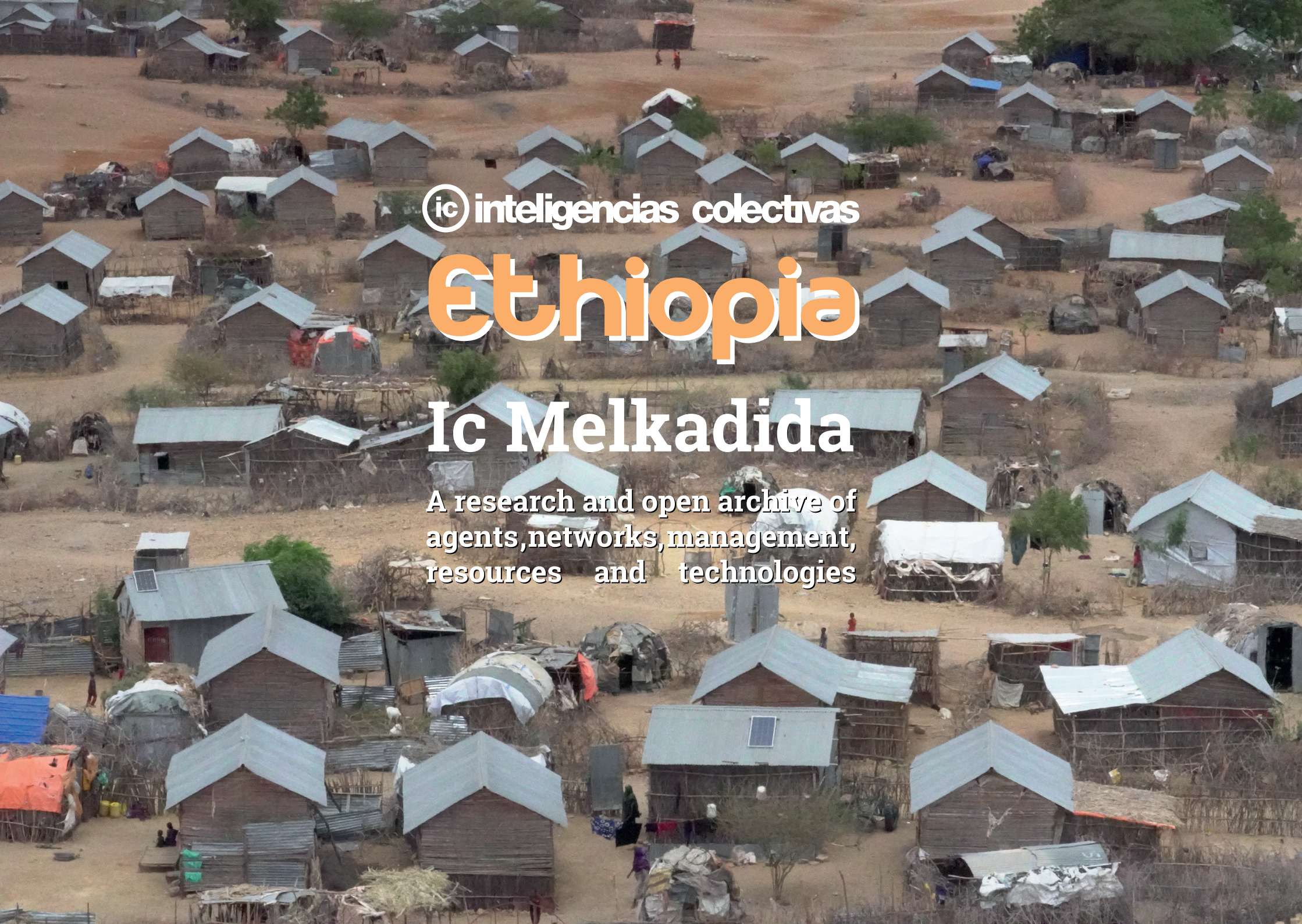




ic inteligencias colectivas

Ethiopia

Ic Melkadida

A research and open archive of
agents, networks, management,
resources and technologies

0. INTRODUCTION & ABSTRACT

1. CONTEXT

2. IC WORKING METHODOLOGY

3. FIELDWORK

4. HUMAN NETWORK

5. CATALOG OF “EVIDENCES”

6. CHALLENGES & OPPORTUNITIES

7. PROPOSALS / FUTURES

8. ACKNOWLEDGEMENTS

IC Ethiopia "Melkadida" is a research project that seeks to discover, catalog, enhance and evolve ways of building and living inherent to the Dolo Ado refugee camps in southern Ethiopia. From this starting point, the project facilitates the different communities to engage in a bidirectional design and development process for a better and more resilient life during their stay in the camps.

IC Ethiopia "Melkadida!" is an initiative of the Zoohaus Association in collaboration with the Technical Cooperation Office of Spain in Addis Ababa, and the organizations that manage the refugee camps, UNHCR and ZOA.

0. INTRODUCTION & ABSTRACT



1. CONTEXT

Ethiopia is the largest recipient of refugees on the African continent and the fifth largest in the world. They come from bordering countries such as Yemen, Eritrea, Sudan, South Sudan, and Somalia.

In the Somali region of Ethiopia, five refugee camps were set up between 2009 and 2011, Melkadida, Bokolmany, Kobe, Hilaweyn, and Buramino. All together they host around 220.000 refugees, outnumbering the host population.

The Melkadida Refugee Camp was set up in 2010 and hosts around 35.000 refugees from Somalia. Extreme dry and hot weather conditions, an environment of desertification, and the recent drought the region has been facing over the last few years, together with less and less attention and fewer funding options, Melkadida is now facing a situation where the main challenges shift from emergency issues to community development on different levels.

Since the beginning various different organizations (UNHCR, ARRA, etc.) have been supporting and managing the camps, helping both the refugee and host communities to develop and find sustainable solutions and living models.

In 2022, Melkadida, with its markets, schools, organizations, cooperatives, streets, its meeting places, looks more like a village than a refugee camp but remains dependent on several international organizations and foreign aid. One of the main challenges for UNHCR and the organizations that support the camp is to generate economic, organizational, and social models that are sustainable over time and allow the communities to be independent and self-sufficient in an increasingly arid and difficult context.

Interest Links:

<https://data.unhcr.org/en/situations/horn/location/163>

https://elpais.com/elpais/2016/09/15/fotorrelato/1473946154_594716.html

2. IC WORKING METHODOLOGY

What do we do and How do we do it.

Towards non-standardized Futures: What do we do and How do we do it.

Every region of the world has its own repertoire of construction techniques. Although perfectly adapted to environmental conditions and shaped by their social and technological realms, they are being ignored and gradually discarded due to a globalized standardization of processes and conception of progress.

