Alternative Architectural Solutions:

Designing equitable paths to sustainable, climate resilient housing in Devgain, Jharkhand, India

Presentation by Nicole C. Little | University at Buffalo | M. Arch + M.UP Candidate | Travel Duration: January 2018

Project Team:

Amrita Project Guide:

Dr. Anil Kumar Sharma

University at Buffalo Faculty Mentor:

Dr. Korydon Smith

Project Partners:

Thiviya SK

Aswathy G Krishnan

Monish Kalathuru

Pradhipa Lakshminarayanan

Live in Labs Amrita Guides:

Souresh, Soumya

Ammachi Labs Collaborators:

Harish, Kripasagar, Sreevidya

Civil Engineering

Architectural Design

Civil Engineering

Architectural Design

To learn from the vernacular, and inherently smart homes of the village and also cultural lifestyles, using this to inform future construction in the village.


Housing:
Amrita Labs hope to win the design and construction contract for the 50 government homes recently funded for the village.


Housing:
Typical Government homes are protypical concrete homes which are unsustainable, inequitable, and do perform well in this climate.

Background

Rammed Earth History and General Information

Village Familiarization Through Previous Reports in Devgain

Literature

Engineering Technology: Structure and Soils

*Material Science: The Utilization of Recycled Materials in Rammed Earth Construction

