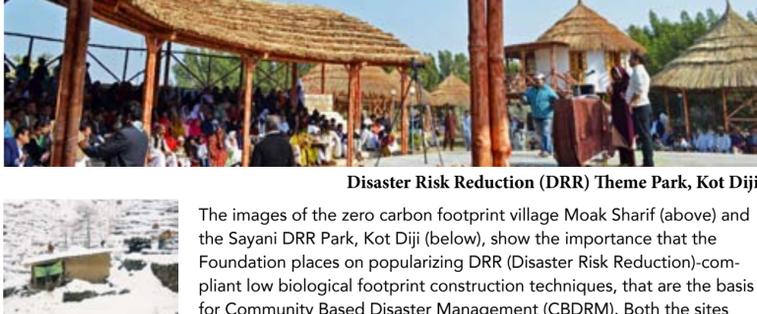


Zero Carbon Footprint Village Moak Sharif



Disaster Risk Reduction (DRR) Theme Park, Kot Diji



Original KaravanGhar, Jabbar, 2005.



Experiment bamboo & wood, 2009.



First Bamboo structure, early 2010.

The images of the zero carbon footprint village Moak Sharif (above) and the Sayani DRR Park, Kot Diji (below), show the importance that the Foundation places on popularizing DRR (Disaster Risk Reduction)-compliant low biological footprint construction techniques, that are the basis for Community Based Disaster Management (CBDRM). Both the sites are training venues for communities, particularly women, to learn green skills for disaster preparedness and income generation. The creation of Barefoot Village Entrepreneurs (BVE) has resulted in promotion of safe methods developed under the Foundation's program *Build Back Safer with Vernacular Methodologies* (BBSVM).

The Foundation built hundreds of sustainable housing units in Hazara and Azad Kashmir in the aftermath of Earthquake 2005, re-using stone and wood from the debris in combination with lime and mud; however, it was in Shaikh Shahzad Camp, Mardan, for IDPs (Intentionally Displaced Persons) from Swat in 2009, that Yasmeen Lari, CEO, took up bamboo as a valuable construction material. In early 2010 experimentation with bamboo was carried out at the Foundation's Base Camp in Battal, Hazara. The first large scale application using bamboo was carried out in Post-2010 Floods Swat and the use of wood in construction was entirely discarded. Not a single tree has been felled since BBSVM program has been taken up. The extensive use of mud walls has helped unleash the creative power of communities, particularly women, who are personalizing each product into a unique designer item.

Zero Carbon Footprint House, Marghazar, Swat, 2010



The first prototype of a house using bamboo dhijji cross bracing and bamboo joists in roof that was constructed in Swat and soon after over three hundred housing units were built in the difficult to access hilly terrain of the area. The housing units were supported by the University of Glasgow & Scottish Government International Development Fund (SGIDF). Although the technique was entirely new, but it was readily embraced by the communities due to its insulation value in the cold climate of Swat.

Seismic-Resistant Traditional Dhijji in Bamboo, Swat, 2010



The bamboo dhijji (cross bracing) has been utilized in housing units built in Swat. Since its construction many seismic jolts have been experienced which the housing units have withstood. The dhijji allows the use of local materials as filling between the cross bracing which is an economical method of construction. The structure is strong enough to withstand earthquake as well as floods. Training provided to communities allows them to self build structure themselves.

Green Women's Centre, Matta, Swat, 2010



Based on the bamboo cross bracing developed for the Zero Carbon Footprint house in Swat, a Green Women's Centre was built in village Beha in Matta in an area that had been wrecked by militants. This was the first bamboo roof with a span of 16' and it was tested the same year when the snow piled up 3' to 4'. This was also the first centre that was built for women. Later a few more centres were built by the Foundation in order to provide socializing and working space for women in Swat.

