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**ABSTRACT**

The Sherpa community is a courageous yet isolated group in the Khumbu region of Nepal who migrated from Tibet in the 16th century. This research highlights the challenges faced by this community, despite their critical role as high-altitude porters and mountain guides, notably on Mount Everest. Currently, they face severe impacts from climate change and natural disasters, including the recent 2015 Earthquake that killed approximately 9000 people. Their homes, nestled between 2,000 and 5,000 meters above sea level, are increasingly vulnerable to avalanches and environmental changes threatening their livelihoods and the longstanding cultural practices. On the other hand, while tourism brings economic benefits, the surge in trekkers and climbers also places pressure on the fragile environment, contributing to pollution and resource depletion. The influx of visitors disrupts traditional ways of life and exacerbates the environmental challenges, intensifying the strain on their community. With limited knowledge of the outside world, the Sherpas are unaware of the causes behind these changes.

The design proposal aims to increase recognition of the contributions of the Sherpa community and develop adaptability strategies to preserve their heritage and environment. Specifically focused on the Khumbu region, the proposal intends to serve as a model for Sherpa villages adapting to the Himalayan ranges. The proposal concentrates on building infrastructure between villages, improving waste management, farming, herding, reinforcing Sherpa homes and lodges, and identifying probable locations for schools, medical services, and disaster shelters through strategic policies, design tactics, and community engagement. The project intends to preserve the Sherpa culture and act as a bridge between tourists and the community while safeguarding their homeland for generations to come.



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*Fig 1: A trail to at Khumbu region*

*Courtesy: Tasnia Chowdhury*

*Key Words: Sherpa Community, Terrestrial Habitat, Environmental Colonialism.*

## INTRODUCTION

The Sherpa community is a courageous yet isolated group in the Khumbu region of Nepal that migrated from Tibet in the 16th century. Over the centuries, they have established themselves as an integral part of Nepal's cultural and environmental landscape, primarily through their significant contributions as high-altitude porters and mountain guides. This research delves into the intricate challenges faced by the Sherpa community, whose resilience and skills have earned them global recognition, especially in the context of mountaineering on the world's tallest peak, Mount Everest. Despite their indispensable role in supporting climbers and trekkers, the Sherpas endure a range of socio-economic, environmental, and cultural challenges that threaten their way of life.



*Fig 2: Without Sherpas, it is impossible for people to climb Mount Everest.*

*Courtesy: National Geographic Learning*

One of the most pressing issues confronting the Sherpa community is the devastating impact of climate change. The Himalayan region, often referred to as the "Third Pole," is experiencing some of the fastest rates of warming on Earth. The Sherpa villages, situated between 2,000 and 5,000 meters above sea level, are increasingly vulnerable to glacial melt, avalanches, and unpredictable weather patterns. These environmental changes not only endanger their homes but also disrupt their traditional farming and herding practices, which have been finely tuned to the region's natural rhythms over generations. Furthermore, the catastrophic earthquake of 2015, which claimed approximately 9,000 lives

across Nepal, served as a grim reminder of the region's vulnerability to natural disasters. Many Sherpa homes and lodges were reduced to rubble, leaving families to grapple with rebuilding their lives in an already challenging environment.

The effects of climate change extend beyond immediate physical damage. Glacial retreat and changing precipitation patterns threaten the water supply, a critical resource for both the Sherpa community and the millions of people living downstream of the Himalayan rivers. These challenges exacerbate the socio-economic vulnerabilities of the Sherpa community, which relies heavily on agriculture, livestock, and tourism for sustenance. As the environment becomes less predictable, the risk of food insecurity and economic instability grows, further straining the resilience of the Sherpas.

While tourism has emerged as a vital economic lifeline for the Sherpa community, it also brings a host of complex challenges. The influx of trekkers and climbers to the Khumbu region has led to significant environmental degradation. Trails are littered with waste, water sources are contaminated, and fragile ecosystems are strained under the weight of increasing human activity. The growth of tourism has also introduced cultural tensions, as traditional Sherpa ways of life are disrupted by external influences. The demands of catering to tourists often prioritize short-term economic gains over the preservation of cultural heritage, leading to a gradual erosion of long-standing customs and practices. Moreover, the Sherpa community's limited access to education and global information networks leaves many unaware of the broader causes behind the environmental and social changes affecting their lives.

Considering these challenges, this research proposes a design-driven approach to address the multifaceted issues faced by the Sherpa community. The primary objective is to increase recognition of their invaluable contributions and to develop strategies that enable them to adapt to the rapidly changing environmental and socio-economic landscape. Focusing specifically on the Khumbu region, this proposal aims to serve as a model for other Himalayan communities confronting similar challenges.

Central to this design proposal is the enhancement of infrastructure between Sherpa villages. By improving connectivity, the initiative seeks to foster greater collaboration and resource-sharing among the villages, which can enhance resilience against external shocks such as natural disasters or economic downturns. A key component of this effort involves the development of sustainable waste management systems to address the mounting pollution caused by tourism. By introducing community-led recycling initiatives and eco-friendly waste disposal methods, the project aims to mitigate the environmental impact of tourism while empowering the Sherpa community to take ownership of their ecological stewardship.

In addition to waste management, the proposal emphasizes the importance of bolstering traditional farming and herding practices. By integrating modern agricultural techniques with indigenous knowledge, the initiative seeks to enhance food security and reduce dependence on external resources. Reinforcing Sherpa homes and lodges to withstand extreme weather conditions and seismic activity is another critical aspect of the proposal. This includes the use of locally sourced materials and sustainable building practices that honor the aesthetic and cultural values of the Sherpa community.

Recognizing the importance of education and healthcare in fostering long-term resilience, the proposal also identifies strategic locations for schools, medical services, and disaster shelters. These facilities will not only provide essential services but also serve as hubs for community engagement and capacity-building. By involving the Sherpa community in the planning and implementation process, the project ensures that their voices and perspectives are at the forefront of decision-making. This participatory approach is essential for fostering a sense of ownership and ensuring the sustainability of the proposed interventions.

The proposal also seeks to promote sustainable tourism practices that benefit both the Sherpa community and the environment. This involves establishing guidelines for responsible trekking and climbing activities, such as limiting group sizes, encouraging the use of eco-friendly gear, and implementing leave-no-trace principles. Additionally, cultural exchange programs can

be developed to foster mutual understanding and respect between tourists and the Sherpa community. These initiatives aim to enhance tourists' appreciation of Sherpa culture while providing the community with opportunities to share their heritage and traditions in a dignified manner.

The overarching goal of this research is to safeguard the homeland of the Sherpa community for generations to come. By addressing the interconnected challenges of environmental degradation, socio-economic pressures, and cultural erosion, the project aspires to create a resilient and sustainable future for the Sherpas. Through strategic policies, innovative design tactics, and active community participation, the proposal aims to set a precedent for holistic development in high-altitude regions. Ultimately, this research underscores the importance of recognizing and supporting the Sherpa community as stewards of the Himalayan landscape, whose survival and prosperity are intricately linked to the well-being of this majestic and fragile region.

By bridging the gap between traditional knowledge and modern innovation, this research highlights the potential for adaptive strategies that honor the Sherpa community's heritage while addressing contemporary challenges. The Sherpas' unique position as both custodians of the Himalayan environment and integral participants in global mountaineering culture underscores the need for a nuanced approach that balances environmental conservation with socio-economic development. This study not only sheds light on the pressing issues faced by the Sherpa community but also offers a roadmap for sustainable development that can inspire similar efforts in other vulnerable regions around the world.

*"Deeper in the white mountains, through the melting glaciers; the science behind the Sherpa communities - the guardians of the Himalayas."*



Fig 3: A Sherpa in his everyday job

Courtesy: Ameet Ghosh

### Addressing Key Points

This paper focuses on three central themes: the Sherpa Community, Terrestrial Habitat, and Environmental Colonialism. It is structured to explore the origins, lifestyle, and current living conditions of the Sherpa people, while examining both tourist-driven and less touristy contexts in the Himalayan region. Special attention is given to the multifaceted impacts of climate change in this fragile ecosystem.

To provide a broader perspective, the research integrates insights from three theoretical practitioners and analyzes three case studies. These elements offer a comparative understanding of similar challenges faced worldwide, showcasing how various individuals and communities have addressed them, and inspiring the focus of this paper.

The three theoretical practitioners featured are:

1. **Dolores Hayden** – Known for her work on urban landscapes, cultural memory, and community preservation.

2. **Rebecca Solnit** – A thinker who emphasizes the intersection of geography, culture, and activism.
3. **Anne Feenstra** – An architect committed to sustainable and community-driven design in sensitive regions.

The three case studies are:

1. **Patagonia National Park** by Kris Tompkins – Highlighting the balance between conservation and sustainable tourism.
2. **Community Architecture Projects in the Peruvian Jungle** – Exploring grassroots architectural approaches for ecological and cultural preservation.
3. **New Gorna Village** by Hassan Fathy – An iconic example of sustainable architecture that integrates traditional knowledge and community needs.

## SHERPA'S: A BRIEF HISTORY

### *Who are the Sherpas?*

Migrating from Tibet in the 16th century, the Sherpa community settled in the rugged Himalayan region of Nepal. Over the following two centuries, they expanded into the Himalayan regions of India, gradually developing a culture deeply rooted in rituals, symbols, and rich traditions intertwined with the mountains they call home. Living at altitudes ranging from 2,000 to 5,000 meters above sea level, this resilient ethnic group thrived in the isolation and silence of the towering white peaks, remaining largely unknown to the world before mountaineering gained global attention.

The term "Sherpa" has since become synonymous with mountain guides, reflecting the community's unparalleled knowledge of climbing and their invaluable contribution to the success of climbers attempting to conquer these majestic yet perilous peaks. Their courage, expertise, and intimate understanding of the terrain have made them indispensable, but their traditional way of life extends far beyond mountaineering. For centuries, the Sherpa people sustained themselves through farming, herding, and

trading, maintaining a harmonious relationship with the natural environment. At that altitude, one could believe that nature appears to be untouched and immune to human destruction.<sup>1</sup>

However, the modern world has encroached upon these "guardians of nature" in ways that are both exploitative and unsustainable. At first glance, the pristine, snow-clad landscapes they inhabit might seem untouched and immune to human impact. Yet, these areas are among the most vulnerable to the devastating effects of climate change. Isolated from global developments, the Sherpa community often struggles to understand the root causes of the environmental changes wreaking havoc on their lives.

Rising temperatures and shifting weather patterns have increased avalanches, endangering Sherpa lives, livelihoods, and the trekking industry they rely on. Climate change has brought their fragile ecosystem to a tipping point, risking irreversible damage without urgent action.

Climate change is in such a vulnerable condition from which we can never come back again, whereas for these communities to survive, they need this high-altitude environment to stay intact.<sup>2</sup>

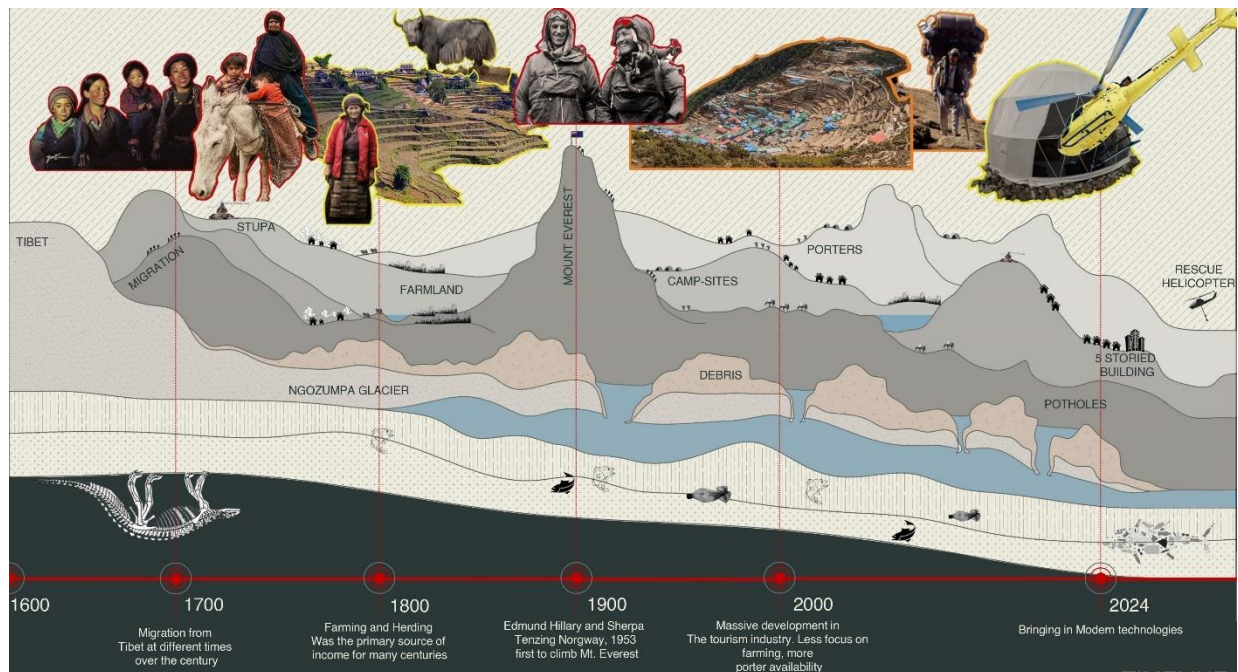


Fig 4: Sherpa Community- Timeline



Fig 5: While trekking through Khumbu region  
Courtesy: Salman Taseen Haque

### Why am I so interested in this particular community?

It has been an extraordinary privilege and a deeply enriching experience for me to have the opportunity to meet and live alongside the Sherpa community during my visits to the Himalayan region. Immersing myself in their vibrant traditions, culture, and way of life has been both humbling and inspiring. Witnessing their unwavering resilience in the face of harsh environmental conditions and their deep-rooted spiritual connection to the land has profoundly impacted my perspective. These experiences have not only deepened my respect for their heritage but also motivated me to bring greater awareness to their courage, strength, and enduring spirit. Through their kindness and hospitality, I have learned valuable lessons about community, harmony, and adaptability, which I hope to share with a broader audience to honor their remarkable contributions to the cultural and ecological fabric of the Himalayas.



Fig 6: After crossing Chola Pass; Altitude 5420m  
Courtesy: Salman Taseen Haque

### The Sherpa Culture

The Sherpa culture in Nepal's Khumbu region is intricately interwoven with Tibetan Buddhism, shaping every aspect of their daily lives, traditions, and identity. This spiritual connection is reflected in their traditional attire, such as the woolen **chuba**, a versatile garment designed to provide warmth in the cold, rugged Himalayan climate. Sherpas employ practical layering techniques with the **chuba**, allowing flexibility in the harsh and often unpredictable weather conditions of high altitudes. Their devotion to Buddhism is also evident in the sacred landscapes they create, marked by prayer stones inscribed with mantras, colorful prayer flags fluttering in the wind, and serene monasteries that dot the mountain paths. These symbols not only reflect their spiritual beliefs but also serve as a reminder of the harmonious relationship they maintain with nature and their environment.

Festivals are a vibrant expression of Sherpa culture, with celebrations such as **Losar** (the Tibetan New Year) and **Mani Rimdu** standing out as significant cultural and religious events. These festivals bring communities together in shared rituals, featuring sacred dances performed by monks, chanting of prayers, and communal feasts that reinforce social bonds and spiritual unity. These celebrations are not merely events of joy but are deeply symbolic, honoring deities, invoking blessings, and reflecting the Sherpas' gratitude for their environment and heritage.

Sherpa cuisine, an integral part of their culture, embodies both practicality and tradition, tailored to meet the demands of high-altitude living. Dishes like **thukpa**, a hearty noodle soup, and **momos**, steamed dumplings filled with meat or vegetables, are both nourishing and flavorful, providing essential sustenance in the challenging Himalayan climate. **Tsampa**, a roasted barley flour staple, serves as an energy-rich food that underscores the Sherpas' resourcefulness and resilience. Together, these culinary traditions represent the Sherpas' adaptability to their environment and their ability to preserve their cultural identity through food. Through their attire, spiritual practices, festivals, and cuisine, the Sherpas of the Khumbu region maintain a rich cultural legacy that continues to thrive amidst the growing influences of tourism and modernization.



