EMPOWERED NETWORKS: Exploring Digital Equity & Spatial Subversion in the Rohingya Refugee Settlements

A Thesis

Submitted to the

Faculty of Miami University

In partial fulfillment of

The requirements for the degree of

Master of Architecture

Department of Architecture and Interior Design

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2023

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Abstract

This thesis aims to re-investigate effective placemaking in the humanitarian context, particularly in the Rohingya refugee crisis in Bangladesh. It will explore the impact of design in promoting digital equity within existing spatial subversions in the refugee camps. The empowerment of underprivileged populations through digital literacy and equity has been an emerging topic in the design field for the last two decades. On the other hand, the global crisis of refugee settlements and the geopolitical debates regarding the physical and socio-cultural rehabilitation of informal and forced migration across countries continue to persist. The Rohingya population from Myanmar, often called "the world's most persecuted minority"[1], has been forcefully displaced and is confined within the refugee camps in the coastal borders of the neighboring country Bangladesh. While they are thriving in a status quo with the repatriation in stasis, the settlements continue to grow, creating complex challenges regarding the spatial design, functioning of the community, and their empowerment within the closed boundaries.

This thesis is an attempt to explore how multi-scalar mapping can reveal impactful socio-economic dynamics concerning the design complexities in a refugee settlement, which often gets out of focus from a top-down aerial perspective. Moreover, the prevalent practices regarding the use of digital tools in design are often indifferent to the questions of digital equity among the underprivileged population and in the accommodation of relevant needs of technology and energy sources in the camps. Although initiatives to improve Internet accessibility, such UNHCR's Connectivity for Refugees and NetHope, advance and increase programmatic research on usage and accessibility, there is still "a persistent gap between idealized visions of what digital connectivity could achieve (globally) and evidence about how new connectivities are used in specific contexts" (Smart et al., 2016).[22] Design interventions have the potential to work as a subversive advocate for the refugees in this situation, to bring out their voices and needs from a bottom-up approach of spatial dissection.

The purpose of this thesis is to investigate the dynamics of place-making within the critical socio-cultural context of the refugee camp and the ways to promote digital equity through design. This has a major impact on shifting the socio-economic paradigm in the settlements and ensuring long-term resilience and empowerment for the refugees. The research will be conducted in the existing Rohingya refugee camps in Bangladesh as the case study. The final aim is to explore adaptive alternatives in placemaking, within the digital infrastructure of the camps, which will empower the refugees to create an agency for themselves that reciprocates the context-specific paradoxes.

Key Questions

1. How to empower the refugees through design, particularly through digital literacy and connectivity?
2. How to promote digital equity within the spatial subversions and the critical socio-cultural context of the camp?

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1. Staff, Al Jazeera. "Myanmar: Who Are the Rohingya?" Rohingya | Al Jazeera. Al Jazeera, April 18, 2018. https://www.aljazeera.com/features/2018/4/18/who-are-the-rohingya.
2. Kaurin, Dragana. "Space and Imagination: Rethinking Refugees' Digital Access." UNHCR - The UN Refugee Agency, April 2020. https://unhcr.org/innovation/wp-content/uploads/2020/04/Space-and-imagination-rethinking-refugees%E2%80%99-digital-access_WEB042020.pdf.

List of Abbreviations

UN	United Nations
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Interantional Children Education Fund
UNDP	United Nations Development Program
WFP	World Food Program
IOM	International Organisation for Migration
GoB	Government of Bangladesh
GoM	Government of Myanmar
EU	European Union
IDP	Internally displaced population
MoU	Memorandum of Understanding
NFI	Non food items
NGO	Non government organisation

Project Background- The Rohingya Refugee Crisis

Until 2017

The Rohingya are a large Muslim ethnic minority in Myanmar at the center of a humanitarian catastrophe. Myanmar government does not recognize them as citizens or one of the 135 recognized ethnic groups in the country. Myanmar regards them as illegal immigrants, a view rooted in their heritage in East Bengal, now called Bangladesh.

The history of the region of Burma has seen a sequence of ethnic shifts, conquests, expansion, and collapse that is quite typical of the history of most regions of the world. In the last millennium and a half, there has tended to be a core state or core in the Irrawaddy Valley, which repeatedly expanded towards and contracted from the periphery of the modern-day territory of Myanmar; therefore, by the mid 90's around one third of the population of Myanmar was made up of ethnic groups distinct from the Burman majority. This naturally reflected the history of interaction with China to the north, India to the west, Thailand and Laos to the east and Indonesia and Malaysia to the south. In particular, the mountainous regions to the north and east of the central Irrawaddy regions have long been home to a diverse range of non-Burmese ethnicities. Some of these groups live exclusively in modern day Myanmar but many live on both sides of the various borders. Up to the nineteenth century, the evidence points to a degree of ethnic and religious tolerance, even as the Burmese regions became increasingly dominated by Buddhism, while more marginal groups retained animist beliefs or adopted Christianity or Islam.

These discussions lead to the fact that it is particularly important to separate the history of Arakan from that of Burma up to the 1800s. The core of the Burmese civilization in central Burma, along the Irrawaddy Valley is geographically and culturally linked to the Tibetan region, southwest China and the rest of East Asia. The south (the modern-day Mon and Tanintharyi provinces) is part of the wider Malaysian Peninsula and has sea links to the south, including Sri Lanka and parts of Indonesia. In fact, this was the original vector for the early spread of Buddhism to Burma.

However, Arakan region in the west has always been separated from the rest of Burma by a high and difficult-to-traverse coastal mountain range. As such, for most of its early history, both in terms of ethnic makeup and political economic interaction, the natural links of the region were across the Bay of Bengal to India rather than with the rest of Burma. It was also a relatively poor province, reliant on subsistence agriculture and fishing, so it was generally of little interest to would be conquerors.[3]

This state of isolation only changed from around 1000 AD, when the Rakhine ethnic group moved from central Burma to Arakan. From then until the late 1700s, Arakan had periods of dependence on the rulers of central Burma, periods of independence and even short periods when it dominated neighboring Bangladesh. It seems that the Rohingya were an important part of the ethnic mix of Arakan in this era. Nineteenth century British reports refer to how the local Muslims called themselves "Rovingaw" or "Rooinga". More importantly, as early as 1799, Francis Buchanan referred to "Rooinga" in the area. In 1784, Arakan was formally annexed by the kingdom of Burma. However, this conquest brought the kingdom into conflict with the

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[3] https://edition.cnn.com/specials/asia/rohingya

British who also had an interest in the region. At the end of the first Anglo Burmese war (1824-6), Arakan was appropriated by the British, who once again separated from Burmese rule. However, when British had conquered the rest of Burma in the 1880s, the province was included in colonial Burma. At the same time its administrative title was changed from Arakan to Rakhine. Burma was designated a separate administrative state to India in 1937 and the borders were drawn based on state borders that had existed just before the war of 1824-6. So, the new administrative unit thus integrated Arakan into what was to become, a mere ten years later, the newly independent country of Burma. This purely administrative decision is what led to the situation we are in today.

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Burmese nationalists resented the British rule and one source of unrest was the lack of support the British gave to the Buddhist religious hierarchy. The seeds for deep divisions in the country along religious lines had already been sown. Things really came to a head during World War II. Burma became caught up in the war in 1942 when the Japanese invaded the area. Initially their arrival was welcomed by some Burmese nationalists who, as with the Indian Congress Party, saw the defeat of the British Empire as a step on the road to independence. However, the Rohingyas remained loyal to the British (as

did many other non-Burmese ethnic groups), leading to significant ethnic strife between the Rohingyas and Burmese ethnic communities. It has been estimated that some 307 villages were destroyed, 100,000 Rohingyas lost their lives and a further 80,000 fled the region as a result. In turn, the British recruited soldiers from among the displaces Rohingyas, and, looking for allies, promised the Muslims of northern Arakan relative independence and the creation of a Muslim National Area, in exchange for their contribution to the war effort.

In 1947, some Rohingyas formed their own army and sought incorporation of northern Arakan into the newly created East Pakistan, now Bangladesh. This initiative failed, but after Burma achieved its own independence in 1948, some Arakanese Muslims went on to petition the Constituent Assembly in Rangoon for the integration of Maungdaw and Buthidaung districts into East Pakistan. It drove the Burmese authorities to regard the Muslim population of Arakan as hostile to the new regime and to see them as outsiders whose loyalty lay with a different state. These events helped create belief that only Buddhists could really be a part of the new state, an attitude reinforced by the attempt of the Burmese Communist Party to overthrow the new state after 1948.[4]

For the Rohingyas, the period immediately after independence meant restrictions, as the region was deemed a frontier area, reflecting the tensions of the war years and the short lived revolt of 1947. However, compared to the significant armed revolts by the communists, Shan and Karen tribes, Arakan remained peaceful. Key to the steady increase in the level of discrimination and violence aimed at the Rohingyas has been the shifting legal definition of Burmese citizenship. The story that the Rohingyas are somehow alien to the state of Myanmar now finds its expression even in the constitution and the law of the country. One of the preconditions to genocide is the systematic denial of the standard legal rights to an identified group. A key part of the persecution of and discrimination against the Rohingyas is denying that they are legitimate citizens of the state they were born in ad live in.

The 1974 Constitution of the Socialist Republic of the Union of Burma defined citizenship as follows: 'All persons born of parents both of whom are nationals of the socialist republic of the Union of Burma are citizens of the Union.' This was a critical step because, since the Rohingyas were not formally treated as citizens in 1947, they could not now be citizens of the state. Their national registration certificates (from the 1947 legislation) were replaced with foreign registration cards. The next legal step was the 1982 Burmese citizenship law, which created four categories of citizenship: citizen, associate citizen, naturalized citizen, and foreigner. Different categories were assigned to the ethnic groups based on their residence in Burma before 1824. Anyone not belonging to these categories, specifically the Rohingyas was deemed to be foreign.

Under the 1982 legislation, the Rohingyas were denied full citizenship due to ethnic classification used in 1948. In addition, legal structures were left vague, with substantial amounts of administrative discretion, and their few legal rights were undermined by the regular passing of Martial Law legislation.

