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Healing Garden Chamchamal – Transforming valuable building heritage into modern and healing earthen architecture

01 Animal therapy center

Over the last decades, the vernacular earthen architecture of Northern Iraq has been largely displaced by reinforced concrete constructions, so much so that an appreciation for a traditional Kurdish Architecture has been dangerously eroded.

The Healing Garden project, initiated by the Jiyan Foundation for Human Rights, puts a strong emphasis on the use of increasingly endangered traditional building materials and techniques. Through the use of traditional materials in an earthquake resistant structural system and a training programme for local workers, the construction of the Healing Garden is strengthening Kurdish building traditions and suggests a direction for transforming valuable building heritage into modern earthen architecture in the region.

The people of the Kurdistan Autonomous Region in northern Iraq have been the victims of oppression and violence for centuries, suffering most recently at the hands of ISIS and before that under the Baath regime of Sadam Hussein. During the Anfal Genocide of 1987-89, hundreds of villages were torn apart as millions of Kurds were forcibly relocated into controlled settlements. Currently, of the population of 5.7 million, there are 1.5 million refugees living in the Iraqi Kurdistan. The importance of a functioning mechanism for trauma therapy has become of huge importance, as research indicates that without therapeutic treatment, it can take up to three generations for victims and their families to recover from a traumatic experience.

The Jiyan Foundation for Human Rights has been providing trauma therapy in the Kurdistan Region for 15 years. The Healing Garden project in Chamchamal was initiated in 2015 and marks the first time that the Foundation has embarked on an architectural project

02 Map of Iraq with location of the Healing Garden

that embodies its contemporary therapy and development ideologies. The project was realised in close co-operation with a team of local craftsmen by an international and multi-disciplinary network consisting of ZRS Architekten Ingenieure, CODE TU Berlin, Bauhaus Universität Weimar, BORDER and others. This network forms the foundation upon which the Healing Garden project can be developed as a practice-based DesignBuild collaboration in stages over the coming years.

This paper describes the Healing Garden project as an example of how earthen architecture can contribute to the strengthening of local identities and empower local communities.

Trauma therapy in a post-war disaster region

The Jiyan Foundation has been operating since 2005 at various locations in Kurdistan Iraq, working mostly with conventional methods and in spaces provided by the state. The concept for the Healing Garden pursues contemporary ideas in the field of trauma therapy and the architectural design aims to complement these aspirations. Completed in 2016, the animal-assisted therapy centre is aimed specifically at women and children. The holistic therapeutic approach includes the idea that patients interact more openly with animals and this enables them in turn to communicate more openly with their therapists, sheltered by a pleasant and protected setting. Along with the building progress, the therapists were also trained by international professionals in the special techniques required for the method.

The second building phase contains, in addition to further therapy spaces, a bakery, open-air theatre, community space and a series of workshops. Here patients can associate with traditional handwork as a cultural practice thus helping them to reconnect with their cultural heritage and identity. Moreover, patients are often resident at the centre for longer periods and these activities allow them to spend their time productively. Additionally, a series of gardens planted with traditional plants and trees provides an additional therapeutic activity as well as becoming spaces for retreat in connection with nature.

Urban design and community healing

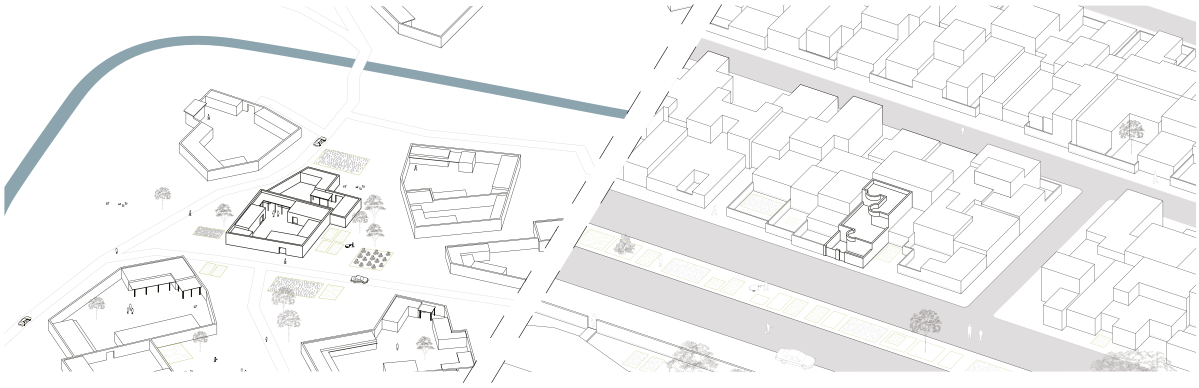
The Shorch neighbourhood of Chamchamal, where the Healing Garden is located, was settled during the forced relocations perpetrated against the Kurds by Saddam Hussein's regime in the late 1980s. Through the violent destruction of over 4,000 Kurdish villages and the murder of some 180,000 people, the Kurds were forced to leave their homes and live in such forced settlements called "Collective Cities", the locations and layouts of which were defined by Iraqi military priorities aimed at supressing the Kurdish culture. Years later the vast majority of Kurdish families still live in Shorch and other "Collective Cities". New families and communities have since emerged in areas where the density of traumatic experience is extremely high.

