Architecture in the hands of amateurs
Can architecture be governed by and for society

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Abstract: According to Augustin Berque, a orientalist geographer: «the space is the relationship between society and it's environment», we can't deny the massive role architecture has on society and the effect it has on the way we see ourselves, and in ancient times we have used architecture as a language to express our thoughts, wether we used rocks or stones or earth the point is that it was our language because it was manufactured by ourselves.These days architecture is mainly governed by pluralism and so it's hard to see ourselves in space when its being played in the background. By studying the cases of self building from vernacular architecture (the cases of Kasbah and ksur in Morocco), to shantytowns during – modernism, creative commons and open source architecture, this dissertation explores the possbility and potentiality of an architecture governed by society and raises the question ion wether it is possible for people to use open source technology as a designing tool to create their own space.

Keywords: self building, open source architecture, creative commons, vernacular architecture.

Introduction

Architecture today isn't represented by any specific style or school, unlike the functionality of modernism or the subjectivity of postmodernism, today architecture's new challenge is the great demand for livable spaces that are integrated with their environment. Social housing and sustainability, might be the new objectives that architecture should seek to resolve through the mediums of technology. The purpose of this research is to travel across the 17th, 20th and 21th century to pinpoint the different forms of self building and how society and architecture shaped each other giving birth to various outcome; from the ingenious sustainability of vernacular architecture through the anarchy of shantytowns and finally the philanthropy of *open source architecture*, we will try to hold a better understanding of the swinging pendu-

Ait Hammou Ou Said ksar in the Draa Valley Morocco Credit byTuul & Bruno Morandi, https://brunomorandi.photoshelter.com

lum between architecture, society and the magnetic force of technology. Bernard Rudofsky wrote: «Vernacular architecture doesn't go through fashion cycles. it is nearly immutable, indeed, unimprovable, since it serves its purpose to perfection. As a rule, the origin of indigenous building from and construction methods is lost in the distant past».[2]

During the 15th and 17th century, through the study of the vernacular architecture in Draa valley in the south east of Morocco, we begin to understand the basics that led to such type of construction and how people almost intuitively built an organized sustainable form of architecture. The two case studies are «ksur» and «Kasbah»[3] more specifically *ait hammou* and *dar el Hiba*, *ksar* in arabic literally means *castle*. Built against each other to be protected from warmth and sedentary berbers tried to protect themselves from nomadic berbers attacks using high fortified defensive walls and Kasbah means central part of a town or citadel»; also known as *qasaba*, *gasaba* and *quasabeh*, in older English *casbah* or *qasbah*. They are fortified houses for the representatives of *pasha glaoui* to serve the administrative control during the independance. The first aspect to be studied is the norms and techniques that have been used in order to have a better understanding of the reason for these buildings to emerge as well as the omnipresence of the sustainable aspect through out the endeavor by analyzing: the housing form, plans and interior distribution, and finally the materials used.

2. Rudofsky 1965.
3. Baglioni 2010.

Kasbah Dar El-Hiba into the Tissergat ksar Draa Valley Morocco Credit by Eliana Baglioni.

The housing form

Human and cultural factors: lifestyle and the relationship between the house and the economic activity may affect the shape of the house. *Traditional house=manifestation of human* is an equation that went from spontaneous to gradually refined architecture. Norms of «Ksur»: Built against each other to be protected from warmth and sedentary berbers which tried to protect themselves from nomadic berbers attacks using high fortified defensive walls and creating bridge tunnels between houses for thermal isolation and ventilation.[2]

Norms of «Kasbah»: They are fortified houses for the representatives of *pasha glaoui* to serve the administrative control during the independency. The house doesn't have a great specialisation since the society was once nomad so the spaces are used according to need therefore the same space can be used for different activities in different seasons. Often the *kasbah* are more articulate and occupy large areas by combining several central patio buildings that are such that allow the highest possible ratio between the internal volume and the outer surface, condition that occurs in the *ksur* of southern Morocco characterized by a pre-desertic Climate. The use of patio houses and a compact urban aggregation, represents an effective response to weather conditions, creating thus a sustainable urban system.