Inteligencias Colectivas is about looking at reality in a different way. Looking at the margins or outside what was supposed to be Design, Architecture, and Urbanism we have encountered amazing objects and interventions which have given us the information we think is extremely valuable regarding what is really important for people and how they live in a social, economical, and political way.

Tacit citizenship agreements, self-made devices, and half-breed techniques are pure open-code knowledge, taught by imitation and improved through years of trial and error experimentation.

While these are not considered valuable in professional contexts, we believe that these manifestations of human creativity are an endless source of inspiration and learning that should be considered as cultural heritage in order to improve the perspectives of future developments. It is about shifting the way we think about design.

The usefulness and beauty of a design depend on our vision of the world and the contexts in which our daily life unfolds, of the paradigms by which we act, and by which we know why objects are what they appear to be.

Inteligencias Colectivas (IC) is a cultural project developed by the Zoohaus Cultural Association team in collaboration with various different agents since 2010, in the format of an open platform for research on design and cultural heritage, an archive from which to share knowledge of construction details, inventions, objects, and processes of a cultural, architectural or tactical urbanism nature that are not standardized; real examples of collective and intelligent materialities, we called “evidences”. By means of a theoretical-practical working methodology, IC is a meeting place where participants record, catalog and highlight these examples of collective and intelligent design, evolving and transforming them by the design and construction of prototypes that address contemporary needs, generating locally and internationally-based networks that make visible how innovation and the production of knowledge are generated collectively and collaboratively.

IC's mission is to share knowledge in an open and accessible way, understanding that in this way it legitimizes knowledge and cultural heritage and gives visibility to the communities we work with. Thus, the information collected is organized in a database with a creative commons license. This is organized in several work phases that structure the project: 'Catalog' — a compendium of local evidences discovered all over the world —, 'Upgrade' —a technically drawn compilation of the evidences. Legitimate- showing how it's built', detailing features and mechanisms—, 'Prototyping' —critical prototypes from an assortment of evolved evidences developed by IC members in collaboration with local communities, experts and institutions in building workshops—; 'Human network' — an active knowledge network of citizen-experts—. All these categories are geolocalized in the last section, an "Open Map" - showing where creativity comes from.

IC's theoretical-practical methodology consists of bidirectional teaching-learning processes, taking in feedback and organizing urban actions hand-in-hand with local collaborators, delivering hybrid or unexpected solutions, and being aware that true urban innovation comes from agreements between apparently unlikely partners.



3. FIELDWORK

During the past two years, Zoohaus Association in collaboration with the OTC in Addis Ababa (Spanish Cooperation Office), UNHCR and ZOA have been partnering on a mission where the first steps of Inteligencias Colectivas methodology could be implemented in the Melkadida and Dolo Ado refugee camps. The objectives originally presented for this mission were as follows:

- 1.** Encourage the organization of networks of people around culture, manufacturing, and the collective construction of public space.
- 2.** To document and publicize initiatives based on recycling, inventiveness, and creativity in the use and reuse of resources.
- 3.** To highlight the value of the territory's own capacities, its inhabitants, and its cultural context.
- 4.** Encourage citizen participation and social cohesion for the development of the socio-urban tissue, motivating the development of networks for the organization and management of common goods in the context that concerns us.
- 5.** Promote the empowerment of the local community by encouraging individual and collective initiatives carried out within the context in which we work.

First on-site IC research work took place between the 25th/30th of September 2022 in the Melkadida camp. The camp is currently facing challenges related to community development on different levels. For this reason, IC together with UNHCR chose a transversal scope of research focusing on four main issues: Infrastructure, Shelter, Public spaces, and Education.

As part of our working methodology, our approach to these main themes combined both interviews and focus group discussions and dérives, or walkabouts with the locals. This combined approach allowed us to meet key actors in different areas while also having direct contact with locals both in public and private spaces.

Informal meetings and everyday life routines are the perfect environments to find true examples of local culture, skills and individual creativity. This kind of knowledge usually arises in everyday objects and routines and not in focus groups or formal meetings away from the space where these examples exist. This is why contact with locals in their own scenarios is crucial for our research focus.

The IC methodology has several work phases that can be developed independently. For the Melkadida project, work has been developed to map the evidences (catalog) and needs of the “human network” in the field, pointing to a set of opportunities and possible upcoming developments and activities. All of this research is detailed below in this report.

4. HUMAN NETWORK

Inteligencias Colectivas is about sharing.

Sharing knowledge and sharing responsibility among the human network of the project.

In IC Melkadida, the project was conceived from the outset by collaboration with the Technical Office of Spanish Cooperation in Ethiopia and was developed together with the UNHCR agency in Ethiopia and the NGO ZOA. Thanks to the great collaborative work of the 4 entities, the mission could be undertaken, allowing us to recognize a large number of local entities and emergent initiatives with which we met to approach and relate with the context and its inhabitants to develop the field research.



Supporters

UNHCR Ethiopia

UNHCR, the UN Refugee Agency, is a global organization dedicated to saving lives, protecting rights and building a better future for refugees, forcibly displaced communities and stateless people. The Ethiopia operation focuses on emergency response to the different IDP situations, addressing protection needs of refugees and promoting their self-reliance in line with the Global Compact on Refugees (GCR). The UN Refugee Agency branch runs the 5 camps in the Dolo Addo Somali Region of Ethiopia.



AECID

The Spanish Agency for International Development Cooperation (AECID), a public law entity under the aegis of Spain's Ministry of Foreign Affairs and Cooperation, is the management body for Spain's international development cooperation policy. Its principle mandate is to promote, manage and implement public international development cooperation policies, aimed at combating poverty and achieving sustainable human development in developing countries.



OTC Addis Ababa

AECID's technical cooperation office in Ethiopia is the unit responsible for the identification and monitoring of development cooperation projects and programs financed by the Agency, as well as those tasks of support and coordination of all Spanish Cooperation actors present in the country.



ZOA

International relief and recovery organisation, providing relief to people affected by violent conflicts and natural disasters in fragile contexts and assisting them during their recovery from the crisis.

Partners:

Zoohaus

European creative network-based platform, established as a non-profit cultural association, born in 2007 mixing up interests of different agents related to the fields of design, architecture, and urbanism. Since 2009 Zoohaus develops Inteligencias Colectivas, an open online platform and free database which brings together knowledge considered to be on the fringe of traditional construction and urban practice.