Denial of citizenship led to restrictions on movement and access to education, as well as the loss of land holdings. The 1974 constitutional and legal changes also saw an increase in the levels of violence by the state towards the Rohingyas, and this led to a

[4] https://edition.cnn.com/specials/asia/rohingya

growth in the number of refugees fleeing to Bangladesh. Soon after this, the 1977 Nagamin (Dragon King) campaign was designed to identify every individual in Burma as either a citizen or a foreigner. In Rakhine, this was interpreted by the Buddhist community and the army as a license for attacks on Rohingya communities, and by 1978 over 200,000 more Rohingyas had fled to Bangladesh. In turn, Bangladesh returned most of these refugees back to Burma.
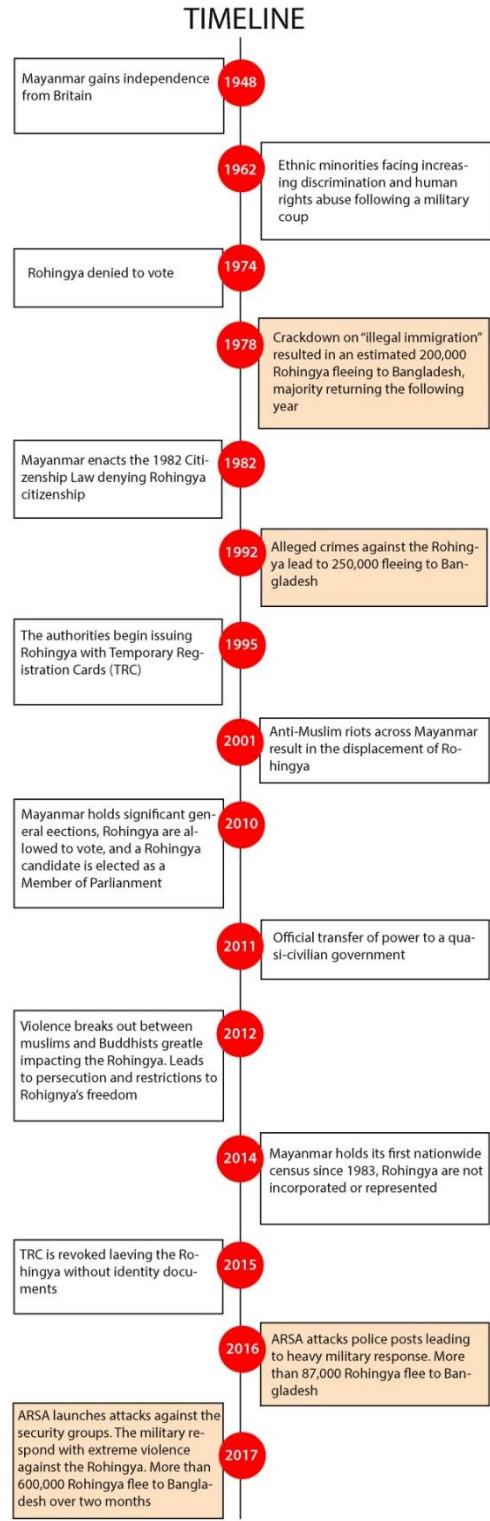
Political unrest after 1988 revolt and the annulled 1990 elections saw an increased deployment of the Burmese military in northern Rakhine. Nonetheless, some Rohingyas were allowed to contest the 1990 elections based on the 1982 citizenship laws. The renewed attacks in the period 1991-2 saw 250,000 flee to Bangladesh, and again were marked using forced labor, beating, rape and land theft. Not only were the Rohingyas displaced from their villages by the new villages or the army bases, but those forced to return from Bangladesh found their previous communities had been destroyed and re-appropriated by groups favored by the state. Typically, this led to renewed tensions, and subsequently more repression and a continuation of the refugee flow to both Bangladesh and Malaysia.
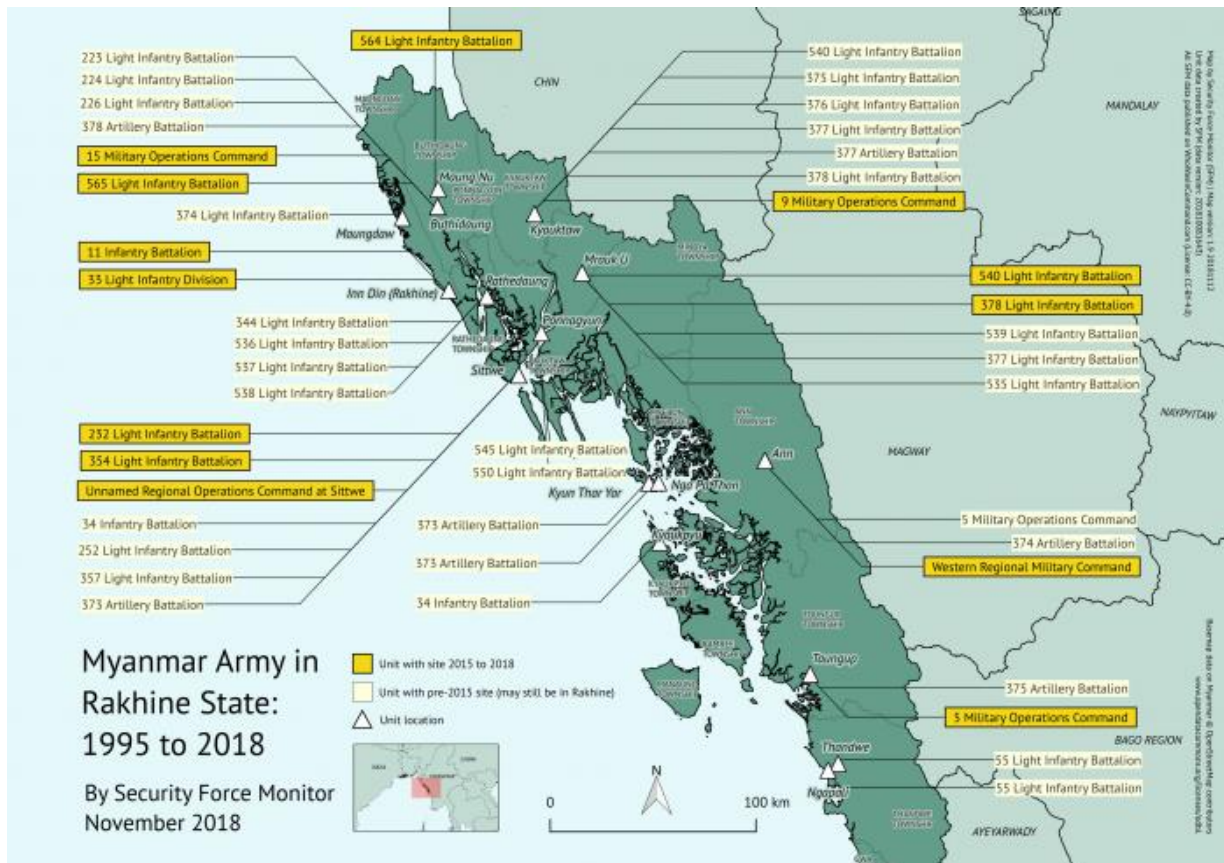
Bangladesh consistently and forcibly sent back refugees to Burma, including those who had fled in the 1970s and again in the early 1990s, in violation of various UN declarations on human rights and the rights of refugees. Those who fled to Malaysia have often been allowed to stay, but as stateless refugees, since the Burmese government will not accept them back and the Malay officials are prepared neither to force their removal nor to provide them with proper refugee status.

The major political influxes causing the present scenario are narrated shortly in the following table:

TIMELINE

Year	Event
1948	Mayanmar gains independence from Britain
1962	Ethnic minorities facing increasing discrimination and human rights abuse following a military coup
1974	Rohingya denied to vote
1978	Crackdown on "illegal immigration" resulted in an estimated 200,000 Rohingya fleeing to Bangladesh, majority returning the following year
1982	Mayanmar enacts the 1982 Citizenship Law denying Rohingya citizenship
1992	Alleged crimes against the Rohingya lead to 250,000 fleeing to Bangladesh
1995	The authorities begin issuing Rohingya with Temporary Registration Cards (TRC)
2001	Anti-Muslim riots across Mayanmar result in the displacement of Rohingya
2010	Mayanmar holds significant general eections, Rohingya are allowed to vote, and a Rohingya candidate is elected as a Member of Parliament
2011	Official transfer of power to a quasi-civilian government
2012	Violence breaks out between muslims and Buddhists greatle impacting the Rohingya. Leads to persecution and restrictions to Rohignya's freedom
2014	Mayanmar holds its first nationwide census since 1983, Rohingya are not incorporated or represented
2015	TRC is revoked laeving the Rohingya without identity documents
2016	ARSA attacks police posts leading to heavy military response. More than 87,000 Rohingya flee to Bangladesh
2017	ARSA launches attacks against the security groups. The military respond with extreme violence against the Rohingya. More than 600,000 Rohingya flee to Bangladesh over two months

Since 2017:

The 2017 Rohingya persecution in Myanmar began on 25 August of that year when the Myanmar military forced, and local Buddhist extremists started attacking the Rohingya people and committing atrocities against them in the country's north-west Rakhine state. The atrocities included attacks on Rohingya people and locations, looting and burning down Rohingya villages, mass killing of Rohingya civilians, gang rapes, and other sexual violence.

According to the Joint Response Plan from UNHCR and GOB, "as of 01 January 2022, approximately 918,841 Rohingya refugees/FDMNs are registered in Bangladesh as part of the Government-UNHCR joint registration exercise, residing in thirty-three extremely congested camps formally designated by the Government of Bangladesh in Ukhiya and Teknaf Upazilas of the Cox's Bazar District, as well as on the island of Bhasan Char."

Regarding the current needs assessment, the JRP further narrates, "The most commonly reported needs for host communities include shelter materials, income-generating activities and employment, and health care reflecting the persistent impacts of the COVID-19 pandemic. Other priority needs among the host community include cooking fuel, access to safe and functional latrines, as well as access to clean drinking water."

