SDG7 AND SUSTAINABLE BUILT ENVIRONMENTS

ENERGY OPTIMISED, INCLUSIVE, PRODUCTIVE AND HEALTHY SPACES FOR MARGINALISED COMMUNITIES







SELCO Foundation | August 2022

Criticality of Built Environments

Raising temperatures

Disasters that are frequent with increased intensities

Building systems are inefficient and not resilient

Build materials and construction techniques not adaptive

Poor mitigation of indoor air pollution and heat from active sources

Uncomfortable indoor conditions

High cost to cooling and other energy needs

Recurring costs for repairs and renovation

High expenditures for healthcare and reduced days of productivity

Approach of SDG7 enabled Built Environments

Energy Optimisation

Sustainable Energy

Sustainable Built Environments

Better Health and Wellbeing

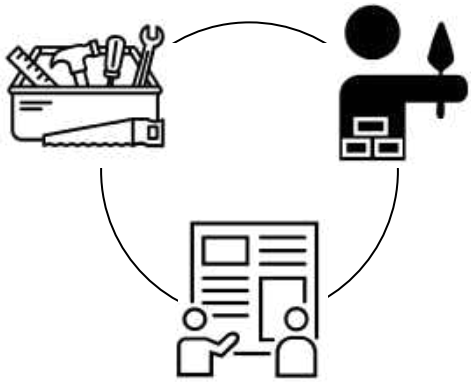
Productivity Increase

Reduced Operational costs

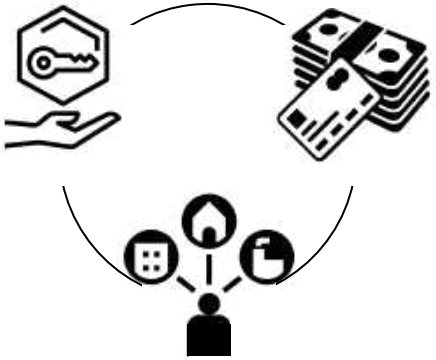
Aspirational

Design and Technology as a catalyst combined with appropriate capital, training, linkages and policy environment

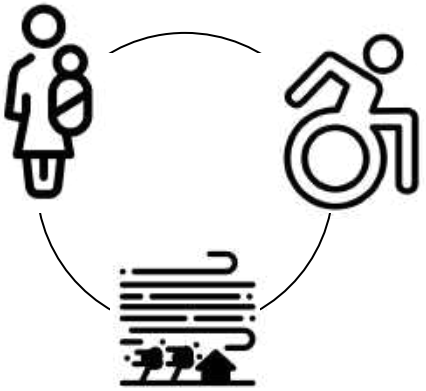
Ecosystem for Built Environments



Integrated Built Environments –Contextualised in Layouts, Materials, Construction Methodology



End User Financing – Inclusive, Patient, Flexible and Accessible



Socio-cultural considerations - Customisation based on participatory inputs for typology and segmentations

Focused Sectors

Seen: Construction Worker Housing in Bengaluru, KA

Seen: Cool roofing integrated with Task lighting for home based tailors, KA

Seen: Village level Clinics in heat stressed communities, KA

Housing and Shelter
Across tenure type (displaced to permanent), climate and disaster resilience for urban and remote contexts

Workspaces
Micro-businesses, animal husbandry, handicraft and agricultural built workspaces focused on increasing productivity, income, savings, resilience and aspirations

Public Institutions
Healthcare, Day-care, educational spaces, rural infrastructure like libraries, kitchens, community halls etc for resilient and long term assets for community

Housing and Shelter

Across tenure type (displaced to permanent) for urban and remote contexts

Increased Heat Stress (and Cold Stress) due to use of Unsustainable Materials

Heat trapping materials

Lack of proper ventilation

Cooking and other activities also increase indoor heat stress and air pollution with lack of ventilation

Lack of Access to Reliable Energy

Increased power-cuts in summers and monsoons.

Voltage fluctuations disallowing use of critical cooling appliances

Poor access to Inclusive Financing and Conducive Subsidies

Groups with no security of land require access to affordable housing subsidized by government or private employers

Few long term, low interest, high risk loan portfolios for large capital investments of resilient housing or cool roofing solutions

100+ Built
10 Lakhs+ Powered

Housing and Shelter

Across tenure type (displaced to permanent) for urban and remote contexts

Solution Matrix

A. Improved **(Cool) Roofing**

- Surface finishes
- Insulated Panels
- Improved Slabs

B. Complete **New construction or Upgrades** for Energy Optimisation & Climate Resilience

- Homes (Portable and Permanent)
- Home based workspaces

C. Efficient Equipment & **Sustainable Energy Integration**

- Lighting and Fans
- Air conditioning and active cooling
- Others – Water, Cooking etc

Productive Workspaces

Across Micro-businesses, animal husbandry, handicraft and agricultural

Loss of Health and Wellbeing

Excessive heat or cold stress

Increased indoor air pollution where active heat sources like forges, kilns etc

Extreme drudgery due to poor ergonomics, manual labour and inefficient layout or poor lighting

Hazardous conditions resulting in injuries

Loss of Productivity

Hours and days lost due to extreme temperatures worsened by poor infrastructure

Production reduction due to spoilage and damages caused by ad-hoc storage

In livestock, increased mortality rates and production loss

Loss of Income

Recurring repairs and upgrades in built environment

Increased cost due to energy inefficiencies

Increased expenditure to safeguard against losses

Income loss due to health and productivity

100+ Built

Productive Workspaces

Across Micro-businesses, animal husbandry, handicraft and agricultural

Solution Matrix

A. Optimal Natural Light and Thermal Comfort

B. Efficient Layouts and Ergonomics for Work

With Branding and Signages for Optimal Footfall

C. Efficient Heating and Mechanised Appliances Integrated with Clean Energy

D. Disaster Resilience and Futuristic in Design and Application







Public Institutions

Across Healthcare

Lack of and Gaps in Infrastructure

50% of all health centres are yet to be set up

Guidelines for setting up energy optimised centres are nascent and need to be developed into training modules for every level of governance