Fig 7: Collage of traditional attire and sacred landscapes



Fig 8: Collage of Sherpa cuisine and culture

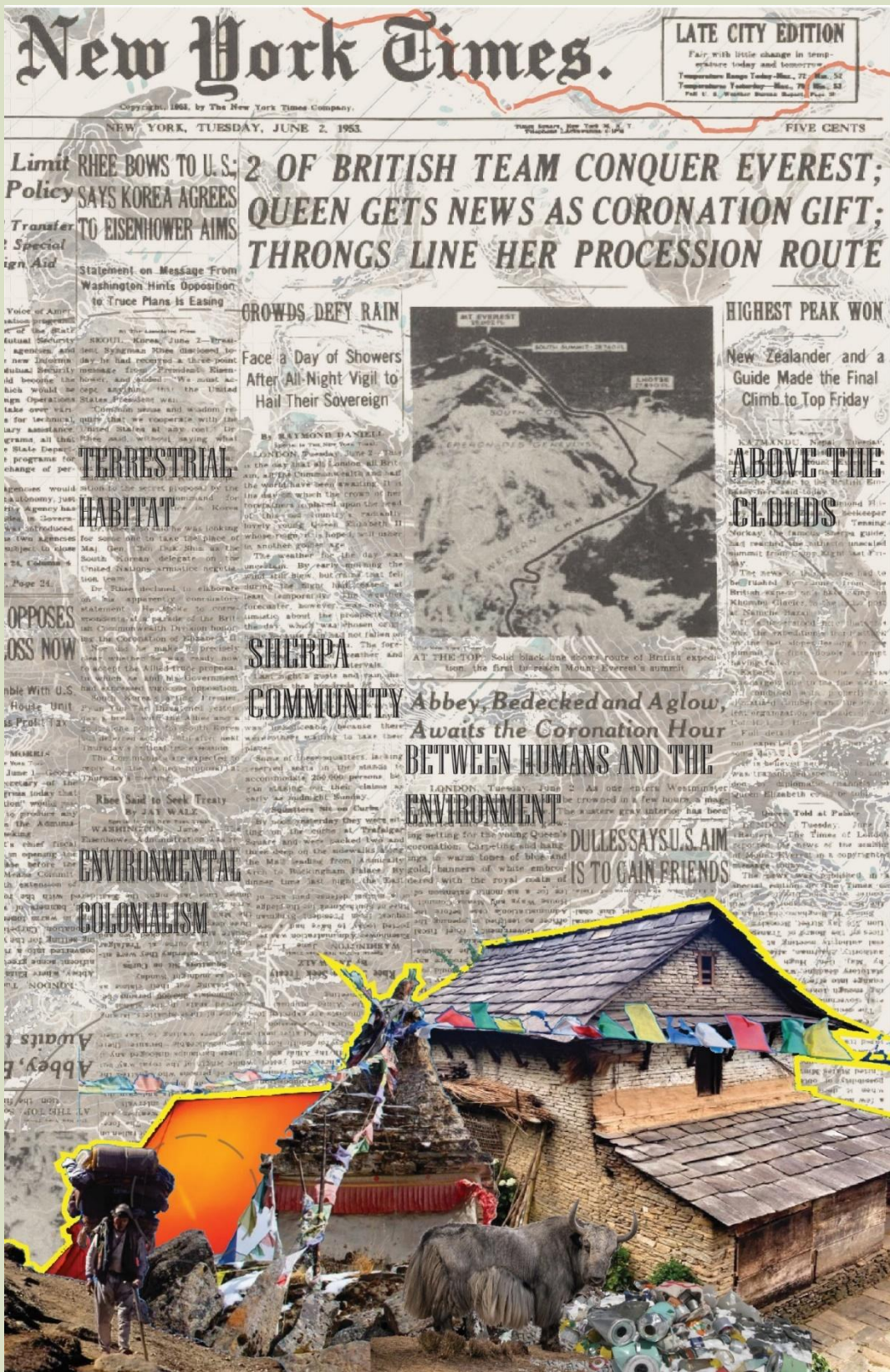


Fig 9: Sherpa community at a crossroads

## DYNAMICS OF CLIMATE CHANGE

"Small developing countries like us are paying a price for the emissions of the developed countries," said Ang Dorje Sherpa, an experienced climber of Mt. Everest. The Himalayan region indeed faces significant challenges due to climate change, from melting glaciers to increased occurrences of extreme weather events, which results in an impact on socio-economic aspects for the communities living in that region. The Himalayan region is often referred to as the third pole of the planet. They hold the largest reservoir of ice and snow after the Arctic and Antarctic, which extends not just in Nepal but also in many sub-continent of India as well. In the past 50 years, climate change-induced warming has triggered the melting of this reserve at a far quicker rate than in any other recorded period. These events can have a devastating impact on downstream communities, infrastructure, and ecosystems.

Moreover, shifts in precipitation patterns and changes in the monsoon timing have major consequences on vegetation and agriculture cover in the region. In extension landslides due to extreme rainfall make the communities living in the mountains highly vulnerable. "In 2017, scientists analyzed hundreds of satellite images to map 1,541 glacial lakes in the Nepal Himalayas. 64 of these are dangerously full, close to bursting and flooding human habitations downstream," warns Sudeep Thakuri, a climate scientist at Midwest University in Surkhet, Nepal. "The total surface area of these lakes has increased by 25% in just the 30 years between 1987 to 2017," he says.<sup>3</sup>



Fig 10: Sherpa community at a crossroads  
Courtesy: The Weather channel

The Sherpa community is feeling its effects in a deeply personal way. The Himalayas, often referred to as the "third pole" because of the vast ice reserves, are warming at a faster rate than other regions of the world. Glacial melt in the Khumbu region, such as Ngozumpa Glacier the largest glacier of the Himalayan region, has seen a significant increase in the number and size of supraglacial lakes on its surface. Researchers point to rising temperatures and melting glaciers as the primary cause for the increase in the size and number of lakes in the Himalayas, which has led to profound environmental changes affecting the Sherpa community's traditional lifestyle.

Recent studies by the Global Landscapes Forum, show that Himalayan glaciers, including the Khumbu Glacier, have thinned by nearly twice the rate observed in the 1960s. Some glaciers have lost up to 50% of their thickness over the past 50 years, driven largely by temperature increases that are now around 1°C warmer than early 2000 levels. Additionally, Khumbu Glacier's minimum ice temperature has been measured at just -3.3°C, very close to the melting point, which indicates its high vulnerability to even minor temperature increases. This level of warming has destabilized glacier formations, making landslides and avalanches more frequent, as well as affecting the water supply for communities dependent on glacier-fed rivers.



Fig 11: Ngozumpa Glacier  
Courtesy: NASA.gov



Fig 12: Landscape Montage

Since the early 1960s, 29 glacial lake outburst floods (GLOFs) have been recorded in the Nepal Himalayas, the most recent ones being in 2016 and 2017. In June 2016, an outburst of the Lhotse Glacier Lake, one of the largest in the Everest region, flooded the Imja Valley with over 2 million cubic meters of water. American hydrologist Elizabeth Byers, who was doing fieldwork in the valley with her colleagues, remembers hearing something like a rock fall. Within no time she saw a “black tongue of water, boulders, and silt” racing downhill toward the village of Chukhung in the valley. In April 2017, a catastrophic outburst of the Langmale glacial lake swept large parts of the Makalu-Barun National Park. The flood stemmed from a massive rockfall from the nearby Saldim Peak, and coupled with an avalanche, caused significant damage – carving canyons, stripping vegetation from the banks of river Barun, and depositing debris and boulders along a 6.5 km stretch of the river.<sup>4</sup>

Kaji Bista, the lab manager of Pyramid International Laboratory in Lobuche, a settlement near Everest Base Camp, demonstrates incredible resilience and dedication to fixing a faulty weather gauge under the blazing high-altitude sun. “We need to keep everything going,” he says. The revival

of the laboratory will be a significant result of the ongoing efforts to address the impacts of climate change in that region. Scientists can monitor critical environmental parameters such as permafrost melts, glacial retreats, precipitation, and atmospheric pollutants once the lab starts operating again. The Italian and Nepalese governments, who were funding the lab, stopped financing it in 2015. In the absence of scientific staff at the laboratory, named after the building’s interesting structure, Bista has continued to hold the fort for the last 12 years for basic maintenance of the lab and field equipment. In February 2024, the Italian research body EVK2CNR and Nepal Academy of Science and Technology (NAST) rekindled hopes for the Pyramid lab by signing a five-year funding agreement under which 37 new scientific projects are scheduled to start by 2025.<sup>5</sup>

The lack of consistent data in the Himalayan region over the past few years has created challenges for assessing, preparing, and responding to any environmental calamities that might occur. This also hampers any efforts by government and non-government agencies to develop strategies for mitigating risks and building awareness amongst the communities living in that region. This results in generating awareness programs based on outdated data,

leading to misconceptions and inadequate preparation for any current or future occurrences regarding the frequency of glacial lake outbursts, extreme rainfall events, or landslides. "Whenever we start collecting data again, we need to tell school children and village people what this data might mean for them," Bista says.

### **SHERPA'S PERCEPTION OF CLIMATE CHANGE**

Rooted in his firsthand experiences and deep connection to the Himalayan landscape, the 92-year-old Kancha Sherpa reflects on the significant changes that have unfolded in front of him over the decades. As the only surviving member of the historic Everest expedition led by Edmund Hillary and Tenzing Norgay in 1953, Kancha Sherpa holds deep knowledge about the transforming landscape and evolving climate of that region. Sitting in his family guest house 'Nirvana Home Hotel' in Namche, he reflects on a lifetime spent amidst these majestic mountains. "Earlier, tall grass grew on the stretch from Gorakshep (a small settlement at 5,164 meters elevation) to the Everest base camp. There were cowsheds in Tengboche (3860m) and Gorakshep. Now the glaciers have retreated, the grass is gone, and it's all covered with gravel," he says.<sup>6</sup>

As a high-altitude porter with seven Everest expeditions Kancha's perspective and spiritual connection to the mountains gives a unique insight into the cultural and environmental concerns by not only him but also his community. The litter and pollution brought by local tourists and mountaineers have upset the mountain Gods, a profound respect for nature based on hundreds of years old beliefs and practices followed by these communities. These deep-rooted sentiments highlight a major connection between environmental issues, cultural values, and the impacts of allowing tourism in their sacred mountains.<sup>7</sup>

"No one has ever told us about climate change – in fact, our village administrators and most of our folks think it is getting less hot by the year," says Kalpana Rai from Monjo. Sitting on the cliffside of one of the most popular hiking trails from Monjo to Namche Bazaar, she sells knick-knacks. Kalpana says her family is not bothered by talks of fast-melting glaciers. "These are

nature's gifts – they protect us, they won't harm us if we don't harm them."<sup>8</sup>

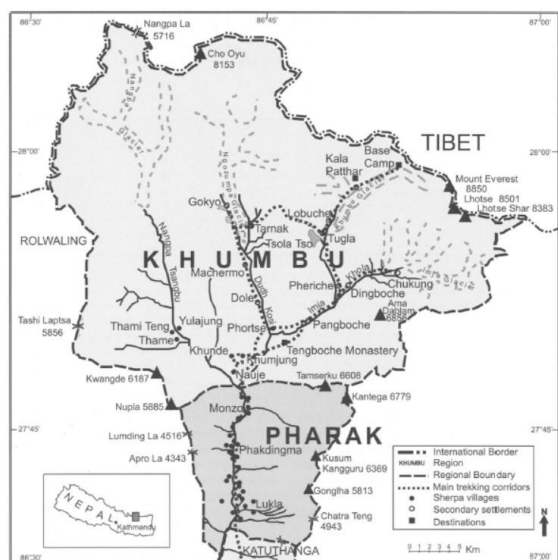
Ganesh Kharel, a teacher at the Mahendra Jyoti Secondary School in Chaurikharka village of the Everest region recognizes the importance of educating the children about their fragile surroundings, especially in such an environmentally sensitive unique region. He values the importance of preserving nature and educating the current generation on this who can contribute to building a sustainable future based on today's education. "They are the ones who will inherit this beautiful but fast-changing landscape," he says.<sup>9</sup>

Even if the curriculum does not cover much knowledge about the mountains and climate change, the children in Kharel's school are curious about their surroundings and look for ways to upgrade themselves about the place they live in. "Our teachers tell us about what's happening around us though, in bits and pieces. And we learn from life," says Mingma Chhamji Sherpa, a student of class ten in the Mahendra Jyoti Secondary School. Mingma helps her mother in their agriculture fields. "We now grow cauliflower and capsicum – vegetables we didn't grow earlier."<sup>10</sup>

### **TOURISTY AND NON-TOURISTY LAND**

The Khumbu region has been hosting international trekkers since 1964 while attracting international mountaineers since 1950. Tourism in the region has seen a dramatic change since then. The regional airport in Lukla, Pharak was expanded in 2001 to accommodate 60,000 people per year and has been acting as a major gateway to the region. Well-defined tourist routes started to develop in the region, including deep routes like Gokyo during the 90s. Map 1 shows the main trekking corridors throughout both the Pharak and Khumbu regions. Before that tourists were seen camping and hiking as commercial groups with Sherpas/non-Sherpas as guides and porters. But after 1990, as much as commercial groups, individual trekking using local inns also became popular. Most of these tourists per year preferred to stay in Sherpa-owned and operated inns. Although hosting the trekkers since 1964 has brought a major change in the way of living for the Sherpa communities. During the 1970s they started renovating their family homes and

herding huts into inns. The Sherpas who used to live their life relying on farming and herding, now put their entire concentration on hosting their guests.<sup>11</sup> This had a huge impact on the forests and vegetation in the region. They started cutting down trees for timber-built inns and firewood, up until the 1979 regulation on Sagarmatha National Park, which allowed each family 3 to 6 trees per structure. The Khumbu Sherpas then relied on importing trees from the Pharak region. In the mid-80s both Khumbu and Pharak region were flourishing with bigger inns. This went well up until the mid-90s when Pharak put restrictions on exporting from their forests. The Khumbu builders then faced the challenge of bringing timbers from far afield through porters or government helicopter service, which cost them a fortune.<sup>12</sup>



Map 1: Main Trekking Corridors, Pharak and Khumbu region

Tourism is a cornerstone of the Sherpa economy, but it has introduced a host of environmental, social, and cultural challenges. While it provides vital economic benefits, the steady influx of trekkers places immense pressure on the fragile Khumbu ecosystem. Overcrowding and mismanagement have led to severe pollution on Everest, with discarded trash and waste marring its slopes. This contamination threatens not only the mountain's natural beauty but also critical resources like clean water, arable land, and forests. Deforestation, water pollution, and the erosion of trails further strain the environment,

jeopardizing the livelihoods that Sherpas have historically depended upon.

The risks associated with guiding trekkers and climbers have also escalated due to climate-related hazards such as avalanches, unpredictable weather, and glacial melt. As a result, many Sherpas are discouraging the younger generation from taking up this once-revered role, which is now seen as increasingly dangerous. While tourism has created new opportunities, it has simultaneously disrupted traditional ways of life. Many Sherpas have shifted from farming and herding—practices that once formed the backbone of their culture and self-sufficiency—to tourism-related jobs, creating a growing disconnect from their ancestral roots.

This generational shift poses a significant cultural dilemma. Younger Sherpas are drawn to the financial rewards of tourism but at the cost of preserving their cultural identity and traditional skills. Meanwhile, senior members of the community advocate for diversifying career opportunities for the next generation, aiming to foster sustainable livelihoods that ensure long-term resilience against environmental and economic uncertainties. The challenge lies in balancing economic growth with environmental stewardship and cultural preservation, ensuring that the Sherpa way of life endures in harmony with their ever-changing landscape.

## THE UNCERTAIN FUTURE

'I See No Future': Sherpas Leave the Job They Made Famous-The New York Times. The centuries-old traditions, spiritual beliefs, and unique circumstances are reflected upon Kami Rita Sherpa's perspective on measuring success by respecting and understanding the inherent risk and fragility of these majestic mountains, rather than measuring it by conquering peaks. Despite his own success as a mountain guide who holds the record for most ascents of Mount Everest, took his 24-year-old son, Lakpa Tenzing, to the foot of the magnificent peak, Mt. Everest, in late 2021 and told him this was as close as he should think about coming to it!