The patio

The patio is an interior courtyard functions as a shaft of light: all rooms facing it receive indirect light, and it also has a ventilation function, like a chimney it pulls up warm air and cools the rooms.
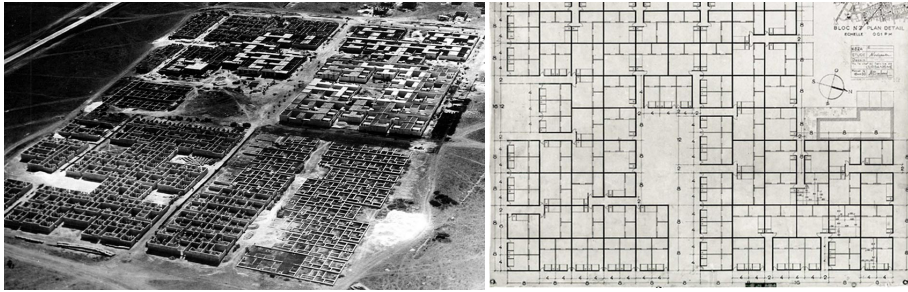
The courtyard structure of vernacular Moroccan houses as it happears in the Ecochard, The courtyard housee of the cité horizontale *built around 1952 in Casablanca. Ecochard did social housing with a 8x8 courtyard for each house called «honeycomb» in Casablanca. Ecochard didn't believe every site as a* tabula rasa *bit rather a socially, politically charged geography that needs to be explored and surveyed; his urbanism plans were conceived under the Marshall Plan which gave loans to Europe for reconstruction -he decided to make a survey called «enquete» or «the quest» in english, which he conducted on his own relying on his own photographs, It consists of 2 phases. the first phase: consists of a quantitive analysis, evaluating issues like the distribution of shantytowns, degrees of urbanization, population densities, demographic trends, logics of the internal migration, using diagrams that are easily communicated with local actors, politicians, planners and architects. The second phase is more a qualitative analysis, appropriation of space, collective and individual symbolism in the built environment (http://socks-studio.com/).*

The three ventilation cycles. The first cycle: cool night air enters rooms and it loses the heat accumulated during the day. The second cycle: invested directly from sunlight, heat gradually spreads warm into rooms. The third cycle: hot convection currents increase due to the heat accumulated in earlier sunny hours fresh air is expelled from rooms. Plans and interior distribution. The plan consists of three inscribed cubes: the first one is the largest and it represents the perimeter of the house, the second is the distribution area, and finally the smallest is the central patio with arches that rest on 2, 3, 4 pillars on each side.