Following the signing of the MOU between the Government of Bangladesh and UNHCR (on behalf of the UN agencies working in Cox's Bazar), from November to December 2021, nine UN agencies coordinated by

UNHCR initiated multi-sectoral assessments to better understand the needs of Rohingya refugees/FDMNs living on Bhasan Char and to facilitate planning of supplementary relief efforts. These assessments identified needs in the provision for access to services pertinent to registration, child safety, gender-based violence, health and nutrition, food security, water, sanitation and hygiene, shelter, non-food items, informal education, skills and capacity building, environmental management, and disaster preparedness. These needs, as well as environmental pressures, will tend to increase as the population increases over 2022. Attention is also required for persons with special needs including children, women, older persons, and persons with disabilities. Ensuring accessibility, particularly with regard to persons with disabilities, is also required. The Government of Bangladesh continues to facilitate movement from Bhasan Char to Cox's Bazar and vice-versa on a need's basis, the precise modalities and arrangement of which will be agreed between the Government and the UN. [5]

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[5] https://reliefweb.int/report/bangladesh/2022-joint-response-plan-rohingya-humanitarian-crisis-january-december-2022

The Thesis Purpose:

Although there are multiple levels of national and international aid initiatives at work, there remains the continuing paradox of permanence vs temporariness in the existing camps. The population keeps growing along with it's needs to sustain, whereas the resources and facilities remain stagnant. Within these challenges, several noteworthy architectural projects are being implemented in the camps, with an aim to improve the livelihood of the refugees. However, there are substantial amount of reported socio-political and cultural crisis that seems to be deliberately ignored throughout the process. Studying the responses of the refugees from public interviews as well as opinions of professionals working there, it seems like there is a metaphoric "media goggle" at place, which tends to focus only upon the infrastructural developments and cast a deep shadow upon the persistent and deep-rooted crisis. By the time the political authorities are convinced about the expert opinions, there remains hardly any point of implementing the preventive measures in the concerned area. Such was the case in the Rohingya refugee crisis triggered in August 2017, where following a massive genocide, millions of Rohingya population were forced to migrate from Myanmar to neighboring country Bangladesh. The consequences took a massive toll not only upon the migratory population, but also upon the host country, Bangladesh. Being a developing country itself, it was way beyond its capacity to facilitate for the abrupt emergency, maintaining a balance inland. Among other debates, a particularly mentionable one was about the BD government's decision to shift the migratory population to a remote island called Bhasanchor. Although a substantial number of theoretical arguments were provided from the experts in different fields regarding the probable damages of shifting the settlements, it failed to be convincing enough due to the lack of measurable data.

The refugees are in need of empowerment and a platform to voice out there needs from their perspective, rather than a top-down approach of assessment that is currently at place.
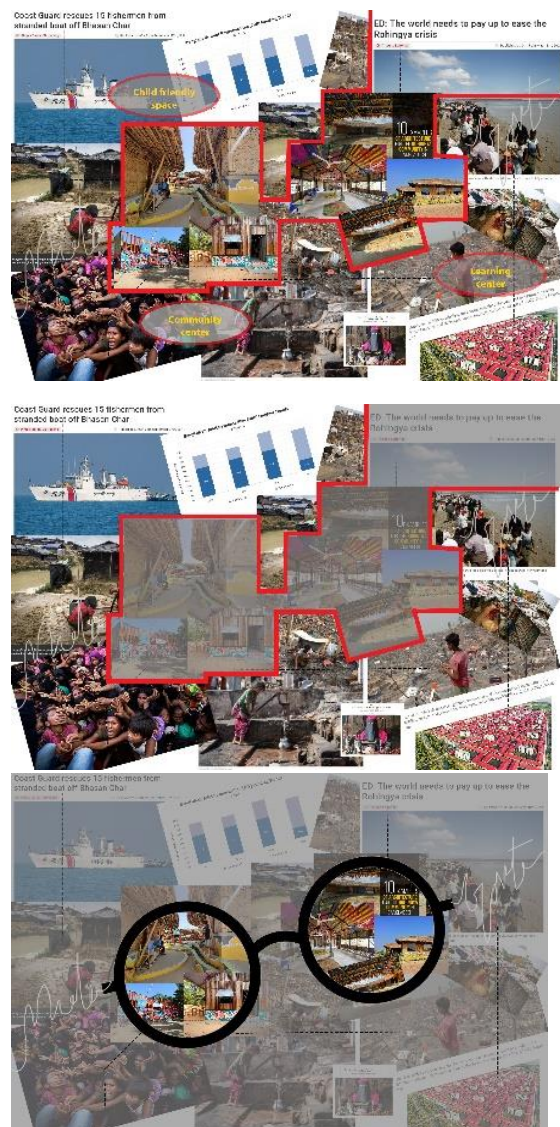
This thesis aims to explore ways of using architecture for the advocacy of the underprivileged, using digital tools as medium. One part of the analysis will include predicting possible scenarios in immediate and long-term future, and the other portion will focus on bringing up effective design solutions on both policy level and infrastructural level to mitigate the possible deteriorations predicted.

The tools already in use in this field are ArcGIS, GAN modelling, simulation softwares and digital algorithmic inputs and deep learning technologies for AI for predicting future scenarios. The use of aforementioned digital tools and similar sort of intervention is being investigated in other regions/countries, but it's not yet explored specifically for Rohingya issue. How can architecture contribute to mitigate humanitarian crisis?-this has been a long-debated question in the field, which I would like to investigate further and see if emerging technologies can add new dimensions to the inquiry.

It is further important to understand the social, economic, and geographic condition of the camp locations in question: Bhasanchar & Cox's Bazar, Bangladesh, as well as the background of lifestyle of current refugees in their home country Myanmar. Also, the condition of the host community in cox's bazar and the dynamics of co-living in the same location is another crucial thing to investigate. Besides, throughout the thesis investigation, another factor to be kept in mind would be the inclusivity and appropriateness of using the technology to respect the sensitivity of the topic of refugee crisis. With the current global trends in technology, it is important to direct these tools to empower the underprivileged and protect them from imposed decision making on their behalf.

Relevant Practices/ Precedents

For this section, I have used the case studies or ongoing research from interdisciplinary fields which are relatable to this thesis. These are works from both academic as well as organizational backgrounds.

1. The Toolkit

This is a collaboration project between Ennead Lab, Stanford University and the United Nations High Commissioner for Refugees, exploring the process of planning, building and operating refugee settlements, with the goal to nurture mutually beneficial relationships among refugees and host communities alike, all with an eye towards durable solutions and rational exit strategies.

To better plan settlements, the Toolkit is a methodical framework for integrating information, design, technical tools. This concept works on three physical scales: macro, mezzo, and micro, as well as three stages of camp evolution: contingency, long-term, and exit. This project was tested in several middle eastern refugee camps including Zataari, Mugombwa-Rwanda, etc. As reported in the official website, "This system will also allow UNHCR planners to evaluate local ecological conditions and design camps that maintain a sustainable relationship between refugees and the land. Information gathered will be fed back into the process so that future efforts draw upon past experience. Initial testing of the toolkit has yielded superior results within a limited time frame and with no added capital costs."[6]
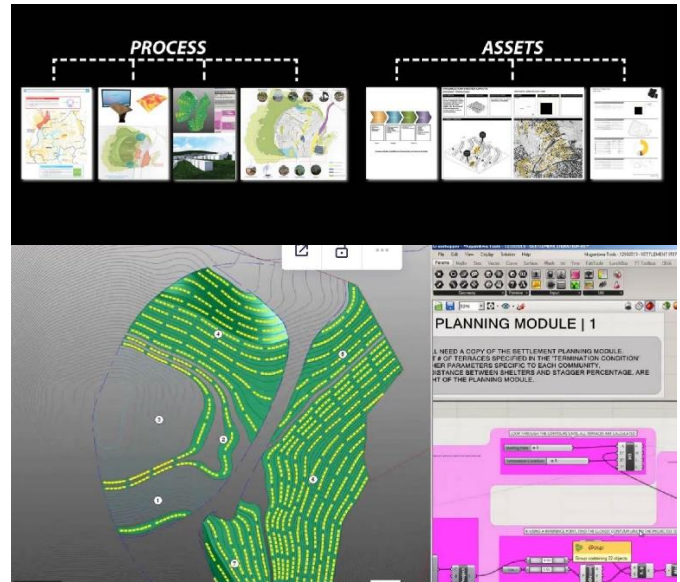
TESTING THE TOOLKIT:
Mugombwa, Rwanda
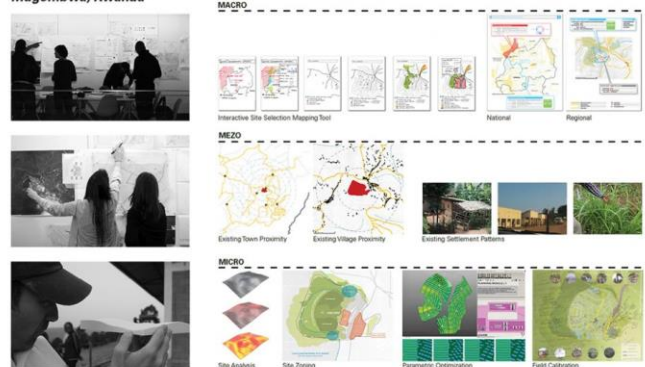
This method turns out to be particularly effective in the cases where the paradox of temporariness and permanence is an everyday reality- as is the case with Rohingya settlements at present. Similar technique can be used to assess the ecological, cultural, and spatial needs of the sustaining refugee settlements in Cox's Bazar and how to make the best use of the limited resources for a prolonged period.

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[6] https://www.enneadlab.org/projects/rethinking-refugee-communities#project-15472

2. *Memory through Design*: Supporting Cultural Identity for Immigrants through a Paper-Based Home Drafting Tool

Dina Sabie, Samar Sabie, Syed Ishtiaque Ahmed

This is ongoing interdisciplinary research broadly under the field of computer science and information technology. Current practices in HCI (human computer interaction) mostly focus on the practical needs of immigrants, rather than the emotional and cultural needs. For this research, as an approach to instigate the memory of space from the immigrants, a paper-based home drafting tool, "Our Home Sketcher" was built. Through this tool, the immigrants were given the opportunity to draw their preferences of light, space, and privacy issues in an ideal home plan- which were then put into an algorithm for a generative software to be able to produce 3d models of the sketched houses. The study included 16 immigrants from different countries to North America who participated in the house design process. This study was done with a limited number of people and the intention was to bring out the gaps in the design patterns of the continent that fails to facilitate the deeper needs of the immigrants. The results brought out insightful outcomes regarding how collective memory impacts the perception of space and has an active role in improving the process of placemaking. [7]
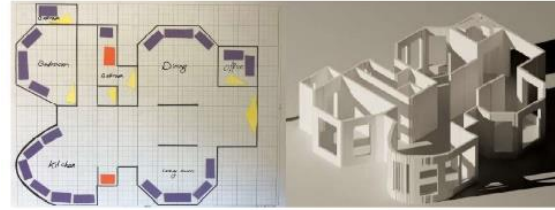
Figure 7: Faceted walls (P1, female, graduate student, 20s)
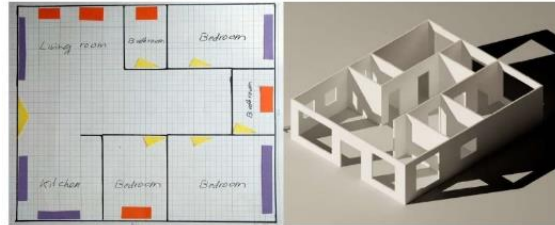
Figure 6: The kitchen and the living room face the front yard (P12, male, doctor, 20s)
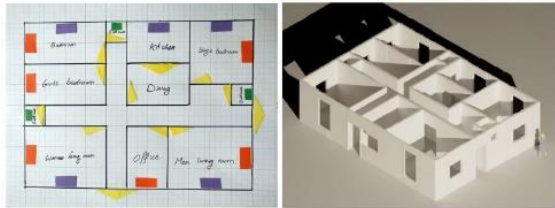
Figure 4: A clear separation between male and female (P6, female, housewife, 20s)

Figure 2: The design sessions

Image source: Memory through Design: Supporting Cultural Identity for Immigrants through a Paper-Based Home Drafting Tool, CHI 2020, April 25–30, 2020, Honolulu, HI, USA

This is potential research that can also be relevant in the Rohingya refugee communities. It seems particularly relevant to this thesis in its initial conceptual framework about how to empower the voice of immigrants and engage them in the process of placemaking.

