2024

A Growing Dome in the Clouds of Everest: An Applied Anthropology Project in the High Himalaya

Gary Mark Lesley
Minnesota State University, Mankato

~A GrowingDome in the Clouds of Everest~

An Applied Anthropology Project in the High Himalaya

By

Gary Mark Lesley

An Alternate Plan Paper

Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science

May 29th, 2024

A GrowingDome in the Clouds of Everest. An Applied Anthropology Project in the High Himalaya:

Gary Mark Lesley

This Alternate Plan Paper has been examined and approved by the following members of the student's committee.

Advisor Dr. Kathryn "Jay" Elliott

Committee Member Dr. Ronald Schirmer

Committee Member Dr. Shane Bowyer

Acknowledgements

I am deeply grateful for the opportunity to have pursued graduate studies in Anthropology at my alma mater, some forty-plus years after my initial experience. From the outset, I have been given freedom to pursue my degree in a manner that has aligned with my personal interests while also respecting my accumulated life experiences. I have made a conscious effort to utilize this freedom responsibly, without overstepping its bounds. As a non-traditional student, this has only added to the richness of my experience. Over the past two and a half years, I have thoroughly enjoyed engaging with both my instructors and my cohort. Specifically, I would like to express my gratitude to:

Dr. Schirmer: Thank you for being my first professor in a long time and for understanding my *meta-approach* and sense of humor while guiding me to stay focused.

Dr. Schalge: Your ability to appreciate how I map things *with animals and icons*, even though I struggled with coding compared to my peers, has been invaluable.

Dr. Blue: You were my initial introduction to the department, and your welcoming demeanor made me believe that I could achieve *great heights* in anthropology.

Dr. Bowyer: Your persuasion led me to leave my previous confines in Mexico and return Norte to MSU. Maybe there is a place *for an explorer like me* to stay in residence here?

Dr. Elliott: Your endorsement of my return to the Khumbu region and the *transformation of a trek into applied anthropology* has been pivotal. The enhanced receptivity you encouraged me to develop through journaling and active listening lies at the core of this project. Thank you all for this opportunity. To my two invaluable cohorts, Marius Vold and Alaina Evers; your support and encouragement have been instrumental throughout this journey. It has been an honor to share this path with such brilliant and dedicated individuals. I say to you: *Follow your bliss!*

Keywords

Geodesic growingdome, Sherpa, Sir Edmund Hillary School, Khumbu, Indigenous intelligence, Food sovereignty.

Abstract

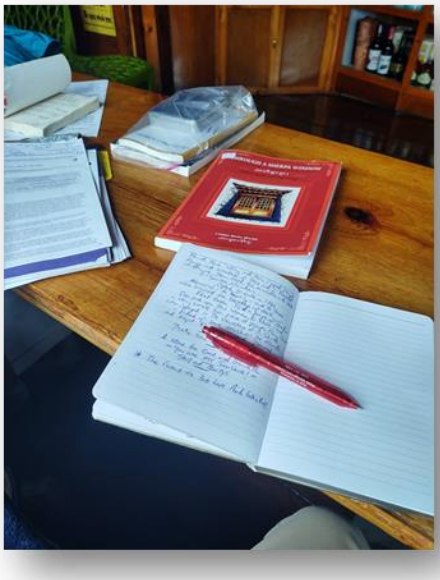
Presented is a novel approach to addressing food insecurity within a remote indigenous community situated in the high Himalaya of Nepal. The village faces challenges in accessing fresh, affordable produce, particularly during harsh winter seasons. This threatens the community's food sovereignty and adversely affects the stability of the Sir Edmund Hillary School, a site of historical and cultural importance. Through the integration of indigenous knowledge and technological advancements, this APP details a strategy to augment local agriculture, drawing on applied anthropological methodologies. The genesis of this project stems from the creative leadership of the school principal and his vision for a greenhouse capable of year-round cultivation to enhance the nutritional well-being of students, staff, and the local community. Central to the proposed solution is the installation of a 42-foot solar geodesic growingdome, supported by feasibility studies and the endorsement of the principal, school board, and community elders. Methodologically, the research utilizes an analysis of Shar-wa (Sherpa) culture, ethnographic immersion in the upper Khumbu Valley, and an examination of technologies related to high-altitude, deep-winter farming. Findings establish the growingdome's potential to mitigate the community's food security challenges, a sentiment echoed by the stakeholders. This APP also delves into fundraising strategies, potential support alliances, and ethno-sensitive policies to mitigate unintended consequences. In addition to serving as a business plan for the project, this APP aims to stimulate related research and development. Beyond its immediate local impact, this initiative carries broader implications for sustainable, eco-sensitive agriculture in remote communities across the Himalaya and analogous regions globally.

Note

This manuscript makes use of *Chicago Style 17th edition* with author discretion used for enhanced readability, clarity, and emphasis.

Table of Contents

Appendices



Chapter One: Introduction

- **Nepal: The People and the Land**

A diverse land with a population of 30 million people representing over 125 ethnic groups and 123 languages, Nepal is akin to an *anthropological cornucopia*. Situated as a land-locked democratic republic in South Asia, it resonates amidst the powers of India to its west and China to its east. Within its borders rise eight of the world's top ten tallest mountains. Mt. Everest, known as *Sagarmatha* or the Goddess of the Sky in Nepali, and *Chomolungma* or the Goddess Mother in Tibetan, stands as the pinnacle. Kathmandu, with a population of 1.5 million, serves as the country's major hub and capital. Pokhara, with a population of 500,000, was annexed by Nepal in the late 1700s and emerged as a major transit city for Tibetan textiles. It has rapidly grown into a tourist center, with its first major roadway completed in 1968 and the recent opening of Nepal's second international airport.

(Nepal map pin, Shutterstock.com)

The country underwent significant turmoil in its constitutional monarchy following the 2001 massacre of the Royal Family, including King Birendra, by his son, the Crown Prince. Similar to the fall of Camelot after the Kennedy assassination, Nepal experienced a dark period and faced a strong communist pull from China. The Maoists capitalized on discontent, leading to The People's War and a series of corrupt regimes until the enactment of a new constitution in

2015, organizing the country into a parliament of 7 provinces and 75 districts, with the Maoists remaining a minority party.

Despite progress over the last 25 years, usaid.gov reports that Nepal remains among the world's poorest countries, with nearly a fourth of its population living below the poverty line. Indigenous communities in the mountainous Himalayan regions lack basic modern conveniences.

The federal government's *One house, One tap* program is a constitutionally mandated effort to address the lack of clean, safe drinking water, while electricity remains a challenge for rural communities. The expansion of hydro-electric power offers hope, though the environmental impact of massive hydro plants constructed by the Chinese raises concerns.

Sustainable waste-management systems, once not an issue, have become major challenges as populations grow. Agriculture, central to the current economy as well as the early settlers in the Kathmandu Valley for nearly 10,000 years, now faces declining productivity and diversity at higher altitudes. According to the Food and Agriculture Organization of the United Nations/Nepal, food crop sales account for 30% of Nepal's GDP, with 66% of the population involved in its production across three distinct geographical zones. The flat, river plains are characterized as sub-tropical to tropical, while the hill regions are mostly temperate, and the mountainous areas range from sub-alpine to alpine. These regions cultivate a variety of crops including rice, maize, millet, wheat, barley, melons, sugarcane, some tobacco and cotton, tomatoes, garlic, onions, radishes, and potatoes. Despite advancements, Nepali farming remains primarily subsistence based. As altitude increases, there is a decline in diversity, productivity, and nutrition levels of produce. Notably, indigenous wild hemp thrives at high altitudes and

presents a promising cash crop for many mountainous communities if Nepal removes limitations on its commercial cultivation and harvesting.

Nepal boasts abundant forest resources crucial for tourism and the wood-products economy, necessitating careful resource management. The National Forest system includes designated Community forests, fostering local participation to ensure sustainable practices in harvesting and planting while enhancing self-reliance in income-generating activities. Additionally, carpet textile production, oilseed processing, cigarette, cement, and brick production play significant roles in Nepal's economy. Recent years have seen growth in the educational services/private schooling industries, reflecting evolving generational attitudes towards continuing education due to increased economic levels and exposure to European/US career opportunities (Cosic 2017).

Nepal's rapid growth in eco/adventure tourism and electricity sales from hydroelectric energy is noteworthy, but governance challenges remain due to systemic corruption. Nepal abounds with rivers at the command of gravity. Enormous kinetic and potential energies generated from 20,000' glacial headwaters as they course their way down to the plains some 15,000 lower are being mostly consumed by one big customer: India, with its voracious appetite for growth and power. As these rivers are flowing, so too are the dollars. To just where remains quite limited to but the few… as the Nepali system of government and administration remains systemically corrupted to the core.

From an anthropological perspective, Nepali culture is influenced by Tibeto-Burmans (from the East) and Indo-Aryans (from the West), with Hinduism as the major religion. The largest ethnic group in Nepal are the Chhettri. They make up nearly one fifth of the population. The next fifth are made up of Brahmin-Hill and Magar. Other minorities include: Tharu,

Tamang, Newar, Kami, Muslim, Tadav, Rai, Gurung. Nearly the last fifth of Nepali ethnic groups include over 75 cultures. Despite progress, gender inequities and caste systems persist, although improvements are seen in education and healthcare.

The official language of Nepal is Nepali, of which about 45% speak. Hinduism is the major religion with a practicing majority of 80% of Nepali people. About 10% practice Buddhism with 4% Islam and about 2% Christianity. The high percentage differential between Hindu and Buddhist can be misleading as many practitioners of each hold common beliefs and are respectful of each other's differences. As Nepal promotes itself as the birthplace for Siddhartha Gautama, the Lord Buddha, there has been both a pragmatic and synthetic coexistence between the two faiths over the centuries, including common deities such as the Mother Goddess and an innate spirit of tolerance as found throughout Nepali people (Brower 1991).

Regarding gender, Nepali society remains a strongly patriarchal culture. While making strong gains in status, career and compensation matters, inequities in education, health and domestic violence continue to hamper progress for women in Nepal. Though illegal, the challenges of a still-entrenched caste system continue to hamper women's rights. On the positive side, infant and maternal mortality rates are declining as support grows from both governmental and NGO organizations to support the women's role in Nepali society. Another indicator of growth includes more women entering the Nepali political arena, though barriers remain.

- **The Sherpas of Khumbu: A Prominent Minority in a Land of No Majority**

The Sherpas, a prominent minority in the Khumbu Valley, migrated centuries ago, adapting to the rugged terrain and evolving economies. Their cultural heritage, rooted in Tibetan Buddhism, is preserved through oral history, mythology, and religion, embodying resilience and adaptation. Sherpa society, characterized by close-knit family structures and hierarchical norms, is evolving amidst tourism and migration, with increasing numbers migrating to the West. Women enjoy relatively high status based on ability, and Sherpa culture emphasizes respect for elders and traditional naming conventions.

Before delving into how a near epidemic, a potato field, and a Yeti skull all contributed to the transformational forces upon an indigenous culture, let's first examine how and why the Sherpa people came to settle in the Upper Khumbu Valley. In the late 15th century, likely due to a combination of religious and non-sectarian factors, ancestral clans of Sherpas (known as *Shar-wa*, meaning "People of the East") were forced out and chose to migrate from the eastern part of Tibet known as the Kham region. After establishing temporary settlements across Tibet, these westward-moving people eventually crossed the Himalayas, embarking on a journey of over 1300 miles via the 19,000-foot Nangpa La Pass approximately 500 years ago. Evolving in the shadows of Chomolungma (Mt. Everest) and the dynamics of the surrounding peaks and river valleys of the Khumbu, pastoral nomadic societies developed in many of the same villages that exist today (Brower 1991).

According to legend, an ancient, secluded valley hidden by Guru Rinpoche was discovered by an early group of settlers searching for Beyul: a safe and holy place to reside and practice their faith. This valley is now known as the Khumbu, extending from the ice fields and

glacial headwaters at the base of Chomolungma, flowing downward into the Imja Khola and Dudh Kosi rivers (Baker 2006).

Due to the isolation and rugged lifestyle in the Khumbu, research indicates that the Sherpa population, consisting of fewer than 200 households, remained relatively constant until the Little Ice Age period. They subsisted on buckwheat, turnips, some greens, and meat and milk products from their yaks and female yaks (naks). The warming trend around 1850, attributed to global warming, coupled with the introduction of potatoes, contributed to the growth and improved health of Sherpa communities. Additionally, an influx of Tibetan immigrants and traders further fueled population growth in the region (Skog 2016).

For many years, Khumbu has consisted of six primary village communities: Phortse, Pangboche, Khumjung, Khunde, Nauje (Namche Bazaar), and Thame. Each of these communities claims to be the site of the first Sherpa settlement. However, it is likely that Nauje, being the lowest settlement with the most marginal agricultural prospects, was the last to be settled, possibly starting as a satellite of the nearest villages Khunde and Khumjung in the 19th century (Fisher 1990). After the initial settlement by the first arriving Sherpas, subsequent waves of immigration have contributed to the population of Khumbu. Immigrants from Tibet have continued to settle here over the centuries, and various ethnic and caste groups from lowland Nepal and India have also moved into Khumbu, particularly in recent years. Despite these migrations, Sherpas still outnumber these later arrivals.

A population census conducted by Professor Jeremy Spoon In 2006 revealed that there were approximately 3,000 to 4,000 Sherpa household members spread across 576 households in Khumbu. About 2,800 of these residents lived in the area for more than three months annually. Most spent between 9 and 12 months in Khumbu, using Kathmandu as a retreat during the

winters, especially for more affluent households. It has also become increasingly common for wealthier families to send their children to private schools in Kathmandu for 10 to 12 months a year.

Spoon also reported that Sherpa agro-pastoralism specializes in high-altitude varieties of crops and livestock, alongside the harvesting of forest resources. Locals supplement these activities by obtaining agricultural and pastoral products from regions below 3,000 meters through trade at the weekly market, Tibetan vendors, and trips to Kathmandu and beyond. Herding strategies for various types of yaks, cows, yak-cow hybrids, as well as limited sheep and goats, require seasonal transhumance between lower and higher common pastures across valleys (Spoon 2012). However, herding is declining, and many Sherpa households now outsource agricultural labor needs to individuals from throughout the region and nation while they manage teahouses, trekking outlets, and side gigs. This influx of laborers is causing demographic shifts in Khumbu, which are likely to continue in the future with certain consequences.

Khumjung and Khunde are located near an old lake and the southernmost foothills of the sacred Khumbi Yuhlla mountain, where the local deity resides among the rocks and crags of its rugged top. Khumjung is home to the school established by Sir Edmund Hillary, and the hospital sponsored by Hillary's organization is situated in Khunde.

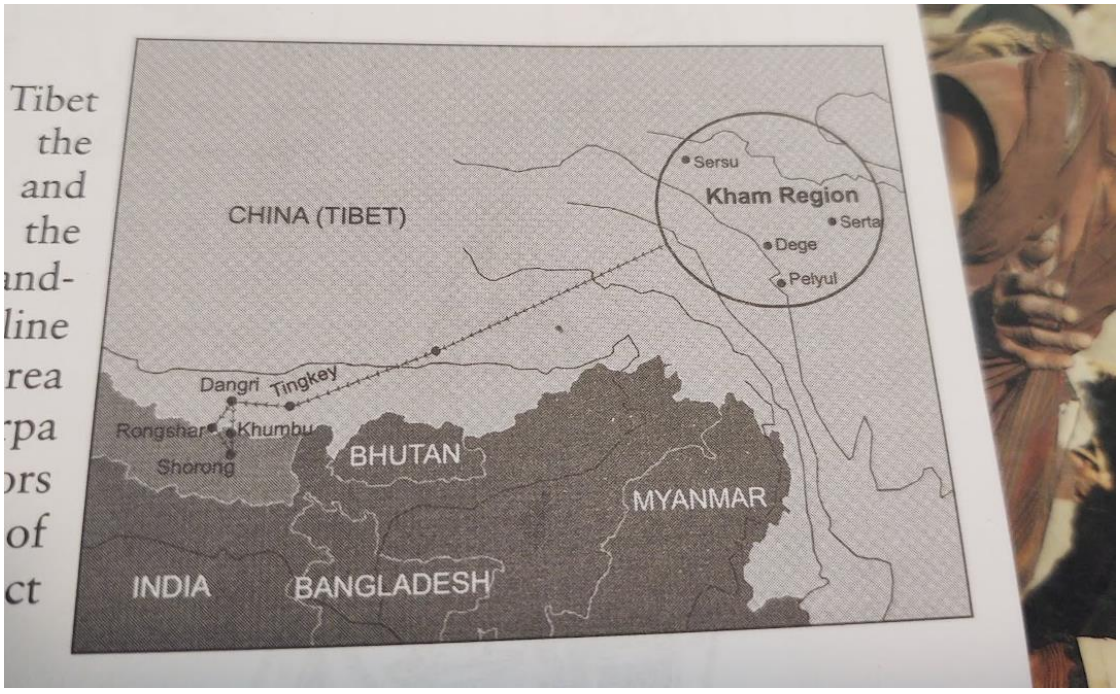
From conversation with a Khumjung resident (Mindo), she affirmed that a substantial portion of the village's population is now involved in tourist enterprises with a growing number of other castes employed as laborers. Her estimate for Khumjung was about 200 houses/structures with 500 families and 1900 people. Nearly half of the houses are now rented as original owners have moved down-valley or Kathmandu or further. Darjeeling in India now has a significant Sherpa Community.

The migration of Sherpas to the West has seen a significant increase in recent years, particularly to the United States, where New York City hosts the largest Sherpa community with approximately 16,000 individuals. According to the 2021 Nepal census, there were 130,637 Sherpa within Nepal's borders, making up less than 5% of the country's population.

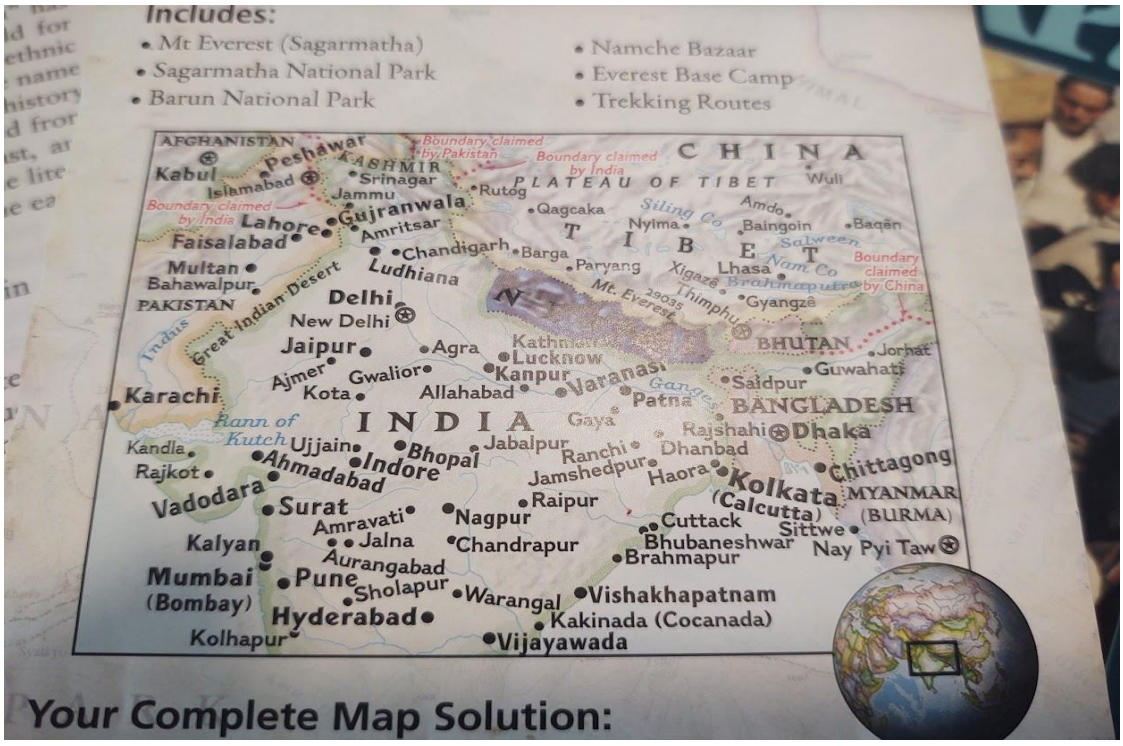
Sherpas adhere to an ancient form of Tibetan Buddhism and speak a language belonging to the Tibeto-Burman linguistic group. As mentioned earlier, Sherpas were historically known as nomadic people, resulting in minimal written historical records or artifacts. Therefore, their culture is preserved and passed down through oral history, mythology, legends, and religion.

Traditionally, Sherpa families lived in a close-knit system where everyone resided in one large room. Sherpa society retains a somewhat hierarchical structure, with a strong emphasis on respecting elders. Women hold relatively high status compared to many other cultures within Sherpa society, as individual status is based more on ability than gender.

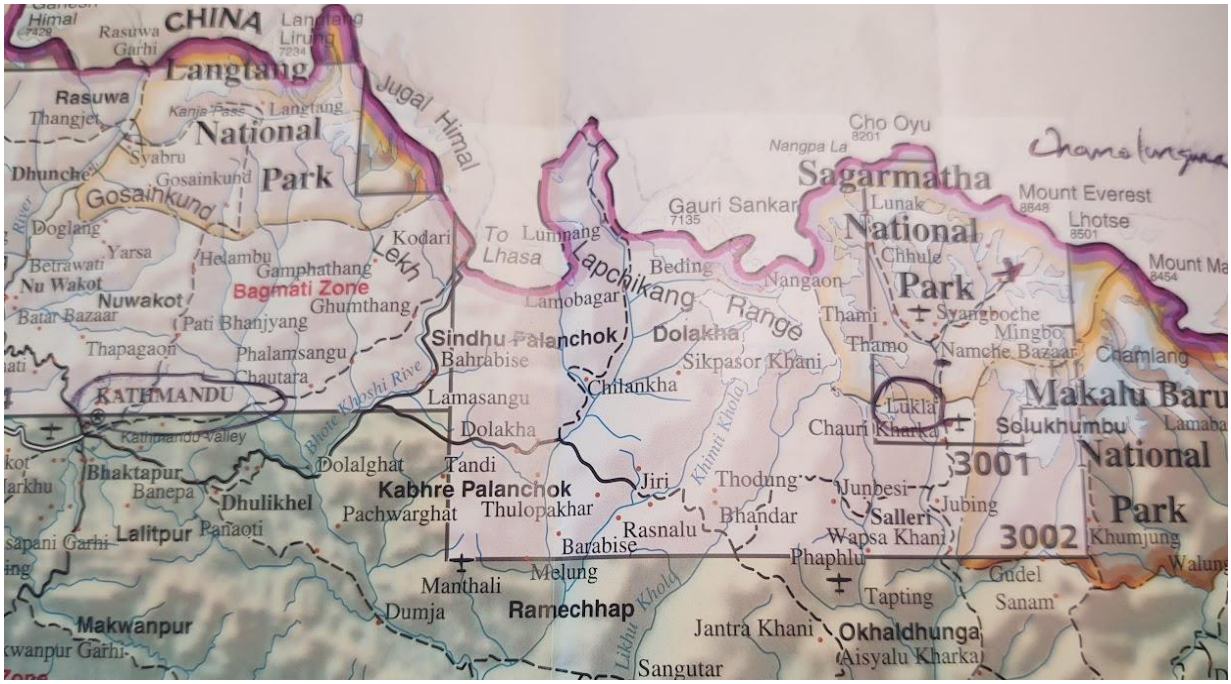
Every member of the Sherpa community is given a name by their parents or a llama. The first name of a Sherpa child, whether a boy or girl, is often derived from the day of their birth, such as Dawa for Monday, Mingma for Tuesday, Lhakpa for Wednesday, Phurba for Thursday, Pasang for Friday, Pemba for Saturday, and Nima for Sunday. The second name is unique and often reflects gender sensitivity. Common second names include Norbu (male, meaning precious gem), Tsering (male, signifying long life), Tenzing (both genders, representing upholder of the dharma), Pema (both genders, symbolizing lotus), and Lhamo (female, meaning goddess). Sherpa is typically used as the last name (Sherpa 2008).



Migration route of the Tibetans across the Plateau and into the Himalayas.

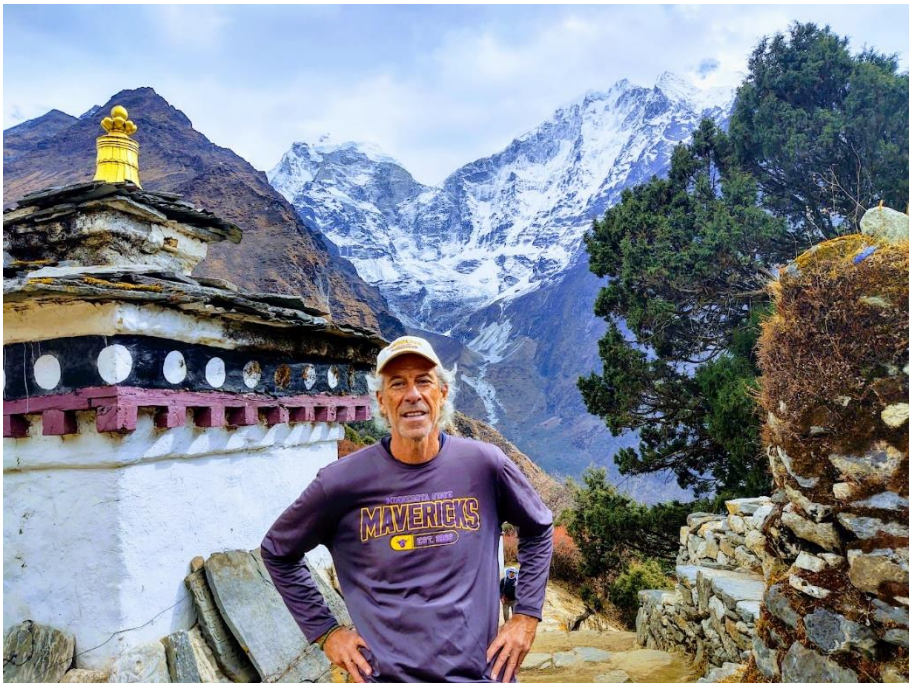


Nepal as it rests upon the Northeast shoulder of India and under the mantle of Tibet.



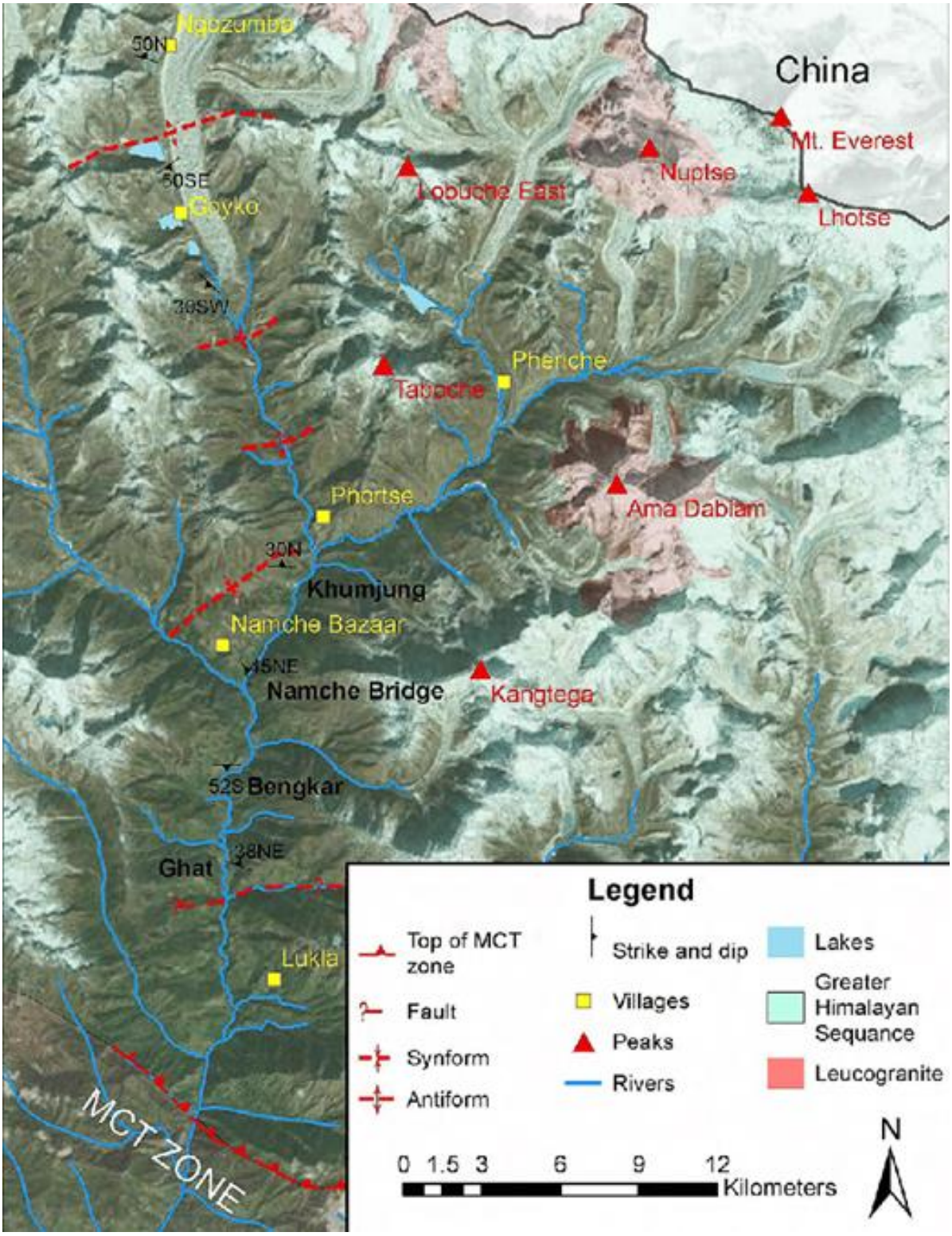
Kathmandu-Lukla above; 45 minutes by air.

Early views leaving Lukla. Lots of scenery changes along the way.



From the Khumbu Valley; Go Mavs!

Khumbu Glacier just below Everest Base Camp



(Khumbu Valley map, researchgate.net)

Lukla (yellow)-Khumjung Village (black) above Namche (yellow): 3-4 days trek

- **The Impact of Sir Edmund Hillary on Sherpa Culture**

His prominence well established through his mountaineering feats, including the first summit of Mt Everest in May of 1953, it was in many ways thanks to Sir Ed that most Sherpa's first experience of modern medicine was vaccination during the 1963 smallpox epidemic. Hillary knew that the disease might be a problem during his Himalayan Schoolhouse Expedition because the American Mount Everest Expedition had reported a case. Hillary's expedition came across other cases and deaths, and fear of the disease grew amongst the local population who began asking for help. Hillary resolved that a vaccination program had to become a major part of the expedition. Hillary sent a message to Kathmandu requesting a supply of vaccine which arrived two days later. With the disease spreading rapidly, members of the expedition team immediately began vaccinating villagers and eventually were to give over seven thousand vaccinations throughout the district. Hillary later wrote that of all the expedition's activities "the one most widely appreciated was undoubtedly the vaccination, and this hadn't been part of my original plans." Nepalese authorities in Kathmandu also most certainly appreciated Hillary's efforts.

(GL Photo of Commemorative Plague courtesy Himalayan Trust)

Hillary and his team were also instrumental in diagnosing the all-too-common presence of hyperthyroidism and goiters, present among nearly 90% of Sherpa. An iodine deficiency due to low-soil iodine levels was identified. A program was established prioritizing young mothers and ultimately supplementing all living in the Khumbu region, resulting in the dramatic

reduction of thyroid disfunction over the following decade. Hillary went on to build the first medical clinic in Khunde in 1966 at the request of the Sherpa community (Heydon 2011).

In his book "View from the Summit," Sir Edmund Hillary recounts the construction of the airfield at Lukla, a strategic location for introducing aircraft into the developing Khumbu Valley region. He describes how an unexpected opportunity arose when a group of farmers from Lukla, a small village in a tributary valley at 9,000 feet, approached them with land for sale, believing it could be used for an airfield. They even claimed that the wind always blew in the right direction, which surprised Hillary given their lack of knowledge about airfields.

Nevertheless, upon visiting Lukla, they agreed that the site was indeed suitable, especially since it wouldn't require the destruction of much arable land. The land comprised rough pasture, heavy scrub, and terraced potato fields, with a significant slope of over a hundred feet from bottom to top (12-degree pitch), though this wasn't a concern for a STOL (short take-off or landing) aircraft. Lukla does bear the dubious distinction as the World's Most Dangerous Airport and is the closest experience a flyer will get to landing and departing from an aircraft carrier in the mountains. It definitely beats walking, as far as this traveler is concerned.

(GL Photo of Commemorative Plague courtesy Himalayan Trust)

Negotiating the land purchase was relatively straightforward, and Hillary bought it on behalf of the Nepalese government for $835, a substantial sum for the area at the time. Since they lacked mechanical equipment, everything had to be done manually. Over a hundred Sherpas worked to clear the bush, remove roots, and level the land. The terraced potato fields required extensive earthmoving, and large boulders were dealt with using an *Indigenously intelligent* method pioneered by Sherpas: digging holes, rolling rocks into them, and covering them with earth. Today, the surface is paved. It's still all downhill on the way out!

So where does the 200-year-old Yeti (rock-living animal) scalp enter into the equation here? As the story continues according to Hillary, during his 1960 expedition in search of the mysterious and legendary mountain creature, he negotiated with the monastery in Khumjung to allow him to take a so-called yeti scalp back to the U.S. for scientific examination.

Just what did the monks receive in return? Hillary agreed that two of their representatives could accompany the relic over its travels, the monastery would receive the equivalent of about 8000 Nepali rupees or $80 US and a school would be built for the local community. Hillary recollects that he never intended to build any schools but was happy to accommodate the wishes and desires of the Sherpa people. Though his team found no Yetis, and the *scalp* was supposedly an assemblage of goat skulls, the lore continues, and the Yeti remain a fixture in Sherpa mythology and tradition. The mountain rock is an animate force in Sherpa culture and the Yeti is considered as a guardian spirit force that roams across the peaks of the Himalaya (abode of snow).

- **The Sir Edmund Hillary School, Khumjung Village: Schoolhouse in The Clouds**

(Photo from Hillary 1964)

Class 001, 1961

Otherwise referred to as the Khumjung Secondary School, the Hillary School is located in Ward four of Khumjung Village in Khumbu Pasang Lamu Rural Municipality of Solo Kumbu district in Province One of eastern Nepal. It is situated at an elevation of 3790 meters from sea level. It lies inside the Sagarmatha National Park (SNP), A World Heritage site designated by UNESCO. The development of tourism in the Khumbu region over the last five decades has made considerable changes in the livelihoods of the local people. Although the level of tourism

benefit distribution is not equal and equitable throughout the district, its impacts are diverse. As per the record of SNP, more than 55,000 tourists visited the Khumbu region in 2018 and the trend shows that the tourist number is increasing annually.

After a successful attempt of conquering Mount Everest on 29th May 1953 with Tenzing Norgay Sherpa, Sir Edmund Hillary spent most of his time in supporting people of Solo Kumbu district. During one of his visits in the Everest region in 1960, Sir Ed asked one of his Sherpa friends if there was anything he could do for the Sherpa people. His Sherpa friend replied "Burra Sahib, our children have eyes, but they cannot see. Therefore, we would want you to help open their eyes by building a school in our village." This statement touched the heart of Sir Edmund, and he immediately began to raise funds and build the first school in Khumjung in 1961, later to be known as 'schoolhouse in the clouds' and to be joined by additional schools Hillary sponsored throughout the district. Local Sherpa and other indigenous children received the opportunity for formal education. Sir Edmund continued supporting the school through the Himalayan Trust and gradually upgraded it to a secondary school in 1985.

Today, the Khumjung School has made significant contributions in the field of education in the Kumbu region. Students who went to Khumjung School are now working in diverse fields in different places within and outside the country. One of those students is now its principal (N.D. Rai)! The school has been successful in building an image of a best school among Community School. In remote mountain region of Nepal. With challenging political and socioeconomic context, the school has both opportunities and challenges to maintain its quality standard in order to provide children to these. Education as per the demand of changing context.

Sir Edmund Hillary School; Khumjung Village, Nepal

Considering the potential opportunities and challenges, the School Management Committee, with Technical Support from Himalayan Trust Nepal, has developed an aspirational, long-term school management plan. The planning process followed an "appreciative participatory planning and action approach" according to the school's management plan.

The planning process identified the current situation at *discovery phase* and referred to envisioned future vision as *dream phase*. Tasks included preparation of action plan, budget with local framework at design phase and develop strategies for implementation with commitment of stakeholders at *destiny phase*. The two-day participatory workshop in Khumjung School and one day consultation workshop in Kathmandu followed the same process. The stakeholders of Khumjung School set the following vision, mission, and objectives:

> Vision: Quality education in the Mount Everest region. Mission: Providing quality education to the students by qualified teachers using modern teaching methods and technologies with a safe and child friendly classrooms, hostels, playground and other essential infrastructure facilities. Also providing knowledge on local language and culture to the students.
> (Reference to technologies is noteworthy in the context of this project)

(The information and data above have been excerpted from the School Management Plan (2018-2028) for Khumjung Secondary School, as shared with the author and provided by Chairman of the Schoolboard: Laxmari Adhikari).

Chapter Two: Goals of the Project

- **Genesis: *Out of green things… On the roof of the world***

"OK, brother. Regarding the crops for winter, my priority goes for green vegetables because during that time Kumbu is out of green things" (N.D. Rai, Principal of Sir Edmund Hillary School, Khumjung Village, Nepal. Email message to author July 21st, 2023).

In a simple way, this project is about green things; healthy, nutritious, leafy produce along with fruits which may grow upon other green plants. And the power of the sun. It is also a story about a visionary school headmaster who wished for a magical greenhouse of sorts. Capable of growing and harvesting simple food items, especially through the dead of winter, such a structure would be novel and transformative. To date, available agricultural techniques and logistics do not allow that to be a reality. The plan and objective of this project changes reality through the synergy of sunshine, green vegetables and Indigenous intelligence. "If only I had a greenhouse… that we could grow our vegetables all year around" says N.D. Rai, Principal Sir Edmund Hillary School, Khumjung Village, Nepal.

The true genesis of the project dates back to June of 2022. I had returned to the Khumbu to further my ethnographic studies of the Sherpa culture and their resiliency. While taking a tour of the famed Hillary School in Khumjung Village, my guide, who also happened to be the principal, shared a challenge and a dream. If only he could be a better servant with the ability to provide a healthier diet for his hostel students, and live-in staff, especially during those *greenless*

winter months between October and May. Either excessively costly or not available at all, access to any leafy greens, fruits or vegetables makes the upper Khumbu much less attractive to down valley teaching or schooling options and an ongoing source of challenges for Principal Rai. His wish, at the time, was considered rather hopeless as the operable example of a greenhouse, known as a *chapro* in Nepali, was comprised of flimsy, plastic sheeting and shaky supports made of branches or stone walls and pilings. These structures, at best, supplement the chances of harvesting a few varieties of produce other than potato during the summer months. Shown below is a chapro located down valley, where the clime is more moderate and the altitude 3,500 feet below Khumjung.

Cauliflower and tomatoes are frequently attempted. The effective growing season is also over a month longer with richer soils. Water availability is generally good.

Upon my return to Khumjung Village in May 2023 and during a meeting with Principal Rai, I shared with him additional details from those I'd provided him over the past year since the 2022 visit. I reiterated that my research and feasibility studies supported findings establishing the growingdome's potential to mitigate the school's food security challenges. We discussed the positive effects for the community and the importance of unified involvement. The following

day, I discussed the growingdome capabilities and fundraising requirements with members of the school board and elders from Khumjung and Khunde. The sentiment echoed by the stakeholders matched those of the principal and his excited staff. Their request for me to consider taking on the task of conducting the project was received with great respect and sense of gratitude for the trust extended. *Reciprocity and implementation* in action; powerful concepts specific to the sherpa culture I'd gleaned earlier from my engagements and anthropological studies. There was a moment of trepidation and doubt which lasted no longer than likely thoughts Hillary and Tenzing experienced as they began the last 100 yards of Everest's first summit. I accepted the task and challenge, within eyesight of the original schoolhouse built by Sir Ed himself, and some of us went for coffee at a nearby lodge to consummate our new effort.

Authorization Letters were prepared for me to officially represent the Sir Edmund Hillary School and Khumjung Village for the raising of funds and associated purchases required to design, source, transport, construct, and initiate operations for a 42' growingdome from Growing Spaces of Pagosa Springs, CO. A quote from Hillary lifted my spirit as I hoped it would equally lift a dome from Colorado to Khumjung, "Nothing venture, nothing win."

- **Significance of the Project**

The Khumbu Valley of Nepal, home to the indigenous Sherpa community, exemplifies the intricate relationship between sustainable agriculture and cultural preservation. Sustainable agriculture in this region is characterized by traditional farming practices deeply embedded in the Sherpa culture, which relies on a delicate balance between environmental stewardship and livelihood needs. Thus, food sovereignty and sustainability are of paramount importance to the objectives of this effort. They are the twin keys to establishing a virtuous cycle of health, wellness and knowledge for the Sherpa and villagers of Khumjung and neighboring Khunde.

Sherpa agriculture in the Khumbu Valley has long embraced sustainable practices like agroforestry, terrace farming, and crop rotation (Dangol 2015). These methods, adapted to the challenging mountainous terrain, prioritize soil conservation and biodiversity, ensuring the resilience of local ecosystems (Subba 2005). The traditional Sherpa agricultural calendar, guided by lunar cycles and indigenous knowledge, reflects an intimate connection between farming practices and the natural environment (Sherpa 2010).

However, the Khumbu Valley has witnessed the impacts of climate change, altering precipitation patterns and threatening the sustainability of traditional agriculture (Byers et al., 2009). Sherpa culture, deeply intertwined with the land, faces challenges as changing weather patterns impact crop yields and the availability of traditional medicinal plants.

Efforts to enhance sustainable agriculture in the Khumbu Valley must consider the preservation of Sherpa culture. Sustainable agricultural practices can be strengthened through community-led initiatives that blend traditional knowledge with modern techniques (Kollmair, et al., 2006). Empowering Sherpa communities in adopting climate-resilient crops and promoting

sustainable tourism practices, a significant aspect of the local economy, can contribute to both cultural preservation and economic sustainability (Dangol 2015; Sherpa 2010).

Sustainable agriculture in the Khumbu Valley is not only crucial for environmental conservation but also plays a pivotal role in safeguarding the rich cultural heritage of the Sherpa people. Balancing modern innovations with traditional wisdom is essential to ensuring the resilience of Sherpa agriculture and its harmonious integration with the unique cultural fabric of the Khumbu Valley.

For Sherpa and other Indigenous communities of the Himalaya, like their Polar brothers and sisters of Alaska, food is more than just physical sustenance. It embodies culture, tradition, and togetherness, as well as biological needs. Community needs for adequate nutrition in remote geographical locations are well documented. In the high Himalaya of Nepal, both isolation and extreme environmental conditions, including high altitude, create the need for addressing enhanced health through greater biodiversity and access to a broader dietary supply of fresh, organic, nutrient-dense vegetables and fruits. Thus, *food security* describes more than merely whether sufficient food is being produced, or a one-size-fits-all food-nutrition relationship and incorporates all of the numerous ways in which a food system supports health in its various biophysical, social, and ecological dimensions (Kosic 2022). These include matters such as the importance of certain foods, food choice, local perceptions of hunger, uncertainty and worry about food safety or shortages, and any other psychosocial, sociocultural, or environmental stresses that result from the process of putting food on the table (Devereux & Maxwell 2001).

