



Left. Original living conditions.

Below. Map of Sindh province, Pakistan.



VISION

PROMOTING SOCIALLY JUST ECO ARCHITECTURE FOR DRR-COMPLIANT UNIVERSAL SHELTER.

MISSION

TO FOSTER A SPIRIT OF ENTERPRISE AMONG POOR HOUSEHOLDS TO ATTAIN A BETTER QUALITY OF LIFE BY REPLACING THE CYCLE OF DEPENDENCY WITH A CULTURE OF SELF RELIANCE.

INTRODUCTION

The work on Green Shelters project was taken up in January 2018. **7 villages** located in Mirpur Khas, Tando Allahyar and Thatta districts and **8 villages** in Makli were targeted. The 8 Makli villages are largely populated by mendicant (beggar) communities that are the poorest of the poor. They have been surviving due to the alms collected from shrines and meagre portions distributed from their soup kitchens. These villages are located in the vicinity of Makli World Heritage - a spectacular site carrying lofty structures profusely ornamented with stone carvings and scintillating glazed tiles (kashi).

The basis is the creation of a holistic model with a rights based approach, designed within the framework of Lari's Barefoot Architecture that incorporates zero carbon affordable shelters and other basic facilities for marginalized communities. The project stems from large-scale Disaster Risk Reduction (DRR)-compliant development carried out by HF in seismic- and flood-affected areas since 2005 along with the completion of over 40,000 zero carbon shelters in collaboration with IOM.

The project envisages the use of Lari OctaGreen (LOG), a prefabricated green construction technique that allows quick assembly and ease of transportation for shelters and other structures. These are non-engineered structures that have been successfully tested in disaster prone areas using zero/low carbon sustainable materials i.e. bamboo, mud and lime.



Original makeshift shelter.



Survival in tents.



Original destitute living.



Silhouette of Makli Necropolis from east. Courtesy: Suhail Zaheer Lari Collection.



METHODOLOGY

The holistic model is based on provision of LOG (12'0" octagonal shelter), eco-toilet (shared by 2 families), water hand pump (shared by 6 families), earthen Pakistan Chulah and a women's centre. These are gifts but are not free - in return each household is required to provide one month's voluntary work for community benefit and environmental improvement.

This low cost integrated approach has achieved remarkable results with investment of only Rs. 30,000 (US\$260) per household.

Among the most important activities was the setting up of the central Zero Carbon Cultural Centre (ZC3), a large hangar-like structure size 57'x80'x 37' high in order to facilitate the following:

- Bamboo construction workshop for training of mendicant communities.
- Ease of access by women to work in crafts workshops and livelihood trainings.
- Conducting ParhoPakistan (Read Pakistan) digital reading program for children and women.
- Trainings for Barefoot Entrepreneurs programs – trained workforce that provides guidance at a small fee to grantees.
- Watch and learn workshops for grantees.
- Elevated stage for public assemblies particularly women and children.
- Display of demonstration units and plantation procedures.

CHALLENGES

- Negotiations with landlords to allow the landless to build.
- = Insufficient space for building. Once the area was cleared of debris, garbage and hazardous scrub boundary walls, substantial area became available for building.
- = Initial lack of funds to finish off the structures. This was overcome by income generation through newly acquired skills.

Zero Carbon Cultural Centre (ZC3) provides a large space for community's usage.



Women's Makli Commune pavilions inside ZC3.



Community assemblies and trainings in ZC3.



HF/PCATP/INTBAU Pak Zero Carbon Workshop for student volunteers.



Village street created with new shelters for dignified living.

OUTCOME

By acquiring dignified living conditions, a desire has emerged among the one time beggars to seek productive employment. After finishing their structures, entire villages have been cleared of age-old garbage and debris. Hazard-free environment has been achieved by raising the plinths and dry scrub boundaries replaced with bamboo and reed walls. The villages are being kept clean, and extensive tree plantation has been taken up.

Men and women are striving to find productive work and are eagerly taking up livelihood opportunities being offered to them – from the production of glazed tiles to growing hydroponic fodder.