[7] https://dl.acm.org/doi/10.1145/3313831.3376636

3. Predicting & Modeling Integration of Refugees to Alleviate Economic Pressures

Jason Kim, Rishabh Meswani, Neel Patel-Shah, Aviral Pereira, John Shotton

This is a project under the foundation named AI for Good. Founded in 2015 by a team of Machine Learning and Social Science Researchers in the US and Europe, AI for Good is headquartered in Berkeley, California with an international network of core team members, partners and volunteers supporting their work.

This is a broad scale global project where AI is used to predict the ideal destinations for refugees through algorithmic mapping of the refugee migration pattern. A double-sided tracking approach is used to determine the capacity of the receiving country as well as the migratory needs on the refugee's end to determine the ideal matches. [8]
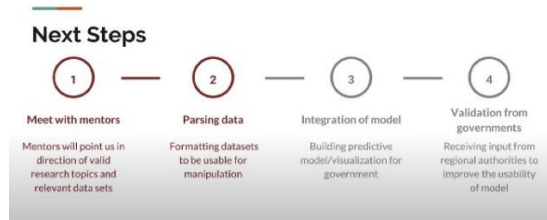
This is a vast scale project which has interesting learning outcomes that can be used in this thesis within the Rohingya crisis. There is an ongoing issue of internal (allegedly forced) migration of the refugees within the host country from Cox's Bazar to Bhasanchar Island. Using the tracking methods from this project, narrowing down the scale and parameters, a cross-camp analysis could be done within the existing Rohingya camps to bring out a comparative screening of the facilities and livelihood qualities among those camps. This can bring to surface important information regarding the preferences of the refugees to chose one camp over the other and the underlying reasons, to understand the challenges better.

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8 Source: https://ai4good.org/what-we-do/sdg-launchpad/urban-development-architect/
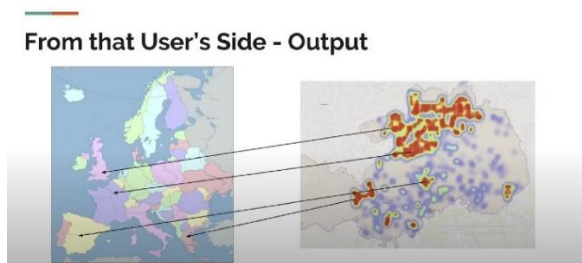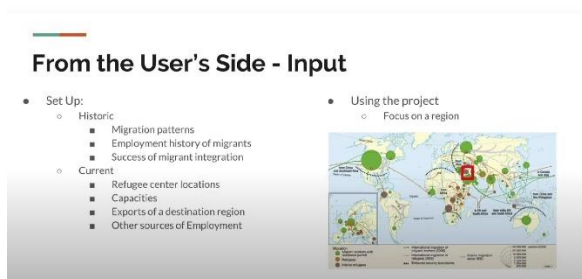
4. Putting deep learning to use in Afghanistan's refugee crisis

Droughts forced 300,000 Afghans to flee their homes, and refugee camps sprang up across the west of the country. (Photo by Hoshang Hashimi/AFP via Getty Images)

This is project powered by NRC to help alleviate the refugee situation in Afghanistan. This project set out initially with ArcGIS to amp out the number of tents from the Satellite image tracing to get a measurable data about the number of refugees and their spontaneous locations. However, generic image tracing fell short in accuracy due to multiple local and cultural factors which could not be included in the machine learning process through bare image mapping. This is where AI came to work. Through deep learning inputs, the AI was successfully used to trace the necessary data and it could effectively recognize the local parameters that changed the meanings of images in regular mapping process, previously.[9]

This work shows some inspiring possibilities of using AI in the mapping process for needs assessment in refugee camps. With multiple layers of factors at play, staring from global scale geopolitical dynamics to human scale sociocultural contexts, AI has the potential to be effectively trained to determine the issues or happenings, which are otherwise overlooked in an aerial perspective. There is a substantial amount of debate regarding which party this AI is going to facilitate and whether it is going to empower the powerful even

more or not. However, the immersion of digital technology in this field is inevitable and it's time to integrate it in in a manner that the people in need can benefit from it, before things of out of hand.

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[9] Source: https://techmonitor.ai/technology/ai-and-automation/putting-ai-to-use-in-afghanistan-refugee-crisis

Site & Location

BANGLADESH: COX'S BAZAR REFUGEE/FDMN POPULATION AS OF 01 JANUARY 2022

Ramu

Naikhongchhari

Ukhiya

Kutupalong Balukhali Expansion Site
635,965

MYANMAR

Camp 14 / Hakimpara
34,039

Camp 16 / Bagghona / Potibonia
21,863

Camp 15 / Jamtoli
54,231

Camp 21 / Chakmarkul
16,387

Camp 22 / Unchiprang
22,484

Teknaf

Camp 25 / Alikhali
7,881

Camp 24 / Leda
27,409

Nayapara RC
22,869

Bay of Bengal

Camp 27 / Jadimura
16,077

Camp 26 / Nayapara
41,771

Legend:
- Highways
- Roads
- Settlement in camp
- Settlement in camp with host community
- Building in host community
- Camp boundary
- Union boundary
- Upazila boundary
- District boundary
- Myanmar

0   5   10 Km

Creation date: 15 January 2022 | Map Created by ISCG | Sources: ISCG, SMSD, RRRC, OSM | Projection: BUTM | Grid: MRGS 100,000
The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations

For this thesis, I am intending to do comparative study involving the 33 camps currently functioning along the Cox's Bazar to Teknaf belt as well as in Bhasanchar Island. As I proceed forward with the thesis, the site location might be further narrowed down according to the direction and requirements of the outcomes and proposals. Following are the maps of the existing camps in Cox's bazar

Satelite view of some of the existing camps:

Kutupalong RC

Balukhali MS

Hakimpara

Moynarghona

Leda MS

Alikhali
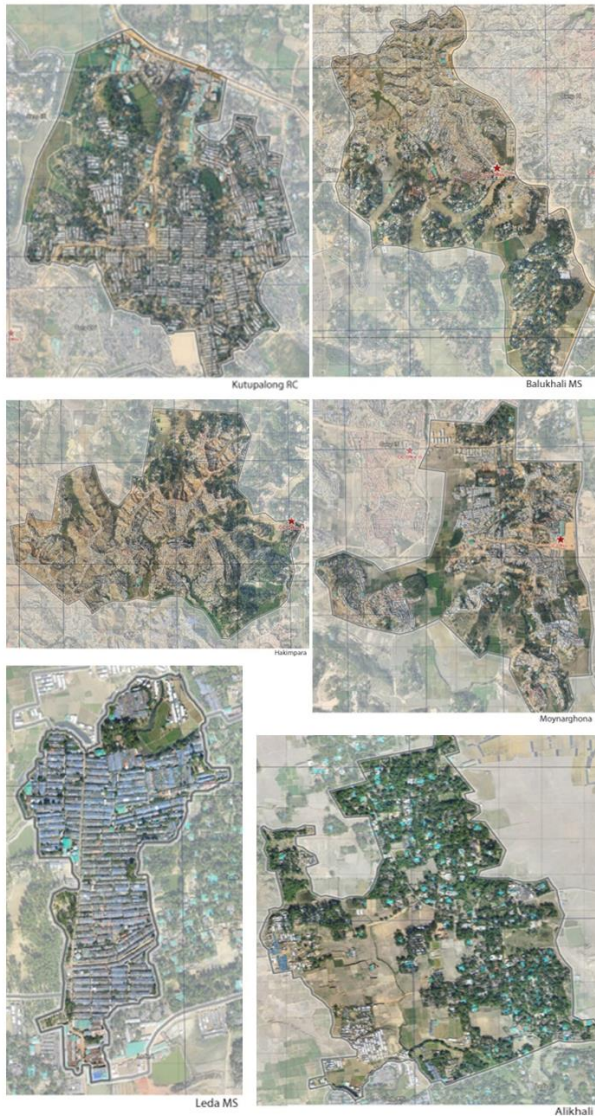
Methods

The methods that I am intending to use for my thesis are describes as follows.

1. Site Survey

Under this method, physical survey of the targeted site will be done with documentation of the current parameters to be considered. On site photographs, videos and in person interviews with the refugees might be considered as some of the specific things to be done. Screening of the information collected will be used through diagrams and infographics to express the observations. In my previous work, I went to the camps with a team of volunteers for three days and covered 7 sites in total. The comparative analysis was presented through icons and site images like the picture below. For this thesis, since I might not be able to visit the sites personally, I am planning to engage a team of interested students/architects to volunteer and will do online interviews of people who are working there as well as the refugees if possible.