Drawings

Architectural Designs

Construction Details

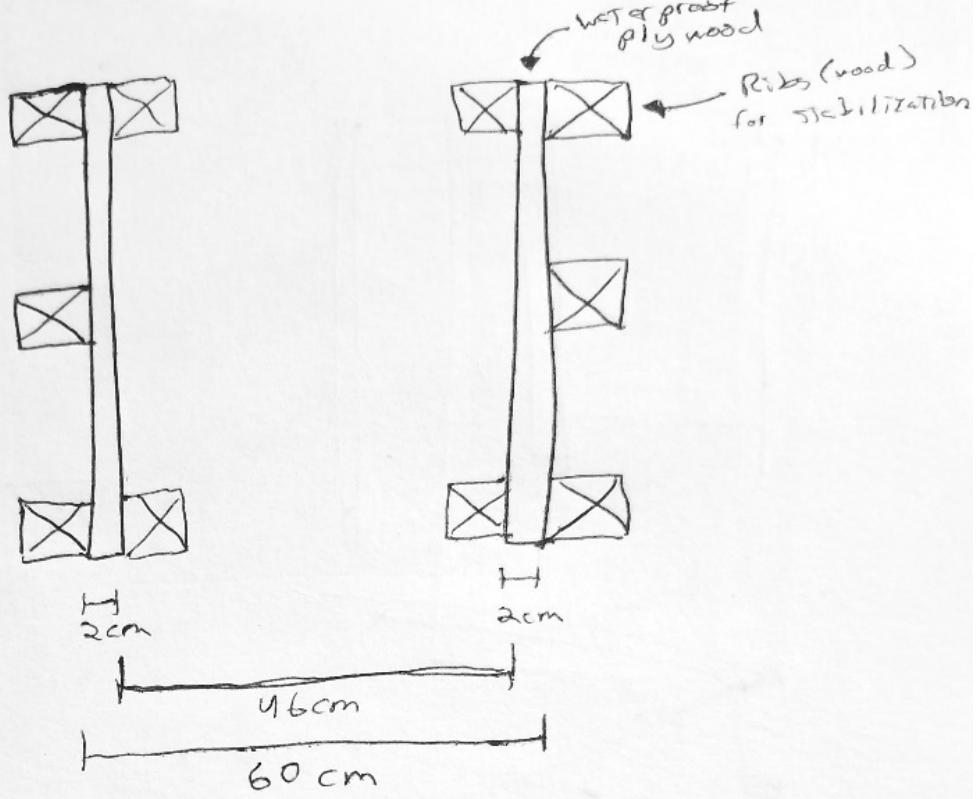
Formwork Design

Climate Responsive Design
in Jharkhand, India

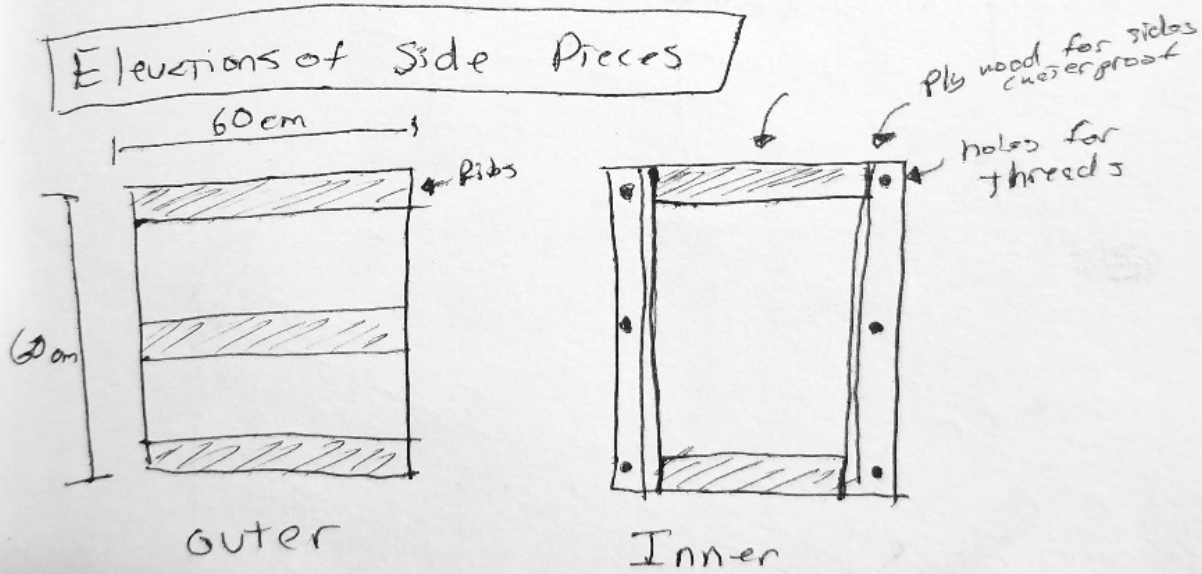
Formwork Design

Designs, Communication, and Fabrication

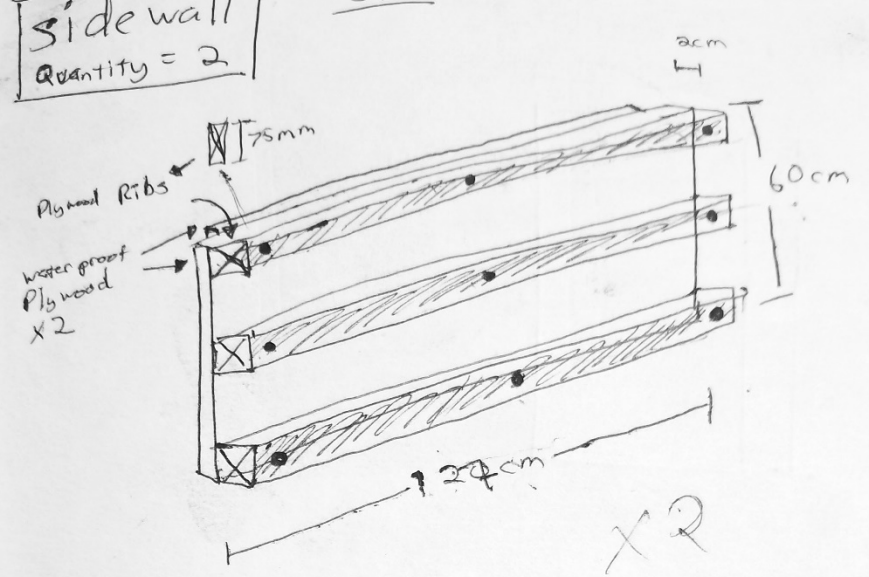
Section



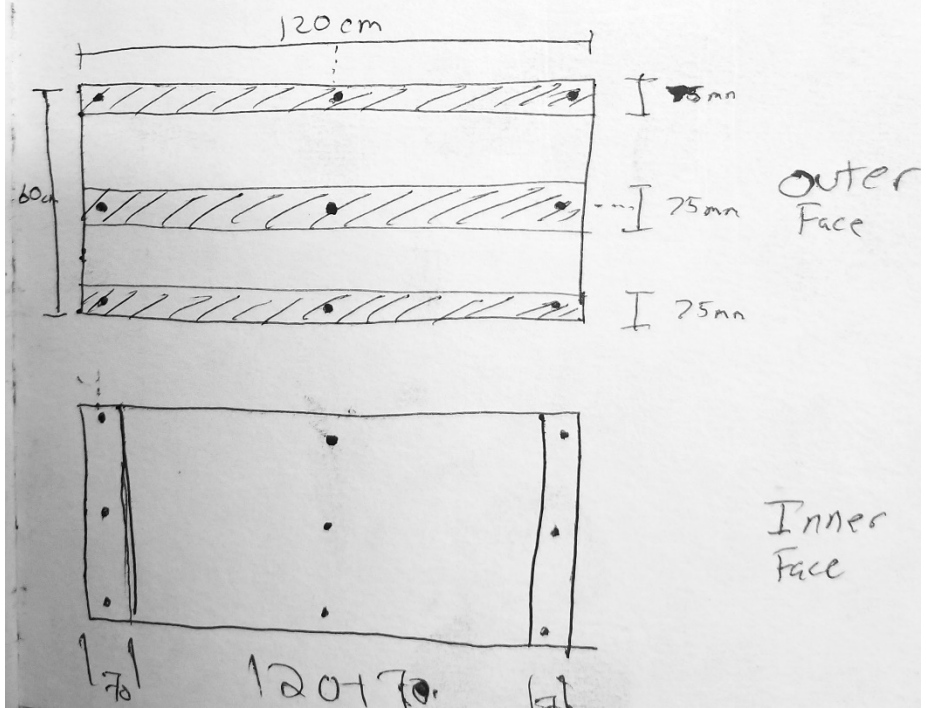
Elevations of Side Pieces

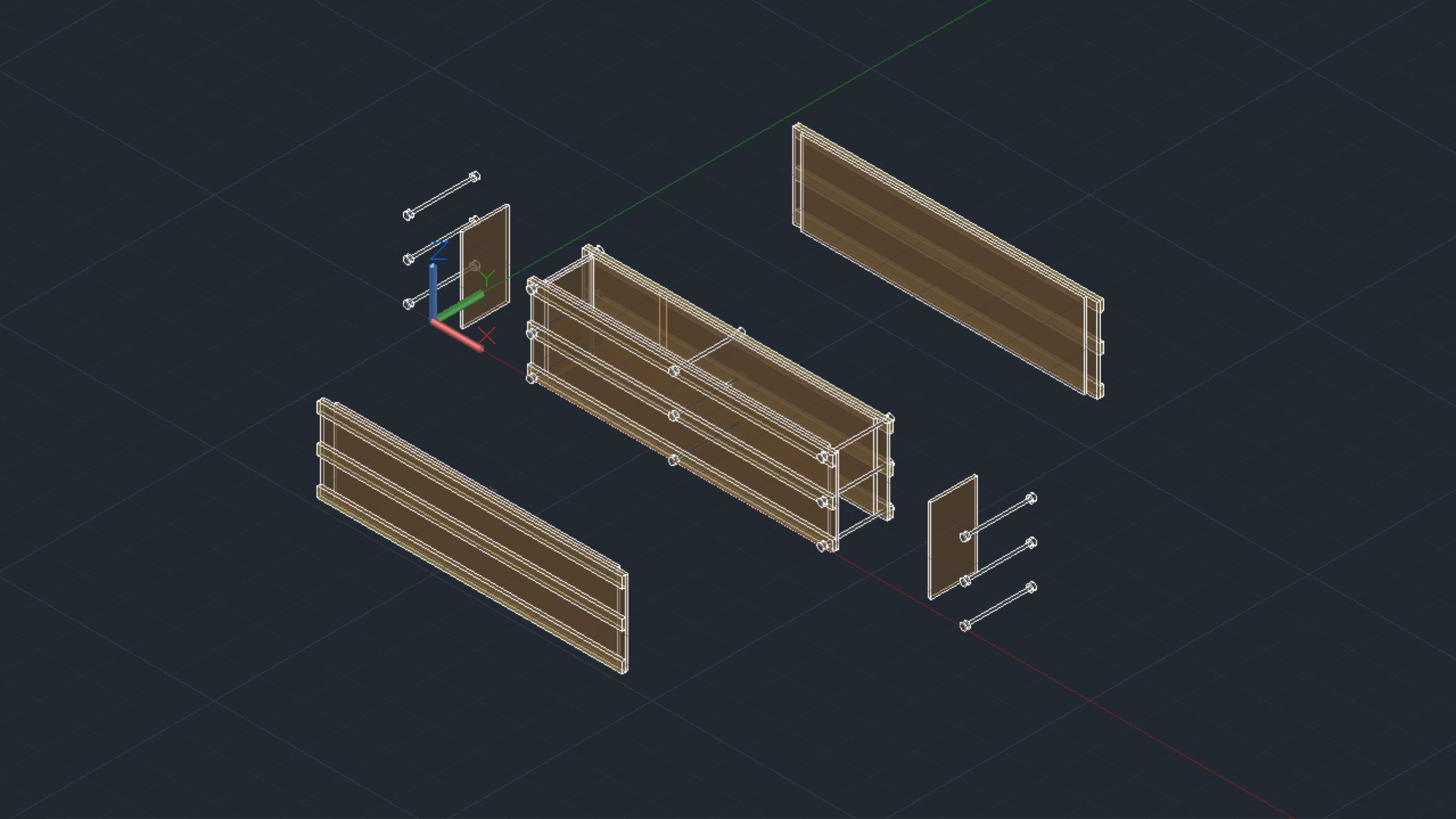


Sidewall
Quantity = 2



Elevations






Environmental Benefits
Social Benefits
Economic Benefits
Health Benefits

Action Plan

Defining Objectives (Survey, Demonstrations, Soil Collection) and Timeline

Mud House

+ Generally Very Happy

+Comfy During Hot Summer Months

+Almost All Materials are Free

- Cold in the Winter

- Clay Tile Roofs Tend to be Leaky

Frequent, Labor Intensive Maintenance

- Termite Issues with Timber Frames

Concrete

+ Warm in Winter

+Minimal Maintenance

- Expensive to Build
- Perception of Wealth
- Very Hot in Summer

Brick Houses

+ Warm in Winter

+Less Maintenance

- Expensive to Build (many incomplete)

- Perception of Wealth

- Very Hot in Summer

Housing:
Amrita Labs hope to win the design and construction contract for the 50 government homes recently funded for the village.

Community Center:
Amrita University itself is funding a Community Center for the village that also doubles as visitor accomodation.

Housing:
Typical Government homes are protypical concrete homes which are unsustainable, inequitable, and do perform well in this climate.

Community Center:
The current meeting space is in bad condition and too small. Current visitor accomodations are in a health clinic and tuiton center which is disruptive to functions on either end.


