# ANNUAL REPORT

## 2020 - 2021

Himalayan Institute of Alternatives, Ladakh

(An Alternative Institute For Mountain Development)

## Vision

"HIAL aims to develop Ladakh into a benchmark for sustainable living for the mountain world, where all the children receive a meaningful education that prepares them for a life of dignity in harmony with nature."

## Mission

"Create a transformative educational experience for students by inculcating in them the practice of learning via practical application of knowledge. Foster an environment of responsible entrepreneurship. Establish centres of excellence to showcase innovative approaches to education and environment. Enable sustainable and locally embedded development in mountain societies."

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# Content

# School of Architecture Construction & Engineering (ACE)

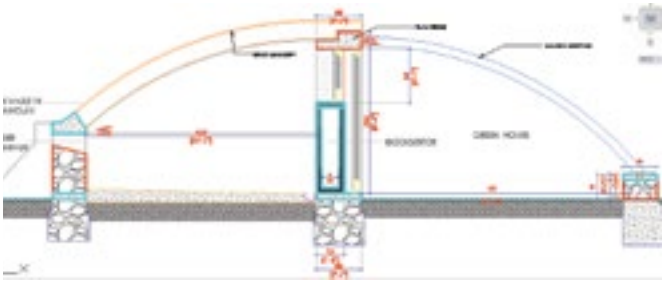
The School of Architecture Construction & Engineering (ACE) has been at the heart of HIAL's activities this year. Despite the Pandemic, a fair amount of innovation in architecture, construction and building techniques was achieved this year. Following are some projects done this year:

## Do-It-Yourself (DIY) Lab:

Integration of earthen building technology with RCC frame structure is one of the crucial step that can be a game-changer in the building industry of Ladakh. DIY lab is the first successful experimental building that combines the conventional RCC frame structure with straw-clay blocks ex-fill so that it presents itself as a Passive Solar system that exploits the best of both worlds: RCC (as thermal mass and structural strength) and the straw-clay block (as insulation). The building's aim is to provide hands-on training to students & professionals interested in soil construction techniques, craft & carpentry, building science research etc. among other things.

DIY, HIAL

DIY, HIAL



Cow-Shed

Pre-FREB Staff-Quarter

## Innovative Cow-Shed:

Innovative Cow-shed, as a pilot project, aims to present itself as a prototype that combines passive solar principles and waste management together. The bio-digester as the southern thermal wall has double benefit: first, it provides warmth to the residing cows during harsh winter, resulting in high milk productivity benefiting both the cows and the entrepreneur. Second, the temperature required for bacteria in the anaerobic bio-digester is provided by the digester acting as a heat storage system, hence ensuring its continuation during severe winter. While the thermal wall keeps the cows warm & the biogas generation recovers waste materials, treating waste on-site saves money, energy, and material.

## Pre-FREB Staff-Quarter: Interior Designing and Finishing

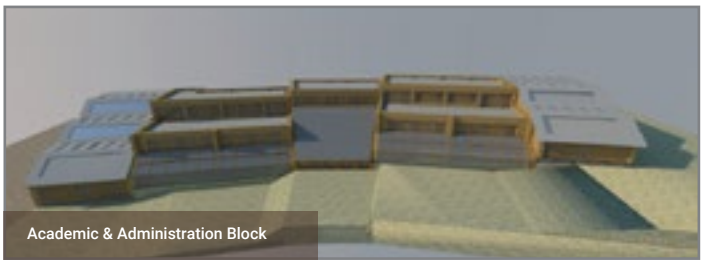
Initiated in late 2019, after much experimentation, this building is about to complete its interior. This building is a sophisticated version of straw clay technology in which Pre-FREB modules made of straw and clay are assembled with internal RCC reinforcements to make the system earthquake resistant. The modules can be assembled quickly like legos in less than 20 days.

The construction system is designed in such a way that the cavity for insulation can be adjusted and is flexible for different insulative materials adapted for different degrees of coldness. Pre-Freb technology presents itself as a possible solution for modular multi-storey composite structures with natural material.

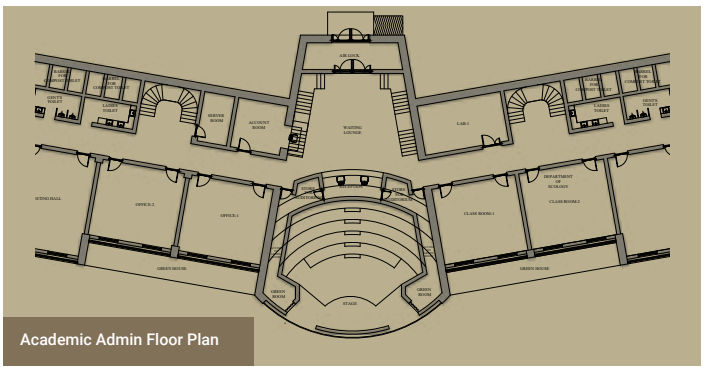
Pre-FERB Staff-Quarter, interior, HIAL

## Academic & Administration Block:

After so many test buildings, Academic-Admin block is going to be the first large scale application of Passive Solar-Earth technique as a real case application. This building is going to adopt straw-clay block exfill in the RCC frame system, and is going to be a display of varieties of Passive Solar heating technologies with natural lighting. Programmatically, this building aims to cater the core departments of HIAL viz. Department of Architecture and Construction, Department of Energy and Department of Ecology. With a central auditorium of 150 capacity, this building constitutes design studios, classrooms, laboratories, staff rooms, meeting rooms, library, Director's and CEO's office rooms.



Academic & Administration Block



Academic Admin Floor Plan

VIP Guest House, HIAL

## Gymnasium:

Aiming to develop international gymnasts from Ladakh itself, gymnasium is going to be the first structure of the HIAL's sports academy. Architecturally, this structure is going to be the application of passively heated Catalon-dome made of timber tiles out of waste packing boxes. Research and development on the structural and envelope portion is going on with the pioneer of this technology, the Hunnarshala. This structure is going to be a showcase for optimized high span structure and can be a model for large conference halls, airport terminals, sports halls etc. in Ladakh. Apart from standard gymnastic amenities such as Pommel Horse, Rings, Parallel and Uneven Bars, Pit etc. the gymnasium also accommodates spaces for activities such as gym, yoga and meditation.