2. Mapping

Since this thesis will include a lot of data analytics and algorithmic pattern analysis, mapping will be used as a tool for the base file to begin with. It could be a series of mapping of the existing 28 camps and their settlement layouts which will be further screened under different layers of amenities for comparison. Geo data collection will be primarily done from HDX website and AutoCAD tracing of some of the maps might be necessary as well. I am also looking into recent softwares (for example CA modelling) that are used in some of the thesis that I observed by other students or academics and planning to use them in my work. Some of the diagrammatic outcomes of such works are included here:
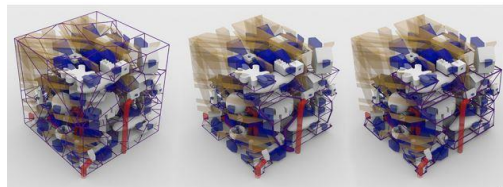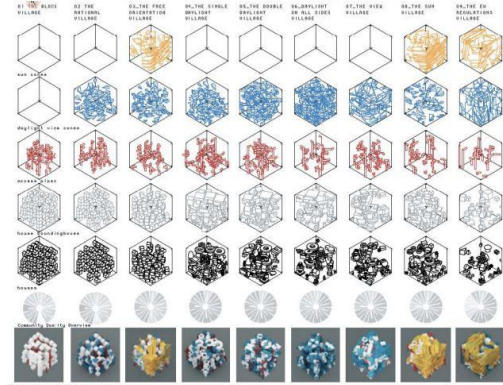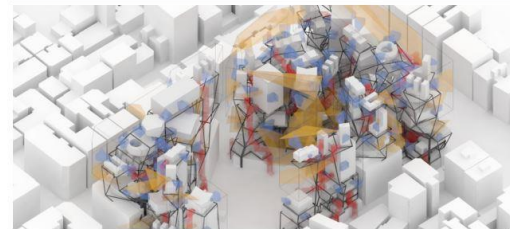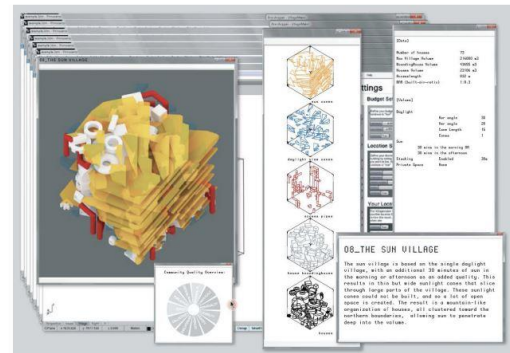
3. Drawings

This is an elaborate part of the methods, which will be used in various ways throughout the thesis. Design interventions and research observations will be expressed primarily by drawings which will include architectural masterplans, house modules as well as analytical graphical drawings from site observations. I am planning to use mixed media for this purpose.

From my previous work, drawings as different scales to express design interventions, as shown in the following example:
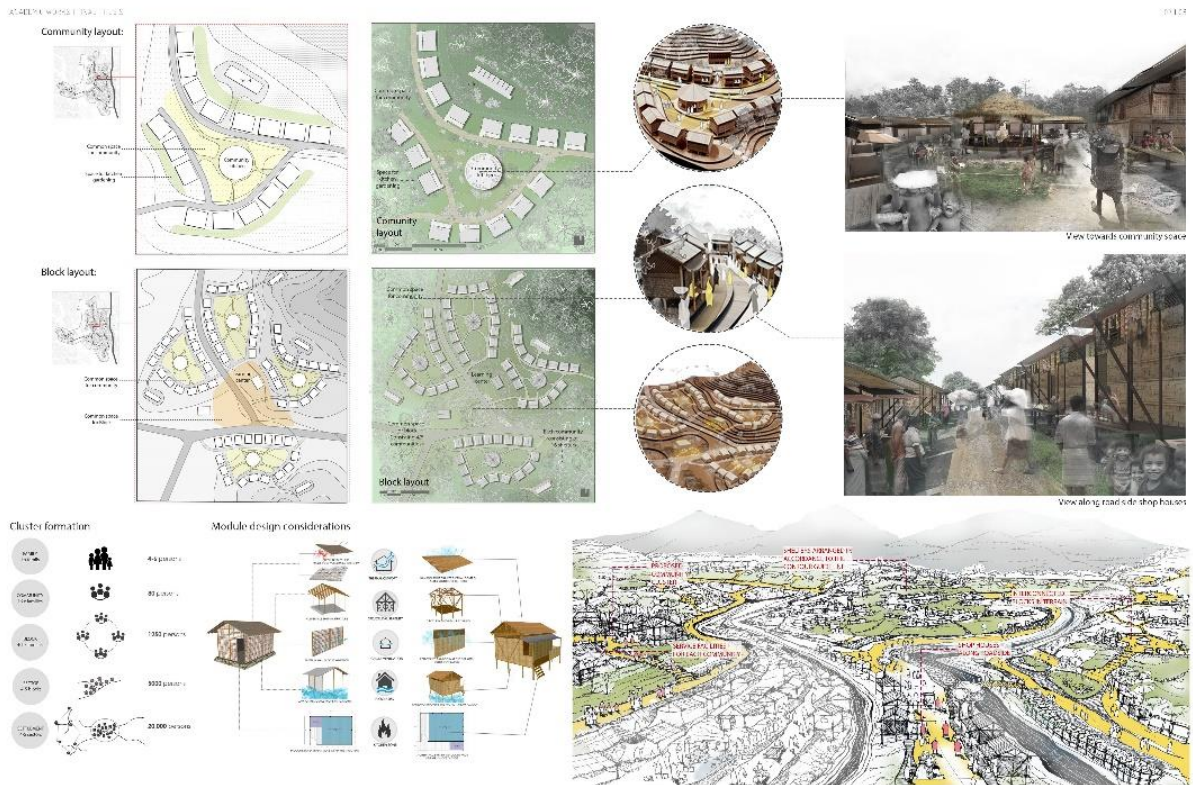
4. Diagrams

Diagrams will be extensively used in the initial part of the thesis before entering the design interventions. It's a useful tool to visually express study process, collected information, timelines and conceptual ideas. Above is a relevant image of explaining the evolution of use of technology through a flow diagram.

5. Comparative Drawings

This method is efficient for bringing out important information which might otherwise get overlooked. The drawings could be layers of the same image, each expressing a unique factor superimposed upon the base image, or a series of different images with one or two common feature t compare. Following is an example of such a comparative drawing that I found from the case studies, where different house modules were observed within a fixed area constraint.

6. Collage

Collage is also another important method in expressing complex thesis questions and paradoxes in a visual way. It can also be used to view the existing conditions in a focused or comparative way. Along with photo collages, I am planning to include graphical interventions with mixed media within the collage to express the ideas more comprehensively.

Design Interventions

Text within collage:

2 0 1 7

2 0 2 2

GENOCIDE & ETHNIC CLEANSING

ROHINGYA

HOW CAN DESIGN HEAL?

HOW TO ADAPT?

POWER-PLAY AND JUSTICE

SCOPES OF EMPOWER-MENT?

WHAT DO THEY WANT?

DIGITAL NETWOKRS

SPATIAL DYNAMICS

943,529 Total population

17,635 Kutupalong Registered Camp
629,350 Camp 1E, 1W, 2E, 2W, 3, 4, 4 Ext, 5, 6, 7, 8E, 8W, 9, 10, 11, 12, 13, 17, 18, 19, 20, and 20 Ext
112,757 Camp 14,15 and 16
16,478 Camp 21
555 Others*
23,015 Camp 22
26,550 Camp 24
26,043 Bhasan Char
8,842 Camp 25
42,544 Camp 26
23,028 Nayapara Registered Camp
16,732 Camp 27

MYANMAR
BANGLADESH

Camp population

2017: WORLD'S MOST PERSECUTED MINORITY

GENOCIDE & ETHNIC CLEANSING

FORCIBLY DISPLACED FROM MYANMAR TO NEIGHBOURING COUNTRY BANGLADESH

2022: WORLD LARGEST REFUGEE CAMP BY POPULATION

POPULATION UPDATE
926,606 Total Refugee Population
52% Female   48% Male
1% Person with disability   52% Children   4% Older Person

Demographic Profile
52% Children   44% Adult   4% Older Person   1% Person with Disability

52%   48%
Female   Male

Place of origin
68% of the rohingya came from Maungdaw township.
Maungdaw 68%
Buthidaung 26%
Rathedaung 5%
Other 1%

+1   1%   1%
1-4   7%   7%
5-11   11%   11%
12-17   7%   7%
18-59   24%   20%
60+   2%   2%

Key Questions:

- How to **empower** the refugees through design, particularly through ensuring **digital literacy** and **connectivity**?

- How to promote **digital equity** within the **spatial subversions** and the critical socio-cultural context of the camps?

DIGITAL ACCESS AND EQUITY

MOBILE PHONE SHOP
DIGITAL LITERACY RATE
LIMITED ELECTRICITY
MOSQUE/ INFORMATION CENTER
LIMITED INTERNET
DOOR TO DOOR IN PERSON COMMUNICATION
CULTURAL/ RELIGIOUS ADAPTATION OF SPACE
GENDER BIAS
NO SMART PHONE

Access to media/ information
Community gathering
MOBILE PHONE SHOP
Connection to culture/ Heritage
GENDER BIAS
48%
52%
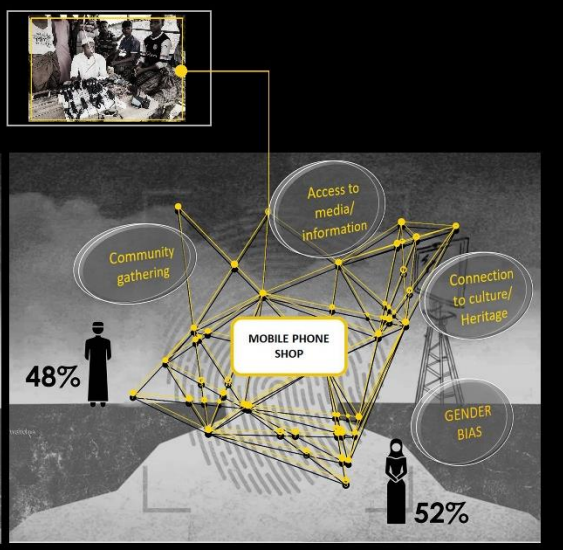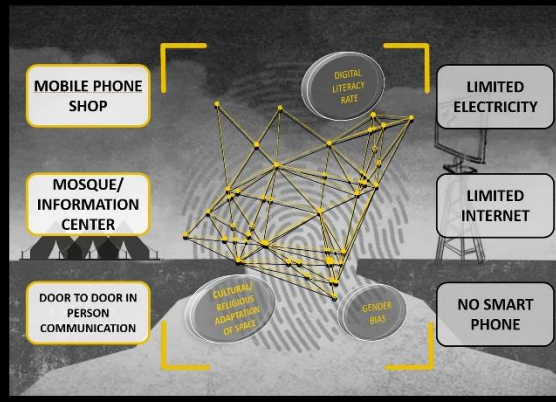
SPATIAL SUBVERSION

As an elected leader, Romida represents some 16,000 people in one part of the massive camps. She helps resolve family disputes, coaches people on how to prepare for disasters or how to stop child abuse, and tries to make sure things like damaged homes and roads get fixed. In a community often dominated by conservative men, she stands out.

