2012). Uncontrolled building and interventions mainly built to service the touristic area and individual businesses rather than the community have also impacted the area negatively. One of the main reasons for this is also the lack of knowledge from the inhabitants and infrastructure to control and protect the area (Local Environmental Action Plan, Velipoja Commune, 2006) Not planned but uncontrollably adapted

as 'touristic development', Baks-Rjoll will have to adapt to these challanges. The risks of coastal erosion, land slide, flooding, biodiversity decline and a landscape that should be protected are just some of the challenges laid in front of it. 'The cultural and natural values of landscapes are inextricably linked, and the communities living in or near these landscapes are central to sustaining them. It embraces the central role of indigenous and local communities as stewards of the landscape and puts them at the heart of management of these protected areas, sharing in the benefits and responsibilities of conservation.' (Brown, Mitchell, Baresford, 2005)

'Protected areas should include those lived-in, humanized landscapes where people and nature live in some kind of balance. These places, and the communities that live in them, are important in themselves and for the lessons they can teach all of us about sustainable living. This is the idea behind Protected Landscapes and Seascapes' (Phillips, 2002). This kind of approach asks for interventions that will not only protect the current landscape but make it flourish not only for its current or future biodiversity but also for the population which must co-habit the area and protect it. The synergy that local communities can form with their environment can and should become an integral part to every proposal.

A POSSIBLE SOLUTION FOR THE FUTURE: Amphibious Devices

Complex protected areas like Baks-Rjoll, especially areas which during the recent years have mostly worked against protecting its landscape rather than towards, pose a challenge in implementing different types of small interventions. Those intervention should be able to "jump-start" a series of movements to regenerate and protect an area that otherwise has been declining in the past years. From the map and territorial analysis done and as mentioned above, threats like land erosion from the sea, land erosion from deforestation, flooding, decline in biodiversity as well as a direction taken in becoming a touristic area just the tip of the spear. In a society that is now working to prevent rather than fix, Baks-Rjoll must be equipped with systems that can help preserve and nurture its biodiversity, protect the land from sea erosions as well as offer housing and touristic opportunities that can be flood resilient and gentle to the landscape itself. The interventions proposed aim to address the main issues that the area is facing. On one side the the touristic developments of Velipoja are pressuring the still not urbanized part of the sea line that stretches south past the Viluni Lagoon. On the other side the area is known for flooding risks and as a protected landscape. Erosion from the sea due to strong Shiroka Winds and tides have been a factor to the constant decline of the shoreline. Pollution as well as the fact that the area has been declared a protected landscape and is home to rare birds and medicinal plans asks for a particular approach. The interventions aim to create tools and operations to preserve the coast through artificial interventions and improve the current conditions. It offers a set of sand dunes and a barrier of reef balls and also the mountain using local vegetation. The wetlands present in the area have been the home of rare species of birds and the so called amphibious devices aim to reinforce the current landscape, to create better conditions for the local species to breed and live in the wetlands. Benefits from these interventions would in turn create opportunities for new kinds of tourism, like bird watching, allowing for monetary return which in turn can also create a touristic attraction for people who love bird watching.

The amphibious house

Based on the design of a house that rises with the sea level[1] the last amphibious operation proposed comes in the form of Amphibious Housing. An amphibious house can be defined as a building that rests on the ground but can adapt to incoming floods raising along with the water level. Amphibious construction brings together standard components solutions from both the construction and marine industries to create intelligent solutions to flooding. Construction of these structures is slightly more expensive rather than mainstream house building due to foundation system that allows the house to raise but overall costs can be comparable. The technology is suited for areas with high flood-risk or where there are uncertainties about possible future flooding levels or for historical or sensitive landscape solutions where a more radical or heavy handed solution would not be preferred. Construction costs can be further cut down by adopting digital fabrication construction techniques. Allowing for customizability and on-site production, digital tools could further

1 / see www.treehugger.com/sustainable-product-design/amphibious-house-design-goes-with-the-flow-rises-with-floods.html

