REVITALIZATION PROJECT OF SLUM TRANSFORMATION:
A CASE STUDY HAY- AL TANAK, BEIRUT, LEBANON

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ABSTRACT

Slums are global phenomena that exists as a solution for those who couldn't afford a house. This phenomenon is growing accompanying the rapid urbanization and the growth of the urban population, three-quarter of the world population anticipated to live in an urban environment by 2050 (Avis, 2016, p. 57). This paper reviews slum's evaluation of revitalization project for one of the poorest slums in Beirut called Hay-Al Tanak. Improving both physical and social environments with a long term design intervention aiming to create a new sustainable housing development and upgrading the existing structure. Enhancing the responsibility for urgent action to support the present and secure the future generation

Key words: Innovative finance, resilient communities and cities, slum upgrading, socio-economic challenges, sustainable development, urban environment, vernacular architecture.

1. INTRODUCTION

An Informal structure like slum, appeared to be a creative solution for those who couldn't afforda house, this solution based on cheap available local material, to be a roof over people's heads. Slums are global phenomenoa grow as settlements, city regions or neighborhood to be known by it's "informality or illegality". This grows based on many reasons: economic stagnation, high unemployment, poor planning, political forces, corruption and migration.

The majority of slum formation, is due to rapid urbanization and growth of urban population. By 2050 the total number of people living in cities is expected to grow from approximately 4.4 billion todays to 6.7 billion (Avis, 2016, p. 57). This issue could not be neglected and immediate action should be taken. Slums are often defined by unhealthy homes, high density of population, limited or no access to basic services, unstable structure, no secure land tenure, unsecured and precarious environment, people living in extreme poor conditions.

In Lebanon case, rapid urbanization, poor management and unequal development of urban areas have contributed to the growth of informality and the creation of underserved urban neighborhood around the city Beirut (Hassan Z., Francesca G., 2018). The appearance of most slums in Beirut dates from the late 1940s until 1975 (beginning of the civil war), when the rural-urban migration took place, migrants build them own shelters on public properties. Population of informal settlements grow rapidly after the Syrian war started in 2011, the refugees considered the poor urban settlements as first station. The proposed revitalization project focused on the strategy of developing a particular small scale slum. Located in the capital of Lebanon-Beirut called" **Hay-Al Tanak"**. Aims, to introduce new fresh ideas, intend to develop both social and physical environments in the settlement, present innovative techniques and tools, offering particular treatment based on historical and cultural impact, to take architecture and urban design into another levels and wider perspectives, present possibilities and opportunities deal with vernacular design language. Hay-Al Tanak is an example that could help find a solution to how slum upgrading as an emergency action to improve lives now and preserve the planet for generations to come.

Before going through the revitalization proposed strategy of "Hay-Al Tanak" in details, will introduce briefly, the five biggest and known slums in the world, considering the historical establishment issues, high density and various urban scales:

– Orangi Town in Karachi / Pakistan, the settlement population exploded in the early 1970, when thousands of people migrated from East Pakistan after the 1971 war of independence (United Nation., 2016).

– Ciudad Neza / Mexico, has a population of 1.2 million. Once a sprawling slum, has become more like a suburb due to the effort made by residents to build community and deliver public services (United Nation., 2016).

– Dharavi in Mumbai / India, with a population of 1 million, the slum has an informal economy with an estimated $1 billion annual turnover. However, dwellers oppose attempts to develop Dharavi, which is located on prime real estate in India's financial, Mumbai (United Nation., 2016)

– Kibera in Nairobi / Kenya, with population of 700,000, Africa's largest slum, its home to more than 50,000 children most of who go to school set up by residents and local churches (United Nation., 2016).

– Khayelitsha in Cape Town / South Africa, is a home to nearly 400,000 residents, however activists believe that the population three times larger. Around 12,000 households had no access to toilets services (United Nation., 2016).

The paper presents a guideline which can be generalized in urban poor environments taking into consideration the special circumstances for every area. Emphasis the action of reconsidering slum's, aim to re-humanize cities in the facing of trends impacting them, decrease the risks that threading our present and future by planning and building sustainable cities, managing slumsintelligently, reflect how to make cities and communities inclusive and resilient.

2. LITERATURE REVIEW

Initially the study focus on selected references that employ a qualitative methodology related to the development of poor urban areas. The design strategy followed in the revitalization process for Hay-Al Tanak, based on implemented known innovative tools and technics, but according to special circumstances on the area, the set-up actions of the intervention are unique and new in sense. the design focus on achieving social and environmental development through architecture and urbanism tools, inspired by functional urban and architecture operations took place in different places around mostly in Latin America.

2.1. Examples of innovative tools in slum upgrading

To achieve sustainable development relies critically on creating cities without slums by diagnose the central problems of slums, the lack of spatial access and related services. Emphasis the role of local communities and local government to combine technical knowledge with local aspiration into contextually appropriate urban sustainable development (Christa Brelsford "et al.", 2018, p. 8).