... But some of these men don't like having a woman in charge.

"WE NEED WOMEN IN LEADERSHIP ROLES TO DEMAND THIS CHANGE THAT WE NEED. WOMEN ARE HAPPY THAT THEY CAN SHARE PROBLEMS WITH ME AS A LADY LEADER. THEY ARE HAPPY TO HAVE ME, BUT I DON'T KNOW ABOUT GUYS. MAJHIS* ARE OFTEN NOT HAPPY TO SEE ME AS A LEADER. ULTIMATELY, I WANT TO KEEP THE WOMEN IN MY CAMP SAFE. I WANT TO ENSURE EVERY WOMAN'S SAFETY."

WHAT DOES THAT CHICKEN HAVE TO DO WITH A MOSQUE? OR AN NGO AUTHORITY? HOW IS IT RELATED IN THE SOCIAL INJUSTICE AND THE POLITICS OF SPACE? IS ARCHITECTURE CAPABLE OF ENSURING GENDER EQUALITY? ... SPECIALLY WHERE CULTURE ITSELF IS THE PROPAGATOR? HOW TO BALANCE BETWEEN THE PARADOXES OF CULTURAL CONSTRUCT VS INTERNATIONAL AGENCIES? HOW DO THE REFUGEES INTERPRET THEIR POLITICAL AGENCIES? WHAT IS THE ROLE OF DESIGN IN EFFECTIVE PLACEMAKING? HOW CAN ARCHITECTURE LISTEN?

EMPOWERED NETWORKS

- SHOPS
- MOSQUE
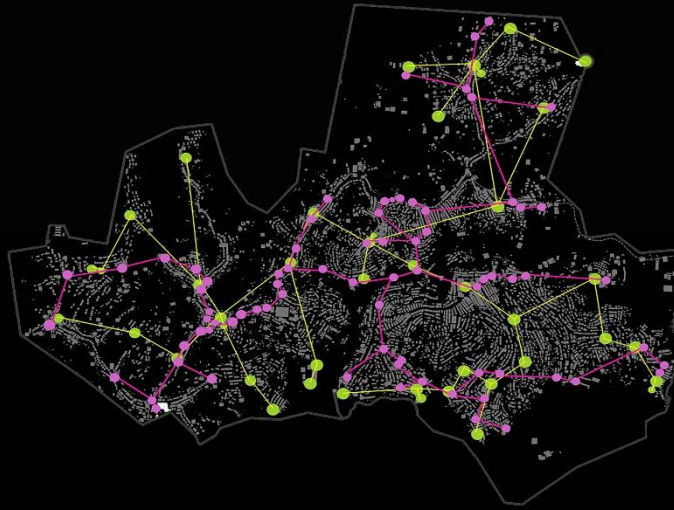
CAMP 14

CAMP 15

CAMP 16
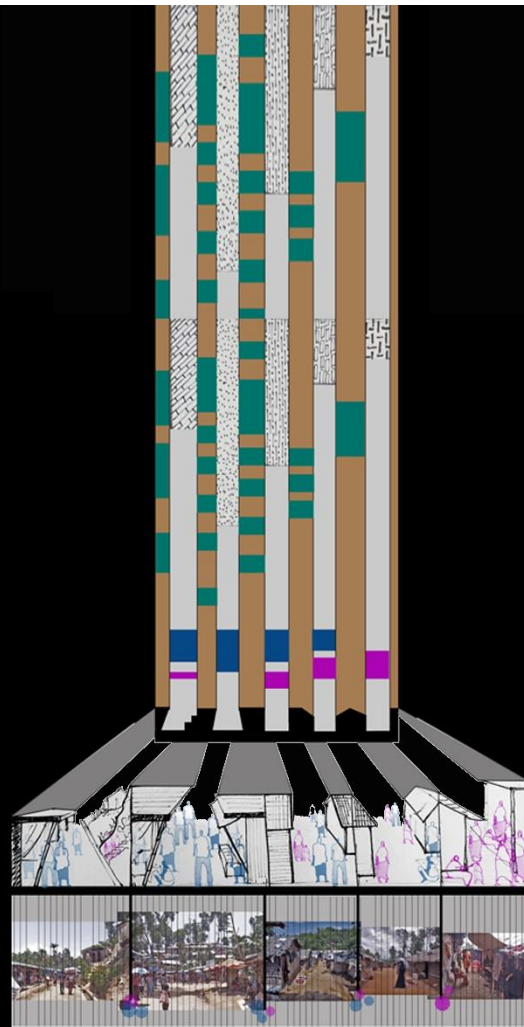
ANALYTICAL SKETCH OF EXISTING CAMPS STUDYING THE PRESENCE OF MEN AND WOMEN
IN DIFFERENT SECTIONAL SLICES, FROM PUBLIC TO PRIVATE ZONES IN THE ALLEYS

SHOPS/PUBLIC INFRASTRUCTURE

SHELTER/HOUSES

PORTION OF MALE

PORTION OF FEMALE

EXPLORING THE SITE

BACK ALLEYS CATER FOR DAILY ACTIVITIES OF WOMEN, LIKE SEWING CLOTHES, TAKING CARE OF CHILDREN, SOCIALIZING, ETC.
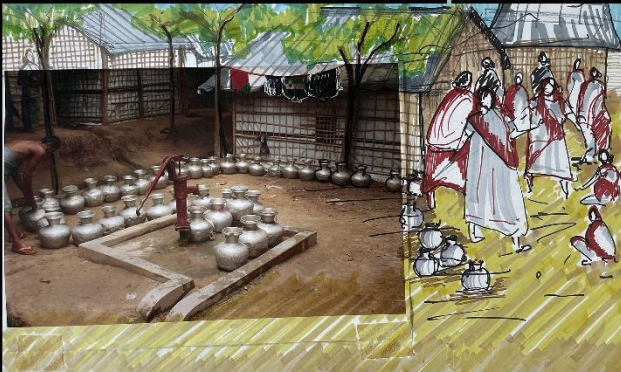
WOMEN WAIT FOR HOURS DAILY IN THE WATER PUMP STATIONS DUE TO LACK OF ADEQUATEFRESH WATER ACCESS, THESE ARE ALTERNATE COMMUNITY GATHERING SPACES IN CONTRAST TO THE FORMAL ONES LED BY NGO.

DAILY FUNCTIONS

WATER COLLECTION LATRINES/ SANITATION LEISURE/EMPLOYMENT COMMUNITY KITCHEN POULTRY/ KITCHEN GARDENING

NETWORK OF EMPOWERMENT

DIGITAL/TECHNOLOGY NEEDS

MOBILE CHARGING STATIONS LOW RANGE RADIO RECEPTORS SOLAR ELECTRIC SOURCES

CAMP 16, MOYNARGHONA

POINT TO POINT WIRELESS NETWORK

(An internal internet system based on radio recpetion)
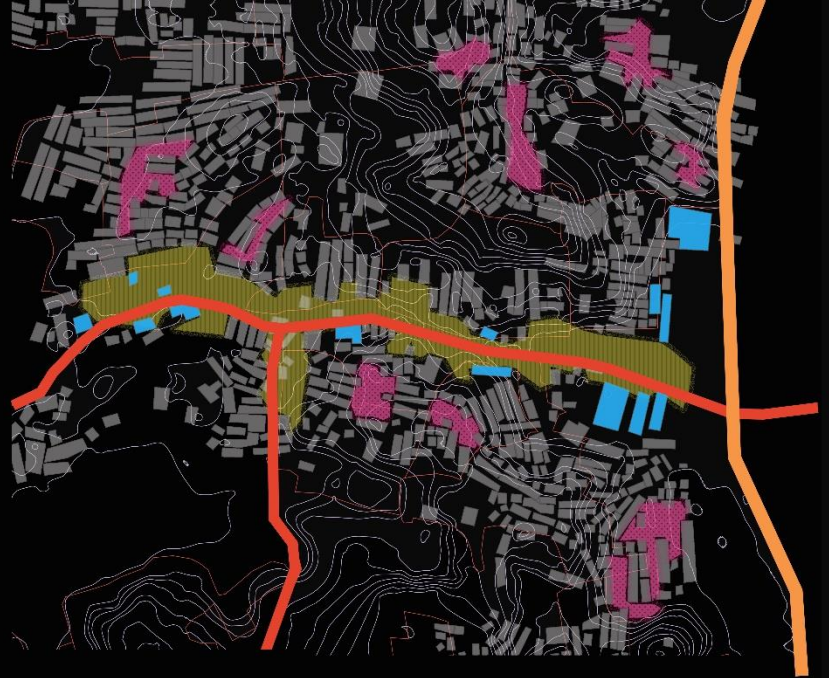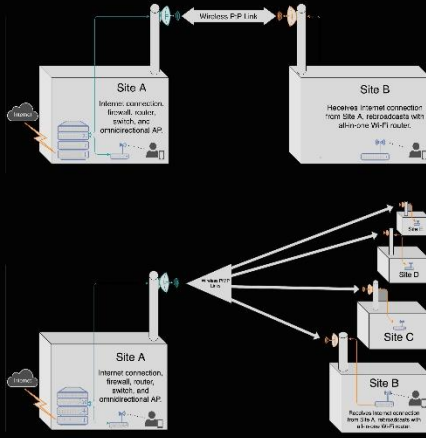
RAINWATER COLLECTING
MODULE