Researchers:

David Cárdenas Lorenzo:

David is an architect, illustrator and researcher. Graduated from Universidad de Alicante and Master degree ETSAM (Escuela Técnica Superior de Arquitectura de Madrid) in 2012. He seeks to merge drawing with industrial design, crafts, or editorial design. His work involves transforming drawings in accordance with the way these objects are made.



Juan Chacón Grajera:

Juan is an architect, researcher and educator who graduated of ETSAM (Escuela Técnica Superior de Arquitectura de Madrid) and co-founder of Zuloark (2001), an open office for distributed architectural, urban, and regional design. He is also co-founder and member of the meta-studio Zoohaus (2007). He develops his architectural practices in Berlin since 2009 crossing disciplines related to space, city and landscape through diverse methodologies of realization, teaching, and research.



Luis Galán García:

Luiso is an Architect, urbanist, researcher, and teacher who graduated with masters from the Polytechnic School of Madrid. He is part of the Zuloark team and the Zooahuse platform developing his professional practice from architecture, urbanism, and civic design through education, urban innovation, cultural management, and a wide range of design-related areas.



Makers:

Women's Group

Support group for refugee women and girls

The peasants, goat meat and milk sellers, and charcoal workers who comprise this group approached us about the daily life of refugee women and their families, talking about their everyday tasks, their spaces, the difficulties they share, and the advantages of living in the camp. Women are in charge of almost everything that needs to be done in the camp, from their jobs to taking care of the family and the house; they have no free time or leisure time. They are in charge of obtaining and repairing the tools needed to do their work, managing the money, and supplying, feeding, and caring for the whole family with their own means.



Refugee Central Committee R.C.C.

Local refugee government committee for Melkadida camp

Official camp leadership assists refugees dealing with challenges in partnership with UNHCR and ARRA, they function as informants and mediators between camp residents and external authorities, paying particular attention to security-related issues inside the camp, which they report to ARRA. The meeting with the RCC working group was very useful to get to know the current problems and demands of the refugee community regarding water and food distribution, shelter, education, relationships with the local community, public infrastructures as well as transport and communication with other areas.



Dehabo Abikr Adam.

Craftswoman and seller of palm products and objects. Village market of Melkadida.

Habbo's knowledge of the different ways of working palm leaves allows her to make an infinite number of objects from the most useful to the most decorative, including the famous mats used to make the facades of traditional houses. With all the generosity that characterizes the women of the area, she showed us her point of sale and her workspace, as well as the way in which, with a simple pin punch and the skill of her hands, she would shred the strands of palm leaves to the size she needed to weave them together and build each piece.



Youth association

Associative work based on respect.

The youth group we interviewed told us about the difficulties in their lives, especially in terms of higher education, sports initiatives, security, and social activities as well as their future and life expectations as young refugees. It is very remarkable how in this group the natural distance of the Somali culture between girls and boys was blurred throughout the conversation and how the space for dialogue and confrontation began to emerge.

Bekele

Government of the host community. Village of Melkadida

The elderly head of the local community explained to us how their territory, culture, spaces and lives have been changing before and since the camp's construction, and he introduced us to some of the programs they carry out together with the refugee community. At the end of the meeting he asked us only one favor that left us very intrigued saying "you have access to everything you wanted to know about the community and the village but I ask only one thing of you, whatever you want to do here please think about the young people, they are the ones who have it hardest in these times of uncertainty".



Mother crafts asociation.

Intergenerational care and support

The support program for mothers was developed around the space for socializing and entertainment by working on the construction of local handicrafts. Mothers of different ages talk and discuss the issues that were of concern to them and about the support they will provide to the various needy people who have approached them.



Abderrahman Ibrahim Soobou

Father of a refugee family. Camp neighbors.

In a remote area far from the exit/entrance of the camp, this neighbor kindly showed us his home. It was very interesting and revealing to get to know the bamboo housing module provided by the IKEA foundation by talking with the person who inhabits it.

In his plot several buildings coexist from different periods and of different construction techniques, by chatting with Abderrahman, father of 12 children, we understood how each one had evolved and what the construction process had been in each extension from the initial module.



Yashin Hared Abdullahi & Abdulmajid Abdi Adawa

Child protection officer & Education Officer. Principals at the Save the children schools.

Save the Children's schools carry out a wide range of programs that include not only education, food, and medical follow-up of the students, but also important training programs for parents whose children are unable to go to school or assistance to children with disabilities and different learning capacities.

The school is a place full of life, with multiple buildings and spaces that accommodate all the necessary uses, the covered juice space, sports space, offices, classrooms, latrines, workshops... and so on.

Meeting the students in one of the classes that were being taught at that moment helped us understand how good the children's English skills are, as well as their cheerful and welcoming spirit.



Charcoal production cooperative.

In harmony with everyday life and Nature

The cooperative, made up almost entirely of women, manages to produce and sell excellent charcoal to hundreds of camp families. The use of charcoal mainly for cooking is vital to reduce the large deforestation in the areas near the fields, which used to be forests and are now almost completely desertified.

The pieces of charcoal they produce have improved little by little, increasing their heating efficiency and adapting their size to the format of the new stove models.

The cooperative receives large trunks of wood that they cut up and burn in their two types of ovens depending on what they need. Once burned the logs are passed through the crusher turning the burned wood into powder, this mixture is combined with water that contains dissolved rubber and is pressed into cubes to make the final pieces of charcoal. These pieces are left to dry and put in packages for direct distribution and sale.



Mohamed Adush Hasan

Principal of the three ARRA schools.

During the visit to the primary school built in 2011, we were able to learn from its director about the education and childhood programs that the three ARRA schools manage. The students, between 1 and 8 years old, are all children of refugee families. In the Somali cultural tradition, only some of the children go to school, whose schedule is from 8 to 12 with a short break when milk and food are given to the students.



Ethiopia's best architect

A woman to build everything in her house

Once again, a woman from the host community, proud of her living environment and her work, invites us to get to know the house she has built with her own hands.

Based on her skills and the support of the other women, each part of her house and the buildings that make up her lot, from the most structural to the most mundane and close at hand, have been built by themselves.

Every detail is developed and built from their own inherited popular knowledge or from what they have learned in the process together with the other women who support them in the construction.



Ahmed Mohamed Elmi & Ken Mohamed Omar

Just married refugee couple. Camp neighbors.

These neighbors kindly showed us the new home that they had been given for their recent marriage.

They came to Melkadida 13 years ago, when Ahmed was 30 years old and they are very happy to be able to start their family in their new house. They showed us one of the 3 types of houses built by the IKEA Foundation, the special module, built with cement blocks and a metal sheet gable roof, where the bedroom was located, and the adjacent outdoor space that served as a living room.

Haibiba Abdi Farah

The art teacher at Save the Children school.