From encouraging the younger generation to climb peaks, it is fascinating to see how the traditional beliefs within Sherpa families have shifted to concerns about safety and the

increasing risks or dangers associated with high-altitude mountaineering. Dangers like unannounced avalanches, the possibility of falls, and extreme weather. Families have lost children, and men have lost limbs to the extremeness of these mountains. According to the Himalayan Database, a mountaineering record-keeping body, nearly one-third of the 315 recorded deaths on Everest over the past century have been of Sherpa guides. Despite all this awareness of the risks associated, families who continue engaging in the profession have a deep understanding of the uncertainties and sacrifices involved, which are overpowered by necessity and traditions. But at what cost? Sherpas early in their career make about \$4,000, minus expenditures for arranging gear, for their once-a-season Everest expedition, which accounts for the bulk of their yearly income. The earnings barely cover the expenses of four. In addition, the lack of security and safety nets for Sherpa guides and their families, in case of death or disabilities, turns into an unimaginable burden which is causing them to shift away from the profession. The failure of the government which promised welfare programs and limited insurance payments resulted in families sending the young to study abroad or find employment in cities within Nepal, for a stable livelihood, rather than risking their lives for nothing.<sup>13</sup>



Fig 13: 'I See No Future'  
Courtesy: The New York Times

## ROLE OF GOVERNMENT OF NEPAL

The Nepali Government earns millions of dollars each year through the tourism industry and by that, directly through the Sherpa community. In the avalanche on Everest in 2014, which claimed the lives of 16 Sherpas, the community highlighted the requirement for

proper safety measures, meaningful reforms, and support for this industry. After the disaster, the Sherpas threatened to cancel Everest expeditions, which bring in millions of dollars every year to Nepal. The government then announced the welfare fund for climbing guides, but, according to government officials and expedition leaders, it has never been activated. Although the 2014 disaster brought attention to critical issues associated with this profession, consistent efforts are required to transform this awareness into meaningful solutions. "While insurance policies have been improved, they give the families of Sherpas only about \$11,000 in the event of death and about \$3,000 in case of injury. They also provide a guarantee of about \$5,000 to cover expenses for a rescue operation in case of an accident. To manage expeditions on Nepal's peaks above 20,000 feet — climbing is allowed on 414 of them — the industry needs at least 4,000 high-altitude-acclimatized Sherpas, according to Tashi Lakpa Sherpa, the founder of 14 Peaks Expedition, a mountaineering company."<sup>14</sup>

Additionally, in an intention to economically support the Sherpa community, by creating more job opportunities for local porters and yak herders, the government generated a rule requiring gear to be carried to base camp from Syangboche, the site of the nearest airport to Everest, at 12,467 feet, to the base camp, at 17,500 feet, by porters and yak. However, the government was forced to reverse the decision after expedition operators complained that there were not enough porters and yaks. In March, only weeks before the season began, officials ordered that helicopters be allowed to ferry the loads to the base camp. As Sherpas abandon the mountains, expedition organizers say they are already seeing patterns.<sup>15</sup>

## EXISTING LIVING CONDITIONS AND LIFE-STRUCTURE

The distinctive ways of Sherpa settlements are the reflection of their adaptation to the environment in the high altitude. The settlements grow near the main rivers passing through the region, the Bhoté Kosi and Dudh Kosi Rivers. Khumbu Sherpas have developed a unique way of seasonal settlements between their main villages and their other dwellings at different altitudes as far as twenty kilometers away from each other. Some families maintain

more than half a dozen houses in different villages. Their movements depend on the season change and agriculture and herding management. Apart from the touristy season, their living arrangements depend on the requirements of their herding and crop generation. Sometimes the families scatter themselves in their various dwellings according to priorities, social responsibilities, and sometimes personal preferences. They maintain these scattered patterns of lifestyle, from a period of a week to many months. But following the two main tourist seasons, March-May and September-November, every year the families come back to their main villages, as these months are the main source of their income.<sup>16</sup>



*Fig 14: Khumjung Village*  
*Courtesy: Google Earth*



*Fig 15: Typical Sherpa House/Lodge*  
*Courtesy: Wikimedia Commons*

The Khumbu Sherpa maintains locally acquired materials to build their houses. Their dwellings are structured with un-mortared stone and gabled roofs of slate, fir shakes weighted with stones, or corrugated iron. One of the local materials they use is white clay, which gives their houses a distinctive color. After the government restrictions in the late 1970s on the tree-felling in the Sagarmatha National Park, they bring up all their timbers from Pharak, and the corrugated sheets, glass, and

other accessories are brought up as well, all by the process of portering.

The standard layout of their two-story houses is very similar to each other. Notable is that these designs are maintained by almost all the Sherpa families, except for the poorest ones. The lower story provides a stable for the livestock and a storage area for the grain, fodder, and fuel wood. The upper story is mainly a single large room with south-facing (front side) windows, including a long window bench with tables to allow the trekkers to dine in and a fireplace in the middle of the room. The back windowless wall is often used to display household wealth like brass cooking pots, carpets, and groceries imported from the lower altitude villages. The highly religious communities and followers of Buddhism also like to cover their walls with pictures of saints and their own families. They also maintain either a separate room or just an altar on the left side of the house.<sup>17</sup> The toilets are not considered to be a part of the house and are placed in the back, separated and away from the house. Most of the houses face the same direction, not only prioritizing the sunlight but also their beliefs about auspicious and inauspicious directions. The living patterns are the standard housing conditions seen most often, while today the housing patterns extend beyond that, prioritizing tourism. These houses are now mostly renowned as Teahouses amongst tourists.

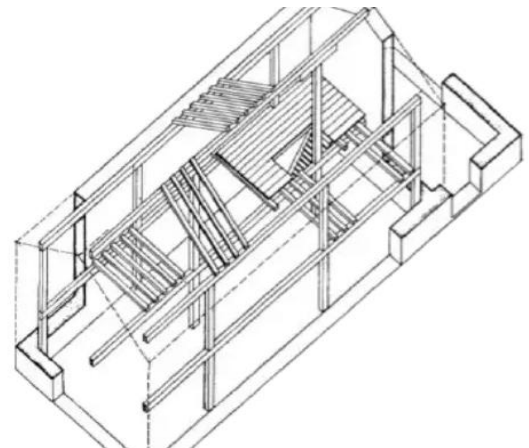


*Fig 16: House structure*  
*Courtesy: Architecture Student, India*



## TEXTURES

## MATERIALS PALETTE

**Stone:** A prominent building material, particularly in the higher elevations where stone is abundant. Stone masonry techniques, sometimes with mud mortar, are commonly used for walls and foundations.

**Wood:** Timber, particularly from trees like deodar, is crucial for beams, rafters, and structural elements in traditional Himalayan architecture. The use of wood contributes to earthquake resistance and provides stability to structures.

**Mud and Clay:** Mud and clay are used in various forms, including rammed earth construction, wattle and daub (mud plastered on a framework of bamboo or other materials), and as a component in brick-making. These materials are readily available and play a significant role in vernacular architecture.

**Slate:** Slate, especially in the lower valleys, is used for roofing, providing a durable and weather-resistant covering for buildings.

**Bamboo:** Bamboo, particularly in the lower valleys and eastern Himalayas, is used for scaffolding, roofing, and sometimes as a structural element in construction, especially in areas where timber is scarce.



Current construction practices include

- (A) a reduced weight gable,
- (B) laying of the floor joist in the wall,
- (C) a light upper story,
- (D) resting of the floor joist on the window frame,
- (E) a roof-to-wall connection, and
- (F) a thin layer of mud mortar in the masonry.



## Discourse

**Dolores Hayden**, urban historian, and poet is a professor emerita at Yale University. Her books on the American landscape include *The Power of Place: Urban Landscapes as Public History* and *Building Suburbia*. Based on her extensive experience in the urban communities of Los Angeles, historian, and architect Dolores Hayden proposes new perspectives on gender, race, and ethnicity to broaden the practice of public history and public art, enlarge urban preservation, and reorient the writing of urban history to spatial struggles.

Amongst her many books and poems, specifically in *The Power of Place*, I find inspiration for my paper based on the outlines she put up that included the chronological change in elements from the social history of a region to connect the lives of people that have changed over the time, expressed through an urban space. She explores the idea of nurturing a space through the memory of its community. The book possesses a decade of research through community engagement, and walking tours, including artists historians, and practice by *The Power of Place*, a nonprofit organization Hayden founded in downtown Los Angeles, Hayden revived the urban landscape history as African American, Latino/a and Asian American families have experienced it. Los Angeles was just the start, she then explored the idea throughout the United States, from New York to Charleston, Seattle to Cincinnati, Hayden led a new movement across urban preservation, public history, and public art to accept American diversity at the heart of the vernacular urban landscape.

**Rebecca Solnit** is an American writer. Solnit has worked on environmental and human rights campaigns since the 1980s, notably with the Western Shoshone Defense Project in the early 1990s, as described in her book *Savage Dreams*, and with antiwar activists throughout the Bush era. She has discussed her interest in climate change and the work of 350.org and the Sierra Club, and in women's rights, especially violence against women.

Solnit inspired me through her book *Wanderlust: A History of Walking*. Rebecca Solnit relates walking and thinking, walking and culture, and argues for the necessity of preserving the time and space in which to walk

in an ever more automobile-dependent and accelerated world. She argues on how walking reflects the many occasions from history, socially, politically as well as aesthetically. Walking has shaped our culture, and everyday walkers play a big role in that.

**Anne Feenstra**, T.U. Delft 1993 Master of Architecture, worked for over a decade in Europe and London. His passion for design and build-ability combined with his determination to make architecture, took him to teach at Kabul University, Afghanistan, where he worked on design and building for the first National Parks of the country, the National Museum, and five UNICEF Maternity Waiting Homes. In 2009, he moved to India to guide thesis students at the prestigious School of Planning and Architecture in Delhi and worked in highly innovative urban processes like DELHI2050 and Mussoorie 2040, and challenging rural projects in Sikkim, Uttarakhand, Ladakh, and Punjab. His inclusive and sustainable architecture in Afghanistan and India made Professor Anne Feenstra a recipient of the Global Award for Sustainable Architecture 2012. Throughout his career, he has worked with different communities and in different landscapes, which is very inspiring. And on top of it, Feenstra is currently working with a non-profit organization on designing a sustainable environment through waste management in the Himalayan region.

**Nirmal Purja**, also known as Nimsdai, is a renowned Nepalese mountaineer and former Gurkha and British Special Forces soldier. Born in 1983 in the Myagdi District of Nepal, he grew up in a humble family in the Dhaulagiri region, near the Himalayas. Nirmal gained global fame for his extraordinary mountaineering achievements, most notably completing the ascent of all 14 of the world's 8,000-meter peaks in just six months and six days in 2019. Purja is also celebrated for his advocacy of Nepalese climbers' contributions to the mountaineering world, often overshadowed by Western climbers. In 2021, he was part of the first all-Nepali team to summit K2 during winter, a historic achievement. Beyond climbing, Nirmal promotes awareness about climate change, the environment, and the importance of preserving the Himalayas. His courage, determination, and dedication continue to inspire climbers and adventurers worldwide.

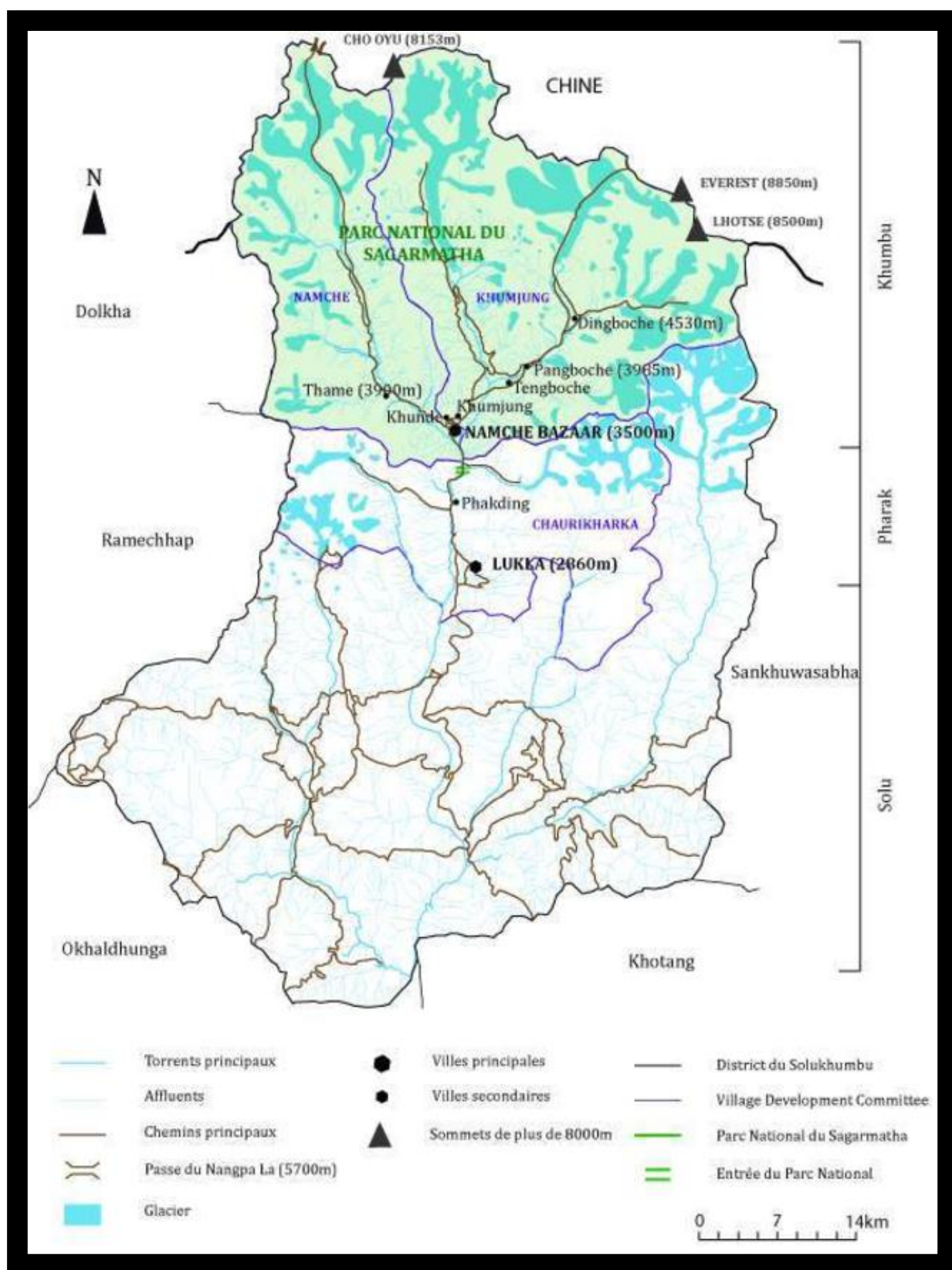


LOCATING SHERPAS IN THE WORLD MAP



The Khumbu region, Nepal  
 Oldest homeland of the Sherpas  
 Four of the world's tallest mountains,  
 including Mount Everest  
 Around 10,000 Sherpa people

Map 2: Locating Sherpas on the World map



Map 3: Solu-Khumbu District

## THE LAND: LOCATION SEEN LOCALLY AND GLOBALLY

Nepal, a landlocked country nestled in the heart of the Himalayas, is renowned for its breathtaking landscapes, diverse culture, and rich history. Home to eight of the world's ten highest peaks, including the iconic Mount Everest, Nepal attracts adventurers and spiritual seekers from across the globe. Among its most celebrated communities are the Sherpas, an ethnic group known for their unparalleled mountaineering skills, resilience, and deep-rooted traditions. Originating from the Tibetan Plateau centuries ago, Sherpas have settled predominantly in the mountainous regions of Nepal, particularly in the Khumbu region.

Solu, Pharak, and Khumbu are the three regions that comprise the Solu-Khumbu district, located in the Himalayan region of Nepal. Among these, Khumbu, the northernmost area that forms part of the Sagarmatha National Park, serves as the primary research site for this paper. This region holds global significance as the location of Mt. Everest, the world's highest peak, which has cemented its reputation as a premier tourist destination in the Himalayas. The importance of this area is highlighted in Map 1, which illustrates the Solu-Khumbu district and identifies its main and secondary villages. Beyond its fame for Mt. Everest, the Khumbu region is also celebrated for its vibrant villages, which are deeply rooted in Sherpa culture and traditions. Namche Bazaar, locally referred to as Nauje (elevation 3,400 meters), is widely recognized as the capital of Sherpa communities. Renowned as a key stop for trekkers, Namche functions as the primary economic hub of the region, offering services, accommodations, and cultural interactions essential for both residents and visitors.

Other notable villages in the region include Khumjung (3,790 meters) and Khunde (3,820 meters), which have historically attracted the attention of development practitioners and researchers. These villages gained prominence following the studies of Christoph von Fürer-Haimendorf, a pioneering ethnographer, who conducted extensive fieldwork here in the 1950s. Since then, they have remained pivotal sites for understanding Sherpa life, culture, and development in the region.

In addition to these prominent villages, the Khumbu region is dotted with numerous smaller secondary settlements inhabited by Sherpa communities. Many of these are strategically located near the confluence of the Bhote Kosi and Dudh Kosi rivers, underscoring the importance of these waterways to local livelihoods and settlement patterns. These secondary villages, while lesser-known, contribute significantly to the cultural and ecological tapestry of the Sagarmatha National Park, presenting unique opportunities for exploration and study.

Although Sherpa communities are widely dispersed throughout the Himalayan region, as depicted in Map 3, the specific Khumbu Sherpas hold a distinct identity, residing in the Khumbu region for centuries. This ethnic Sherpa community, numbering approximately 10,000 individuals, is distributed across 13 main villages within this mountainous terrain. For the Khumbu Sherpas, territorial belonging is deeply intertwined with their sense of identity. They regard themselves as members of the "old clan," a term that underscores their ancestral ties to the Khumbu region.

Interestingly, this territorial identity extends beyond geographical boundaries and influences social categorization. Even children of Khumbu Sherpas, if raised outside the Khumbu region, are not referred to as "Khumbuwa" (people of Khumbu). Instead, their identities are tied to the places where they reside, such as Pharak Sherpa, Darjeeling Sherpa, Shorung Sherpa, Kulunge Sherpa, or Kathmandu Sherpa. This naming convention reflects the integral role of territoriality in the Sherpa identity and emphasizes how place shapes cultural and social connections.