Green KaravanGhar, Khairpur, Upper Sindh, 2011



The houses built in the katcha in Khairpur are based on bamboo dhijji cross bracing and bamboo roofs similar to those built in Swat, except that instead of stone filling the walls are finished with matting and lime mud plaster. The methodology has withstood five waves of floods, that at times have gone above 5' height. The housing units as well as other structures have survived well and the community continues to live in the houses built through generous support of Swiss Pakistan Society,

Floating Women's Centre, Khairpur, Upper Sindh, 2011



While 2010 Floods played havoc in Swat in the north of Pakistan, they also destroyed entire villages in the rest of the country. The most affected areas in Sindh were the katcha area, which lie close to the river. Although they suffer inundation every year, the 2010 floods rose to several feet height, destroying everything. This the first two storey high floating centre for women's usage, which has provided protection to families along with their belongings for the last five floods rising to above 5'.

Linked School & Dispensary Buildings on Stilts, Khairpur, Upper Sindh, 2011



A school and dispensary have been designed on stilts to demonstrate the importance of elevated community buildings, particularly in areas where high floods are the norm e.g. in the katcha areas. The buildings are linked with an elevated bridge. In the last five years high waters have passed under these buildings, providing safety to human lives and families' belongings. Two women's centres, a school and a dispensary as well as over 100 houses were built through funding raised by Swiss Pakistan Society.

KaravanShelter, Moak Sharif, 2011



The floods in 2011 played havoc in many areas of Lower Sindh and destroyed entire villages, Moak Sharif, in Tando Allahyar being one of them. on request of the landlord Mr. Mahmood Nawaz, construction of housing units were undertaken with the Foundation's own resources. After initial reconnaissance the first house was built in a couple of days with lime stabilized mud walls and bamboo roofs. To instill confidence 15 family members were asked to test the structure for strength.

KaravanShelter, Khakoo Wasan, 2012



The entire village of Khakoo Wasan was built due to the generosity of Ms. Safeeyah Moosa, who provided funding for several women's centres, dispensaries and other community structures. The KaravanShelters built with lime stabilized mud and bamboo roofs, have been personalized by households, with women using their creativity to decorate them with traditional motifs and raised patterns. The methodology encourages women's involvement in beautifying their habitat.

Build Back Safer with Vernacular Methodologies, IOM Shelters, 2012-2014



Based on the pilot at Moak Sharif where the KaravanShelter was used, BBSVM (Build Back Safer with Vernacular Methodologies) was developed as a full scale program and training in the correct use of mud, lime and bamboo was imparted to over 500 implementing partners of IOM (International Organization for Migration). Under the program 40,000 shelter units have been built covering over 1700 villages in Sindh. Due to this program the Foundation was finalist in World Habitat Awards 2015.

Improved Green Chaura, Moak Sharif, 2012



Prior to the launching of BBSVM, detailed research was carried out into vernacular forms in Sindh (research supported by DFID/IOM). The chaura stood out as a most remarkable form that was attractive and, due to its shape, largely withstood disasters. Accordingly, the chaura form with technical intervention using bamboo roof joists and straw purlin rings (fabricated by rural women) has been developed by the Foundation as the most economical, and attractive form that can provides DRR-Compliant shelter.

Jamil ParhoPakistan Center, Moak Sharif, 2012



Built with the help of Murad Jamil, the Jamil ParhoPakistan Centre utilizes mud brick vault on ground floor with mud walls supporting a bamboo chaura thatched roof, providing a picturesque view. The construction of mud vault has been successfully carried out, providing providing a channel at ground floor for disposal of flood waters, and a cool shaded place for children's activity during normal conditions. The design employs traditional way of building arcuate structures common in the region.

Residential Suites on Stilts, Guava Orchard, Moak Sharif, 2012



The first suite, consisting of one room and eco toilet raised on stilts in a low lying orchard area, was built on an experimental basis to gauge the cost of such construction. Later, 3 more were built to provide accommodation to the visitors, trainees, volunteers and personnel of the Foundation, a facility which has been used often. The construction consists of bamboo framing with dhijji cross bracing, application of lime mud plaster on matting, and a bamboo chaura thatched roof.