Save the Children's schools are the only ones in the camp that have art subjects where mainly traditional handicraft techniques are taught. Again, it is exclusively young girls who learn how to craft palm leaves or how to weave with colored cotton thread.

Haibiba is a very special person loved by her students, who teaches and at the same time transmits the artistic tradition of craft to the new generations, who are learning very calmly and leisurely, working in teams to finish each piece.



Spice Cooperative.

Recently founded cooperative. Adam Abdi Habael, Ibrahim Adam Noor, Fatima Farah Duale, Hassan Abdullahi Arniar, Noor File Abdullahi, Nuria Ali Valugow.

Association of harvesters who go outside the camp to collect leaves, seeds, fruits and different products to produce spices, then mix them and sell them in Melkadida Market. The cooperative was created two years ago but they are already starting to sell in other camps' markets and soon they want to reach regions like Dolo on the southern border with Somalia or even Kenya.



Cookstoves cooperative.

Laboratory of the family's daily life.

Another cooperative composed entirely of women has been working for many years in collaboration with multiple support programs and NGOs to produce stoves or cookers for refugee housing. The two models of stoves or cookers they distribute are built by assembling light pieces made of cut metal plates, together with heavy elements made of clay baked on-site.

Each type of stove or cooker has evolved from the prototypes and tests they have been carrying out. Some of them were discarded because they did not work well, and others because they did not perform well among the users.



Mohamed Ahmed Issak

UNHCR Accompanying person for the mission

Mohamed travels every week from Dolo to Melkadida to work alongside the UNHCR WASP team. WASP is one of the main cross-cutting issues in all the programs in the camp, which leads Mohamed to relate to everything that happens, working from the field and addressing the social implications and monitoring each mission or action that is carried out. With extensive knowledge of the situation and the social network in the field, he was the perfect companion, facilitating every meeting and visit we made.



ACNHUR Environmental Health/WASH (water, sanitation and hygiene) technical team.

The installation that needs the most care and that might fail at various different sites.

Team of engineers and technicians in charge of the river water extraction system, its filtration and purification, and its distribution. For each of the fields, there is an independent system that pumps water from the river to two facilities, one for the irrigation of the agricultural production areas and another for the water treatment facilities. Most of the water is used for drinking. Once treated, it is pumped to the large elevated reservoirs adjacent to the field from which it is distributed by gravity to each of the sources or water collection points in the different areas of the camp.



Nursery and seeds production team.

Greenhouses, plantations and agricultural and restocking programs, reforestation in the desert. Joseph Guedi Muhamed, Akaram Mohammed Abdi, Blay Ibrahim Adam, Sumi Moris Ibrahim, Faio Habdi Abdurrahman.

In small greenhouses, all the production of tree species for the repopulation of the territory takes place. The main programs consist of giving small trees to families and people from the camp who will take care of and water them growing the specimens at their homes, always with the support and guidance of the Nursery and seed production team.

5. CATALOG OF “EVIDENCES”

a) Point of Interests / Statements.

What we look for:

- We look for spontaneous construction details, unexpected solutions that mix popular technologies with the imagination of the person that builds it.
- We look for everyday objects, common architectures and urban situations that are apparently insignificant. We want to see them from a new perspective; we want to give them a value.
- We look for actions that work without prejudice, with the immediate, with what is at hand.
- We look for tools that enable new dynamics and inventions and the alternative use of materials.
- We look for designs using alternative energy sources.
- We look for the transformation of everyday objects to give them super powers.
- We look for things that understand very well the particular conditions of their environment and use it to their advantage.
- We look for hybrids of the history of technique. Objects/details/architectures that contain pieces, technologies and materials from different historical moments.
- We look for half-breeds. Situations, objects, and architectures that mix materials with different origins and natures.
- We look for covers. Variables, declinations of the same material/technology, that has evolved or have been modified to be applied to different contemporary situations.
- We look for ever-evolving objects. Ever-changing architectures that learn from the city and change so as to adapt to contemporary situations. We look for resilient architectures.
- We look for elements that imply an oral tradition. Technologies that have been transmitted from generation to generation. We look for designs that (maybe) don't need drawings to be manufactured.
- We look for urban situations and management strategies that require negotiation between agents for their design, production, and future use.
- We look for small fragments of reality that describe multiple social, economic, and political layers.
- We look for situations where there is a horizontal hierarchy of technology: Objects/architectures where structure, installations, ornament, details, finishings, aesthetics, etc. have equivalent importance.

b) Evidences.

What is IC-evidence?

The “Evidences” of Inteligencias Colectivas are hybrid constructive systems, assembled or invented objects, non-standardized tactical urbanisms, etc. These are born out of necessity and adaptability and reveal, inform and shape the multiple social, ecological, technological, and political layers of the contexts where they are found. Looking for and finding those “evidences” is a way to understand and get to know the cultural and common heritage of a territory and the people behind it. It traces the network and provides insights into how communities operate, giving clues to possible developments and opportunities.



01 Traditional host community Housing

Structural complexity and environmental balance

The traditional northern Somali house (1) in this area consists of a 3.5 to 4m diameter dome, traditionally built by women, together with relatives and friends. These structures are used as one more room on the family plot. Users told us that the elderly feel comfortable in this type of shelter, which they have traditionally both grown up in and lived in. Somali domes belonged to nomadic settlements and moved from time to time to a new location but here in Melkadida the domes are set up permanently on the family plots. The structure is organized in parallel arches every 25 cm approx in two perpendicular directions. Acacia branches of about 15mm are intertwined in groups of 3 or 4 to form arches of different lengths. The arches are sunk about 15cm into the ground. For all joints, rope made from textile remnants is used. As we were told, the branches are bathed in boiled acacia sap. This makes them resistant to termite attacks. Mats made of woven palm leaves are arranged on the structure (see evidence 08).

The use of complex structural elements (group of thin branches instead of thick elements), joints without nails, and local materials seems to us valuable in terms of availability of material and environmental balance.

(1) *Construction of Somali Aqal*

(2) <http://www.somalimuseum.org/nomadic-houses.html>

(3) <http://www.africavernaculararchitecture.com/ethiopia>

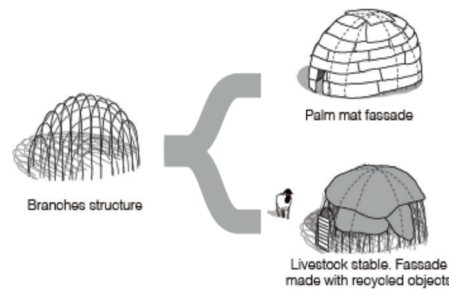


Image: evolution of traditional Somali Aqal

02 Wood and Clay Housing Evolution

The 21th century vernacular

Melkadida camp is a great example of how knowledge brought by both refugees and the host community is fused and evolves, bringing to life new construction solutions adapted to the availability of materials and climate reality. Western influence brought, in the last century, the post and beam structural type as well as the iron sheet facade. Local constructors have developed new facade solutions for this scheme based on the use of small branches, clay and/or plastic sheets, and traditional construction techniques. A framework of vertical and horizontal branches executed over the main posts shapes a facade which is permeable to wind and light without the need to have windows. This solution is usually adopted on the facades of shops and houses.