Within the Khumbu territory, the villages reveal striking disparities in their levels of development, shaped largely by their geographical location and access to resources. Certain villages, such as Namche Bazaar, have flourished as bustling hubs of tourism, benefitting immensely from their strategic proximity to major trekking routes and iconic landmarks like Mount Everest. These villages enjoy relatively better infrastructure, including guesthouses, markets, communication networks, and healthcare facilities, driven by the steady influx of trekkers and climbers. Tourism has provided residents with opportunities to diversify their income through

guiding, lodging, and trade, fostering economic growth and improving their standard of living.

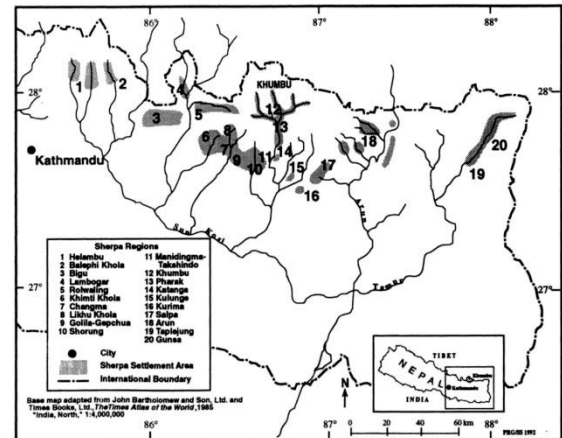
In contrast, many other villages in the Khumbu region remain marginalized, bypassed by both trekkers and developmental efforts. These remote settlements often lie off the main trekking routes, making them less accessible and less attractive to visitors. Consequently, they lack basic infrastructure such as reliable roads, schools, healthcare centers, and consistent electricity. Economic opportunities in these villages are limited, forcing residents to rely on traditional subsistence agriculture or seasonal migration for work. The absence of essential services exacerbates hardships, leading to issues such as inadequate education, poor healthcare, and reduced quality of life.

For the inhabitants of these overlooked villages, the challenges are not only economic but also existential. Many grapple with whether to continue living in isolation or to migrate to more developed areas in search of better opportunities. This struggle raises critical questions about the sustainability of life in these remote areas, where limited resources and development efforts are juxtaposed against the region's rich cultural heritage and stunning natural beauty. Addressing these disparities requires tailored strategies to balance the needs of tourism, conservation, and the equitable development of all villages in the Khumbu region.

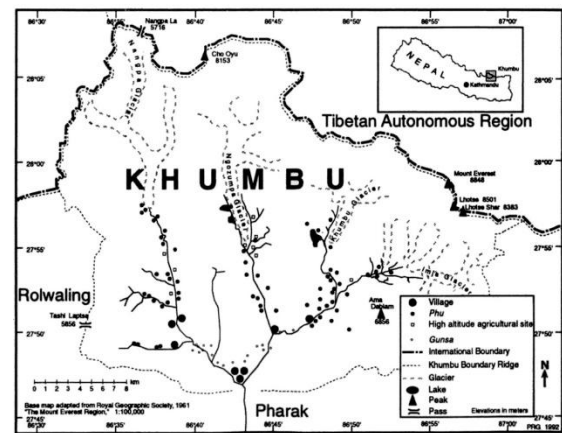
However, shifting trends in trekking and tourism are beginning to alter this dynamic. Trekkers and adventurers increasingly seek authentic and off-the-beaten-path experiences, venturing into the lesser-known corners of the Khumbu region. This growing interest offers a glimmer of hope for these neglected settlements, which may now find themselves included in trekking circuits and eco-tourism initiatives.

Map 4 and 5 provides a detailed visualization of the settlement patterns within the Khumbu region, highlighting the spatial distribution of villages and their varying degrees of connectivity. It offers valuable insights into how geography and accessibility influence the development and integration of these communities within the broader regional context. This paper seeks to go beyond the well-documented main villages, turning attention to some of the less-renowned and

often overlooked settlements in the region. By investigating these villages, the research aims to uncover the socio-economic and environmental challenges that their residents face, including limited access to essential services, economic instability, and the impacts of isolation.

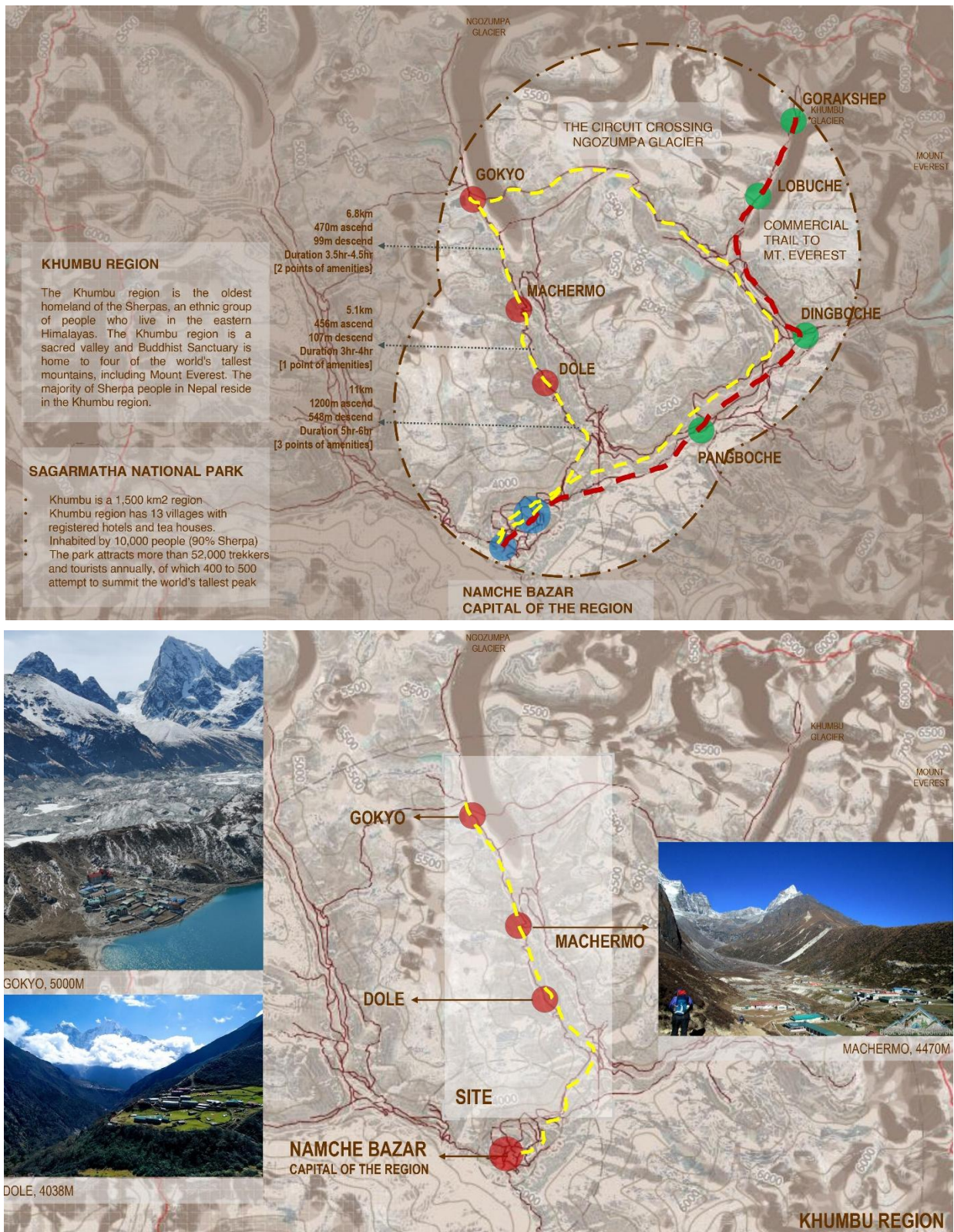


Map 4: Sherpa Settlement Area and Region



Map 5: Khumbu Settlement Pattern

Additionally, the paper will examine how life in these underrepresented settlements has transformed over time, shaped by factors such as shifting demographics, evolving tourism trends, and increasing environmental pressures. Understanding these dynamics is essential for evaluating the long-term sustainability of these communities. Through this exploration, the study hopes to contribute to a more nuanced understanding of the diverse realities within the Khumbu region and propose pathways for inclusive and balanced development.<sup>18</sup>



Map 6: Site Location, Khumbu region

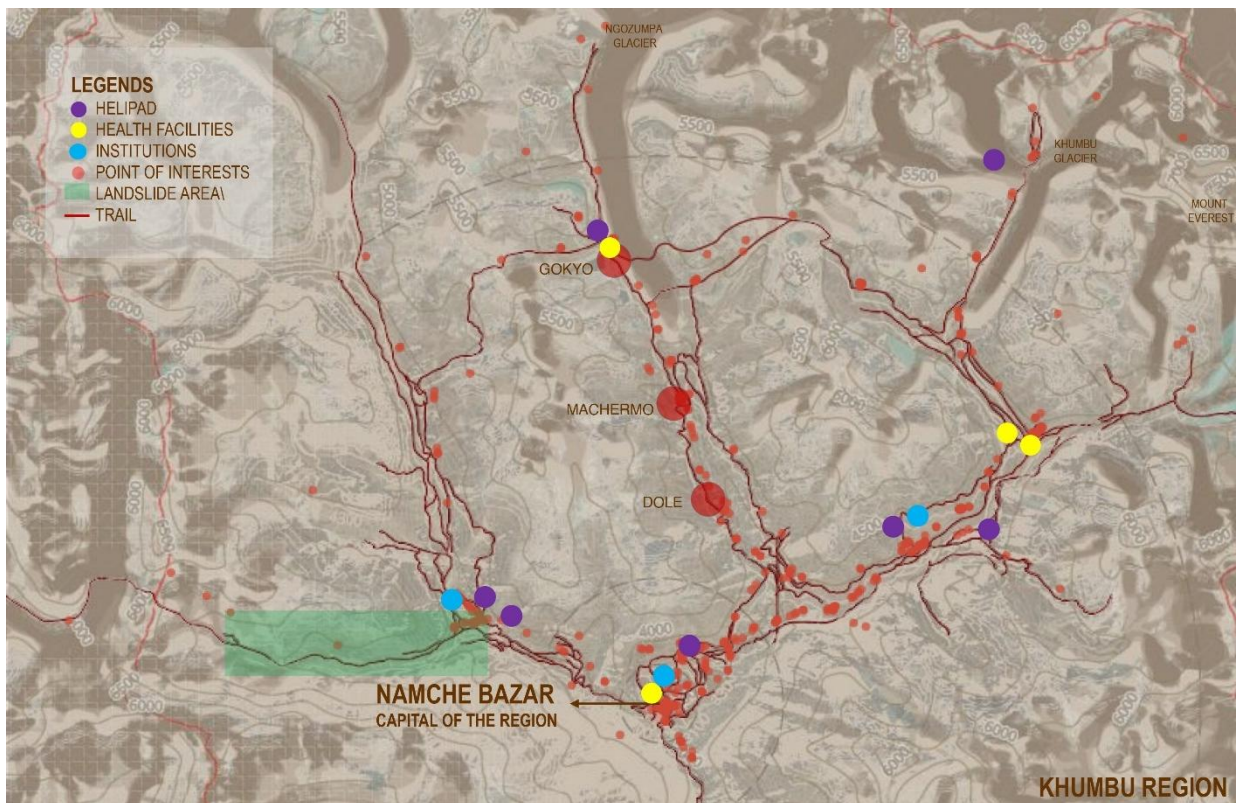
The Sherpa villages throughout the Khumbu region are not random settlements but the result of deliberate and thoughtful site selection, deeply rooted in tradition and religious principles. A defining yet often overlooked aspect of these villages is the invisible yet profound connection between the scattered groups of houses. On closer analysis, this connection becomes evident, stemming from the Sherpas' shared religious traditions. This bond fosters a strong sense of social cohesion and spiritual unity, allowing villagers to live their daily lives with purpose while enduring the challenges of an exceptionally harsh and remote environment.

Although the thesis will function as a comprehensive module for the entire Khumbu region but will concentrate specifically on three secondary villages as shown in Map 5, Dole, Machermo and Gokyo, that struggle with minimal facilities, even as tourist numbers continue to rise each year. By shedding light on these villages, the research seeks to provide valuable insights into their unique dynamics and propose practical strategies for sustainable development. The goal is to address the needs

of the Sherpa community, balancing the preservation of their cultural heritage with the pressures of growing tourism and the looming threats of climate change. Through this lens, the study aims to contribute to the long-term resilience and well-being of these remarkable mountain communities.

As depicted in the map 7, even with minimal infrastructure such as health facilities, institutions, and emergency evacuation points, the specific trail holds immense significance due to its captivating scenic views and the unique cultural and natural experiences it offers. These qualities make it a popular destination for trekkers despite the limited resources available.

This focused approach enables an in-depth examination of the distinctive challenges faced by these villages, such as the lack of adequate infrastructure and resources to accommodate both the local population and the growing number of visitors. It also highlights the strain on natural resources and the need for sustainable practices to balance economic benefits with environmental conservation.