Transitional schools. Thambadai and Pottuvit in Sri lanka. «I wish to create a community that actively embraces open-source design to generate innovative and sustainable living standards for all.» – Cameron Sinclair. Open Architecture Network was a free online, open source community dedicated to improving global living conditions through innovative and sustainable design. It was developed by Architecture for Humanity. The aim of the network is to allow architects, designers, innovators and community leaders to share innovative and sustainable ideas, designs and plans; to view and review designs posted by others; to collaborate with each other (people in other professions and community leaders); to address specific design challenges; to manage design projects from concept to implementation. See: global village shelters in Granada and Communitty center in Ambedgar Negar, India. (www.ted.com/talks/cameron_sinclair_on_open_source_architecture).
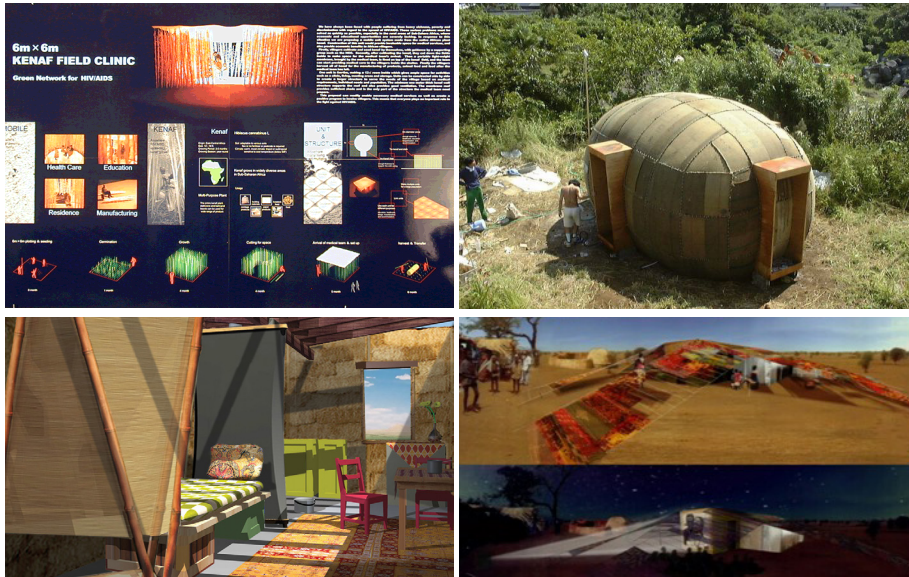
Self sustained and technology oriented projects: Kenaf Field Clinic (6x6m) Green Network for HIV/AIDS: the idea is to make health clinics that are mobile and distributed throughout sub-Saharan Africa, so instead of getting people to walk 10, 15 kilometers to see the doctors ,the doctors go to patients. Low-Tech Ballon System: in the same context of making up ideas that deal with governance, and creating communities through complex networks, they engaged not only architects but also engineers and technology based professionals, like in this example of a inflatable hemp house which was built and is functioning. Kosovo project: through a open design competition to build an emergency shelter but it became a transitional shelter that would last five to 10 years,that and be placed next to the land where the resident lives in, and that he would rebuild his own home and allow him to rebuild and regrow itthe way he wants to rebuild and regrow it the way he wants to. Community center: in this project is supposed to be a clinic but it's also a community center so they set up trade routes and economic engines within the community so it can be a self-sustaining project, economic engine turned into movie theatre at night, so it wouldn't be just a Aids clinic but also community center.
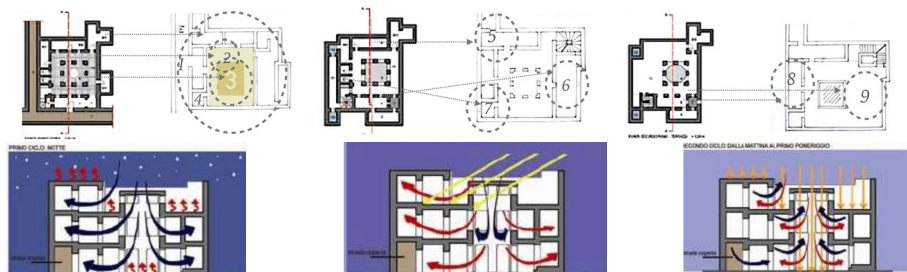
In the patio architecture: the ground floor has no function except the patio that when it's covered it becomes a living area since it's fresh and far from radiation, and at winter it serves as storage and warehouse; the first floor: is dedicated for women, it's a private space; the second floor: is dedicated to guests, with direct access from the stairs without crossing the first floor and strangers aren't allowed to get in the kitchen, bedrooms and a storeroom. Terrace plan: covered area called meseria which is a small living room, and uncovered area which is the terrace and it serves for sleeping on summer nights and other household activities. The 3 ventilation cycles: cool night air enters rooms and it loses the heat accumulated during the day; invested directly from sunlight, heat gradually spreads warm into rooms; hot convection currents increase due to the heat accumulated in earlier sunny hours fresh air is expelled from rooms.