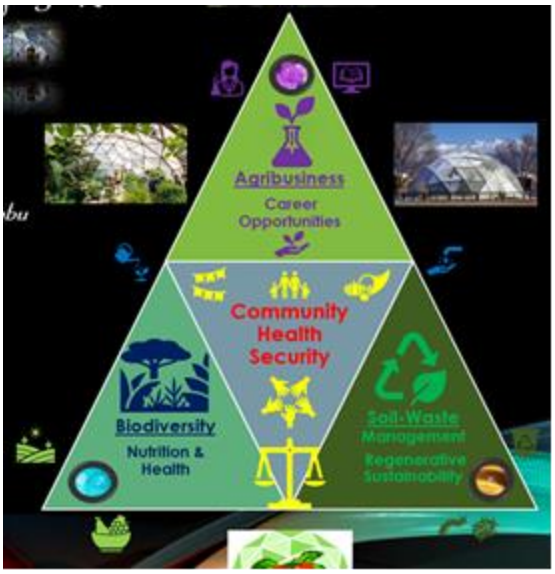
The solar geodesic growingdome technology, expertise, and capabilities to bring forth a solution is available and well established. Motivated by the added element critical in the developmental chain of necessary events in the maintenance of ethnographic sensitivity is the

desire and request by the Indigenous community itself, to employ new techniques and prosper within its cultural traditions and lifestyles.

From a conversation (Feb 2024) with Dr. Abhyu Ghimire, (Kathmandu, Nepal), mountain medicine pioneer and Base Camp Medical Dir. For Mt Everest:

> In Kumbu, the issue with nutritious food is that it is only accessible to the top 10% of the economically stable population. It has to be imported from places where the food can actually grow, hiking up the prices by two or three times. If people could grow food locally, the prices should drop, making it accessible for almost everyone up here (upper Khumbu).
> Not many nutritional studies have been done in Kumbu. The studies that have been done are at lower altitudes of the same district and do not accurately reflect the picture at higher altitudes. In my practice, I have seen deficiencies of iron, calcium, vitamin B12, vitamin D3. Zinc, magnesium and potassium. With the lack of investigations, these are the only ones that could be suspected with certain accuracy solely based on clinical findings. I suspect many deficiencies out there. These are my two-cents worth…

The application and success of the first solar geodesic growingdome in the high Himalaya will serve to revolutionize biodiversity, sustainable-regenerative practices, agribusiness, and much more, for numerous, indigenous communities across Nepal, and beyond. Logistical challenges aside, it's possible. With the realization of how a solar-powered geodesic growingdome is capable of serving as both a producing environment of fruits, leafy greens and vegetables as well as a "living" laboratory, the growingdome objectives include hands-on learning and exploration related to environmental science, food sustainability and alternative energy sources. A full curriculum will be established, referencing best practices from other schools and their growingdome strategies. A methodology for applying the virtues of such a laboratory are encompassed in what I refer to as *The Three Jewels.*



At the heart of the *Three Jewels* approach rests the community, consistent and aligned with the role which the Hillary School plays for both Khumjung and neighboring village Khunde. Critical issues of food insecurity and sovereignty will be benefited by the integration of biodiversity, application of sustainable-regenerative practices including waste management sciences and agribusiness, with its associated socio-economic opportunities. This can also serve to advance the culture of entrepreneurship, which has already taken root. The growingdome will also facilitate the development of an associated outdoor gardening area operated by the students and serving as a conduit to the surrounding community farming.

The inspiration for drafting the words below came as a result of the immersive activities I participated in including walks and talks with members of the Khumjung community and students and staff from the school, and a certain sense of responsibility. The sights and sounds of nature's emanations could not be ignored. After sharing the free-flowing and holistic formations of both the premise of the Three Jewels and the elements that would support it, Principal Rai's clear endorsement and adoption of it affirmed my continued interests to craft it as a tool that could be passed on to the staff and students and ultimately, as the original stakeholders might see

fit, the rest of the community. Therein lies the opportunity for the growingdome to serve not only as a *living laboratory* but also as a *living metaphor* (Fienup-Riordan 2000).

> From the wish of a teacher, and from Three Jewels of the Mountain; a gift for the people of the Khumbu. From the Amethyst: wisdom of the divine sky. From the Turquoise: protection and wealth, and from the Tiger's eye: grounding and re-birth. Always from the hands and minds and souls of the people: eternal blessings to grow forth with guidance, wisdom and health for all. These form the slumbering ledges of the Three Jewels:
>
> To relieve the land from the pressure to produce
>
> To producing naturally and efficiently, in variety only limited by the imagination
>
> And the desire
>
> In sustainable fashion and regenerative energy
>
> Flowing in and through all things freely
>
> Unabated as the mountain winds
>
> Balanced upon its pinnacle, the community of people
>
> In unity with the sacred land and all the spirits
>
> Bridging ancient ways with modern technology for timeless growth
>
> And the ground sings with an abundant voice
>
> Echoing harmony with the prayers of thanks and praise
>
> From all - For all
>
> Of the wisdom and energy and illumination of the Three Jewels
>
> As they shine through health and wellness and joy

With support and in collaboration with the principal at the Hillary School, the *Three Jewels* will serve as an ethnically sensitive metaphor and also, a branding tool in the further development of fund-raising strategies, curriculum development and community engagement.

- **Research Questions**

While this non-sponsored applied anthropology project does not heavily rely on original data, it has gathered a substantial amount of qualitative, ethnographic information about Sherpa culture. This information stems from a thorough analysis of literature spanning over two years, covering the history and contemporary studies published on Sherpa culture and traditions. By amalgamating scholarly and non-academic sources and methods, knowledge from various levels has been incorporated into this project.

In Chapter Three, I review the methodology applied which allowed me to properly grasp and pursue the principal's vision with the intention to also execute the initiative in conjunction with a team including the Sherpa community.

I identified the following as keys to achieving the project's goals:

- Identification of the appropriate growing structure
- Design and transport plan
- Operations and productivity
- Funding and Execution
- Mitigation of unintended consequences

Chapters Three and Four address these issues as both an applied anthropological challenge with ethnically sensitive considerations as well as a technical initiative with potentially transformative ramifications.

Chapter Three: Review of Research-Related Information and Data

From the inspirational genesis of Principal Rai and his desire for year-round produce, I conducted an industry review and evaluation of suitable *green-house* structures, including on-line resources and personalized interactions. Information and knowledge were accumulated regarding the topic of *controlled environment growing techniques* as well as the physical design requirements for *suitable structures* in the deep-winter Himalayan environment.

With a narrowed focus on currently available, commercial technology, and from an on-the-ground grasp of the specific range of climatic conditions involved, it was quickly apparent any traditional form of glass-based, gable-roofed green-house would not be practical on multiple accounts not the least among such was being terribly inefficient.

From a combination of intuition and practical elimination, the discovery of geodesic dome technologies in conjunction with discovery of an innovative business in Pagosa Springs, Colorado rapidly led to a viable solution to Principal Rai's dilemma; *a solar powered, polycarbonate (PC)-paneled, eco-friendly, geodesic growingdome* for the Hillary School. Following is a discussion on the methods I used to address the research questions.

- **Methodology**

Methods used in this project included extensive literature review, immersive ethnographic experience, significant, in-field participant observations and an assessment of resources regarding growingdomes. Industry-level influencers researched included the economic drivers in Nepal, Remote/Extreme Deep Winter Growing and Philanthropic Funding. Following is a description and discussion of activities from each component of the methodology which resulted in this paper's findings.

Literature Analysis: Discussion, True Beginnings

Embarking on my first journey up the Khumbu Valley in October 2021, I found myself gazing upwards amidst the rocky base of Mt. Everest, Sagarmatha in Nepali, at an altitude of 5400 meters. This experience heightened my awareness, not just outwardly but also inwardly. External beauty, while breathtaking, reaches a saturation point akin to how a high-intensity light overwhelms the eye. However, internal beauty, like joy, continues to uplift and expand boundlessly, reflecting inwardly and projecting onto an ethereal veil encompassing everything Sherpa. Here is where and when my literature review began in earnest sans any books or journal articles. It was the birthplace of the interest emanating from a mountain of expanded consciousness.

This deep dive into the world of Sir Edmund Hillary felt long overdue, leading me to unexpected depths and uncharted territories beyond renowned works like "Lost Horizon" and "Seven Years in Tibet," delving into the hidden, sacred valleys of the Himalaya known as Beyul.

My research journey has been guided by a blend of autobiographies, novels, and scientific research papers by esteemed cultural anthropologists, some of whom I've now spoken with, nurturing my knowledge and understanding of indigenous cultures and their transformative journeys. My experiences over the past 30 months, coupled with cultural and applied anthropology studies and extensive readings, have granted me intimate insights into the Sherpa as an indigenous community, Nepal as a developing nation, and the pivotal role of the Khumbu region in both realms. This has allowed me to relate to the collective body of work spanning the past 50 years, where authentic voices build upon each other's contributions, propelling Sherpa cultural development and studies forward.

My journey began with a curiosity about the concept of Shangri-la, eventually leading me to diverse sources like James Hilton, Heinrich Harrer, Sir Edmund Hillary, William ‘Zeke’ O’Connor, Dr. James F. Fisher, Dr. Barbara Bowers, Dr. Lhakpa Norbu Sherpa, Dr. Vincanne Adams, Professors Jeremy Spoon and Lindsay Skog, and philanthropist Richard Blum, among others. *The Heart of the World* by Ian Baker was especially illuminating. The presence of the Dalai Lama's teachings and writings is notably pervasive in my research, resonating deeply with the core values and practices of Sherpa culture. Most recently, the highly regarded work of Dr. Stanley Stevens and *Claiming the High Ground* has been extremely insightful regarding the adaptive strategies of Sherpa integrating their relationship with the environment and continually evolving their subsistence strategies.

Since the first handful of Hillary books arrived back in the Spring of 2022, my studies-dedicated library of *Anthro-Sherpa-Himalaya*-themed books as well as a handful on geodesic design theory and greenhouse/growingdome techniques now totals over 100 editions. Hilton’s “Lost Horizon” still fascinates me greatly. What did he really discover from ethnologist Joeseph Rock and his explorations of Tibet that inspired the rich novel? A collection of Buckminster Fullers books has also been added to the shelves. His everlasting strivings for achieving more with less from a fuller understanding of nature’s efficient principles is highly motivating as it pertains to the application of his geodesic, structural designs to the growingdome project.

As I continue to explore the intertwined narratives of Sherpa history, Himalayan culture, and Tibetan spirituality, the Dalai Lama's enduring presence serves as a beacon of compassion and wisdom, bridging realms of history, culture, and human connection across the snow-capped peaks of the Himalaya.

Ethnographic Immersion: Discussion

I first arrived in Kathmandu in October 2021 and have spent a total of 79 days in Nepal across three expeditions. In June, I will embark on my fourth trip, spanning another 21 days. Most of these days have been, or will be once again, spent somewhere in the Khumbu region between Lukla and Khumjung. Over time, I've developed acquaintances, made friends, and even formed a cultural kind of family. This experience has become deeply personal for me.

Through this form of ethnographic immersion, I've been enabled to facilitate in-depth cultural understanding, uncover hidden knowledge, build trust and collaboration, and grasp critical elements which can help ensure the development of culturally appropriate interventions that positively impact the community. Specifically, this will be seen in the Consequence Management policy which I've crafted and is discussed in Chapter Four and shared in the Appendix.

For practicing anthropologists involved in applied projects with remote, indigenous cultures like this one, ethnographic immersion plays a crucial role. It enables anthropologists to develop a nuanced understanding of the cultural nuances, complexities, and challenges faced by the community. This deep understanding is essential for designing and implementing effective and culturally sensitive interventions or projects that address the needs and aspirations of the community (Spradley 2016). Ethnographic immersion refers to the deep involvement of an anthropologist in a specific cultural context or community, typically through extended periods of living among and interacting with the members of that community. This approach has allowed me to gain firsthand insights into the daily lives, beliefs, practices, and social structures of the Sherpa culture I've engaged with. It goes beyond mere observation or data collection. In the case

of this project, it emphasizes active participation and engagement within the Khumjung community and the Hillary School.

Participant Observation: **Discussion**

One of the key advantages of being a participant observer includes the ability to uncover hidden or tacit knowledge within the community. Through direct engagement and conversations with community members, the practicing anthropologist uncovers insights that may not be apparent through other research methods.

If I had not engaged the principal of the Hillary School during the tour I was able to participate in, I would never have been aware nor likely able to glean the desires he had of a greenhouse of sorts. Furthermore, participant observation can foster trust and rapport between the anthropologist and the community members. My return for my third visit to Khumjung with the completed *assignment* was a significant trust and relationship builder. This trust is built through long-term relationships, mutual understanding, and an appreciation for respective cultural norms. The result in this instance has been a collaborative approach to the over-arching, food sovereignty challenges with community stakeholders. Together we will work to co-create healthy solutions that are meaningful, culturally sensitive and sustainable in the local context.

During my stay in Khumjung in June 2023, the Rinpoche, the esteemed, incarnate Chief Lama of the region, made a special journey from his monastery in Tengboche. This visit was a significant event, and I had the privilege of being the only non-local present to witness his arrival and procession, thanks to my host family. Moreover, I was granted the exceptional opportunity to enter the temple and receive His Holiness's blessing. This experience left a profound impact on me and serves as a meaningful illustration of the principle of reciprocity that I often mention regarding Sherpa culture. I will never forget the warmth and joy of his friendly smile.

The community's deep appreciation for my efforts in addressing their agricultural challenges was palpable during this event. It exemplified the essence of reciprocity, where mutual respect and gratitude are exchanged, forming a strong bond between individuals and communities. This experience also resonates with the concept of participant observation, where active engagement and immersion in the cultural context led to profound insights and meaningful connections. Witnessing the interactions with the Chief Lama and being a part of the Khumjung community during this event provided me with invaluable perspectives and reinforced the importance of cultural understanding and collaboration in my work.

Industry Engagement: Discussion

Three industries significantly impacted this project and were the focus of significant research. The economic repercussions of the rapid growth in eco-tourism and mountaineering in Nepal, particularly in the upper Khumbu region of Everest, must be carefully considered for any initiatives in the area. Through firsthand experience gained over two years and three expeditions along the Khumbu Valley, my role as a participant observer has allowed me to become increasingly sensitive and attuned to the subtleties within the region's industrious dynamics.

Similarly, residing in Minnesota has provided an opportunity to understand the critical nuances of *the deep-winter farming industry* and related growing structures, which has been beneficial for this project, especially regarding the application of solar geodesic growingdomes. Additionally, Minnesota's strategic location provides access to the philanthropic fundraising industry, further enhancing the project's potential for success.

Overall, the intersection of these three industries—eco-tourism and mountaineering in Nepal, deep-winter farming expertise, and philanthropic fundraising—has played a pivotal role in shaping the direction and effectiveness of this project. After additional discussion regarding the tourism industry, below, the subjects of deep-winter farming and philanthropic fundraising are pursued in greater detail later in this chapter.

Eco-Tourism and its Broad Impacts

Nepal and its economy, environmental challenges and political challenges were introduced in Chapter One. It was noted that Nepal, a country known for its breathtaking landscapes and towering mountains, has witnessed significant economic impacts from eco-tourism and mountaineering. Along with the current social and environmental challenges facing

Nepal, the current economic benefits derived from these tourism sectors are significant contributors to Nepal's overall economic landscape.

According to a study by Shrestha, et al., (2020), eco-tourism has led to the creation of jobs in various sectors such as hospitality, transportation, and local handicrafts. This has directly contributed to income generation and poverty alleviation, particularly in rural areas dependent on tourism like the upper Khumbu region. Moreover, eco-tourism has been a driver in environmental conservation and community development initiatives.

Local communities from Lukla to Namche and Khumjung are actively involved in eco-friendly practices and Sherpa cultural preservation, further enhancing the socio-economic fabric of Nepal. The revenue generated from eco-tourism also supports conservation efforts in Sagarmatha National Park and protected areas are serving to safeguard Nepal's natural heritage for future generations (Ghimire & Heinen 2021).

Economic Impact of Mountaineering: Mountaineering, particularly expeditions to the Himalayas, has been a hallmark of Nepal's tourism industry. The allure of summiting world-renowned peaks like Mt. Everest attracts mountaineers and adventure enthusiasts from across the globe. The revenue generated from mountaineering permits, guide services, and expedition logistics has a substantial economic impact. According to Khanal and Nepal (2019), mountaineering contributes significantly to Nepal's GDP through permit fees, equipment rentals, and accommodation services. Additionally, it creates employment opportunities for local guides, porters, and support staff, particularly in mountainous regions.

However, the environmental impact of mountaineering, such as waste management and conservation challenges, requires sustainable management practices to mitigate adverse effects (Dahal & Joshi 2020). New restrictions are being placed on the number of climbing permits

being issued though this is dubious based upon the inherently corrupt systems in place throughout Nepal.

Hopefully, the country will recognize, with the ability to implement equitably, the necessary policies and administration to foster sustainable development, preserving natural resources, and promoting cultural heritage. In an important regard, the Sherpa of Khumbu have been granted a high degree of autonomy from the Nepali government, to live, manage and operate the lands and villages they currently occupy within the Sagarmatha National Park.

- **Cultural and Ethnographic Considerations: Discussion**

Regarding the importance of viewing the project as a *multifaceted, living laboratory* and a source of knowledge and education, it's crucial to highlight a critical element pointed out by Dr. James Fisher. He draws attention to the challenge of preserving Sherpa identity among the new generation of children who are being educated and living outside of the Khumbu, particularly in Kathmandu. This situation jeopardizes the figurative roots of wisdom and tradition that were once nurtured in the potato fields of their ancestors' villages. However, Fisher notes that the Sherpa community initiated the education of their children well before the rapid expansion of trekking and tourism in the region. According to Fisher, a prominent cultural anthropologist from Carleton College in Minnesota, this foresight bought them valuable time. Fisher's book "Sherpas: Reflections on Change" (1990) elaborates on these points.

> Further reflection leads me to believe that it is the schools that are the crucial link between tradition and modernity, because they have enabled Sherpa to exploit the forces of change. Having successfully met the modern world on its own ground, these educated Sherpas have the cultural self-confidence to intensify their ethnic identity.

Here lies one of the reasons why the Sherpa continue to exhibit resilience to this day: cultural equilibrium. This is exemplified by what I term as Indigenous intelligence, which involves the

ongoing integration of time-tested, proven, and traditional practices with a flexible attitude that embraces and accommodates constant change as an integral part of their culture. Fisher further elaborates on this concept.

> The schools brought change, but it also gave Sherpa the tools to maintain its cultural equilibrium. If loss of Sherpa identity occurs, it will be among the new generation… in the cement and brick and asphalt of Kathmandu.

It takes One to Know One

During my first trek up the Khumbu Valley in October 2021, I encountered the entrepreneurial spirit of Sherpa lodge and tea house owners. From the owner of the North Face Lodge in Lukla, whom I've come to know well, to one of the first Sherpa homeowners who seemed more like an artist from L.A. – perhaps because he also lived there part-time when not in Nepal – to the hard-working, jovial owner of a tea house with whom I discussed expansion plans on my way to Namche Bazaar, their inquisitive yet fearless personalities immediately captivated me. This allure is what anthropologist Vincanne Adams describes as the seductive charm of the Sherpa people, making them naturally appealing and intriguing, especially to individuals like myself, while also serving them well as astute business owners and forward-thinkers.

This mutual attraction highlights the significance of reciprocity in Sherpa culture and the ability to execute tasks effectively. The interplay between *reciprocity and implementation* is a crucial dynamic that holds considerable importance, particularly in relation to the growingdome project and its implementation. This brings to mind another cultural characteristic that I not only observed but also experienced firsthand.

It's More Than *Mañana*

After spending a year and a half in Ajijic, Mexico, I developed a newfound appreciation for a different attitude toward time. While it wasn't an easy adjustment initially, I was motivated

to adapt. Over time and with practice, I learned to embrace the deeper meanings of the *siesta* and the concept of *Mañana*. Literally meaning "tomorrow" in Spanish, Mañana also conveys a laid-back attitude of *"what's the rush, man?"* Yet, it holds a deeper cultural significance in Hispanic culture that warrants a meaningful discussion on time, life, and priorities. Maybe Mañana.

During my time in Khumjung Village, I became more aware of an interesting parallel with the Sherpa and their strong Buddhist beliefs regarding time, priorities, the afterlife, and reincarnation, all of which intertwine with their entrepreneurial spirit. While there is a clear desire among the Sherpa to complete tasks in a timely manner, there's also a fatalistic component that acknowledges at some level, "*Hey brother, if it doesn't happen in this lifetime, there's always the next."* This nuanced perspective is challenging to articulate but is something I have come to respect and credit my experience in Mexico for helping me understand and appreciate. Though my orientation remains with this lifetime as it pertains to the growingdome initiative, it is yet, a rare and somewhat sublime aura that cloaks a finely balanced expectation for results from the Sherpa community.

Earlier, the *Three Jewels* were introduced and discussed as an ethnically oriented metaphor, signifying the reverence for traditional wisdom, guidance, and faith. To emphasize the ongoing cultural negotiation, resilient and adaptive cultures like the Sherpa use metaphors to educate themselves and others about their past, present lives, and the preservation of their cultural identity amidst technological advancements. This aspect is a fundamental attribute of the project's anthropologically sensitive execution methodology.

- **Remote/Extreme Deep Winter Growing: Discussion**

Off-grid deep winter farming refers to agricultural practices that occur in remote areas without access to traditional power sources or during the winter months when natural conditions are harsh. These farming systems face unique challenges due to limited sunlight, extreme temperatures, and limited access to resources such as water and nutrients. However, with innovative solutions such as the solar geodesic growingdome, and sustainable practices, off-grid deep winter farming can be made viable and environmentally friendly.

Here in Minnesota, the cold, grey winters do not accommodate traditional food production, resulting in less-than-optimized use of land and soil for much of the year. Current deep winter greenhouse technology lags behind innovative opportunities feasible for winter food production in Minnesota. According to the University of Minnesota's extension office, the definition of a deep winter greenhouse is "a passive-solar greenhouse that relies on energy from the sun to heat the building instead of more traditional heating sources."

One of the main challenges of off-grid deep winter farming is the lack of sunlight. Solar power presents a viable solution to this challenge, allowing farmers to generate electricity for lighting, heating, and powering essential equipment. Solar panels can be installed strategically to

maximize sunlight absorption even in winter months, providing a reliable source of renewable energy.

(Photo from King Dome Inc., negreenhouses1.myshopify.com)

Wintertime in the upper Khumbu Valley brings copious amounts of sunshine. With an effective increase in UV energy at a rate of 10% additional for each 1000 meters of altitude, premium solar power more than negates the cold temperatures. In the solar-geodesic growingdome, the sun's heat-energy is captured as it passes through the efficient, translucent polycarbonate panels and strategically reflected by a mirror-coated reflector curtain towards the water pond. The water serves as a passive thermal mass acting like a heat battery, storing heat during the daytime for release in the night when outside temperatures dip. This is accomplished with a system of fans and ducting, allowing for moving air around and through the raised planter boxes. Thus, the soil and earth itself serve as heat batteries, efficiently applied to maintain desirable temperature ranges of both air and soil.

Building on farmer innovation, the early research and development of this technology was spurred by the desire to reduce fossil fuel inputs in indoor food production. The inclusion of Smart/A-I innovations will only add to the abilities for increased productivity with less resource use (Carlson 2024).

Another challenge in traditional greenhouse design is maintaining optimal growing conditions in harsh winter environments. Greenhouses and high tunnels equipped with insulation materials can help regulate temperature and protect crops from frost and extreme weather. Additionally, incorporating regenerative agriculture practices such as cover cropping, crop

rotation, and composting can improve soil health, increase water retention, and enhance overall resilience to environmental stressors (Brown & White 2019).

Water scarcity is a significant concern for off-grid farming, especially in winter when natural water sources may freeze. Rainwater harvesting systems combined with efficient irrigation techniques such as drip irrigation or hydroponics can minimize water wastage and ensure crops receive adequate moisture. Furthermore, integrating aquaponics systems that utilize fish waste to fertilize plants can enhance nutrient cycling and reduce the need for synthetic fertilizers. Water supply in Khumjung Village is not a challenge nor is electricity, thanks to recent installation of micro-hydro-electric generating facilities in both Khumjung and Khunde. Plans call for the growingdome to be plumbed for water on demand and wired for lighting and optional, supplemental heating if desired/needed. Significant mulching will be required to naturally supplement the soil composition for the growingdome and will take community engagement to accomplish.

Off-grid deep winter farming poses challenges related to energy, climate, and resource management. However, by leveraging solar power, regenerative-sustainable practices, and innovative technologies, these challenges can be overcome. Implementing a holistic approach that combines renewable energy, efficient water management, and soil conservation practices is crucial for creating resilient and sustainable off-grid farming systems (Smith 2020).

- **Funding Typology: A Handful of Types to Start With**

Funding for the growingdome project is a significant challenge which must be overcome for achieving actual execution. Accordingly, identification and typing of sources is among the first steps in assembling a funding strategy for a non-profit organization or foundation such as

the one affiliated with this project. From a review of accessible literature on this topic, five fund types have been assembled. Though terminology can vary and categories over-lap, from prior for profit, business experience and added information from my research on nonprofits, they include:

1. **Government Funds** which are initiated with local, state or federal government money and deliver support through loans or grants.
2. **Public Entity Funds** which are initiated with dedicated public entities like economic development agencies or special use authorities that are affiliated with, but operate independently from, city hall. They also provide loans or grants.
3. **Philanthropic Funds** which are set up separately from city hall and are capitalized with funds from community foundations or local anchor institutions to provide grants to small businesses, charities and non-profit organizations.
4. **Financial institution Funds** which are capitalized by the variety of banks and CDFIs that commonly lend to small business. They provide grants and loans to businesses. And
5. **Business Chamber Funds** which are run through local nonprofit business associations and provide long-term and quickly deployed loans to the small businesses in their communities.

From this typology, three questions about each fund are developed to facilitate the decision-making process for which is most applicable. *How is the fund capitalized? Who is the intermediary, or coalition of intermediaries that distributes the money, and for what various purposes or objectives are funds earmarked?*

Strategies and tactics for funding will be addressed separately in this paper. The discussion in this section aims more for categorical distinction than comprehensiveness. Given the community-oriented, non-profit nature of this project, the base type of funding will be

sourced from the *Philanthropic Funds* type. A useful study I researched, produced by the Stanford Social Innovation Review (SSIR 2009) through the Stanford Graduate School of Business, identified ten sub-type funding models and I re-named them in a manner more suitable for this project. I review and breakdown *types and sources* to elucidate effective strategizing in regard to securing project funding for the Hillary School growingdome.

These models, along with profiles of representative non-profits, are ordered by the dominant type of funder. The first three sub-types: *Soulful Connectors, Builder Beneficiaries,* and *Motivating Members,* are funded largely by many individual donations. The next sub-type: *Big Thumpers,* is funded mostly by a single person or by a few individuals or foundations. The next three sub-types: *Motivating Members, Social Soldiers*, and *Choice Brokers*, are funded largely by the government. The next sub-type: *RE-Directors*, is supported largely by corporate funding. And the last two sub-types: *Niche Marketeers, and Local Globalizers*, have a mix of funders.

As the SSIR points out, devising a framework for nonprofit funding presents challenges. To be useful, the sub-type models cannot be too general or too specific. It cites a useful example of a community health clinic serving patients covered by Medicaid and a nonprofit doing development work supported by the U.S. Agency for International Development. Though both are government funded, the type of funding they get, and the decision makers controlling the funding, are very different. Lumping the two together in the same model would not be useful. At the same time, designating a separate model for nonprofits that receive Title I SES funds (Academic programs-related funding), for example, is too narrow to be useful.

My iterations and revisions derived from the Review make use of three parameters to define the sub-types: the source of funds, the types of decision makers, and the motivations of

the decision makers (Foster, Kim, Christiansen 2009). This helped me to generate the ten distinct funding models.

Funding Sub-types

1. ***Soulful Connectors***

   Some nonprofits, such as the Make-a-Wish Foundation or the Susan B. Komen Foundation, grow large by focusing on causes that resonate with the existing concerns of large numbers of people at all income levels, and by creating a structured way for these people to connect where none had previously existed. Nonprofit leaders considering the *Soulful Connector* funding model should ask themselves the following questions:

   > *Have a large cross section of people already shown that they will fund causes in this domain? Can we communicate what is compelling about our nonprofit in a simple and concise way? Does a natural avenue exist to attract and involve large numbers of volunteers? Do we have, or can we develop, the in-house capabilities to attempt broad outreach in even one geographic area?*

2. ***Builder Beneficiaries***

   Some nonprofits, such as the Cleveland Clinic, are reimbursed for services that they provide to specific individuals but rely on people who have benefited in the past from these services for additional donations. Two of the best examples are hospitals and universities. Nonprofit leaders should ask themselves the following questions:

   > *Does our mission create an individual benefit that is also perceived as an important social good? Do individuals develop a deep loyalty to the organization in the course of receiving their individual benefit? Do we have the infrastructure to reach out to beneficiaries in a scalable fashion?*

3. ***Motivating Members***

   Nonprofits, such as church and synagogues, rely on individual donations and use such a funding model. These individuals (who are members of the nonprofit) donate money because the issue is integral to their everyday life and is something from which they draw

a collective benefit. Nonprofit leaders considering this funding model should ask themselves the following questions:

> *Will our members feel that the actions of the organization are directly benefiting them, even if the benefit is shared collectively? Do we have the ability to involve and manage our members in fundraising activities? Can we commit to staying in tune with, and faithful to, our core membership, even if it means turning down funding opportunities and not pursuing activities that fail to resonate with our members?*

4. ***Big Thumpers***

There are a few nonprofits, such as the Stanley Medical Research Institute, which rely on major grants from a few individuals or foundations to fund their operations. Often, the primary donor is also a founder, who wants to tackle an issue that is deeply personal to him or her. Conservation International (CI), whose mission is to conserve the Earth's biodiversity and to demonstrate that humans can live harmoniously with nature, is an example of a nonprofit that uses this funding model. CI's ability to identify locations around the world where protecting an area of land can have a significant effect on preserving global biodiversity helps it attract donors who are willing to contribute large amounts of money so that they can have an important and lasting impact on protecting the Earth. The majority of CI's contributions come from a few large donors. Nonprofit leaders considering this funding model should ask themselves the following questions:

> *Can we create a tangible and lasting solution to a major problem in a foreseeable time frame? Can we clearly articulate how we will use large-scale funding to achieve our goals? Are any of the wealthiest individuals or foundations interested in our issue and approach?*

5. ***Social Soldiers***

Many nonprofits, such as the Success for All Foundation, work with government agencies to provide essential social services, such as housing, human services, and education, for

which the government has previously defined and allocated funding. Nonprofit leaders considering the *Social Soldier* funding model should ask themselves the following questions:

> *Is our organization a natural match with one or more large, preexisting government programs? Can we demonstrate that our organization will do a better job than our competitors? Are we willing to take the time to secure contract renewals on a regular basis?*

6. ***Creative Solvers***

These nonprofits have developed novel methods to address social issues that are not clearly compatible with existing government funding programs. They have convinced government funders to support these alternate methods, usually by presenting their solutions as more effective and less expensive than existing programs. Nonprofit leaders considering this funding model should ask themselves the following questions:

> *Do we provide an innovative approach that surpasses the status quo (in impact and cost) and is compelling enough to attract government funders, which tend to gravitate toward traditional solutions? Can we provide government funders with evidence that our program works? Are we willing and able to cultivate strong relationships with government decision makers who will advocate change? At this time are there sufficient pressures on government to overturn the status quo?*

7. ***Choice Brokers***

Some nonprofits compete with one another to provide government-funded or backed services to beneficiaries. Among the areas where *Choice Brokers* compete are in housing, employment services, health care, and student loans. What distinguishes these nonprofits from other government-funded programs is that the beneficiaries are free to choose the nonprofit from which they will get the service. Nonprofit leaders considering this funding model should ask themselves the following questions:

> *Can we demonstrate to the government our superior ability to connect benefit or voucher holders with benefits, such as successful placement rates and customer*

satisfaction feedback? Can we develop supplemental services that maximize the value of the benefit? Can we master the government regulations and requirements needed to be a provider of these benefits? Can we find ways to raise money to supplement the fees we receive from the benefits program?

8. ***RE-Distributors***

Some nonprofits, such as AmeriCares Foundation, have grown large by collecting in-kind donations from corporations and individuals, and then distributing these donated goods to needy recipients who could not have purchased them on the market. Businesses are willing to donate goods because they would otherwise go to waste (for example, foods with an expiration date), or because the marginal cost of making the goods is low and they will not be distributed in markets that would compete with the producer (for example, medications in developing countries). Nonprofit leaders considering this funding model should ask themselves the following questions:

Are the products that we distribute likely to be donated on an ongoing basis? Can we develop the expertise to stay abreast of trends in the industries that donate products to us so that we can prepare for fluctuations in donations? Do we have a strategy for attracting the cash we'll need to fund operations and overhead?

9. ***Niche Marketeers***

Some nonprofits provide a service that straddles an altruistic donor and an outside the box deliverable motivated by market forces. Even though there is money available to pay for the service, it may appear unseemly or unlawful for a for-profit to do so. Organ donation is one example where Niche Marketeers operate. There is a demand for human organs, but it is illegal to sell them. Nonprofit leaders considering this funding model should ask themselves the following questions:

Is there a group of funders with a financial Interest In supporting our work? Are there legal or ethical reasons why it would be more appropriate for a nonprofit to deliver the services? Do we already have a trusted program and brand name?

10. ***Local Globalizers***

There are a number of nonprofits, such as Big Brothers Big Sisters of America, that have grown large by creating a national and possibly international network of locally based operations. These organizations focus on issues, such as poor schools or children in need of adult role models, that are important to local communities across the country, where government alone can't solve the problem. Nonprofit leaders considering this funding model should ask themselves the following questions:

> *Does our cause address an issue that local leaders consider a high priority, and is this issue compelling in communities across the country? Does expanding our organization into other communities fulfill our mission? Can we replicate our model in other communities? Are we committed to identifying and empowering high-performing leaders to run local branches of our organization in other communities?*

As mentioned above, evaluation and applicability will be discussed in a later section. Though the Stanford Review was not focused on international fund-raising; the particular categorization will serve the strategizing efforts, with the condition that the scope of funding sources considered includes or focuses on international sites and global projects.

Chapter Four: Results and Findings

- **Sherpa Resiliency: A Study in Indigenous Intelligence**

From his seminal work "Claiming the High Ground: Sherpa Subsistence and Change in the Highest Himalaya," Dr. Stanley Stevens, a Professor of Anthropology at Louisiana State University, delves into the adaptive practices and cultural heritage of the Sherpa people, particularly in the Khumbu region. This study sheds light on the resiliency and Indigenous intelligence exhibited by the Sherpas and helped me to better grasp their navigating the

challenges of their environment while maintaining their cultural identity. I refer to this balancing act as a sacred equilibrium of sorts.

Contrary to popular perception, the Khumbu region is not viewed by Sherpas as a harsh land but rather as fertile, bountiful, and inherently valuable. Their intimate knowledge of local microclimates, diverse crop and livestock varieties, and the utilization of local pasture and forest resources form the foundation of their sustenance strategies. Additionally, Sherpas employ a range of risk-minimizing practices and emergency fallback strategies, allowing them to thrive despite the high variability in crop yields and the risks associated with harsh winters. I learned that because every third or fourth year, the potato crop would not be the best, they maintained a one-year surplus. My potato pancake was likely from the prior year's harvest. Delicious notwithstanding such Indigenous intelligence!

Through generations of refinement, these adaptive practices demonstrate the Sherpas' creativity, resourcefulness, and adaptability. They not only embrace change but also maintain continuity in their culture and society. The Sherpas perceive historical changes in the regional economy and environment as outcomes of their own choices and integration of new ideas, techniques, and technologies while preserving long-valued patterns of life. The willingness to both considers and move ahead with the solar geodesic growingdome best epitomizes this attitude and cultural characteristic I've come to understand and appreciate.

The recent shifts in Sherpa land use and cultural facets reflect a dynamic yet grounded approach to change within the framework of shared values, beliefs, and identity. This continuous cultural evolution within a context of cultural continuity underscores the Sherpas' status as a vibrant and vivacious, adaptive society in the Khumbu region. Dr. Stevens' research provides valuable insights into the resilience and adaptive capacity of indigenous communities like the

Sherpas, highlighting the importance of cultural heritage in sustainable-regenerative developments including agriculture and nutrition.

Through the *Three Jewels* of *Biodiversity, Agribusiness* and *Regenerative, Sustainable Practices*, the sovereign rights of the Sherpa community to *Health and Food Security* are firmly embraced and supported. The fundamental premise of the geodesic growingdome technology is literally drawn through the sun's light, directly and reflected, into the growingdome. With acknowledgement to Intel for mirroring their tagline, the Hillary School growingdome will be designed, built and operated with *Indigenous intelligence inside*.

- **Solar Geodesic Growingdome Capabilities and Feasibility**

Indigenous communities like Khumjung are deeply rooted in traditional relationships with their land, air, and water. However, the rapid impact of globalization and modernization in various parts of Nepal is increasingly affecting these traditional ties.

Implementing the Three Jewels approach is expected to create a positive cycle of secondary and tertiary benefits. Empowerment will initiate potentials for significant transformations in growing techniques and production capabilities. By effectively integrating the growingdome with local schools and communities, opportunities for ongoing education, horticultural training,

volunteering in maintenance, planting, and harvesting, as well as small business education sponsored by classes, will create a holistic and positive environment for many individuals.

According to Growing Spaces, a manufacturer based in Pagosa Springs, CO, advancements in technology and building materials have facilitated the establishment of over 1000 geodesic, off-grid, eco-friendly, solar-powered growingdomes in 14 countries over the past two decades. These domes enable the cultivation of fruits, herbs, and vegetables that would otherwise be unavailable or unfeasible due to limited growing seasons and environmental constraints.

Several of these growingdomes operate successfully at high altitudes, sustaining year-round production even in harsh winter conditions. A notable example is Cloud City Farm, highlighted in the story "Growing the Impossible at 10,000 Feet" on Growing Spaces' website. Situated at 10,000 feet above sea level with only 28 frost-free days annually, Cloud City Farm demonstrates how innovative technologies like growingdomes can overcome environmental challenges and support thriving agricultural practices even in extreme conditions. Cloud City Farm: Growing the Impossible at 10,000 Feet (growingspaces.com) For reference, a fully functioning 42’ growingdome is capable of producing over 2,000 pounds of herbs, vegetables and fruits in a year.

According to Lem Tingley, the president and owner at Growing Spaces, about 300 of their domes are currently being operated by schools, with 90% still in use after the first 5 years. He shared the following data:

- Depending upon just how the interior growing plan is designed and what the goals of production are, a 42’ growingdome can be capable of providing a year-round yield of up to 2,260 lbs. of herbs, vegetables, and fruits. (2.5 lbs. / sq. ft. X 905 sq. ft.)

- These yields can be increased up to 10X through alternative techniques including vertical growing and terraced or mezzanine features in the growingdome.
- The retail value of a possible mix of production over 12 months could be $21,486 or greater based upon location and transportation costs. (See ROI Calculator; Appendix E)
- This can be translated into meeting the minimum needs of 20 to 50 children or 10 to 25 adults over a year. (Adults = 226 lbs. of fruit and veggies / year)
- A conservative amount to budget every year for maintenance and upkeep: $350 to $400/month.
- Eventual re-building/replacement reserve is $300 to $400/month. ($75,000 replacement cost in 20 years' time)

Growing Spaces has identified some key similarities between the Hillary School's growingdome project and a development initiative in Naujaat, Nunavut, an Indigenous Inuit community located on the Arctic Circle with a population of 1065. Information from Ryerson University's Enactus Project in Toronto, Canada, reveals that Northern Canadian communities pay four times the national average for fresh produce. Moreover, the extreme temperatures, often dropping below negative 30 degrees Celsius, make outdoor food cultivation nearly impossible in regions like Nunavut. Consequently, 35% of Nunavut residents experience severe food insecurity, with one in every three households in Naujaat struggling to feed their children adequately for days.

In response to these challenges, Enactus Ryerson initiated Project Growing North with the goal of supplying fresh, locally grown produce to Northern Canadian families. Through fundraising efforts, they secured $264,000 ($23,000 more than what is needs for the Hillary School!) to construct a geodesic growingdome in Naujaat, retrofitted with over 30 vertical

hydroponic towers capable of yielding over 20,000 pounds of produce annually while reducing costs by up to 51%, according to their project report.

To engage youth in finding solutions, Enactus Ryerson developed an educational curriculum implemented at local health centers, Arctic College, and the community school. Students receive instruction in business, horticulture, healthy eating, and sustainable greenhouse operations. They also have hands-on experience caring for greenhouse plants as part of the program. Additionally, a cooperative program was established for students to manage and operate the greenhouse, involving over 270 individuals in the Naujaat community.

These successful initiatives in Nunavut set a promising precedent for the Khumjung project. The milder winters and greater sunlight in Khumjung compared to the Arctic region suggest favorable conditions for implementing similar strategies to address food insecurity and promote sustainable agriculture.

Timeline

Here is the estimate, based upon information and guidance from Growing Spaces as well as from my personal experience in the execution of complex, international, cross-cultural operations.

- Time to design 42’ kit, assemble and prepare for transport upon purchase order: 70 days (P+70 days)
- Transit time Pagosa Springs to Kathmandu: 14 days (P+84)
- KTM to Lukla via Truck and helicopter: 3 days (P+87)
- Lukla to KJV: 3 days (P+90)
- Time to unpack and construct on site (with expert assistance): 10 days (P+100)
- Time to build/complete interior: 7 days (P+107)

- Time to prepare to plant first seeds: 7 days (P+114)
- First edible leaves of Swiss Chard or Kale? 100 days (P+214)

Thus, from Purchase Order in the States (U.S.) to *Salad on the plates* at the school hostel: a little over 7 months. If the fundraising allows for the target build date to be in June of 2025, the school hostel will have its first fresh greens in January. That will surely be *Mission Accomplished; Part I!* Caveats to include funding/payment delays, transport and customs challenges, weather conditions in Nepal, labor availability in Khumjung and all blessings necessary received from the Monastery, Yeti issues aside.

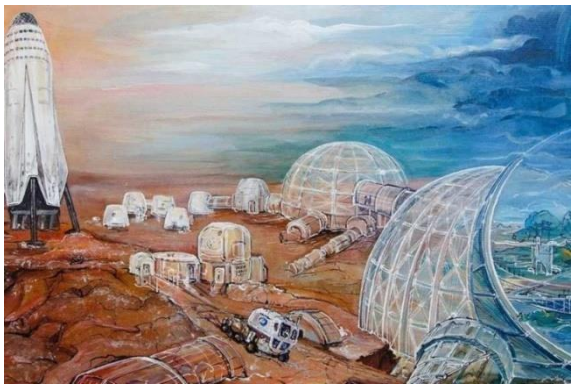
Comparative Analysis: Remote, Off-grid Growing Space Structures, Shape Matters

The investigation on most suitable design architecture for the extreme weather conditions and the Khumjung Village location quickly revealed the geodesic dome construction as superior, especially for use as a growing space alternative to a traditional greenhouse.

The geodesic dome, popularized by visionary architect Buckminster Fuller, emerges as an optimal solution for extreme weather conditions in remote locations due to its ingenious design principles. Fuller's application of triangulation imparts exceptional strength, efficiently distributing stress across the structure. This inherent stability is critical for withstanding harsh weather, including high winds and heavy snow loads. The dome's spherical shape minimizes wind resistance, deflecting forces and reducing the risk of structural failure in extreme climates.