## VIP Guest-House:

As an example of high-end passively heated earthen structures, VIP Guest house is under construction of its second floor. Functionally, this building is designed to accommodate VIPs, high-profile visitors, donors etc. With elegant interiors, this building is also going to be an example for passively heated rammed earth hotels and resorts.

## Solar Heated Military Tent

In February, 2020, HIAL constructed a Solar Heated Military Tent specially designed for the soldiers in the Galwan valley (Eastern Ladakh) where the temperature stays sub-zero for most part of the year. This is a portable tent which is made up of light weight equipments so that it is easy to carry and transport. The structure of the tent consists of two parts: a lobby which is framed like a greenhouse and a bedroom.

Solar Heated Military Tent can prove to be a path-breaking innovation towards the promotion of Carbon Neutral Ladakh.

Solar Heated Military Tent, HIAL

Solar Heated Military Tent, HIAL

Solar Heated Military Tent, HIAL

# School of High Altitude Desert Ecology (SHADE)

## Plantation

A lot of the planned plantation activities for the year 2020-21 had to be modified because of the prevailing CoVID-19 emergency.

Despite the challenges that CoVID-19 posed, we not only continued to nurture our existing plants but also planted a few thousand more in Kargil, Nubra and our own campus.

Solar Greenhouse, HIAL

Farmers Workshop with ICICI Foundation, Chushot


Farmers Workshop with ICICI Foundation, Thiksey

## Farmers Workshop with ICICI Foundation

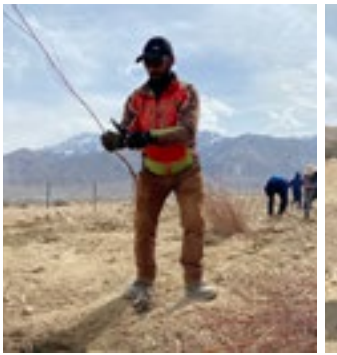
HIAL Conducted a workshop/training for farmers in collaboration with ICICI bank for over 7 days in the villages of Stok, Matho, Thiksey, and Chushot. This workshop/training is a part of CSR activity of ICICI Bank. The training programme, conducted by Mr. Tsewang Nurbu, touched upon various topics such as organic farming, greenhouse, soil health, insects pest management and drip irrigation.

## Bio Fencing by MakeMyTrip Spring Plantation 2021

HIAL started this year's plantation season in Ladakh by planting around 130 saplings of Kikar, 130 Tsarsing Tree saplings, 130 Sea Buckthorn saplings and 130 Syah flowering plant saplings on campus.

This plantation drive was led by Mr. Tsewang Nurbu, our Plantation Coordinator who guided and helped all our team members to understand the process of plantation by elaborating on the techniques of soil preparation, digging, sowing and watering frequency.
With this event, our plantation activities for this year started on campus and we are looking forward to a greener year at HIAL.

We used the slack time to carry out a lot of repair and maintenance work like restoration of the polycarbonate greenhouse, deweedification of greenhouse plantations, organic pest control of the plants, water measurement research of HIAL's soil and corresponding survival rates and manure treatment of soil for increasing soil fertility.



Bio Fencing by MakeMyTrip Spring Plantation,

Bio Fencing by MakeMyTrip Spring Plantation, HIAL

# Ice Stupa

## Ice Stupa Competition 2020-21

Himalayan Institute of Alternatives, Ladakh (HIAL) enabled the making of 21 Ice Stupas across 16 villages this winter and a total of 67 million litres of water was conserved to be used in consecutive spring.

On the occasion of World Water Day, the final results of this year's Ice Stupa Competition 2020-21 were announced at Takmachik Village in collaboration with District Administration, Leh and Takmachik Villagers Association.

