A GLOBAL APPROACH TO VERNACULAR PRACTICES

P5 PRESENTATION
50% of the population of South Asia was affected by at least one type of natural hazard between 1990 and 2008.
CONSTRUCTION IN INDIA

20% NATIONAL CARBON EMISSION

80% FOR STEEL, BRICKS, CEMENT

156% GROWTH RATE BETWEEN 2000 - 2007
MIGRATION

URBAN POPULATION FROM 31% IN 2011 TO 42.5% IN 2025
Migration
50 million of new urban residents by 2030 will be in mid-sized cities
HIMACHAL PRADESH
AND THE FRAGILE HIMALAYAN ECOSYSTEM
Himachal Pradesh
in India
Himalayan Plateau
KULLU DISTRICT
IN HIMACHAL PRADESH
KULLU DISTRICT
IN HIMACHAL PRADESH
GLACIERS ARE MELTING
CEMENT PRODUCTION = 94% INDUSTRIAL EMISSION = 50% TOTAL CO2 OF HP
SANJAULI TOWN, SHIMLA
HOW IS THE BUILT ENVIRONMENT OF THE AREA?
VERNACULAR
The term vernacular derives from the Latin vernaculus, meaning “domestic, native, indigenous”; from verna, meaning “native slave” or “home-born slave”.

It’s the everyday language spoken by a people as distinguished from the literary language.
“A satisfactory definition of vernacular is more difficult at the moment. The most successful way of describing it seems to be in terms of process: how it is “designed” and built [...]”

The peasant owner is still very much a participant in the design process, not merely a consumer. [...]”

The model itself is the result of the collaboration of many people, over many generations, as well as the collaboration between makers and users of buildings [...]

Since knowledge of the model is shared by all, there is no need for drawings or designers.”
VERNACULAR =

“architecture without architects”
ORDINARY VERNACULAR

GRAND VERNACULAR
GRAND VERNACULAR ARCHITECTURE

ORDINARY VERNACULAR ARCHITECTURE
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ORDINARY VERNACULAR ARCHITECTURE
A. Grand Vernacular  

342 m²  
(70% covered outside + 30% interior)

B. Ordinary Vernacular  

331 m²  
(30% covered outside + 70% interior)

A = B
<table>
<thead>
<tr>
<th></th>
<th>A. GRAND VERNACULAR</th>
<th>B. ORDINARY VERNACULAR</th>
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<tbody>
<tr>
<td>SPACES</td>
<td>342 m²</td>
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<tr>
<td>(70% covered outside + 30% interior)</td>
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<td>MATERIALS</td>
<td>630 m³</td>
<td>290 m³</td>
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<td>(144m³ wood + 490m³ stone)</td>
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<td>(70m³ sand + 140m³ aggregate + 170m³ cement + 0.5m³ steel + 61.5m³ bricks)</td>
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<td>RESULTS</td>
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## RESULTS

<table>
<thead>
<tr>
<th>Space</th>
<th>Materials</th>
<th>Embodied Energy</th>
<th>Climate</th>
<th>Carbon Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Grand Vernacular</td>
<td>342 m² (70% covered outside + 30% interior)</td>
<td>325400 MJ</td>
<td>325 M^2</td>
<td>115000 kg Co₂</td>
</tr>
<tr>
<td>B. Ordinary Vernacular</td>
<td>331 m² (30% covered outside + 70% interior)</td>
<td>631300 MJ</td>
<td>342 M^2</td>
<td>80000 kg Co₂</td>
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**Materials:**
- A: 630 m³ (144m³ wood + 490m³ stone)
- B: 290 m³ (70m³ sand + 140m³ aggregate + 170m³ cement + 0.5m³ steel + 61.5m³ bricks)

**Climate:**
- A: Uₜₕ = 0.24 W/m²K, Uₜₕ = 2.00 W/m²K
- B: Uₜₕ = 2.00 W/m²K, Uₜₕ = 2.00 W/m²K

**Notes:**
- A ≈ B
- A = 2B
- A = 1/2 B
### RESULTS

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<td>631,300 MJ</td>
<td>80,000 KG CO₂</td>
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\[
U_{\text{horiz}} = 0.24 \, \text{W/m}^2\,\text{K} \\
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\]

\[A = B\]
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A. Grand Vernacular

- **Spaces**: 342 m² (70% covered outside + 30% interior)
- **Materials**: 630 m³ (144 m³ wood + 490 m³ stone)
- **Embodied Energy**: 325400 MJ
- **Carbon Footprint**: 115000 kg CO₂
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- **Materials**: 290 m³ (70 m³ sand + 140 m³ aggregate + 170 m³ cement + 0.5 m³ steel + 615 m³ bricks)
- **Embodied Energy**: 631300 MJ
- **Carbon Footprint**: 80000 kg CO₂
- **Climate**: \( U_{\text{horiz}} = 2.00 \text{ W/m}^2\text{K} \)