FILTRATION FABRIC

WATER PITCHER

BAMBOO POLES

BASE

COOK POT

COOK POT HOLDER

SOLAR DISK

LEVER TO
OPERATE DISK

WOODEN BASE
FRAME

SOLAR COOKING
MODULE

COMMUNITY GATHERING

REFFERENCE IMAGES FROM
VILLAGES IN MYANMAR
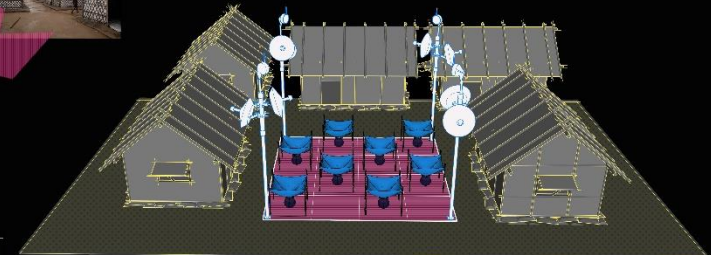
RAINWATER COLLECTION DURING MONSOON
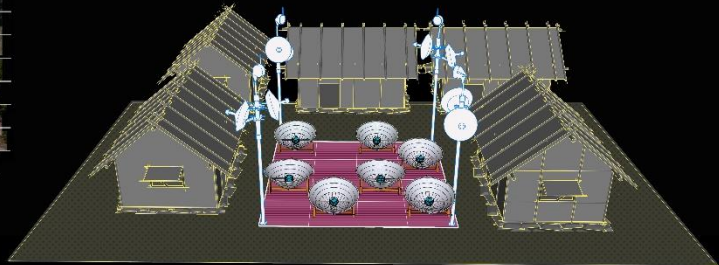
SOLAR COOKING DURING SUMMER
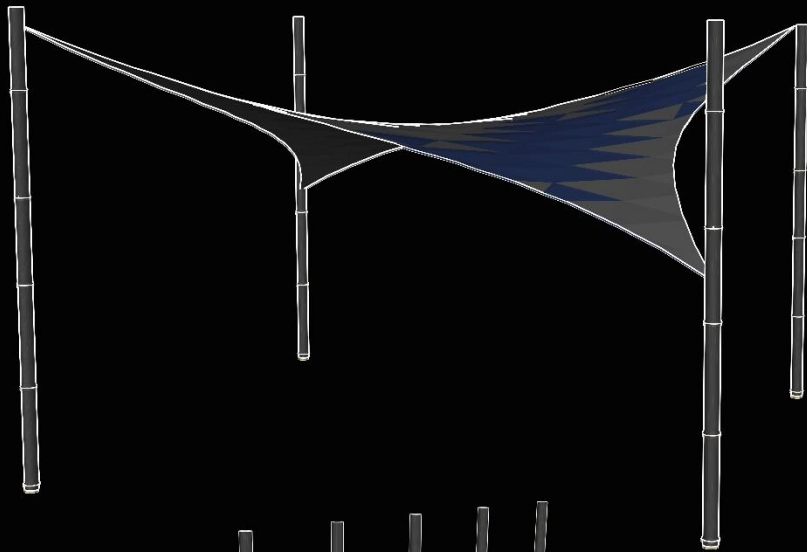
SITTING MODULE INTEGRATED
WITH CHARGING STATION POWERED
BY SOLAR FABRIC

WATER COLLECTION

1. Panels To Charge Controller

2. Charge Controller To Batteries

Solar Charge Controller
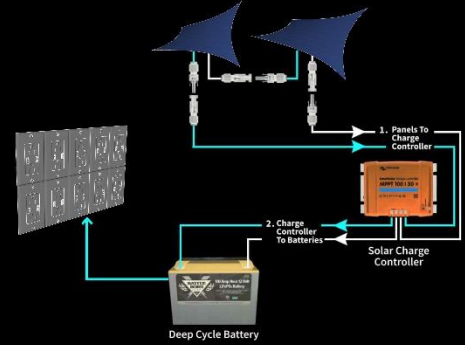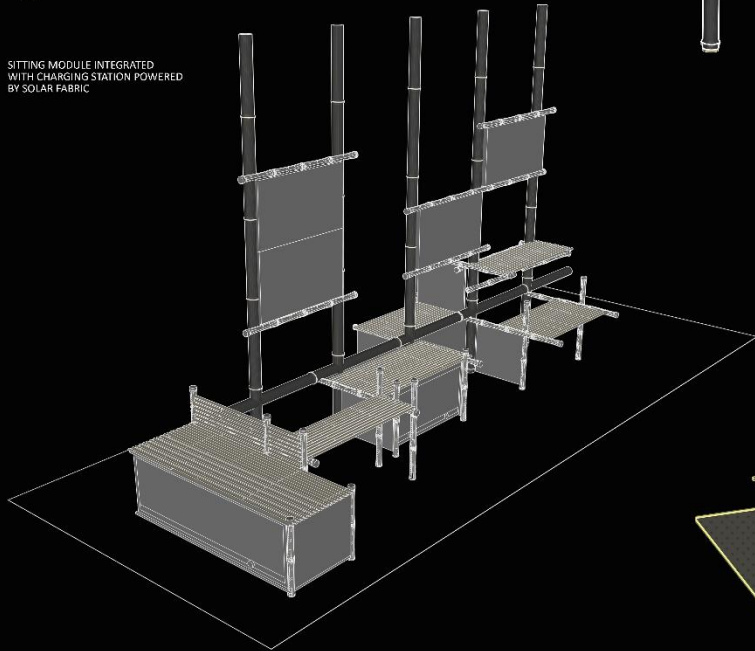
Deep Cycle Battery

- Electricity production: 10-15 W/SFT
- 1 charging point = 5 W
- 1 light bulb = 25 W
- 30 SFT Fabric = 20 power plugs, 8 light bulbs
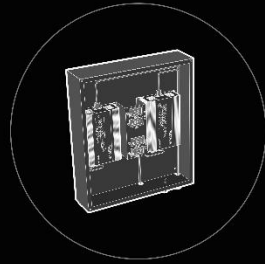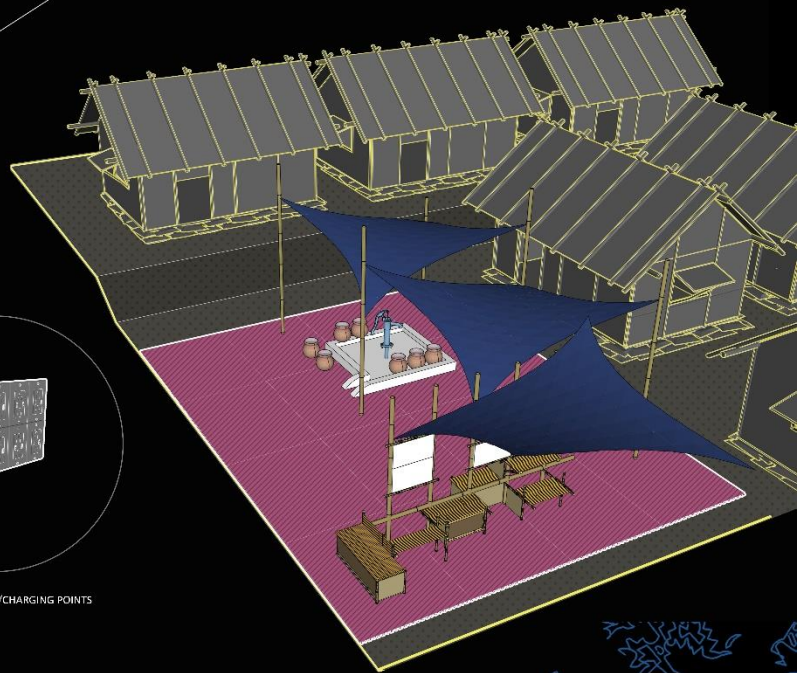
SOLAR CHARGE CONTROLLER
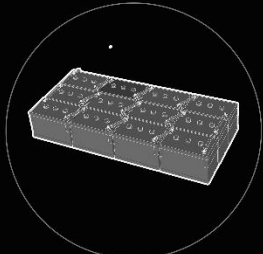
DEEP CYCLE BATTERY
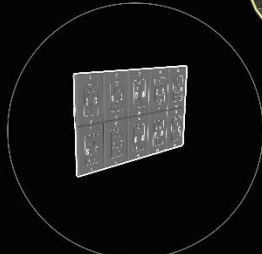
SWITCHBOARD/CHARGING POINTS

Romida: "We have one toilet for 10 or 20 houses. It's difficult for unmarried women to go far from their homes to use the toilet. They need to pass groups of men on the way, which is pretty uncomfortable. We fear being attacked when it's dark. There are many problems, especially for women. Domestic violence is a big one, and the fact that there are no jobs for the men – or women – is a huge cause of this."

Latrine usage

A communal latrine should be shared by no more than 20 people during the emergency phase of a camp, according to UNHCR standards. Many sites are operating beyond the U.N. guideline.

Other zones

Balukhali
115 per latrine

U.N. guideline
20 people per latrine

BANGLADESH

Kutupalong
Refugee Camp

Cox's Bazar
Teknaf
Highway

COURTESY:

Light Cavity

Variable wall thicknesses
approximately .25"-0.3"
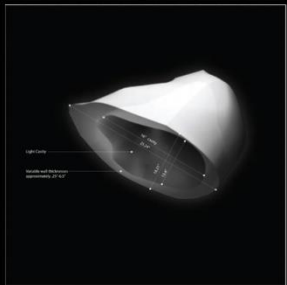
Latrines

Latrines prevent people from defecating in the open and spreading communicable diseases. There are 7,839 latrine blocks in the camp cluster, with up to five latrines per block. The following data was collected and analysed by the U.N. migration agency IOM, the ISCG coordinating body and disaster assessment agency REACH.

Latrine usage

THE SIDEWALK INSTALLATION EMPLOYS A BEACON SYSTEM WITHIN THE CORE (DACTYL) OF THE BENCH (IDA) USING TONY CONTROLLED, SOLID-STATE, ENERGY EFFICIENT LED LIGHTING THAT CAN BE SEEN FROM A DISTANCE. DRAWING ON REAL-TIME DATA ON PEDESTRIAN POSITIONS, THE BENCH GLOWS, GROWING BRIGHTER AND CHANGES COLOR TO COMMUNICATE INFORMATION ABOUT USAGE OF THE ALLEYS AND CREATE NEW ATMOSPHERES ALONG THE SIDEWALK.