In certain cases, the branch framework is covered on the interior or exterior with mud or plastic sheets enhancing the privacy of the interior.

As well as in traditional Somali houses, builders make brilliant use of a local, sustainable resource in a construction solution that is also perfectly adapted to local climate conditions.

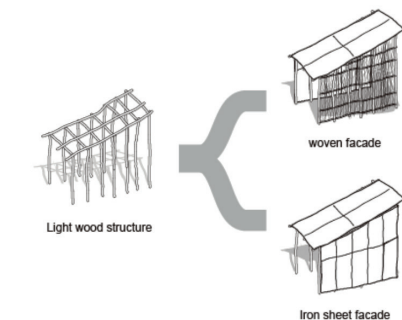


Image: evolution of western light wood structure shelter



03: Donkey Carreta

Resilient Transport and Cargo Method

Despite its size, around the Refugee Camp of Melkadida, there are not so many motorized vehicles, besides the ones of the organizations working on site. The majority of the community living in Melkadida (both refugee and host) is traditionally pastoral (1) and donkeys have been in the Horn of Africa for at least centuries (2). Therefore, the use of donkeys as a climate-resilient method of transport (3), beasts of burden and support for daily chores seems obvious. “Donkey Karreta” is a donkey-drawn cart made of a simple metal structure with wheels, and a transport basket hanging from the structure. This basket is made of rope and its base is secured by two tire rings joined together. The way it is built allows flexibility of use and easy maintenance with reused or natural materials (old clothing and fabrics, ropes, natural fibers, car tires, etc.). We can find “Donkey Karretas” all around the Melkadida Camp, but they gather mostly in the main street market, waiting to be loaded with different products, goods, and people. They are usually driven by children and teenagers. The “Donkey Karreta” provides a climate-resistant, easy-to-use, traditionally-accepted multipurpose technology. It also generates an economy for the families who run them and they are easy to maintain with locally available materials.

(1) *Pastoral Society*

(2) *The history and spread of donkeys in Africa*

(3) *Donkey Climate Change Resilience, Climate Change: The Role of Working Animals*

04 Anti Termite post base

Being in the right place in the right amount.

Termites are problematic for wood frame constructions. In Melkadida refugee camp, light wood frame structures are the main solution for shelter refugees. Locals have developed simple and clever solutions to preventing termites reaching the pillars from being reached by termites. A piece of hardwood (Acacia) is used as the base of the post. At 60-90cm high, this piece is joined to a soft wood post. The joint is a half-lap splice joint or a simple direct joint of the two pieces. The first solution works better for vertical load transmission to the base. Joints are made using just nail and hammer solutions combined with metal stripes. (see evidence 09)

This solution is widely spread in the community and we can find it in shopscommerce, public buildings, and houses. Unfortunately, hundreds of shelters that did not use this solution in their construction are currently in danger of collapse. In this context, and with limited resources, this solution gives us clues toof a new mind frame for mental frame thinking aboutof building materialsconstruction elements: use high-quality materials just where they are really needed in the piece and combine them with more affordable materials.



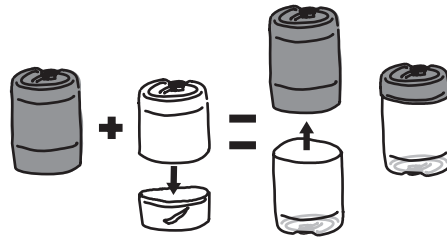
05: Rolling Water Container

DIY water distribution system

Water is vital for all known forms of life, despite providing neither food, energy, nor organic micronutrients. (1). In recent years, water has become an increasingly scarce resource in the horn of Africa (2) due to desertification and increasing problems of drought. A guaranteed water supply in the refugee camp of Melkadida has been provided by UNHCR and the different organizations and NGOs working on site. Six water points provide drinkable water along the camp from the local perennial Genale river after filtering and treatment. From these six points, the inhabitants of the camp have different methods to transport the water barrels that they fill to their households. The rolling water container is made up of two cylindrical plastic barrels assembled together, a strong metal wire used as an axis, and a rope to pull it. These rolling barrels can be seen all around the water points, pulled by children, who can transport water to their homes in a playful and easy way. These barrels can easily be found and the technology is easy to implement, avoiding the need to load and carry up to 20 L containers.

(1) <https://en.wikipedia.org/wiki/Water>

(2) <https://www.unicef.org/documents/water-crisis-horn-africa>



06: Palm furniture Structure

A thousand ways of using a resource

In a context where wood is a very scarce resource due to the deforestation of the last decade, the use of sustainable natural resources such as the branches that are detached from palms and grow back every year, becomes a strategy with great potential, taking advantage of each part of the frond to build multiple objects.

These can be lightweight surfaces for lying on or sitting on; chairs, benches, or beds made from the strong core of the branch. The boards are nailed to the eucalyptus support structure and trapped at the ends, leaving the edges free and reducing the use of nails. In the market, they are sold in batches with different ledges according to the type of furniture to be made.

Families in the camp that want a new piece of furniture for their house start by buying the palm leaves they need in the market, and then call the carpenter, who will assemble the furniture made to measure in their own homes.



07 Hand Palm Broom

The thousand ways to use a resource

Using the flattest parts of the palm branches, very resistant strips of different sizes are made depending on what they are going to be used for. Using the tips to join metal facades, strands of the size that the artisan wants are taken out. Once the necessary quantity is obtained, the thinner ends are cut to leave them all of the same lengths, then all the strands are bent together from the center and are tied tightly with other strands of the palm.

The tying is done with simple functional strands or more traditionally with decorative braids, thus obtaining an extremely light and very resistant utensil that can be found everywhere in the camp.



08 Palm Mat Fassade

The not-so-forgotten traditional housing envelope system

The local families of Melkadida, however numerous they may be, live in houses with only one room, the bedroom. Everything else is outside in open or semi-covered spaces. The sleeping rooms are built by the women, like almost everything else in their culture, with a delicate and at the same time resistant structural system that gives them that peculiar spherical shape.

The temperature inside is much lower than outside, because of the shade and the ventilation system of the facade.