Ice Stupa Competition, Shara

Ice Stupa Competition, Kulum

Ice Stupa Competition, Apati

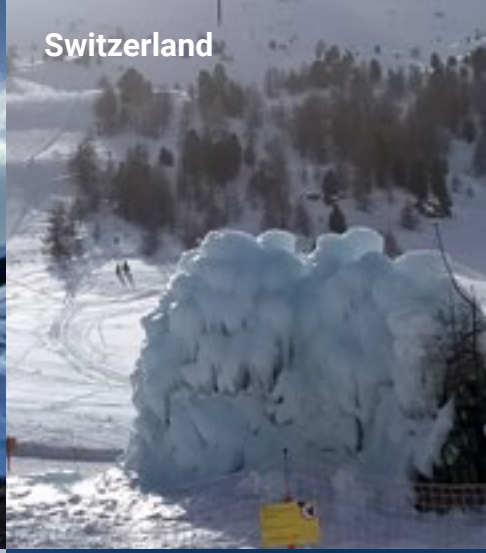

Tarchit


Takmachik

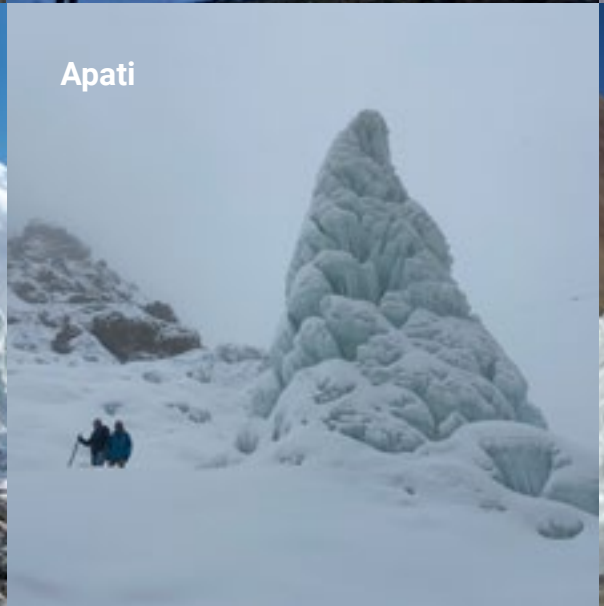

Kharit

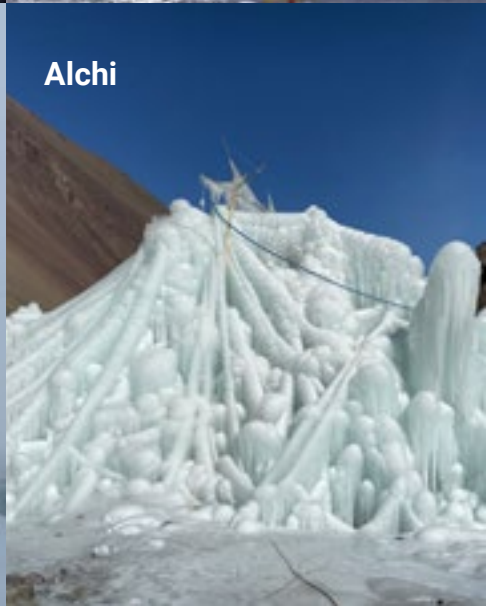

Kulum


Lamsu


Switzerland


Phyang


Apati


Alchi

## Winners of Ice Stupa Competition this Season

1st Cash Prize: Rs. 3 Lakhs, Capacity: 8 Million Litres, Tarchit Team

2nd Cash Prize: Rs. 1 Lakhs, Capacity: 4.5 Million Litres, Karith Team

2nd Cash Prize: Rs. 1 Lakhs, Capacity: 4.5 Million Litres, Takmachik Team

3rd Cash Prize: Rs.75 Thousand Capacity: 2.25 Million Litres, Phyang Team


3rd Cash Prize: Rs.75 Thousand Capacity: 2.25 Million Litres, Kulum Team

In addition to the above prizes, the Ice Stupa Project also acknowledged the other four participating teams for their marvelous efforts with a cash prize of Rs 25,000 each:

- Lamtso
- Apathi
- Alchi
- Sanjak Phosa


Cash Prize: Rs. 25,000, Lamtso Team


Cash Prize: Rs. 25,000, Apathi Team


Cash Prize: Rs. 25,000, Alchi Team

Celebrating Water Day at Takmachik

The certificates and prizes were given by Aba Chewang Norphel and other dignitaries like Lama Lobon Konchok Sharap, SDM Khaltsi, Shri. Tanvir Ahmad and Counsellor Lamayuru Constituency Shri. Morup Dorjey who also blessed the occasion with their presence.

A total prize money of 7.5 lakhs was awarded by Sonam Wangchuk from his personal funds accrued from the various awards that he has won to promote enterprise and entrepreneurship for the youth of Ladakh so that they can begin to take stewardship of their eco-systems through local innovations and interventions like the Ice Stupa artificial glacier.

## Ice Climbing Festival

The second edition of the annual Ice Climbing Festival was organised at Gangles Valley, Leh. Ice-walls are built artificially for the climbing festival by the Ice Stupa Teams participating in the Gangles Ice Valley project since 2018 to conserve water for downstream villages and for the city of Leh.

HIAL partnered with Ladakh Mountain Guide Association (LMGA), the first Indian registered guides' association to promote adventure tourism across the region and ignite the spirit of adventure amongst the youth of Ladakh.

Ice Climbing Festival

Ice Climbing Festival

Ice Climbing Festival, Gangles


Ice Climbing Festival, Gangles


Ice Climbing Festival, Gangles

## International Visit

Two of our team members, Yasin Ahmad and Angchok Norboo, associated with our Ice Stupa project for the last 6 years, went to Samedan, Switzerland to transfer the Ice Stupa building technique to Academia Engiadina and Glaciers Alive.

They are developing an automated system to build Ice Stupas in Samedan that will help improve the process and ease the challenges of building them manually. They are also working on innovating a new type of snow producing technology which will be used to reclaim melted glaciers. This project is planned to be applied in various high altitude geographic locations across the world as a tool to combat the impact of global warming.

Our technology-transfer collaboration and research work with Academia Engiadina and Glaciers Alive has been going on since the last four years. Together, we are trying to refine and innovate new techniques, devices and expertise required in creating artificial glaciers in Switzerland, before moving on to replicating it in different parts of the world.

Ice Stupa team member Yasin Ahmad and Angchok Norboo in Switzerland

Ice Stupa in Switzerland

Yasin Ahmad and Angchok Norboo, associated with our Ice Stupa project for the last 6 years, went to Samedan, Switzerland

## Kulum Project

HIAL's School of Ecology, has taken up a project to rehabilitate the abandoned village of Kulum through the triple effort of building Ice Stupas to augment the vanishing streams, undertake plantation and retrofit passive solar buildings. This research is being supported by the Ministry of Tribal Affairs (MoTA), Govt. of India.

Kulum, like many other villages in the Trans-Himalayan region, was left abandoned by the families therein primarily due to extreme shortage of a surface water, leaving no room for agricultural possibilities.

This project aims to replenish the groundwater table as well as increase the surface water flow. With the help of the villagers, we are experimenting with a combination of ice structures, vertical and horizontal, in the valley. The water harnessed from all these artificial glaciers will be directed into a drip irrigation system and will be used to restart agricultural activities in spring 2021 (after almost a decade of no agricultural activity).

Abandoned house in Kulum due to water shortage

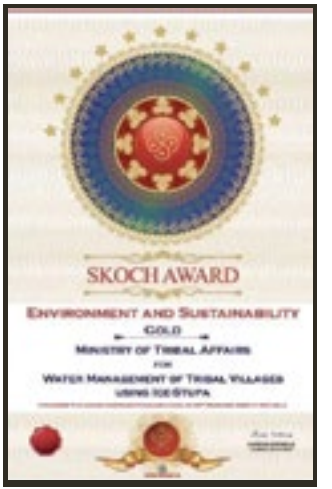
The villagers' participation facilitates an exchange of skills and knowledge where we learn from their experiences and they take away organisational skills from our institution. This project not only aims at rehabilitating a village, but also plans to train, encourage and help the locals to take up lea dership roles and become the catalysts of change through such projects in future.

## SKOCH Award

HIAL led project, 'Water Management of Tribal Villages using Ice Stupas' funded by the Ministry of Tribal Affairs (MoTA), bagged the SKOCH Challenger E-Governance Award in the Environment and Sustainability Category.