The ParhoPakistan (ReadPakistan) program on the big screen in ZC3 is imparting digital sight reading to all, encouraging out-of-school children to enrol in formal school system. There is a long waiting list of out-of-school children who would like to join. Many of registered children also arrive in the morning and wait for the class to start. Similarly, since a computer lab with 5 computers has been set up, youth from the surrounding area have also started to come to ZC3. For them a playground is being developed with sports courts for the youth and small playground for the children. Additionally, crafts are being taken up for children consisting of clay sculpting, newspaper papiermache, string and balloon crafts etc.

MAKLI'S OLD MENDICANTS ARE FINALLY FINDING WAYS TO LIVE WITH DIGNITY AND SELF RESPECT.



Neat and orderly line of new shelters.



Rhythm of new shelters overlooking marshy area.



Under construction shelters.

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Creating new semi urban landscape.

LOG (LARI OCTAGREEN) SHELTERS

Cost: Rs. 15,000 (US\$130.5) per family

650
Shelters

Prefabricated bamboo panels with cross bracing are bolted together to make a strong octagonal form. Walls with matting infill are treated by women using mud/lime plaster. The conical roofs are neatly thatched to provide safety from rain at the same time maintain air flow for cooling. Even during intensely hot weather, the structure, inspired from vernacular traditions of the northern dhijji (cross bracing) and Thar desert conical roof, remains cool without requiring mechanical ventilation.



A well decorated shelter, showing pride and ownership.



Clean orderly lifestyle and a life of dignity.



Creation of loft inside the shelter to expand useable space.

GREEN ECO-TOILETS

Cost: Rs. 7,500 (US\$65.2) per family

325
Toilets

Prefabricated bamboo panels with cross bracing are utilized to make the toilet cubicle which is similar in construction to LOG. Toilets are fitted with a pan to receive liquids and a WC seat and cover over a pit containing a bucket to receive solid human waste. This allows the periodic removal of waste for making organic compost, which when sold is a source of regular income. The shower area is treated with 4"x4" glazed tiles fabricated by Women's Makli Commune at Rs. 10 per tile, affordable by most villagers.



Structure of eco-toilet.



A highly decorated eco-toilet



Interior view showing liquid pan, cover with seat, and shower space.

RAISED EARTHEN PLATFORM WATER PUMPS

Cost: Rs. 1,500 (US\$13) per family

215
Pumps

Raised water pumps are designed on earth/lime platforms in order that drinking water is available even during flooding. The platforms are designed in two levels separating clothes washing platform from the one used to procure water for drinking. Water, being a basic human need, the installation of water hand pumps has led to improved hygiene and health for women and children and helped large-scale plantation in an otherwise barren landscape.



Water pump in use.



A highly decorated water pump to demonstrate distinctiveness.



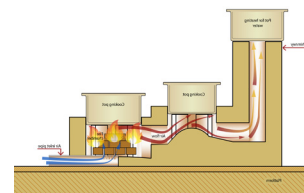
DRR-compliant elevated water pump accessible during floods.

ZERO CARBON FUEL EFFICIENT PAKISTAN CHULAH

Cost: Rs. 1,000 (US\$9) per family

600
Stoves

The self built low cost earthen Pakistan Chulah comprises double stove combustion chambers, chimney, air regulation pipe, utensils storage, and washing area. The chimney ensures minimal smoke and thus curtails any health hazard for the users. The earthen platform raised above the surrounding dirty environment leads to improved hygiene management and a clean dining space for the family. Over 50,000 no-cost stoves have been built by Chulah Barefoot Entrepreneurs.



Section showing technical details.



Sketch showing arrangement..

COMPARISON WITH OPEN FLOOR-MOUNTED SINGLE STOVE

- Can reduce fuel consumption by over 50% for 2.7 billion people.
- Can annually prevent 3.5 million deaths of women and children.
- Reduces time for cooking by 75%.
- Provides dignity to women.
- Provides low-cost dining space for marginalized sections.
- Provides a hygienic environment for improved children's health.
- Provides a social congregation space.
- Allows self building leading to unique designer stoves expressing creativity and pride.



Self built earthen Pakistan Chulah, a family dining and socializing place.

Community WOMEN'S CENTRES

Cost: Rs. 5,000 (US\$43) per family

8
Centres

These centres have been built in collaboration with the community, who have participated in their assembly and finishing. The colourful needlework patchwork (rilli) coverings have been contributed by women of the village. The centres provide assembly spaces for women, at the same time trainings are arranged for income generation activities. Wherever there is demand, the centres are being equipped with sewing machines.