These urban structures are still clearly visible 30 years after their establishment, although the individual houses have been increasingly modified and expanded. In Shorch, "neighbourhoods" are separated from a central main road by security corridors allowing them to be easily isolated and controlled. These communities are ingrained with the cultural trauma of being forced to relocate into urban structures that bear no resemblance to those of their original villages and were designed with the express purpose of repression and violence. The Healing Garden occupies one of these corridors and as such replaces the originally military function with a civil, community orientated usage.

The design of the Healing Garden makes reference in its material and form to traditional villages in the region thus providing the community with a tangible

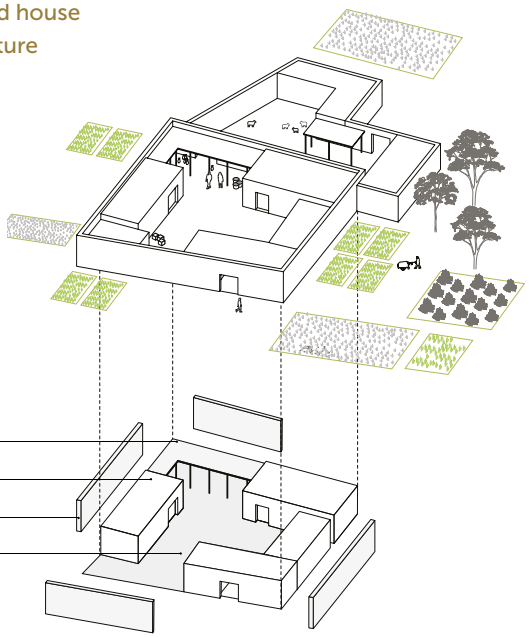
03 Site plan with building phases

04 Healing Garden – Mother and daughter



Village before Anfal Genocide // Collective City after Anfal Genocide

Transforming the historical courtyard house into contemporary earthen architecture