This recognition is a major step for our organisation's passion towards solving the water problem in Ladakh by way of storing the Winter wastewater to be used during sowing season in Spring. During the 2019-20 winters, 26 Ice Stupas were built with a storage capacity of 60 million litres of water and has brought relief to 35 villages so far.

Instituted in 2003, SKOCH Awards salutes people, projects and institutions that go the extra mile to make India a better nation.




## HIAL and University of Fribourg Collaboration

With the increasing popularity of Ice Stupas across the world, students across universities are undertaking research and development projects in it. We are keen on collaborating with them to refine the construction and output of an Ice Stupa to the point of perfection based on their research findings.


HIAL and University of Fribourg Collaboration

HIAL and University of Aberdeen Collaboration

This winter provided us with many opportunities to test and validate our ideas. Various interesting experiments are happening and picking up pace. Seven new weather stations are installed across Ladakh at different Ice Stupa locations. The scientific data acquired through these will be useful in stating facts and actually observe the impact of our work. We can then streamline and ease the Ice Stupa building process with an aim to scale up the project in various parts of the world.

## HIAL and University of Aberdeen Collaboration

HIAL collaborated with University of Aberdeen to perform site suitability analysis for artificial glaciers in Ladakh. Within the project, one Ice Stupa was made in Phaterakh, Phyang by the villagers. This helped in studying how the physical factors contribute in making Ice Stupas at various locations in trans-Himalayas.

A weather station was installed near the glacier to measure the abiotic parameters like wind, temperature, water pressure among other. This data will help in spatially selecting glacier locations and their impact in years to come.

## HIAL and University of Loughborough in Association with NatGeo

An association with University of Loughborough and NatGeo oversaw the installation of 2 high end weather stations across Ladakh. This gives us an opportunity to understand our climate and validate the work through a scientific lens. The University provided training to the Ice Stupa team members on the installation of weather stations and subsequently, the Ice Stupa team executed the installation and maintenance of the same.

This data will be useful in understanding the relationship between nature and Ice Stupas, through which we aim to replicate the process in similar geographical areas around the world.

## HIAL & Shijay Projects India Pvt. Ltd.

This winter, non-invasive geophysical techniques were used to study the water retention of Ice Stupas. A team from Shijay Projects India Pvt. Ltd. visited Ladakh in the month of March. The teams partnered to use the cutting edge technology of a "ground penetrating radar" in order to understand the ice formation in artificial glaciers. This represents first of its kind survey done to understand the implications of Ice Stupas on the surrounding areas and gives a highly accurate estimate of water conserved in such structures.

Interpretation of the results provided scientifically valid feedback for the project. This helped in improving the water retention techniques and resulted in making bigger Ice Stupas during the season.

## Improving and Innovating the Ice Stupa Making Process and Understanding the Ice Itself.

The Ice Stupa team is dedicated to constantly improving and innovating on the Ice Stupa making process in order to achieve the best possible outcomes. This year, the Ice Stupa team innovated and experimented with various new techniques that will help us in understanding our work scientifically as well as scaling up the project and making it easy to make Ice Stupas. During this phase, the team worked on the following techniques

1 A new type of "sprinkle top Ice Stupas" were repeatedly made during the 2020-21 winters. These structures use less equipment and require less maintenance time to make the structure. The same was experimented with in Samaden, Switzerland by the visiting Ice Stupa team members working with Glaciers Alive.

2 A fully automated artificial snow making technology was prototyped in Divozilla, Switzerland. The scaling up potential was tested along with a fully automated system that would depend on weather conditions to make snow. The same technology is to be tested in Ladakh in coming years. If successful, this would be the first of its kind glacier reclaiming technology in the world.

3 Insulation through vacuum: The cold Ladakhi winters that mark the onset of the Ice Stupa season also brings in challenges like frozen pipes in -30°C temperatures. To counter this issue, the Ice Stupa team began experimenting with vacuums to be used as an insulator. If successful this experiment will revolutionise the process of making artificial glaciers

# Courses and Academics

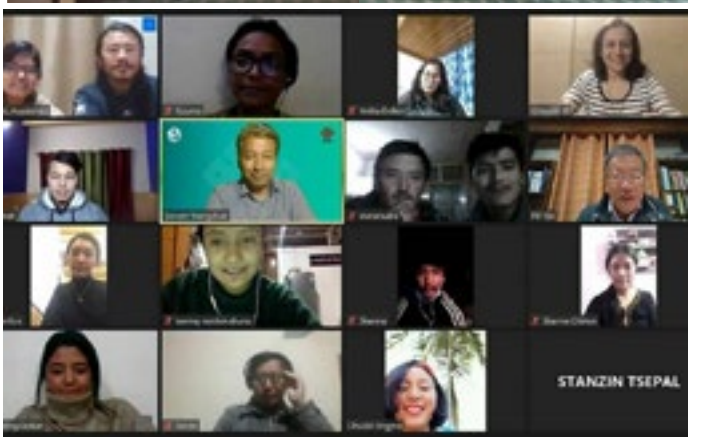
HIAL conducted 6 courses last year in Eco-Responsive Architecture, Responsible Tourism, Post Harvest Produce, Leadership and Ecology & Ice Stupa. The Integral Education fellowship course could not be completed due to COVID-19.

## HIAL Experiential Learning Module (HELM)

Ladakh being a high altitude desert mountain has its own set of unique challenges. This combined with its recent declaration as Union Territory, gives rise to further challenges but also new opportunities to the people of this region. In order to face these challenges, the people especially the youth have to be equipped with leadership skills to lead their people and land into the future of building a new and progressive Ladakh.

Our 3-month HELM (HIAL Experiential Learning Module) course was designed exactly to fulfill this need. Curated and led by our founding CEO and Dean, Ms Gitanjali JB, and supported by faculty from Rashtram School for Public Leadership, the course aimed at empowering the practicing and aspiring youth leaders in Ladakh with the knowledge, skills and attributes to help them create impact in their areas of interest through the implementation of their 'Big Idea' during the program.