Rammed earth

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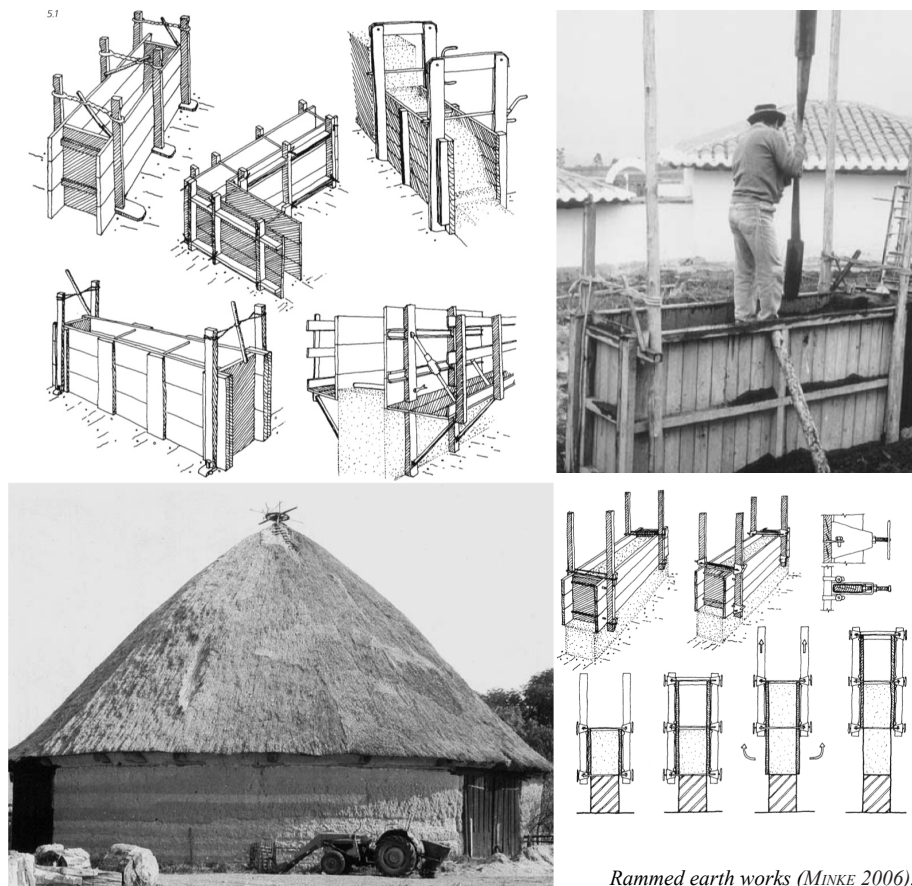
Rammed earth works (MINKE 2006).

Compact layers of damp earth in wooden formwork; used for thick (40-100 cm) bearing walls; masonry goes through the perimeter after drying to prevent the deformation; the formwork is taken block by block. Workforce: the raw earth housing yard are traditional used and managed by small artisan «company», the master chief called maalem and other laborers the working tools: proportional+traditional+crafstmanship. The sustainability aspect of earth as a building material; readily available material; ecological, recyclable; reusable in construction and agriculture field; low energy consumption and low cost; allows a different variety of techniques (rammed earth, mud bricks...); the materials: building with earth. The reason of birth for these techniques is the adaptation to the environnemental challenges and availability of materials. Wood and earth arent mostly used randomly but its because they are the most available ones on the planet. Low consuming water and the production and installation doesn't require great skills and can be made on site mud bricks: sun dried blocks of earth shaped in wooden models it's formed by hands into molds, the drying varies according to climate and seasons as for the workforce: the masonry has the same traditional masonry sustainability and advantages: they are used for strong walls, mud bricks have high inertia due to the high gravity which is suitable in the areas with high climatic temperature.[4]

4. MINKE 2006.

Self building during the 20th century. The case of shantytowns in Morocco. Self building gone wrong
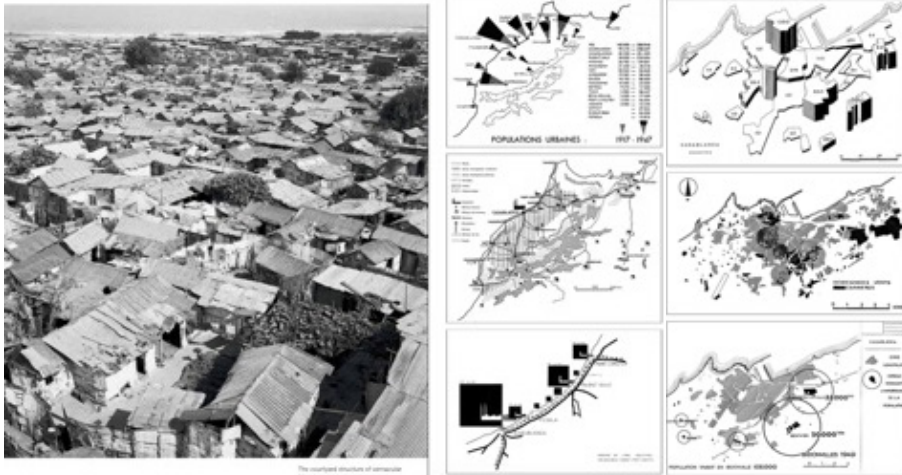