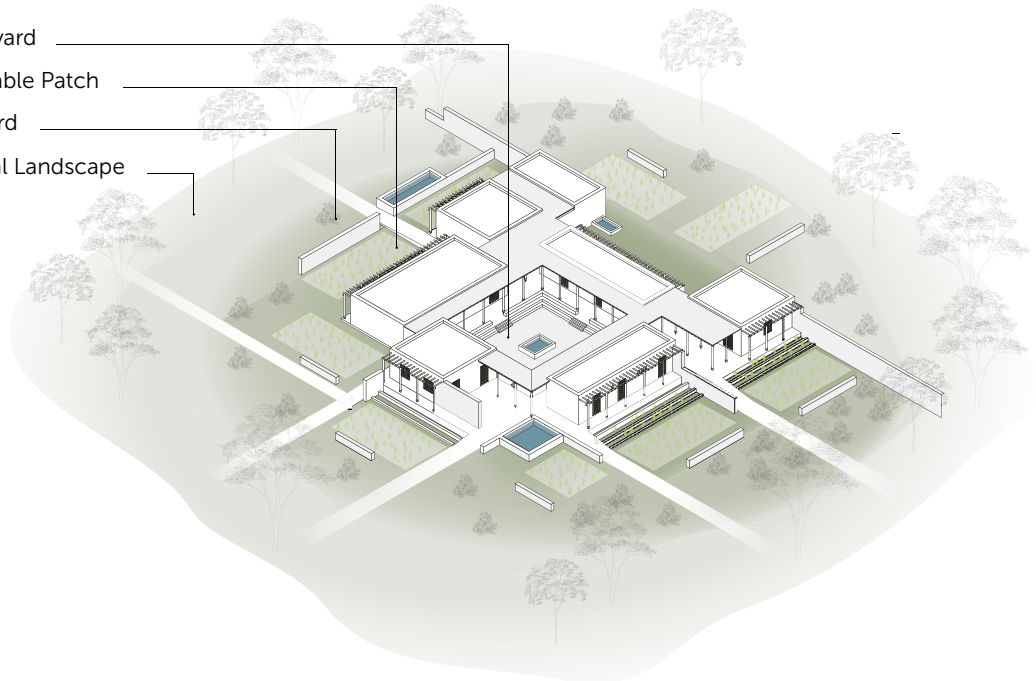


Elements

Shadow roof
Houses
Walls
Courtyard

Four Zones

Courtyard
Vegetable Patch
Orchard
Natural Landscape



05 Design building concept

06 Healing Garden – Entrance

link to their built heritage. Alongside therapy functions, the ensemble will provide spaces for cultural practices such as handwork, gardening and cookery. These activities help strengthen the community's link to their past and identity. The Healing Garden aims to become a meeting place promoting inclusion in a disconnected community.

Towards a healing built environment

Over recent decades the increasing rejection of traditional building techniques and materials in favour of a generic concrete frame building system has dangerously eroded an appreciation for vernacular Kurdish architecture. This is despite the fact that cement-based materials cannot offer the same climate mitigating properties as earthen materials. It was the express wish of the Jiyan Foundation to construct their new buildings using earthen materials, however the skills for designing and building using these techniques have become locally scarce over the last decades.

During ZRS's initial four-day workshop with the Jiyan Foundation and local actors in Chamchamal, the building typologies and techniques present in the historic villages were analysed. Based on this research an architectural concept was developed that takes cues from courtyard houses found in the region. The reinterpretation of a traditional village atmosphere should contribute to the creation of a space that represents trust, identity and healing.

In order to minimise reliance on external resources, a grey-water treatment plant has been constructed and will provide water for the plants and animals. The entire site will be cultivated on the principles of Permaculture, focussing on a resource positive and sustainable activation of the landscape. All of these measures aim to instigate the start of a desperately needed debate on climate change, renewable energy and the environment in a region that is economically reliant on the export of fossil resources.

Climate adaptive architecture in earth

The local climate is characterised by a hot summer, where temperatures can regularly exceed 45°C, and a wet winter of around 5°C. Concrete buildings heat up rapidly during the day and release heat throughout the night. This leads to overheating in summer and to the increased popularity of air conditioning units, which are often extremely energy inefficient, expen-

07 Animal therapy center

sive and difficult to dispose of correctly. The wet winter months mean that poorly executed reinforced concrete elements are prone to corrosion and other damages; over a longer period of time this can lead to dangerous instabilities and leakages. Houses in conventional materials are unable to buffer changes in humidity as effectively as natural building materials, and this can cause condensation on internal surfaces, eventually leading to damp, mould or other damage.