HELM presentation session, HIAL



Students of HIAL Experiential Learning Module

## Some of these Big Ideas of the Students and their Mentors were as Follows:

The sessions included understanding the context of Ladakh and other Himalayan model regions like Sikkim, their issues, challenges and possibilities. Concept of 'Leadership' was explored by studying about various world leaders who changed the world & analysing their leadership styles, understanding Governance, Diplomacy, Statecraft & International Relations, rethinking Economy, Social leadership, Technological leadership, Military leadership, Economic leadership, Role of Liberal Education in Leadership and the Role of Philosophy in Political Leadership. Parallel experiential modules focussed on the development of various leadership and life skills like the art of persuasion, negotiation, communication and critical thinking. The focus in all of these sessions was the presentation of the Indic knowledge systems alongside the prevalent western frameworks.

Faculty for the course along with Ms Gitanjali and Mr Sonam Wangchuk were Mr Raghav Krishna, Mr Shobit Mathur, Mr Sreejit Datta and Mr Raghav Panday from Rashtram, Mr Yaron Barzilay from Acropolis, Mr Amitabh Mattoo, Rtd IAS Officer and writer, Ms Padmini Nagaraj, Academic Dean, Shrishti School of Art and Design and Mr Aryan Bhattacharjee, freshman student New York University.. The Guest Faculty were Shri Satya Pal Malik, Governor of Meghalaya and the ex-Governor of J & K state, Shri PD Rai, Shri Rigzin Jora, Shri Vallabh Bhansali, Mr K Pandiarajan, Shri Saugat Biswas, Ms Atishi Marlene, Mr Anshu Gupta, Shayam Krishna Kumar, Shri Subhash Kak, Mr Sopnendu Mohantay, Mr Paul Dupius, Mr Deep Jyoti Sonu Brahma.

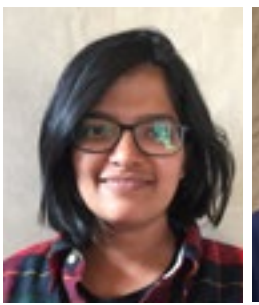
### Course Design & Lead Faculty

**Gitanjali JB**

### Internal Faculty

**Sonam Wangchuk**

### Course Assistance



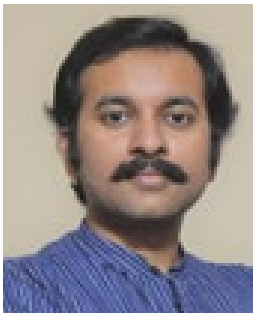
**Varada Kulkarni**

**Chamba Tsetan**

## External Faculties

Raghava Krishna

Yaeron Barzilay



Sreejit Datta

Paul Duplis

Aryan Bhattacharjee

Raghav Panday

Amitabh Mattoo

## Guest Speakers

Satya Pal Malik

PD Rai

Saugat Biswas

Subhash Kak

Anshu Gupta

Nawang Rigzin Jora

Vallabh Bansali

Sopnendu Mohantay

Pandiarajan

Atishi Marlene

## Mentors

Sonam Wangchuk

Dr Anand Khakkar

Padmini Nagaraj

Stanzin Dorjay

Pankaj Sharma

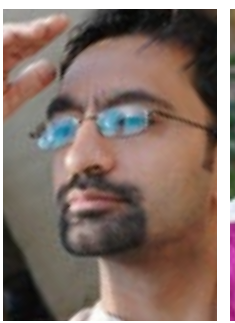
Deep Jyoti Sonu

Konchok Tashi

Manish Adalkha

Tundup Dorjay

Thanles Chorol



Vinod Sreedhar

Snigdha Pattnik

## Organic Farm and Forest Produce Processing

Conducted by Pankaj, Chef-turned Entrepreneur, the aim of this 3-month certificate course in Organic Farm and Forest Produce Processing was to spread awareness about the various agricultural and forest-based product opportunities and development of new products from the local produce like apricots, barley and buck-wheat. It introduced the students to various methods of food preservation and preparation practiced in mountain regions like Ladakh.

The course provided a comprehensive overview of wild and cultivated plant growing, their potential, processing techniques, value-addition and marketing. This included sustainable wild-plant harvesting methods, food-plant preservation as well as the creation of non-food products from native plants. This course exposed the students to the theoretical knowledge as well as practical skills required for developing plant-product businesses right from the harvest in the fields to their final sales and marketing.

Students of OFFP preparing apricot jam

Students of OFFP and mother's from Phyang village preparing apricot for jam making

Students visiting Apricot belt of Sham valley

Contextual study - Apricot dryer and user interaction


rototype in market by Tashi Dolkar (Pancake Pre-mix)

## Applied Ecology and Ice Stupa Course

The first batch of Applied Ecology and Ice Stupa Course at HIAL was launched this year with six students with different backgrounds, from different parts of Ladakh.

The 3-month certificate course was designed to give an overall ecological perspective of the world we live in and how humans should make space for themselves which is sustainable for all other living and non-living components of the earth. It focused on climate change and its impact on the high altitude regions of the world, particularly Ladakh. The course emphasised on how innovations like Ice Stupas and artificial glaciers along with new plantation techniques and low energy intensive solutions can come together to strengthen our resilience and adaptive potential against climate change.

Applied ecology and Ice Stupa course students, Takmachik

Ecology and Ice Stupa tour, Lamsu






The students during the course tenure completed the following projects that helped in creating and improving the existing scientific database for the Ice Stupa project;

1. Mapping the geothermal potential of Ladakh for water conservation
2. Preparation & compilation of a comprehensive "Weather Station manual"
3. Preparation & compilation of a "Ice Stupa making manual"
4. Insulation through vacuum experiments for freezing pipes during Ladakhi winters
5. Ice Stupa's impact on agriculture via case studies of Kulum & Lamtso

At the end of the course, there was a week-long residential lecture series conducted at Secmol. Various resource persons from Ladakh and outside Ladakh were part of it. Stanzin Namgyal, Tsewang Namgyal (Director at Snow Leopard Conservation), Tashi Chotak (VC at Wildlife), Aba Norphel, Stanzin Dorjey Gya, Rohit Joshi, Prof. Nick, Surya Bala Subramanium




Students of Applied Ecology and Ice Stupa course

## HIAL Responsible Tourism Fellowship Programme

The aim of the Responsible Tourism course is to have practicing or aspiring tourism entrepreneurs understand their sectors better, develop innovative products, services and business models by building sustainability in all their offerings.