INDIA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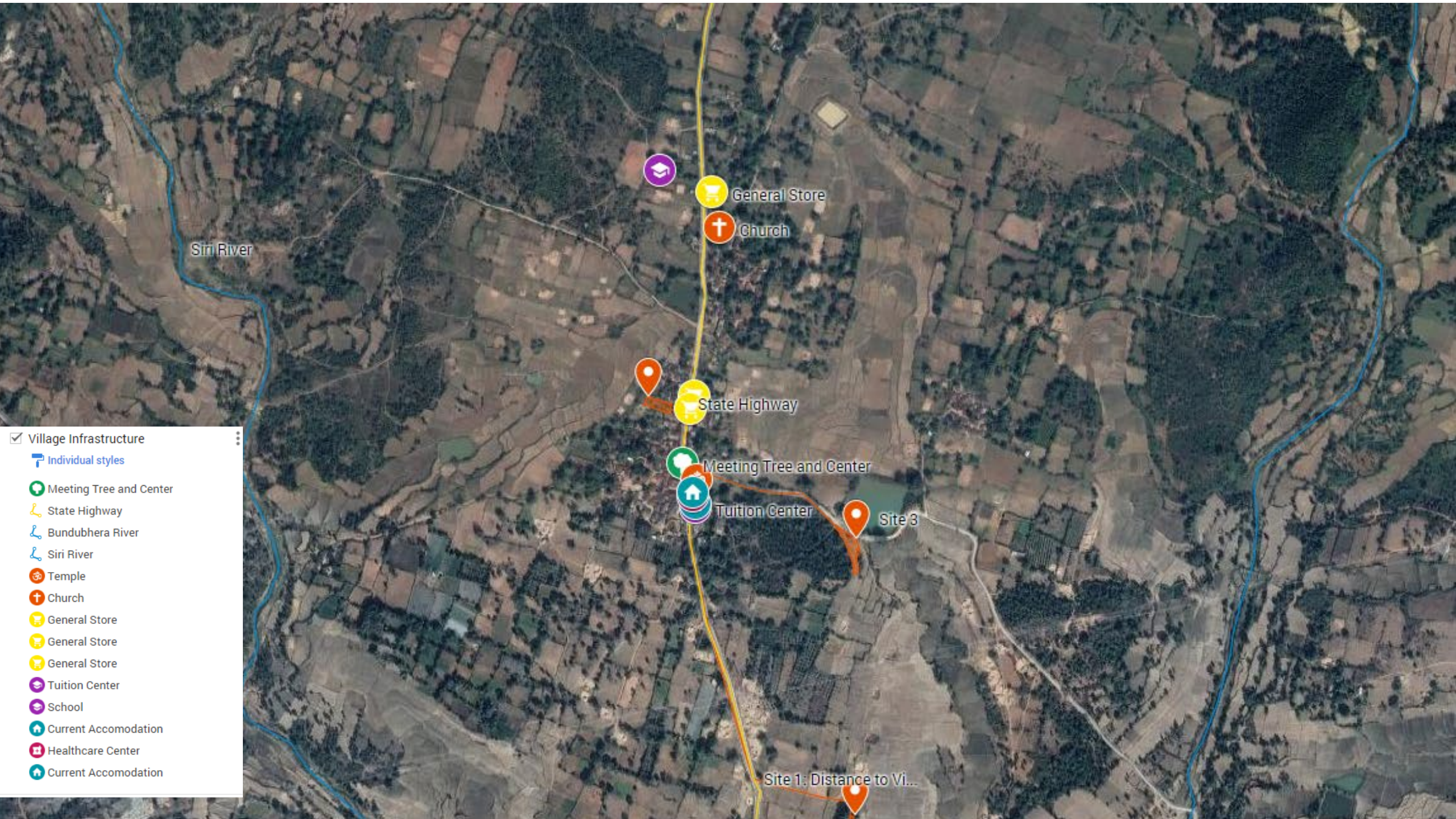
(हड्डी रोग विशेषज्ञ
कुसई, स्टेट बैंक के नि
मो० 923438959


Site 2:
Area: .088 ha
Distance to Village Center: 131m
Site 2
Site 2: Distance to Vi...
Site 3: Distance to Vi...
Site 3
Site 2:
Area: .135 ha
Distance to Village Center: 276m
Site 1:
Area: .01 ha
Distance to Village Center: 749m
Site 1: Distance to Vi...
Site 1


Siri River
General Store
Church
State Highway
Meeting Tree and Center
Tuition Center
Site 3
Site 1: Distance to Vi...
Village Infrastructure
Individual styles
Meeting Tree and Center
State Highway
Bundubhera River
Siri River
Temple
Church
General Store
General Store
General Store
Tuition Center
School
Current Accomodation
Healthcare Center
Current Accomodation


Site 2

Pros (+)

Closest to Village Center

Ample in Size

Closest to Village Amenities
Including General Store and Tea Shop,
Temple and Church