The geodesic dome's success in extreme conditions is further validated by architectural experts like Shoji Sadao and engineers such as Thomas C. Howard, who have applied the design in diverse environments. In summary, the geodesic dome's combination of structural strength, efficiency, and adaptability position it as the most suitable architectural design for confronting the challenges of extreme weather conditions in remote locations.

Notably, Fuller's commitment to efficiency is evident in the dome's ability to cover large spans with minimal materials, ensuring cost-effectiveness and sustainability. The lightweight framework, comprised of interconnected triangles, facilitates ease of transportation and assembly in remote areas where traditional construction methods may be impractical. This efficiency extends to energy consumption; the dome's aerodynamic form requires less energy to maintain temperature, making it an environmentally conscious choice. Bucky believed it imperative that we choose wisely as our actions now impact whether we create a paradise on earth or risk further weakening of earth's fine-tuned and balanced ecosystem. "The future is a choice between Utopia and oblivion."



(Courtesy of Pacific Domes, Ashand, OR)

Commercial Options

An internet review, including Amazon, Etsy and Alibaba, revealed upwards of 50 companies marketing some form of geodesic dome structure in the U.S. and abroad. These structures, available in various sizes up to 50 feet in diameter and greater, were described for the intentions of camping, *glamping*, protective enclosures, gardening, solariums, and including full-time year-round living space.

When the parameters for use as a commercial-grade, kit-able, off-grid, deep winter (limited fossil fuel usage) growing space was added to the search, it narrowed the grouping down to the following three firms: Growing Spaces, Arctic Acres and Pacific Domes.

Further review revealed Arctic Acres as the Canadian dealer for Growing Spaces, the manufacturer, based in Pagosa Springs, CO. After a thorough analysis of the websites, associated YouTube videos, customer testimonials, blogs and over-all business model evaluation of both Growing Spaces and Pacific Domes, it was determined that Growing Spaces was more focused on the use of geodesic design domes for off-grid, eco-sensitive harvesting with over 30 years of successful experience at it. Pacific Domes puts forth an impressive array of dome uses across a wider spectrum and epitomizes the philosophical aspects of Buckminster Fuller's terraform future. Similarly, a future relationship with Pacific Domes would be very easy to foresee…

(See Appendix C for more information on Growingdome Comparative Analysis)

- **Estimated Budget Details: Discussion**

Funding goals based upon the current estimate of anticipated costs is $241,000.

Parent Category	**Grantee Budget Category**	**2024**	**2025**	**Total**	**Justification**
Travel	Airfare	$12,500	$30,000	$42,500	5x domestic trips @ $1000/flt over 30-mo.pd. 10x Int'l flts KJV, Nepal @$3750
Travel	Vehicle Rental and Maintenance	$500	$500	$1,000	3x car rental domestic
Travel	Other Transportation	$5000	$60,000	$65,000	$50,000 dome kit CO to KJV, $15,000 additional materials and supplies materials to KJV
Lodging/Food	Lodging	$1,500	$15,000	$16,500	Domestic travel, Kathmandu, Lukla, KJV
Lodging/Food	Food	$500	$4,500	$5,000	In accordance w/Lodging
Equipment/Lab	Equipment & Supplies	$0	$75,500	$75,500	42' Growingdome kit, additional interior components
Equipment/Lab	Laboratory Costs	$0	$0.00	$0.00	
Equipment/Lab	Laboratory Tests	$0	$3,000	$3,000	Horticultural-related, environmental controls, plant science related

Compensation	Applicant and Team Members Compensation	$0	$1,000	$1,000	Int'l Travel and in-field stipends
Compensation	Assistants and Consultants Compensation	$0	$17,000	$17,000	Int'l Travel and in-field stipends, including comp for construction Supervisor from Growing Spaces
Evaluation	Measurement and Evaluation	$0	$3,500	$3500	In support of Lab Testing and dome operations
Other	Institutional Overhead	$2,000	$3,000	$5,000	Legal, Admin, office supplies, Accounting, website, crowdfunding and social media management
Other	Dependent Care	$0	$0	$0	
Other	Miscellaneous	$1,000	$5,000	$6,000	Unexpected expenses, travel change costs, tips, taxes
	Subtotal	$23,000	$218,000	$241,000	

The two largest components of the budget are the acquisition costs of the growingdome; $75,500 and the anticipated transportation costs, estimated from initial quotes, at $50,000, to kit a complete dome unit and move from Pagosa Springs, CO to the Hillary School site. Routing will go through Denver, a potential terminal point in India, Kathmandu to Lukla in Nepal and up-valley to Khumjung. Likely, every form of modern and age-old form of transport will be employed including trucks, planes, possibly ship, helicopter(s) and porters for sure.

It is important to note that while this model is not intended nor foreseen as a sustainable solution for placement of growingdomes across the high Himalaya, it is critical that for a true evaluation and maximized opportunity for success to exist, variables including the dome itself, be as controlled as possible, including installation and initial operations. The budget and the plan call for a Growing Spaces technician to be on-site for the construction. Also onsite will be an experienced technical advisor regarding the interior set-up and launch of a basic growing plan for the school's produce needs. The budget also includes financial and technical

support for the first year of production prior to a complete hand-off to the growingdome's designated, local director/horticulturist.

Though preliminary in its formative nature, a business model is envisioned that would dramatically reduce costs for future acquisition and placement of growingdomes through Nepal and its surrounds through an in-country, authorized partnership which would facilitate local and regional materials, labor and expertise. Of special interest would be the use of recycled materials to replace the traditional cedar wood struts contained throughout the growingdome. Recycling of plastics and reduction of wood usage is of high interest and a government-led priority in Nepal.

- **Funding Considerations, Strategies and Tactics: Fundraising for the Hillary School 42' Solar Geodesic Growingdome**

This section is significant in both its scope and importance. It aims to provide guidance on creating and executing a successful fundraising campaign for the Hillary School 42' Solar Geodesic Growingdome. It includes critical considerations that will influence the methods used to raise the required $241,000 project cost. The newly formed nonprofit, 501I3 foundation called *Growingdome in the Clouds Foundation* (GDITCF), has as its sole mission, the raising of funds allowing for transport and construction of the first growingdome for the Sir Edmund Hillary School and the twin communities of Khumjung Village and Khunde. The foundation will lead and coordinate the fundraising activities, and a Go Fund Me (GFM) site has been set up for this purpose (refer to the Appendix for links to both the GDITC and GFM websites). The guidance and tactics outlined in this presentation will hopefully play a significant role in the actual execution of the project. Thus, the goal of this paper and specifically, in regard to funding, is to provide a foundation; literally, through the GDITCF and intellectually, through the typology,

considerations, strategies and tactics as outlined in this paper, to allow it to be successfully executed.

General Implications and Considerations for Nonprofits

Establishing effective funding sources and methods for an applied anthropology project is challenging. However, initial outreach and activities have been revealing and inspirational. Minnesota is particularly favorable for nonprofit organizations due to the significant role of its foundations, corporate giving programs, and state funding. The state's philanthropic base awards over $2.5 billion annually to support its thriving nonprofit sector (as per the 2023 Minnesota Grants Directory).

The Directory will be carefully reviewed and analyzed to Identify potential sources for funding. Key terms and concepts will be applied to assess compatibility with the mission and objectives. These criteria include: Agro-diversity, health and nutrition, food sovereignty, food systems, social entrepreneurs, disruptive technologies, critical social challenges, innovative solutions, self-sufficient agricultural systems, rural-poor empowerment, food-chain transformation, food insecurity, sustainable/regenerative agriculture, bio-diversity, Indigenous farming, rural livelihood, environmental protection, global food security, knowledge sharing, eco-sensitivity, micro-clime technology, smart agriculture, and Indigenous Intelligence.

Discussions with Minnesota State University – Mankato administrators have highlighted the usefulness of platforms like GrantForward and the Grants Resource Center for federal and private funding alerts, strategic insights about agencies, higher education funding opportunities, and leveraging successful grant proposals.

Identifying foundations open to unsolicited proposals is crucial. Even those not receptive to such proposals can set trends that influence other grant makers, making it essential to identify

them as well. The most common types of giving programs accepting proposals are community foundations, corporate giving programs, and private foundations.

As nonprofit leaders navigate the current economic climate, it's crucial to closely examine funding strategies and maintain discipline in fundraising efforts. Clarity about effective funding models is vital, as it can lead to successful fundraising campaigns and support the growth of nonprofit organizations.

Determination of criteria regarding foundations who are open to unsolicited proposals is critical. In some cases, foundations that are not open to unsolicited proposals but have an influence on the sector or sectors covering funding here are none-the-less setting trends that influence other grant makers. These should also be identified. The most common types of giving programs accepting proposals from non-profits, as detailed prior, are "community foundations, corporate giving programs, and private foundation."

Locally and state-wide, a review of the MN Grants Directory (2023) shows nearly 2,000 active foundations and corporate giving programs. This should provide a wide variety of funding interests from which to seek grants. The publication contains a wealth of information on over 100 of these foundations. This information will be reviewed and analyzed to seek possible partnerships with local foundations and agencies looking to support the growingdome program.

From an initial web-based analysis, the largest sources of international funding organizations which engage with food and agriculture-related initiatives include the following: The Bill and Melinda Gates Foundation, Ford Foundation., Walton Family Foundation, Agroecology Fund, The Conservation, Food and Health Foundation, National Geographic, Global Green Grants, Food Tank, Foundation for Food and Agricultural Research, Agricultural Foundation, Farm Foundation, Cisco Foundation, Land O Lakes/ Venture 37, Heifer Project

International, Multination Exchange for Sustainable Agriculture, International Fund for Agricultural Development, Australian International Food Security Center, Biodiversity International, Christensen Fund, Eco Agriculture partners, Global Planet Foundation, United Nations Food and Agricultural Organization, and the World Vegetable Center.

The MN Grant Directory states that developing methods to effectively identify and connect with non-profits in the agricultural space who are committed to the development of food systems and access to fresh, nutritious, socially benefitting foods is of paramount importance.

Importance of Discipline and Focus

Nonprofit leaders may be tempted to seek funding wherever available, but this approach can lead organizations astray. During challenging times, it becomes crucial for nonprofit leaders to carefully assess their funding strategy and maintain discipline in fundraising efforts. Nonprofit organizations have diverse funding paths, and not all may support large-scale programs. However, achieving greater clarity about effective funding models is beneficial for all nonprofits, and some can develop models that generate substantial funding.

Philanthropists are increasingly adopting a more disciplined approach to nonprofit investing. As our society relies on the nonprofit sector and philanthropy to address critical issues, a realistic understanding of funding models becomes increasingly vital for realizing these aspirations.

Questions about funding needs, sources, and scarcity become more prevalent during tough economic times. Unfortunately, answers to these questions are not readily available because nonprofit leaders often excel at creating programs but struggle with funding strategies. Moreover, philanthropists may struggle to gauge the impact and limitations of their donations.

Financial ambiguity has consequences, leading to misallocation of funds and hindering the success of promising programs. Nonprofit organizations and funding sources must align better to ensure that funds reach areas where they can make the most significant impact. In contrast, the for-profit sector in which I am more familiar with, demonstrates greater clarity in financial matters, especially in understanding business models. Business leaders can articulate their strategies clearly, enabling informed discussions with investors about profit generation. This clarity fosters successful businesses, profitable investments, and ongoing learning experiences. The nonprofit sector, however, often lacks such clarity in discussing long-term funding strategies. The various funding types that sustain nonprofits are often poorly defined, leading to a lack of understanding and clear strategic thinking (Hansmann 2008).

It would be poor advice to prescribe a single approach to pursue for the funding of this project. Instead, a model must be articulated clearly that can support the growth of the necessary organization which makes use of this plan and use that insight to examine the potential and constraints associated with the funding plan pursued.

Beneficiaries Are Not Customers

One reason why the nonprofit sector has not developed its own lexicon of funding models is that running a nonprofit is generally more complicated than running a comparable size for-profit business. When a for-profit business finds a way to create value for a customer, it has generally found its source of revenue; the customer pays for the value. With rare exceptions, that is not true in the nonprofit sector. This does not imply that those who support the growingdome initiative will not participate in a value proposition.

Duke University business professor J. Gregory Dees, in his work on social entrepreneurship, describes “the need to understand both the donor value proposition and the

recipient value proposition" from the context of social ventures and investment in the common good (Dees 1998). Clara Miller, former CEO of the Nonprofit Finance Fund (NFF), who has also written wonderfully about this dilemma, talks about "all nonprofits being in two 'businesses'—one related to their program activities and the other related to raising charitable 'subsidies'". NFF has a website which is a terrific resource for funding, advocacy and financial networking advice for nonprofits (nff.org).

A Distinction Worth Noting

As a result of this distinction between beneficiary and funder, the critical aspects and accompanying vocabulary of nonprofit funding models need to be understood separately from those of the for-profit world. It is also why the term *funding model* is better suited as opposed to *business model* to describe the framework. A Business Plan incorporates choices about the cost structure and value proposition to the beneficiary. A Funding Model, however, focuses only on the funding, not on the programs and services offered to the beneficiary.

Strategic Considerations

Raising funds for international non-profit projects in transformative small farm agriculture requires strategic planning and implementation. Below are five strategic areas of consideration crucial for successful fundraising in this context.

1. Innovative Technology Integration: Adopting innovative agricultural technologies like precision farming and sustainable irrigation systems can boost small farm productivity and sustainability (Mancini & Palladino 2019). Donors are often interested in supporting projects that demonstrate the use of cutting-edge solutions to address agricultural challenges.

2. Capacity Building and Training Initiatives: Developing capacity building and training programs for smallholder farmers is essential for empowering them with the skills and knowledge needed for modern farming practices (Food and Agriculture Organization [FAO], 2020). These initiatives should be highlighted in fundraising efforts to showcase their long-term impact on improving livelihoods and food security.
3. Market Access and Value Chain Enhancement: Facilitating market access and integrating small farms into value chains can enhance their economic viability and sustainability (Inter-American Institute for Cooperation on Agriculture [IICA], 2021). Fundraising appeals should emphasize the importance of building infrastructure and establishing market linkages to attract investors interested in sustainable agricultural development.
4. Community Participation and Engagement: Implementing participatory approaches that involve local communities in project design and decision-making fosters ownership and sustainability (International Fund for Agricultural Development [IFAD], 2018). Donors value projects that prioritize community engagement as it contributes to social cohesion and inclusive development.
5. Impact Measurement and Transparent Reporting: Implementing robust impact measurement frameworks allows organizations to demonstrate tangible outcomes and accountability to donors (United Nations Development Programme [UNDP], 2020). Fundraising materials should emphasize transparent reporting mechanisms to showcase measurable results in terms of yield improvement, income generation, and environmental conservation.
6. Successful fundraising for international non-profit projects in transformative small farm agriculture requires strategic considerations such as innovative technology integration,

capacity building, market access enhancement, community engagement, and impact measurement. By aligning fundraising strategies with these strategic pillars and providing transparent reporting, organizations can secure sustainable resources to drive positive change in smallholder farming communities globally.

Fundraising Tactics

Fundraising in International Non-Profit Projects in Transformative Small Farm Agriculture. Below is an outline of ten tactical elements which must be taken into account for the creation and execution of a successful fund-raising campaign attractive to the correctly matched donors.

1. Strategic Partnerships and Collaborations: Collaborating with governmental agencies, NGOs, and private sector entities can leverage resources and expertise (Smith 2020). For example, forming alliances with agricultural research institutions can demonstrate credibility and attract funding from scientific communities (Brown 2019).
2. Impactful Storytelling and Communication: Crafting compelling narratives that highlight the project's impact on smallholder farmers' lives can resonate with donors' emotions and values (Johnson & Lee, 2021). Utilizing multimedia platforms such as social media, videos, and blogs can effectively convey these stories to a wider audience (Smith 2020).
3. Donor Engagement Events and Campaigns: Organizing fundraising events, campaigns, and donor appreciation initiatives can strengthen relationships and encourage ongoing support (Brown 2019). Hosting farm tours, workshops, or virtual seminars showcasing project outcomes can engage donors directly and foster a sense of involvement (Johnson & Lee 2021).

4. Grant Applications and Funding Proposals: Applying for grants from government bodies, foundations, and international aid agencies requires strategic proposal writing and alignment with funders' priorities (Smith 2020). Developing detailed project plans, budgets, and impact assessment frameworks can increase the likelihood of grant approval (Johnson & Lee 2021).
5. Corporate Social Responsibility (CSR) Partnerships: Collaborating with corporations through CSR partnerships can access corporate funding, in-kind donations, and employee engagement opportunities (Brown 2019). Highlighting mutual benefits such as brand visibility, social impact, and sustainable supply chain initiatives can attract corporate donors (Johnson & Lee 2021).
6. Utilizing Crowdfunding Platforms: Crowdfunding platforms like Go Fund Me, Kickstarter and Indiegogo offer opportunities to reach a wide audience and garner support for transformative agricultural projects (Belle Flamme, Lambert, & Schwienbacher 2014). By creating engaging campaigns highlighting project objectives and impact, organizations can attract individual donors passionate about sustainable agriculture.
7. Organizing Fundraising Events: Hosting fundraising events such as galas, auctions, or farm-to-table dinners provides a platform to connect with potential donors and sponsors (Cronley, Fenwick, Brown 2017). These events offer opportunities to showcase the project's achievements, engage stakeholders, and solicit donations while fostering a sense of community involvement.
8. Engaging Corporate Partnerships: Collaborating with corporate partners aligns fundraising efforts with corporate social responsibility initiatives (Husted & Allen 2018).

Organizations can seek sponsorships, grants, or in-kind donations from companies interested in supporting transformative agricultural projects and enhancing their brand image.

9. Implementing Peer-to-Peer Fundraising: Leveraging peer-to-peer fundraising campaigns empowers supporters to raise funds on behalf of the organization through personal networks and social media (Barnes & Mattsson 2017). Providing fundraising toolkits, incentives, and recognition motivates individuals to mobilize their communities and amplify fundraising efforts.
10. Creating Strategic Partnerships with Foundations: Building partnerships with philanthropic foundations and grant-making organizations opens avenues for funding opportunities and institutional support (Sacks, Moore, LaGesse 2020). Organizations should align their project goals and impact metrics with foundation priorities to increase chances of securing grants and long-term funding partnerships.

Employing specific tactics such as crowdfunding platforms, fundraising events, corporate partnerships, peer-to-peer fundraising, and strategic partnerships with foundations can significantly enhance fundraising efforts for international non-profit projects in transformative small farm agriculture. By implementing these tactics strategically and adapting them to suit the project's objectives and target audience, organizations can increase their capacity to secure sustainable resources and drive positive change in agricultural practices worldwide.

It's Possible

Critical considerations in fundraising $241,000 for a transformative agricultural initiative in Nepal involve a multifaceted approach integrating strategic planning, targeted outreach, and effective resource utilization. One pivotal aspect is establishing a clear and compelling narrative

outlining the initiative's purpose, impact, and sustainability to resonate with potential donors' values and interests.

Strategic planning entails focused research to identify suitable funding sources such as government grants, private foundations, corporate giving programs, and individual donors interested in agricultural innovation and sustainable development. Leveraging existing networks and partnerships within Nepal's agricultural sector and internationally can yield valuable funding opportunities. Targeted outreach requires tailored communication strategies using platforms like social media, fundraising events, and personalized donor engagement to convey the initiative's goals effectively. Building trust and credibility through transparent reporting and accountability mechanisms further enhances donor confidence and long-term commitment.

Effective resource utilization involves prudent budgeting, cost-effective strategies, and rigorous monitoring and evaluation to ensure optimal fund usage for measurable impact and sustainability. Collaborating with local stakeholders, government agencies, and international organizations like National Geographic can enhance project visibility and attract additional support.

Fundraising nearly $250,000 for a transformative agricultural initiative in Nepal necessitates meticulous planning, strategic partnerships, diverse fundraising channels, transparent financial management, and a strong focus on innovation and impact evaluation. Addressing these critical considerations can secure the necessary funding for positive change, unlocking opportunities for sustainable growth in Nepal's agricultural sector.

To enhance the success in grant proposal discovery and writing for this project, the following checklist from "Recommendations for Writing Successful Grant Proposals: An Information Synthesis" (Wisdom, et al., 2015) is recommended:

- Research and identify appropriate funding opportunities as outlined in this paper.
- Use key proposal components, such as food sovereignty and sustainable-regenerative practices to persuade reviewers of project significance and feasibility.
- Describe proposed activities such as the Three Jewels methodology persuasively, clearly, and concisely.
- Seek review, engagement and feedback from all collaborators.
- Share the timeline.
- Exploit the expansive literature review.
- Promote with transparency the reasonable budgets, and
- Consider interdisciplinary collaborations, alliances and strategic partnerships.

- **Consequence Management: Do no harm, with cheerful tolerance and natural dignity**

"Tell us Erkien, if there were one thing we could do for your village, what would it be? I know you would like a medical clinic and believe that your farms could be improved, but if you had one choice, what would it be? 'We would like our children to go to school…'" (Sir Edmund Hillary 1960).

Education is a universal tool and an immeasurable element of wealth. This project places a high priority on the value and respect for indigenous intelligence in the broadest sense and scope. Thus, in accordance with the project's commitment to mitigation of unintended consequences in Khumjung Village and Khunde communities on account of the introduction of novel, agricultural technologies through the application of a solar geodesic growingdome, a model policy has been drafted in a culturally sensitive and forward-thinking style.

The purpose of this policy is to establish initial guidelines and procedures to mitigate unintended consequences associated with the introduction of new farming and agricultural technologies in indigenous communities. The policy, as it transfers into the hands of its stakeholders, and applied as they see fit, consistent with the vision and mission, aims to foster sustainable-regenerative development, preserve cultural integrity, and ensure the well-being and health of indigenous peoples while embracing advancements in small-farm agriculture.

The policy will apply to all stakeholders involved in the introduction, adoption, and implementation of new farming and agricultural technologies with impacts upon the Sir Edmund Hillary School students, staff, and surrounding indigenous communities.

In parallel footsteps with the guiding, Hillary philosophy as applied to the first schoolhouse and clinic built over 60 years ago, the keys to the growingdome, along with the full authority and ownership, shall belong fully to the school and its community. The following shall help assure a successful development and hand-over process to the school and its administrators for their adaptive management and monitoring.

Advisory Panel: (To be determined)

Principles: Respect for Indigenous Rights, Environmental Sustainability, Collaborative Decision-Making, Socioeconomic Equity and Cultural Sensitivity.

Community Consultation and Consent Guidelines

Prior to the introduction of new farming and agricultural technologies, developers and stakeholders should engage in meaningful consultation with indigenous communities to assess needs, preferences, and potential impacts. Free, prior, and informed consent (FPIC) must be obtained from indigenous communities before implementing any technological interventions on their lands or territories.

Mitigation Strategies will contain actions to develop contingency plans to address unforeseen negative consequences promptly, providing resources and support to affected communities. Mechanisms will be established for ongoing dialogue and collaboration between technology developers, government agencies, and indigenous communities to address emerging issues and refine technology implementation. Resources shall be allocated for adaptive management strategies that allow for the modification or discontinuation of technologies if adverse effects are identified.

Additional components of the complete policy address Impact Assessment, Capacity Building and Knowledge Transfer, Adaptive Management and Monitoring, Conflict Resolution and Grievance Mechanisms, Implementation and Accountability:

The Mitigation Policy for Unintended Consequences in Indigenous Communities will provide a framework for responsible and sustainable innovation in agriculture while safeguarding the rights and well-being of indigenous peoples. By fostering this collaboration, respect, and equitable participation, the growingdome project can be a model for designing and implementing resilient, sustainable-regenerative agricultural systems that benefit both present and future generations, beginning in the Khumbu and extending beyond. This will be a significant step toward greater food security and sovereignty of the community. To truly “do no harm, with cheerful tolerance and natural dignity” shall be a worthy goal. (See Appendix F for *Mitigation Policy For Hillary School Growingdome Project***)**

Chapter Five: **Discussion and Conclusion**

Nearly three years ago, what started as a straightforward study of Sherpa culture and its resilience to rapid change evolved into a deeper exploration of reciprocity and implementation; a duo of nuanced characteristics that I saw embodying the form of two hands embracing one another. While the global impact of challenges like poor nutrition and lack of food sovereignty was not the primary focus of this applied anthropological initiative, the project uncovered communal tactics and techniques to address them. Situated within the clouds of Chomolungma (Mt. Everest) and its surrounding community, a historic and culturally significant school provided the backdrop for the merging of Indigenous Intelligence with the resilient, adaptive Sherpa culture. For the Sherpa people, who view the benefits of new technology as an extension of their traditional ways, change is neither foreign nor feared; it is foundational to their societal journey and ethnogenesis, from Tibetan survivors to thriving world citizens. At its core, indigenous intelligence resides.

From the primal allure of the highest ground on earth, the forward-looking vision of a principal, and the intrinsic resilience of a culture emerges a 42-foot solar-geodesic growingdome awaiting its wings. Following a great circle route, inspired by Bucky Fuller, and sung about by John Denver, from Pagosa Springs, CO to Khumjung Village, Nepal, an airway has been mapped

out. Now, funds must be raised, and tickets purchased. By applying a business plan approach to project execution and adhering to disciplined funding guidance, the following scenario may soon become reality:

Hillary School, Khumjung Village, Nepal. February 202?

Principal Rai and the hostel cook, along with the head nurse from the Khunde Clinic, enter Growingdome-1 at the end of a cold, snowy school day. "Look here, we have ripe bananas!" calls out the principal in an excited tone, as all three are met with the warm, moist, 28°C air inside.

"How are the strawberries coming along?" asks the nurse. "We have two young mothers who will benefit from the added vitamin C and potassium," she adds. "They are looking pretty good," answers the cook. "We have some nice green, Swiss chard ready to eat too!" About that time, Pema Sherpa arrives. He will be making a small purchase of fresh cucumbers and tomatoes for feeding the monks at the Gompa (monastery). The rupees go to support the students' agribusiness ventures they've started.

After collecting the produce, the four exit the growingdome, once again back into the -5°C cold mountain air and head their separate ways. The principal recalled a comment he had shared with an old student anthropologist a few years back.

OK, brother... regarding the plants for winter, my priority goes for green vegetables because during that time, Khumbu is out of green things.

Realizing that not only did he have green things growing and harvested in the depth of winter, but also yellow and red, a phrase came into his mind they used to share with one another during the challenging times getting the first of the colony of three growingdomes built.

Hoka hey!

- A Lakota saying for *Let's do it*, gleaned from the story *Black Elk Speaks* (Neihardt 1932), a copy of which that anthropologist left with him as a gift. *Yes*, whispered the principal.

We did it.

We shall never know what heights we can achieve…

or which summits we shall stand a top…

so long as we ***just keep climbing.***

- GML

Author's Note

It would be incomplete not to briefly acknowledge something well-known to seasoned researchers: the unexpected coincidences and connections that often arise during extensive research efforts. R. Buckminster Fuller, renowned for coining the term "Synergetic" and pioneering whole systems thinking, played a significant role in this realm. The synergy between Fuller and singer-songwriter John Denver gave rise to the Windstar Project and the concept of geodesic biodomes in the Rocky Mountain High country in the late 1970s. Similarly, the inspiration behind what is now the business Growing Spaces also took root around that time.

The chain of coincidences and connections doesn't seem to end there, including the author's own ties to John Denver both as a pilot and his relationship with the Mankato area during the author's university years. Some fifty years later, the universal principles and constants that have become increasingly evident to me, through diverse life experiences on Earth emphasizes the profound interconnectedness that binds us all, surpassing our full understanding. We are all connected.

In more ways than one…

Born and Raised in Colorado

Bucky Dome

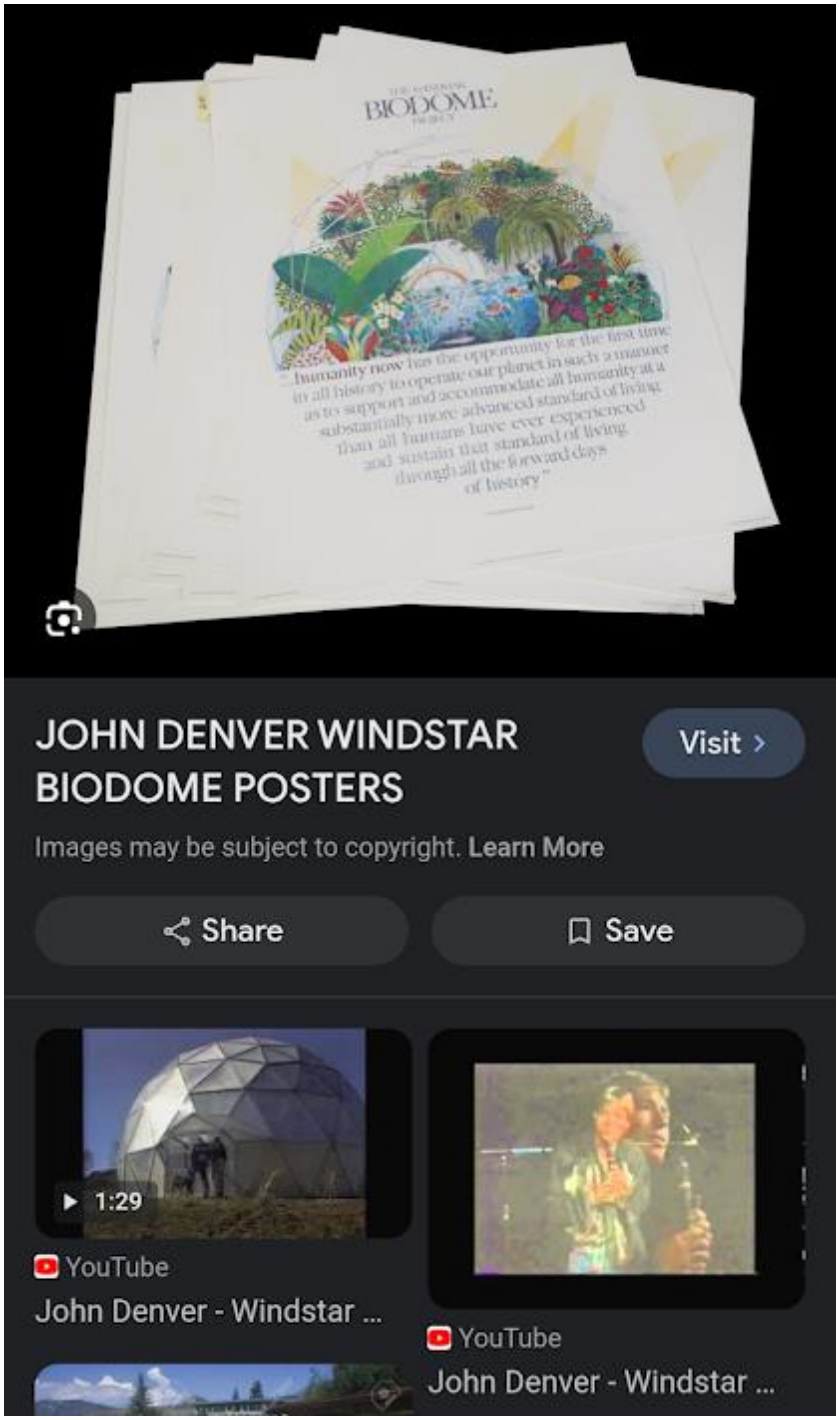
- In 1980, John Denver and Tom Crum teamed up with Buckminster Fuller, the inventor of the Geodesic Dome, outside of Aspen. They were operating on the assumption that if we learned "to do more with less" we could feed the world and solve our environmental problems. They built a large Biodome Greenhouse, the basis for what is now the Growing Dome!

Buckminster Fuller, John Denver and Tom Crum

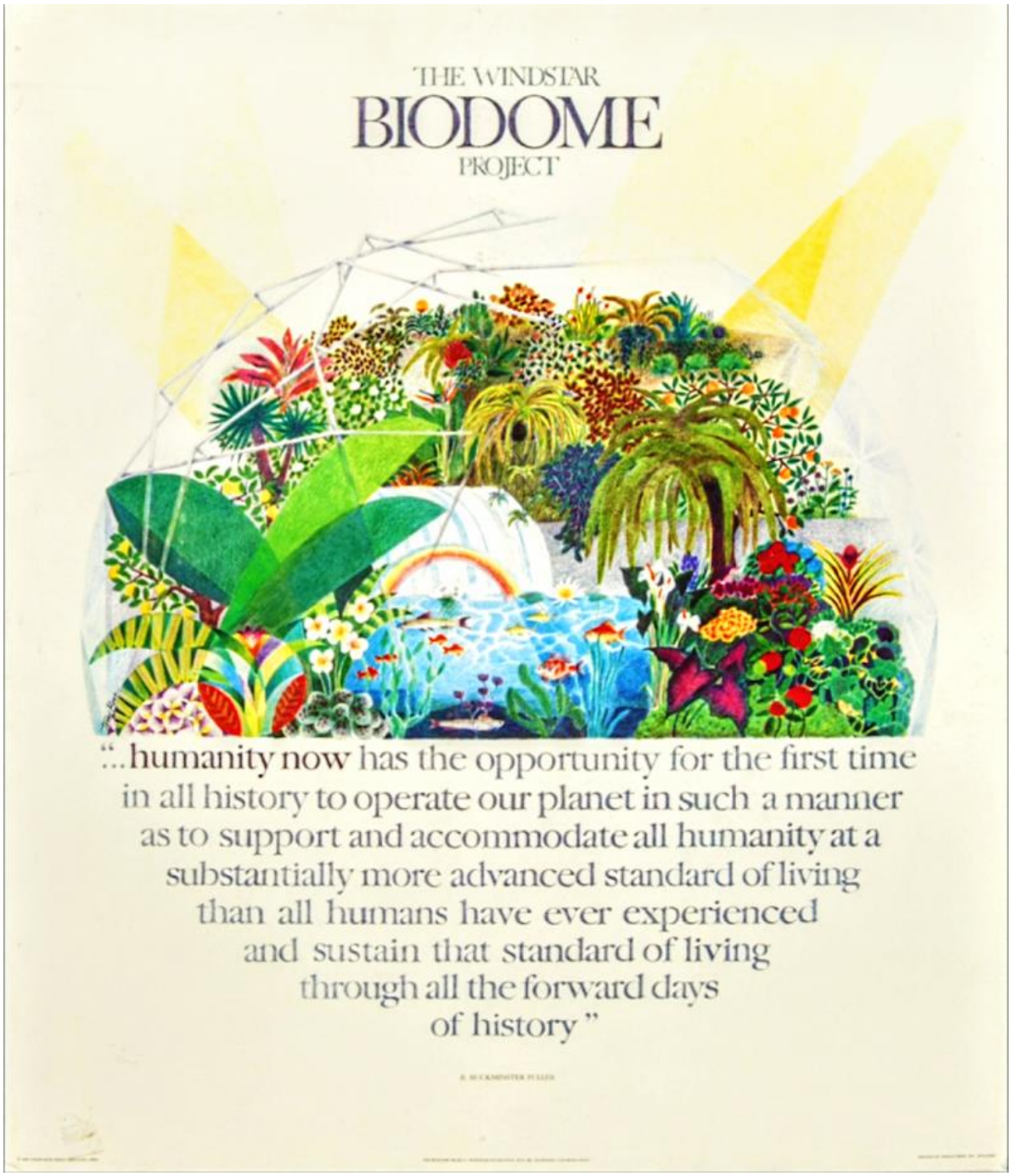
Windstar Ranch, Aspen, CO

(Courtesy of Growing Spaces)

Yes, that is JD in a geodesic growingdome above. Below is a scene from a TV Special.



Posters are gone… but maybe someday…



In memory of John Denver and Buckminster Fuller.

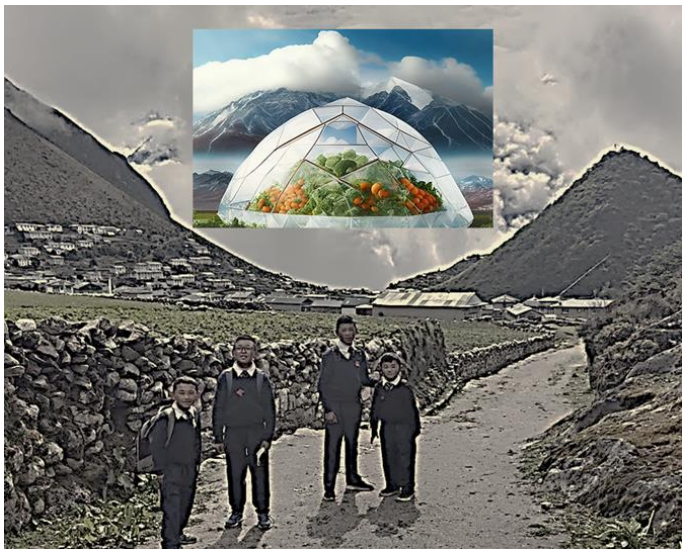
Hoka hey… We're still working on it.

Appendix A:

(All photos and artwork property of Gary Mark Lesley unless otherwise noted)

Solar Geodesic Growingdome Gallery

(See Appendix J for additional photos)



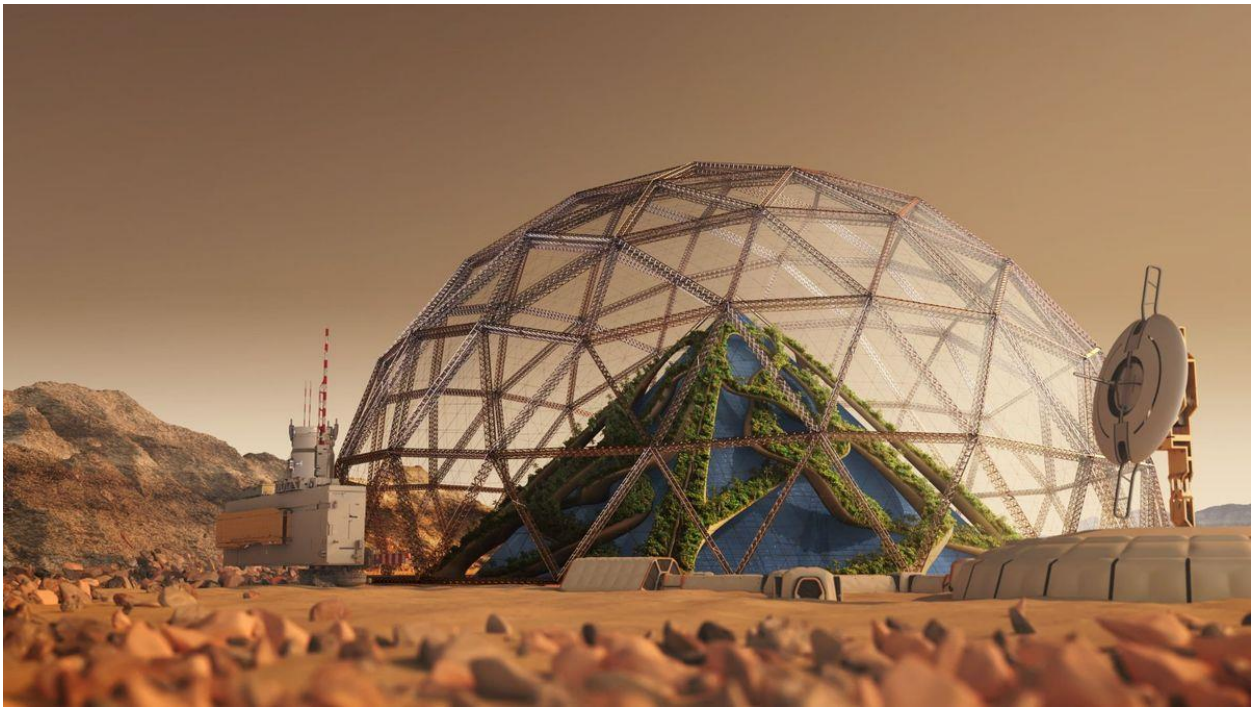
Interior: 42’ Growingdome

(Photo courtesy Growing Spaces)

Geo-Thermal Growingdomes; Pagosa Springs, CO

(Photo courtesy Growing Spaces)

Geodesic Dome on Mars (Future)

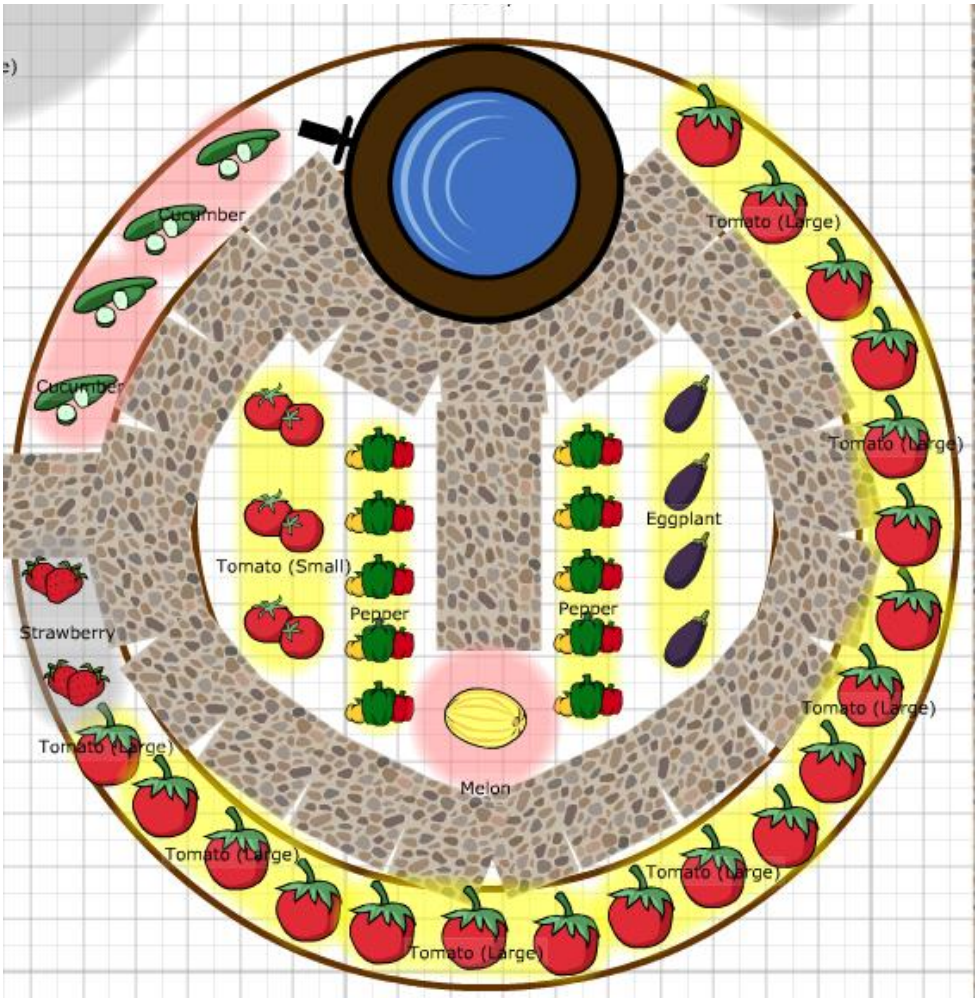


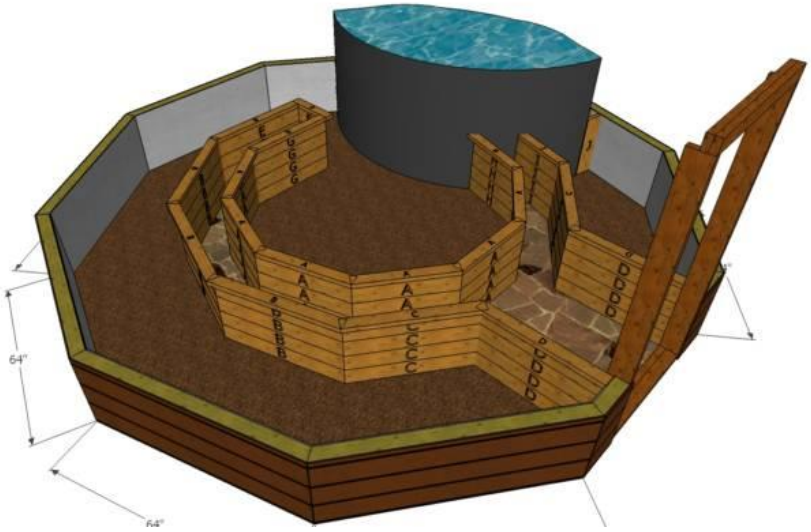
(Photos courtesy Google Images)

(Photos courtesy Growing Spaces)

Interior: 42’ Growingdome

Interior Growingdome Planting Design (Graphics courtesy Growing Spaces)





(Photos courtesy Google Images)

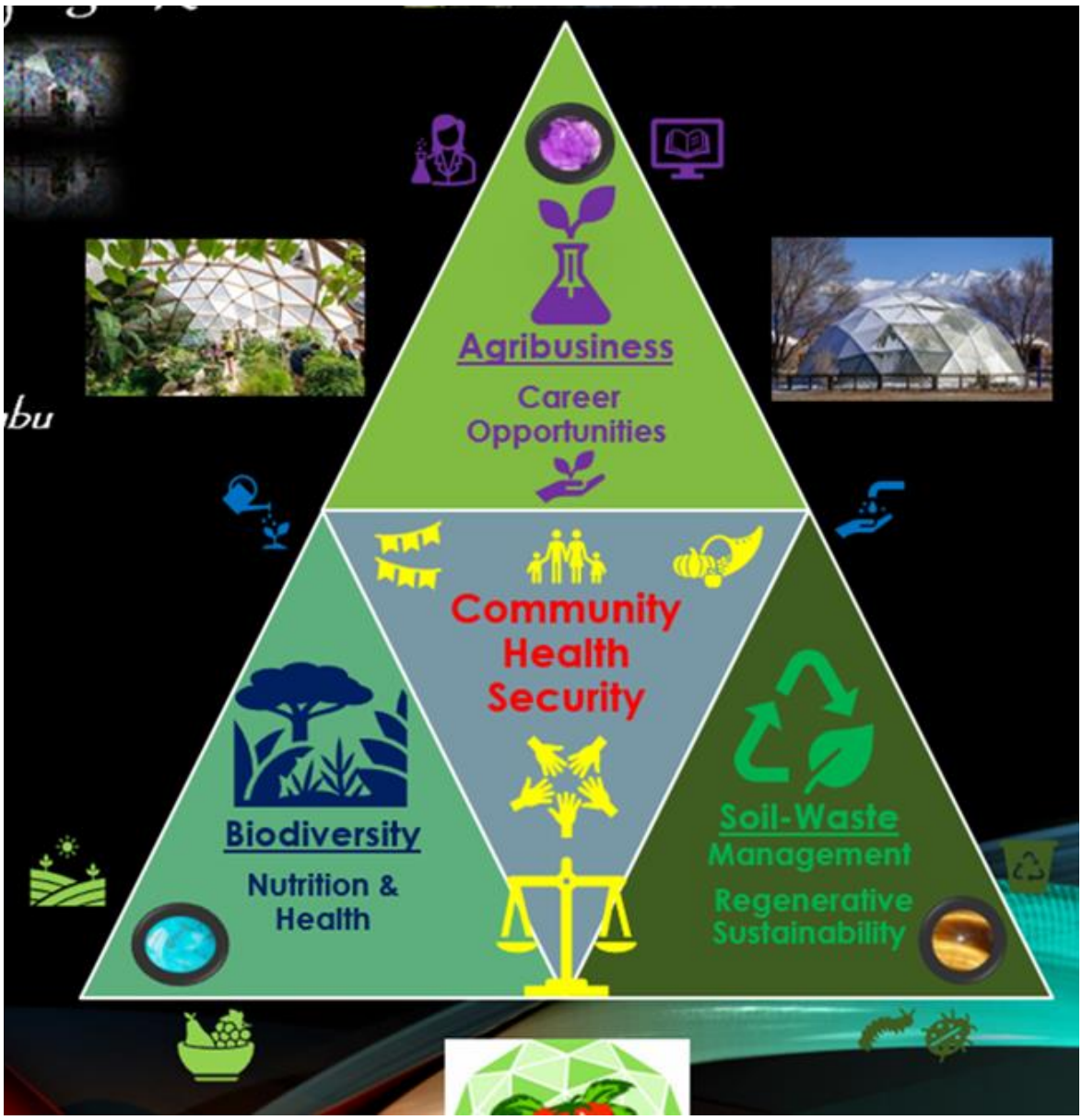
Geodesic Technology…

Nature's Design…

Indigenous Intelligence

At the center of the project, the Community and its sovereign rights to *Health and Food Security* are firmly supported. The three legs of the triangle form a stability that is present through nature and inherent in all structural design. The fundamental premise of the geodesic growingdome technology is reflected, in the sun's light and invisible power, through the symbology of the *Three Jewels* of *Biodiversity, Agribusiness* and *Regenerative, Sustainable Practices*.