– Proposing a new strategy for the slums upgrading projects by finding the similarities between vernacular urbanism and slums. Solve housing problems through the rapid increase in population growth, without facing the troubles of the informal areas and slums phenomena and to achieve sustainable housing development depending on the concept of the self-built environment (Abdel Aziz T., AIndjy S., 2011, pp. 228-235).
– The UN-Habitat explains why are cities an important part of tackling climate change and how they can contribute to reducing it? Our expanding cities, towns, and villages can create buildings and infrastructure that are highly energy efficient and designed with the local climate in mind using innovative technologies (krstin M., 2019).
– Approach sustainable development goals explain how important to note the role of financial innovation in reducing urban poverty and upgrade slums, present finance efficient mechanisms and instrument through different cases (Nora S., Larissa K., 2015, p. 8).

2.2. Cases of architecture proposals-influence Hay-Al Tanak development

Here are some examples of interventions, inspired in proposing an architecture program for **Hay-Al Tanak slum**:

– **Grotao Community Center and Park in Sao Paulo** proposed a solution to relocate dwellings in the center of the territory and replaced them by going vertical to reduce the urban sprawl and they created an open public space in the center (Bridgette M., 2012).
– **Favela Cloud Imagines the Slums of Rio as Futuristic Architecture,** the design proposes an alternative way of developing the build environment, drawing on the social and organizational qualities of the favela itself (Fergs H., 2012).
– **San Diego-Tijuana,** it is an architectural approach by Teddy Cruz at San Diego-Tijuana border, focused on the informal, not as an aesthetic category but as "praxis", a set of functional urban operations that allow the transgression of imposed political boundaries and top-down economic models. The informal is the site from which to produce new interpretations of infrastructure, property and citizenship (Teddy C., 2014).
– **Medellin-Colombia, urban transformation,** opted for a different strategy, to use architecture and urbanism as a tool for social development. Designed a comprehensive strategy that seeks solutions to mobility, governance and education together with the recovery of public space and green areas. The aim is to recover the poorest sectors of the city that were dominated by communist groups, paramilitaries or drug smugglers (John D., 2012)**.**

This valuable intervention has the capacity to provide satisfactions and opportunities to local communities that creates both connection and viable way of construction.

3. STUDY METHODODLGY

The paper examines a case study to deduct revitalization strategy for Hay- Al Tanak, Beirut, Lebanon. It applies two research method: first, the inductive method, collecting data about slums in Beirut in general and then in specific about the selected site. Second, the field method, the author visited the site and its neighborhood, taking photos, interviewing dwellers to recognize the existing problems. Third method, the analytical part, the paper analyzes results of interviews and observation. Listen to people, understand them needs and problems, made the topic more realistic and humanist, to build a strong bond between community and development, with one goal, comprehensive strategy for holistic success.

3.1. Typology of slums in Beirut

Slums classification in Beirut, attempt to understand and organize them according to their mode of production and the particular regional and national political situations, that led to their establishment. Furthermore, depending on the time when they developed, and the region where they were located, each of these types, as it is explained below, tends to have some common characteristics, in terms of location, relation to the law, level of services, and living conditions (Mona F., Isabelle P., 2003, p. 7). slums can belong to categories which can be listed as:

1. **Slums that began as international refugee's campus or low-income housing areas for international refugees.** Those slums are the oldest slums of Beirut. They come from period of time 1920-1955. They were being created and occupied by Arminian, Syrian, Kurds and Palestinian nationalities. Today, only traces remain of the Armenian camps while the Palestinian camps are among the main slums of the city (Mona F., Isabelle P., 2003, p. 7).

2. Slums began as housing area for **rural to urban migration** in relation with the industrialization and urbanization process. Those slums come from 1950s-1960s. Various waves of refuges came from the south and north of Lebanon to the city Beirut and its suburbs, due to poverty and insecurity issues. In this period unexceptional camp grew, at least in part, to house Syrian rural migrants called **(Wata El Mousseitbeh)** (Mona F., Isabelle P., 2003, p. 7).

3. During the civil war (1975-1990) slums began as **squatter settlements**, established in several parts of the city, where refugees occupied either building or entire neighborhoods, that abundant by their owners, transformed large plots of land into large squatter settlements (Mona F., Isabelle P., 2003, p. 8).

Fig. 1a. Existing slums in the early 1950's in Beirut. Source: (Mona F., Isabelle P., 2003)
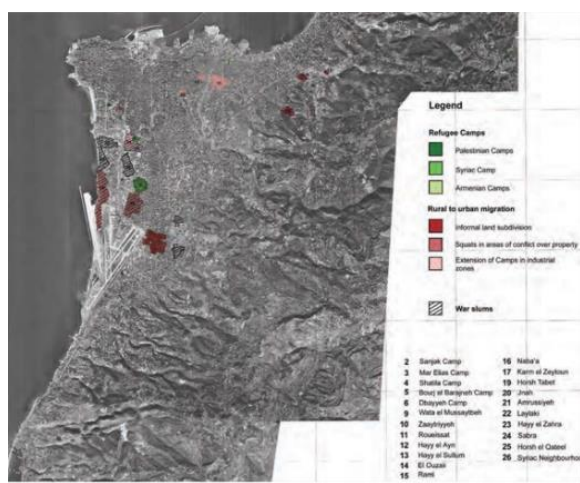
Fig. 1b. Existing slums in Beirut 2020. Source: (Mona F., Isabelle P., 2003)