Women's training in progress.



Tayyaba Jamiluddin Aali Women's Centre.



Interior view.

GREEN LIVELIHOODS BAMBOO WORKSHOP

43
Men

The setting up of bamboo workshop in ZC3 has provided the venue for large-scale training for bamboo products. On the one hand, those trained in fabrication of bamboo panels for shelters and eco toilets have got regular employment, while many others have started their own enterprise after learning simple techniques of making inexpensive bamboo furniture. All bamboo material is provided free of charge, in order that the products may be marketed at the lowest prices. This has helped many of the mendicants to begin earning by marketing simple furniture items to the proud owners of newly built shelters who had never possessed any furniture before at affordable price of Rs. 300-500 (US\$2.60 to US\$4.3).



The bamboo workshop in ZC3 for production of LOG & other items.



Bamboo bench.



Bamboo tables.



Water stand for water treatment.



Bamboo waste/trash bin.

PLANTATION BY COMMUNITY

2600
Trees

514
Bushes

TOTAL IN 6 COMMUNITY FORESTS

Banana	192
Morenga	180
Gul mohar.....	144
Jaman	18
Neem	24
Peepal	24
Khacha	96
Biris	96
Mango	72
Guava	150
Kaneelar	144
Papaya	132
Falsa	120
Buk chao	120

TREES 1512

Nazboo	72
Tulsi	72
Coriander	120
Phitti	120

BUSHES 384

TOTAL PLANTATION IN HOUSES & STREET

Banana	350
Morenga	580
Gul mohar.....	58
Euclyptus	100

TREES 1088

Nazboo	130
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BUSHES 130



Tree plantation on roadside by communities.

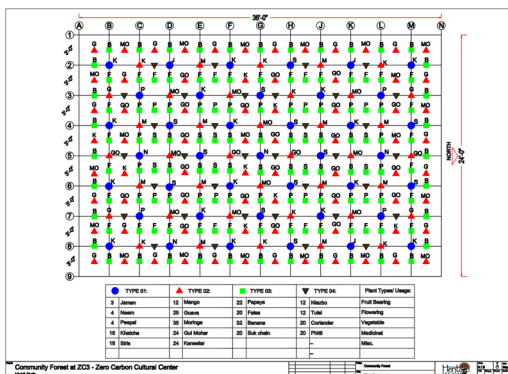


Women and children equally involved in plantation.

COMMUNITY FORESTS 24'X36' WITH 300+ NATIVE SAPLINGS

6
Villages

Miyawaki-style community forests are being planted in various villages. Most of the land was considered barren due to salinity in the soil. However, since the entire lot is excavated to a depth of 3' and the soil replaced with a mix of new soil, agricultural waste and organic compost, the saplings are doing well. The first forest was planted on 11 March and has survived well. More forests have been planted by the community itself under supervision and with saplings and other material provided to them.



Drawing showing location of over 300 plants in 24'x36' area.



View of first community forest planted on 11 March 2018.



View of the same community forest on 23 May 2018.

ENTERPRISES CERAMIC ORNAMENTS

**10
WOMEN**

Led by Kareema, the production of ceramic ornaments has proved to be a great source of livelihood. She is able to market the jewellery and other items to the devotees who flock various shrines that are located on the periphery of Makli WH. The mendicant women are trained by master artisans specialising in ceramics and taught about entire production process of preparing of clay and moulds, and finishing to ensure good quality products. Kareema markets these items where she earlier used to seek alms.



Once mendicants, now highly skilled glazed ceramic artisans.



ENTERPRISES CLAY PRODUCTS

**15
WOMEN**

After a great deal of effort, low cost firing techniques have met with success making glazed tiles and terracotta products highly affordable for marginalized sections. The production of patterned, plain and decorative tiles (Rs. 10 for glazed, Rs. 5 for terracotta) by training mendicant women has opened up a host of opportunities for income generation. These and other household ceramic products have become hugely popular with an ever-growing market.



Clay artisans working in ZC3 as part of Women's Makli Commune.



Packaging.



Once mendicants, now highly skilled clay craftspeople.