Map 7: Major Infrastructures, Khumbu region

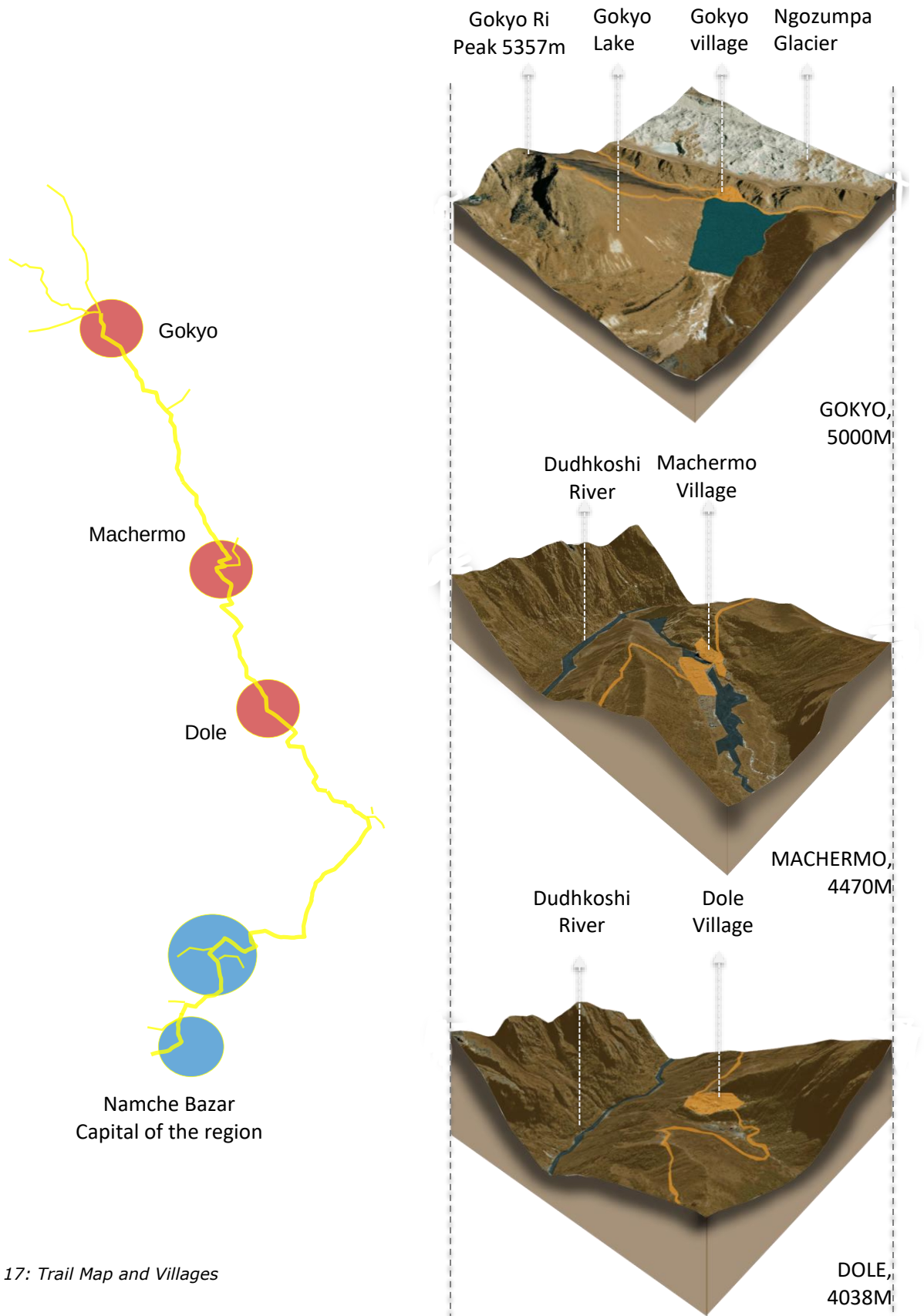


Fig 17: Trail Map and Villages

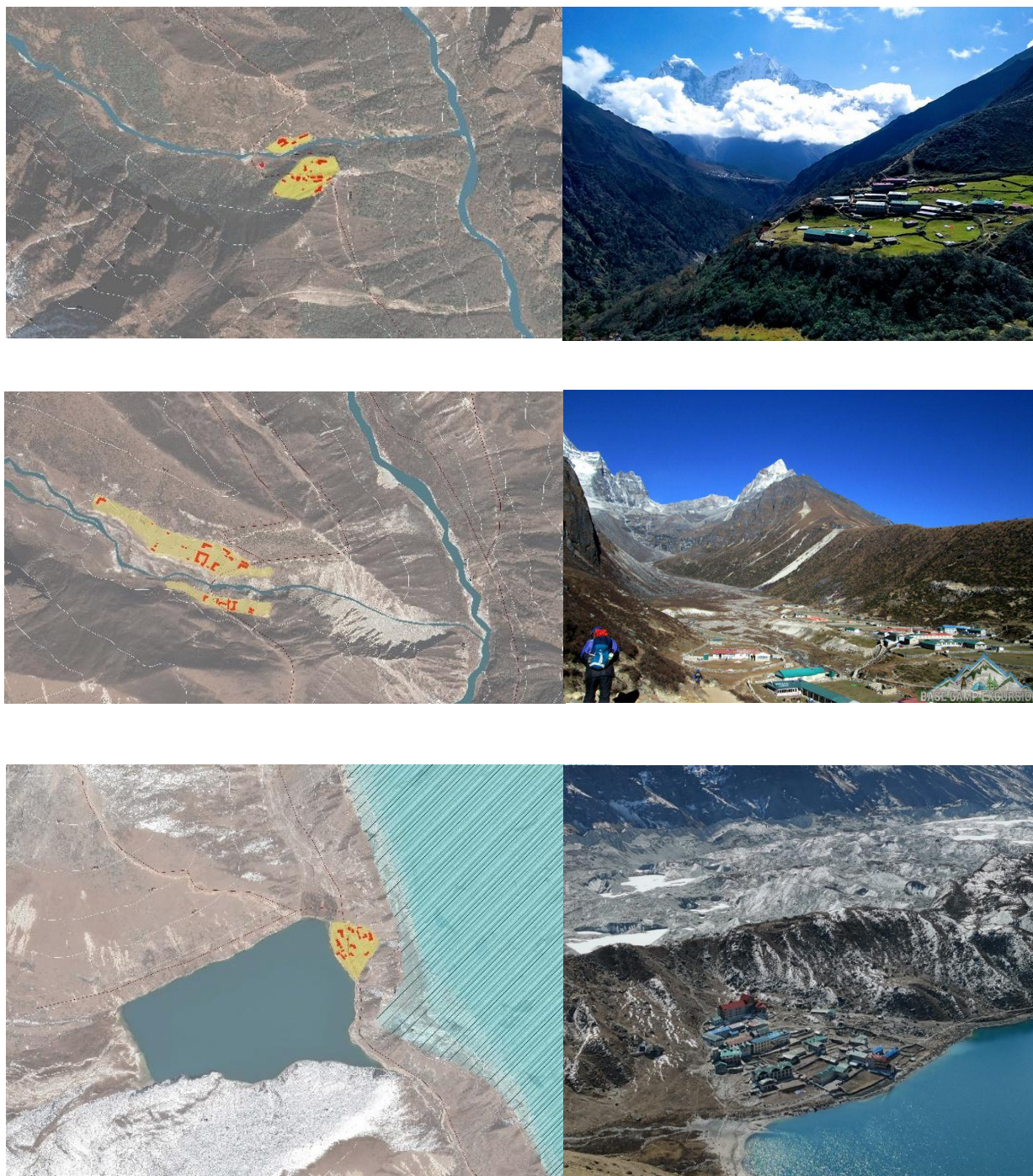


*Fig 18: Dole, Machermo and Gokyo, respectively*

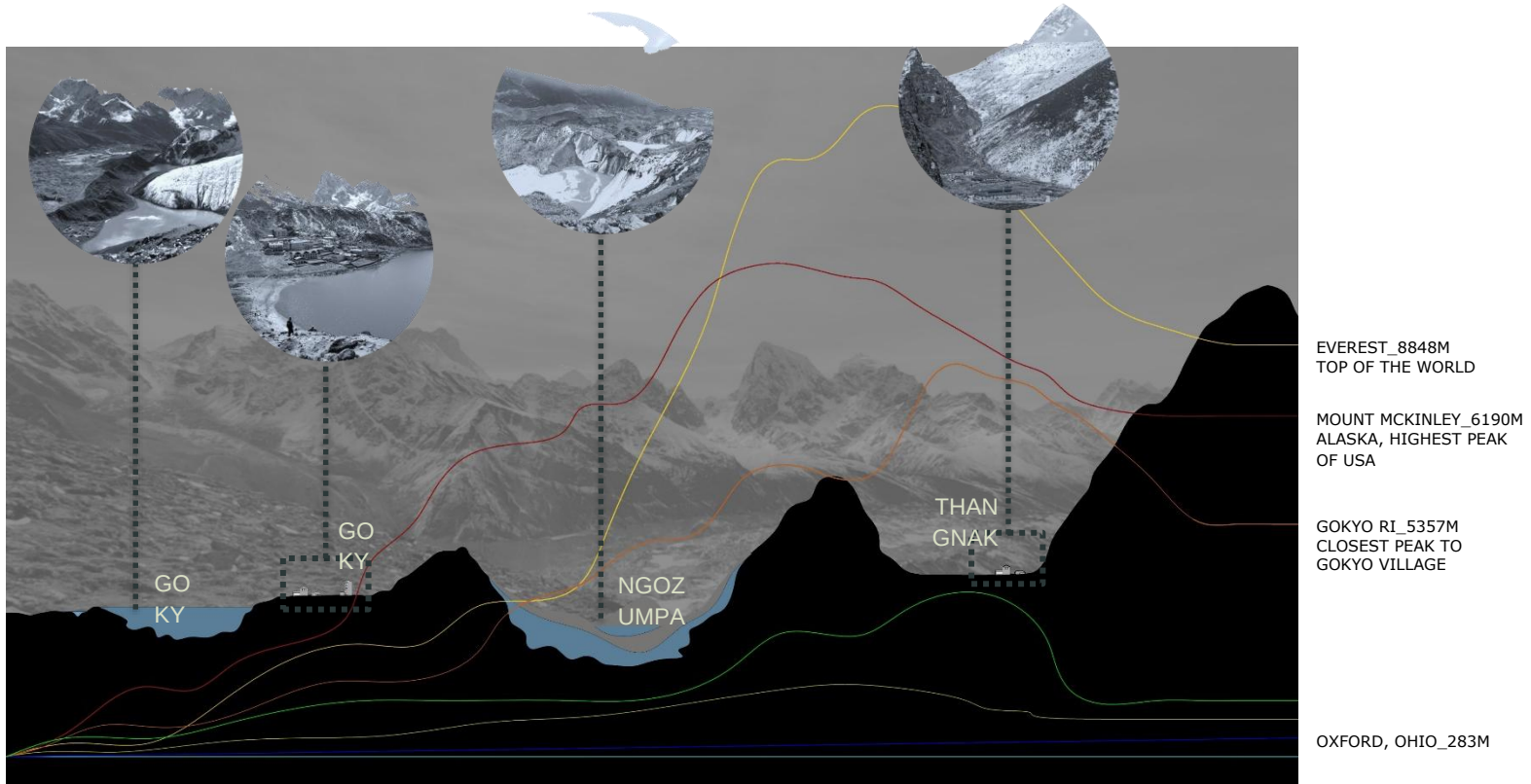


Fig 19: CONCEPTUAL SECTION THROUGH GOKYO LAKE, GOKYO VILLAGE, NGOZUMPA GLACIER TO THANGNAK VILLAGE

## CASE STUDIES

### *Patagonia National Park*

On an area of 130,499 acres Patagonia National Park, Chile now offers amazing recreation and to experience wild-life opportunities. One of the largest grassland restoration projects by Kris Tompkins under her nonprofit organization Tompkins Conservation. Along the Chacabuco River an iconic east-west valley, The Chacabuco valley, shown in Figure 1, a corridor once used by Nomadic people and wildlife is conserved and transformed into parklands with proper infrastructure for public access is what makes the park outstanding in nature.



Fig 20: The Chacabuco Valley

The project has inspired many conservationists in the process of creating a sustainable future. What I found most intriguing was the process Tompkins followed, dismantling hundreds of miles of fencing, removing sheep and cattle, without hampering the valleys and then reinstalling all of it in addition to developing public-access infrastructure, as if everything was already a part of it.

### *Community Architecture Projects in the Peruvian Jungle*

In light of, Plan Selva (Jungle Plan) -- a project to build modular schools in Amazonian villages, there were 6 interesting community projects, shown in Figure 2, built in the country's largest

natural region, by Construyeldentidad and Semillas, what I found related to my research topic very intriguingly. Building innovative projects using traditional materials and techniques and exchange of ideas between students and professional and community engagement. From designing Community centers and refugee camps to Institutions, they created spaces for communication between indigenous communities while developing relationships was one of the objectives of the project. These are the methods and techniques that inspired me or what I am looking for in building sustainable solutions for the Sherpa community living deep in the mountains.



Fig 21: Part of many communal spaces where the community engages and communicates, Peruvian Jungle

### *New Gourna Village*

Design and built between 1946 and 1952, a Conservation project, the new Gourna Village in Luxor, Egypt, shown in Figure 3, inspired many architects and planners worldwide with its intriguing nature is my third case study. Architect Hassan Fathy worked on integrating traditional materials with modern architectural principles. The project involved community engagement to empower the poor through participation, which makes the project more intriguing to me. With proper survey, conservation documentation, analysis of weather conditions, and chronological change of environment and how the existing buildings are adapting to it while making proper use of the spaces, Fathy did a brilliant job in conserving the village of 174 households. The methods and processes of his work made the village capable of the environmental challenges now and to come. Fathy was successful in

creating contemporary vernacular architecture for a post-colonial Egypt.



*Fig 22: The New Gurna Village*

## **DESIGN PROCESS AND TACTICS**

Studying the lives and livelihoods of Sherpa communities through this research paper, reveals a rich and complex history facing challenges, starting from their origin, and moving along to an era dominated by tourism and climate change. The threat to the traditional ways of life and cultural heritage of the centuries-old Sherpa community has raised concerns in terms of modernization and globalization, tourism and commercialization, climate change and environmental degradation, government policies, and cultural policies.

Addressing the theories of the three theoretical practitioners and analyzing the three case studies, the design process requires understanding these threats to the Sherpa communities through a holistic approach that prioritizes community empowerment and engagement, sustainable development, proper use of resources, and the preservation of their culture and heritage, while also welcoming the tourism. Due to these rapidly changing circumstances in their fragile surroundings, this community needs support in adapting and upgrading the perimeter of their knowledge, while maintaining their heritage to sustain their future and developing resilience from external pressures.



## DESIGN METHODOLOGY

This brings us to the core of my presentation today: a design proposal aimed at preserving the rich heritage and fragile environment of the Sherpa community, while simultaneously addressing the challenges posed by climate change and the increasing pressures of tourism.

Although the proposal is centered on the Khumbu region of Nepal, its principles and strategies are scalable and adaptable, offering a potential model for other Sherpa villages across the Himalayan range. The overarching vision is to achieve a delicate balance between modernization and tradition, ensuring that the Sherpa way of life not only survives but thrives in the face of a rapidly evolving world.

The proposal is built on several key pillars, each addressing a critical aspect of the community's resilience and sustainability:

### 1. Building Infrastructure and Maintaining Waste Management and Hygiene Systems

- Developing durable, climate-resilient infrastructure to support local communities and trekkers alike.
- Introducing effective waste management systems to combat littering and pollution caused by increased tourist footfall.
- Implementing hygienic sanitation facilities to promote public health, especially in high-traffic areas like trail junctions and lodges.

### 2. Emergency Shelter and Cultural Hub

- Establishing multi-functional buildings that serve as emergency shelters during extreme weather events or natural disasters.
- Incorporating cultural hubs within these spaces to celebrate and educate others about Sherpa traditions, creating a point of pride and engagement for locals and visitors.
- Designing these hubs with a focus on vernacular architecture to preserve the aesthetic and cultural identity of the region.

### 3. Reinforcing Homes and Lodges

- Strengthening existing homes and lodges to withstand the increasing

frequency of extreme weather events caused by climate change.

- Utilizing sustainable construction materials that align with traditional building methods, minimizing environmental impact while ensuring durability.
- Incorporating passive solar design and efficient insulation to improve energy

### 4. Organic Farming and Herding Practices

- Encouraging the adoption of **sustainable organic farming techniques** that are resilient to changing weather patterns. This includes practices such as composting, crop rotation, and the use of organic fertilizers to maintain soil health and productivity.
- Promoting Climate-resilient herding methods that align with traditional Sherpa practices, ensuring livestock can thrive despite shifting grazing patterns caused by environmental changes.
- Supporting **community-led training programs** to share knowledge about organic farming and sustainable herding, empowering local farmers and herders to adapt to the challenges of climate change.
- Establishing local markets for organic produce, fostering economic growth and ensuring that these practices contribute to a sustainable livelihood for the Sherpa community.

### 5. Addressing Glacier Impact: Formation of Lakes and Planning for Future Migration

- Identifying and monitoring lakes formed by glacial melt to mitigate the risks of glacial lake outburst floods (GLOFs).
- Assessing potential safe zones for future migration if climate change forces relocation.
- Collaborating with experts to create a comprehensive plan that incorporates geological, cultural, and logistical considerations for these scenarios.