Since all the courses have a component of almost 70 percent hands-on practice, delivering the course online this year was a challenge. But we redesigned the course in a way that allowed the students to take up real-life tourism projects in their regions and contexts.

The course was led by Tanzin Norbu, mentored by our Founding CEO and Dean, Ms Gitanjali JB, and supported by Ms Varada Kulkarni and Mr Chamba Tsetan. To make the course more lively, every Friday the team invited highly experienced professionals, academicians, tourism practitioners and entrepreneurs from India and across the world like Europe, America and the United Kingdom as guest speakers. And to make the course more hands-on, the team introduced several case studies relevant to responsible tourism and often asked striking questions to spark the debate among the students in an extremely collaborative and inviting environment.

As a result during our course we often found that all 12 of our students were buzzing with creative and innovative thoughts. At the end of the course this is what our students had to say:

### Internal Faculty

**Sonam Wangchuk**

**Gitanjali JB**

**Stanzin Nurboo**

## Guest Faculties

**Stephan Marchal**

**Mr. Krishnagopal**

**Abeer Gupta**

**Helena Norberg-Hodge**

**Vinod Sreedhar**

**Nawang Phuntsok**

**Claire Bennett**

**Janhavi Welukar**

# Research and Publications

***A New Education: Today's Imperative for Tomorrow's Conquest.***

*What is the true purpose of education? Is it merely the acquisition of skills necessary to earn a living? Or is it the development of social awareness for better citizenship? Is it about the development of intelligence and character? And what about embarking on a path of self-discovery? If the answer is all off the above, then is our current education system capable of achieving it? The article delves into the limitations and inadequacies of the current system of education and postulates a new framework for true education that would develop the human potential in its integrality.*

***By Gitanjali J B***

***Himalayan Farm Stay by Tanzin Norbu***

*The sudden rise in mass tourism, particularly for the Leh-pa (residents of Leh town) tourism became a major cash economic contributor as compared to traditional agriculture and animal husbandry. The other part of Ladakh moved into Leh to get their share of work. As a result it drained away all the young and skilled workers from the other part of Ladakh to Leh by making it a congested town of Ladakh. HIAL Responsible Tourism department recognised this imbalance to redress this deteriorating situation HIAL Responsible T ourism department decided to set up Farm stay in various villages of Ladakh.*

***By Tanzin Norbu***

***Storing Water: Ladakh's Ice Engineers by Nishant Tiku***

*Hulking ice stupas dot the arid landscapes of northern India's Ladakh region. Villagers of the region have turned to natural engineering solutions to preserve water – an increasingly scarce resource due to accelerating glacier shrinkages.*

***By Nishant Tiku***


# SENSe (School of Energy Studies)

## Introduction

SENSe (School of Energy Studies) was established this year with a focus on reducing the carbon footprint of Buildings in Ladakh.

The goal of a carbon neutral Ladakh cannot be realised unless the building sector becomes carbon neutral.

Therefore, passive solar designs are the right solution that will help Ladakh meet the space heating needs of buildings in an absolutely environment-friendly and sustainable way.

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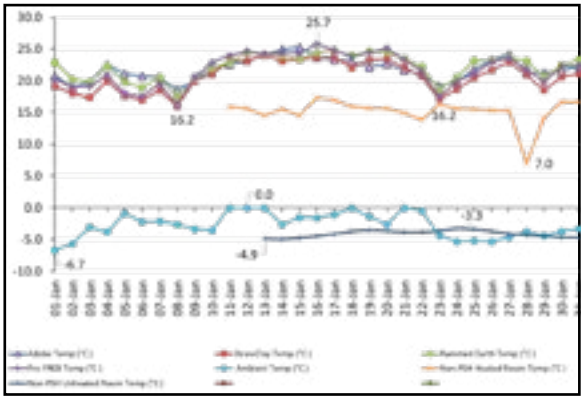
## Passive Solar Housing (PSH) in Ladakh

SENSe of HIAL has partnered with The Energy Resources Institute, New Delhi, India (TERI) and the University of Applied Sciences and Arts Northwestern Switzerland (FHNW) to undertake a project titled "Passive Solar Heated (PSH) Housing in Ladakh, India".

The objective of this study is to disseminate the PSH building concepts and technologies by studying its best practices within the cold arid region of Ladakh. The long-term goal is to develop a study that can be used as a reference by the policymakers to proactively promote the concept of PSH housing among the common masses, governmental and defence institutions. Swiss Agency for Development and Cooperation (SDC, DEZA in German) is supporting the research part as well. The study also tries to explore the thermal comfort range of locals and develop building energy simulation models for the region.

Passive solar house, SECMOL

Passive solar house, HIAL Phyang




## PSH Performance of all HIAL Buildings (Dec 2020 onwards)

This winter we started to compare the indoor air temperature data of all our four PSH staff quarters. It was very encouraging to see that all the four buildings performed exceptionally well and stayed comfortable above 20°C even in the peak winter months of Dec-Feb when outside it can drop down to as low as -15°C.

## Encouraging Building By- laws in Ladakh

On 10th January 2021, Mr Sonam Wangchuk along with our SENSe team members, Rohit Ranjan and Yashvi Malhotra met the Lt. Governor (LG) of Ladakh to emphasise on the need of PSH-centric building byelaws and energy conservation codes in Ladakh for materialising the vision of a 'Carbon Neutral Ladakh.' The team also informed the LG about various initiatives in energy studies at HIAL, our PSH projects in Ladakh and several other initiatives which we have taken like Thermal Comfort Survey, specific to Ladakh, a detailed monitoring of heat transfer through the building envelope to develop and validate a simulation model.

Performance of HIAL's model staff quarter design (2 BHK designs constructed using different building materials - Rammed earth, Adobe bricks, Straw clay bricks and Pre-FREB blocks) was presented vis-a-vis a conventionally heated building of Leh. Upcoming projects Passive Solar Heated Concrete Pillar and Beam Structure (PSH Framed Structure) and Passively Heated Portable Solar tent were discussed in detail.

According to a 2010 study, around 90% of Ladakh's domestic energy is consumed for space heating and cooking needs. These are some of the solutions developed specifically to meet the housing needs of the Defence and the Government organisations to reduce their yearly kerosene consumption of around Rs 500 crore used primarily for space heating, which is still growing at the rate of around 30% per year.