School on Stilts in Low Lying Areas, Karim Dad Wasan, 2012



This school has been built with funding specially provided by Ms. Safeeyah Moosa (South Africa), which provides education to over 100 school children. The 3-room school is on stilts as the area was prone to flooding. The free ground floor is utilized for school's extra curricular activities, as it provides ample shaded area during hot summer months. A problem, that has been resolved, relates to the soil being soaked with cow dung, which has required extra protection for bamboo stilts.

Mud Vault Dispensary, Khakoo Wasan, 2013



Mud vaults have been used for this single storey dispensary. The dispensary provides an entrance and waiting space, the doctor's consulting room, a mid-wife's consulting room and a small dispensary for storing medicines. The mud vault provides cool interior spaces and a unique architectural form. The dispensary is run by a community paramedic who has confidence of the village households. 4 vaulted dispensaries have been built through generous funding from Ms. Safeeyah Moosa (South

Disaster Risk Reduction (DRR) Centre, Moak Sharif, 2013



This is one of the seven DRR Centres that have been built as part of the W-cBDRM (Women-centred Community Based Disaster Risk Management program conducted in collaboration with IOM (International Organization for Migration). The centres are built with bamboo frame and dhijji cross bracing and carry a chaura thatched roof built with bamboo joists. The DRR Centre houses the Women's DRR Committee, and is equipped with monitors and solar panels, providing DRM and green skills trainings.

Karavan Latrine, Moak Sharif, 2013



This is the prototype of eco-toilet that was first built to try out the possibility of acceptance of such toilets. The mud walls and KaravanJoist roofs also provide possibility of roof farming or Chhat Bagheecha. The two-seat box provides separation of liquids (drained into a plantation bed) and solids (collected in a bucket). The solid (night soil) is removed to a composting bin which is maintained by a Khad Adhi (Compost Sister) who purchased the night soil to make compost.

Karavan Pakoswiss Chulah as a Social Node, Lower Sindh,



Lari Principles for DRR (Disaster Risk Reduction) require that all valuable items e.g. food, drinking water, cooking places and household goods are kept on elevated locations. Thus, a chulah also should be prevented from being damaged from flood waters. The fuel efficient, smokeless double stove (designed by Pakoswiss Technologies) once placed on an earthen platform provides safe and hygienic cooking, eating & socialising place which becomes operational as soon as flood waters recede.

Rural Designer Chulah Kitchens, Lower Sindh, 2014



The Karavan Pakoswiss Chulahs have become extremely popular in Lower Sindh where several of the Foundation's Barefoot Village Entrepreneurs (BVE) have helped build more than 14,000 chulahs, now spreading from Mirpur Khwas to the remote areas of Tharparkar. Each one is beautifully decorated by the housewife and is unique in its own characteristics. Building upon the basics of building safe structures, rural women have made each into a designer item, that is transforming the rural landscape.

Seismic-Resistant Mud Wall Shelter, Awaran, 2014



The Earthquake 2013 at Awaran allowed the development of seismic-resistant structures using strengthening of mud walls with bamboo and the typical KaravanRoof. The walls were built with recycled earth from the debris. The use of bamboo lattice in the corners, internal and external faces of the wall and their anchoring and joining together has produced a structure that is expected to withstand severe earthquake jolts. In case of a collapse, since the roof is very light, valuable lives will be saved.

Memorial Library with Mud Walls by School Volunteers, Kot Diji, 2015



The massacre of 132 children at Peshaware Army Public School in December 2014 shook the entire nation. With support from Ms Safeeyah Moosa, a memorial library in their memory was built at the Sayani DRR Park, Kot Diji. It was built by school children of Kot Diji, who fabricated over 10,000 mud bricks and also helped to lay them and plaster the walls. The children were honoured in a function held in March 2015, attended by dignitaries of Khairpur.