The Three Jewels of Khumjung and Khumjung



(Photo courtesy Google Images)

Appendix B:

Related Website and Video Links

Growingdome in the clouds Foundation: www.growingdomeintheclouds.org

The New Heart of the Hillary School Growingdome

"With Good Soil and Seed... We Shall Grow and Succeed." From the heart of the solar growingdome, the soul of the school and the community will be mixed into the energy of the sacred earth. From this, the Three Jewels of Biodiversity, Sustainability and Agribusiness will take root and flourish for the benefit of many and all.

https://youtu.be/OcJR6Zzwiic

Yes... it's Possible!

A Solar Geodesic Growingdome for the Hillary School of Khumjung Village. Join us with your support to bring a solar-powered, eco-friendly, geodesic growingdome to Principal Rai and the Sir Edmund Hillary School within the clouds of Mt. Everest! Mixing the indigenous intelligence of this high-altitude potato farming village with new technology will serve not only students and staff but the entire area with enhanced nutrition, educational opportunities and sustainable, regenerative practices with benefits across the community.

https://youtu.be/635cEN-jkQg

Geo Growingdome to get its Wings...

Over the mountains of Colorado to the Sir Edmund Hillary School high in the clouds of Everest, a pathway is taking form. From the dreams of Principal Rai, to have a greenhouse which can produce a variety of vegetables and fruits all year round, and provide better nutrition for his students, staff and community, a vision has been put into motion. Because it IS Possible! Visit www.growingdomeintheclouds.org for more information on how to join our Team and give Principal Rai and the Sherpa communities of Khumjung and Khunde the wings their growingdome needs. Tashe Delek and Thuche Thuche!

https://youtu.be/JI0IRPO9DJc

People of Khumbu… June 2022

A part of me... a part of you... Life in Khumbu...from above the clouds. And within. 28 days in Nepal with the people of the Valley of Sagarmatha (Mt. Everest); watching, listening, hearing, tasting and feeling the re-indigenization of my very own spirit. Blessed to have spent time living with a beautiful Sherpa family in Khumjung Village and 3 days with Principal Rai and the fabulous students of the Sir Edmund Hillary School of 1962. Clearly...from the center of the clouds, the 'Bridge across forever' inter-locked among the youth; students who contain that intrinsic desire for knowledge that flows from their sub-conscious minds... and stretches for the sun. Illuminating us all. Namaste/Tashi Delek/Ho-ka Hey! GML (Thank you Glenn, for your musical inspiration. Truly... *an Eagle*...from Above.)

https://youtu.be/NO7dxec-3_8

Live... like tomorrow never comes

May/June 2023 Research Initiative in Nepal and the Khumbu Valley. Scenes from the trail, smiles from the people and sensations from the heart. Special thanks to Zac Brown Band for musical inspiration. "YES... I'll Be Back!" We have work to finish... only the start, upon the shoulders of great spirits. Tuchay! Hoka hey! Tashi Delek! GML

https://youtu.be/Y_e_RKxYVIY

Appendix C:

Growingdome Comparative (Commercial Industry) Analysis

Growing Spaces Greenhouse Kits - The Best Geodesic Dome ...

growingspaces.com
https://growingspaces.com

Growing Spaces manufactures the best greenhouse kits for all-season gardening, from small backyard greenhouses to large greenhouses for schools and ...

Our **geodesic dome** greenhouse kits are designed with sustainable solar greenhouse technology, have an expected lifespan of 15-20 years, and are suitable for ...
90-day returns
22' Growing Dome · 42-foot · 26' Growing Dome · 15-foot

Growing Dome Geodesic Greenhouse Kits

Arctic Acres
https://arcticacres.ca › domes

Our unique design and innovative features allow for affordable and convenient winter **growing**. ... **Growing Domes** allow for comfortable year-round **growing** and amble ...
42ft dome kit - What's included

Lumen & Forge Geodesic Greenhouse Dome Kit - 16ft

Mulberry Greenhouses
https://mulberrygreenhouses.com › products › copy-of-l...



The **geodesic** design works to have more efficient and uniform airflow throughout the structure while keeping temperature levels stable and maximizing solar gain.
$4,199.95 · Free 3–5 day delivery · In stock

GREENHOUSE DOMES

Pacific Domes
https://pacificdomes.com › greenhouse-domes

Our Custom **Geodesic** Greenhouse & **Grow Domes** are ideal for energy efficient **growing** and hydroponics. Our advanced system provides the climate and light control ...

Zip Tie Domes - Geodesic Dome Greenhouse Kits and ...

Zip Tie Domes
https://www.ziptiedomes.com

Affordable **Geodesic Dome** Greenhouse Kits and Chicken Tractor Kits that are Easy to Build, and No Tools are Required! Custom Sizes to Fit Your Project.
Free delivery
Missing: ~~growing~~ | Show results with: growing

Geodesic Domes

Greenhouse Emporium
https://greenhouseemporium.com › collections › geod...



What are **geodesic domes** and what makes them special? ... **Geodesic domes** are formed by a series of triangles that fit together, creating a tight waterproof ...
5.0seller rating (20) · Free 4–6 day delivery · 30-day returns

Greenhouse Dome

BDiR Tensile Structure
https://www.bdir.com › product › greenhouse-dome-t...

We build affordable, the most advanced **Geodesic Dome** Greenhouses and **Geodesic Grow Domes** for industrial growers and home gardeners who want to get healthier ...

Geodesic Dome Greenhouse

Alibaba
https://www.alibaba.com › showroom › geodesic-dom...

A **geodesic dome garden**, provides sunlight and is the for choice of any space. It is also easy to install and **dome** gardening is easy to maintain. Custom **geodesic** ...
3.9seller rating (154) · 30-day returns

Low cost geodesic dome greenhouse kit

Geo-Dome.co.uk
https://geo-dome.co.uk › article

Building the **dome** was very straightforward; I joined five hexagons around a pentagon panel using mole grips to pull the panels tight together then fixed them ...

Greenhouse Dome - a Year-Round Grow Dome for Your ...

Hypedome
https://hypedome.com › blog › geodesic-greenhouse-...

These beauties, sometimes known as **geodesic dome** greenhouses, are revolutionizing gardening by offering an environment where you control your plants **growing** ...
Missing: ~~sale~~ | Show results with: sale

Geodesic Growing Dome greenhouse for sale

Kids Garden Community
https://community.kidsgardening.org › discussion › ge...

Nov 19, 2023 — Our school in Alaska is selling a **geodesic dome** greenhouse kit (unopened) from **Growing** Spaces at a greatly reduced price!

USA Geodesic Domes | Commercial Domes

harmonydomesusa.com
https://www.harmonydomesusa.com

We Create Durable **Geodesic Domes** That Are Tough on the Outside and Gorgeous on the Inside. Harmony **Domes** USA **Geodesic Dome** Rentals & **Sales**. Call Today For A Free Quote. Event **Domes**. Projection **Domes**.
Buy Dome Kits · Shop Products · Our Showroom · Our Domes · Shop All · Glamping

DomeSpaces USA: Domes In Stock | DomeSpaces® - Official...

Domespaces
https://www.domespaces.com



Compare our geodesic home options, offering the best prices for novel eco-conscious living. Curious about dome home costs? Visit our site to explore options and find your dome house. **Domespaces**® Official Site. Models: Camping Domes, Glamping Domes, Glass Domes.

Natural Spaces Domes - Geodesic Dome Homes

Natural Spaces Domes
https://naturalspacesdomes.com

Natural Spaces Domes · Primary Menu · **NATURAL SPACES DOMES** - For half a century, we have been helping people like you design and build their dream dome. · Built ...


Appendix D:

Growingdome Feasibility Report and Climatology:

From Growing Spaces (Supplier)

1/17/2024

TO: Gary Lesley, Growingdome in the Clouds Foundation

FR: Lem Tingley, Owner, Growing Spaces Greenhouses

RE: Review and Feasibility Report: 42’ Solar Growing Dome:

Sir Edmund Hillary School
Khumjung Village, Nepal
27.8238 N, 86.7159 E
Elev: 3790 m (12,434 ft)

Dear Gary,

We are excited for the opportunity to work with you on bringing a Growing Dome to Khumjung Village. Despite it being an extreme climate, based upon the weather insights and climate data you have provided us (see Addendum), we are confident that the greenhouse will allow the community to grow an abundance of appropriately selected produce year-round. We have installed our Growing Domes in food deserts

across the globe, and all have been successful in producing food for their communities. Here are just a few examples:

Cloud City Conversation Center, Leadville, CO
www.c4leadville.org
Elevation: 10,158 feet (3,096 m)
Average Winter Low -26 deg C, Average Winter High -2 deg C
The goal of the Cloud City Farm is to address healthy food access challenges in Lake County and inspire stewardship of our natural resources through local food production, educational opportunities, and community engagement. Cloud City utilizes a 42' Growing Dome greenhouse to grow food for their community year-round.
https://growingspaces.com/cloud-city-farm-growing-at-10000-feet/

Tlinget and Haida Tribes, Juneau, AK
www.ccthita.org/
Average Winter Low -14 deg C, Average Winter High -1 deg C
The 42' Growing Dome greenhouse project was funded by the Bureau of Indian Affairs (BIA) and a planning grant from the Native American Agriculture Fund (NAAF). For the Native Lands & Resources department who is overseeing the project, the dream is to eventually involve the Tribe's Head

Start students in the garden growing process and supply fresh produce to our tribal enterprises such as Smokehouse Catering and Sacred Grounds Café. For the first year, the team will focus on growing the basics: broccoli, kale, spinach and Tlingit potatoes, some of which were provided by Sustainable Southeast.
https://www.ktoo.org/2022/08/03/garden-talk-a-tour-of-taayi-hit-tlingit-and-haidas-new-greenhouse/

Aleutian Islands, AK
https://youtu.be/DTFsH47BlJ4?list=PLaq6r5nsLDdfGTX5DsZEEdg90iJCo_z5a
https://itgrowsinalaska.community.uaf.edu/2022/04/19/gardening-in-the-aleutian-pribilof-island-region-of-alaska/

Bear Park Permaculture Center at Colorado Mountain College, Steamboat Springs, CO
Elevation 6,867 ft (2,093 m)
Average Winter Low -15 deg C, Average Winter High -1 deg C
The Bear Park Permaculture Center has been under development since 2013, with its first students working on the site in spring 2016 and the

construction of a 42-foot Growing Spaces dome in 2020. The outdoor gardens and 4-season dome serves as a center at Colorado Mountain College Steamboat Springs for hands-on education in permaculture and sustainable thinking, design, and practice.
https://coloradomtn.edu/campuses/steamboat-springs/bear-park-permaculture-center/
https://growingspaces.com/bear-park-permaculture-center/

Growing Spaces Headquarters, Pagosa Springs, CO
www.growingspaces.com
Elevation: 7,110 ft (2,167 m)
Average Winter Low -17 deg C, Average Winter High 4 deg C
We also have over 30 years of experience growing food in the 6 Growing Domes we have at our facility in Pagosa Springs, CO. Most of the produce harvested from these domes goes to the local food banks, and our 42' Growing Dome is currently dedicated to growing food for the Archuleta County Senior Center.
https://pagosasun.com/stories/archuleta-seniors-incs-grow-dome-continues-production-despite-cold,26200?

Though no one of these domes matches precisely the conditions as outlined for the Hillary School site in KJV and contingent upon final location there, the critical elements of high elevation, winter cold conditions and available solar energy provide relatively close matches to support our findings.

You have advised us that the Hillary School Growing Dome will have access to electricity and the intentions are to wire it to supply lighting and auxiliary heat if/as needed.

You have also stated that to insure proper construction of the first dome for KJV, the project will provide for Growing Spaces personnel to direct the build, with assistance from local laborers and community support. We understand one of the community elders is licensed in construction and will work in conjunction with our personnel. This individual will ideally be able to over-see future dome construction on-site in KJV or across Nepal.

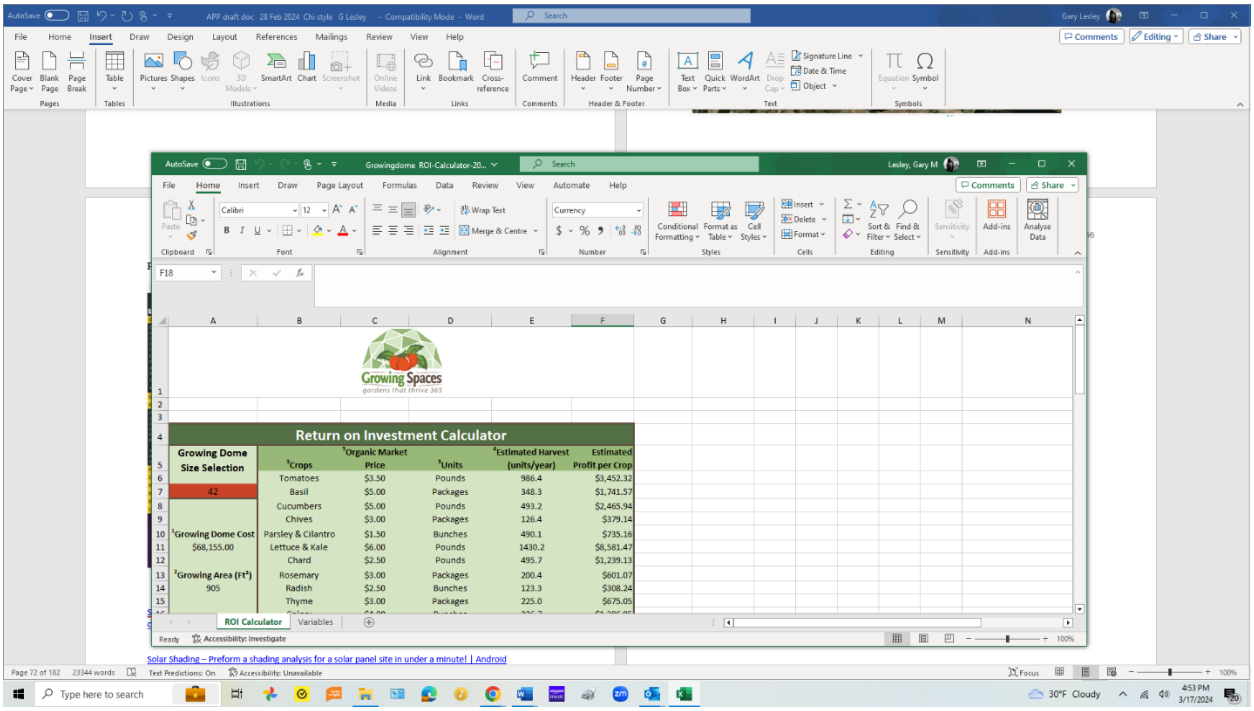
We understand an important element of the Growing Dome is its incorporation into the community at-large and the Hillary School students specifically as a living laboratory for agriculture and sustainable-regenerative practices. This is the case with many of our Growing Domes we've placed with schools across the US and Canada, including numerous communities of indigenous peoples. We are happy to continue to provide you with contacts and information regarding the creation and usage of related, class curriculums.

Sincerely,

Lem Tingley
Owner/CGO
Growing Spaces Greenhouses
Pagosa Springs, CO
970-731-2120, lem@growingspaces.com

Appendix E:

Growingdome ROI Tool



[Growingdome ROI-Calculator-2023-2.xlsx]

(Provided by Growing Spaces)

Appendix F:

Climatology Data

Name: Khumjung Chamga
Status: Place
Region name (Level 3): Khumbu Pasanglamhu
Region name (Level 2): Solukhumbu
Region name (Level 1): Province 1
Country: Nepal
Continent: Asia

Climatology Synopsis:

The climate of Khumjung
In Khumjung, Nepal, nestled within the Himalayan highlands, the Köppen climate classification (based upon seasonal precipitation and temperature) identifies the area as an ET or tundra (polar) climate zone. The unique tundra climate in this region brings consistently chilly temperatures and fluctuating atmospheric conditions throughout the year.

The yearly average highs swap between a somewhat balmy temperature of 8.3°C in July to the frigid -3.9°C observed in January. Equivalently, average lows vary from -14.1°C in February to 5°C in July. A unique characteristic of Khumjung's weather pattern is the level of snowfall, experienced wholly in April at 614mm and leanly in November at 51mm with fading snowfall days from 24.4 in May to 3.7 in December.

Relative humidity in the region moves from a low of 41% in December to an exceptionally damp 92% in July, matching the peak rainy season when rainfall intensifies from 18mm in January to 312mm in July. This wet season sees 30.9 rainfall days in July, plummeting to minimal 1.3 by December. The percentage of cloud cover similarly displays a dynamic range, with a low of 7% in December rising to a peak of 71% in July.

****

The best time to visit Khumjung
Tourists seeking the most hospitable conditions in Khumjung should consider visiting between mid-April to June, where the weather starts to warm. The average high temperatures remain between 2.7°C in April and 7.6°C in June, while average lows display moderation from -7.2°C to 2.4°C.

Bright sunlight stays between 10.9 hours in April and 8.5 hours in June with minimal rainfall and relative humidity provisionally dropping. Winds during these months are much calmer, with average wind speeds ranging from 10.5km/h in April to 8.3km/h in June.

Late fall to early winter, from October to December, is a period characterized by rising snowfall levels, from 255mm in October to 69mm in December. The snowfall days increase to 20.4 in October but taper off slightly to 10.5 by December.

The cold period includes average high temperatures falling from 3.4°C in October to -1.5°C in December and average low temperatures sinking from -5.3°C to -11.8°C. The relatively dry air is marked by humidity levels decreasing from 68% in October to a yearly low of 41% in December.

Spring weather in Khumjung
In Khumjung, the high temperatures move from a chilling -2.3°C in February to just 4.5°C in April. Concurrently, the lows dip from -14.1°C in February to -2.9°C in April.

Snowfall is notably prevalent during this period, peaking at 614mm in April with snowfall days amplifying to 24.4. Concurrently, rainfall notably increases from 26mm in February to 104mm in April leading to a damp overall environment.

Summer weather in Khumjung
Summertime in Khumjung, which spans from May to August, is marked favorably by warmer temperatures, with highs varying from 7.6°C in June to 8°C in August, and lows climbing from 2.4°C to 4.1°C.

Rainfall reaches its peak this season, going from 160mm in May to a remarkable 312mm in July. Conversely, the humidity spikes from 84% in June to a yearly high of 92% in July.

Autumn weather in Khumjung
While autumn in Khumjung sees a moderate decline in average high temperatures, from 6.7°C in September to 0.9°C by November, it is the lows that take a significant plunge from 1.5°C to a freezing -9.5°C over the same period.

Sunshine hours are on a steady decline from 7.6 hours in September to 7.4 hours in November, and snowfall picks up, ranging from 387mm in September to 51mm in November.

Winter weather in Khumjung.
The monthly average high temperatures drop from -1.5°C in December to -3.9°C in January while the monthly average low descends from -11.8°C to -14.7°C.

Snowfall reaches a substantial 145mm in January, accompanied by 7.4 snowfall days. The relative humidity is on a diminishing course, falling from 55% in November to a yearly low of 41% in December.

****

Monthly Metrics

Weather in January

Khumjung, Nepal is welcomed by the New Year with a true winter imprint. Temperatures tending on the chilly side contribute to an overall cold ambiance, while even during the daytime hours, a coat will not be superfluous. January is also the month with the highest pressure of 1017.6mb and one of the lowest humidity percentages at 47%. Weather systems often usher in chills and snowfall, making it a splendid period for snow lovers. Daylight slowly increases in January, giving signs of the oncoming warmer seasons.

Temperature
In Khumjung, January is the month with the lowest recorded average temperatures, measuring a high of -3.9°C and a low of -14.7°C.
Humidity
In Khumjung, the average relative humidity in January is 47%.
Rainfall
In Khumjung, in January, it is raining for 2 days, with typically 18mm of accumulated precipitation. Throughout the year, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
January through December are months with snowfall in Khumjung. In Khumjung, in January, snow falls for 7.4 days, with typically accumulated 145mm of snow. In Khumjung, during the entire year, snow falls for 164.1 days and aggregates up to 3078mm of snow.
Daylight
In January, the average length of the day in Khumjung is 10h and 36min.
On the first day of the month, sunrise is at 6:48 am and sunset at 5:13 pm. On the last day of January, in Khumjung, sunrise is at 6:45 am and sunset at 5:36 pm +0545.
Sunshine
In January, the average sunshine is 7.3h.
UV index
The months with the highest UV index are January through April, June through December, with an average maximum UV index of 2. A UV Index of 2, and less, symbolizes a low threat to health from unsafe exposure to UV radiation for the ordinary person.
Note: The daily high UV index of 2 in January translates into this advice:
The majority are not significantly affected by prolonged sun exposure. Infants, children, and those with fair skin must always have protection. When the Sun's UV radiation is most intense during midday, it's best to find shade and limit exposure. To best shield against UV radiation, choose sun-safe garments and dependable sunglasses. Mark this! Snow reflection can nearly double the UV radiation intensity from the Sun.

Weather in February

When February arrives, Khumjung experiences a mild improvement in temperatures, though it remains cold. The month distinguishes itself due to an increase in both snowfall and snowfall days, with 194mm snowfall making February the second snowiest month of the calendar year. Fluctuating weather conditions and heavy snow make this time of year both challenging and attractive. As the days become longer, the town gradually opens its arms to the approaching spring season. Despite the cold, February in Khumjung holds its own beauty.

Temperature
The advent of February in Khumjung, Nepal, brings an average high-temperature of a still subzero cold -2.3°C, almost identical to the preceding month. Throughout February, Khumjung anticipates an average low-temperature of -14.1°C.
Humidity
In February, the average relative humidity is 53%.
Rainfall
In Khumjung, Nepal, in February, during 2 rainfall days, 26mm of precipitation is typically accumulated. Throughout the year, in Khumjung, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
January through December are months with snowfall. In February, in Khumjung, it is snowing for 9.8 days. Throughout February, 194mm of snow is accumulated. In Khumjung, Nepal, during the entire year, snow falls for 164.1 days and aggregates up to 3078mm of snow.
Daylight
The average length of the day in February is 11h and 13min.
On the first day of the month, sunrise is at 6:44 am and sunset at 5:37 pm. On the last day of February, sunrise is at 6:23 am and sunset at 5:57 pm +0545.
Sunshine
In February, the average sunshine in Khumjung, Nepal, is 7.2h.
UV index
January through April, June through December, with an average maximum UV index of 2, are months with the highest UV index in Khumjung. A UV Index estimate of 2, and below, represents a minimal health hazard from unprotected exposure to Sun's UV rays for the average person.
Note: The maximum UV index of 2 during February leads to these instructions:
Most people can stay in the Sun for up to 1 hour without burning, apart from children that always must be protected from sun exposure. Protect yourself from the midday Sun's peak UV radiation by minimizing exposure. Clothes that are both tight-knit and comfortably loose are prime choices for sun protection. Be careful! The Sun's UV radiation can nearly be doubled by the reflective quality of snow.

Weather in March

In March, the weather in Khumjung changes, suggesting the arrival of spring. As warmth seeps into the town, the days extend noticeably. The month carries an increased amount of rainfall and snowfall of 37mm and 285mm respectively, propelling the transition between seasons. The period is characterized by the visible melting of snow and a rise in humidity levels. March comes as a relief after the harsh winter and brings about a fresh, revived aura in Khumjung.

Temperature
An average high-temperature of a still subzero cold -0.4°C marks March, exhibiting a close resemblance to the conditions in February. Khumjung's average low-temperature in the month of March is recorded at -11.8°C.
Humidity
The average relative humidity in March in Khumjung is 59%.
Rainfall
In Khumjung, in March, during 3.2 rainfall days, 37mm of precipitation is typically accumulated. In Khumjung, during the entire year, the rain falls for 142.4 days and collects up to 1198mm of precipitation.
Snowfall
Months with snowfall are January through December. In Khumjung, during March, snow falls for 17.9 days and regularly aggregates up to 285mm of snow. In Khumjung, during the entire year, snow falls for 164.1 days and aggregates up to 3078mm of snow.
Daylight
The average length of the day in March in Khumjung is 12h and 1min.
On the first day of the month, sunrise is at 6:22 am and sunset at 5:57 pm. On the last day of March, in Khumjung, sunrise is at 5:49 am and sunset at 6:14 pm +0545.
Sunshine
The average sunshine in March is 9.6h.
UV index
The months with the highest UV index are January through April, June through December, with an average maximum UV index of 2. A UV Index of 2, and less, symbolizes a minimal health vulnerability from exposure to the Sun's UV radiation for average individuals.
Note: The UV index of 2 during March leads to these advisories:
Most individuals face no significant issues with extended sun exposure, but it is always essential to protect children, babies, and those with sensitive skin. To guard against the harmful effects of the Sun, minimize exposure during midday. For optimum UV protection, wear sun-resistant attire complemented with a hat and quality shades. Take heed! Reflection from the snow can almost amplify the Sun's UV radiation by double.

Weather in April

April sees a significant rise in temperatures and a clear shift towards springtime. Khumjung moves deeper into spring, with prolonged daylight hours and bursts of sunlight. The month is marked by the highest amount of rainfall for the first half of the year, amounting to 69mm. Garden enthusiasts can witness a bloom in the flora, while residents can douse in the mellow warmth of the sun. April, with its inviting weather, brings smiles to the faces of the people of Khumjung.

Temperature

The arrival of April brings a soft temperature shift, with the average high-temperature nudging from a subzero cold -0.4°C in March to an icy 2.7°C. Khumjung, in the month of April, anticipates a consistent average low-temperature of -7.2°C.

Humidity

In April, the average relative humidity is 66%.

Rainfall

In Khumjung, during April, the rain falls for 5.6 days and regularly aggregates up to 69mm of precipitation. Throughout the year, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.

Snowfall

January through December are months with snowfall in Khumjung. In Khumjung, in April, during 21.5 snowfall days, 488mm of snow is typically accumulated. In Khumjung, during the entire year, snow falls for 164.1 days and aggregates up to 3078mm of snow.

Daylight

The average length of the day in April is 12h and 50min.

On the first day of the month, sunrise is at 5:48 am and sunset at 6:15 pm. On the last day of April, in Khumjung, sunrise is at 5:19 am and sunset at 6:31 pm +0545.

Sunshine

April has the most sunshine of the year, with an average of 10.9h of sunshine.

UV index

The months with the highest UV index in Khumjung are January through April, June through December, with an average maximum UV index of 2. A UV Index of 2, and less, symbolizes a low health risk from exposure to the Sun's UV radiation for average individuals.

Note: In April, the maximum UV index of 2 suggests these recommendations:

While most people are not greatly affected by extended sun exposure, those with fair skin, babies, and children must always have protection. During midday, the Sun's radiation is strongest, and it's advisable to reduce direct exposure. Sunglasses providing both UVA and UVB protection are non-negotiable on sunlit days. Take to heart! Snow reflection can almost magnify the Sun's UV radiation twofold.

Weather in May

May provides a robust introduction to summer with even higher temperatures and abundant sunshine. Notably, this month experiences the maximum amount of snowfall at an astonishing 614mm. An increase in humidity levels can be felt alongside a steep drop in pressure. The town heals under the influence of the rain and the turquoise colors of the central Asian summer begin to bloom. May in Khumjung is a vibrant spectacle to behold.

Temperature
The beginning of May reveals an average high-temperature of a still 4.5°C, showing minimal deviation from the previous month. Khumjung throughout May, records an average low-temperature of -2.9°C.
Humidity
In May, the average relative humidity in Khumjung, Nepal, is 74%.
Rainfall
In May, the rain falls for 10.3 days. Throughout May, 104mm of precipitation is accumulated. Throughout the year, in Khumjung, Nepal, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
Months with snowfall in Khumjung are January through December. May is the month with the most snowfall in Khumjung. Snow falls for 24.4 days and accumulates 614mm of snow.
Daylight
The average length of the day in May is 13h and 32min.
On the first day of the month, sunrise is at 5:18 am and sunset at 6:31 pm. On the last day of May, sunrise is at 5:02 am and sunset at 6:48 pm +0545.
Sunshine
The average sunshine in May is 10.6h.
UV index
With an average maximum UV index of 1, May is the month with the lowest UV index in Khumjung. A UV Index reading of 2, and below, represents a low threat to health from unprotected exposure to Sun's UV rays for average individuals.
Note: In May, the maximum UV index of 1 transforms into these recommendations:
Unlike children, who always need sun protection, most individuals can remain in the sun for up to an hour without getting burnt. The Sun's UV radiation is especially harmful around midday, so reduce exposure and stay safe. A hat with a generous brim can prevent nearly 50% of UV rays from reaching your eyes. Remember this! The UV radiation of the Sun can be nearly doubled by the reflective properties of snow.

Weather in June

The weather in June marks the peak of summer in Khumjung with the highest day temperatures and the longest daylight hours. A marked increase in rainfall of 160mm, doubles that of May's, turning summer into a mixed bag of sunny and rainy days. Despite some occasional showers, residents continue their daily activities with a little more energy. Natural beauty is at its peak, with green landscape unforgettable on the eyes. The weather remains fairly stable, heralding tranquility in the region.

Temperature
June brings a slight increase in the average high-temperature, progressing from 4.5°C in May to 7.6°C. In Khumjung, the average temperature during the nights of June drops to 2.4°C.
Humidity
In Khumjung, the average relative humidity in June is 84%.
Rainfall
In June, in Khumjung, the rain falls for 25.1 days. Throughout June, 160mm of precipitation is accumulated. Throughout the year, in Khumjung, Nepal, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
Months with snowfall in Khumjung are January through December. In Khumjung, during June, snow falls for 15.1 days and regularly aggregates up to 285mm of snow. Throughout the year, there are 164.1 snowfall days, and 3078mm of snow is accumulated.
Daylight
June has the longest days of the year, with an average of 13h and 54min of daylight.
On the first day of the month, sunrise is at 5:01 am and sunset at 6:49 pm. On the last day of June, in Khumjung, sunrise is at 5:04 am and sunset at 6:58 pm +0545.
Sunshine
In Khumjung, the average sunshine in June is 8.5h.
UV index
January through April, June through December, with an average maximum UV index of 2, are months with the highest UV index in Khumjung. A UV Index of 2, and less, symbolizes a low threat to health from exposure to the Sun's UV radiation for ordinary individuals.
Note: In June, a daily UV index of 2 turns into the following recommendations:
Children, babies, and those with sensitive skin should always be shielded from long periods of sun exposure. Considering the Sun's intensity during midday, it's wise to minimize direct exposure. On days when the sun blazes, arm yourself with sunglasses that block UVA and UVB radiation. Alert! The snow's reflection can amplify the UV radiation of the Sun nearly twice.

Weather in July

In July, Khumjung gets into a typical monsoon season with a continued rise in temperatures and humidity touching its peak at 92%. This month witnesses the highest rainfall of the year reaching 312mm, turning Khumjung into a rain-soaked paradise. While rains are a common occurrence, periods of sunshine do show up, bringing cheerfulness and vibrancy. A decline in wind speeds and sunshine hours do not dampen the overall comfort level. Embracing the monsoon, the town flourishes in shades of green, covered by a blanket of fog and mystique.

Temperature
Khumjung's temperatures tend to reach their peak averages in July, with a high of 8.3°C and a low of 5°C.
Humidity
The most humid month in Khumjung is July, with an average relative humidity of 92%.
Rainfall
July is the month with the most rainfall in Khumjung. Rain falls for 30.9 days and accumulates 312mm of precipitation.
Snowfall
January through December are months with snowfall in Khumjung. In Khumjung, Nepal, during July, snow falls for 7 days and regularly aggregates up to 158mm of snow. Throughout the year, in Khumjung, there are 164.1 snowfall days, and 3078mm of snow is accumulated.
Daylight
In July, the average length of the day is 13h and 43min.
On the first day of July in Khumjung, sunrise is at 5:05 am and sunset at 6:58 pm. On the last day of the month, sunrise is at 5:19 am and sunset at 6:48 pm +0545.
Sunshine
July has the least sunshine of the year in Khumjung, with an average of 5.2h of sunshine.
UV index
The months with the highest UV index are January through April, June through December, with an average maximum UV index of 2. A UV Index value of 2, and less, symbolizes a minimal health vulnerability from unprotected exposure to Sun's UV rays for average individuals.
Note: In July, the maximum UV index of 2 translates into these guidelines:
Children necessitate constant protection from sunlight, unlike the majority, who can remain under the sun for about an hour without burning. Solar radiation is at its peak intensity during midday, so it's advisable to stay indoors or in the shade. Employ a hat with a wide brim for robust protection, cutting UV exposure by half. Heads up! The UV radiation from the Sun can almost be doubled by snow reflection.

Weather in August

August continues the monsoon legacy from July, but with slightly lower temperatures and rainfall. With the decrease in rainfall to 260mm, the receding rains give a sign of the approaching autumn. Mornings are usually calm and peaceful, followed by short bouts of rain in the evenings. The wind speed also takes a dip, adding to the quiet ambiance of monsoon days. Despite the season, the town of Khumjung becomes a site of beautiful scenery and pleasant weather.

Temperature
Khumjung's shift into August sets the average high-temperature at 8°C, a figure that deviates only slightly from July's 8.3°C. August is characterized by a steady nighttime low-temperature of 4.1°C.
Humidity
In Khumjung, the average relative humidity in August is 91%.
Rainfall
In Khumjung, Nepal, in August, during 31 rainfall days, 260mm of precipitation is typically accumulated. Throughout the year, in Khumjung, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
Months with snowfall are January through December. In Khumjung, during August, snow falls for 9.6 days and regularly aggregates up to 147mm of snow. Throughout the year, there are 164.1 snowfall days, and 3078mm of snow is accumulated.
Daylight
The average length of the day in August is 13h and 7min.
On the first day of the month, sunrise is at 5:20 am and sunset at 6:48 pm. On the last day of August, in Khumjung, sunrise is at 5:35 am and sunset at 6:20 pm +0545.
Sunshine
The average sunshine in August is 6.2h.
UV index
January through April, June through December, with an average maximum UV index of 2, are months with the highest UV index in Khumjung, Nepal. A UV Index estimate of 2, and below, represents a minimal health hazard from exposure to the Sun's UV rays for the average person.
Note: The daily high UV index of 2 in August translates into this advice:
While most individuals can withstand prolonged sun exposure, it is imperative that babies, children, and those with sensitive skin always be shielded. Protect yourself from the midday Sun's peak UV radiation by minimizing exposure. It's wise to wear UVA and UVB-blocking sunglasses when the sun shines brightly. Heed this! Snow reflection can almost augment the UV radiation of the sun by double.

Weather in September

Coming to September, the weather in Khumjung witnesses considerable change with the onset of autumn. Conspicuous changes are evident with the departure of the monsoon season and rainfall dropping to 151mm. The town undergoes a transformation with the emergence of autumn colors making it a picturesque beauty. The decrease in humidity and clear skies allows Khumjung to bask in the autumn sun. Nevertheless, the temperature starts to dip as the month progresses, signaling the onset of the colder months.

Temperature
Khumjung records a slight change with September's average high-temperatures adjusting to 6.7°C from August's 8°C. During the month of September, Khumjung's nighttime temperature lowers to an average of 1.5°C.
Humidity
In September, the average relative humidity is 87%.
Rainfall
In Khumjung, during September, the rain falls for 23.1 days and regularly aggregates up to 151mm of precipitation. Throughout the year, in Khumjung, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
January through December are months with snowfall. In September, in Khumjung, it is snowing for 16.8 days. Throughout September, 387mm of snow is accumulated. Throughout the year, in Khumjung, Nepal, there are 164.1 snowfall days, and 3078mm of snow is accumulated.
Daylight
In Khumjung, the average length of the day in September is 12h and 20min.
On the first day of the month, sunrise is at 5:36 am and sunset at 6:19 pm. On the last day of September, sunrise is at 5:49 am and sunset at 5:46 pm +0545.
Sunshine
The average sunshine in September in Khumjung is 7.6h.
UV index
The months with the highest UV index are January through April, June through December, with an average maximum UV index of 2. A UV Index of 2, and less, symbolizes a low health risk from exposure to the Sun's UV rays for ordinary individuals.
Note: A daily high UV index of 2 in September leads to these guidelines:
Although prolonged sun exposure does not typically bother most people, children, babies, and those with sensitive skin should always have protection. The Sun's UV radiation is especially harmful around midday, so reduce exposure and stay safe. A wide-brimmed hat is a staple for defending the face, eyes, ears, and neck from the Sun. Notice! The UV radiation of the Sun can be intensified nearly twofold due to the reflective quality of snow.

Weather in October

October brings along autumn in full swing, painting the town of Khumjung in vibrant hues. As compared to September, the relative humidity takes a plunge from 87% to 68%. The month gets less rainfall, there is a brisk change in the temperature and the wind speeds turn it chilly. The brilliance of October lies in the riot of colors that it brings along, making for a spectacular natural display. The nights become longer as winter approaches, but October remains an exquisite month in Khumjung.

Temperature
Khumjung records a mild change in average high-temperature during October, easing from a chilly 6.7°C in September to 3.4°C. Khumjung temperatures generally rest at a low of -5.3°C during the October nights.
Humidity
In Khumjung, the average relative humidity in October is 68%.
Rainfall
In Khumjung, in October, it is raining for 5.8 days, with typically 44mm of accumulated precipitation. Throughout the year, in Khumjung, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
Months with snowfall in Khumjung, Nepal, are January through December. In October, in Khumjung, it is snowing for 20.4 days. Throughout October, 255mm of snow is accumulated. Throughout the year, in Khumjung, there are 164.1 snowfall days, and 3078mm of snow is accumulated.
Daylight
In October, the average length of the day is 11h and 30min.
On the first day of the month, sunrise is at 5:50 am and sunset at 5:44 pm. On the last day of October, sunrise is at 6:07 am and sunset at 5:15 pm +0545.
Sunshine
In Khumjung, the average sunshine in October is 7.9h.
UV index
January through April, June through December, with an average maximum UV index of 2, are months with the highest UV index. A UV Index of 2, and less, symbolizes a low health risk from exposure to the Sun's UV rays for average individuals.
Note: The average daily UV index of 2 in October transforms into the following instructions: Despite most people tolerating extended sun exposure, it is critical to always protect those with sensitive skin, infants, and children. The Sun's harshest UV rays are around midday; it's wise to seek shade and limit time outdoors. Wearing sunglasses with both UVA and UVB protection effectively reduces sun-induced eye damage. Heed this! Snow reflection can almost augment the UV radiation of the sun by double.