Like many other elements of the Somali building tradition, the facades of the houses are made by weaving strands of palm leaves and knitted by hand by interweaving strands of cloth or cotton yarn with the palm leaves. The facades are light, cheap, resistant, and easy to install and replace as they are tied with ropes to the structure.

These mats are also made in a more decorative way, using pattern-colored finishes for interior wall decoration or to lie comfortably on the floor.



09: Plastic Container Cooling Pullover

Artisan meet Science

Some people living in the Melakadida Refugee Camp spend their time away from their shelters, working or carrying out daily tasks; you can see many of them carrying a plastic water container wrapped in a hand-woven decorative garment. As they explained, this wet cloth keeps the water fresher in the heat

of the desert, and it is a well-known technique used by the people living in this environment. The colorful traditional braided fabric that keeps the water containers cool is made from reused clothes and it's locally crafted. This sustainable and simple cooling system with traditional techniques and reused materials it's practical and decorative at the same time.

10 Wooden Joins

Doing the most with the least

The population of Melkadida has nowadays no access to the electric grid, nor access to specific tools like electric screwdrivers, drills, welding machines, etc. In this context, a special treatment of construction joints has been developed by builders and craftsmen.

Joints in the building process are solved with nails and hammers. 50mm nails with washers to allow thin iron or plastic sheets to be attached to wooden posts without being torn. For joints between thick pieces of wood (for example in roof structure frames or anti-termite post bases [see evidence 04]) a 1" soft iron band is used, usually coming from recycled sheets of iron. This type of joint is used especially in wooden structure buildings and pitched roofs.

On the other hand in traditional constructions, built by women, we can only find joints between elements made of rope produced with recycled textiles. This is another example of how a lack of means and materials gives rise to simple and imaginative solutions.



11 Corrugated Galvanized Steel

Door and window decorations

Lightweight, simply installed and economical, corrugated steel sheets are maybe the most widespread building material on the planet. First patented in 1829 (1), it proved to be light, strong, corrosion-resistant (2), and easily transported, and particularly lent itself to prefabricated structures and improvisation by semi-skilled workers.

Its use in Melkadida, as well as in thousands of other rural areas across African countries are nowadays related to economic status. Its lack of maintenance has a lot to do with this fact.

The way in which doors and windows are designed using this material in the shops in Melkadida is especially striking. Instead of setting the axis of rotation vertically (more difficult to execute and where hinges would be necessary), the axis is executed on the lintel. When the doors and windows are opened, they are anchored to the porch cover and, thanks to the constant temperature in the area, they are left open all day.

The frames and the structure of the doors and windows are made of eucalyptus branches. Sheet metal is installed using nails and a hammer. Due to its rigidity, it helps to brace the structural frame. In buildings of higher economic status, decorative cutouts are made in the eaves of the roof.

Also striking are the cheerful patterns and colors of the veneers (vegetable prints, imitations of brickwork, etc.) that are reminiscent of the prints of traditional fabrics.



(1) https://en.wikipedia.org/wiki/Corrugated_galvanised_iron

(2) <https://en.wikipedia.org/wiki/Corrosion>



12 Plastic Barrel Car Toys and Shock Balls

Handmade Toys

By May 2021, 64% of the population in the Melkadida refugee camp was under 18 years old (1). The lack of opportunities, activities and development for this younger generation presents one of the biggest challenges in the camp. Around Melkadida from time to time, it is common to see children playing with a ball or even some of them dragging a toy car. Both games can be found repeatedly in the field and the toys are made of reused materials that can be found in the field such as plastic drums, ropes, wooden sticks, old clothes, or shoe soles. This, which at first glance highlights the scarce resources available on-site, also reinforces the creativity and adaptability of having to build your own toys. There are many studies on the benefits of play in children's development. In addition, it provides an opportunity for the treatment and management of some types of solid waste and reinforces community interactions among the children (2)(3).

(1) <https://reliefweb.int/report/ethiopia/melkadida-camp-profile-may-2021>

(2) <https://developingchild.harvard.edu/resources/play-in-early-childhood-the-role-of-play-in-any-setting/>

(3) <https://publications.aap.org/pediatrics/article/142/3/e20182058/38649/The-Power-of-Play-A-Pediatric-Role-in-Enhancing>

13 Thorn Fence

Nearly living architecture

In the semi-desert areas of southern Ethiopia, the thorny branches of the acacia are used to delimit family plots, thus preventing animals from getting in or escaping. This practice, widespread throughout the continent, is brilliant in its simplicity.

The branches do not need to be assembled. They are stacked in a pile one meter wide and one and a half meters high. The long branches are placed by the outer faces leaning against each other towards the interior in a slightly triangular section.

The main drawbacks of this type of fence are its maintenance and the deforestation of the environment. As an alternative, there is the possibility of planting live acacia bushes to replace the thorn fences (1).

(1) <https://assets.echocommunity.org/presentations/8bc80443-2964-41dd-b689-11fb3d382bfb/live-fencing.pdf>



These evidences allow us to identify areas of opportunity where the main challenges of both the refugees and the host community shape real scenarios. We have identified 5 possible frameworks from which we can work on aspects related to the environmental challenges of the camp, educational aspects, cooperative proposals, or public space construction.



6. CHALLENGES & OPPORTUNITIES

1. Tradition gives us clues about current challenges

From thorn fences to anti-termite details; from traditional housing skills to the evolution of the camp shelter typologies... Building activities in Melkadida are related to the main challenges at different levels.

- **Deforestation (*Shelter and Environment*):** Deforestation related to building activities is one of the main challenges faced in the region of the five camps. As we showed, there are low environmental impact building methods in traditional shelter construction. Is it possible to apply part of this knowledge to future private/public constructions in the camp? Could we reverse deforestation by promoting new ways of building?
- **Effective and affordable anti-termite problems (*Shelter and Environment*):** Termites that feed on wood can cause serious damage to buildings, sometimes causing them to collapse. How can we apply traditional methods to find affordable solutions to treat these problems?
- **Foster women skills (*Shelter and Education*):** Women are skilled builders in both refugee and host communities. We find this characteristic the perfect scenario to promote women's associations. Could "building" be a subject to promote educational and job opportunities for women?
- **Building community (*Education and public space*):** Traditional building methods are practices that gather communities together. This aspect can be explored as an educational tool. Public facilities could be designed and built as part of a community educational process by young people. Could we use the building process as a tool to develop a sense of belonging?



2. Creating a sustainable supply chain

Palms or Palmaceae are used in the Somali region for a variety of purposes related to crafts and building. Palm relates to women's activity, vernacular building techniques, and environmental resources. By promoting projects in several of these aspects we can create a sustainable supply chain.