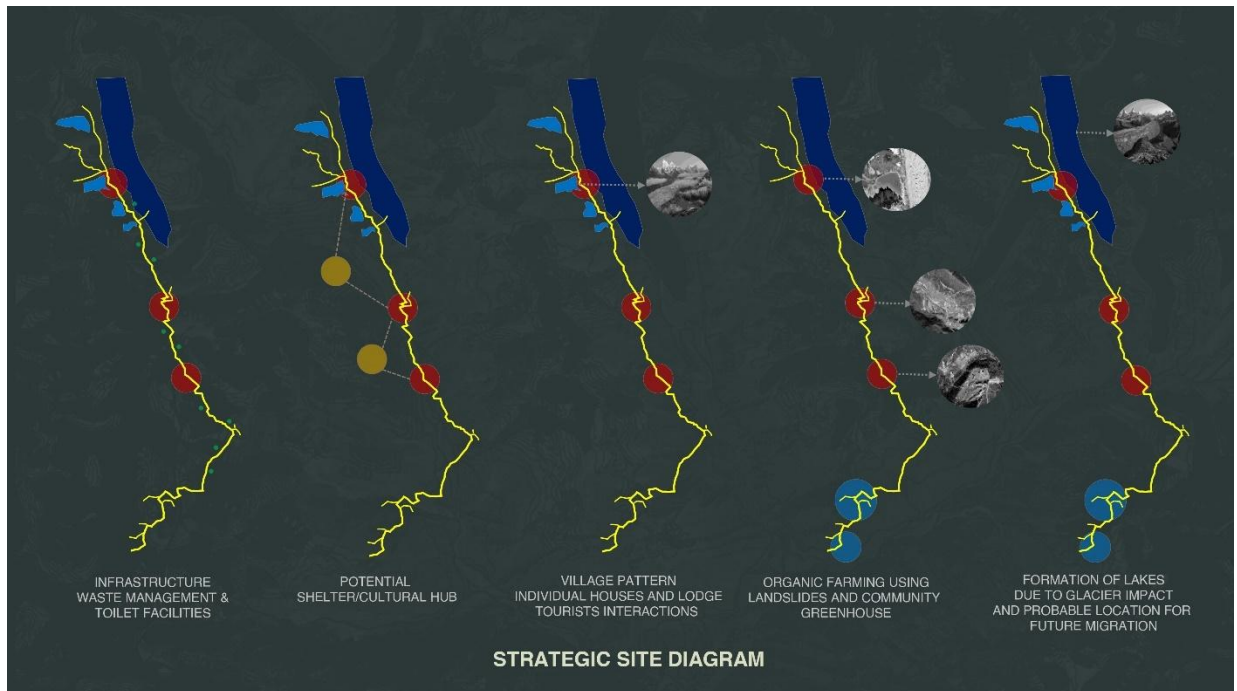


Fig 25: Strategic Site Diagram 01

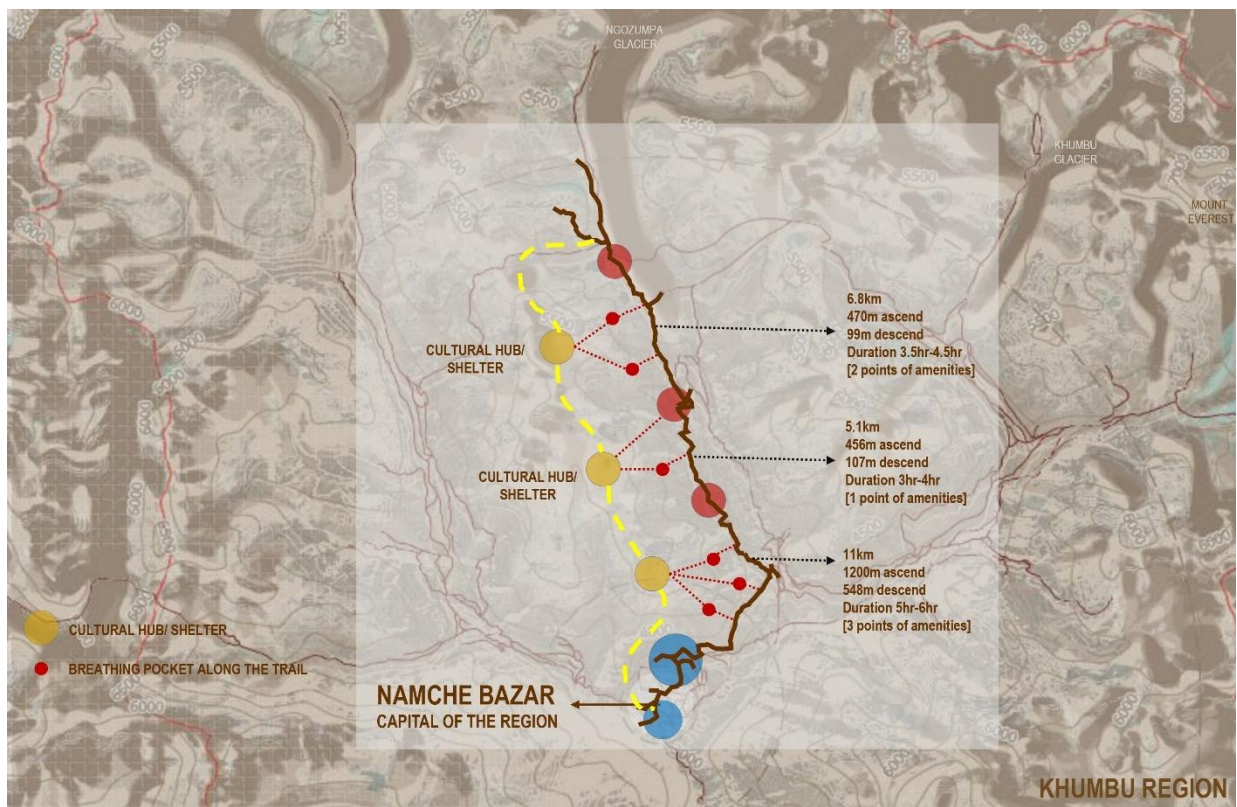


Fig 26: Strategic Site Diagram 02

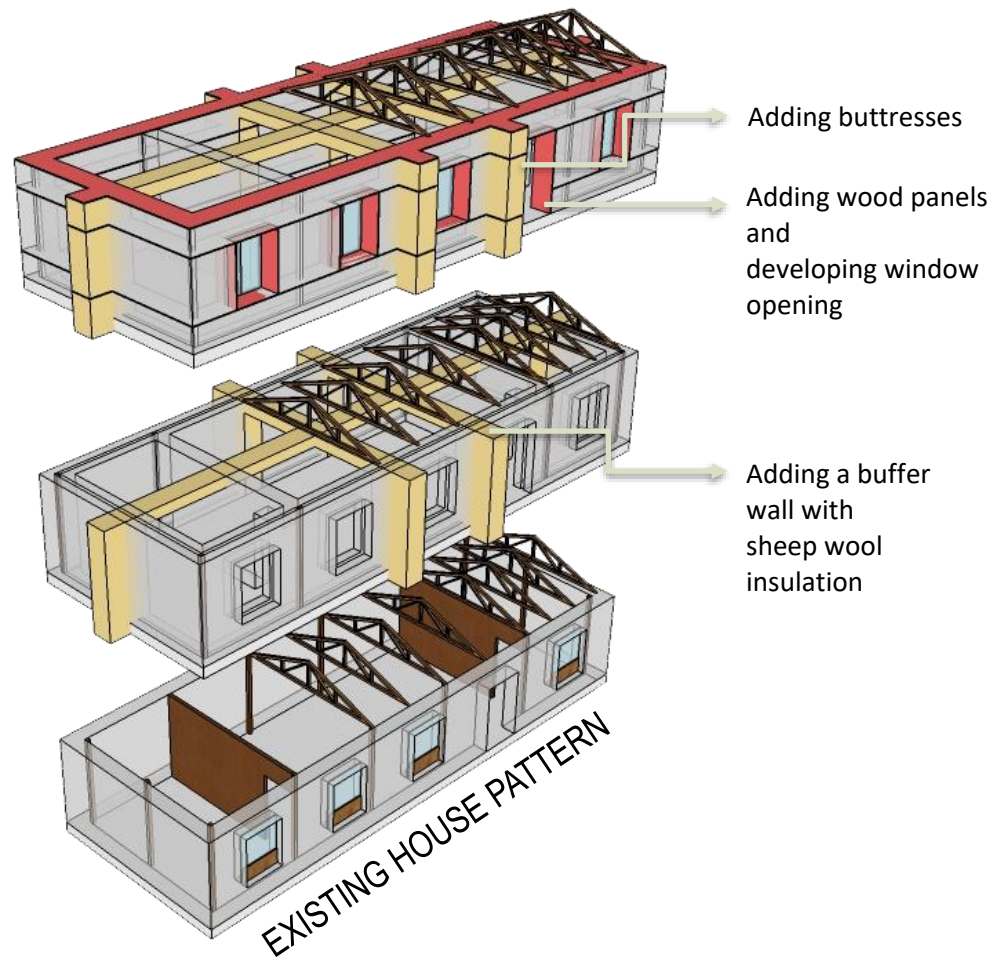


Fig 27: Design Intervention 03



Fig 28: Existing Scenario of Lodges

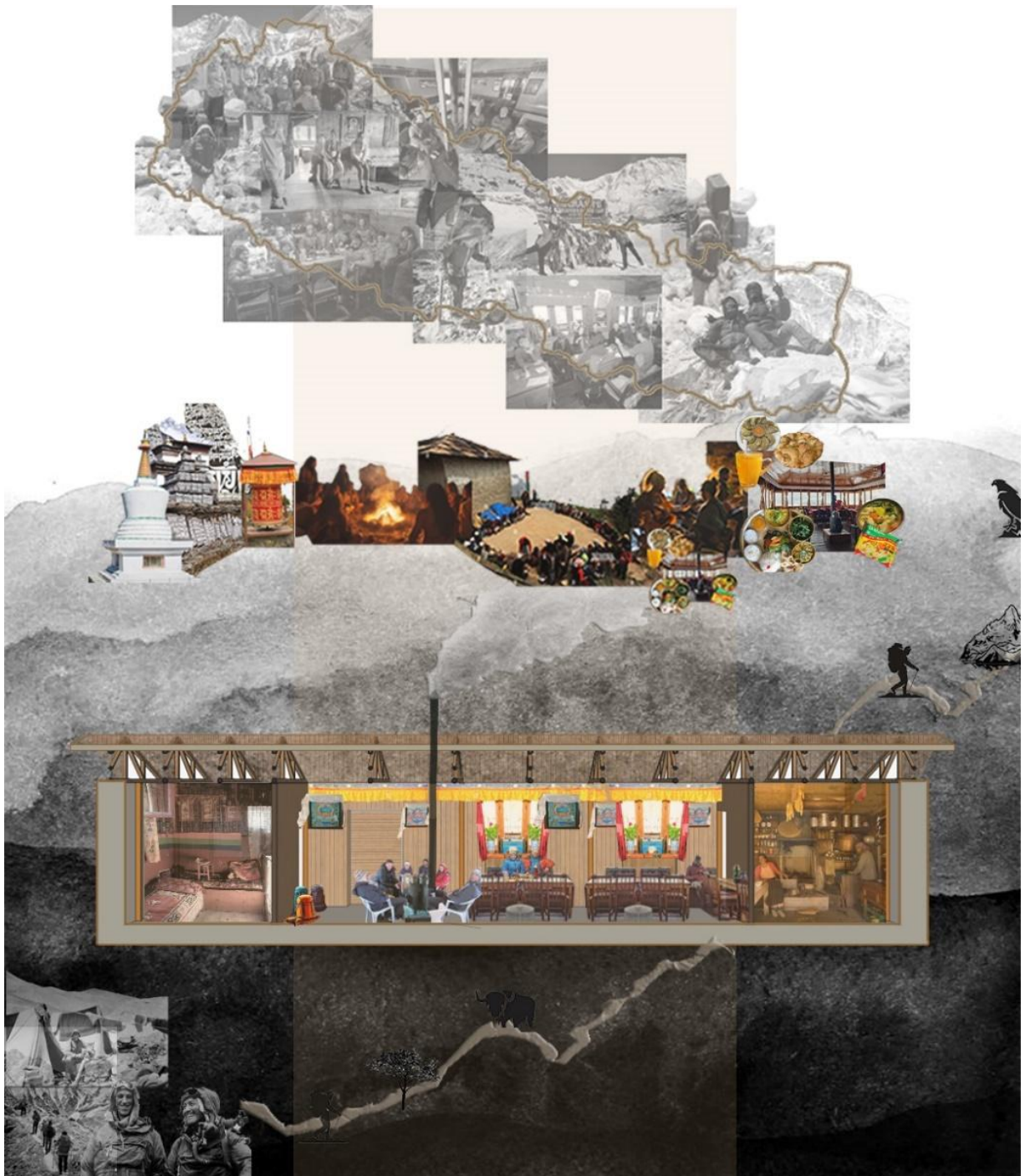


Fig 29: Living Within

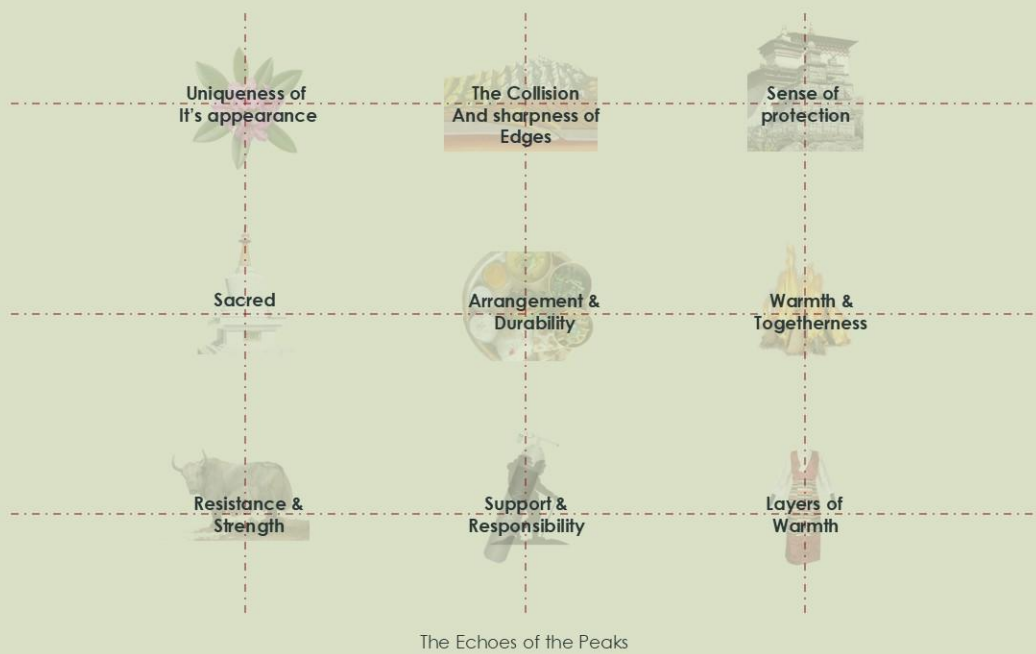


Fig 30: Echoes of the Peaks

## DESIGN PRINCIPLES: ECHOES OF THE PEAK

The design of this architectural thesis is deeply rooted in the cultural and environmental wisdom of traditional Sherpa villages, guided by nine key spatial and symbolic principles. Each concept—ranging from the uniqueness of appearance to the layers of warmth—informs the spatial arrangement and material language of the project. The collision and sharpness of edges reflect the raw, carved geometry of the mountainous context, while a sense of protection emerges from forms that shield inhabitants from the harsh climate. Sacredness imbues the design with spiritual resonance, positioning architecture not merely as shelter but as a vessel for cultural continuity. Arrangement and durability are achieved through compact, resilient structures inspired by local building practices. The design fosters warmth and togetherness, echoing the communal hearth, while also offering support and

create an architecture that resonates with the echoes of the peaks—honoring place, people, and their intertwined heritage.

## SITE AS DESIGN FORCE

The selected site for the cultural hub and shelter with tea-houses along the trail is strategically located within a natural mountain basin, offering both protection from harsh climatic conditions and visual connectivity to the surrounding peaks. The rugged topography provides a natural boundary and sense of enclosure, which enhances the feeling of refuge—a critical factor for a shelter in high-altitude terrain. The position also aligns with the natural flow of the mountain trail, making it an ideal pause point for trekkers and locals navigating the landscape. Its proximity to scattered settlement patterns and existing pathways ensures accessibility while



responsibility, much like the yaks that carry both burden and legacy. Finally, the architecture embodies resistance and strength, essential for survival in high-altitude terrains, and wraps users in layers of warmth, symbolized through textiles and spatial envelopes. Together, these principles



Fig 31: Site as Design Force

maintaining a respectful distance from fragile ecosystems. This setting offers a balance of isolation for safety and contemplation, and connection for cultural exchange and community support, making it an optimal location for a shelter-centered hub.

### **THE TRAIL**

The mountain trail is more than a physical pathway— it is a lifeline that weaves through the landscape, connecting scattered communities, cultural landmarks, and moments of rest and reflection. Carved into the rugged terrain, the trail respects the natural contours of the mountain, minimizing disruption while maximizing access and experience. It acts as both a functional route for movement and a narrative journey that reveals the region's layered histories, traditions, and ecosystems. Along its course, strategically placed nodes such as tea houses, cultural hubs, and observation points serve as places of pause, interaction, and orientation. The design of the trail embraces local construction techniques and materials, ensuring durability and low environmental impact. Ultimately, the mountain trail becomes a spatial expression of resilience and cultural identity, offering not only a path through the peaks, but also a deeper connection between people, place, and heritage.

### **TEA HOUSES ALONG THE TRAIL**

Positioned along the rugged mountain trail, the tea house serves as a vital node of rest, warmth, and cultural connection for travelers and locals alike. Inspired by the Sherpa vernacular, its elevated stone-and-wood structure offers resilience against harsh climatic conditions while evoking a deep sense of resistance and strength. The open deck invites visitors to pause and immerse in the surrounding landscape, reflecting the principle of sharpness of edges and spatial openness. Internally, the warm timber finishes and the presence of a hearth promote warmth and togetherness, encouraging shared moments over tea. Strategically located, the tea house also provides support and responsibility by functioning as a waypoint for guidance and shelter. Its modular design ensures ease of replication along the trail, maintaining arrangement and durability while celebrating the uniqueness of each site through contextual adjustments in orientation and view framing. Ultimately, the tea house is not only a physical refuge but also an embodiment of cultural hospitality and architectural empathy in the highlands.