The case of shantytowns in Morocco

Morocco has been struggling with shantytowns and slums since the 20th century. They are still present up to this day, mostly in Casablanca and Salé; it's still a recurring phenomenon although the government has made some efforts to eradicate it, unfortunately this kind of out of norm self building keeps on spreading. The reasons for this kind of random self-building aren't really just a coincidence but a direct cause to many factors, firstly the rural exodus that happened and developed fast from 1936 to 1952, secondly the rapid growth of Morocco's urban populations, it's also due to urban poverty encourages the formation and demand for slums. With rapid shift from rural to urban areas, poverty migrates to urban areas. Many local and government have for political interests, subverted, efforts to remove, reduce or upgrade slums into better housing option for the poor. Lack of affordable low housing and poor planning encourages the supply sides of slums and finally the poor Infrastructure & Social Exclusion which forces people to adapt the conditions beyond his/her control. Poor families can't afford transportation, or those who simply lack any form of affordable public transportation.

Wikihouse an example of CC architecture

WikiHouse is an open source project to reinvent the way we make homes. It is being developed by architects, designers, engineers, inventors, manufacturers and builders, collaborating to develop the best, simplest, most sustainable, high-performance building technologies, which anyone can use and improve.Their aim is for these technologies is to become new industry standards; the bricks and mortar of the digital age. The project was initiated in the summer of 2011 by Alastair Parvin and Nick Ierodiaconou of 00, a London-based
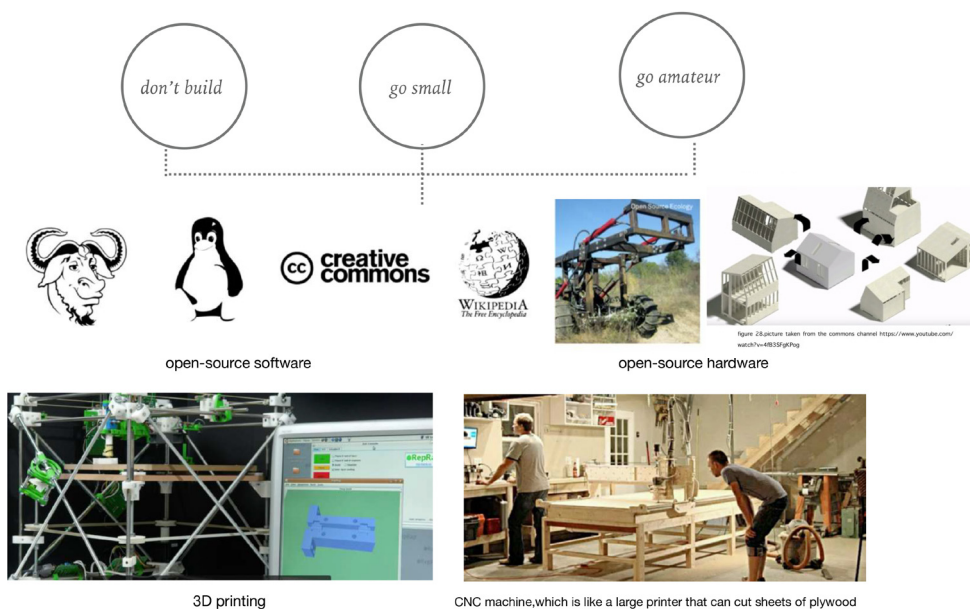
Wikihouse rules for designing can be summarised by this golden rule: never designing a piece that can't be lifted up and making sure it is symmetrical. This concept is inspired by the old construction technique for used for barns.The three principles that oriented this project are: don't build, go small, go amateur. To make this possible and accessibe the project uses Creative commons as the basis for the means of design,the company is trying to rely on open source softwares and open source hardware in the future; for example, the Wikihouse website is an open source software ,and they use CNC machines as well as 3D printers to produce parts that are easily assembled. It functions by visiting the wikihouse website and using the plugin from the model, then downloading the file (using Sketchup since it's easy to use); the information will generate a set of cutting files from which a kit of parts will be printed out using CNC machine and conventional sheet material; the assemblage doesn't need the traditional construction skills because it uses peg connections and mallets which are part of the printed kit the lightweight frames are lifted into place and raised like the traditional barn-raising and a team of 2 or 3 people can complete a small house structure; a basic house chassis is put to place with a small house structure: it can been done in about a day, the house chassis can be integrated with windows or wiring services skin and materials available can also be injected; other models can be made from the same one since it has the capability within itself to generate new parts and make other houses and possibility.