Wellbeing and Productivity of Medical Staff

Lack of access to basic services increase drudgery of staff

Cold and Heat stress decrease wellbeing in staff

Recurring repairs and energy gaps further affect staff productivity

Not inclusive to climate, community, cultures

Health centres are rarely designed with climate and local construction practices

Lack of community ownership in maintenance, repair and upkeep

Universal accessibility features like ramps, grab bars etc. are not considered as part of the centre design affecting access

Public Institutions

Across Healthcare

20+ Built
100
under-construction

Solution Matrix

A. General Care Facilities

for last mile services at village, block, district levels

B. Maternal and Child Care Facilities

for Delivery, Pre-natal waiting rooms etc

C. Speciality Care for Cancer, TB, Eye-care etc

for Consultations, Recovery, Palliative Care

D. Pandemic and Emergencies Health Infrastructure

Portable and Quick to Deploy during Emergencies

Other Public Institutions

Day-care, educational spaces, rural infrastructure like libraries, kitchens, community halls etc.



Bridge Schools, Anganwadis, Community Centres

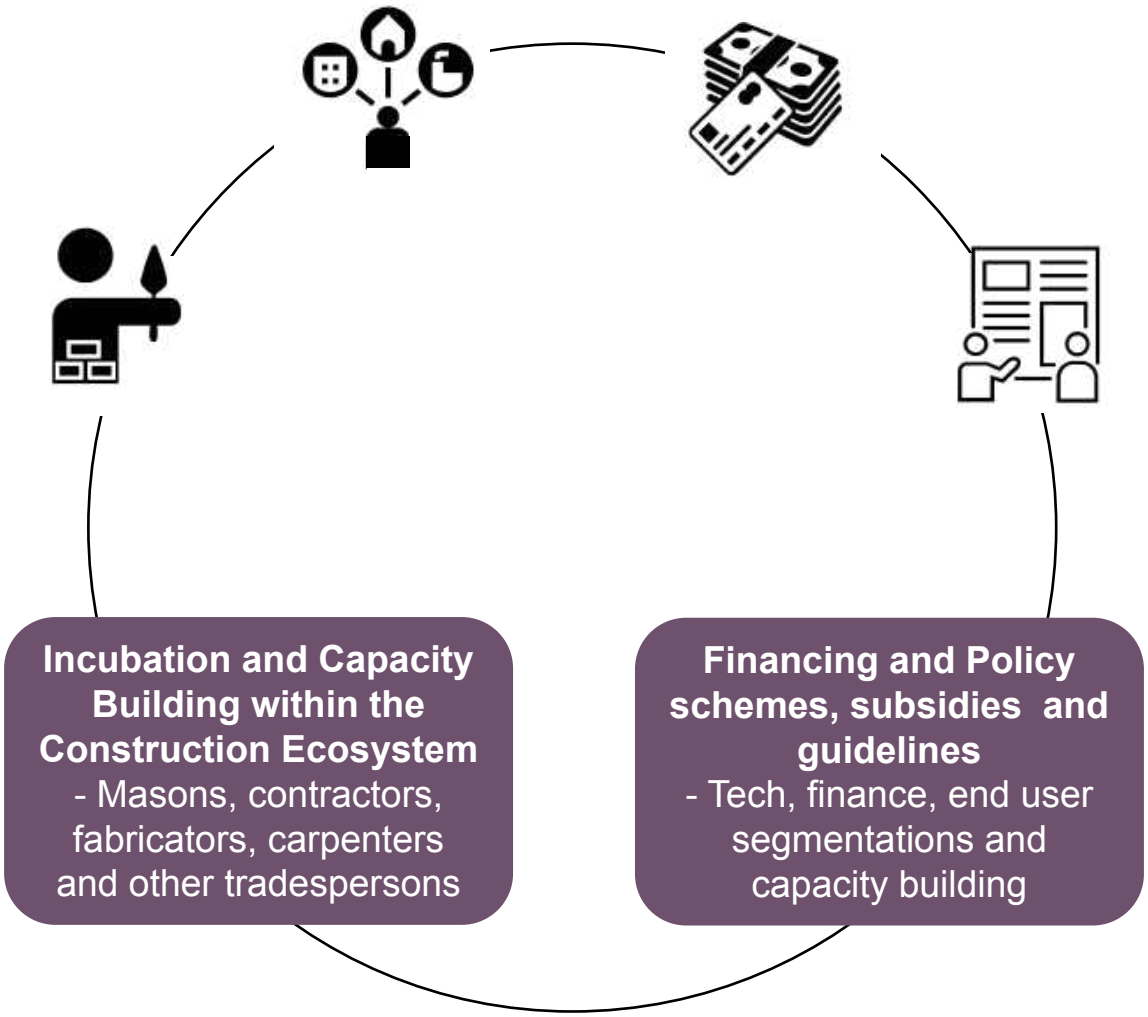
Before

After




Bridge Schools in Bangalore, KA | Anganwadi in TN | Community Kitchens in KA, Library and AV Rooms in Manipur

Phase 2: Ecosystem for Built Environments




SELCO FOUNDATION
WORK AT 45°C
DESIGN FOR DIGNIFIED WORK
The roof accounts for 70% of heat gain in a building, making it a critical element of intervention for designing heat-resilient structures.
Webpage For Resources
Video Playlist