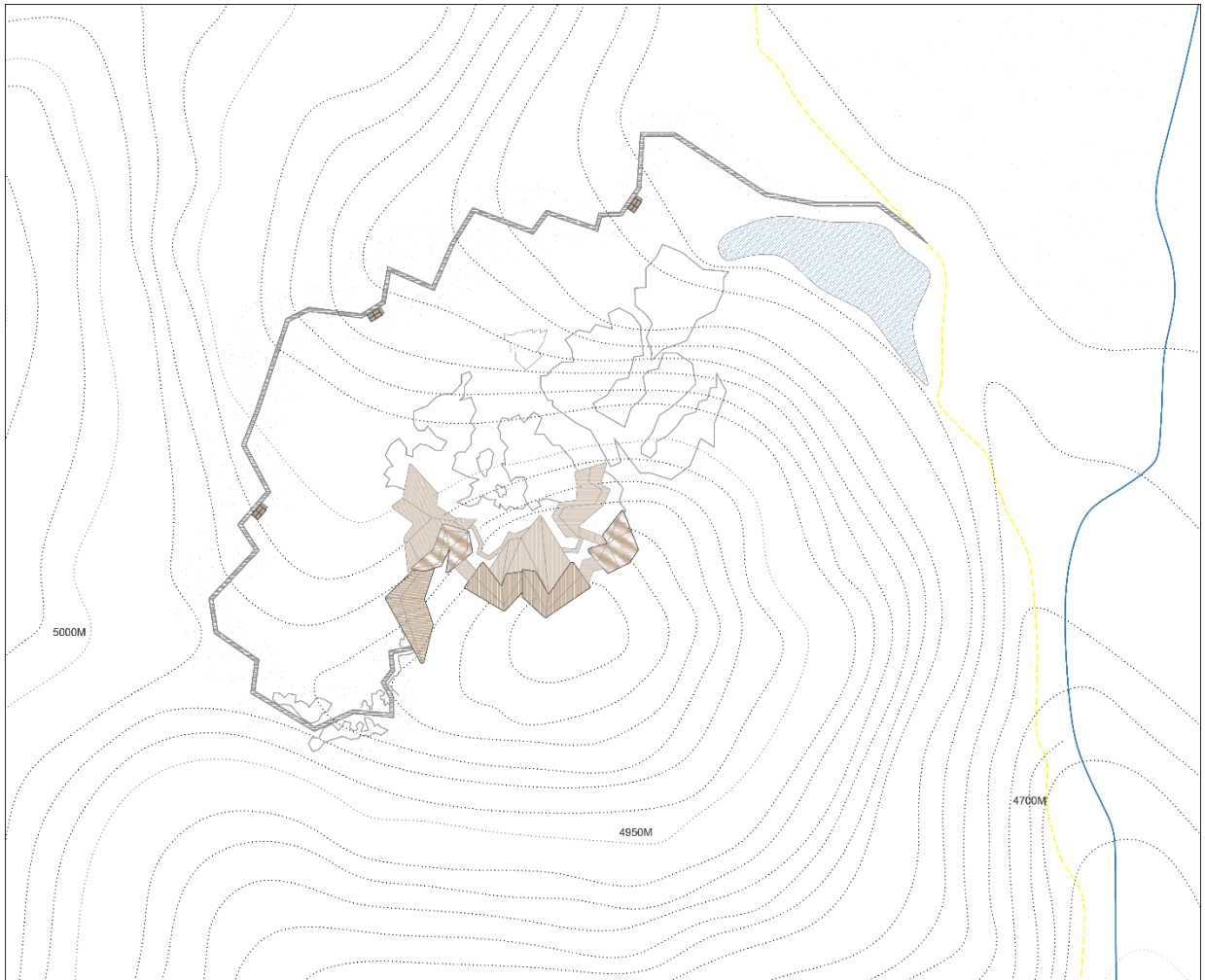


Fig 32: Site Plan



Fig 33: Teahouse

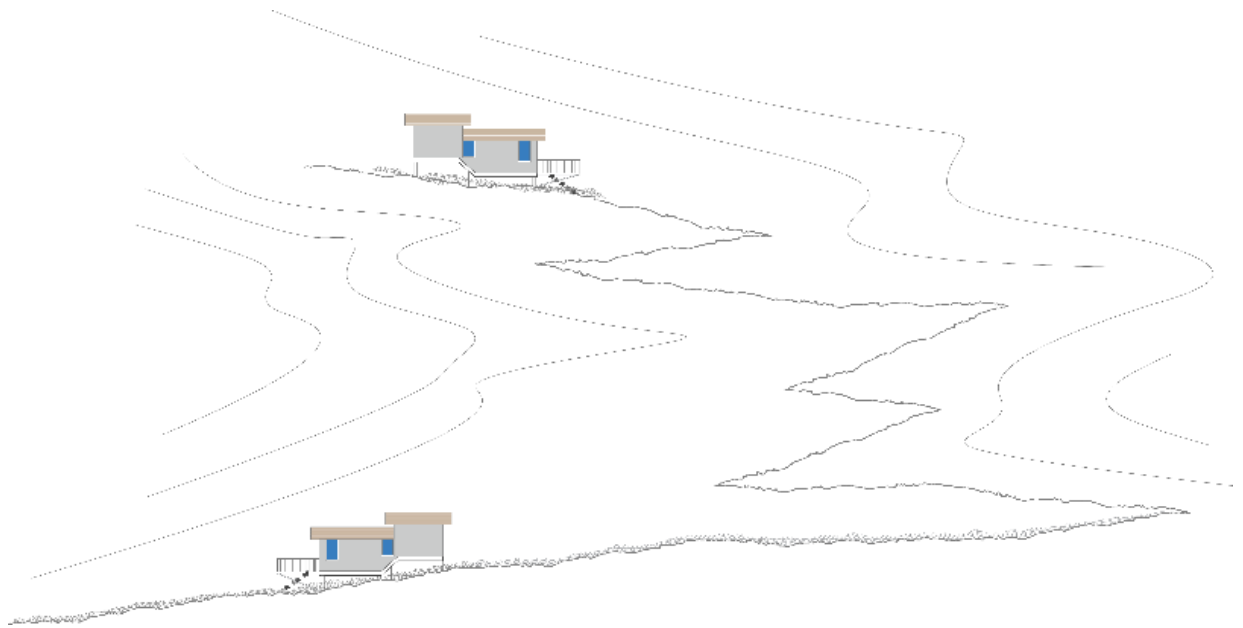


*Fig 34: The Trail and the Teahouses*

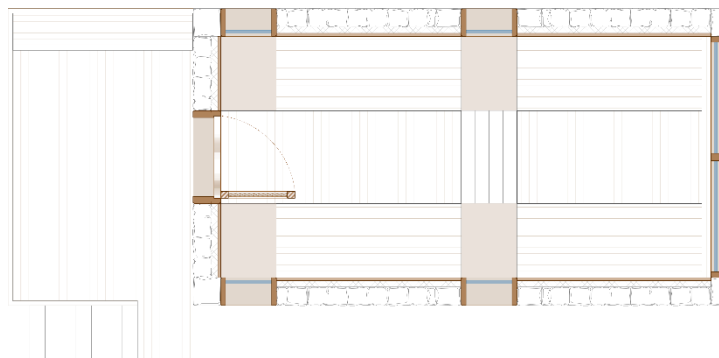


*Fig 35: Teahouse | Plan*

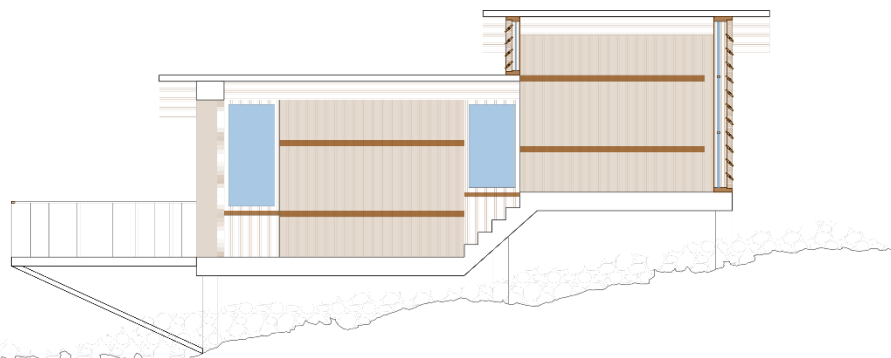


*Fig 35: Teahouse | Section*



**Fig 36:** DESIGN DEVELOPMENT

## CONTEXTUAL DESIGN DEVELOPMENT

The design responds directly to the site's rugged landscape by mapping out spatial boundaries and interventions along key geological formations. The jagged red lines trace the contours and fractures of the mountain, forming a boundary that respects the site's natural flow while proposing zones of human activity. Black circles indicate potential built nodes or anchor points, strategically positioned on more stable plateaus to minimize environmental disruption. This approach reflects a sensitive integration of architecture into the harsh, irregular terrain; the design emerges from the landscape rather than being imposed upon it. By aligning design decisions with site forces such as slope, rock density, and movement patterns, this development aims to create a resilient, context-driven architectural narrative that harmonizes with its mountainous environment.

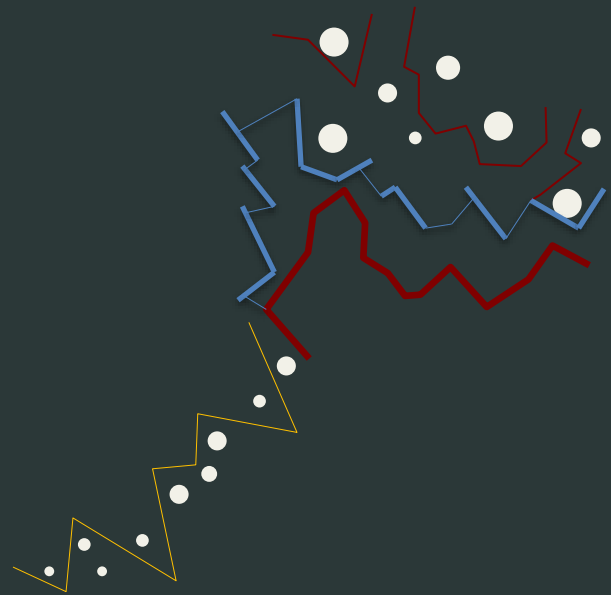


**Fig 37:** Design Development

## THE PROGRAM: CULTURAL HUB/SHELTER

The proposed cultural hub and shelter integrates essential programs that embody the nine key design principles derived from the traditional Sherpa village. At its heart is a **lounge with a central fire chimney**, representing *warmth and togetherness*, offering a communal space for gathering, storytelling, and rest. The **emergency medical services** reflect *support and responsibility*, ensuring care and protection in a remote, high-altitude context. An **open market area**, inspired by *arrangement and durability*, supports local livelihoods and cultural exchange, reinforcing resilience and structure in daily life. The **exhibition space and assembly hall** serve as sacred grounds for cultural expression, echoing *sacredness* and the *uniqueness of appearance* through displays of heritage, art, and traditional practices. An **observation corridor**, symbolizing the *collision and sharpness of edges*, provides panoramic views of the rugged landscape, creating moments of pause and reflection. Finally, the **shelter area**, layered for thermal comfort, represents *resistance and strength*, *layers of warmth*, and a *sense of protection*, offering secure refuge from the harsh mountain climate. Together, these programs create a cohesive architectural narrative that responds to both environmental demands and cultural memory.

## THE CULTURAL HUB/SHELTER DESIGN

The cultural hub and shelter is envisioned as a multifunctional space embedded within the mountainous landscape, serving both as a refuge for travelers and a center for community interaction. Designed to respond to the harsh climate and remote terrain, the structure combines traditional building materials with modern spatial planning to offer protection, warmth, and cultural continuity. It houses essential programs such as a lounge with a fire chimney, an emergency medical unit, a flexible exhibition and assembly space, an open market area, an observation corridor, and temporary shelters. Each element is carefully placed to foster social connection, support local livelihoods, and celebrate indigenous knowledge and traditions. The cultural hub is not just a shelter from the environment—it is a living space that reflects the rhythms, resilience, and rituals of the mountain communities it serves.

## CONCLUSION

In conclusion, the Sherpa community stands at a critical juncture, facing unprecedented challenges as their rich history and culture intertwine with a rapidly changing Himalayan landscape. Climate change, environmental degradation, and the pressures of tourism have disrupted their traditional way of life, threatening both their cultural identity and the natural resources they depend on. These challenges demand thoughtful, holistic solutions that respect the community's values and heritage while addressing their evolving needs.

By fostering collaboration across disciplines, we can develop innovative designs, implement strategic planning, and encourage active community engagement.

Sustainable architectural practices can preserve their environment, while adaptive strategies can help mitigate the impacts of climate change. At the same time, empowering the Sherpas through education and diverse career opportunities can strengthen their resilience, ensuring their economic and cultural survival.

Ultimately, it is through this combination of modern innovation and respect for tradition that we can support the Sherpa community in navigating these challenges, allowing them to adapt while preserving their unique heritage for future generations. Their survival is not just vital for their own identity but also for maintaining the delicate balance of the Himalayan ecosystem they have stewarded for centuries.