Salima Naji's architectures: https://www.salimanaji.org

strategy and design practice, in collaboration with Tav of Espians, James Arthur now with 00 and Steve Fisher of Momentum Engineering.[5]

Some examples of solutions regarding sustainability, open source architecture and shantytowns

When it comes to using natural materials for construction such as earth and mud bricks, we are confronted by some challenges; like the time of execution and efficiency as well as aesthetics, because unfortunately people nowadays have a negative outlook on earth as building material and consider it a sign of poverty and marginalization; which is very comprehensible since most sustainable building are far from the urban fabric and look outdated. The question then arises, what is the technical passage that can be used to have the same kind of efficiency and landscape impact? One of the first answers to this kind of challenge is earth treatments such as additives: using fibres (animal or human hair, cocunuts, bamboo) because it reduces the shrinkage;[7] or thining: addition of sand. Mineral stabilizers as cement are used to stabilize against water. More mechanical tools as the usage of rammed earth panels are considered in order to prevent horizontal shrinkage cracks at vertical joints with one story height panels with 2,4 m width. The execution time can also be fixed with semi mechanical process such as pneumatic compacter. As for designing and shape enhancements, some experiments are being explored like «Stone Spray» a project by architects Petr Novikov, Inder Shergill and Anna Kulik. The Project is a revolutionary robotic construction method that uses soil as the basic material and a liquid binder to solidify the soil granules. And it uses a jet spray system to deposit the mix of soil and binder, for

5. Wikihouse, the information has been retrieved from, https://Wikihouse.cc,https://www.ted.com/talks/alastair_parvin_architecture_for_the_people_by_the_people

constructing architectural shapes.Some architects are already working with rammed earth for their projects, The Ricola Herb Centre in Laufen (Basel, Switzerland) is one of those projects , it was designed in 2012 by renowned architects Herzog & de Mueron.The facade is made of compacted local clay sourced from the Laufen valley using loam with the help of a specialist company that manufactures prefabricated facade elements which are all organic. Another example would be the works of Salima naji, who is a moroccan architect that works with earth as a natural material. In one of her projects she explains how the rammed earth is a technology that must be accompanied by numerous architectural devices, for this project according to the soil of the site, the base has been more or less disbursed and a bituminous waterproofing complex completes the device around a slab embedded in stabilized rammed earth, in the basement and for roofing previously established.[6]

Open source architecture as a solution to the housing crisis

«What began as an academic initiative to improve the quality of life of poor strata of the population has meanwhile become a professional "do tank" offering services that cover the entire spectrum of urban development. Alejandro Aravena (1967 Santiago de Chile) founded Elemental in 2001 in his hometown with the goal of alleviating social deprivation directly instead of hoping for a balance of income relations. Besides building public facilities and public housing. Elemental also develops new approaches for the reorganization of resources and the potential of cities by means of projects devoted to infrastructure and transportation. This research documents the social activity and history of the international architectural team and sheds light on its financing strategies, for example through participative building».[7] (ARAVENA, ANDRÉS 2008).

Chilean architect Alejandro Aravena – 2016 Pritzker Prize winner –, released a number of his residential designs as an open-source resource system to help tackle the global affordable housing crisis. Aravena's firm, Elemental, has posted drawings for four of its low-cost "incremental" housing projects on its website for free download. The aim is to provide the material to government and developers who doubt in investing in social housing. The difference between this project and Cameron clair's open network is that this one tackels the problem of urbanization and offers a settlement between the government and the habitant, on one hand providing half the house with public subsidy

6. See also Salima Naji's website: https://www.salimanaji.org/salima_naji/projets/,and earth architecture›s website for more information http://eartharchitecture.org/?cat=84

7. ARAVENA 2012.

Quinta Monrly, Project by Alejandro Aravena, Elemental 2003 (Source: Archidaily).

to the habitant and on the other hand capitalize on the production of self organized households, the has produced a brief summary of the principles that underpin these projects giving a middle solution that will satisfy both parties, has produced a brief summary of the principles that underpin these projects.aravena has produced a brief summary of the principles that underpin these projects.