## ECBC Ladakh

HIAL was invited to be a part of the team that is adopting Energy Conservation Building Codes for Ladakh (ECBC - Ladakh). ECBC has developed under the Bureau of Energy Efficiency (BEE) under the Ministry of power, Government of India as design innovation for upcoming commercial buildings to harness the energy saving potential in buildings.

# Achievement!

## PSH and Local Materials Included in Tourism Circular

It was a moment of joy for all the team members who have been relentlessly working to promote ecologically sustainable earthen architecture, local materials and passive solar design strategies when The Department of Tourism, UT Administration of Ladakh issued a notification stating that 'All its upcoming buildings in the region needs to have at least 70% of local materials and passive solar design strategies'. This is the first step towards the acceptance of passive solar design strategies and utilisation of local materials in the region.

# Organisational Development

## Departmental Visioning Exercise Teams' Vision & Mission Exercise

This year all the departments at HIAL namely, Architecture, Construction and Engineeting (ACE), Ecology (Plantation and Ice-Stupa), SEnSe (School of Energy Studies), Academics, HR, Finance and Communication along with their team members developed their departmental vision and mission statements in line with the vision and mission statement of HIAL. This was developed into a strategic road map which will be further detailed into specific projects and individual KRAs next year. This exercise was facilitated by our Founding CEO & Dean, Ms. Gitanjali JB and mentored by Mr. Vinod Kala, Founder-Director, Emergent Ventures India.
This would bring clarity to the individual departments and is expected to enable a seamless functioning in future.

30th May 2020

Shri R K Mathur
Lt Governor,
Leh
U T Ladakh

**Sub: Donation to Lt Governor Relief Fund, UT Ladakh**

Dear Sir,

We, the members of HIAL, appreciate the leadership shown by the UT Administration and the elected leaders in the hill council in fighting the CoVID19 pandemic in Ladakh. The administration has been proactive, decisive, and greatly successful in containing this pandemic while ensuring smooth functioning of the Ladakhi lifestyle.

In a gesture of solidarity and gratitude for the UT administration, we, the staff at HIAL and Mr Sonam Wangchuk would like to donate a humble amount of Rs 5 Lakhs vide check no. 000022 dated 28.05.2020 towards the Lt Governor Relief Fund UT Ladakh to continue the fight against the CoVID19 pandemic!

Sincerely,

Gbnjali JB
Founding CEO

CC:
1. Shri Rigzin Samphel, Commissioner Secretary, UT Ladakh
2. Shri Gyal P Wangyal, CEC, LAHDC Leh, UT Ladakh
3. Shri Feroz Ahmad Khan, CEC, LAHDC Kargil, UT Ladakh

# CoVID-19 Contribution by HIAL

The employees of HIAL pooled and donated a sum of Rs 5 Lakhs towards Lt. Governor Relief Fund UT Ladakh, as a gesture of solidarity and appreciation for the work done by the UT administration towards the management of pandemic. HIAL considers itself to be an integral part of the entire eco-system and believes in standing together with the local community at every hour of need.

THE ADMINISTRATION OF UNION TERRITORY OF LADAKH

OFFICE OF THE LIEUTENANT GOVERNOR

Dated 02/06/2020

Kindly accept heartiest thanks of UT Ladakh for your contribution to the Lt. Relief Fund for tackling Covid-19.

Your contribution to the people of Ladakh during this crucial time is highly appreciated.

With best regards,

Yours sincerely,

Dr. Asif Hussain (V.A.S)
OSD to Hon'ble Lt. Governor
UT Ladakh

# Awards and Recognitions

## Sonam Wangchuk: Dr. Kalam Award for creating a Liveable Planet

Mr Sonam Wangchuk was awarded the Dr. Kalam Award, along with Nobel laureate Dr. Yunus from Bangladesh, for Creating a Livable Planet Earth.

In his acceptance speech Mr Sonam Wangchuk said, "Dr. Kalam epitomised simple living and patriotism which to me means a sense of love and stewardship for one's country.
If every individual in the world inculcates these values, we can surely succeed in creating a truly livable planet."


## Gitanjali J B: Chevening Fellowship

We are happy to share with you that our Founding CEO & Dean, Ms Gitanjali JB has been selected for the Chevening fellowship this year. A highly competitive fellowship with a less than 2% selection rate, Chevening a very prestigious fellowship conducted at the Oxford University. Ms Gitanjali will be working on a new framework of higher education that will combine contextual curriculum, experiential pedagogy, indegenious wisdom and a translate-disciplinary approach to real-life problem solving.

# Guest Visits

## Secretary Border Management, Home Ministry, GOI

Shri Sanjeeva Kumar Ji, Secretary Border Management, Home Ministry, Govt of India visited the HIAL campus with his team to explore the possibilities of building passive-solar houses in Ladakh, especially for the Indian Paramilitary Forces.

It is always a pleasure to receive and host individuals and institutions who share our passion and align with our vision of a sustainable future.

## IOCL Conference on Sustainable Housing for Indian Army and BRO

HIAL was invited to present in a seminar on "Sustainable Housing for Indian Army and Border Roads Organisation", organised by Indian Oil Corporation Limited, Leh on 5th February 2021. Our Founding Director, Mr. Sonam Wangchuk and Mr. Rohit Ranjan, Energy Research Engineer, presented the potential of achieving thermal comfort in buildings through passive solar design strategies.

## Ladakh Airforce Chief Visit: Exploring PSH Scope

The chief of Leh Airforce station visited the HIAL campus along with his team members to get a detailed tour of HIAL's PSH buildings and other climate appropriate interventions that we have been working on.

## Mr Tanmay Tathagat, IIT Jodhpur, Mr Dipak Sanin, Retired IAS Officer and Mr Tikender Singh, Former Mayor of Shimla

Mr Tanmay Tathagat has worked extensively on net-zero energy and carbon campus. His organisation is working with IIEC (funded by SDC) on different Renewable Energy Systems' Integration into buildings. Mr Dipak Sanin has worked in the Lahaul-Spiti region. He has experience of how to get environment-friendly policies moving in a govt set-up. Mr Tikender Singh has worked on 24x7 water supply policies in Shimla.