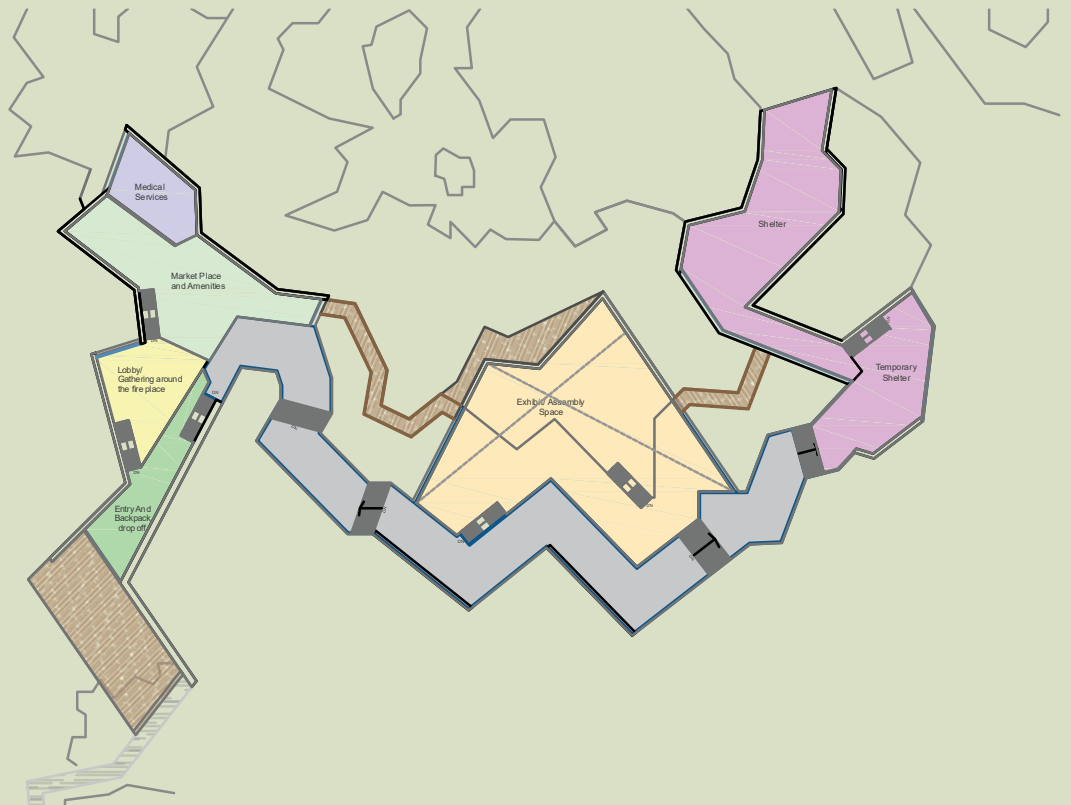


Fig 38: CulturalHub/Shelter | Zoning Plan



Fig 39: CulturalHub/Shelter | Conceptual Plan

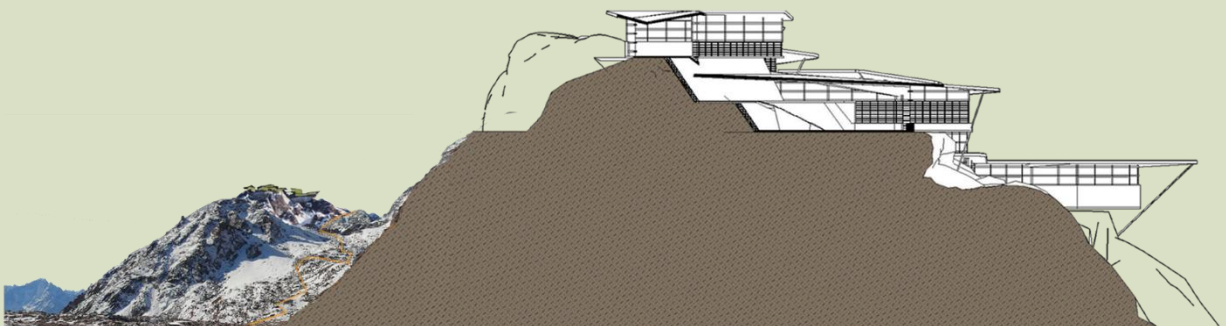


Fig 40: CulturalHub/Shelter | Section

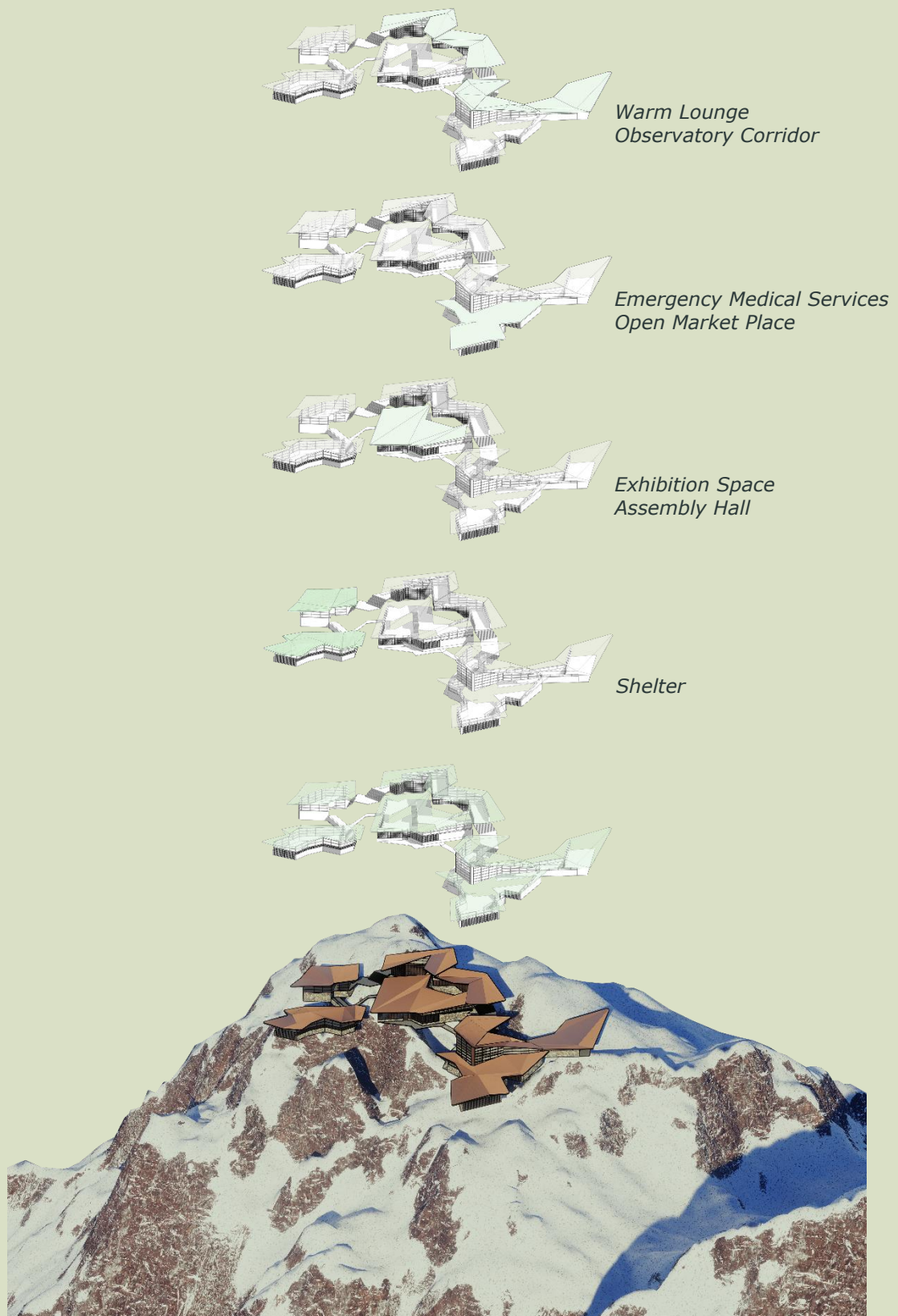
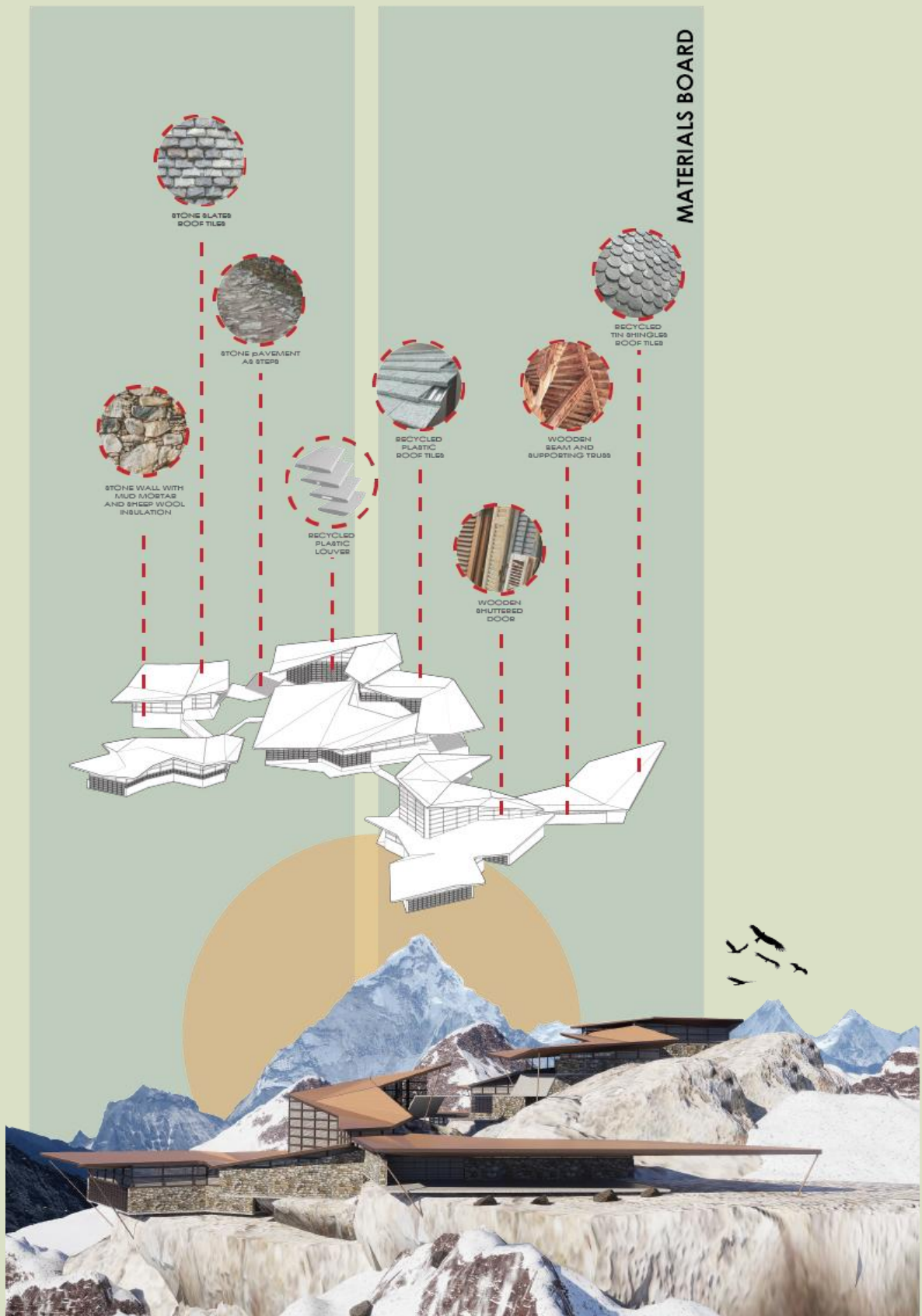


Fig 41: CulturalHub/Shelter | Axonometric Diagram







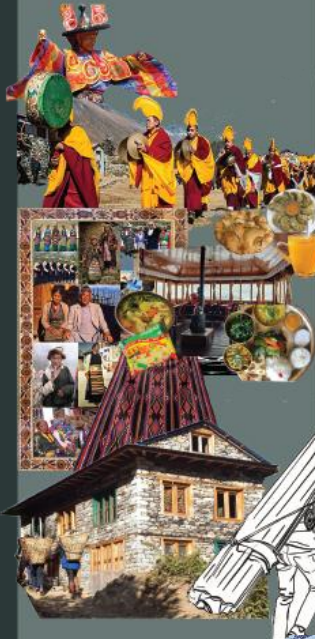
# SPIRITUAL

It is said that prayer beads in the Himalayas were Tibetan Buddhist monks in the 13th century. According to Buddhist belief, this is the devotion of the prayer beads of the mountain deities, and the meaning of the prayer beads of the Buddhist gods.



# CULTURAL

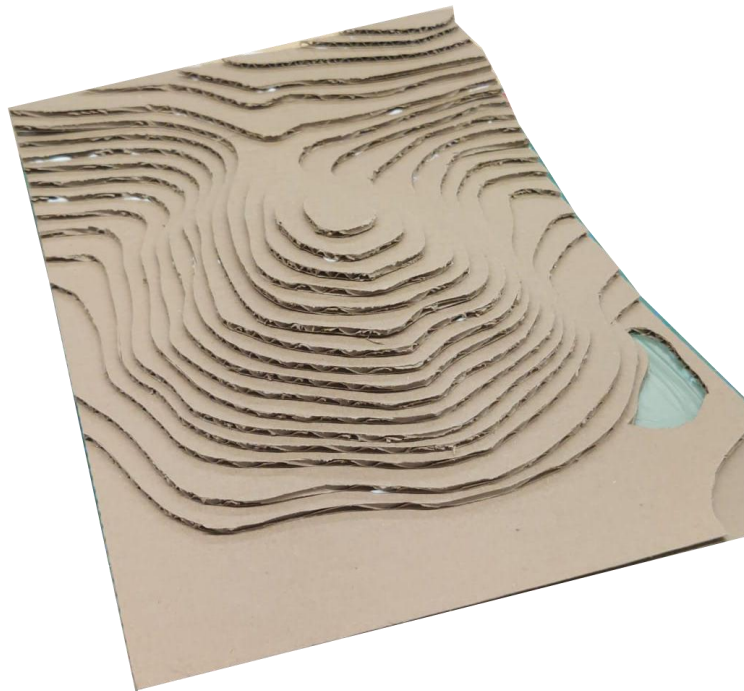
Buddhism is a religion that follows the "Four Noble Truths" and the "Eightfold Path". It is a religion that follows the "Four Noble Truths" and the "Eightfold Path".



# DYNAMIC

THE OCEAN ARE LIVES





## ENDNOTES

<sup>1</sup> Sherpa Serku, Yana Wengel 2023. *The Sherpas and Their Original Identity*. Cambridge Scholar Publishing

<sup>2</sup> Olivier Dangles. 2023. *Climate change on mountains: reviving Humboldt's approach to science*. Cham: Springer

<sup>3</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>4</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>5</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>6</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>7</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>8</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>9</sup> Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

<sup>10</sup> Pasang Yangjee Sherpa 2014. *Climate Change, Perceptions, and Social Heterogeneity in Pharak, Mount Everest Region of Nepal*. Human Organization, Vol. 73, No. 2 (Summer 2014), pp. 153-161

<sup>11</sup> Spoon, J. 2008. *Tourism in a sacred landscape: Political economy and Sherpa ecological knowledge in Beyul*

*Khumbu/Sagarmatha National Park, Nepal*. Ph.D. diss., University of Hawai'i at Manoa.

<sup>12</sup> Stevens Stan. 2003. *Tourism and Deforestation in the Mt. Everest region of Nepal*. The Geographical Journal, Vol 169, pp.255-277

<sup>13</sup> Bhadra Sharma, Mujib Mashal. 2023. 'I See No Future': Sherpas Leave the Job They Made Famous. The New York Times

<sup>14</sup> Pasang Yangjee Sherpa 2014. *Climate Change, Perceptions, and Social Heterogeneity in Pharak, Mount Everest Region of Nepal*. Human Organization, Vol. 73, No. 2 (Summer 2014), pp. 153-161

<sup>15</sup> Pasang Yangjee Sherpa 2014. *Climate Change, Perceptions, and Social Heterogeneity in Pharak, Mount Everest Region of Nepal*. Human Organization, Vol. 73, No. 2 (Summer 2014), pp. 153-161

## SOURCES: ANNOTATED BIBLIOGRAPHY

Adams, V. 1996. *Tigers of the snow and other virtual Sherpas*. Princeton: Princeton University Press.

In this book, Vincanne Adams explores the Western perception of authentic Sherpa communities and how it is complex to characterize them 'virtually'. He also talks about how these portrayals shape a Sherpa's own aspirations.

Fisher, J. F. 1991. *Sherpas: Reflections on change in Himalayan Nepal*. Berkeley: The University of California Press.

James Fisher, in his book talks about his many visits to the Himalayan region, starting from 1964. The book, through his exploration of the region over many decades, traces the transmission of this landscape, from pre-touristy days to touristy days.

Gossling, S. 2002. *Global environmental consequences of tourism*. Global Environmental Change 12:283-302.

The book possesses valuable data on international tourist arrivals, globally (including Nepal), and investigates the consequences in terms of land use, use of energy, the extinction of wild species, and the changes in the perception and understanding of the environment initiated by travel.

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By integrating ethnographic and oral-historical methods, Sherry Ortner investigates in her book, the evolution of Sherpa monastic tradition within the context of Buddhist communities.

Spoon, J. 2008. *Tourism in a sacred landscape: Political economy and Sherpa ecological knowledge in Beyul Khumbu/Sagarmatha National Park, Nepal*. Ph.D. diss., University of Hawai'i at Manoa.

The paper focuses on case studies including 50 years of tourism in Sagarmatha National Park, focusing on the cultural and spiritual values of

indigenous Sherpa communities and their adaptation to the Western style of education.

Andre-Lamat, Véronique. (2017). De l'eau source à l'eau ressource : production d'un capital environnemental ou d'un commun. L'exemple de l'eau domestique au Pharak (Népal). Développement durable et territoires. 10.4000/developpement durable.11869.

The article explores how domestic water is produced as a resource in the region, in the context of economic development. The case studies include detailed maps of the region with important locations marked carefully.

Karan, Pradyumna, and Mather Cotton. "Population Characteristics of the Himalayan Region". Mountain Research and Development, 7 No. 3 (1987): 271-274.

This research project uses images to record and explain the dynamic changes taking place in the Himalayan landscapes over the last half-century.

Shrestha, Arun B., Cameron P. Wake, Paul A. Mayewski, and Jack E. Dibb 1999. *Maximum Temperature Trends in the Himalaya and its Vicinity: An Analysis Based on Temperature Records from Nepal for the Period 1971-1994*. Journal of Climate 12(9):2775-2786

This book includes years-long case studies related to the change in climatic conditions, with proper data analysis in terms of changes in temperature and variation in seasonal timing.

Pasang Yangjee Sherpa 2014. *Climate Change, Perceptions, and Social Heterogeneity in Pharak, Mount Everest Region of Nepal*. Human Organization, Vol. 73, No. 2 (Summer 2014), pp. 153-161

Based on 15 months of research conducted between 2010 and 2012, this research reveals the narrowly defined institutional climate change narratives that focus on the melting of glaciers and glacial lake outburst floods and Sherpa's perceptions of climate change.

Sherpa Serku, Yana Wengel 2023. *The Sherpas and Their Original Identity*. Cambridge Scholar Publishing

This book offers a cultural and historical perspective on the Sherpa people, exploring how their traditional way of life has been impacted by such factors as urbanization, modernization, globalization, and tourism.

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This book offers a critical analysis of the historical evolution of mountaineering and its relation to the phenomenon of tourism, providing an overview of recent developments linked to the diversification, commodification, and commercialization of mountaineering activities.

Olivier Dangles. 2023. *Climate change on mountains: reviving Humboldt's approach to science*. Cham: Springer

This book presents concepts, methodologies, and major achievements of recent research in climate change ecology in mountains by placing this research in a historical perspective, that of travelers and naturalists of the Romantic era, and first of all Alexander von Humboldt.

Stevens, Stanley F. 1990. *Claiming The High Ground; Sherpas, subsistence, and Environmental Change in the highest Himalaya*. Motilal Banarsidass Publishers Private Limited, Delhi.

The book offers a critical analysis of the complex interaction of local environmental knowledge, cultural beliefs, and socio-economic and political conditions in changing sherpas subsistence strategies, land use practices, and local resources management institutions.

Priyadarshini, Subhra . *Risks mount as climate change hits the high Himalaya*. Nature India (2024).doi:10.1038/d44151-024-00033-7

Sestini Valerio, Somigli Enzo. 1978. *Sherpa architecture*. United Nations Educational, Scientific and Cultural Organization.

This book documents the settlements of Sherpa communities in both broad perimeters and narrowed to specifics.

Bhadra Sharma, Mujib Mashal. 2023. 'I See No Future': Sherpas Leave the Job They Made Famous. The New York Times

Stevens Stan. 2003. *Tourism and Deforestation in the Mt. Everest region of Nepal*. The Geographical Journal, Vol 169, pp.255-277

The paper focuses on how tourism development has brought prosperity to many Sherpas but also, however, had adverse impacts on regional forests and alpine vegetation because of the use of firewood by camping groups and inns and the felling of trees to construct inns and other tourist facilities.

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The authors here attempt to explain and contextualize the complexities of the Himalayan region. It is an introduction to the complex geography, history, and social landscape of the Himalayas that underlie the patterns and processes we encounter there today.

<sup>16</sup> Sherpa Serku, Yana Wengel 2023. *The Sherpas and Their Original Identity*. Cambridge Scholar Publishing

<sup>17</sup> Sestini Valerio, Somigli Enzo. 1978. *Sherpa architecture*. United Nations Educational, Scientific and Cultural Organization.

<sup>18</sup> Stevens, Stanley F. 1990. *Claiming The High Ground; Sherpas, subsistence, and Environmental Change in the highest Himalaya*. Motilal Banarsidass Publishers Private Limited, Delhi.