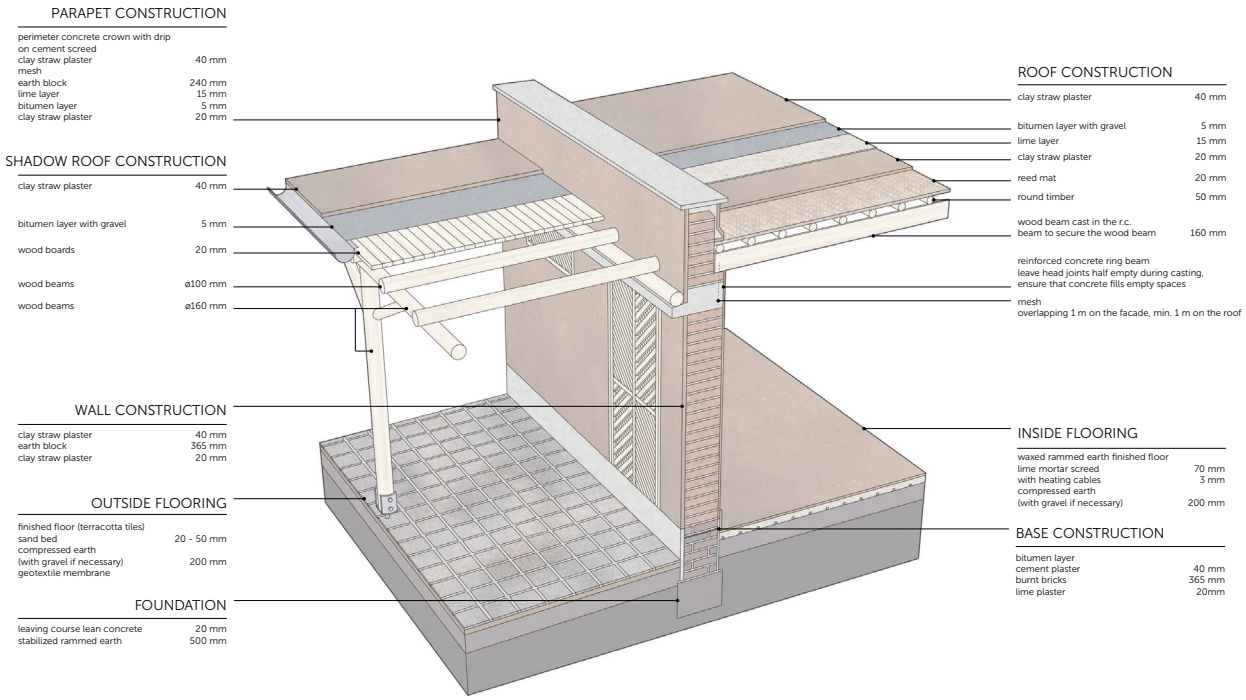
As such, the choice of materials and development of climate adaptive design strategies for the building was of great importance. The aim was to enable the centre to be open throughout the year, without the need for any mechanical heating or cooling. The climate-regulating earthen materials in walls and roof, as well as the integrated ventilation openings, allow the maintenance of a comfortable interior temperature and room climate throughout the year. During the summer, the verandas surrounding each building provide a valuable shaded space for open air activities. While the construction and materiality of each building essentially remains the same, the individual usage of each unit as either animal stall, therapy space or sanitary unit, is expressed through the placement and sizing of the window and door openings. This allows the daylighting and ventilation requirements of each unit to be adjusted as programmatically required. The ventilation openings allow for night-time cross ventilation, buffering the changing temperatures and humidity levels throughout the year.

Materiality & construction techniques

The buildings of the first phase are a series of simple, single-storey earthen volumes, linked by paved paths and shaded by verandas covered with reed mats. Between the buildings a series of covered, shaded and open courtyard spaces unfold that accommodate the enclosures and garden spaces used for animal assisted therapy. The village-like character of the healing garden is strongly linked to the local materials used for the construction. The reddish earthen surfaces are softened by the addition of climbing plants and trees.

One of the main priorities when developing the construction system was to design a contemporary example of the sustainable and traditionally popular materials earth, blocks and timber. In order to protect the earthen materials from rising damp, the foundation and plinth up to a minimum 35 cm of each building is built with burned bricks and equipped with a horizontal damp proof course. The 36.5 cm thick walls are composed of air-dried earth blocks, that were manufactured and dried on site using locally sourced earth.

08 Section and building materials



09 Building site: Production of earth blocks

They are internally and externally plastered with a rough earth plaster containing straw. The horizontal loads from the roof are transferred by a reinforced concrete ring beam, which was cast in-situ. The roof is constructed in the traditional fashion with 15-20 cm diameter logwood, between which a second layer of smaller diameter 3-6 cm wood beams are spanned. On top of these beams, reed mats are placed as a separating layer, upon which a layer of 2-5 cm straw-earth mixture and 5 cm anhydrite gypsum is applied. The final bitumen waterproofing layer is protected from weather and UV radiation by a thin layer earth slurry to complete the roof build-up.

Earth samples were taken from site during the initial workshop and analysed in the ZRS laboratory. The analysed samples turned out to be extremely rich in clay and in the eight-shaped test sample, binding values of up to 360 g/cm² were measured. First mixing ratios for the earth blocks and plaster were developed based on the DIN 18945 Earth blocks – Requirements, test and labelling and DIN 18947 Earth plaster – Requirements, test and labelling.

Due to the high binding forces of the raw material, the challenge on site was that the significantly more expensive aggregates such as sand and fine gravel had to be purchased in larger quantities than the soil, which was free of charge.