Weather in November

November marks a transition towards winter with a further drop in temperatures. Characterized by the least rainfall of the year, a mere 8mm, makes this month a perfect time to visit Khumjung. The vibrant autumn shades gradually fade away, giving way to winter hues. Nevertheless, relative humidity decreases significantly, which makes the weather dryer. The arrival of winter is accompanied by cooler winds, thus a warm jacket becomes essential clothing.

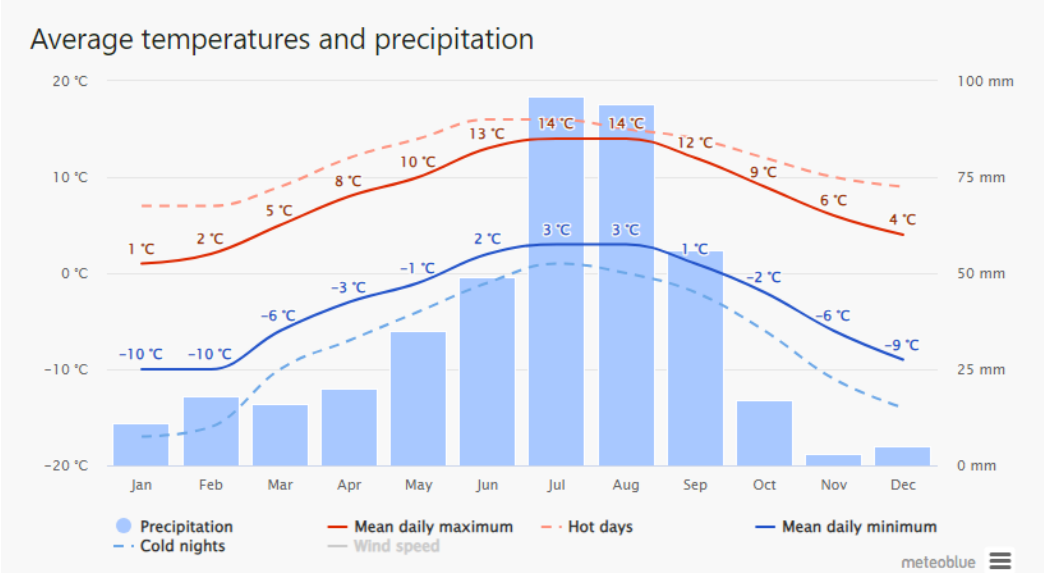
Temperature
Khumjung experiences a transition to a still cold 0.9°C in average high-temperatures with the arrival of November, not greatly differing from October's 3.4°C. November in Khumjung sees the temperature falling to a mean low of -9.5°C.
Humidity
In November, the average relative humidity is 55%.
Rainfall
The month with the least rainfall in Khumjung is November, when the rain falls for 2.1 days and typically collects 8mm of precipitation.
Snowfall
January through December are months with snowfall. The month with the least snowfall is November, when snow falls for 10.5 days and typically aggregates up to 51mm of snow.
Daylight
The average length of the day in November is 10h and 47min.
On the first day of November in Khumjung, sunrise is at 6:08 am and sunset at 5:14 pm. On the last day of the month, sunrise is at 6:30 am and sunset at 5:02 pm +0545.
Sunshine
The average sunshine in November in Khumjung is 7.4h.
UV index
The months with the highest UV index are January through April, June through December, with an average maximum UV index of 2. A UV Index of 2, and less, symbolizes a minimal health vulnerability from exposure to the Sun's UV radiation for the ordinary person.
Note: A typical high UV index of 2 in November suggests the following recommendations: While most individuals can withstand prolonged sun exposure, it is imperative that babies, children, and those with sensitive skin always be shielded. Limiting sun exposure during midday hours helps in reducing the harmful effects of UV radiation. By wearing a generously brimmed hat, you can cut UV radiation exposure significantly. Warning! The reflection from snow can nearly magnify the Sun's UV radiation twofold.

Weather in December

December sets the stage for a full-fledged winter in Khumjung. The weather becomes progressively colder with temperatures weaving their way towards the negatives. An increase in snowfall of 69mm defines December as one of the snowiest months of the year. In this month, the shortest daylight hours are noticed, and the town glistens under the winter sun. Despite the dip in temperatures, December's charm remains unscathed and the weather sets a special mood for holiday festivities.

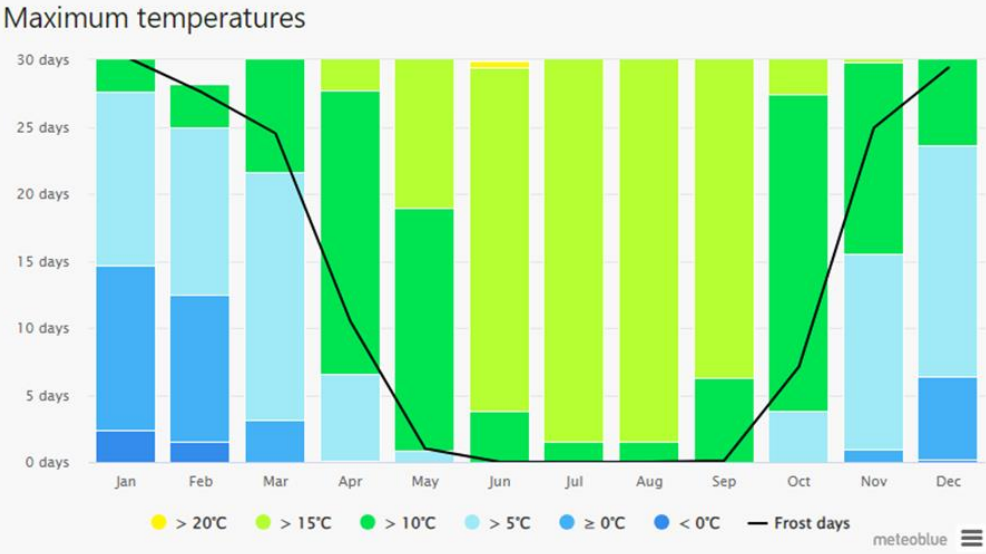
Temperature
As Khumjung, Nepal, transitions from November to December, the average high-temperatures adjust to -1.5°C, nearly the same as the previous 0.9°C. Throughout December, an average low-temperature of -11.8°C is expected.
Humidity
The least humid month in Khumjung, Nepal, is December, with an average relative humidity of 41%.
Rainfall
In Khumjung, in December, during 1.3 rainfall days, 9mm of precipitation is typically accumulated. Throughout the year, in Khumjung, Nepal, there are 142.4 rainfall days, and 1198mm of precipitation is accumulated.
Snowfall
Months with snowfall in Khumjung are January through December. In Khumjung, in December, snow falls for 3.7 days, with typically accumulated 69mm of snow. In Khumjung, during the entire year, snow falls for 164.1 days and aggregates up to 3078mm of snow.
Daylight
The month with the shortest days in Khumjung is December, with an average of 10h and 24min of daylight.
On the first day of the month, sunrise is at 6:31 am and sunset at 5:02 pm. On the last day of December, sunrise is at 6:48 am and sunset at 5:12 pm +0545.
Sunshine
In Khumjung, the average sunshine in December is 7.5h.
UV index
The months with the highest UV index in Khumjung are January through April, June through December, with an average maximum UV index of 2. A UV Index reading of 2, and below, represents a minimal health vulnerability from unprotected exposure to Sun's UV rays for the average person.
Note: A maximum high UV index of 2 in December translates into the following recommendations:
Protection from prolonged sun exposure is necessary for babies, children, and individuals with sensitive skin. The most potent solar radiation is around mid-day, so one should minimize exposure to direct sunlight during this period. Tightly woven clothing, when worn loosely, shields effectively against the Sun. Be aware! The reflective nature of snow can magnify the Sun's UV radiation almost twofold.

Weather data source:
(Courtesy Weather Atlas**;** Ras Al Khaimah, UAE; used with permission for personal, non-commercial purposes)



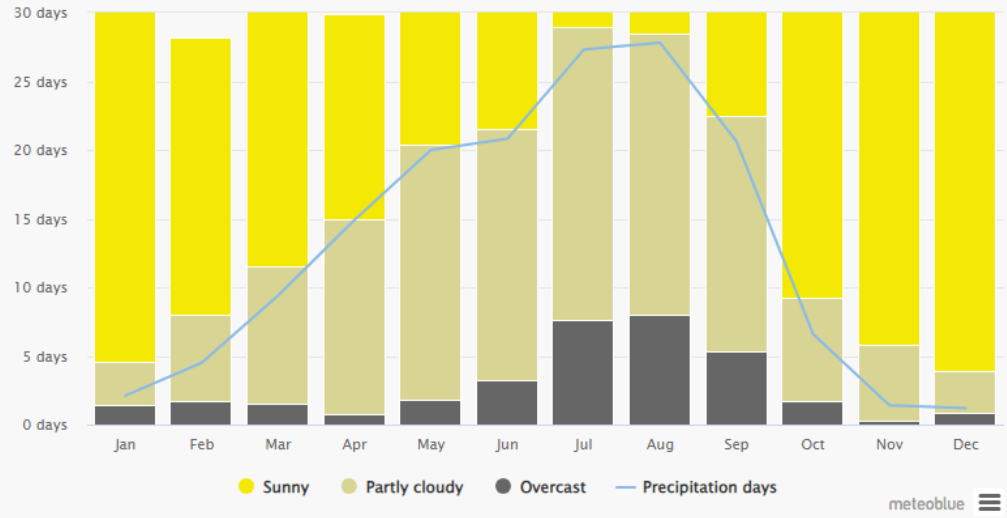
The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Khumjung Chamga. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years. For vacation planning, you can expect the mean temperatures, and be prepared for hotter and colder days. Wind speeds are not displayed per default, but can be enabled at the bottom of the graph.

The precipitation chart is useful to plan for seasonal effects such as monsoon climate in India or wet season in Africa. Monthly precipitations above 150mm are mostly wet, below 30mm mostly dry. Note: Simulated precipitation amounts in tropical regions and complex terrain tend to be lower than local measurements.



The maximum temperature diagram for Khumjung Chamga displays how many days per month reach certain temperatures. Dubai, one of the hottest cities on earth, has almost none days below 40°C in July. You can also see the cold winters in Moscow with a few days that do not even reach -10°C as daily maximum.

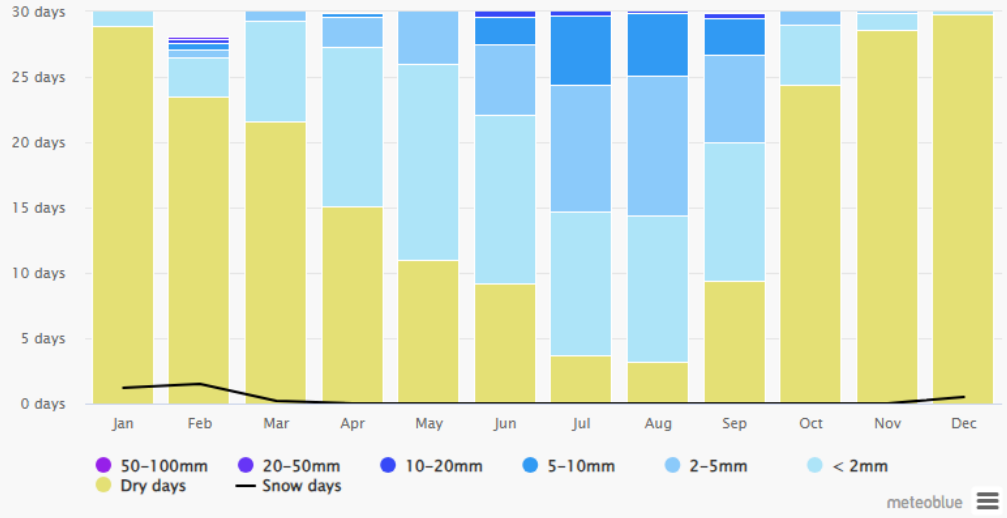
Cloudy, sunny, and precipitation days



The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast. While Reykjavík on Iceland has mostly cloudy days, Sossusvlei in the Namib desert is one of the sunniest places on earth.

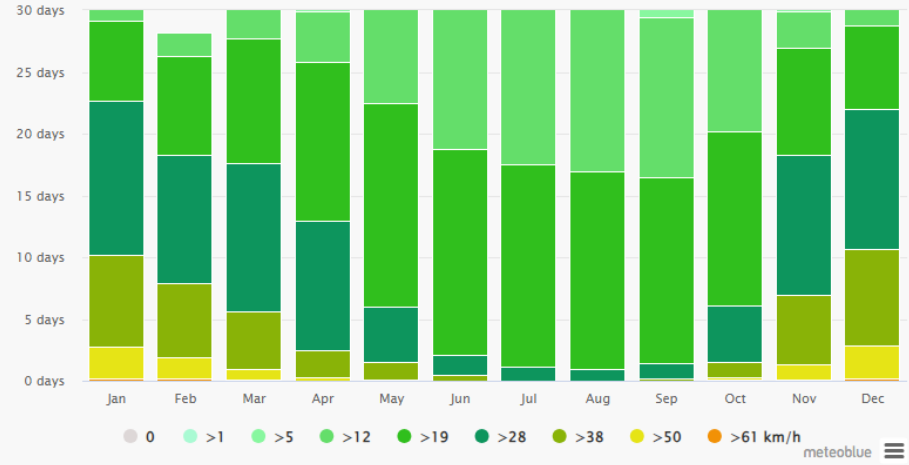
Note: In tropical climates like in Malaysia or Indonesia the number of precipitation days may be overestimated by a factor up to 2.

Precipitation amounts



The precipitation diagram for Khumjung Chamga shows on how many days per month, certain precipitation amounts are reached. In tropical and monsoon climates, the amounts may be underestimated.

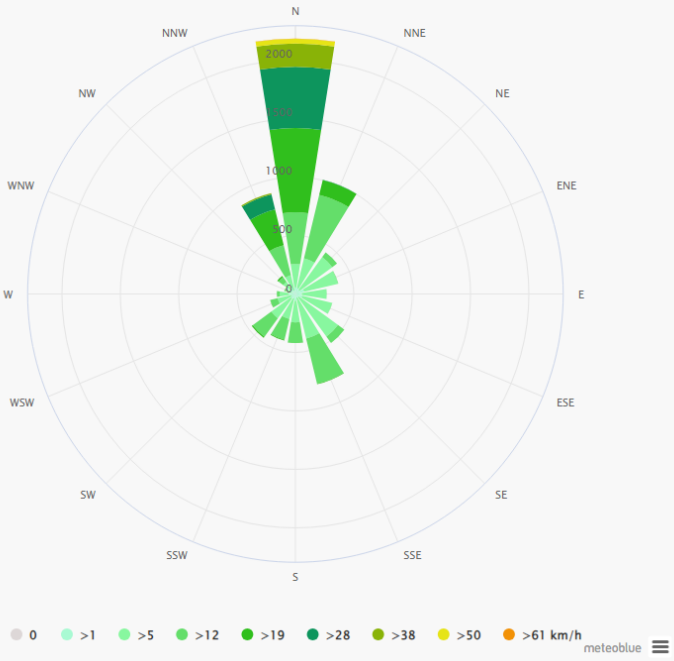
Wind speed



The diagram for Khumjung Chamga shows the days per month, during which the wind reaches a certain speed. An interesting example is the Tibetan Plateau, where the monsoon creates steady strong winds from December to April, and calm winds from June to October.

Wind speed units can be changed in the preferences (top right).

Wind rose



The wind rose for Khumjung Chamga shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE). Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult especially for sailing boats.

Charts Source:
Courtesy meteoblue ®, Basel, Switzerland. Archiving Weather Model Data.

Sun Position

Calculation of sun's position in the sky for each location on the earth at any time of day.
Azimuth, sunrise sunset noon, daylight and graphs of the solar path.
Sunrise and sunset are defined as the instant when the upper limb of the Sun's disk is just touching the horizon, this corresponds to an altitude of -0.833° degrees for the Sun.
Twilight is the time after sunset characterized by a diffuse light (by extension the morning twilight, use term aurora, dawn or sunrise).
Civil twilight lapse of time between sunset and when the sun reaches the elevation height of -6°, in the sky are visible only a few stars and planets particularly bright.
Nautical twilight represents the time the Sun takes a pass from -6° to -12° below the horizon, in this period are distinguished horizon line and the main stars.
Astronomical twilight is the time interval between sunset and when the sun reaches 18° below the horizon, the sky is dark, is possible to distinguish the stars up to the sixth magnitude.
Noon in solar time occurs when the sun is at its highest point in the sky for the day, and it is either due south or due north of the observer depending on the latitude.
Azimuth indicates an angle between a point and a reference plane. Generally is the angular distance of a point from the true North (geographic north) not magnetic, I made this choice, because in this way you can see the sun's position in the map, if you use a compass, you must add the magnetic declination for your location. There are some compass app for smartphones that automatically add the magnetic declination for your location.
The height, or Elevation , is the angular distance of the horizon a point on the celestial sphere, measured as positive if facing the Zenith, and negative if directed towards the Nadir.
Zenith , is the intersection perpendicular to the plane of the horizon passing through the observer with the visible celestial hemisphere and is the point above the head of the observer. The diametrically opposite point is called Nadir.
The knowledge of the position of the sun and the daylight hours, allow to know the **energy** radiated from the Sun (renewable) at the point on the Earth that we are examining.
The solar energy can be **heat engines** produced from solar panels or **electrical** produced by photovoltaic panels.

Back to top Content | Data + Map | Chart Polar | Chart Cartesian | Table | Annual sun path | shadow | download PDF |

Sun chart

Sun path charts can be plotted either in Cartesian (rectangular) or Polar coordinates.
Cartesian coordinates where the solar elevation is plotted on Y axis and the azimuth is plotted on the X axis.
Polar coordinates are based on a circle where the solar elevation is read on the various concentric circles, from 0° to 90° degrees, the azimuth is the angle going around the circle from 0° to 360° degrees, the horizon is represented by the outermost circle, at the periphery.
The azimuth angle indicates the direction of the sun in the horizontal plain from a given location. North is defined to have an azimuth of 0° and south has an azimuth of 180°.
The various trajectories of the sun's in the sky are bounded by those of the 21st day (solstice) of each month from December 21 until June 21.
We plot the time, on the hour, for all hours during which the sun is in the chart.

Back to top Content | Data + Map | Chart Polar | Chart Cartesian | Table | Annual sun path | shadow | download PDF |

Daylight

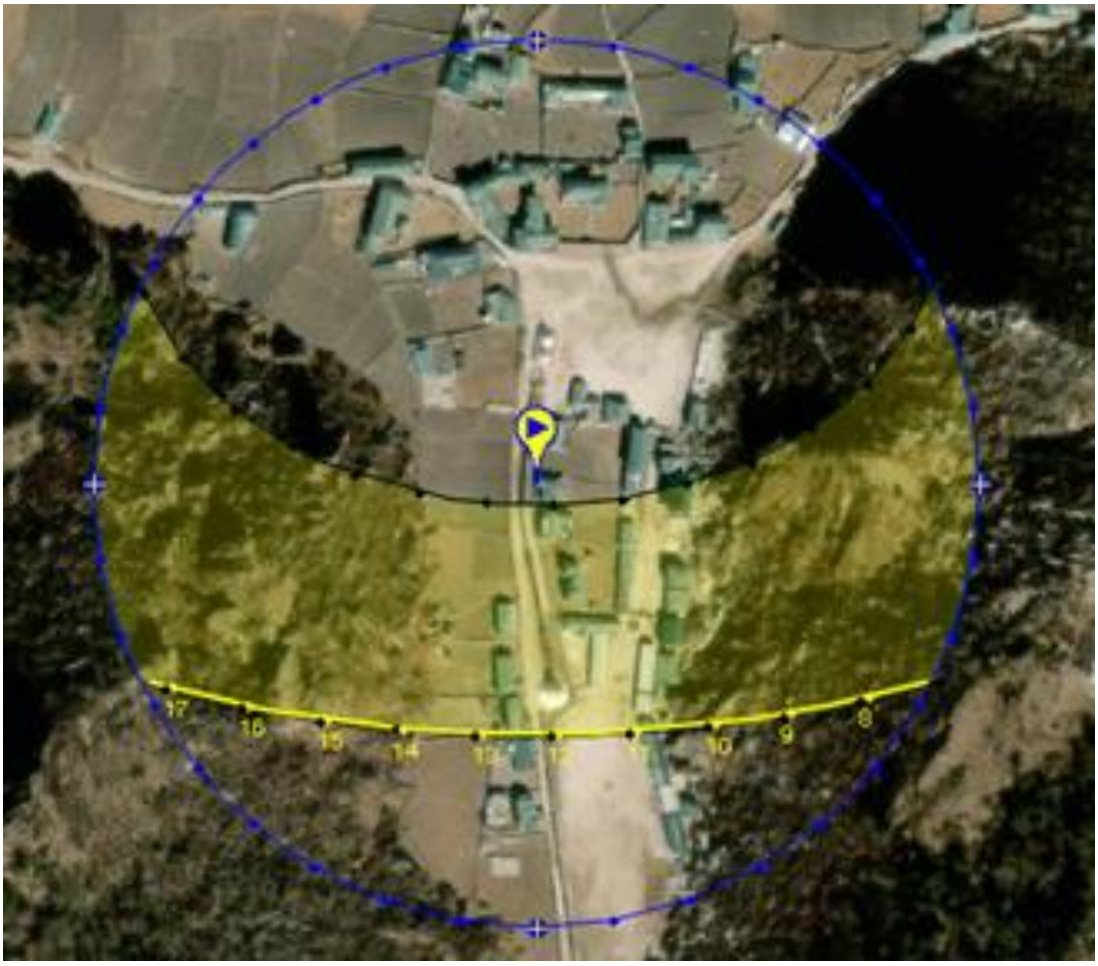
The length of day is the time interval between sunrise and sunset, so the time period in which we can observe the direct sunlight.
The duration depends on the latitude, the longitude, altitude above sea level (more high and more great the length of day) and obstacles horizon.
The algorithm uses the altitude 0 meters.
The transition from day to night is not clear before and after there is a period of scattered light (twilight), where you can still see, the phenomenon is due to reflection (down) of light by the atmosphere that it's over to our point of observation.

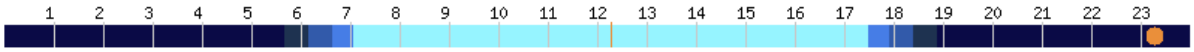
Represented below in aerial view, Khumjung Village and school.

A number of useful tools and forms of solar measurement and evaluation technologies make the applications for solar much easier to predict and project outputs than in the recent past.

The ability to evaluate sun exposure angles, duration and intensity are critical in the optimization of such solar usage and strategies involved. These are some examples of what commonly available tools allow for.


Start Now
1. Click "Start Now"
2. Add Content Verifier by Securify
Mode: sun path
Insert this map tool in your site
Back to top | Content | Data + Map | Chart Polar | Chart Cartesian | Table | Annual sun path | shadow | download PDF



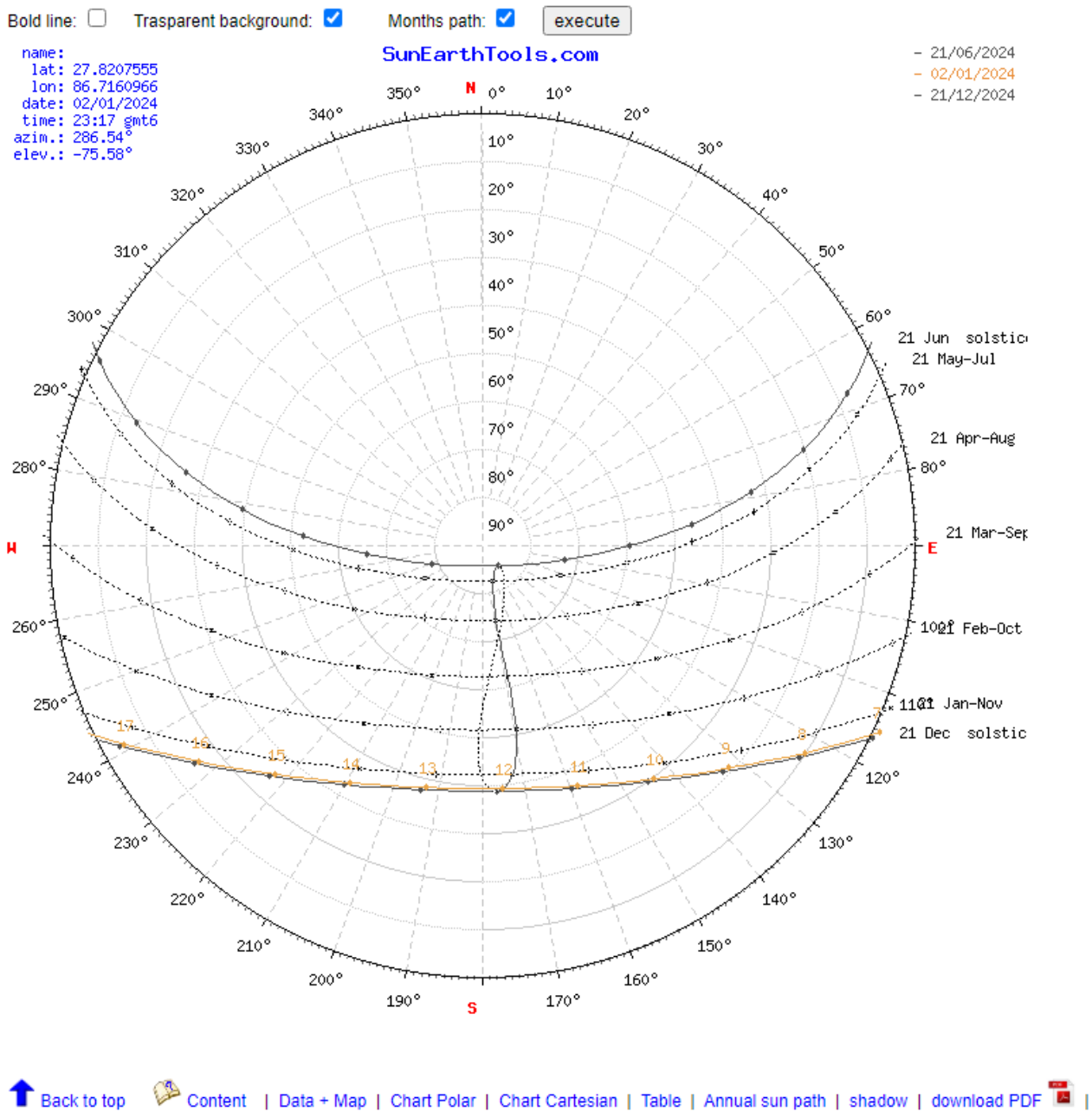


sun position	Elevation	Azimuth	latitude	longitude
02/01/2024 23:17 | GMT6	-75.58°	286.54°	27.8207555° N	86.7160966° E
twilight	**Sunrise**	**Sunset**	**Azimuth Sunrise**	**Azimuth Sunset**
twilight -0.833°	07:04:15	17:29:32	115.7°	244.34°
Civil twilight -6°	06:38:35	17:55:08	112.84°	247.19°
Nautical twilight -12°	06:09:27	18:24:16	109.81°	250.23°
Astronomical twilight -18°	05:40:51	18:52:53	107.01°	253.04°
daylight	**hh:mm:ss**	**diff. dd+1**	**diff. dd-1**	**Noon**
02/01/2024	10:25:17	00:00:28	-00:00:25	12:16:53

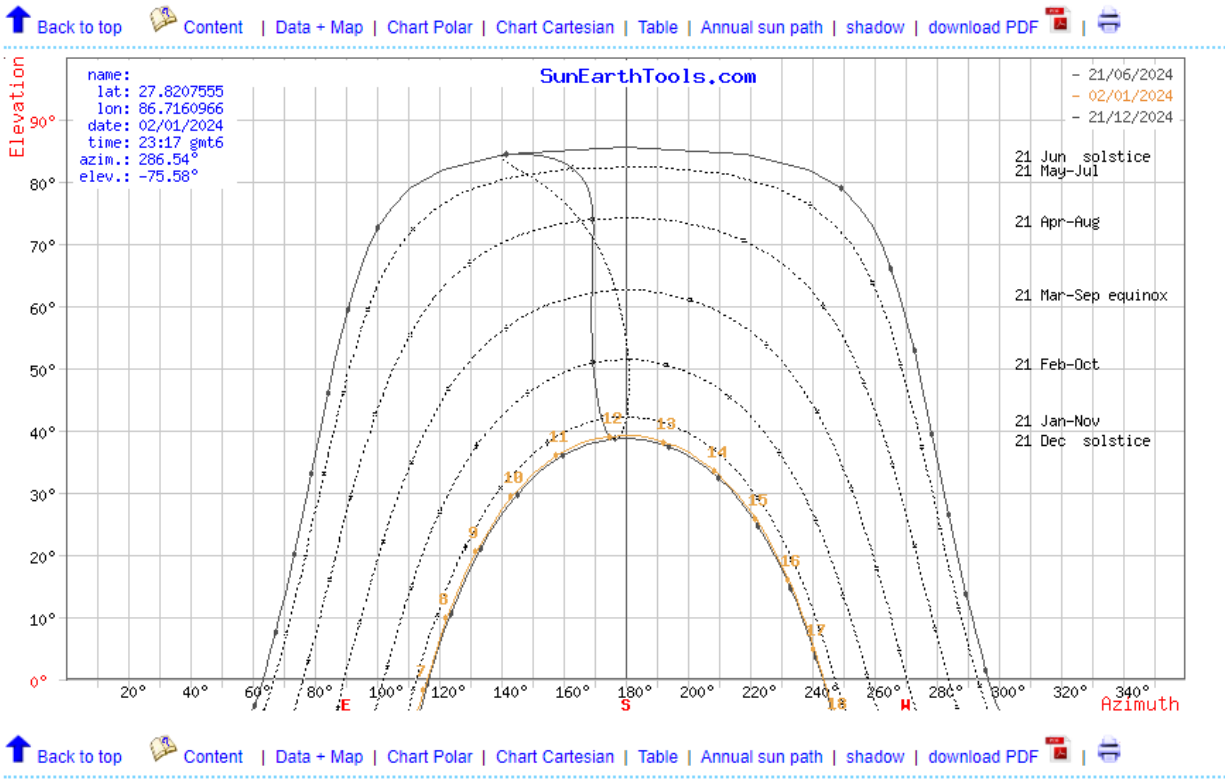
Step (minute): 60 execute download Excel table

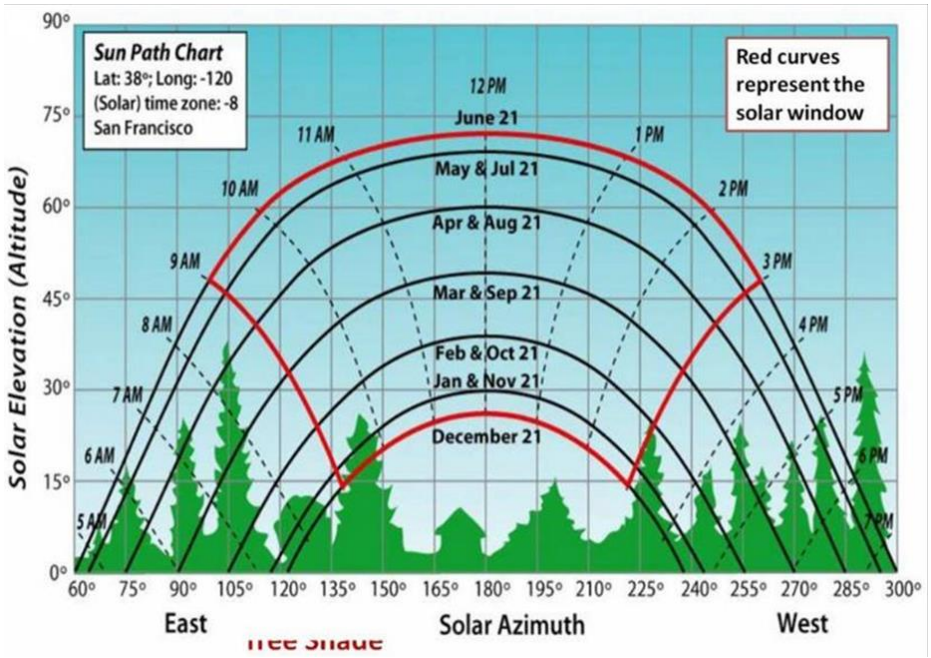
Date:	02/01/2024 | GMT6	
coordinates:	27.8207555, 86.7160966	
location:	27.82075550,86.71609660	
hour	Elevation	Azimuth
07:04:15	-0.833°	115.7°
8:00:00	9.93°	122.7°
9:00:00	20.49°	131.92°
10:00:00	29.44°	143.54°
11:00:00	35.94°	158.03°
12:00:00	39.06°	175°
13:00:00	38.17°	192.66°
14:00:00	33.46°	208.69°
15:00:00	25.78°	221.9°
16:00:00	16.04°	232.39°
17:00:00	4.96°	240.78°
17:29:32	-0.833°	244.34°

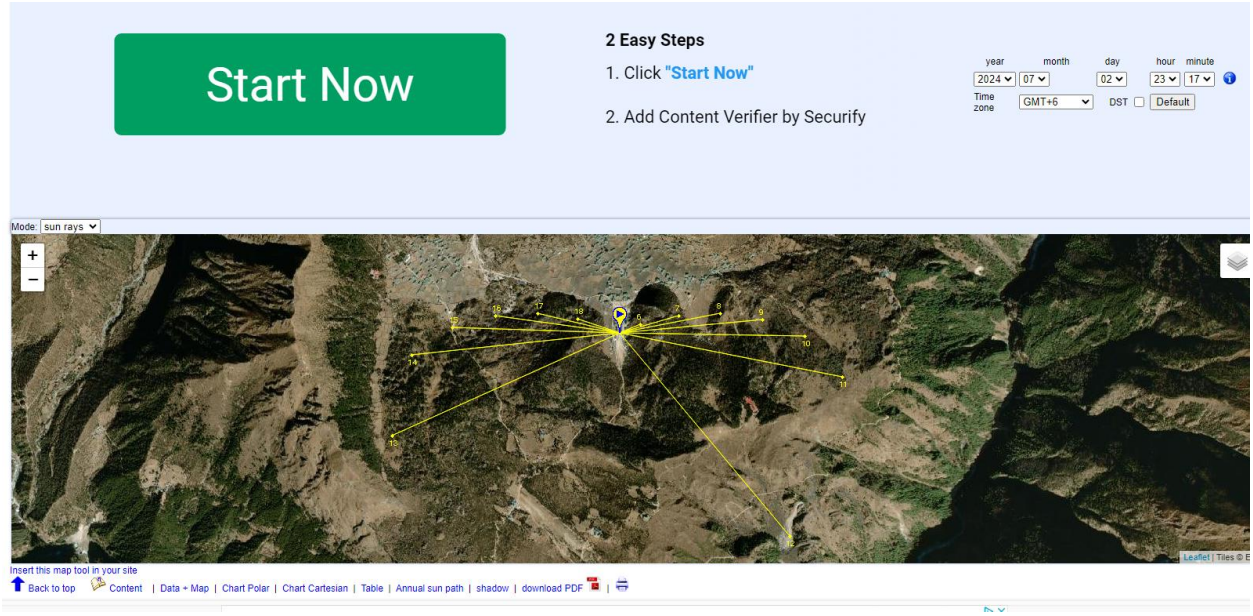
Back to top Content | Data + Map | Chart Polar | Chart Cartesian | Table | Annual sun path | shadow | download PDF |

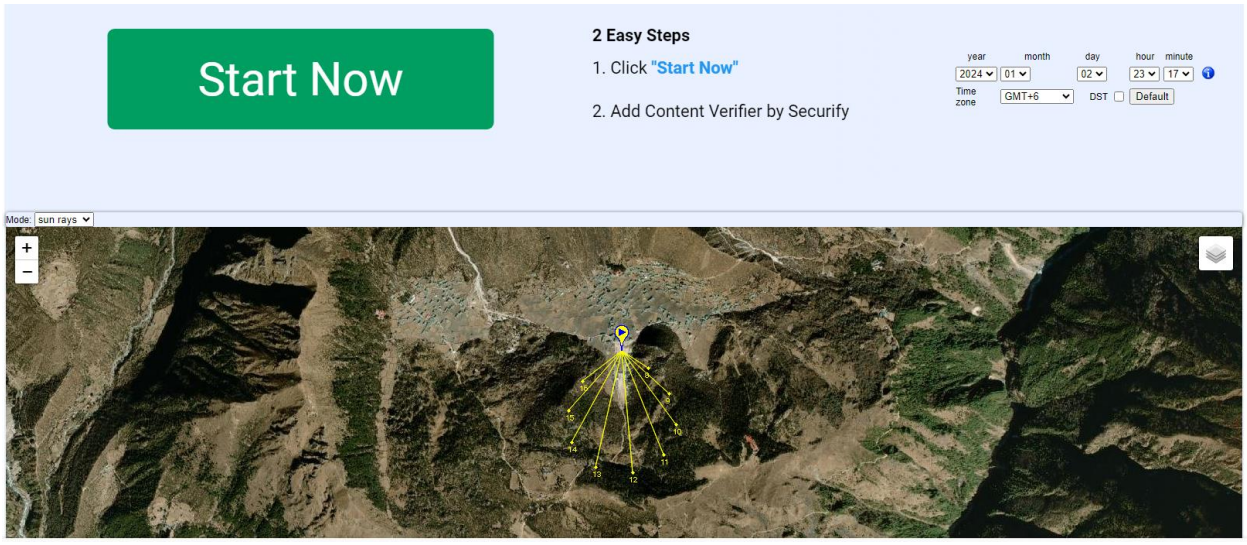


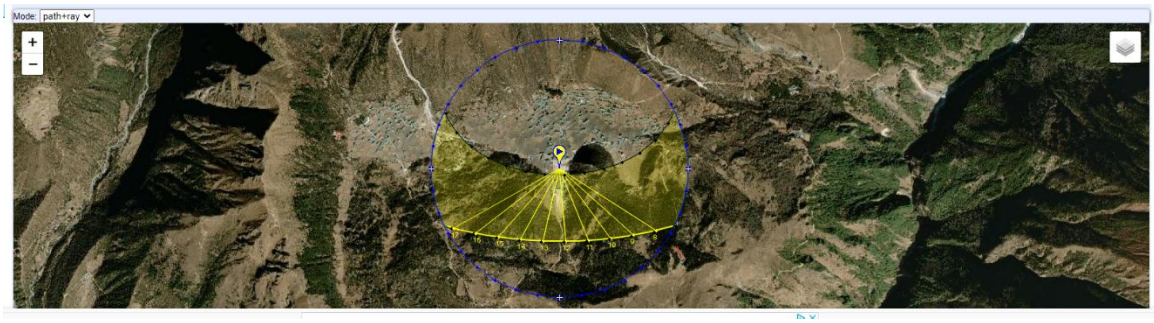
Back to top Content | Data + Map | Chart Polar | Chart Cartesian | Table | Annual sun path | shadow | download PDF |


Back to top
Content
Data + Map
Chart Polar
Chart Cartesian
Table
Annual sun path
shadow
download PDF
SunEarthTools.com
name:
lat: 27.8207555
lon: 86.7160966
date: 02/01/2024
time: 23:17 gmt6
azim.: 286.54°
elev.: -75.58°
21/06/2024
02/01/2024
21/12/2024
21 Jun solstice
21 May-Jul
21 Apr-Aug
21 Mar-Sep equinox
21 Feb-Oct
21 Jan-Nov
21 Dec solstice
Elevation
Azimuth
E
S
W


Sun Path Chart
Lat: 38°; Long: -120
(Solar) time zone: -8
San Francisco
Red curves represent the solar window
12 PM
June 21
May & Jul 21
Apr & Aug 21
Mar & Sep 21
Feb & Oct 21
Jan & Nov 21
December 21
11 AM
1 PM
10 AM
2 PM
9 AM
3 PM
8 AM
4 PM
7 AM
5 PM
6 AM
6 PM
5 AM
7 PM
Solar Elevation (Altitude)
Solar Azimuth
East
West







Path and Ray Evaluation

Inputs for Sun Calc

SunCalc - sunrise, sunset, shadow length, solar eclipse, sun position, sun phase, sun height, sun calculator, sun movement, map, sunlight phases, elevation, Photovoltaic system, Photovoltaic

Solar Shading – Preform a shading analysis for a solar panel site in under a minute! | Android Productivity Apps (wordpress.com)

Appendix G:

Mitigation Policy For Hillary School Growingdome Project

(Draft Policy for reference and review by the Growingdome Stakeholders and Community)

Purpose: The purpose of this policy is to establish initial guidelines and procedures to mitigate unintended consequences associated with the introduction of new farming and agricultural technologies in indigenous communities. The policy, as it transfers into the hands of its stakeholders, and applied as they see fit, consistent with the vision and mission, aims to foster sustainable-regenerative development, preserve cultural integrity, and ensure the well-being and health of indigenous peoples while embracing advancements in agriculture.

Scope: This policy applies to all stakeholders involved in the introduction, adoption, and implementation of new farming and agricultural technologies with impacts upon the Sir Edmund Hillary School students, staff and surrounding indigenous communities.

Guidance: In parallel footsteps with the Hillary philosophy as applied to the first schoolhouse and clinic built over 60 years ago, the keys to the growingdome, along with the full authority and ownership, shall belong fully to the school and its community. The following shall help assure a successful development and hand-over process to the school and its administrators for their adaptive management and monitoring.

Advisory Panel: (To be determined)

Principles:

1. Respect for Indigenous Rights: The policy recognizes and respects the rights of indigenous peoples to self-determination, cultural preservation, and sustainable development.
2. Collaborative Decision-Making: The policy promotes inclusive and participatory approaches that involve indigenous communities in the decision-making process regarding the introduction of new technologies.
3. Environmental Sustainability: The policy emphasizes the importance of environmentally sustainable practices and encourages the adoption of technologies that minimize negative impacts on ecosystems and natural resources.
4. Socioeconomic Equity: The policy seeks to address socioeconomic disparities by ensuring equitable access to resources, knowledge, and opportunities for indigenous communities.
5. Cultural Sensitivity: The policy acknowledges the cultural diversity and heritage of indigenous peoples and promotes technologies that align with traditional knowledge and practices.

Guidelines:

1. **Khumjung/Khunde/Hillary School Community Consultation and Consent:**
    - Prior to the introduction of new farming and agricultural technologies, developers and stakeholders must engage in meaningful consultation with indigenous communities to assess needs, preferences, and potential impacts.

- FPIC must be obtained from indigenous communities before implementing any technological interventions on their lands or territories.

2. **Mitigation Strategies:**

    - Develop contingency plans to address unforeseen negative consequences promptly, providing resources and support to affected communities.
    - Establish a mechanism for ongoing dialogue and collaboration between technology developers, government agencies, and indigenous communities to address emerging issues and refine technology implementation.
    - Allocate resources for adaptive management strategies that allow for the modification or discontinuation of technologies if adverse effects are identified.

3. **Impact Assessment:**

    - Conduct comprehensive impact assessments to evaluate the potential social, economic, environmental, and cultural impacts of introducing new technologies in indigenous communities.
    - Assess the long-term implications and sustainability of technology adoption, considering factors such as resource management, land tenure, and community resilience.

4. **Capacity Building and Knowledge Transfer:**

    - Provide training, capacity-building initiatives, and technical support to indigenous communities to facilitate the adoption and management of new farming and agricultural technologies.

- Promote knowledge exchange and collaboration between indigenous peoples, researchers, and practitioners to integrate traditional knowledge with modern agricultural practices.