**Results**

- **A = B**
- **A = 2B**
- **A = 1/2 B**
- **A = B + 1/2 B**
1 CAR $\times$ 12.500 KM $\Rightarrow$ 2.3 TON$\text{CO}_2$
35 car x 12,500 KM = 80 TON CO₂
1 TREE x 50 YEARS

= 

-1 TONco$_2$
80 trees × 50 years =
FROM RESEARCH TO DESIGN
TOWARDS A NEW CONTEMPORARY VERNACULAR
To which extent the archetypical qualities of the Himalayan vernacular architecture should be embodied in new sustainable designs?
Inspired by grand vernacular

**Explicitness**

Understandable construction
INSPIRED BY BOTH GRAND & ORDINARY VERNACULAR
FEASIBILITY
FAMILY-RUN CONSTRUCTION + SIMPLE TOOLS
INSPIRED BY GRAND VERNACULAR
FLEXIBILITY
NON-TYPIFIED SPACES
INSPIRED BY BOTH GRAND & ORDINARY VERNACULAR
MODULARITY
ONE PROJECT, ONE DETAIL
INSPIRED BY ORDINARY VERNACULAR
INCREMENTALITY
POSSIBILITY OF FUTURE EXPANSIONS
INSPIRED BY ORDINARY VERNACULAR

REPRODUCIBILITY

APPLICABILITY WITHIN A LARGER CONTEXT
VERNACULAR
BUILT ENVIRONMENT
VERNACULAR
BUILT ENVIRONMENT

ARCHETYPICAL
QUALITIES

NEW
ARCHITECTURE

REPRODUCIBILITY
INCREMENTALITY
MODULARITY
FLEXIBILITY
FEASIBILITY
EXPLICITNESS

vernacular  
built environment
archetypical
qualities
new  
architecture
WHAT IS THE ROLE OF THE ARCHITECT?
ARCHITECT DESIGN 100% OF THE BUILDING
INCREMENTAL PRACTICE

ARCHITECT BRINGS THE COMMUNITY INTO THE PROCESS
USERS COMPLETE THE DESIGN

INCREMENTAL PRACTICE
VERNACULAR PRACTICE

USERS DESIGN 100% OF THE BUILDING
ARCHITECT CAN (INDIRECTLY) INFLUENCE THE TREND
HOW?
THREE STRATEGIES:

SITE AND SERVICE

SHOWCASE

TRAINING
FOUR STRATEGIES:

SITE AND SERVICE  SHOWCASE  TRAINING
FOUR STRATEGIES:

SITE AND SERVICE  SHOWCASE  TRAINING
FOUR STRATEGIES:

SHOWCASE
SHOWCASE

= 

PILOT PROJECT WITH A PEDAGOGICAL FUNCTION
HOW TO INTEGRATE
ARCHETYPICAL QUALITIES INSPIRED BY VERNACULAR ARCHITECTURE
IN A SHOWCASE BUILDING?
HOW TO COMBINE

**GENERIC** ARCHETYPICAL QUALITIES INSPIRED BY VERNACULAR ARCHITECTURE

WITH **SPECIFIC REQUIREMENTS** IN A SHOWCASE BUILDING?
WHY THE DAGPO SCHOOL IS A PERFECT SHOWCASE ARCHITECTURE?
VALLEY

KULLU
20,000 POP

MANALI
10,000 POP

50
1. LINKS A LARGE VARIETY OF USERS

It Embodies the issues of the LOCAL BUILT ENVIRONMENT

it's a urgent situation
no safety / no heats
1.
links a large variety of users

2.
It Embodies the issues of the LOCAL BUILT ENVIRONMENT

3.
it's an urgent situation no safety / no heats

LITTLE MONKS
1. Links a large variety of users
2. It embodies the issues of the local built environment
3. It's an urgent situation: no safety, no heats

LITTLE MONKS  TEACHERS
1. Links a large variety of users

2. It embodies the issues of the local built environment

3. It's an urgent situation
   no safety / no heats

LITTLE MONKS  TEACHERS  MONKS
1. Links a large variety of users

2. It Embodies the issues of the LOCAL BUILT ENVIRONMENT

3. It's an urgent situation - no safety / no heats

LITTLE MONKS  TEACHERS  MONKS  CHILDREN
1. Links a large variety of users

It Embodies the issues of the LOCAL BUILT ENVIRONMENT

It's a urgent situation: no safety / no heats

LITTLE MONKS  TEACHERS  MONKS  CHILDREN  VILLAGERS
1. Links a large variety of users

2. It Embodies the issues of the LOCAL BUILT ENVIRONMENT

3. It's a urgent situation 
   no safety / no heats 
   LITTLE MONKS
   TEACHERS
   MONKS
   CHILDREN
   VILLAGERS
   TOURISTS

LITTLE MONKS  TEACHERS  MONKS  CHILDREN  VILLAGERS  TOURISTS
1. links a large variety of users