The visit focussed on mainstreaming Passive Solar Buildings in Ladakh on the policy front.

# Talks & Presentations
# Sonam Wangchuk

# Talks & Presentations
# Gitanjali JB


## HIAL Family

**HH Drikyung Kyabong Chhetsang Rinpoche**
Chief Patron

## Advisory Board

**Padma Shri Tsewang Norphel**
**Padma Shri Murup Namgyal**
**Elijah S Gergan**
**Mr. Wangial Nambarder Phyang**
**Venerable Khenpo Rigzin**
**Dr. Abbas**
**Mr. Mipham Otsal**
**Mr. Sonam Dorje**

## Board of Directors

**Ven Khenpo Rigzin**

**Mr. Tashi Motup**
Sarpanch Phyang

## Senior Management

**Gitanjali JB**
Founding CEO & Dean

**Sonam Wangchuk**
Founding Director

## Academics

**Varada Kulkarni**
Academics Manager

**Chamba Tsetan**
Academics Co-ordinator

**Chuskit Angmo**
Assistant Academics Facilitator

## Finance & Administration

**Michelle Pavri**
Executive Assistant

**Stanzin Gonbo**
Executive Assistant

**Tsering Dolkar**
Human Resource

**Tsetan Dolkar**
Accountant

**Lekhraj Sharma**
Cook & Housekeeping

**Mohd. Ahsan**
Driver & Office Assistant

**Anil Kumar**
Purchase Incharge & Delhi Liasoning

## Ice stupa

**Nishant Tiku**
Ice-Stupa Head

**Rigzin Mingyur**
Technical Executive

**Mohd Yashin**
Technical Executive

**Thinlay Nurboo**
Technical Executive

**Thupstan Nurboo**
Technical Executive

**Angchuk Nurboo**
Technical Executive

## Communication

**Sonam Dorje**
Media Executive

**Tashi Gyalson**
Graphic Designer Executive

**Koyena Biswas**
Communications Manager

## Tourism

**Stanzin Nurboo**
Head (Tourism & Academics)

## Construction

**Sameer Bajracharya**
Lead-Architect

**Sujata Shakya**
Architect & Construction Manager

**Phunchok Namgyal**
Technical support on site

**Skalzang Phunchok**
Construction Supervisor

## Afforestation

**Tsewang Norbu**
Lead - Faculty (Plantation)

**Tsering Chuszom**
Field Assistant

**Mohd. Hussain**
Field Assistant

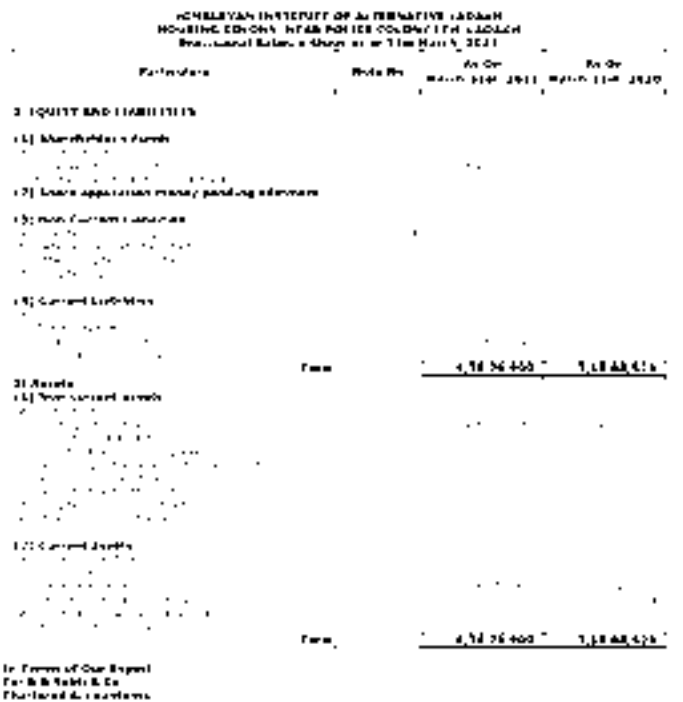
## Energy

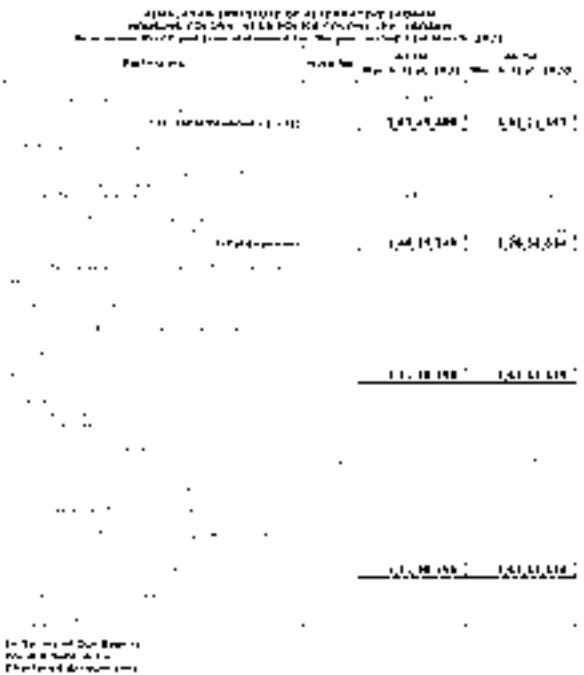
**Rohit Ranjan**
Energy Research Engineer

**Yashvi Malhotra**
Energy Research Assistant

**Jigmet Paljor**
Intern

# Financials





# Support

With fledgling beginnings in 2018, HIAL has in its third year of existence reached its first milestone of having a residential campus with several residential courses. It has achieved this by taking one step at a time with the help of all its supporters and well-wishers.

We could achieve our vision only with the support of passionate individuals and organisations that help us by contributing in various ways. We sincerely thank our Chief Patron HH Drikung Kyabgon Chetsang Rinpoche, Ladakh Autonomous Hill Development Council (LAHDC), our Advisory Committee, Phyang Village and all the other supporters and well-wishers who believe in our ideology and support us consistently.

**Contact Us**
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**Himalayan Institute of Alternatives,**
**Ladakh Phyang Leh, Ladakh, India**