ENTERPRISES RECYCLED FOOTWEAR

5
Women

A recent addition to women's enterprises is the fabrication of sandals from recycled tyres and denim from old jeans. Since footwear is expensive most people and particularly children walk barefoot. Thus, a huge market for affordable footwear exists. A local cobbler was given the task of training women. The sandals are being sold for children (Rs. 50) and adults (Rs. 100). The addition of beadwork by local women adds value (Rs. 150).



Footwear workshop in Women's Makli Commune in ZC3.



Fabricating affordable footwear from recycled materials.

ENTERPRISES Using WATERPUMPS

20
Families

Since potable water is now available to the communities, households are being encouraged to grow plants, vegetables and fodder. Green fodder being particularly suitable for income generation in a land that, due to the salinity in the soil and lack of water sources, is parched and without much output. It became clear that in addition to other plantation, the production of fodder by different means provides an enormous livelihood opportunity. This can be taken up by many families in order that they could have a small, but regular source of income.

Two different kinds of methodologies are being utilized:

1. Making simple tanks by excavating, placing tarpaulin and filling it with water. The Azolla fern is growing fast and sold as highly nutritious cattle and fish feed.
2. Making green hydroponic fodder requires comparatively little water and can be grown by almost all households. A system of sprouting by fodder entrepreneurs has been developed, which is taken in trays by households who nurture it by watering and selling through fodder entrepreneurs.



Azolla being grown in tanks for cattle and fish feed.



Hydroponics green fodder grown from corn.

LITERACY ReadPAKISTAN CENTRE

50
Children

It is estimated that there are approximately 200 out-of-school children in the area. HF's ParhoPakistan (ReadPakistan) program provides sight reading through a digital learning platform. This provides recognition of 150 Urdu and English words and 100 numerals in 15 segments. The program is beamed on a large screen in ZC3 which is watched by children and their mothers. 50 registered children have received uniforms which has added enormously to their self confidence. The waiting list is long; however, after 3 months as the first batch is sent to attend the state school, another 50 will be inducted into the program and so on. With water pumps available, they have begun to make an effort to be neat and clean, brushed teeth and clipped nails. The transformation is a wonder to watch.



State of children when they first joined ParhoPakistan program.



(Above). Brimming with confidence as they learn to read and write.

ENTREPRENEUR TRAINING FOR LIVELIHOODS



Kareema
Makli



Jaari
Makli



Shabana
Makli



Shaina
Makli



Shakeela
Makli



Shareefa
Makli



Shairbanoo
Makli



Humera
Makli



Hoor
Makli



Saima
Makli



Sameena
Makli



Maherbi
Makli



Popri
Makli



Shareefa
Makli



Shibli
Makli



Sakeena
Makli



Kandaree
Makli



Mevi
Makli



Sajna
Makli



Hoor
Makli



Sajna
Mirpurkhas



Shanti
Mirpurkhas

Shanti
Mirpurkhas



Juma
Makli



Rasheed
Makli



M.Ramzan
Makli



Abbas
Makli



Mushtaq
Makli



Talib
Makli



Ghulam Hussain
Makli



Najoo
Makli



Moosa
TandoAllahyaar



Saleem
Makli



Kanji
Mirpurkhas



Baban
Makli



Mansingh
Mirpurkhas



Dharamshe
Mirpurkhas



Mechal
Mirpurkhas

Dedaar
Makli



Moosa
TandoAllahyaar



Saleem
Makli



Kanji
Mirpurkhas



Baban
Makli



Mansingh
Mirpurkhas



Dharamshe
Mirpurkhas



Mechal
Mirpurkhas



Dedaar
Makli



Sahere
Mirpurkhas



Mansingh
Mirpurkhas



Bachayo
Mirpurkhas



Arjun
Mirpurkhas



Rana
Makli



Naaro
Mirpurkhas



Looro
Mirpurkhas

Ahmed
TandoAllahyaar



Mansingh
Mirpurkhas



Dharamshe



Moosa
TandoAllahyaar



Saleem
Makli



Mechal
Mirpurkhas



Arjun
Mirpurkhas



Baban
Makli



Zahid
Makli



Dilbar
Mirpurkhas



Hussain
Makli



Rajoo
Makli



Miskeen
Makli



Parkhan
Mirpurkhas



Dharmoo
Makli



Hakim
Makli