ROAD SIDE SITTING/RESTING MODULE
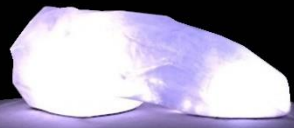
ROAD SIDE SITTING/RESTING MODULE
(ENLIGHTENS AT NIGHT WITH MOTION SENSOR)
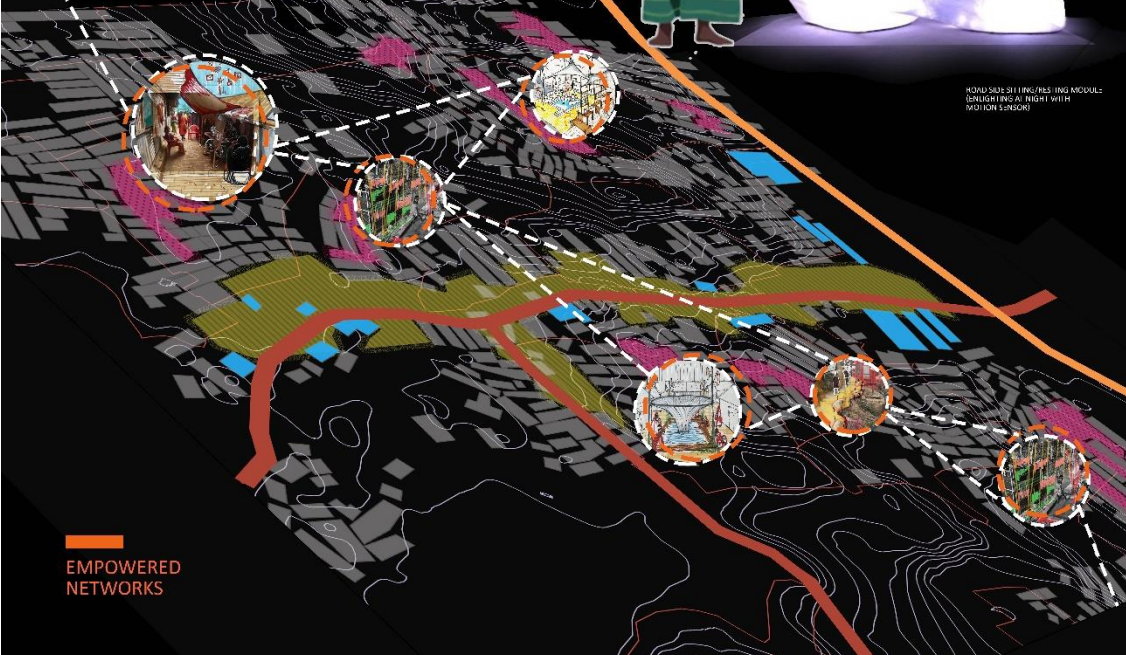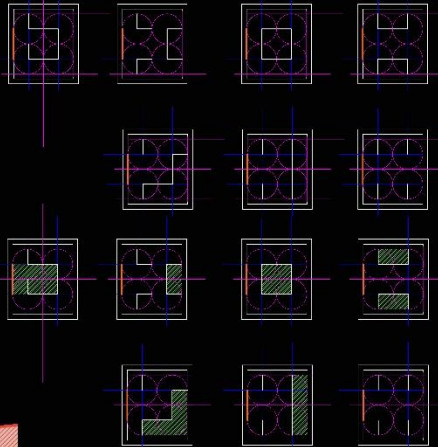
EMPOWERED
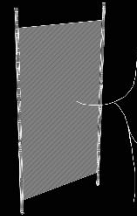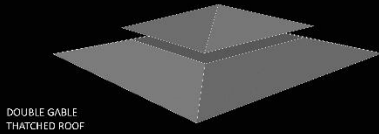NETWORKS
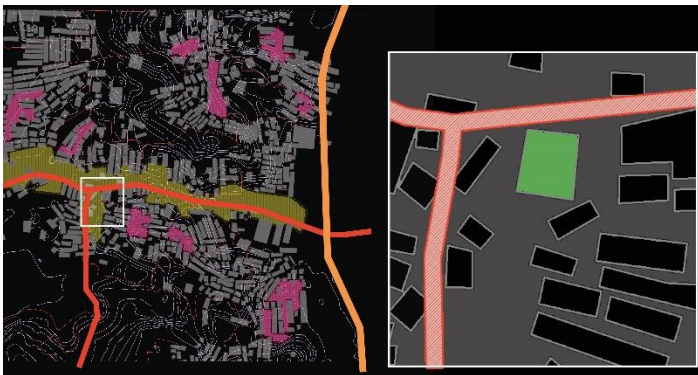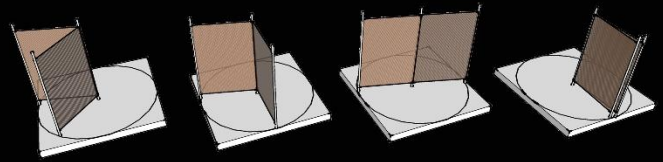
MODULAR ROTATING PARTITION WALL

PRAYER SPACE

NEED FOR PRIVACY FOR EQUAL
ACCESS AT PRAYER SPACE

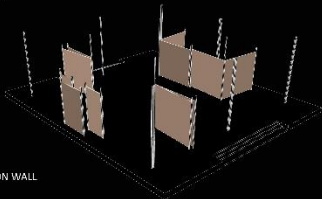ADAPTIVE SPACE LAYOUT ACCORDING TO USAGE

FILLER FOR PARTITION WALL INSPIRED FROM
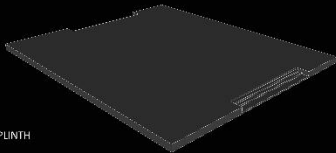TRADITIONAL TIMBER AND BAMBOO CRAFT
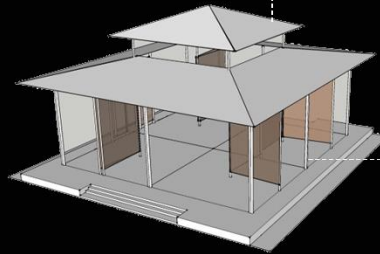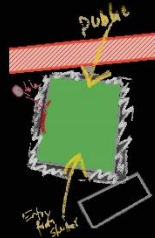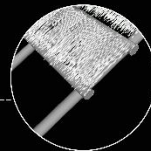
DOUBLE GABLE
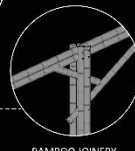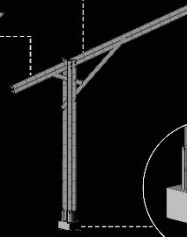THATCHED ROOF

BAMBOO COLUMN
STRUCTURE

PARTITION WALL

BRICK PLINTH

THATCHED ROOF

BAMBOO JOINERY

MOSQUE_AXONOMETRIC VIEW
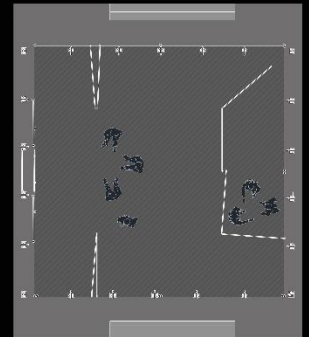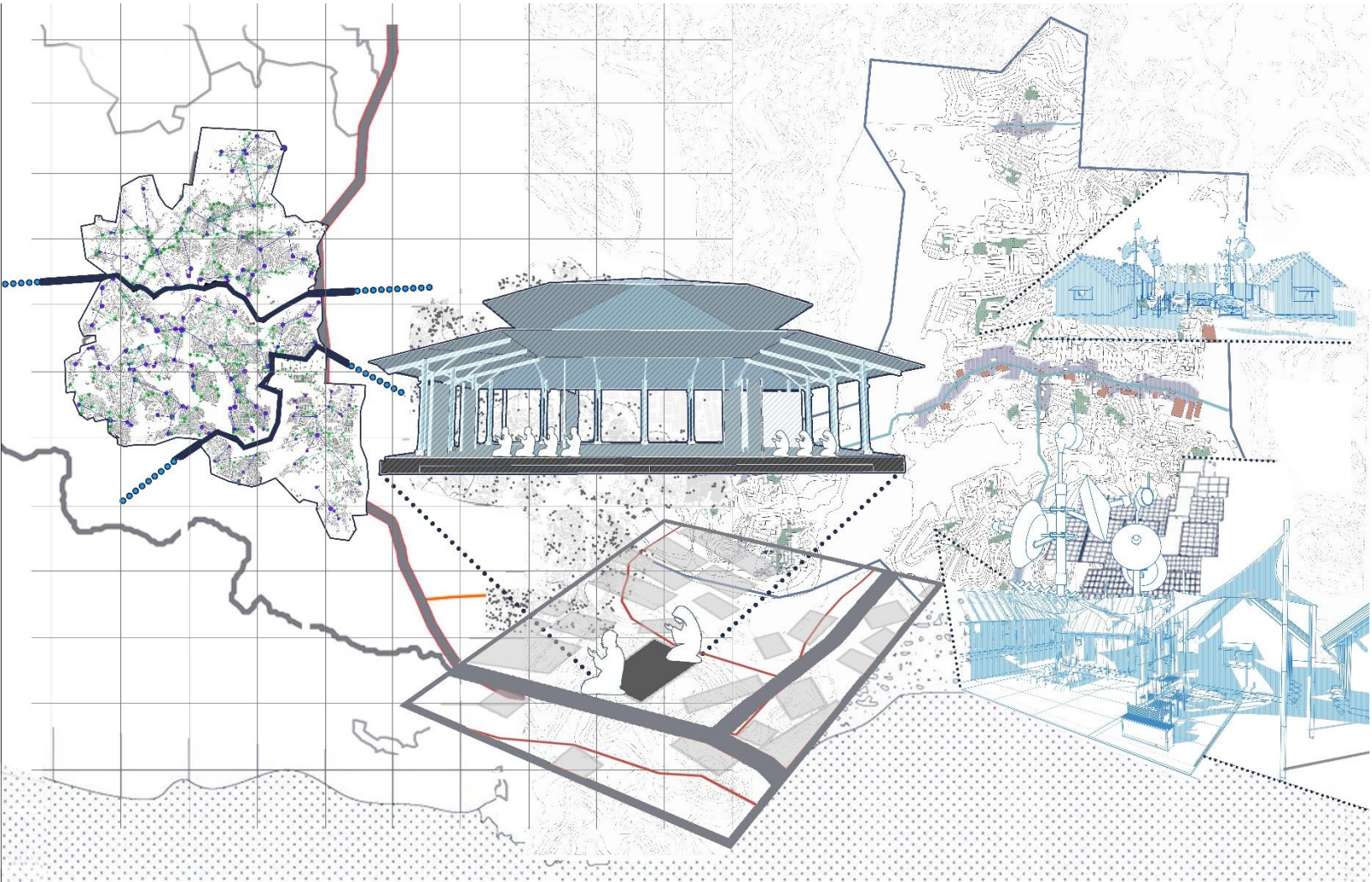
BAMBOO FOOTING DETAIL

MOSQUE_OPEN FLOOR PLAN

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