5. **Adaptive Management and Monitoring:**

    - Implement mechanisms for ongoing monitoring, evaluation, and adaptive management to address emerging challenges and optimize the performance of agricultural technologies.
    - Foster partnerships between indigenous communities, government agencies, and non-governmental organizations to facilitate knowledge sharing and mutual learning.

6. **Conflict Resolution and Grievance Mechanisms:**

    - Establish transparent and accessible grievance mechanisms to address concerns, disputes, or conflicts arising from the introduction of new technologies.
    - Facilitate dialogue, mediation, and conflict resolution processes that prioritize the interests and rights of indigenous communities.

Implementation and Accountability:

1. Government agencies, research institutions, non-governmental organizations, and private sector entities involved in agricultural development must adhere to the principles and guidelines outlined in this policy.
2. Establish monitoring and oversight mechanisms to ensure compliance with the policy and to hold stakeholders accountable for their actions.

3. Regularly review and update the policy in consultation with indigenous communities and stakeholders to reflect evolving needs, priorities, and best practices.

(End of Policy Template)

Appendix H:

Foundation Press Release Links

Growingdome in the clouds Foundation

“I see now, 'Yes, it's possible.' And for so much more, the growingdome as a living laboratory for serving our community's health, nutrition and traditional practices.”

— N.D. Rai, Principal

The following press releases have been developed to support the Hillary School Project.

- **5 Sept 2023 PR #3:** *Sir Edmund Hillary School Seeks Seeds to Grow the Future in Nepal*

https://www.einpresswire.com/article/653562108/sir-edmund-hillary-school-seeks-seeds-to-grow-the-future-in-nepal

- **15 Aug 2023 PR #2:** *Foundation Launches Campaign to Fund Transformative Growingdome for Remote Sherpa Community*

https://www.einpresswire.com/article/649483276/foundation-launches-campaign-to-fund-transformative-growingdome-for-remote-sherpa-community

- **9 Aug 2023 PR #1:** *Seeds of Indigenous Intelligence Germinate Within the Sherpa Clouds of Everest*

https://www.einpresswire.com/article/648992962/seeds-of-indigenous-intelligence-germinate-within-the-sherpa-clouds-of-everest

Appendix I:

Authorization Letters

PAN No.201368695
School Code 110180003

श्री खुम्जुङ माध्यमिक विद्यालय
Khumjung Secondary School

खुम्बु पासाङल्हमु गाउँपालिका-४, सोलुखुम्बु
Khumbu Pasanglhamu Rural Municipality-4, Solukhumbu, 038-540334/540049

Ref no.

Date : 11th, June 2023

To whom it may concern

Meeting held on 8th June2023 between School Management Committee (SMC), Parents Teacher Association (PTA) and staffs of Khumjung Secondary School decided to give authority to Mr. Gary Lesley, a parmanent resident of United State of America. Mr. Gary is fully authorised to collect fund to build Geodesic Growing Dome in Khumjung Secondary School.

Ngawang Dorjee Baing
Principal

Laxman Adhikari
SMC Chairperson

Lesley, Gary M

Subject: FW: FW: Hello! RE Hillary School Three Jewels Project
Attachments: image002.png

From: N.D. Rai <raiascol@gmail.com>
Sent: Sunday, June 11, 2023 10:04 AM
To: Lesley, Gary M <gary.lesley@mnsu.edu>
Subject: Hello!

I hope your journey back to your sweet home went well.

Thank you for your revisit to Khumjung village and Hillary school. You said, you would return with your assignment and you did it. It was nice time with you in Khumbu. The report you provided us regarding solutions to providing a greater variety of vegetables and even fruits, not only addresses my staffs' challenges, but allows the school to develop a curriculum for our students. This also can bring benefits to Khumjung and Khunde communities.

With your geodesic growing dome technologies in harmony with your "Three Jewels" of knowledge: Sustainable regenerative practices, health and nutrition and waste management science, this project contains many benefits.

Please let this letter serve to thank you for your report and notify those who you may approach, in regard to this initiative, that you have our blessings to execute such a plan that brings fruition of the Three Jewels for our school and our community.

Finally, our school family has issued an official letter for you which may simplify the way for Three Jewels project.

Sincerely

ND Rai

Principal

Khumjung Secondary School

(Hillary School)

Lesley, Gary M

Subject: FW: RE Hillary School Three Jewels Project Pushing off

From: Chhimi Tshering Sherpa <schhimi42@gmail.com>
Sent: Friday, June 16, 2023 11:18 PM
To: Gary Lesley
Subject: Re: RE Hillary School Three Jewels Project Pushing off

Sounds great, thank you! I am happy to be part of this great project.

Thank you all for the great initiative on behalf of Sagarmatha national park bufferzone management comittee.

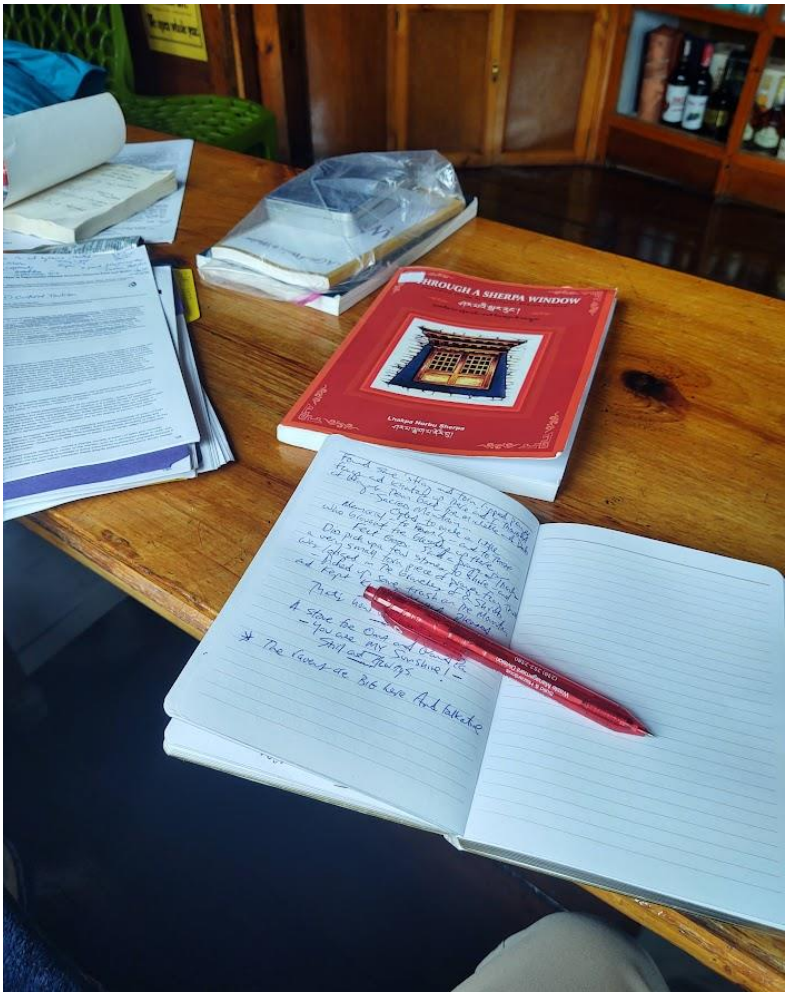
Namaste
Chhimi
Director; Sagarmatha National Park Buffer Zone Committee

Appendix J:

Photo-Essay/Field Notes:

June 2022 Khumbu Expedition, Reference-Only.

My Words have an Ancestor...



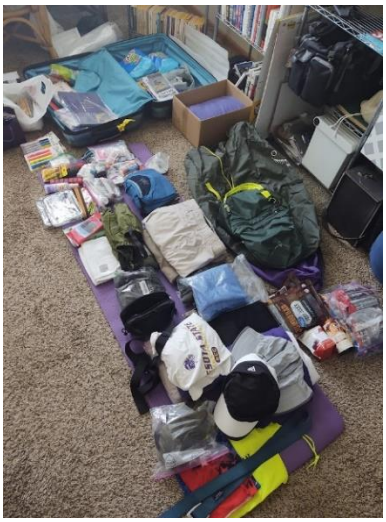
My Deeds have a Lord...

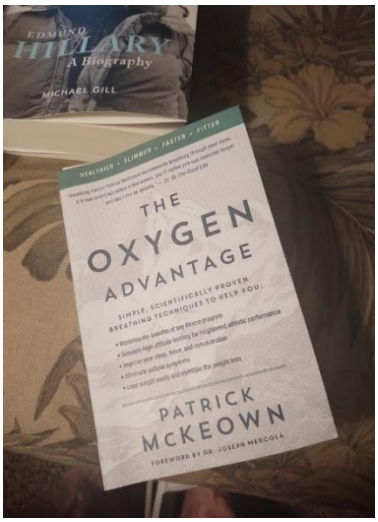
The following photos with commentary are presented in the chronological order of my travels during June 2022. They are intended to portray the content and context of my personal experiences in the Khumbu Valley of Nepal.

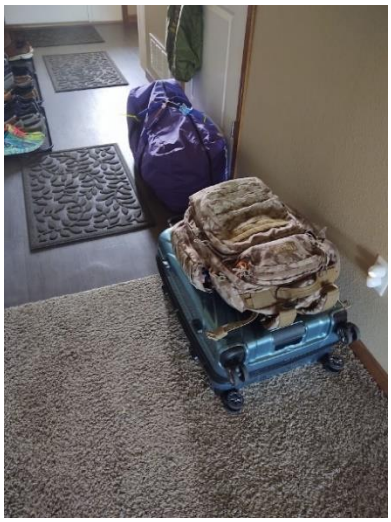
-And those experiences yet to come.

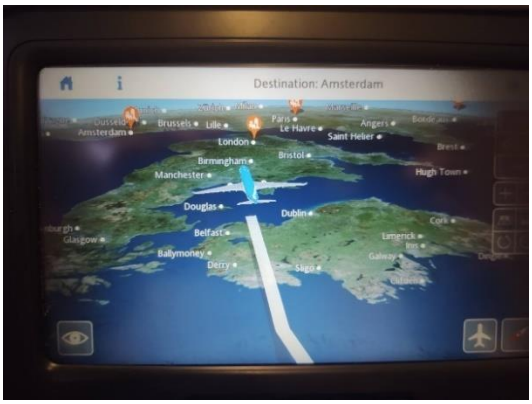
1 June 2022 *-Day Won-* A Victory just to begin…

Out the door at 1000a. Land-Air shuttle to MSP. Flt departure 1500.



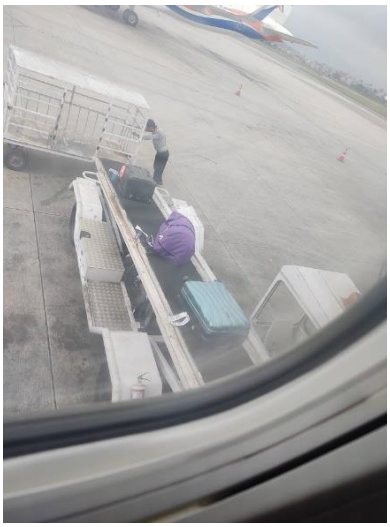






MSP-AMSTERDAM-RIYADH-DUBAI-KATHMANDU-LUKLA

It's a long haul… half-way around the world.



A little *Bailey's Irish Creme* helps… as does seeing my bags come off!

03 June Wed 0840: 33 hrs. of travel time later… WITH my gear!

It's a good day… to be in Kathmandu. To Lukla tomorrow.

Now… where's my man Dil?

They found me, as I knew they would. Total trust. Dil, the owner pf the trekking company *Alpine Ramble*, and Saughat; my partner/guide and friend from my first trek to Everest Base Camp last November. They like to see me in authentic dress! It's all about the experience of 'authentic'; and it plays both ways. Especially when you're tall, and you tell them to *Make my day*!

4 June/Thursday 0615: Kathmandu-Lukla (45 min flt) 4400' to 9340'

Gary to pilot: *Can we fit it in there…again?*

Pilot to Gary: *Three times a day, sir…*

Our airplane was *blessed* to have a Head Lama from one of the nearby Monasteries onboard.

The Tea House after a good night's sleep; **morning 5th June Fri**. Of course, with tea! Ready to hit the trail with Stomper and Diki; my guides up to Khumjung Village; a 3 day trek up to 13,000'. Unfortunately, Saughat could not join me: he was on-call at the hospital for a hernia repair.

Pasang Lhamu Sherpa

First Nepali woman to summit Mt. Everest: 22 April 1993.

Pasang was successful in reaching the summit along with five other Sherpa men. Sadly, the 32-year-old wife and mother of three did not survive the descent. Her exhausted team ran out of oxygen supplies and after being forced to bivouac for a frigid night just below the peak, she remained with a stricken partner. Rescue efforts were late and vain. Her body was recovered 3 weeks later by a search team led by her husband.

This memorial gate marks the start of the trek downward out of Lukla to the Duhd Kosi river and the village of Phakding, the common 1st day objective for Everest trekkers.

Pasang is a revered figure in the Khumbu, especially among Sherpa and the other indigenous peoples of the Everest valley. Mountaineering was not to be expected of Sherpa women; especially 30 years ago. Pasang was a humble and unassuming trailblazer in the truest sense of the word. A foundation that bears her name is a testament to her courage and fortitude. When asked why she wanted to climb the tallest mountain in the world, her husband simply said:

Because she wanted to…

Down-Valley (Lukla to Namche) characterized by diverse cropping and new development







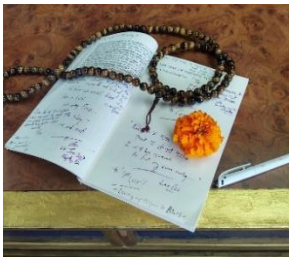
Agricultural activities include a mix of both subsistence and small-production farming. Some elements of transhumance and pastoralism still exist with the large animals; mostly yaks and their hybrid-cow-cousins but that is at higher altitudes (12,000' – 15, 000'). Potatoes (over 20 varieties based upon altitude, temps and soil type) dominate, with a variety of leafy vegetables, radishes, onions, carrots, beans, garlic, pumpkins and squash. Some wheat, barley and millet are produced. Not much rice is grown north of Lukla. The rudimentary green houses are used for growing maize, tomatoes, melons and possibly some fruit/berries. I did see some apple trees mostly unattended.

As much of the valley inhabitants are practicing Buddhists, the killing of animals is not an accepted practice and thus the eating of meat and fish is not common. I did see chickens, and eggs are used in a variety of dishes. There was the occasional goat herder (of a lower cast and possibly Muslim) as the milk, cheese, yogurt and meat appear on some menus along the route. So does chicken, and some of the 'Sherpa' stews are rounded out with yak meat… catering to the trekkers.



I can attest to the yak cheese as ***deri-meto*** *(delicious!)* More on foods later.


This small, up-scale coffee shop where I first tried the yak cheese, with very good coffee by the way, was one of the early experiences I had that began expanding my mind and awareness of Sherpa entrepreneurialism. The 20-year-old young man who was operating the shop was *Mingma Sherpa*; and yes, therefore, of Sherpa heritage (and born on a Tuesday). Mingma is a college-level student in Kathmandu most of the year. His parents own the coffee shop and attached (high-end) clothing store. Talk about multi-level marketing. They also use a website for their Lukla-branded trekking wear. From starting where I knew a *sherpa* as a porter for an expedition, I had come a long way quickly. Here was the making of a second-gen Sherpa money-maker with an owner mentality already baked in… (write that down, Gary)



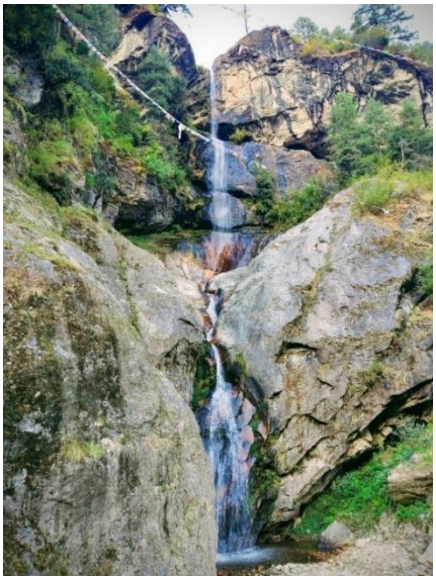

As the old runs into the new. Or the new runs into the old… I more fully noticed from only 6 months ago, certain trends that underlined the increasing pace of transformation; at least as it manifested itself to me as an observer, in new construction.

The BRICK look… at first, I was struck with what's up with that??? Like what the…??? Simulated brick? Who is that for? (Rhetorical question)

And the reddish/orange colors where it used to be all about the green… on roofing and siding. It also appeared that using lavish amounts of wood was no longer a tabu… Had all those millions of pine seedlings that Hillary established 40 years ago really grown that fast?


No.

No longer in original use, as a greater number of towns and villages have developed along the trail, protected enclaves such as this one served as overnight shelter for yak and donkey caravans. A mountain-fed water source is typically near-by; shared by both beast and man.



A good example of one of a number of positive projects, programs and initiatives I observed taking place up and down the Khumbu Valley. Note the range and variety of 'sponsors', very often made up of NGOs and foreign investment.

The trail begins to transition as we head north into the beginning of Sagarmatha National Park.

Hard to really grasp the pitch from the photo. I never and still have not fully gotten over not only how the human porters with 100 kg on their backs… in sandals… negotiate this trail from Lukla up to Khumjung and beyond, but the animals… the true beasts of burden: the yaks and donkeys… You have to see it to believe it; both the humans and the animals and how they do it. And have been for hundreds of years. How many years more? There's a question. And then what? Displacement in multiple forms. Manifested and Latent consequences… for better and worse.

Below is the entrance to the park. We're heading up… and down… and up… to Namche Bazaar.


SAGARMATHA NATIONAL PARK
I alone absorb
22 Kg of CO2 in a year.
All I ask in
Return is that
"you let me live"


SAGARMATHA NATIONAL PARK
SAGARMATHA NATIONAL PARK
UNESCO WORLD HERITAGE SITE SINCE 1979
Distance 4 km
NAMCHE
2:00 hours Walk
Distance 15 km
LUKLA
7:30 hours Walk
LARCHA DOVAN ELEVATION 2935 m

Prior to the pandemic, upwards of 50,000 trekkers visited the SNP in 2019. My sense based upon conversation with lodge owners and trekking outfits is that number is ready to double in the upcoming years. And that's likely just the start. Again.

Sir Edmund Hillary was instrumental in helping establish the need for management of the local lands and environment surrounding Everest, driven through his concerns for his adopted Sherpa Community. Trekking was not much of an issue through the 60's. By the mid 70's, Hillary and other engaged parties heard the alarm bells ringing, calling out the environmental damage resulting from the growing influx of visitors, trekkers, mountaineers and developers. Sir Ed encouraged the establishment of the park, formed in 1976, which began by encouraging rules for waste management and limits for the unsustainable cutting down of trees.

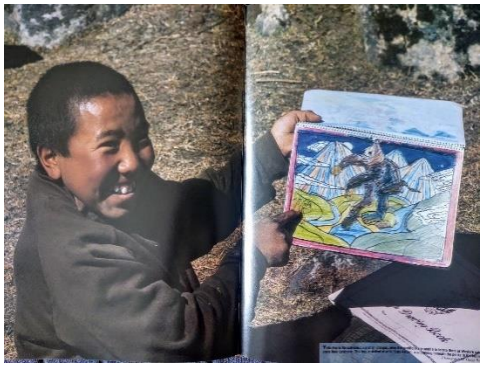
Today, Sagarmatha National Park (SNP) covers over 1100 square km of the Himalayan Ecological Zone in the Khumbu region of the Solo-Khumbu District. It is the home to an estimated 3500 Sherpa. The park not only encompasses the tallest point on earth: Mt. Everest/Jomolungma (Goddess Mother) (8848m/29,040') but also two of the other tallest mountains in the world with #4 Lhotse (South Peak) at 8516m/27,940' and #6 Cho Oyu (Turquoise Goddess) at 8188m/26,864'.

The famous and oft-visited Tengboche Monastery is located in the park enroute along the Everest Base Camp trail. Other significant monasteries are found in Khunde (Khumjung), Thame and Pangboche.

In 2002, with growing sensitivities to the impacts upon indigenous and Sherpa culture in the Khumbu, additional lands surrounding the park composing both forested and private lands, were designated as *Buffer Zone.* Through a greater coordination between local communities in the park and the management of it, of late, by local and indigenous partners, provisions for fostering this closer relationship now include a return to the local communities of a portion of park revenues to be used for development and conservation projects intended to benefit all.

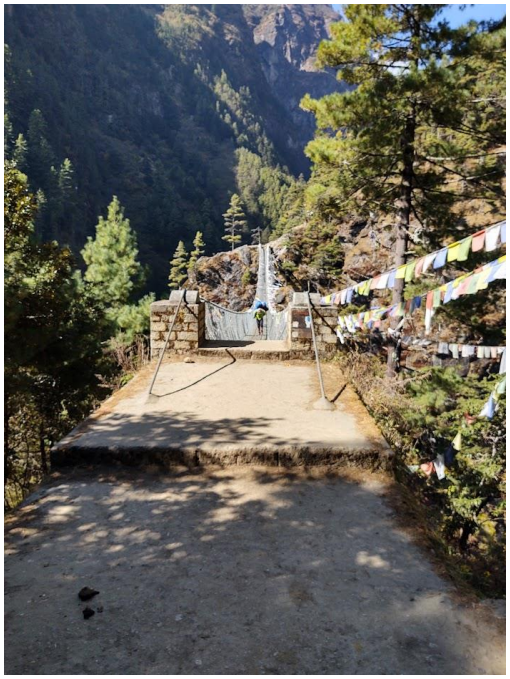
If I recall correctly, the trekking permit to enter the park cost about $40. They did note our time and date info, destination plan, and supposedly keep some track of our progress. There were two other checkpoints on the way up to Khumjung.

The SNP mantra: *Take only photographs… leave only footprints…* And watch out for the Yeti! Ha. More on that to come. It is said that a Yeti scalp is kept at the Gompa in Khumjung Village. Well, we would just have to check that out firsthand. (Photo from Hillary's *Sagarmatha* collection)



The Hillary Bridge enroute to the infamous Namche Hill. (2000' ascent ahead)

Hillary and his team built this bridge, late 1973 I believe, high above the white waters of the Dudh Kosi river. It replaced a wooden log/tree version much lower and continually wiped away during the monsoon season. The efforts to just transport the 4” diameter steel cable and metal surface grating all the way up from Lukla was Herculean.



Incentive for getting across that bridge… and half-way up the Namche Hill… is the first peek…at *THE Peak… IF… the cloud gods blow the sky clear you.*

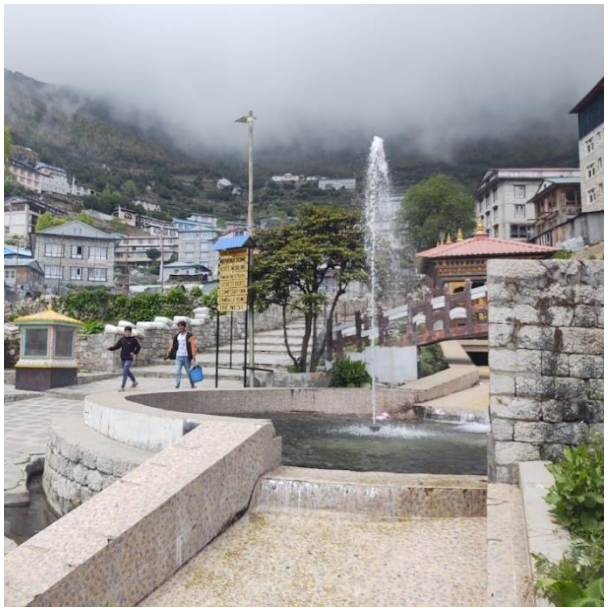
Sagarmatha on the horizon

Beyond human… Beyond humane? Paid by the kg hauled, and the distance.

06 June: 3-hour climb *finally* opens up to the spectacled, terrace community of Namche Bazaar.

Just 2 miles up and over into the cloud; the way to Khumjung Village!

My legs said *'Gary… not today'*



Equal to the fascination I had the first time I set eyes on Namche, *there was an uneasy sense to the place*. It was as if the whole thing could slide right down the valley and off the edge of its southern lip. Even the flat spots weren't on flat ground. As the largest village in the region and the center of both economic and political activities for Sherpa, there may have been more to what I was sensing. I would soon find the land up and over the mountain to be its polar opposite.

This older photo of Namche, at 11,300', probably from around 1980, helps portray it's rather precipitous-appearing array of dwellings and the valley/gorge that drops 2000' below.

Established along a 500-year-old trade route from Tibet, the personality and psyche of the Namche trading post developed since the 1960s on a very different trajectory than did the Khumjung/Khunde community only 2 hours apart. Hillary wrote about his ambivalence toward Namche. Contentious, political factions and a wheeling-dealing, trader heritage often made cooperation difficult. Corrupt relationships between local and Nepali government officials made for a skeptical populace. He later regretted not making more of an effort to engage here.

From the last census (2001) report showing 1650 inhabitants among 400 households, the growing town is the regional center and gateway for Khumbu tourism. Entrepreneurial Sherpa business owners abound here. Replete with bars and barber shops, euro-style coffee shops and German bakeries, Irish Pubs, Italian pizza parlors, a new North Face store, pharmacy, with rows of outlet shops for everything a trekker might need or want. And then some. Did you say Chinese food? You got it. I even spotted a new laundromat with 3 washing machines and a dryer! From the women and children using the municipal wash rack area fed by the mountain stream water…what a juxtaposition. Dozens of lodges and Tea Houses with simple sleeping rooms to luxury suites with fully westernized-attached-bathrooms, hot water showers and flushing toilets. Yes, it all runs downhill. Best to live upstream in this regard.

From conversations with a number of Sherpa business owners, more and more of the successful bug out for the winter months of December and January. Acculturation, transformation or transcendence? The relatives are no longer just down-valley or even in Kathmandu and Darjeeling but now in US states including New York, Colorado and California and across Canada.

Lhakpa Kanchi Sherpa, with me above, and her brother Dawa Sherpa co-own and operate the lodge where Diki and I slept in Namche, the *Sakura Guest House*. Brother and sister both born and raised in Namche. They epitomize the growing number of first-generation Sherpa entrepreneurs making money in ways other than off their backs, selling potatoes or trading millet for salt with Tibetans as very likely their parents may have, and certainly grand parents did. Hard to take a photo of younger (under 50) Sherpa in the Khumbu without an I-phone in their hands.

07 June/Tues morning Namche enroute Khumjung Village

Happy that the over-night rains had stopped… Getting used to life in the clouds is an adjustment. Though I kept reminding myself I did not return for the views, I knew what I was missing in only 100' of visibility. When the skies are clear up here, it's a whole different 'world' as you take in breath-stealing vistas and a number of the world's highest peaks. They weren't far back in my memories from last time, so I chose to enjoy a much more *focused and refined approach to the trail and my own inner sensations.* The surreal surroundings of roaming yak, mani stones and stupas added to the mystical, mythical experience of knowing that Khumjung was *out there*...



We were traversing a table-top plateau; green and grassy, where herders allow their yak to free-graze between Spring and Fall. A government-run yak farm is up here, too. Pastoralism and transhumance still make up a part of Sherpa lifestyle though a lesser and lesser part among fewer families. Hearing the bells toll from the necks of these slow-moving creatures; some invisible in cottony mist made for a heightened, primal consciousness; motionless prayer flags as witness.

I was sure glad I had Diki up here. There were numerous times when the 'path' separated into paths… and staying oriented among all the animal trails would have had me off lord knows where. I knew at some point we had a small descent among ancient stone steps and not that I doubted Diki, but I was still relieved to confirm our terra firma location in the clouds!

A few last stairs up… before down… was the good news…

Khumbu Express, you're cleared for descent…

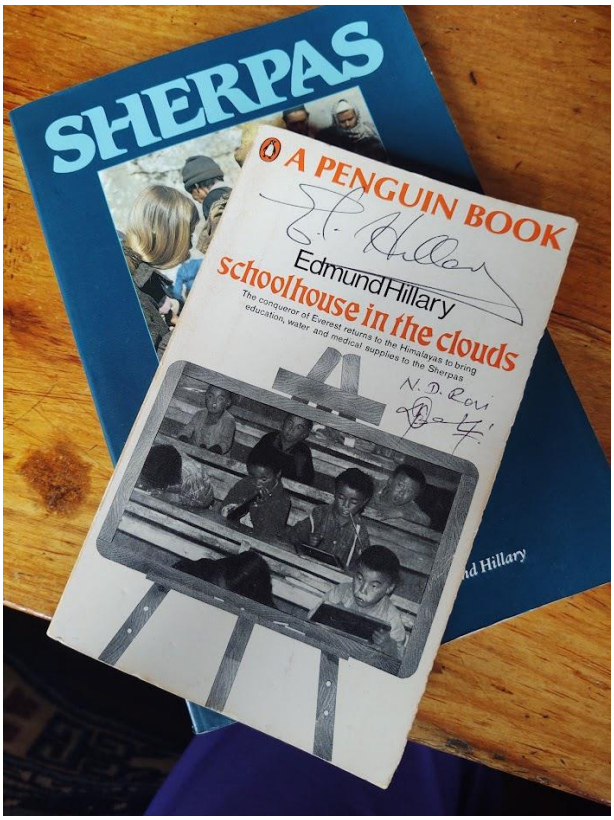
Trekkers: Fasten your backpacks…

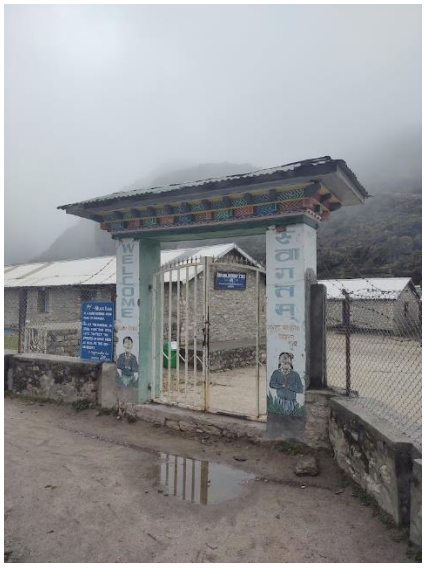
Good job, Navigator…

Now we have to find Doma!

It wasn't hard to find the Hillary School. Or at least know we were close by. *I heard it first*. Even in the clouds. The unmistakable sound of kids in a schoolyard; in any country, at any altitude, rang out as we descended the last stone stairsteps. Just ahead and to our right… it would appear.

How apropos! THE 1st *Schoolhouse in the Clouds;* completed in June of 1961 with help from Zeke O'Connor. I'm fortunate to have found an old copy of the paperback signed by Sir Ed Himself. The book accompanied me to Khumjung, and I was honored to have Principal Rai's name join his.





The original schoolhouse, now among a campus of 12 buildings, is the 2nd from the right with a silver roof. I would come to learn from Principal Rai that it is being transformed into a museum.

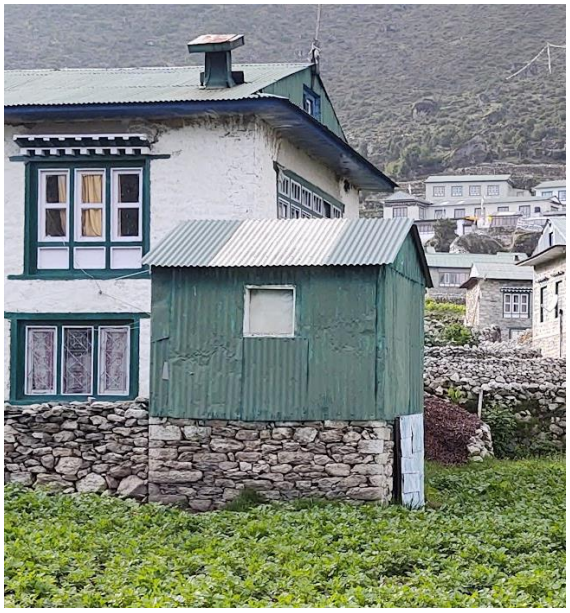
Among the first things you realize when you come down into KJ is how different it is from Namche. There is flat ground, as you can see in the schoolyard! The valley that holds both Khumjung and sister community Khunde created an immediate attraction to me, a sense of stability, purpose and protective surrounds. Even in all the colorless, muted tones of my first acquaintance with the village, the truer impression was filled with multi-colored feelings.


And I had to love seeing a grass yard… with a cow! And lots of potato fields. *Did I say lots???*





I learned 95% of all the planting in the valley was but a few varieties of mountain spuds. Commercially prized for their tastiness throughout the Khumbu, bumper harvests, usually. But I learned every 3-4 years*, not so good…* I had diversification thoughts. Regarding that cow? Hold that dung; *chey* please! That is a living fertilizer machine. Also dried and used as fuel where wood is scarce. Two-tier outhouses proliferate and all are welcome to leave a donation for the spuds!



Typical detached Sherpa outhouse/toilet-*chhakang* shown above. Human waste drops down to the ground floor onto piles of dry forest litter and composted for up to a year. It is collected and taken out to the fields as *chha* (manure) to fertilize the fields with critical nutrients. As the above photo shows, it doesn't have to be transported very far in most instances.

Composting of human waste has served for thousands of years as an environmentally sensitive and effective method of waste management and negated the need for water or chemical additions to the soil. Facing new realities of growing population densities, cultural modifications, hygiene standards and needs for serving western expectations, waste management in the Khumbu Valley is a critical issue. Though I should have, I never asked where my water-fed, flushing toilet transported its contents. I remain confident it will at some point benefit a future potato plant or two. Or more… It's all connected.

In more ways than one.

Back in the early 60's, the Hillary Team brought to light the high propensity for neck growths in nearly all Sherpa of middle age. This astute observation helped lead to identifying acute iodine deficiency in their diets. Neither the Tibetan rock salt nor their local mountain waters provided for this essential trace mineral which is not produced by the body. Hillary was instrumental in establishing a program whereby high-dose iodine injections were made available to everyone in Khumbu, starting with women of child-bearing age. Results from this effort were astonishing. After 1966, cretinism had virtually disappeared and the huge, disfiguring goiters became a thing of the past. Interestingly, although the iodine injections of the past were discontinued, medical researchers suspect that the iodine has been re-cycled through the Khumbu Valley potato crops fertilized with human waste.

Today, iodized salt in Nepal is not only prevalent but government mandated and controlled. Some worry it is excessive. Thyroid cancer, hypothyroidism, accelerated heart rate…

Follow the *chha-chha.* It's still all connected…

Sherpa Food and Drink

One thing's for sure: I've never been hungry in Nepal and that included trekking in the Khumbu. Granted I'm not much of a foodie, and I keep my diet both simple and consistent. I also travel with protein, immunity and energy supplements and stick to *bottled water*. (Re-evaluating that)

The staples I'm accustomed to *rice, pasta noodles, potatoes, simple soups, basic leafy vegetables, peas, carrots, onion, garlic, mushrooms, chicken eggs and grain-based batters for pancakes and waffles* are all quite accessible and locally sourced.

Meats are sometimes available, chicken and beef from either cow or yak. Not a big meat eater, I stayed away from both, also lessening the chances of any bacterial challenges.

Now the higher up the valley one travels; and the end of the 'road' is *Gorak Shep*; an enclave of Lodges near the base camp of Everest, selections get narrowed and the time of year is also a factor as to availability for fresh vegetables and 'meat'.

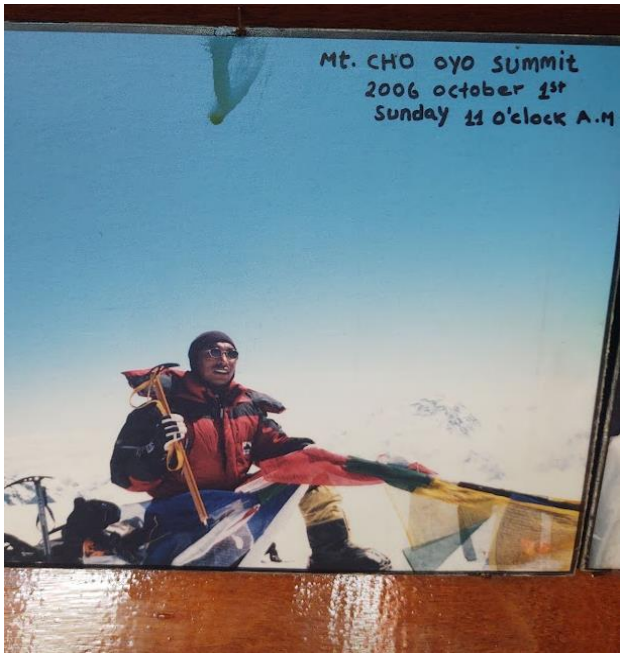
Though the diets of most Sherpa may not include the diversity of prepared dishes which many of the Lodges tend to offer their guests, here is what the *Sakura Guest House* offered for a *traditional experience:*

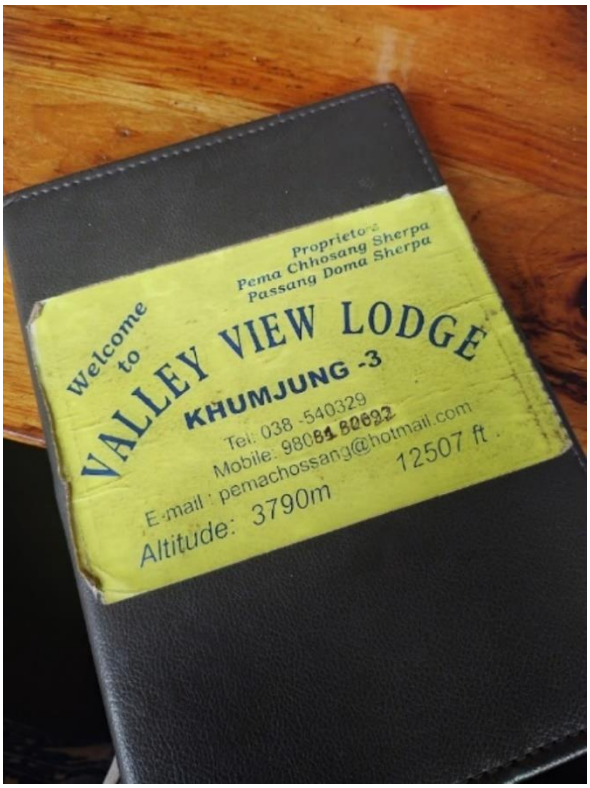
At the *Valley View Lodge*, Doma and Pema's combination home-tea house where I stayed in Khumjung, I found a surprisingly complete and wide-ranging menu. As I was visiting during the off-season and the only one at the lodge, I kept things simple. Doma was sure an excellent cook!

07 June/Tues aft: One last stair way away… Doma greeting Diki and I upon our arrival!

Below: Doma serving Diki and I black tea. I shared a tin of mint cakes Sir Edmund brought up to the summit of Everest in 1953. Doma had limited English though I'm used to communicating with few words. Tenzing, her 14-year-old daughter had superb English skills and made things easy.

Doma's husband Pema is a high-altitude mountaineer himself and has 3 Everest summits under his belt. From the pictures on the wall, I could see he had also summited many of the highest peaks in the Himalayas. Unfortunately, I would soon learn he was actually in Kathmandu on his way to a construction project he was over-seeing in Switzerland. *I would miss him…*

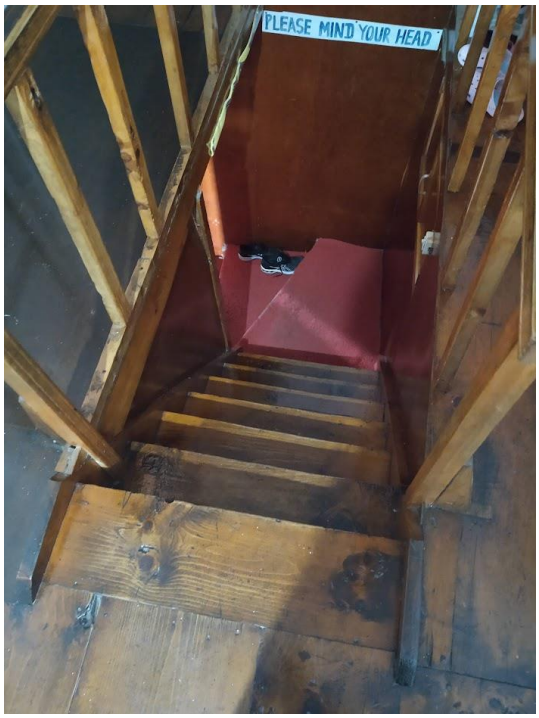


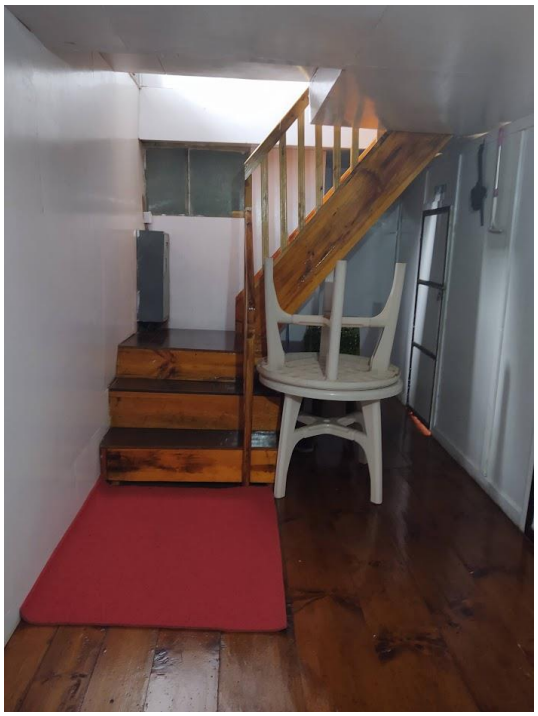


Doma and Pema also have two older daughters, both living in Kathmandu.

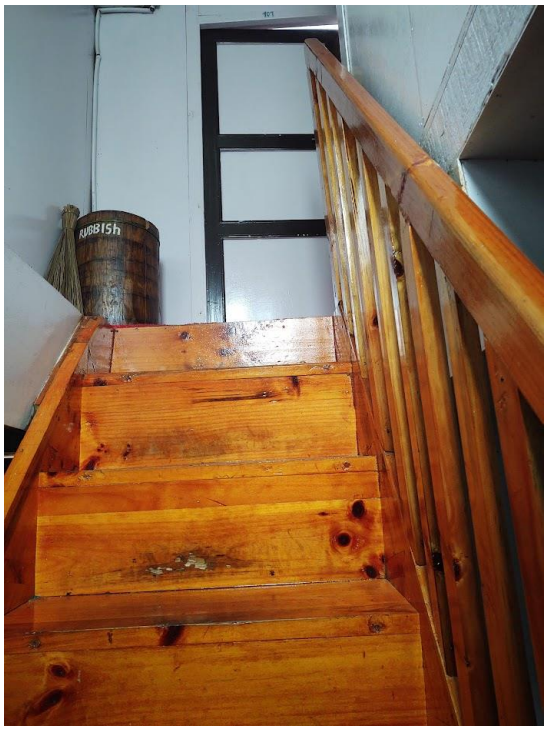
Regarding cost, $1 US was 125 Nepali rupees (NPR). My deluxe room w/att bathroom was about $15/night. There was a hot water shower I used twice. Internet was excellent and consistent.