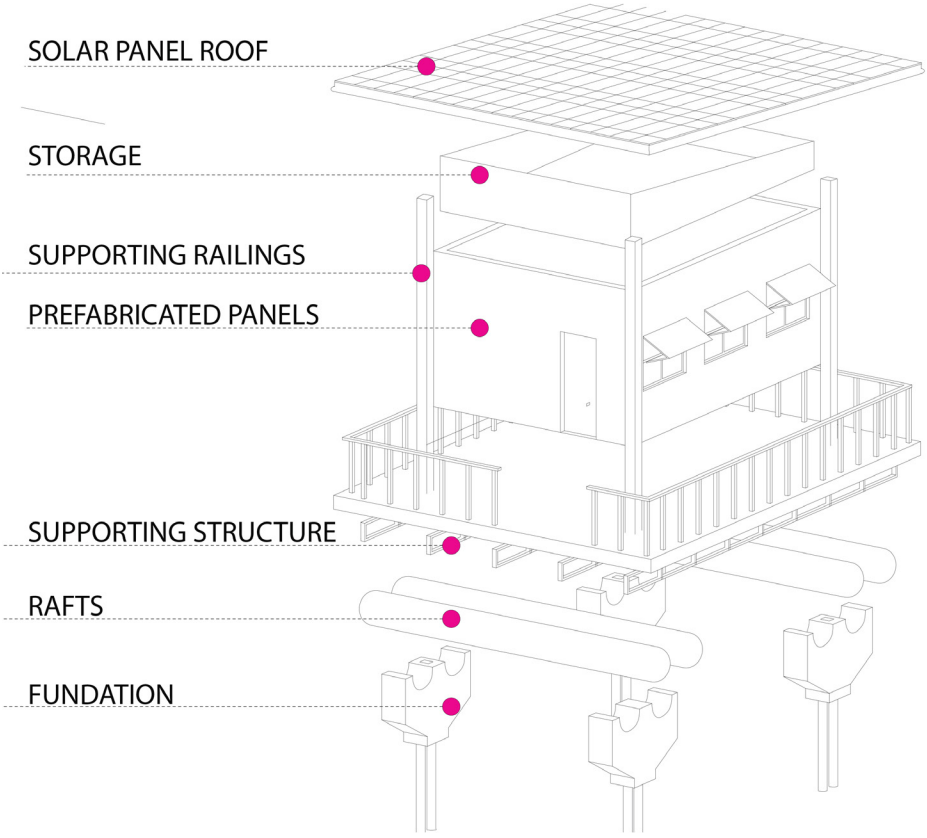


Fig1 / picture name and source

Fig5 / Amphibious House model source / the author

develop and give more reasons to rely on this solution.
As mentioned above, and with flooding being a recurring problem of the area. The proposal presents prototype of a floating house that rises with the water level. The house itself remains undamaged while the platform floats on the rising levels of the waters, being kept balanced by the vertically moving columns. Sitting on 4 floating rafts, the house is lifted along with the water while remaining anchored through the columns. The house themselves can be equipped with solar panels to provide clean energy, cleaning filters for the water as well as all built on sustainable local materials.

Conclusions

The key areas of significance of protected landscapes, as described in IUCN's "green book," are high scenic quality, diverse associated habitats, flora and fauna along with manifestations of unique or traditional land use patterns, and social organizations as evidenced in human settlements and local customs, livelihoods, and beliefs (IUCN, 1994). Protected landscapes are characterized by an harmonious interaction of nature and culture, of diversity of landscape and habitat, biodiversity, and the preservation of the cultural and social fabric that give character to the protected landscape. The solutions proposed are all solutions that aim at emphasizing and protecting the landscape, while creating a relation between the community and the area. All interventions can adapt to the changing qualities of the landscape but still need human intervention to work and protect throughout time. Creating a more sustainable solution for those people to live and be part of the landscape, it's a way to make sure that the landscape will be 'looked after' for years to come. All this development can also be closely tied to tourism as well. Preserving this landscape would offer the area the unique possibility of offering a mixture of ecotourism, bird-watching, coastal tourism that is bound to bring income to the families. In a way the process of preservation of the landscape become a method of valorization. Preserving those landscapes and promoting them should be first and foremost done by the communities themselves. Landscape and land valorization can come through these interventions that aim to empower the landscape and the relationship to its people, where they become the main protectors and promoters.

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