Cohesive Soil

Close to Main Road

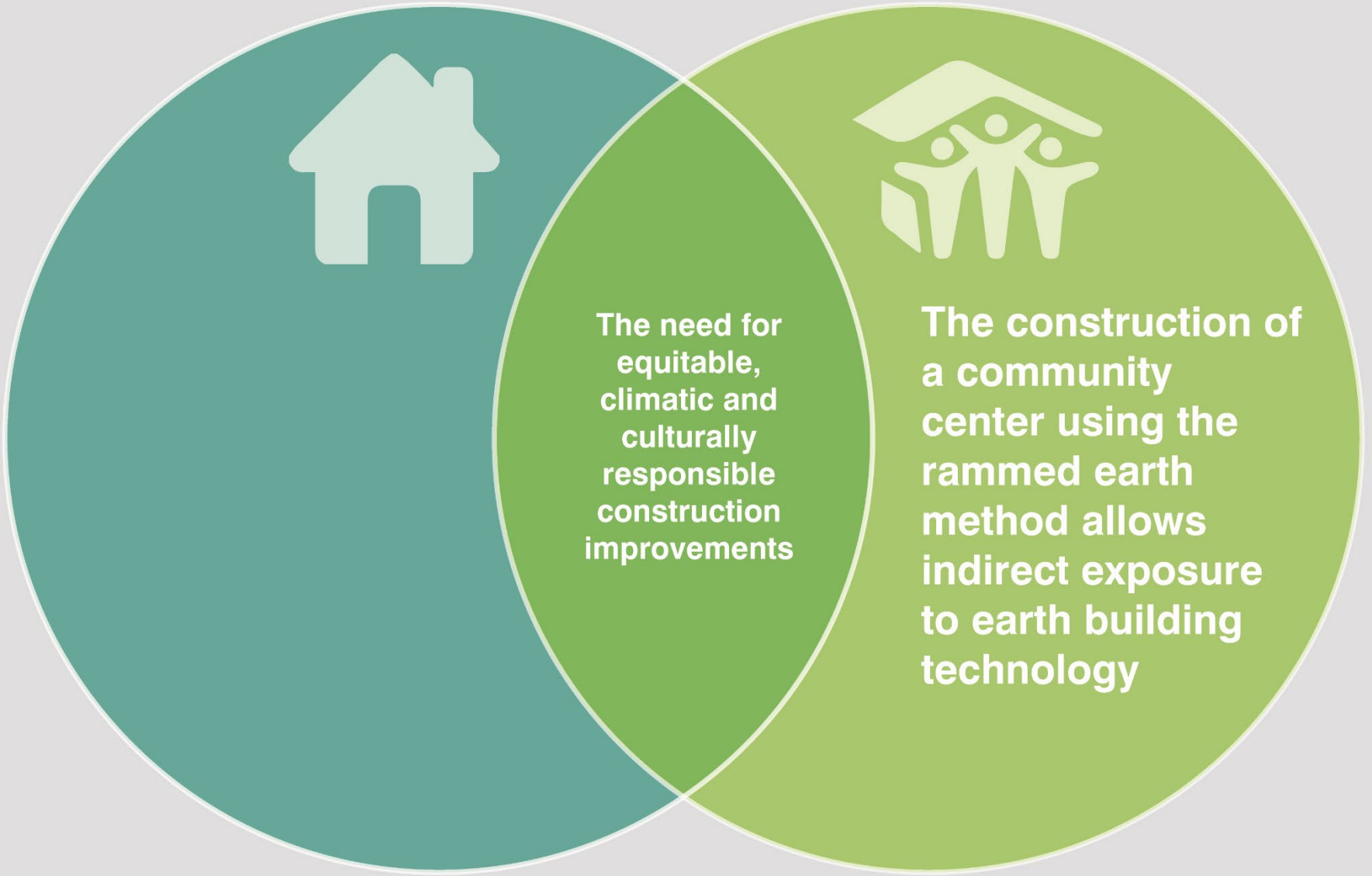
High Density Housing

Cons (-)

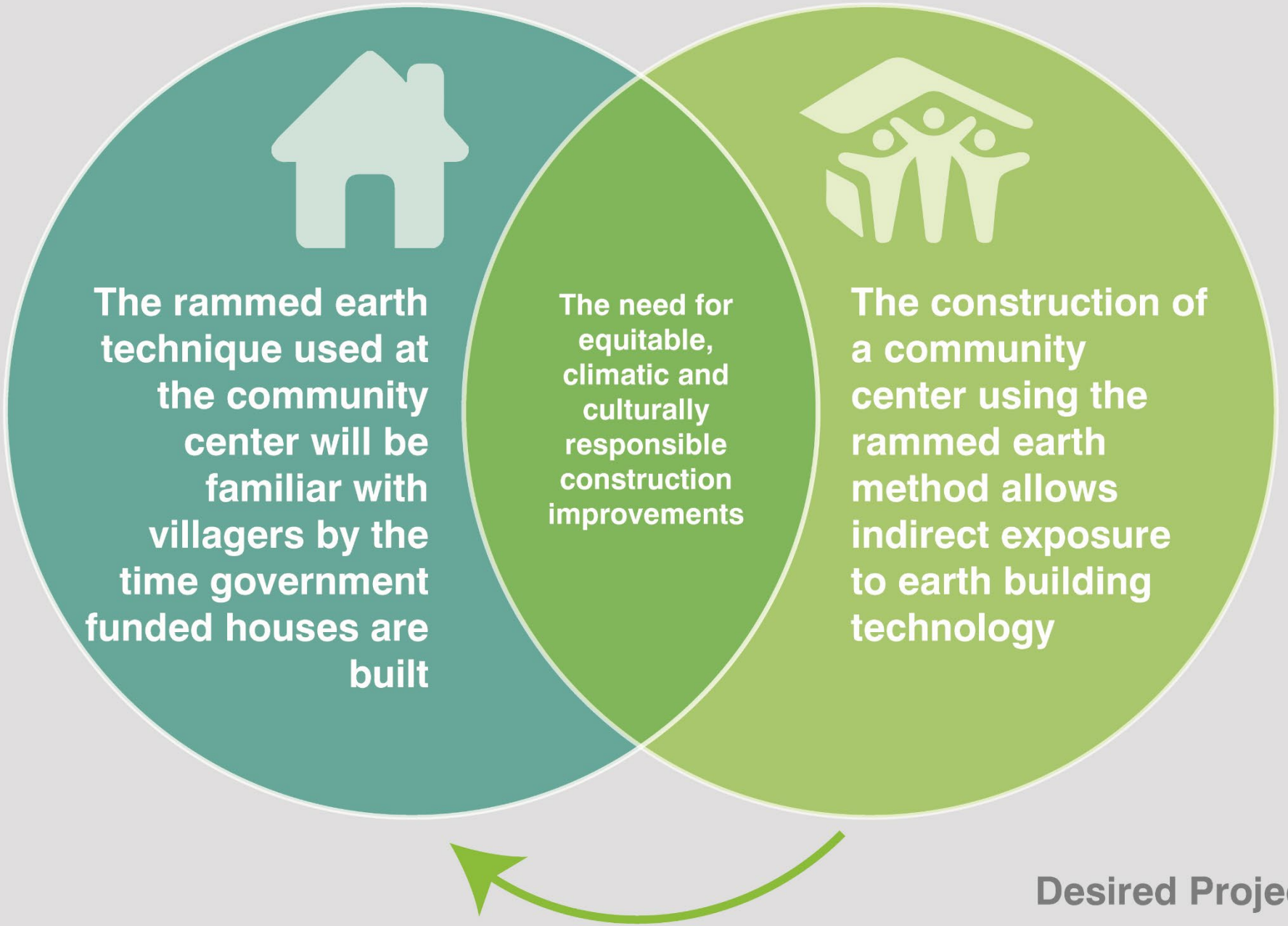
Farthest Distance to Water Source
(100m to well)