In addition, the production of the approx. 70,000 earth blocks stretched over several months and thus the process was exposed to the different climatic conditions. The starting mixing ratio of 2:3:1 (earth:sand:straw), which was developed in the laboratory and worked perfectly at the beginning of the earth block production in March in humid and cool weather, led to a large amount of sub-standard bricks with increasing heat and drier air conditions. To counteract the climatic change the mixing ratio had to be continuously adjusted. To the great delight of the craftsmen, the best earth blocks were produced at the time of Ramadan. In the month of fasting, the adobe block production took place in the late evening hours. Thus, the earth block had the chance to dry out in the cool night hours before the hot temperatures of 45°C during lunchtime caused them to dry out too quickly.

10 Building site: Construction

11 Building site: The roof

The project was realised by local craftspeople, many of whom had no experience of working with earthen building materials. The same constructive elements are repeated in each of the nine buildings and the constructive details were developed to be simple and robust. This allowed the material preparations and working processes to be consistently optimised and improved with each building. It also meant that the same team of craftspeople could realise the second building phase, without the supervision of ZRS on-site. Furthermore, the team can use the same techniques on other local projects, hopefully leading to the further propagation of a contemporary earthen architecture in the region.

Building in dialogue

The Healing Garden project builds on ZRS's principles as an office with a background in DesignBuild. Central to the success of the project is the principle that all partners communicate with each other on an equal level regardless of background or experience. This relates to the social intentions of the project, but also to all other processes including design, organisation and realisation. The project network is based on a philosophy of sharing not teaching and has resulted in the development of deeply personal bonds between the architects in Berlin and the local actors in Chamchamal. The long-term nature of the project has strengthened the bond of trust between all participants, for which the use of modern communication technologies has played a decisive role. Via internet-based messaging services, drawings from Berlin could be exchanged with images from the building site in real time. This ability for real-time coaching and exchange has further strengthened the collaborative nature of the project. As a culmination of this process the local team took over responsibility for the development and construction of the second building phase completed in summer 2018.

Conclusion

In conclusion the project shows the potential of a contemporary earthen architecture to strengthen cultural identity and bonds of community in the Middle East and beyond. The erosion of cultural identity in the form of building heritage is a process that can be observed all over the world and shows no signs of slowing. For regions such as Kurdistan-Iraq, where regional identity has been suppressed for multiple generations, a return to an architecture inspired by vernacular materials and techniques has great potential to provide communities with a new link to their history. Earthen architecture has a huge role to play in these processes, as the most common historical construction technique for large areas of the global south.

For these projects to be truly successful a different and more sensitive understanding of the role of the architect is required. Rather than placing the finalised plans on the table to be realised by a local team, a collaborative and dialogic process has to be followed from the start, where planner and local actors have the space to work together as equals. Only through this process can true ownership of the project by the local community be fostered, and this in turn secures the long-term success of the project. Based on equality and mutual understanding, the project shows how to equip the next generation of architects in Kurdistan and Germany with the skills and tools needed to generate a sustainable built environment for the post-fossil age.

The success of the Healing Garden project is built on this foundation, a locally initiated and owned project, that shows the potential of locally available earthen materials to empower communities.

All images and drawings by ZRS Architekten Ingenieure

12 Healing Garden – View into yard

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Prof. Eike Roswag-Klinge, Dipl.-Ing. Architekt BDA is one of the initiators and directors of ZRS Architekten Ingenieure Berlin und Chair of the Natural Building Lab, Technische Universität Berlin. In his different networks he has been researching on, teaching/learning, designing and building climate and resource adaptive, human architecture in different climate zones for the past 20 years. The projects range from schools out of earth and bamboo in the global south and heritage rehabilitation, to housing, production buildings and schools out of timber, earth and natural fibre insulation in Europe. His research focuses on climate and cultural adaptive architecture and low-tech building systems. Work he has been involved in has, among others, been awarded with the Aga Khan Award 2007, KAIROS Europäischer Kulturpreis 2015, Holcim Award 2011, Gold in Asia Pacific.

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Leon Radeljić, (*1987) is the project leader for intercultural cooperation projects at the Berlin-based office ZRS Architekten Ingenieure. He specialises in sustainable construction projects in Germany and internationally, working with interdisciplinary design teams. He worked on several research projects funded by the European Union and is involved in lecturing and publication activities. Leon Radeljić is a trained carpenter and studied architecture at the Technical University Berlin. In 2016, he was part of the multi-disciplinary group of students that developed the masterplan for the Healing Garden as their graduation project. He has been part of the core design team since the first building phase and is the site manager of the project.

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