«Cities without slums» between dreams and reality

The Moroccan government has tried to minimize the number of shantytowns and slums through the national program The resettlement, which consists of the allocation of developed lots with an area of between 64 and 70 m² for single-family lots and 80 m² for two-family lots) to be valued in assisted self-construction, in the context subdivisions with full or progressive equipment. The use of progressive development responds to the desire to produce lots, financially, more adapted to the possibilities and the rate of savings of households with limited resources while ensuring the safety and health of the inhabitants and the harmonious development of cities, on the basis of subdivision plans and technical previously established. The three operations that were put in place. *Relocation*: operationally it is a question of allocating social housing (with a surface area less than or equal to 60 m² of a total real estate value not exceeding 120,000 dirhams). This mode of intervention is intended for the rehousing of the slums identified and, in some cases, the households concerned by operations of dedensification of the areas to be restructured. The aid granted in this context by the State represents 1/3 of the VIT. *Restructuring*: defined as restructuring operations

aimed at providing large and medium-sized shantytowns that can be integrated into the urban fabric, with necessary infrastructure equipment (sanitation, roads, drinking water, electrification) and regularizing their urban and land use situation. The cost is calculated on the basis of 1.5 million dirhams/ha. State aid (50% of the cost) is intended for road and sanitation equipment. Drinking water supply and electrification are the responsibility of the beneficiaries with a contribution, if any, from the local authority. 270,000 households at the start of the program increased to 421,699 households, with an increase of 56% according to the government's website.[8]

Conclusion

For an architecture that doesn't only create «places» but rather «spaces», where the habitant goes within whenever inside, just like Tadao Ando said: «the individual will recognize his own self when he is inside away from the unholiness of the outside world» then instead of creating a clear seperation between the interior and exterior through objectivity or subjectivity, the space should create an interstitial link between it's usage and the user, through the common creation between the architect, the amateur and nature. Thus for these three creators to find a balance, a strong system should be put in place, one that doesn't have a bias but rather ties between them. Since construction could also be seen as a production system we could study it from an socialist point of view, taking in consideration the output or the resulting product as the building which is done through the means of production and governance, the first one represents the more mechanical aspect or we could say the labor which is passive and uses finance and materials as assets, the later represents the laborer which is active and articulated around three main actors: the government, the architect and society, the production should consider the cost and the tools it's using and for that reason sustainability might be the ground on which it should be founded, with available material like earth and renewable energy, the cost could have a decreasing curve.
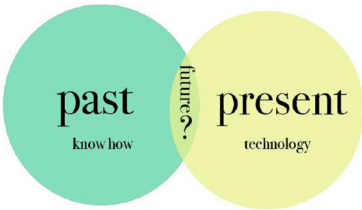Bibliography

8. Villes sans bidonvilles, *Cities without slums*, information retrieved from http://www.mhpv.gov. ma/?page_id=956

hypothesis :

can the equation : past+present give better solutions
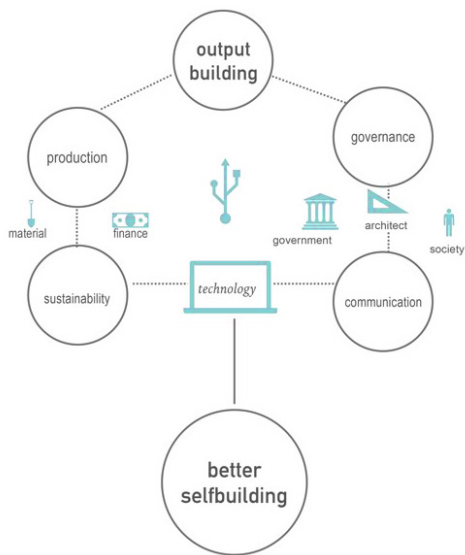using technology as a medium for better solutions in the
near future?

past
know how

future?

present
technology

negative social response

sustainability became an index
of poverty

self made cities

self building without norms
the case of shantytowns

output
building

production

governance

material   finance

government   architect

society

sustainability

technology

communication

better
selfbuilding

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