2. It embodies the issues of the local built environment

3. it's an urgent situation
   no safety / no heats
1. links a large variety of users
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2.
IT EMBODIES THE ISSUES OF THE LOCAL BUILT ENVIRONMENT
1. IT’S A MICRO-COSMOS THAT RESEMBLES A VILLAGE

2. IT EMBODIES THE SAME issues of THE LOCAL BUILT ENVIRONMENT HAS

3. IT’S A URGENT SITUATION NO SAFETY / NO HEATING SYSTEM
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3. IT’S AN URGENT SITUATION
   NO SAFETY / NO HEATING SYSTEM
STRATEGY
EXISTING STRUCTURE
PARTIAL DEMOLITION
INSPIRATION BY LOCAL *GRAND VERNACULAR ARCHITECTURE*
CONSTRUCTION TECHNIQUE OF THE CENTRAL CORE
STONES INFILL
KATH-KHUNI CONSTRUCTION
KATH-KHUNI CONSTRUCTION
KATH-KHUNI CONSTRUCTION
GABION BOX

KATH-KHUNI CONSTRUCTION
GABION COMPOSITION
GABION COMPOSITION
GABION COMPOSITION
GABION COMPOSITION
GABION COMPOSITION
GABION COMPOSITION
GABION COMPOSITION
INTERNAL STRUCTURE
WHAT ABOUT THE THERMAL PROPERTIES OF A GABION WALL?
INSPIRATION BY LOCAL GRAND VERNACULAR ARCHITECTURE
ONCE AGAIN
PROTECTION OF THE CENTRAL CORE / INNER SPACES
SUMMER
THE CENTRAL CORE IS SHADOWED

HIGH SUNRAYS
80° / 70°
WINTER
CENTRAL CORE HEATED BY THE SUN

LOW SUNRAYS
30° / 40°
THE PRINCIPLE OF THERMAL MASS FOR A SOLAR PASSIVE DESIGN
THE PRINCIPLE OF THERMAL MASS FOR A SOLAR PASSIVE DESIGN
THE PRINCIPLE OF THERMAL MASS FOR A SOLAR PASSIVE DESIGN

SHELL
+
CENTRAL CORE
THE PRINCIPLE OF THERMAL MASS FOR A SOLAR PASSIVE DESIGN

- Insulated north façade
- Glazed south façade
- Insulated roof
- Monk's chapel
- Shell
- Central core

The principle of thermal mass for a solar passive design.
THE PRINCIPLE OF **THERMAL MASS FOR A SOLAR PASSIVE DESIGN**

- **LIGHT ROOF**
- **+**
- **TIMBER/GLASS SHELL**
- **+**
- **CENTRAL CORE**
TRE COMPONENTS / ONE STRUCTURE

TIMBER BEAMS
TRE COMPONENTS / ONE STRUCTURE
LINEAR SEQUENCE OF VOLUMES

NORTH

WEST

EAST

SOUTH
existing situation
school building

SCHOOL BUILDING

EXISTING SITUATION
NEW CHAPEL
AS LINK TO MONASTERY
AMPHITHEATRE
AS LINK TO LOCAL COMMUNITY
COMMUNITY CENTER
TRAINING CENTER AND MEDICAL POST
Playground as space for the school
THE BUILDING
MONK’S CHAPEL
+
SCHOOL
MONK’S CHAPEL
+
SCHOOL
+
COMMUNITY CENTER
MEDIATOR
RADIANT WALLS
FIREPLACES AT THE GROUNDFLOOR
AFTERNOON AT THE FIRST FLOOR
LEISURE SPACE / LIBRARY / TEACHER’S ROOMS
Night at the second floor
Children's bedrooms
BASEMENT
CLASSROOMS FOR COMMUNITY
SEMI-COVERED EXTERIOR

MONK’S CHAPEL + MEDITATION SPACE
FIX PROGRAMMES *INSIDE* THE VOLUMES
ORGANIC LABYRINTH OF SPACES ALL AROUND
INTERIOR CONNECT THE TWO REALMS
WALKABLE PATH / VERANDAH
SCAFFOLDING

EPISODES OF RE-USE
<table>
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<tr>
<th>MONTH</th>
<th>MM OF RAIN</th>
<th>M3 COLLECTED</th>
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<td>JAN</td>
<td>120</td>
<td>91</td>
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<tr>
<td>FEB</td>
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## Water Management

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QUALITIES
EXPLICITNESS

QUALITIES
QUALITIES

MODULARITY
FEASIBILITY

QUALITIES
“HOW DIFFICULT IS FOR US ARCHITECTS [...] TO ACHIEVE A RESULT AS NATURAL AS THAT OF ‘ARCHITECTURE WITHOUT ARCHITECTS’ THAT FARMERS AND MEN OF SEA HAVE ALWAYS BUILT WITH CONTENT UNAWARENESS.”

GIO PONTI
THANK YOU