- **Sustainable management (*Environment*):** The use of palm leaves is environmentally sustainable. Currently, the production capacity of the artisans is subject to the amount of material they can obtain. We believe that designing the management of these resources could increase the supply chain. This involves, mapping the number of resources that are available, identifying current collectors, training, and the necessary infrastructure. Is this palm suitable for reforestation?
- **Palm guild (*Education*):** The use of palms brings together various trades: weaving crafts (present in primary school), furniture production, harvesting palm leaves, distribution, and sale of products. An investment in training in these areas, together with an increase in the supply chain, could lead to new job opportunities for young people.



3. Infrastructure development on a human scale

Droughts, rising fuel prices and population increase have turned the water supply into what may be the biggest challenge that Melkadida will face in the future.

The water supply in this rural river area must develop strategies on different levels: not only in infrastructure and main supply networks but also on a user level. The main infrastructure system faces various difficult challenges, such as fuel dependency, a lack of efficiency in pipelines and vandalism on pipelines and distribution points. Rolling water containers give us a clue as to how people adapt infrastructure to their own use.

- **XS size infrastructure (*Energy and environment*):** The water infrastructure can be implemented in terms of supply, distribution, and treatment on a small scale. Following the example of successful current projects in the camp (Coal Cooperative or Fire Stoves Cooperative), new initiatives around individual supply and water treatment should be undertaken to complement the current water infrastructure in the camp. Could human and animal power be used to promote new ways of free-fuel water supply?

- **Community engagement (*Education and public space*):** Infrastructure projects could not only be a way of improving living conditions but also a way of building community engagement. Could a distribution water project be built and maintained by the refugee and host communities?



4. Promote resilience

As we saw in the previous section, the use of Donkey Karreta is widespread in the area for small-scale supplies. We believe that aid organizations can work to support the development of this livestock as well as in the development of new uses for the use of animal energy.

- **XS size infrastructure (*Energy and Environment*):** Current systems for pumping water from the river are gasoline pumps. This supply system generates a dependency that can be a problem in the medium term. We believe that the use of animal-drawn draft pumps for certain uses, especially those related to extraction for agricultural irrigation, can be developed by aid organizations with a relatively small investment.



5. Youth community engagement

Children and the young population of Melkadida impregnate the objects that surround them with the images and cultural icons with which they identify. Plastic recycled toys, balls made of hair and recycled textiles, henna tattoos mixing traditional symbols with contemporary icons, attraction for design and beauty... Everywhere we find these kinds of skills and art forms:

- **Urban Solid Waste (Environment):** The accumulation of plastic waste in Melkadida is a problem that is currently to be seen and will presumably increase in the future. Today, incineration is almost the only way to process this type of waste. Objects like plastic toys or rolling water containers are just two examples of the amount of design and creativity present in the Melkadida community around recycling materials. In a context where resources are limited, could recycling be an input in the economy and culture of the population?

- **Children and Youth (Education):** Promoting a culture of entrepreneurship against a culture of dependency is fundamental in the education of the future generations of Melkadida. The ability to imagine and carry out their own projects is the basis for an education of resilient and empowered individuals for the future. Can the manufacture of recycled objects and other forms of artistic expression be a way to empower the community from the youngest upwards?



Summarizing opportunities by themes

Energy and environment:

- Deforestation: Research projects on traditional local building techniques can give us clues to ways of more respectful building for the environment.
- Water: Develop alternative forms of supply, distribution and treatment focused on the small scale.

Public Spaces:

- Explore traditional building methods as forms of building new public facilities.
- Use public space construction as a way of engaging the youth community in the development of the camp.

Shelter:

- Explore anti-termite methods used in the traditional building process to attend to structural problems in shelters.
- Research the current mixture of traditional and local techniques as an opportunity for future development.
- Promote projects involving shelter and seed nursery departments to find suitable ways of building.

Education:

- Aim art programs based on current children's skills as a creative way of re-appropriation, and empowerment of childhood.
- Engage the young population (especially women) in public decisions
- Build a sense of community and sense of belonging within young people.



7. PROPOSALS / FUTURES

Inteligencias Colectivas does not look at this emergent heritage as something which should remain untouched or be preserved statically. Rather, we understand this emergent heritage as the foundation for new designs that can be evolved through prototypes in different ways.

Each proposal covers several of the main issues studied in this project phase: Infrastructure, Shelter, Public spaces, and Education. IC is positioned as an effective agent to organize this collaboration between departments.

The proposals are articulated on the basis of short-term pilot action and a series of further lines of work that will help to increase both the scope and scale of the results.



1. Women builders workshop

Project objectives:

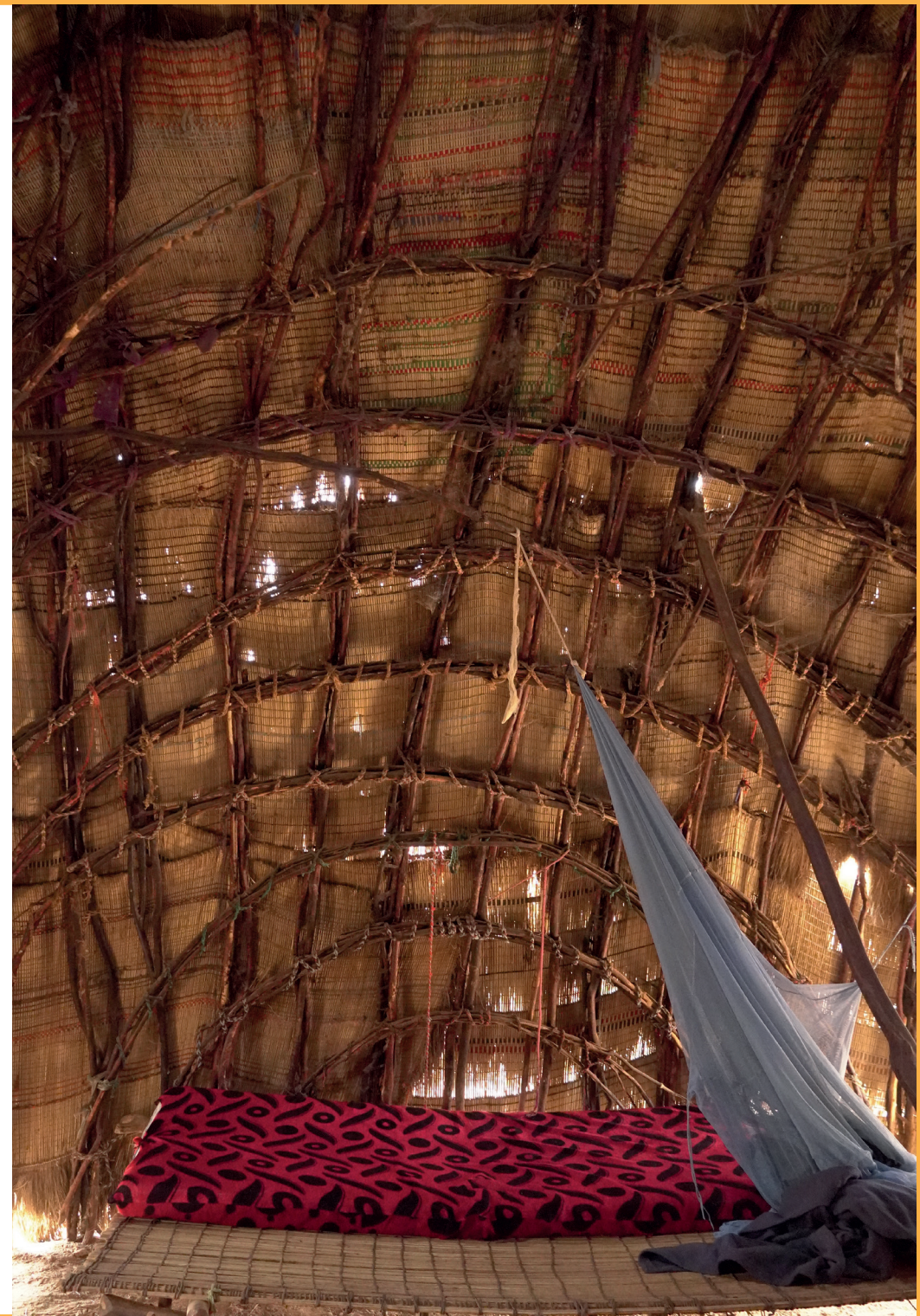
- Identify possible applications of traditional knowledge for the resolution of current problems related to housing (deterioration, deforestation, use of resources, future evolution)
- Introduce the NGO community to the traditional construction systems present in this region.
- Raise visibility of the women's community that treasures this type of knowledge.

Pilot Action:

- Research and construction workshop. Addressed to members of UNHCR's shelter departments working in southern Ethiopia, Somalia, and South Sudan. The workshop will also be offered to members of the camp and the host community, especially for the youth. Somali women will show us the traditional construction techniques of the region.
 - During a 1-week workshop the construction process will be approached from different perspectives: material provenance, craftsmanship, and maintenance.
- The relationship between the building process and deforestation will be especially dealt with, looking for practices that help to reduce forest resources. Suitable alternative materials will be studied

Prospects to be further developed

- Creation of a local work team for the rehabilitation of houses in the area of the Dolo Ado camps using traditional construction techniques.
- Development of a local nursery project: replacing thorn fences with live vegetable fences
- Creation of a cooperative of women builders
- Collaboration on how to apply the same type of construction techniques for other scales and infrastructures. A communal building built with natural and traditional techniques.



2. Resilient approaches to water infrastructure

Project objectives:

- Research and identification of accessible technological alternatives that are not dependent on oil for the pumping, treatment and distribution of water in the areas surrounding the Melkadida camp.
- Elaborate a water use map that incorporates a characterization of who uses it and , how and for what water is used in the camps and the host communities areas.
- Explore the relevance in the current context of technologies based on animal power
- Development of strategic actions involving the departments of energy, education, and the environment.
- Formulate proposals for improvement and innovation of the infrastructure at the user level.

Pilot Action:

- Research and collaborative workshops run together with guest water experts.
- Make collaborative cartographies mapping the whole camp's daily uses of water by the community. This includes who uses the water, how it is supplied from the river to where it is used, what is it used for, what are the leaks in the supply, and what causes them.
- Collect testimonies from the local population about their perception of the water system, its shortcomings, and the alternatives they adopt to deal with them.
- Develop, side by side with guest experts, ideas of low-tech feasible improvements.

Prospects to be further developed:

- Incorporate new forms of water distribution that generate new business and job opportunities
- Develop physical prototypes that complement the current water infrastructure using accessible materials and technologies.
- Promote the breeding and development of local livestock
- Study new forms of relationships between the population and the river.
- Educational program on water devices with the youth population.



3. The youth community builds public space

Project objectives:

- Engage young community members in the construction of their living environment, emphasizing women's presence in public decisions.
- Building a sense of community
- Value traditional technologies.
- Promote the involvement of young women in public decision-making.

Pilot Action:

2-week workshop working with children and the young community

- Discuss with the young people what type of installation/s should be built and who will be the users of them.
- Identify construction materials that can be used or reused within the scope of the field.
- Receive training on the use of tools and the planning and process of work, creating working groups that will be coordinated to take responsibility for different parts of the installation.
- Incorporate children as part of the work team. Design tasks that they can perform independently and that empower them as members of the community.
- Design a schedule of maintenance and repair tasks for the installation with a view to the future, building a commitment and a sense of belonging beyond the completion of the workshop.

Prospects to be further developed:

- Build new prototypes collaboratively where construction and management aspects of previous facilities are reviewed and improved.
- Promote the creation of a construction materials management and recycling center.



4. Craftmanship meets design

Project objectives:

Value local crafts related to the use of palms.

- Give voice to young women and value their work.
- Create a map of the palm supply chain.
- Put local artisan cooperatives in contact with designers and entrepreneurs who can establish new business possibilities beyond the local sphere.

Pilot Action:

- The proposal begins with an investigation to identify initiatives that could support local artisans at a national and international level.
- 5-day workshop inviting Ethiopian and Somali designers and entrepreneurs to meet local artisan cooperatives.
- Drafting a complete map of the supply chain of the materials and instruments used for the production of these artisan works.
- Participatory research on the challenges and opportunities of implementing a larger-scale handicraft industry.
- Proposals for the implementation of a local ecologically sustainable craft industry in the short term
- Include a workshop on children's toys and objects that incorporate up-cycled and reused materials.

Prospects to be developed further:

- A project developed with the environment team to establish sustainable forest exploitation of palm resources in the area
- Invitation to artists and designers to work together with local artisans. Developing a residency program to foster knowledge exchange and skills learning
- Pilot experience in the use of recycled plastics for fabric production.

This first drafts of the proposal include some of the opportunities and challenges explored in the previous point, a further and more in-depth analysis together with cross-theme methodology could combine further proposals. This catalog of proposals has the intention of stimulating a conversation and a collaborative process to learn together about their feasibility and the application of the pilot experiences.



8. ACKNOWLEDGEMENTS

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