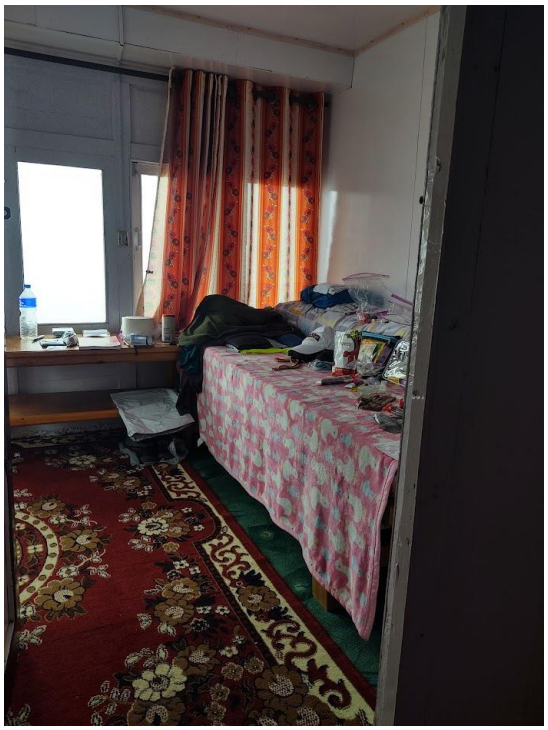
I did not have any electrical outlets in my room, which was up on the third level, but could charge my phone in the dining room. I always had to watch my head…. Wooden stair treads are steep to say the least and could be slippery with socks on. Shoes came off at the door.





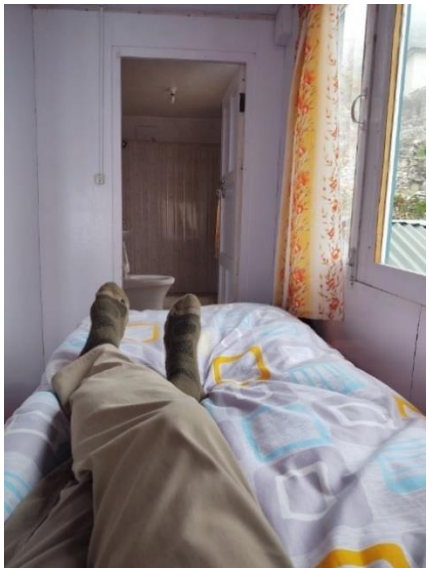
View from the second floor; down to the kitchen and up to my room.





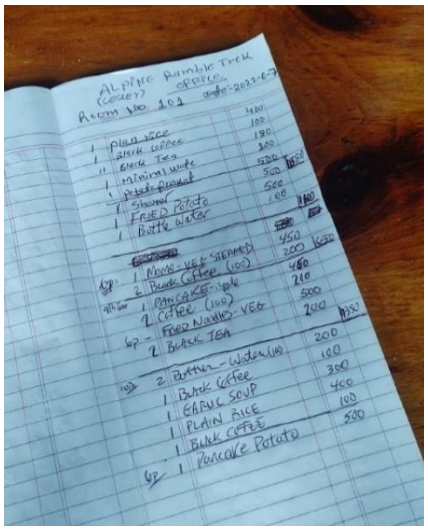
Top of the stairs was me. Two beds; one on the right served as my dresser…

And one on the left to sleep in. Narrow but long… No complaints. *The corner room.* I had views across the village. Most often into the clouds!

A note regarding electricity: Hydro-electric technologies have transformed the Khumbu, bringing reliable, inexpensive power to much of the mountainous communities today.

I kept a ledger book of my own meal expenses and settled every few days to provide Doma some cash flow. Not sure the last time she sold a bottle of Johnny Walker Red, but I thoroughly enjoyed paying her the $70 as well as getting her to do a toast with me. It served as a good sipping pleasure every evening before bedtime and even after sharing in our farewell dinner, I was happy to leave her with half a bottle. I told her to enjoy a toast with Pema when he makes it back home.



Staying warm, from the inside… in Khumjung. Yes it's June!

While I was back at the *Sakura Guest House*, Lhakpa *w/I-Phone*, was kind enough to show me what I thought I recognized…

What looks like a butter churn in the center in many ways is. Used for making Sherpa (Butter) Tea or *su-cha*, it's called a *dongmu* or tea churn. Brewed black tea, butter, salt and milk (usually powdered when up-valley) are poured together and blended/churned for 5-10 minutes. Let's just say it's *an acquired taste* before one can fully appreciate. It helps to *not* think of it as *tea*…

Could YOU say No to Doma?

Knowing this experience was on my list, from our simplified English exchanges, Doma treated me. Initially, I failed to recall proper Sherpa etiquette I had come across in my reading of *7 Years in Tibet*.



I managed the first *bowl* (not really a cup) just fine. With most Westerners, the common response is the 'gag' reflex. Not pretty. I was not about to let that happen and disrespect my host and the efforts involved to make me the tea. About the time I'm saying *tuchay* to Doma and proudly displaying the empty bowl, I quickly get served another… *Yum.* Sort of. I took my time with this one. A little easier to take. I'm asking myself if I could get used to this and like it? Possibly…Thinking of how warming it would be; both on the hands and the stomach in the middle of winter. Heck; even like now, *in 45 degrees of Khumjung June!*

Not that far back, Sherpa would consume 100 bowls or more *a day* in the wintertime. For working men, maybe 200! Su-cha provided Sherpa energy, healthy fats, calories, hydration and the desire for salt. Some say the fats helped keep lips from drying out and many Westerners claim that the su-cha helps to better deal with altitude and acclimatization. Did I mention it's filling? *Oh ya.*

Again, without thinking and doing like I was taught, I finished my bowl, and you know what happens next… There's Doma again, somehow like a flash, it's filled from the pot. And now I recall that one cannot leave a full bowl sit. When you're done, you take a *last* sip and *let it lay…* Actually, I drank most of the third bowl but left enough so that it was clear: Doma: *No Mas. Tuchay!*

I almost liked it. Could check that box now for Sherpa Tea. I felt fortunate not to have not strayed too far from the lodge that afternoon… when after about 3 hours, my western-style toilet was much appreciated. We stuck with the black tea and the milk tea from then on.

No… we will not forget the Dal Bhat: National dish of Nepal!

Bhat is boiled rice; usually white. *Dal* are lentils and they're accompanied by or mixed into a vegetable curry and maybe some pickled or spicy veggies, greens, yoghurt and fried potatoes.

Trekking guides are notorious for the amount of *dal bhat* they can consume, and it is almost always what they request or are fed in the tea houses throughout Khumbu. Behind the curtain or in the kitchen if they are seated there, no fork or spoon is required. Food is mixed and shoveled into one's mouth with the fingers. *With vigor*. Served in big metal dishes that keep all contents front and center, its 2-3 servings minimum! Breakfast, lunch, dinner. Works for them. The cooks have it available in short order. It works for me, too, *but with fork and spoon, please*.

I was honored with a family-style *Dal Bhat* dinner the night before my departure. Doma-certified authentic! It was a marvelous meal and special affair, with the Hillary School Principal and his head teacher, the student hostel director, a number of Doma's close friends and family and their children as well. My extended family in Khumjung was bonding to my heart and soul.

Doma showed me how effective the iron stove could be. *I kind of prompted her by asking if it worked…?* She would have made me a fire anytime, but I chose not to make her heat up the room just for me. But for the Party… oh ya! I actually got hot. No more jacket for the rest of the evening.

Everyone ate hearty! Below: Hillary School Principal Rai (green jacket) dishes up.

The gentleman above in the blue jacket is *Pemba Tshering Sherpa;* an electrical engineer by trade. He introduced himself to me 3 days earlier while I was standing out front of the Khumjung *Gompa*/Monastery. As the only 6'4" outsider in the village, I was quite conspicuous as I traversed the villages, and never felt uneasy. After we exchanged *Namastes,* he asked me where I was from. As *coincidence* would have it, we had plenty to talk about, *in English*, as I came to learn he was the lead research coordinator for both Dr. Jeremy Spoon and Dr. Lindsay Skog; anthropologists whom I was intimately familiar with each's work on Sherpa culture and their experiences in the Khumbu. Of course, he knew Doma… and lived right below her. I will certainly develop this connection further, as my studies and engagement with the community and the school evolve.





Many people have observed that the Himalayan people seem to have an unusually well-developed sense of inner peace and hope. I am convinced that our Buddhist heritage, with its teachings of love, kindness, and tolerance, has contributed to this, especially the notion that all things are relative and impermanent, which is very helpful when we are faced with difficulties. The people of this region may not be wealthy in material terms, but we have traditionally had all we needed, and we rarely went hungry. More important, the sense of freedom and contentment that we have long enjoyed, combined with the strength you draw from the Buddhist teachings, means that we have truly lived in peace.

I am very wary of idolizing old ways of living, because there is much that is commendable in the modern world. However, the clear challenge that faces us, whether we live in the developed or developing world, is to discover how we can enjoy the same degree of harmony and tranquility that we find in traditional communities, while benefiting fully from modern material developments. It is important that we improve standards of living, broaden educational opportunities, raise levels of health, and ease modes of transport. But as we progress from one way of life to another, there is a risk of abandoning what is tried and tested, what appears to be old, merely to have something modern instead. It would be a great shame if, in the process, we were to lose our sense of positive values.

-His Holiness the Dalai Lama

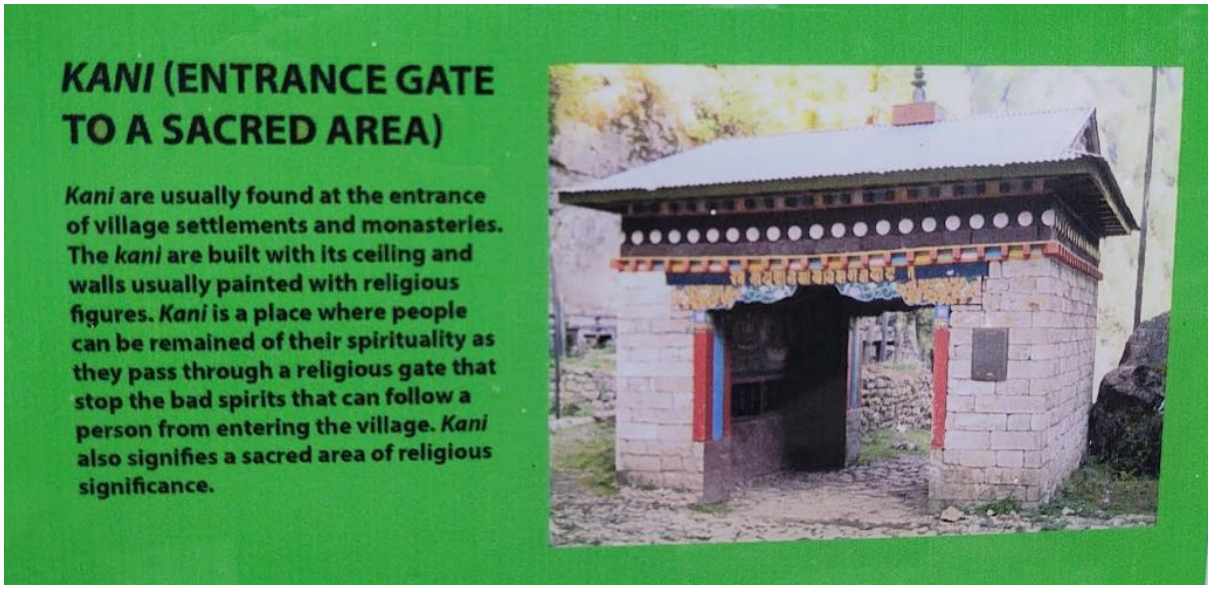
Sherpa Cultural Elements

I came across a small, memorial park dedicated to Zeke O'Connor, located adjacent to the Khunde Hospital. Impressed with the interpretive and educational efforts put forth for the benefit of visitors and trekkers passing through, I especially loved the *Beyul Garden* theme.

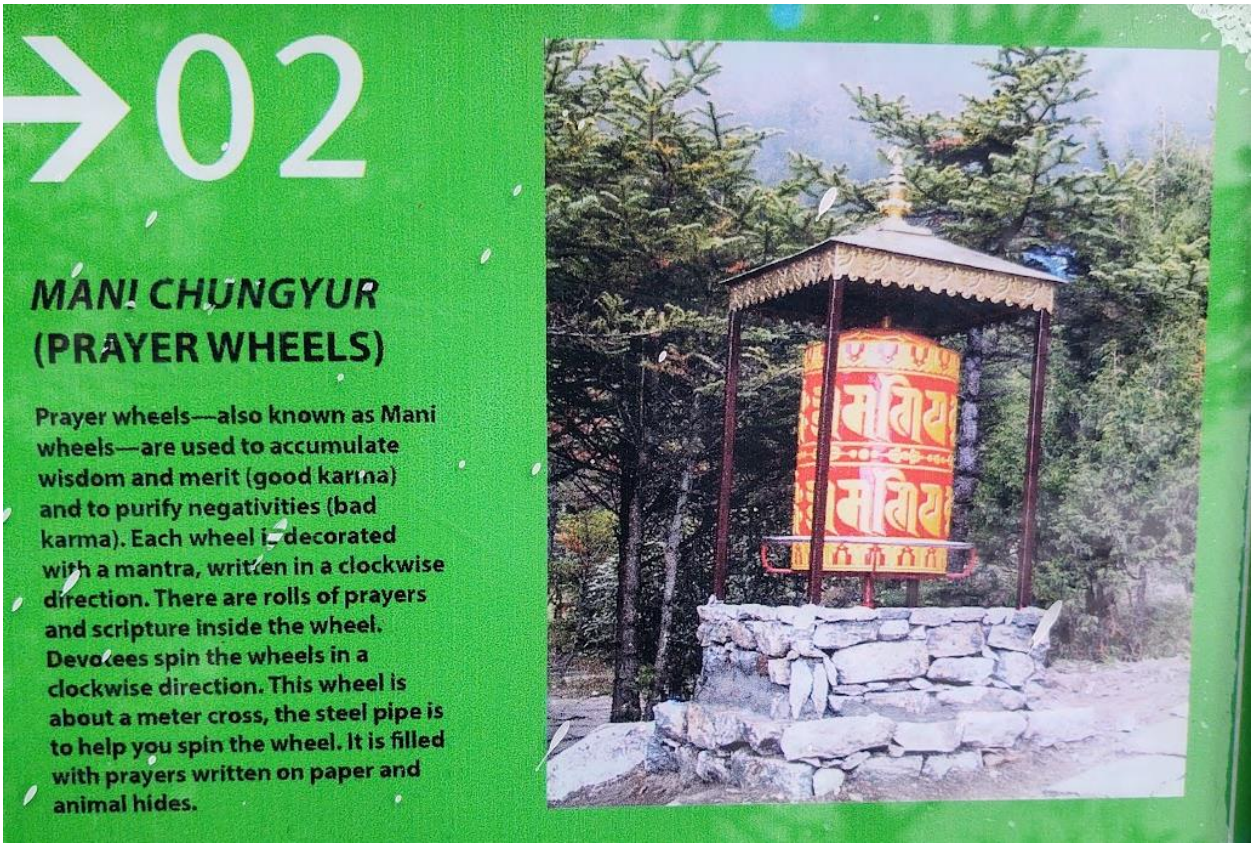
Zeke was a long-time friend and associate to Hillary and the Sherpa Community.

The gardens contained many of the quintessential Sherpa cultural and spiritual elements so prevalent throughout the Khumbu region. Examples of all of them are found throughout the photo collection presented.

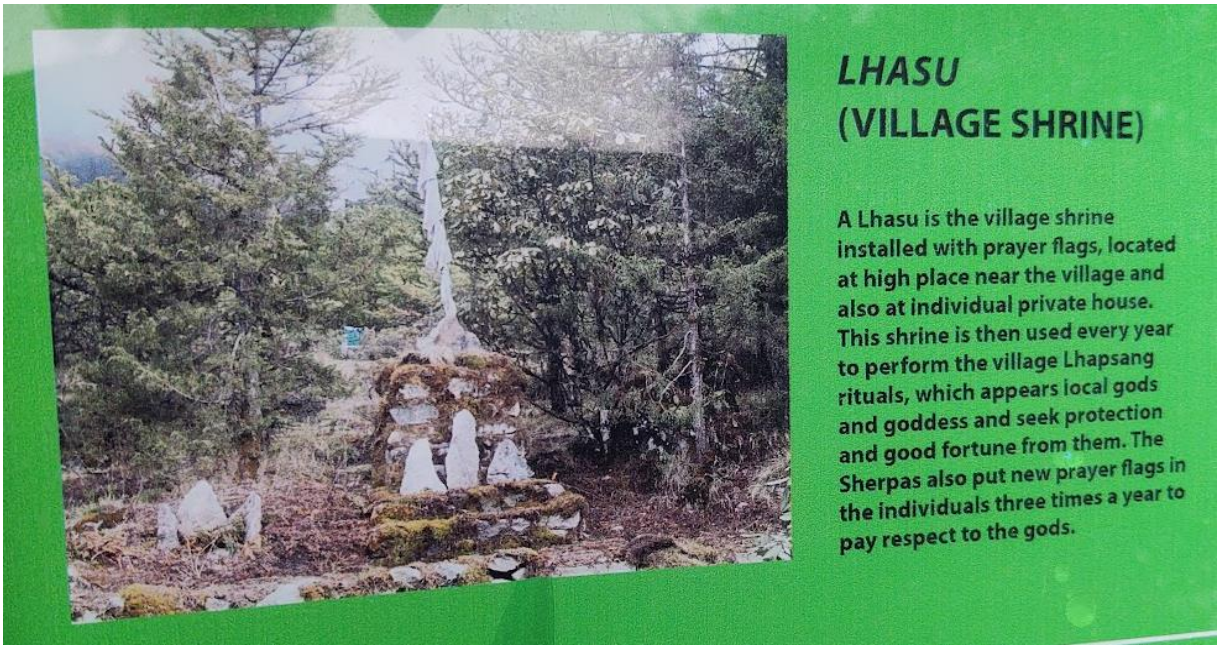
KANI



MANI CHUNGYUR



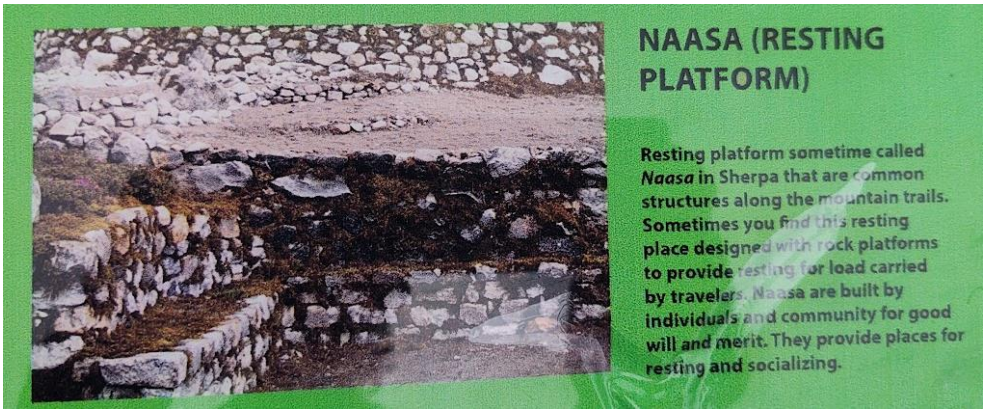
LHASU



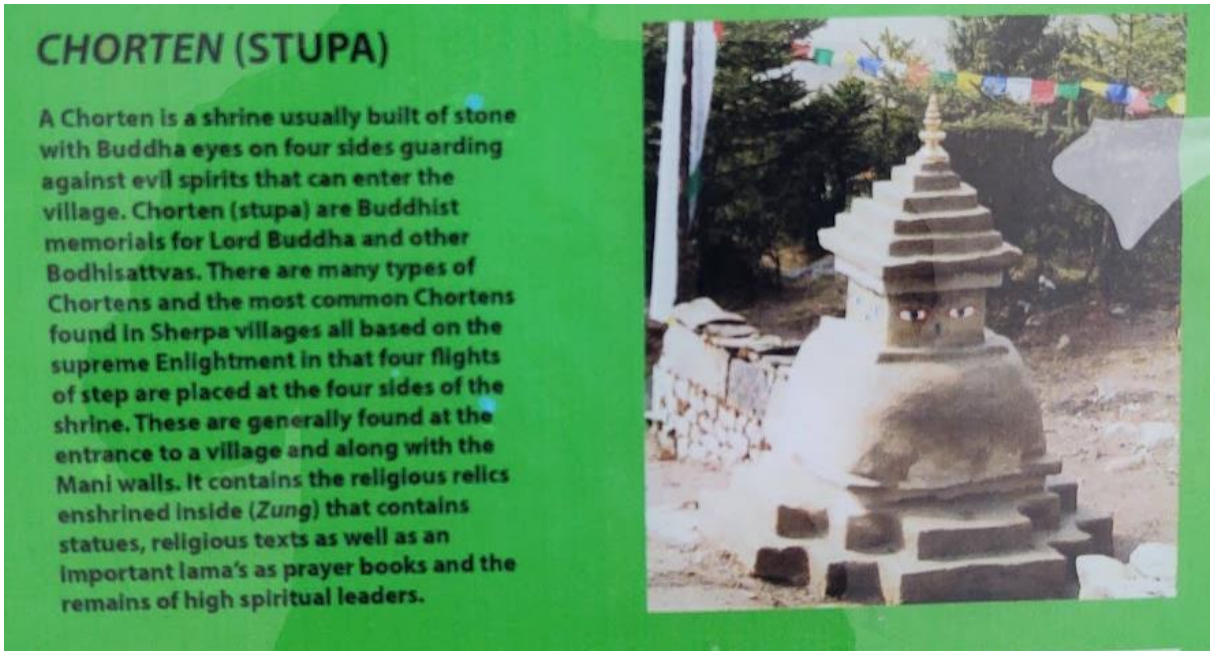
MANI STONES

LABTSA

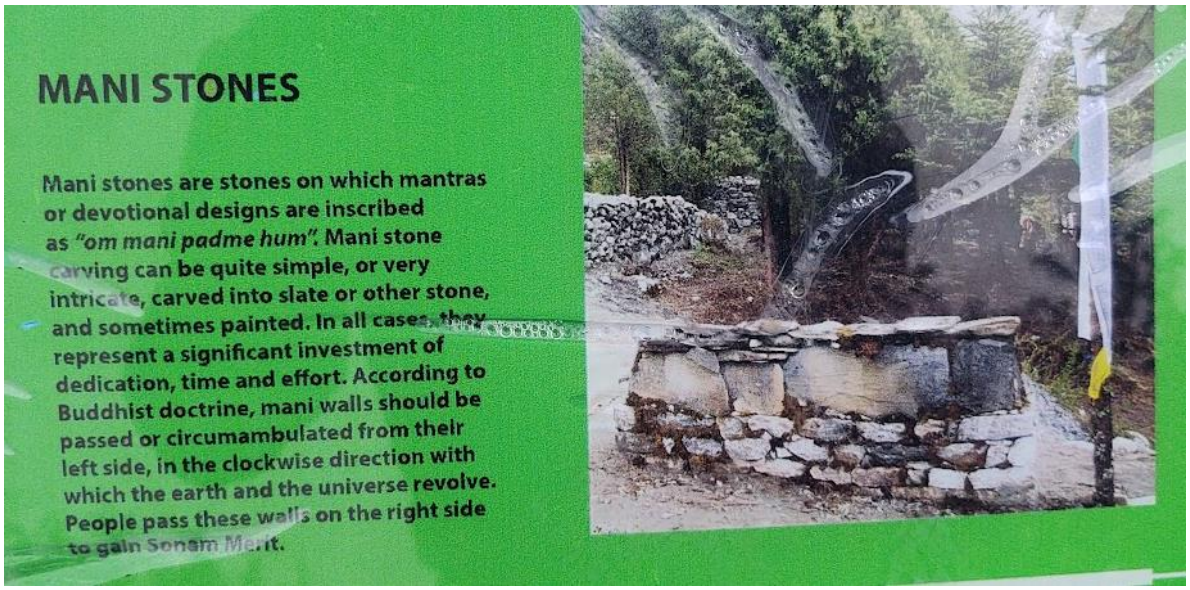
NAASA



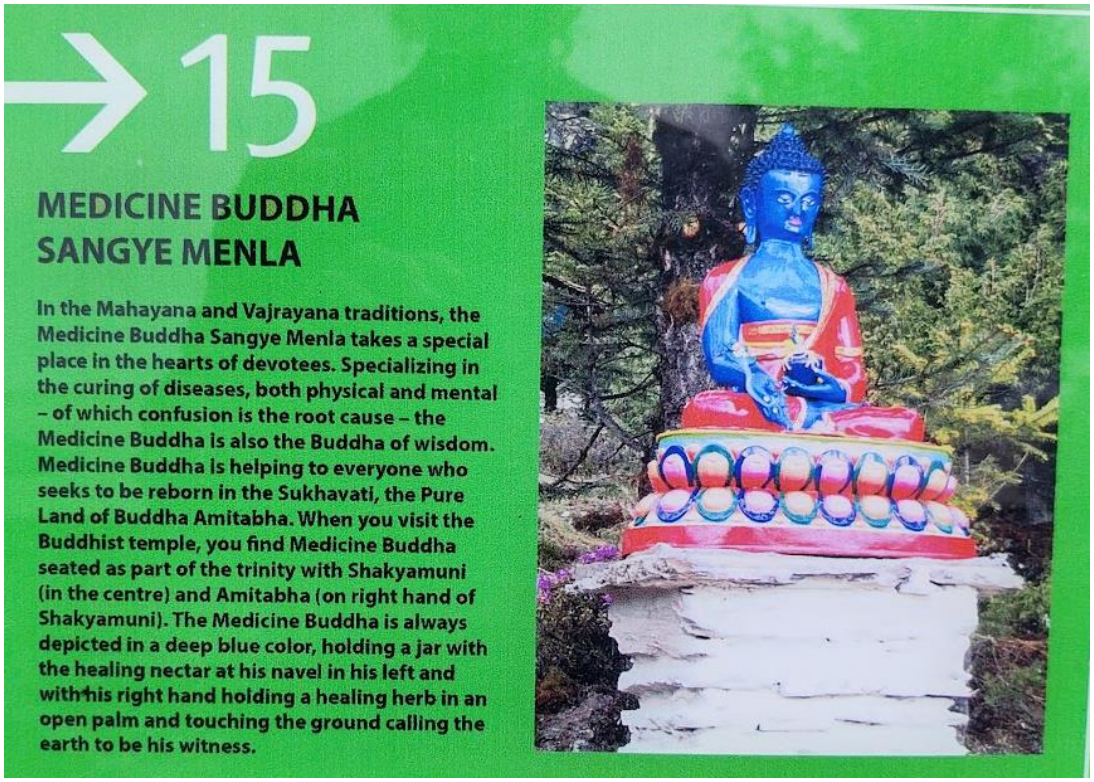
STUPA

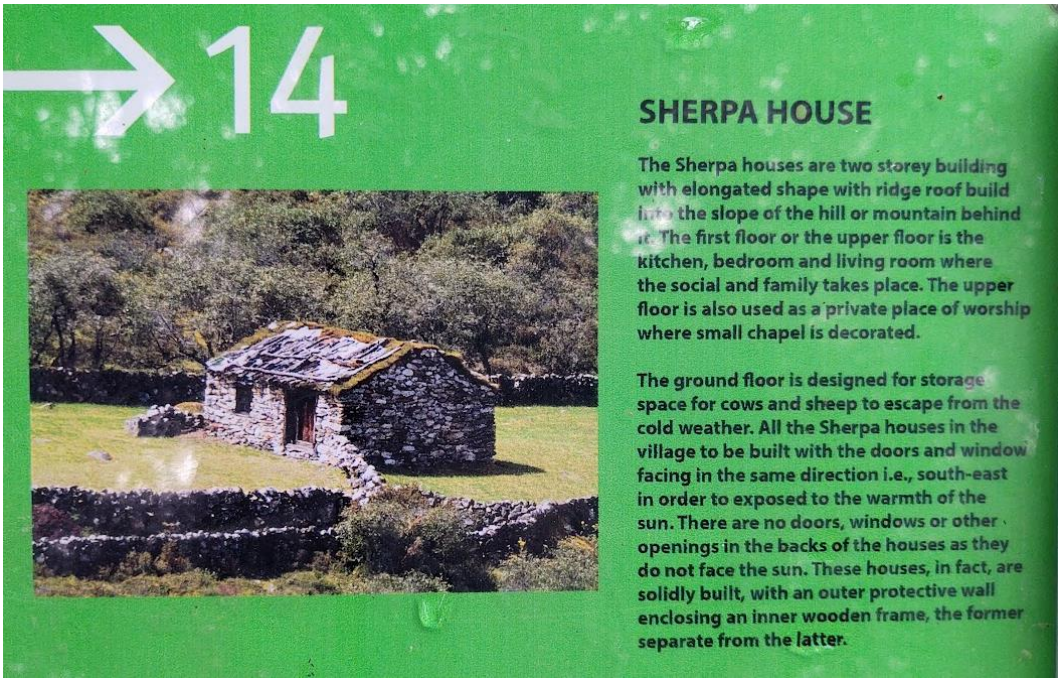


MANI STONES



SANGYE MENLA





SHERPA HOUSE?

Built by an Italian businessman with a Sherpa wife… newly completed home/Trekker's Lodge. Here's to the brave, new world/good-life-for-some in Khumjung Village. Likely no yak or sheep being sheltered on the lower level. Still no garage required, either. Someday?

It's not your grandfather's Buick.

***GOYOL**:* door curtain

To block drafts and provide visual screening. Also used in the household chapel and monastery.

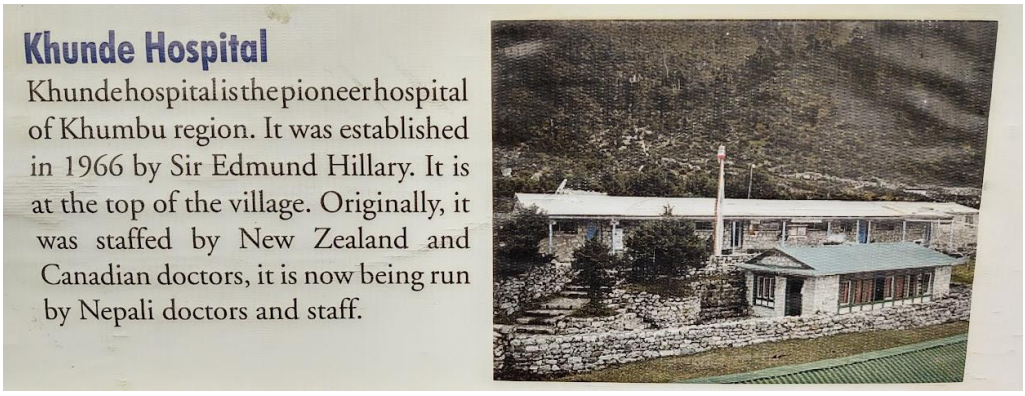
I had a strong affinity to these traditional Tibetan/Sherpa door curtains from the first one I saw back in Lukla. Something primal… I asked Doma where I could buy one in Khumjung, and she gifted me one which now hangs in my bedroom doorway. I cannot help but be drawn back… and forth into my Himalayan experiences with every brush aside of that curtain.

Khumjung Gompa (Monastery)

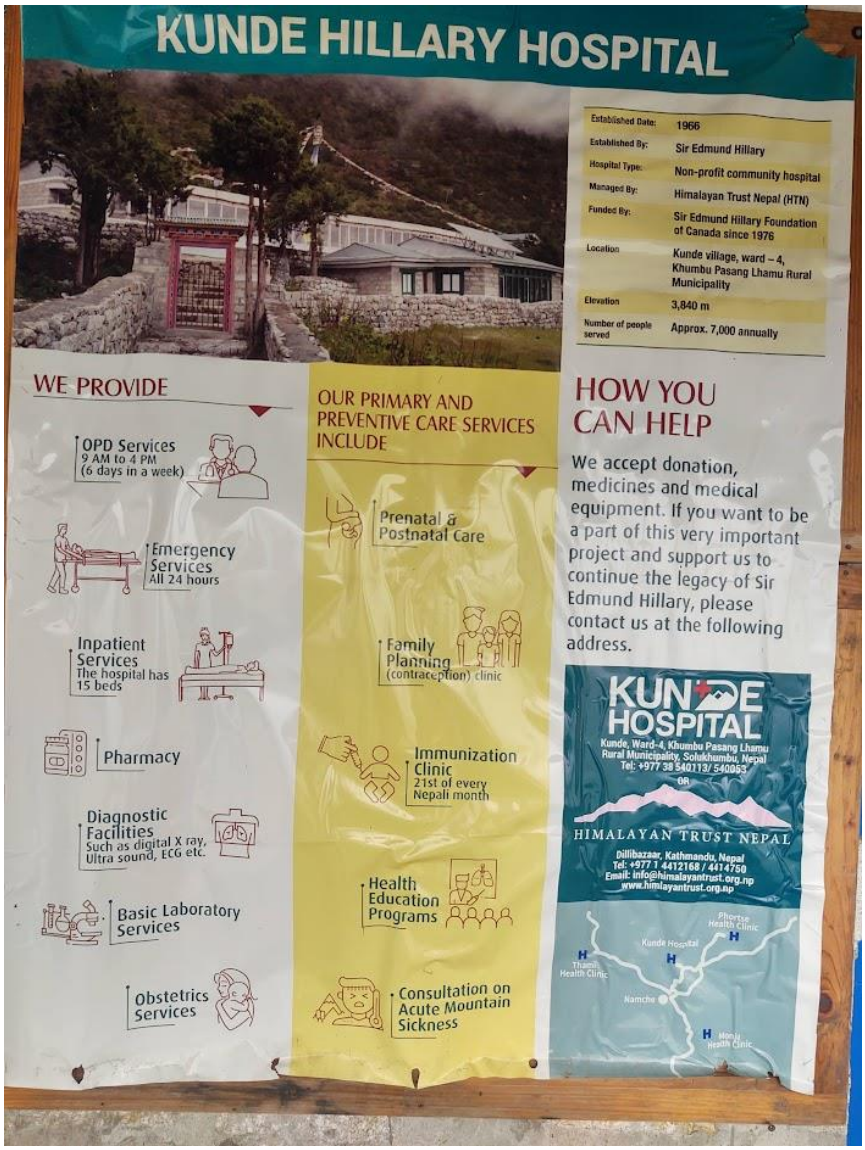
Wondrous display of traditional Tibetan architecture, complete with prayer wheels of all sizes, centuries-old mani stones, prayer flags, carvings and Himal nature as the framer.

Khunde Hospital

(First building constructed: 1966)



Today the hospital is comprised of a number of buildings including long-term housing with a kitchen for those under long-term care. Patients often must travel; by foot, for many days to reach the clinic. A wide array of services is now available at no cost for indigenous residents. A trekker or two has certainly found the facility a life-saver as it is also served by a heli-pad which allows Kathmandu to be reached in an hour.



The Hillary School in Khumjung Village

For hundreds of years, the traditional Tibetan method for educating the youth was a task for the monasteries. And the primary purpose was for the propagation of their religions and ultimately Buddhist society with a supply of monks, lamas and spiritual laymen. Modernization and upward mobility were not among the objectives. Neither were they, in the form of building schools, in the mind or eyes of Sir Edmund. *Until… a consequence unintended.*

It was 1960 and Hillary was engaged in a Khumbu expedition which included a summit and high-altitude physiological studies. There was also going to be a new effort, with Hillary at the helm, to find the mythical and legendary Yeti: the elusive, Himalayan abominable snowman. With sponsorship from the likes of World Book and expert guidance from expedition member Marlin Perkins, from *Wild Kingdom* fame, the effort was launched.

In October of 1960, the Yeti search party entered the Khumbu region, where there was word of an old relic that had been held in the Khumjung Monastery; a 200-year-old scalp of… *a real Yeti.* Though dubious of its authenticity while in need for a provocative story, Hillary put the question to the village elders:

Could we borrow the scalp for a scientific evaluation by our associates in Chicago?

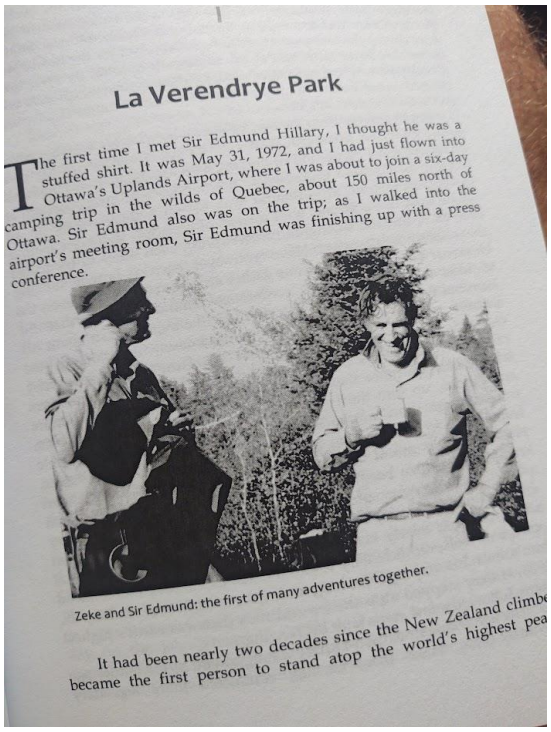
With three stipulations, came back the elders. *Not their first 'rodeo'*…

1. A fee of 8000 rupees (about $80)
2. A village elder to accompany the scalp on its travels, and
3. The expedition will build a school in Khumjung Village.

Here is where the first mention in Hillary's diary appears; of building a school. Though the Yeti never did materialize, and the 'scalp' was debunked as a fabrication from the head of a goat-antelope, the power of the yeti did ultimately manifest itself into a chain of events that arguably affected the trajectory of a culture; the Sherpa culture throughout Khumbu and beyond. Hillary had begun to answer the question rolling in his mind since his summit of Everest with Tenzing:

How can I repay them for the indispensable role they've played in my expeditions?

From the genesis of the first school, the rest is details and history. Sir Ed and his multi-talented team, including the local talent, had the all-aluminum, one-room schoolhouse open for business on 12 June of 1961. 42-year-old Tem Dorji Sherpa was the first teacher and Headmaster.

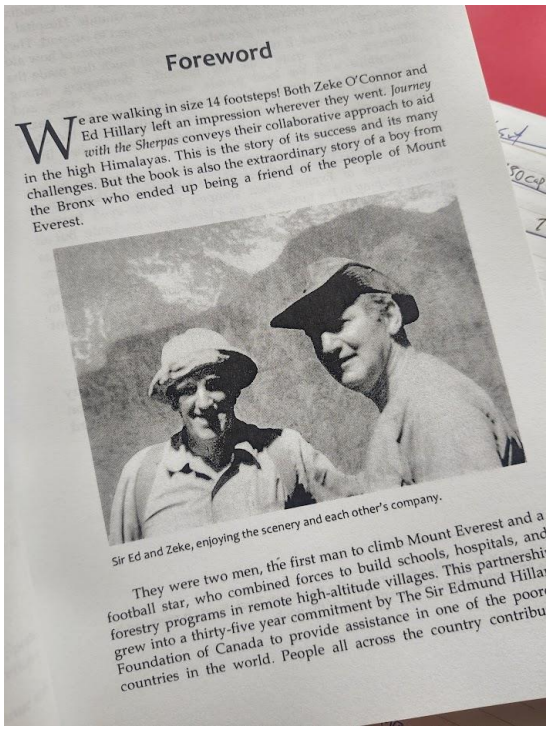


La Verendrye Park

The first time I met Sir Edmund Hillary, I thought he was a stuffed shirt. It was May 31, 1972, and I had just flown into Ottawa's Uplands Airport, where I was about to join a six-day camping trip in the wilds of Quebec, about 150 miles north of Ottawa. Sir Edmund also was on the trip; as I walked into the airport's meeting room, Sir Edmund was finishing up with a press conference.

Zeke and Sir Edmund: the first of many adventures together.

It had been nearly two decades since the New Zealand climb became the first person to stand atop the world's highest pea



Foreword

We are walking in size 14 footsteps! Both Zeke O'Connor and Ed Hillary left an impression wherever they went. *Journey with the Sherpas* conveys their collaborative approach to aid in the high Himalayas. This is the story of its success and its many challenges. But the book is also the extraordinary story of a boy from the Bronx who ended up being a friend of the people of Mount Everest.

Sir Ed and Zeke, enjoying the scenery and each other's company.

They were two men, the first man to climb Mount Everest and a football star, who combined forces to build schools, hospitals, and forestry programs in remote high-altitude villages. This partnershi grew into a thirty-five year commitment by The Sir Edmund Hilla Foundation of Canada to provide assistance in one of the poor countries in the world. People all across the country contribu

In 1973, O'Connor accompanied Hillary on a return to the Khumbu. From his book *Journey With The Sherpas, he wrote:*

> *From then on, the Solo-Khumbu district became something of a backyard for the Hillary family. Ed led mountaineering expeditions in the territory and wrote books about his adventures. In the opening scene in 'Schoolhouse In The Clouds', Ed recalled sitting around a campfire on that expedition, chatting with his Sherpa sirdar, Urkian, about how to improve life for his people. Tell us if there were one thing we could do for your village what would it be? I know that you would like a medical clinic and believe that your farms could be improved but if you had one choice what would it be?*
>
> *And then came Urkian's immortal reply: We would like a school sahib! Of all the things that you have, learning is the one we desire most for our children. With all respect, sahib, we do know you have little to teach us in strength and toughness. We do not envy your restless spirits. Perhaps we are happier and more content than you are? But knowledge for our children - that we would like to see!*

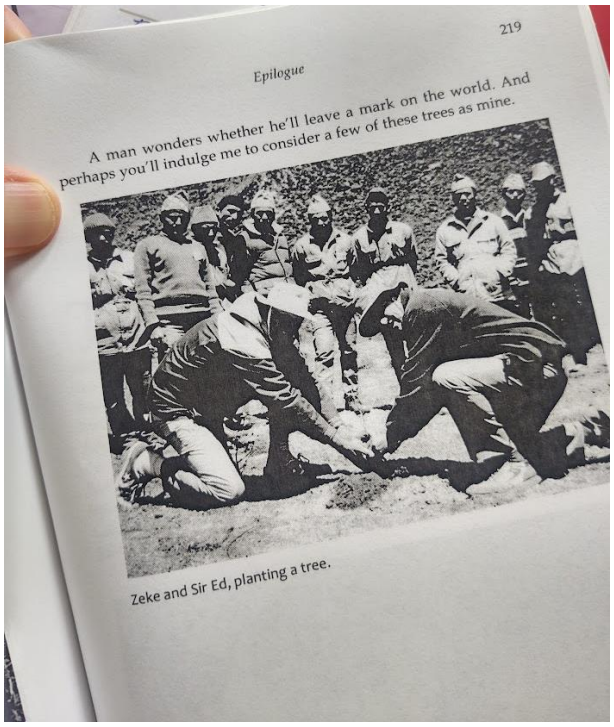
Clearly, O'Connor contemplated the potential that existed for this area. Shut off from the rest of the world since the Communist Chinese taking of Tibet in 1950, the increasing demand by global tourists for new and exotic destinations was certain to create an influx of trekkers and climbers. These Khumbu Sherpa were on a course of destiny with the western world.