Least Amount of Privacy

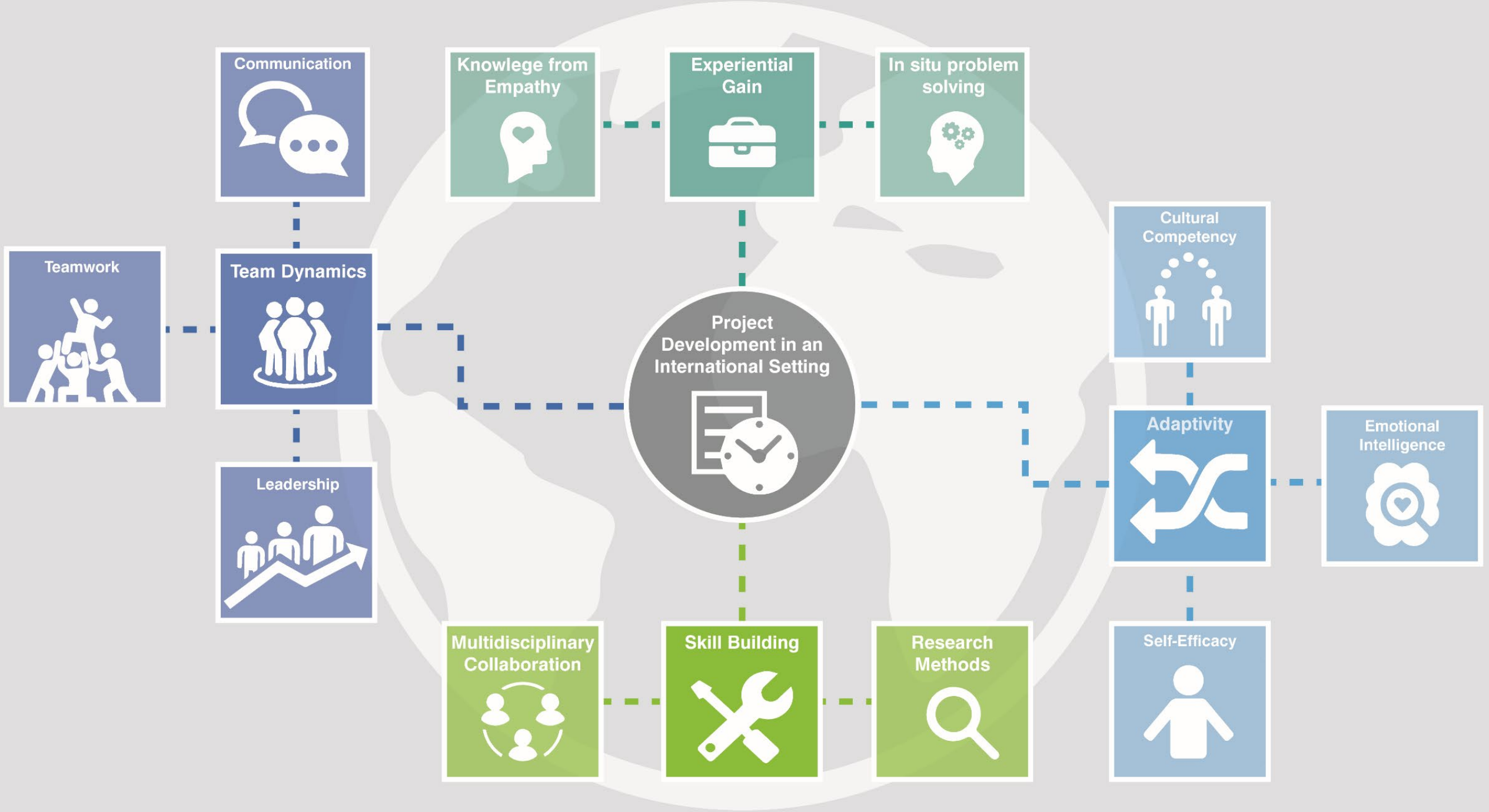
Overall Project Basis

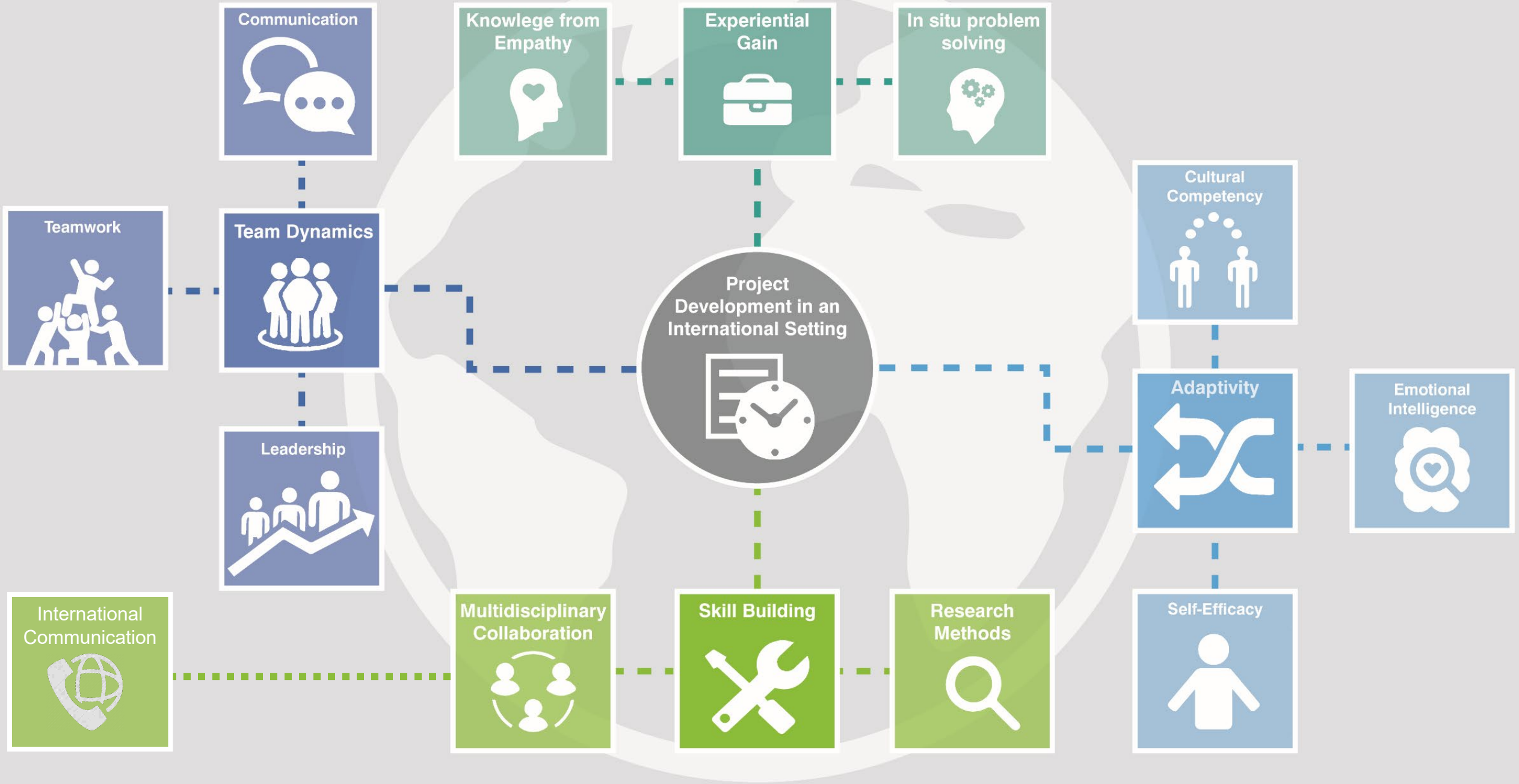


Project Concept



Desired Project Outcomes


Communication
Knowlege from Empathy
Experiential Gain
In situ problem solving
Teamwork
Team Dynamics
Project Development in an International Setting
Cultural Competency
Leadership
Adaptivity
Emotional Intelligence
Multidisciplinary Collaboration
Skill Building
Research Methods
Self-Efficacy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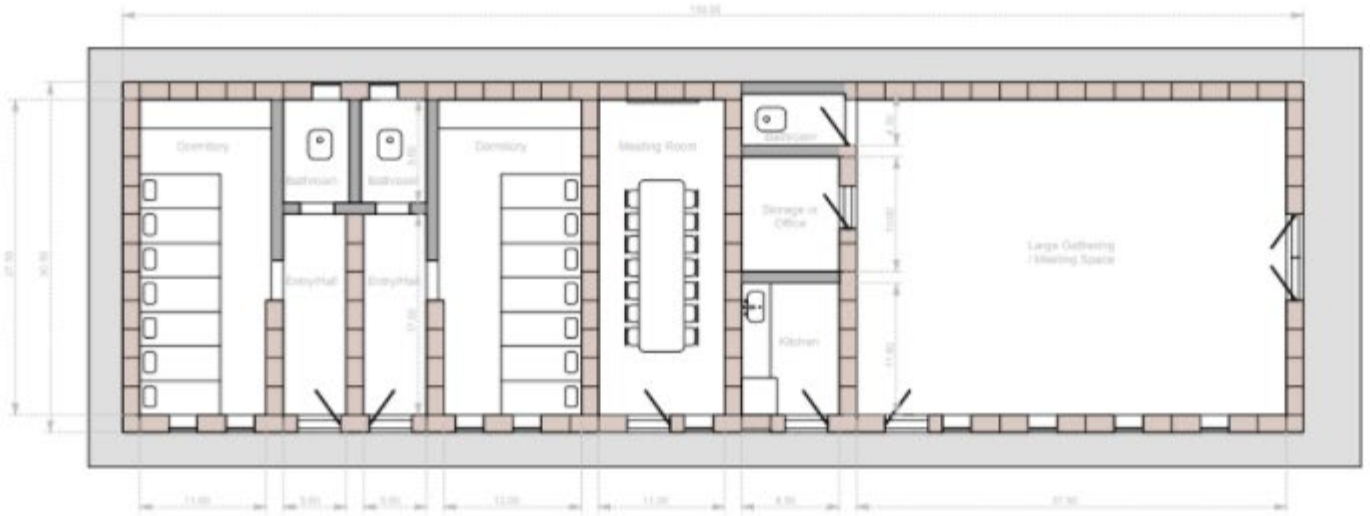
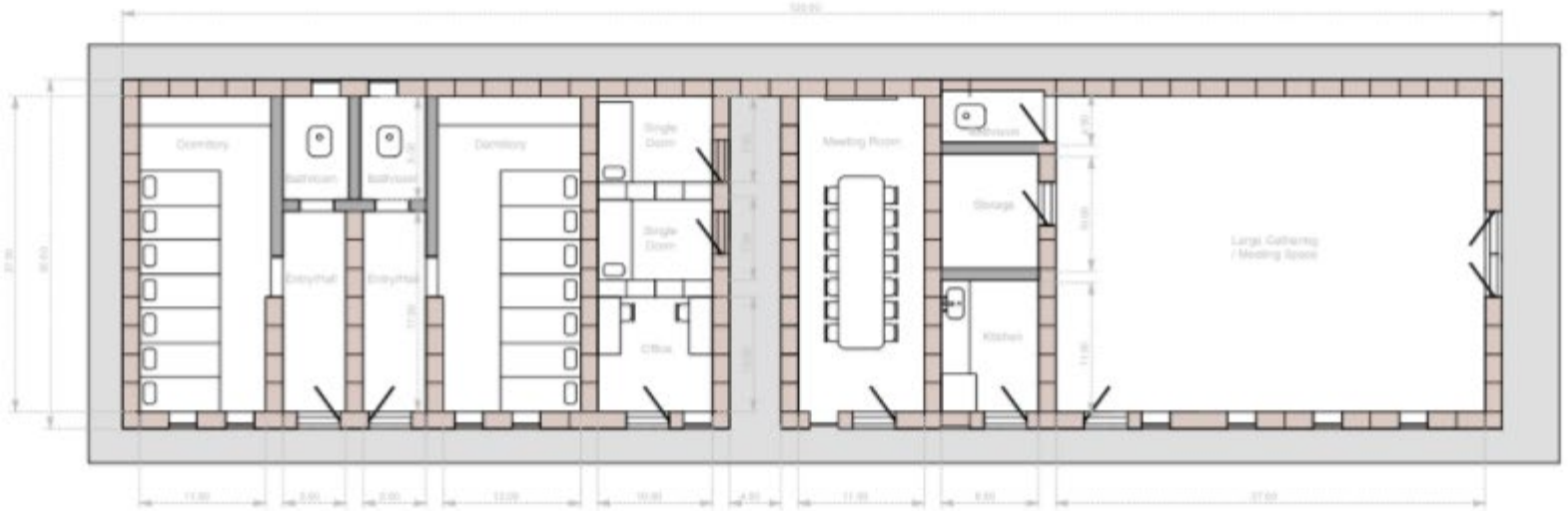
Plans