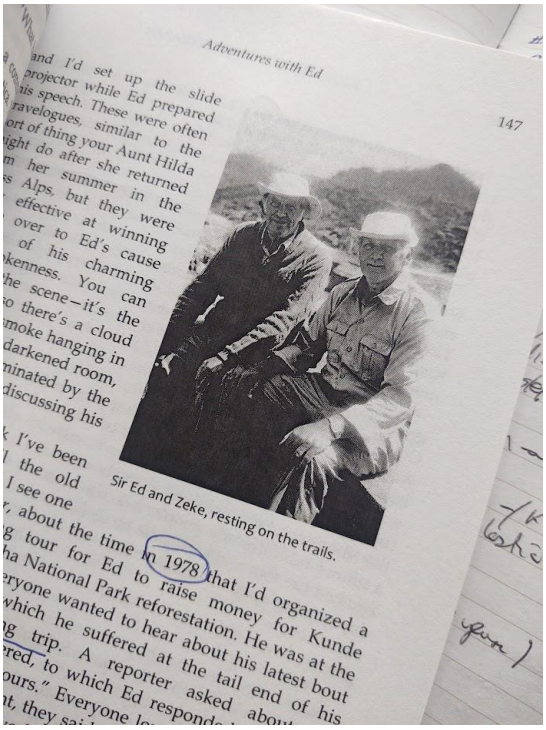
For most all who had the privilege and opportunity to accompany Sir Ed on his earlier expeditions and special trips, the typical desire was to want to do something, not as repayment, but as a small gesture of that same sense of deep, authentic, seductive gratitude.

Zeke recounts how he once asked Ed what we could do for him. He wrote the immortal words that he knew would guide the rest of his life.

Zeke help me help with the Sherpas. That's what you can do.

And he most certainly did. O'Connor went on to become the founding patron of the Sir Edmund Hillary Foundation in 1976, raise millions of dollars and collaborated with a wide range of beneficial programs for the Sherpa community and all the Khumbu for nearly 40 years. The Foundation was an important partner in the development of the Sagarmatha National Park; supporting reforestation efforts, refuse collection and conservation initiatives.





The old photo above was taken on the wall of Principal Rai's office in the school. In 1973, Zeke O'Connor came to Khumjung with Hillary and also became a supporter of the school along with playing a substantial role in the development of the hospital. It was a humbling honor to have a picture taken next to Zeke's. President Jimmy Carter and his wife Rosalyn also made a visit here.

Front Entrance to the school campus of today

Morning Assembly: 0945. Students (all 293) have already finished their cleaning chores in their assigned rooms. After 10 minutes of prayers and exercises, they sing, as in SING the Nepali National Anthem, which can be heard across the entire valley; boom-box assisted. Then, to the cadence of a drumbeat, off they march, in line and in order, youngest students first, to their respective classrooms. Parents accompany the pre-school and kindergarten age kids. First through 10th are on their own. Quite a site. Inspiring as it is impressive. By Western standards, it may appear a bit rigid and dictatorial. I saw no trace of resistance or resentment, rather lots of enthusiasm and spirit. Respect, appreciation, joyfulness… *True, Old School.* Speaking of such:

Here's where it all began; the original building Hillary and his team constructed 61 years ago. From one teacher to now 21. It is being re-purposed into a museum and history center. I'm looking forward to seeing that finished.

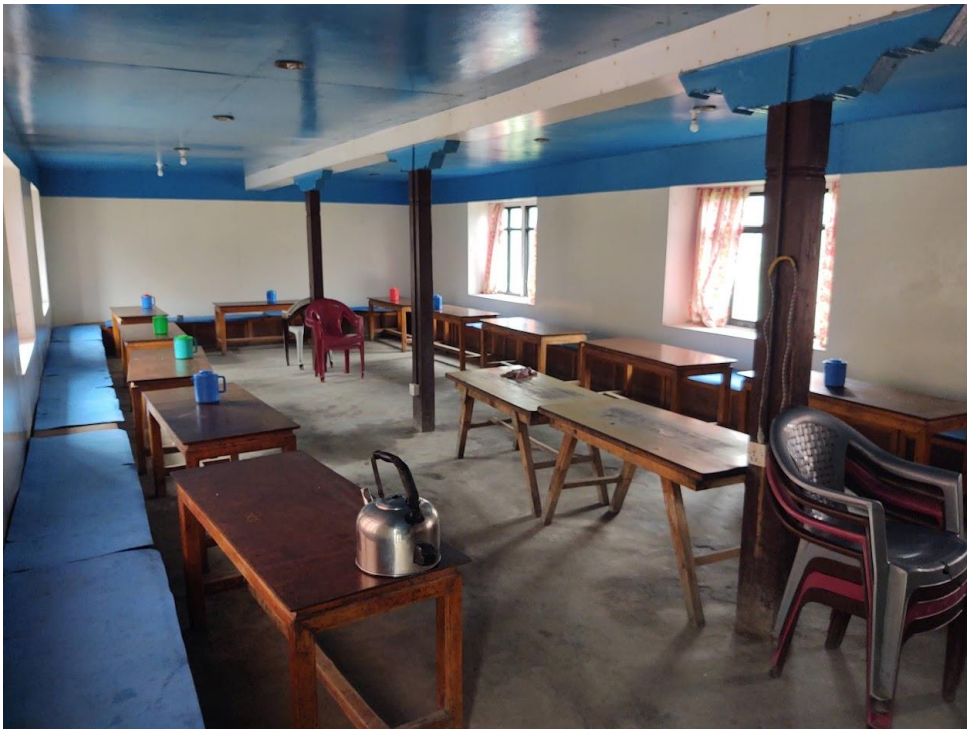
The campus today includes 12 buildings with one newly finished and another (rock pile) planned to begin. Six of the staff have living quarters on-site as does the principal. Twenty-five older students live in the on-campus dormitory and twenty-six children are in a hostel in the village.

The principal's living quarters (above)

The school was kind enough to collect names on the extra flag I brought with me, and it was a special feeling to see the MSU flag I gave to the principal during my first visit up on the wall.

Computer Classroom above, new Science building in yellow, below.

Eyes on the prize



Dormitory dining hall and study area

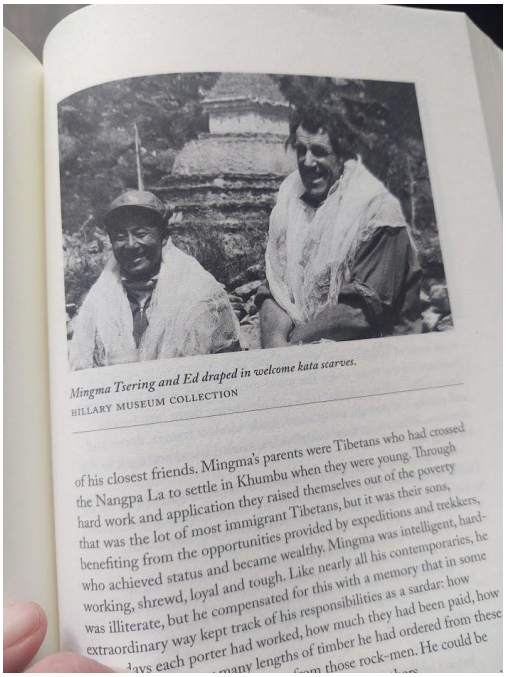
Volleyball is big here… and up and down the valley. The school has a soccer field too. Doma's place is up and to the left. Yes, in the clouds. Those clouds soon enveloped the rest of the village. And I had to find my way back there… If the kid can make it here… how lost can I get? Below Doma's house were two guys always cutting wood with a buzz saw. Like a foghorn, Gary. Worked before.

Didn't hear the boys cutting away; must have been break time. Since all the rock-walled paths tend to lead to the Monastery and if youre heading up, your heading toward the upper row of houses which is where Doma's is, off and up I went. Came up to the Gompa and made a right. Three houses down; *home!*

Could it be… authentic…?

-Spotted alongside the Khunde Hospital. After taking this photo, I just barely managed denying the urge to leave with it. Who would miss an empty, old wooden box? But I just couldn't.

I knew Mingma Tshering Sherpa was Sir Ed's highly respected, and long-time *sardar* (manager/organizer for all things Sherpa). He developed into a prominent member of the Khunde/Khumjung valley as well as up and down the Khumbu. Though he was illiterate, he was Ed's interpreter, compensating for his lack of formal education with a memory for details and the ability to others to get things done. Whatever it took. This formed a close bond and working friendship between the two men of opposite worlds.



Mingma Tsering and Ed draped in welcome kata scarves.
HILLARY MUSEUM COLLECTION

of his closest friends. Mingma's parents were Tibetans who had crossed the Nangpa La to settle in Khumbu when they were young. Through hard work and application they raised themselves out of the poverty that was the lot of most immigrant Tibetans, but it was their sons, benefiting from the opportunities provided by expeditions and trekkers, who achieved status and became wealthy. Mingma was intelligent, hard-working, shrewd, loyal and tough. Like nearly all his contemporaries, he was illiterate, but he compensated for this with a memory that in some extraordinary way kept track of his responsibilities as a sardar: how days each porter had worked, how much they had been paid, how many lengths of timber he had ordered from these from those rock-men. He could be

I've often pondered the importance of such a relationship and how critical it was to allowing Hillary and his team to achieve such un-imaginable feats well beyond the more acknowledged ones in mountaineering. I've come to find there is almost always a similar type of personal, *odd-couple* relationship involved with all great endeavors; especially those that found the summit.

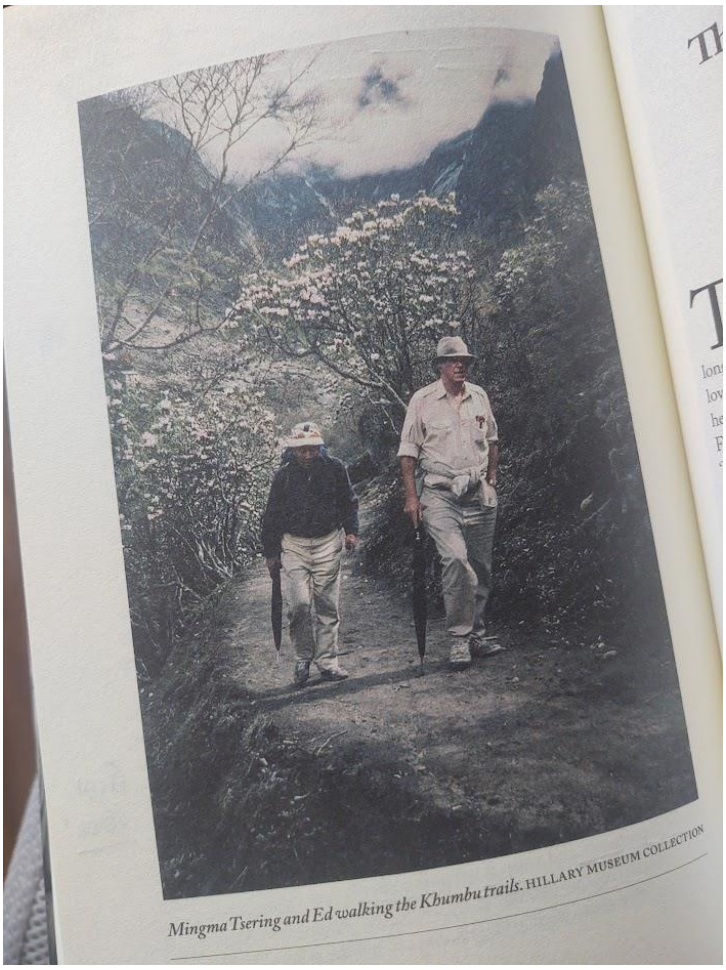
From my reading of James Fisher's *Sherpas: Reflections on Change in Himalayan Nepal* and also Hillary's diaries and biographies, Mingma's house in Khunde was the base of many of his operations in the 60's and 70's. Often, porters coming up valley with gear and equipment and supplies would stage it at Mingma's house. Fisher described Mingma as the mastermind of many Hillary initiatives. At a diminutive 5' tall, he made up for his lack of physical stature with his ability to bark orders lead the men with the effective command presence of a Sergeant-Major.

Doma turned Fisher's *Sherpas* book into living history for me. What a special treat. I showed her photos, and she told me about the children in the pictures, recalling seeing Hillary or O'Connor or other dignitaries and government visits over the past 50 years. Before electricity and running water in the houses; some of, at least. And Mingma's kids. Oh yes, she knew him and his family. After all, the two villages have been tightly inter-woven for many years. My take is they still are. And Doma and Pema surely crossed paths with Fisher during his extended time in Khumjung.

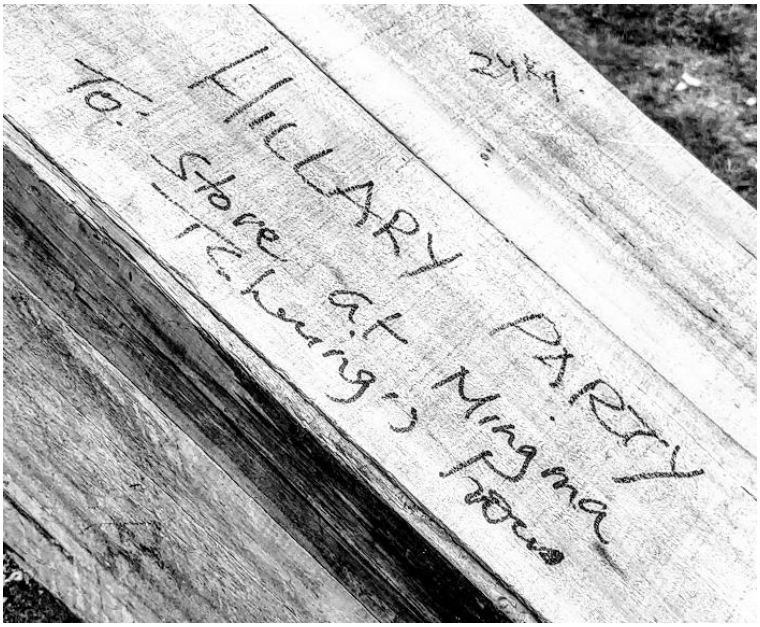
With all that, to then come across this wood box… a connection across time. And space.

A part of the Bridge across Forever.

From Doma to me…



From Mingma and Ed: *a wooden box; maybe not so empty. Contents yet to be discovered…?*



PUJA Wednesday; 15 June

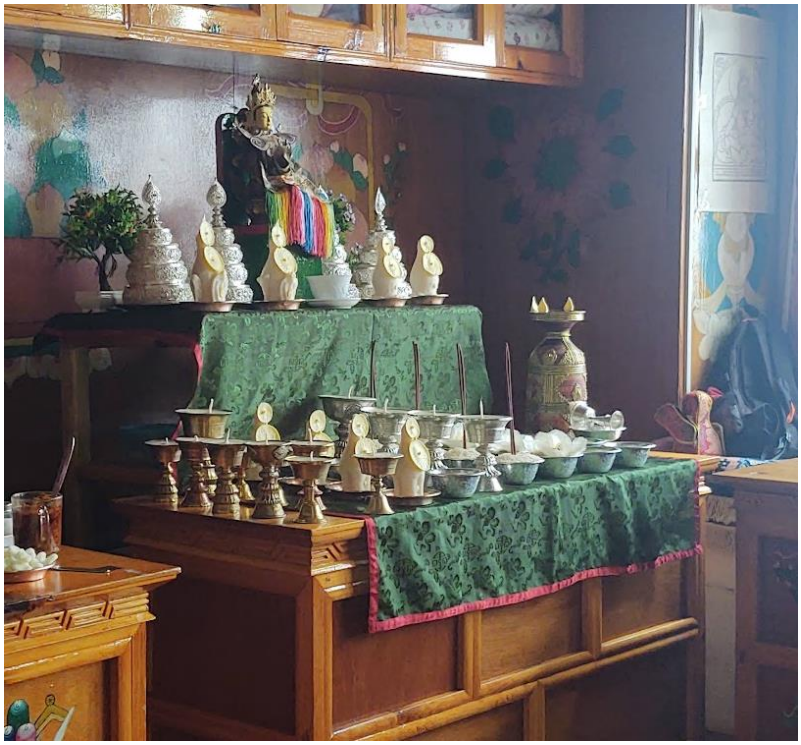
(Departure day to Phakding)

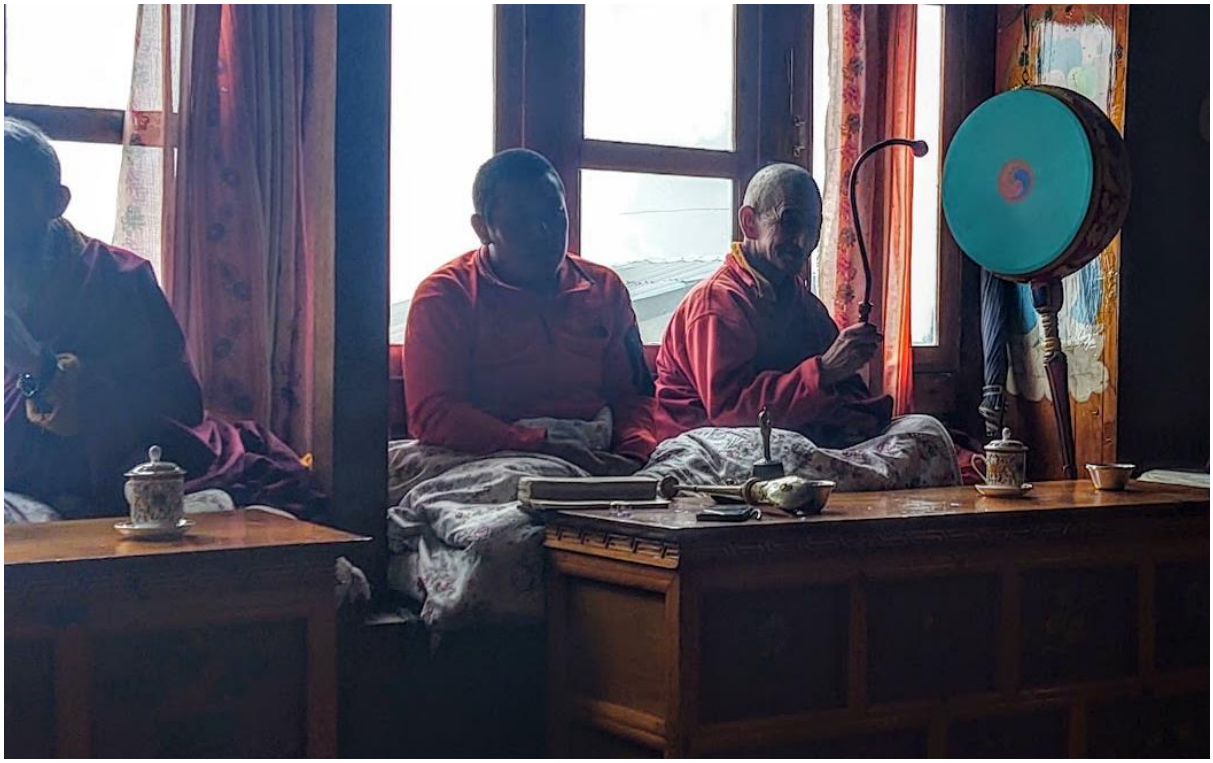
Before leaving Doma's, I was fortunate enough to experience firsthand, a full-fledged *Puja;* or ceremonial worship, performed by the monks from the Khunde Monastery. The Sherpa (Buddhist) owners of the dwelling request this all-day blessing at least once a year and sometimes up to three times. It's a significant production that takes a team – of women – to produce and support. The monks: sometimes up to eight or ten, are fed three times between 7am when they begin to around 6pm when they finish. And the tea doesn't stop all day long. Preparation also took a team of ladies, and they work together among their households when it's their turn. Close family coordination makes the difference. And they have it down pat.

The stamina and discipline required of all the participants is hard to comprehend. And yet, there is a simple, easy-going flow to it all, amidst the serious nature of the business at hand.

The monks took over the dining hall and when I came down in the early morning, and they were in full throat! After hanging out in the kitchen observing the women: five of them including Doma all doing their things like the well-rehearsed production it was, I asked if it might be ok to take a few photos? *Yes... go!* And Doma led me in and sat me down.

Respecting the solemnity of the occasion, I politely smiled at the monks as they alternated between chanting and singing and playing a variety of musical instruments. And… they were totally cool with me, even smiling back. I would take a few photos at a time, trying to emote reverence. Took some video also. Feeling as if I was a participant, it was an over-whelming energetic surge for the rest of my journey and a magical send-off from Doma's and the people/new friends of Khumjung Village.





The sounds… with the harmonized, synchronous chanting; the bells, the cymbals, the drums, the horns… *Ancient sounds…* yet of the here and now… Magical, mystical, mythical for me.

Unforgettable.

Om Mani Padme Hom… the jewel is in the lotus… and a farewell pic with Tenzing and Doma.

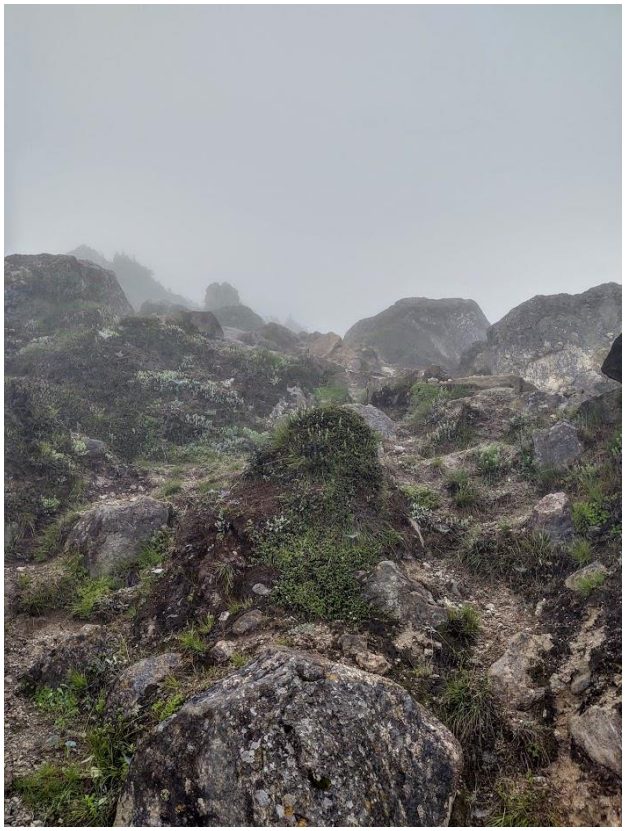
And so fittingly..

I came in the cloud, I was definitely departing in it also! No Diki as I was going solo; up and over and down to Namche where I planned to meet him at the Sakura. Even though visibility was all of 50 feet, as long as I could see my feet and enough of the path, I believed I could find my way to Namche. Actually, I was quite looking forward to the solitude as a part of the transition back to the chaos and craziness of Kathmandu. With no shortage of thoughts and ideas and sentiments… and questions rolling about in my mind, and heart, and soul… with a job to do.

-Passing the gate to the Hilary School before ascending the stone staircase out of the valley. So incredibly grateful for just one more Khumjung smile!

Each step matters… left-foot-right-foot. Just follow the… 'path'…

It's there somewhere… and somehow… down there…



Should be… Namche! Yes. Right where I left it. Thank God; neither of us had slipped away!

-From the Journal

So much comes together when we just let one thing go ourselves No Fear no falling the inner mountain calling the sun is up there and my lungs they sift the mountain air in solitude and yet connected by map in front closed yet directed up and down the stone step path even in Tempest she knows no wrath no favorites played those overstayed their false glories go read them now the same old stories the lessons played amidst the clouds to show just one among the crowds from jewels of three the Trinity in frame of white and Blues the golden warmth once concealed like breath it showered through in harmony with all and you I feel her here through the clouds undenied despite her flustered shrouds a test of faith of nature's sort my ship returns once more to port

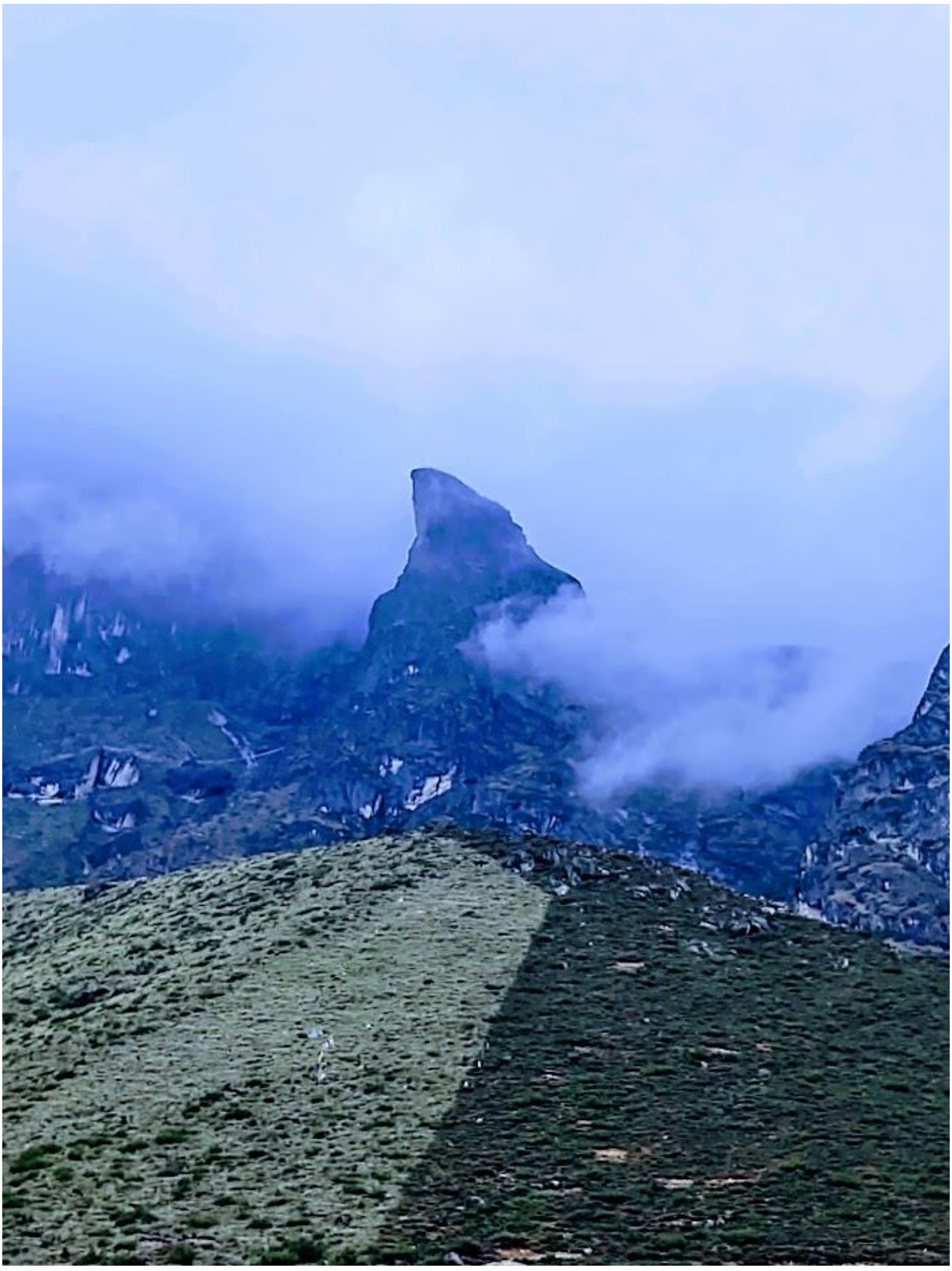
Everything changes comes goes always rearranges inside outside upside down tears of joy from smile to frown ownership you think it's yours like space on each side of the doors you open inward outward 2 and then my friend what do you do if what you see no longer looks like what they taught you from their books make your journey set your claim grasp the slippery earthly frame just remember as you go in light of all is how you came

Certain issues a culture must take responsibility for themselves as best as they are able and allowed regarding other areas of modernization globalization and market driven societies the participation with outside relationships with proper vision and strategic view can find the balance of natural evolution and transformational change to serve all segments of the society and the culture the manure left to itself just stinks it's what you put into it that can smell sweetly look pretty And taste wonderfully delicious

Here's to you Sir Ed I'll be toasting you with a touch of Scotch and the square of mint cake and to tenzing and zeke I feel all your spirits here in the clouds and in the khumbu and in a little swig of Johnny Walker red travel well

It would be difficult for me to conclude this work without sharing a few more sentiments. *Silently, quietly, reverently.* On their own, yet all connecting… and reflecting their light and energy *from the heart*.


SAGARMATHA NATIONAL PARK
KEEP CALM
&
HUG
A PANDA
WAY TO KONGDE
5 KM
WAY TO NAMCHE
10 KM




FLASK

To and from… the path less traveled...

You are the high snow peaks… and we are the shining glow…

We never thought that we would meet… But we met at the height of the snowy peak.

Let us pray that we will meet again… And let us wish good luck and say farewell for now.

-Sherpa Folk Song

Mountains are said to be the abodes of distant gods…
The unreachable metaphors for life.
But at moments such as this, they become intimate…
Offering communion and unity with the natural world.

-George B Schaller

Postscript

The end; *of this beginning.*

Residuals...

6:47 AM the 10th

finger stiff laugh out loud maybe pushing 55 degrees in the dining room period almost saved foggy again cloudy again visibility 100 feet even hearing all the locals coughing Tenzing and Doma included. I'm needing to keep moving sooner and sooner thinking even before the 16th if this weather stays this way which I acknowledge and respect and I have no issue with it. The issues are mine. And mine also to deal with period accordingly blowing on my fingers :) sleeping pretty good great comforter. Don't need to have the window open ha-ha no air conditioning required I know Kathmandu will be a big shift to the massive Florida humidity can handle that I want to sweat. Was thinking of doing some running here but maybe not so smart. Want to keep my immunity up 2 tablets in the water this morning beet chews four to five a day mushroom tea metrics bars for breakfast sitting on my metrics bar so I don't lose any teeth before biting into it solid as a rock have to warm it up :) no mini fridge in these rooms needed it's June 10th! And the sun could be shining brightly in a couple hours. I'm looking at the wood burning stove certainly not glowing in Ed's cherry red color but it's cold looking grey black and its effect is to make the room feel even cooler dash colder I am not thinking about not getting sick!

Departing now on a cloud period of warmth and friendship and appreciation. now... beyond Beyul.

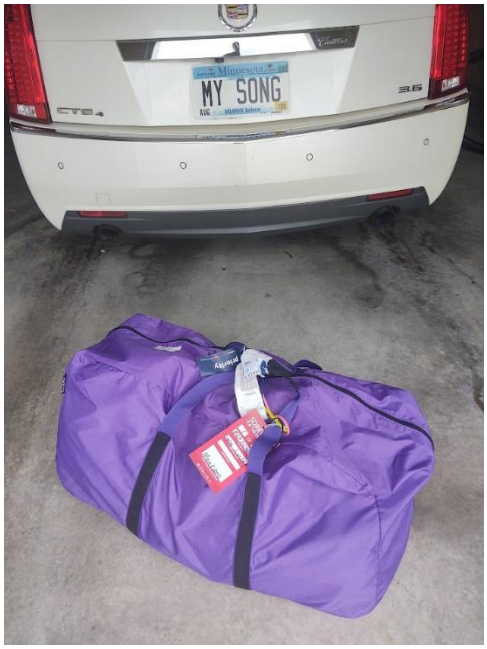
How my trip to liberation turned into imprisonment? Stories of epic Sherpa endurance in schoolhouse book mind blowing. Pity or convalesce sing not in the Sherpa dialect or DNA point of reference makes all the difference this must be rationale for such an attitude the common species homo sapien how long can these primal traits be maintained in modern man? Re indigenization of ourselves. Creature comforts there's a good one! Himalayan style :)

Lessons of the valley

For one to understand true liberation and refuge one must fully comprehend the causes of imprisonment and suffering. one must come to appreciate one's time in the cold and the damp and the disorientation of immersion into the cloud to find the true peace and joy of the clear blue and golden sunshine. Shared luminosity must be achieved by continuing to climb inward, and with delight, according to the laws of God and grasped by the inward man. One need not have the full experience to yet appreciate and honor it in its right and true light. Intrinsic in the hearts and consciousness of all sentient beings. GL

****

Delta delivered.



And five days after my *bag-less* arrival, I was singing a happy tune again…

as my gear, gifts and clothing completed the journey as I had.

Better late than never… My Song.

(End of Appendices)

Bibliography

Adams, Vincanne. *Tigers of the Snow and Other Virtual Sherpas*. Princeton University Press, 1996.

Anderson, D. G. *Kinds of Cultural Anthropology. In Ethnographic Research: A Guide to General Conduct,* pp. 10-35. Waveland Press. 2012

Anderson, David. *Archetypal Figures in the Snows of Kilimanjaro*. Kent State University, 2019.

Appadurai, Arjun. *The Future as Cultural Fact*. Verso Books, 2013.

Baker, Ian. *The Heart of the World*. Penguin, 2006.

Barnes, B., & Mattsson, J. *The Power of Peer-to-Peer Fundraising: Harnessing Your Supporters to Raise More Money with Less Effort*. Wiley, 2017.

Belle Flamme, P., Lambert, T., & Schwienbacher, A. *Crowdfunding: Tapping the right crowd. Journal of Business Venturing,* 29(5), 585-609, 2014.

Bernard, H. *Research Methods in Anthropology*. Rowman Altamira, 2006.

---. Ethnographic Fieldwork: *An Anthropological Reader. In Handbook of Methods in Cultural Anthropology, p*p. 35-56. Rowman & Littlefield, 2018.

Berry, Wendell. *What Are People For?* North Point Press, 1990.

Blum, Richard. *An Accident of Geography*. Greenleaf Book Group, 2016.

---. *Himalaya.* National Geographic Books, 2006.

Bridle, James. *Ways of Being*. Farrar, Straus & Giroux, 2022.

Brower, Barbara. *Sherpa of Khumbu*. Oxford University Press, USA, 1991.

Brown, A., & White, B. *Regenerative Agriculture: Principles, Practices, and Benefits. Journal of Sustainable Agriculture,* 15(2), 45-62, 2019.

Brown, A. *Corporate partnerships in agricultural development: Opportunities and challenges. Journal of Sustainable Agriculture,* 45(3), 215-228, 2019.

Byers, A. C., et al. *A climate policy pathway for near- and long-term benefits*. Nature Geoscience, 2(12), 884-889, 2009.

Cooney, Eleanor. *Shangri-La*. William Morrow & Company, 1996.

Craig, Sienna. *Horses Like Lightning; A Story of Passage Through The Himalayas*. Simon and Schuster, 2016.

Cronley, C., Fenwick, R., & Brown, M. *Fundraising Principles and Practice* (Second Edition). Jossey-Bass, 2017.

Dahal, R. K., & Joshi, H. D. *Environmental challenges of mountaineering tourism in Nepal. Tourism Geographies,* 22(2), 390-407, 2020.

Dangol, D. R. *Climate Change and its Impacts on Agriculture in Khumbu Valley, Nepal*. The Initiation, 7(1), 40-48, 2015.

David-Neel, Alexandra. *Magic and Mystery in Tibet*. Pantiano Classics, 2019.

Dees, J. Gregory. *A Customer By any Other Name*. Duke University/Fuqua, 1998.

Denny, Rita, and Patricia Sunderland. *Handbook of Anthropology in Business*. Routledge, 2016.

Di Giovine, Michael. *Pilgrimage beyond the Officially Sacred*. Routledge, 2020.

Elk, Black, and John G. Neihardt. *Black Elk Speaks*. U of Nebraska Press, 2014.

Eller, Jack. *Introducing Anthropology of Religion*. Routledge, 2021.

Ervin, Alexander. *Applied Anthropology*. Pearson Allyn and Bacon, 2005.

Farmer, Paul. *Infections and Inequalities*. Univ of California Press, 2001.

Fisher, James. *Sherpas.* Univ of California Press, 1990.

FAO. *Smallholder farmer capacity building: Key to sustainable agriculture*. Retrieved from [FAO website link], 2020.

Foster, William Landes, Kim, Peter, and Christiansen, Barbara. *Ten Nonprofit Funding Models.* Stanford Social Innovation Review Spring, Stanford Graduate School of Business, 2009.

Fuller, Buckminster. *Operating Manual for Spaceship Earth*. E. P. Dutton, 1978.

---. *Critical Path*. Macmillan, 1981.

---. *Utopia or Oblivion*. Lars Müller Publishers, 2008.

---. *Ideas and Integrities*. 1963.

Garcia, M., & Patel, S. *Water Harvesting Techniques for Off-Grid Farming: A Case Study in Northern Canada.* Journal of Water Resource Management, 8(4), 102-115, 2021.

Ghimire, S. K., & Heinen, J. T. *Ecotourism and conservation in the Annapurna Conservation Area, Nepal.* In Ecotourism and Sustainable Development in Central Himalaya, pp. 141-159. Springer, Cham, 2021.

Gill, Michael. *Edmund Hillary - A Biography: The Extraordinary Life of the Beekeeper Who Climbed Everest.* Vertebrate Publishing, 2020.

Hansmann, H. *The Role of Nonprofit Enterprise*. The Yale Law Journal, 89(5), 835-901, 1980.

Harrer, Heinrich. *Seven Years in Tibet*. Rupert Hart-Davis, 1953.

Hillary, Edmund. *High Adventure*. Allen & Unwin, 1955.

---. *Nothing Venture, Nothing Win*. Coward McCann, 1975.

---. *Schoolhouse in the Clouds*. Penguin, 1964.

---. *Sir Edmund Hillary's Sagarmatha*. Hofer Media Ltd, 1991.

Hilton, James. *Lost Horizon.* Harper Perennial, 2012.

Husted, B., & Allen, D. *Corporate social responsibility in the multinational enterprise: Strategic and institutional approaches*. Journal of International Business Studies, 49(6), 683-717, 2018.

Huxley, Aldous. *The Perennial Philosophy*. Harper and Brothers, 1945.

IFAD. *Engaging communities for inclusive development: Best practices in participatory approaches*. Retrieved from [IFAD website link], 2018.

IICA. *Enhancing small farm agriculture through value chain integration*. Retrieved from [IICA website link], 2021.

Johnson, C., & Lee, D. *The power of storytelling in nonprofit fundraising*. Nonprofit Management and Leadership, 34(2), 150-167, 2021.

Karma-gliṅ-pa. *The Tibetan Book of the Dead*, The Great Liberation. Shambhala, 1975.

Kemf, Elizabeth. *The Law of the Mother*. Random House (NY), 1993.

Khanal, P., & Nepal, S. K. *Economic contributions of mountaineering tourism in Nepal: A case study of Mt. Everest*. Journal of Mountain Science, 16(12), 2839-2850, 2019.

Kimmerer, Robin. *Braiding Sweetgrass*. Penguin UK, 2020.

Kirshenblatt-Gimblett, Barbara. *Destination Culture*. Univ of California Press, 1998.

Kollmair, M., et al. *Mountain farming systems and agriculture in the Hindu Kush-Himalayan region.* International Mountain Society, 2006.

Kosic, Damir. Climbing Higher Toward a Middle-Income Nepal. The World Bank. https://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country, 2022.

Kraybill, Donald. Amish: *Why They Enchant Us*. Herald Press, 2003.

Lama, Dalai. *Lighting the Way.* Snow Lion, 2005.

---. *My Land and My People*. Grand Central Publishing, 2008.

Larson, Edward. *Evolution.* Modern Library, 2006.

Lindblom, Yoshay. *Beyul Hidden Lands*. Notion Press, 2021.

Lozny, Ludomir. *Continuity and Change in Cultural Adaptation to Mountain Environments*. Springer Science & Business Media, 2013.

Mancini, M., & Palladino, P. *Precision farming: A sustainable solution for smallholder farmers.* Journal of Agricultural and Food Chemistry, 67(28), 7823-7831, 2019.

Marshall, Joseph. *The Lakota Way*. Penguin, 2002.

McCullagh, James. *The Solar Greenhouse Book*. Rodale Books, 1978.

Moro, Pamela. *Magic Witchcraft and Religion: A Reader in the Anthropology of Religion*. McGraw-Hill Education, 2013.

Mortenson, Greg. *Three Cups of Tea*. Penguin, 2006.

Mu, Yang, et al. *Tourism and Sacred Landscape in Sagarmatha (Mt Everest) National Park, Nepal.* Tourism Geographies 21, no. 3: 442–59, 2018.

Mundy, Talbot. *Om The Secret of Ahbor Valley*. A. L. Burt Co., 1924.

---. *The Winds of the World*. DigiCat, 2022.

Nivedita, Sister. *Myths and Legends of the Hindus and Buddhists*. Dover Publications, 2001.

Norgay, Jamling. *Touching My Father's Soul*. Harper Collins, 2002.

O'Connor, William. *Journey with the Sherpas.* Wintergreen Studios Press, 2012.

Paelian, Garabed. *Nicholas Roerich*. Saraydarian Inst, 1974.

Perry, John. *The Heart of History: Individuality in Evolution*. SUNY Press, 1987.

Prophet, Mark. *The Masters and the Spiritual Path*. Summit University Press, 2001.

Ramsay, Cynthia. *Sir Edmund Hillary & the People of Everest*. Andrews McMeel Publishing, 2002.

Roerich, Nicholas. *Beautiful Unity*. Roerich Museum Press. 1932

---. *Heart of Asia*. 1929.

---. *Realm of Light*. 1931

---. *Shambhala.* 1930

Sacks, E., Moore, K., & LaGesse, D. *The Foundation Center's Guide to Proposal Writing (Eight Edition).* The Foundation Center, 2020.

Scott, James. *Seeing Like a State*. Yale University Press, 1998.

Shackel, Paul. *Places in Mind*. Routledge Group, 2004.

Sherpa, Lhakpa. *Through a Sherpa Window: Illustrated Guide to Sherpa Culture.* Vajra Publications, 2008.

Sherpa, P. M. *Climate change in mountain regions: Some perspectives from the Khumbu Himal, Nepal.* Himalayan Journal of Sciences, 6(8), 115-118, 2010.

Shinde, Kiran. *Religious Tourism and the Environment*. CABI, 2020.

Shor, Thomas. *A Step Away from Paradise*. City Lion Press, 2017.

Shrestha, S., et al. *Economic impact of ecotourism in Nepal: A case study of Annapurna Conservation Area.* Journal of Sustainable Tourism, 28(9), 1255-1275, 2020.

Skog, Lindsay. *Khumbi Yullha and the Beyul: Sacred Space and the Cultural Politics of Religion in Khumbu, Nepal*. Annals of the American Association of Geographers. 2017

Smith, J. *Strategies for successful grant writing in agricultural projects*. Journal of Agricultural Extension, 25(1), 45-58, 2020.

---. *Off-Grid Solar Power Systems for Agriculture: A Comprehensive Guide.* Sustainable Farming Publications, 2020.

Spoon, Jeremy. *The Heterogeneity of Khumbu Sherpa Ecological Knowledge and Understanding in Sagarmatha (Mount Everest) National Park and Buffer Zone,* Nepal. Human Ecology/Springer 39, no. 5: 657–72, 2011.

---. *Tourism, Persistence, and Change: Sherpa Spirituality and Place in Sagarmatha (Mount Everest) National Park and Buffer Zone, Nepal*. Journey of Ecological Anthropological 15, no. 1: 41–57, 2012.

Spradley, J. P. *Participant Observation. In The Ethnographic Interview*, pp. 15-30. Waveland Press, 2016.

Stevens, Stanley. *Claiming the High Ground*. Univ of California Press, 1993.

UNDP. *Impact measurement and reporting guidelines for agricultural development projects.* Retrieved from [UNDP website link], 2020.

Vitaliano, Dorothy. *Legends of the Earth*. Citadel Press, 1973.

Ward, Francis. *The Mystery Rivers of Tibet*. 1923.

Wundt, Wilhelm. *Elements of Folk Psychology*. Wentworth Press, 2016.

Wisdom, Jennifer, Riley, Halley, Myers, Neely. *Recommendations for Writing Successful Grant Proposals: An Information Synthesis.* Journal of the Association of American Medical Colleges, 90, 2015.

Yanda, Bill. *The Food and Heat Producing Solar Greenhouse* : Design, Construction, and Operation. Echo Point Books and Media, 1980.