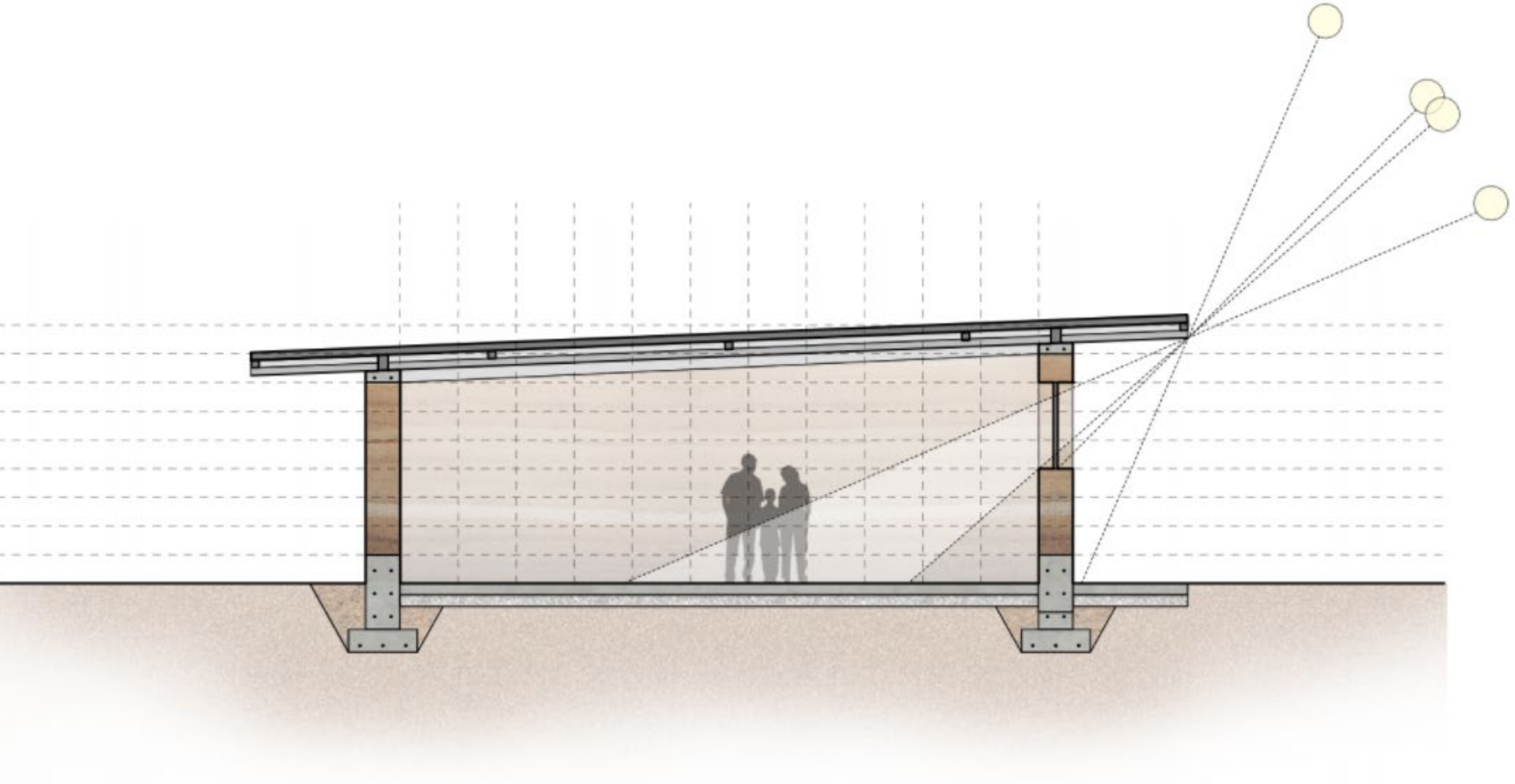


Full Build - Option A



Full Build - Option B

Section



Interior

Exterior


GEOTECHNICAL ENGINEERING
LABORATORY


मेरा नाम शान्ति है...और
"मुझे विश्वास है कि मेरा पानी स्वच्छ है"
क्या आप का भी है?


WHO2WON


MATA AMRITANANDAMAYI MATH

Thank you LILA and UB CGHE for an incredible learning experience!

Questions?