3.2. Hay-Al Tanak slum – grow as a housing for rural-urban migration – developed as squatter settlement

Hay-Al Tanak slum is an example of settlement which grow as a housing for rural-urban migration and developed as squatter settlement. Hay-Al Tanak, the name reflects its identity (Eng. *Tin material*), the poorest neighborhood among all slums in Beirut. It's the only slum occupied by Druze community, migrated from Lebanese mountains or **Jabal el Druze** in Syria. This place developed as a squatter settlement in area of contested property right. The slum is one parcel of an area 13.481 m2. It contains very high density of inhabited. This settlement suffers from poor technical infrastructure (piping system, precarious construction), bad environment condition, high pollution of soil, air and noise, lack of privacy and security (Mona F., Isabelle P., 2003, pp. 19-20).
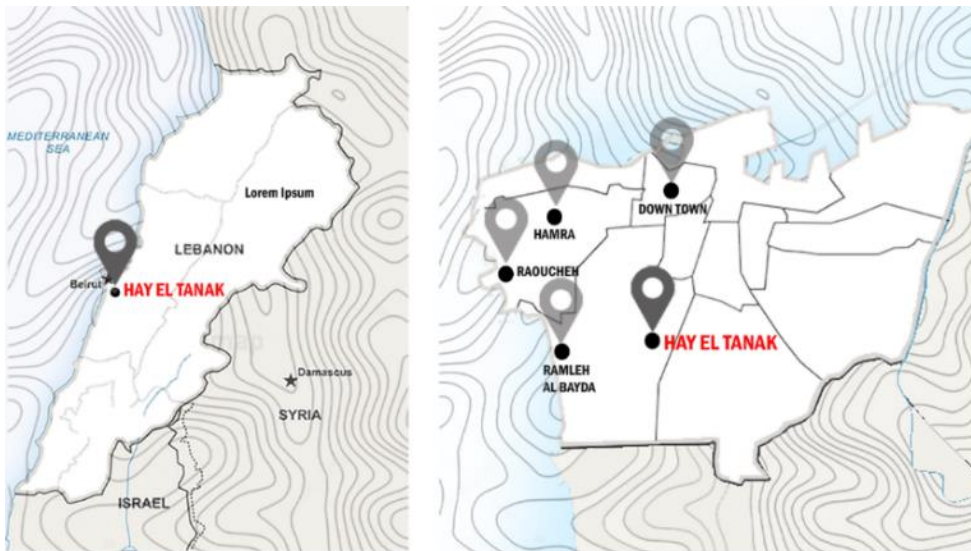

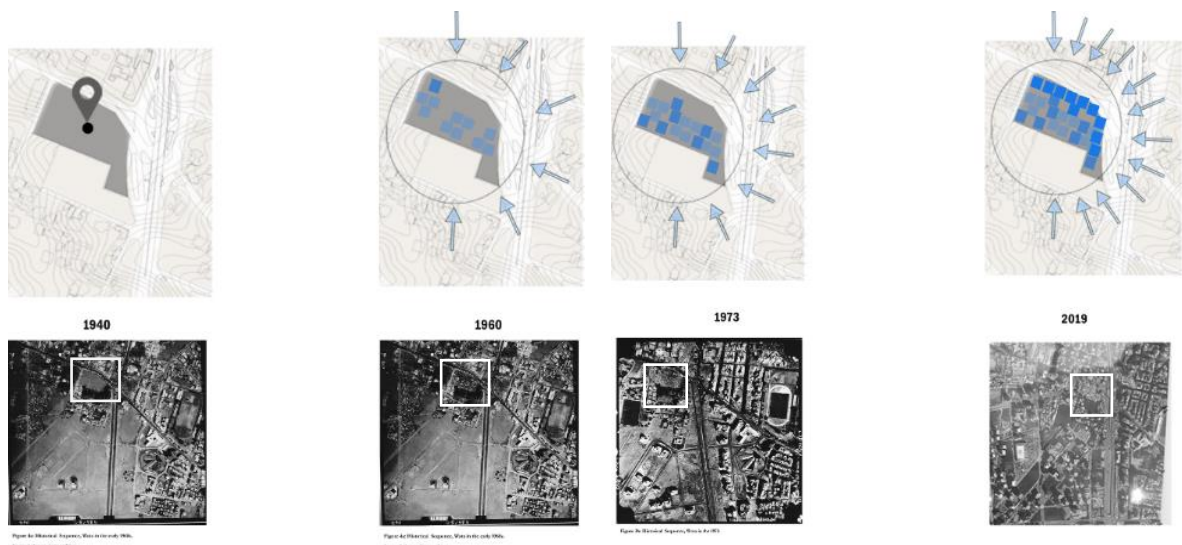Fig. 2. Location of Hay-Al Tank. Source: Author's figure

Fig. 3. Migration waves to Hay-Al Tanak, timeline and the growing density. Source: Author's figure

3.3. Meeting with inhabitants and site observation

In order to reach tangible finding, the author preferred to meet samples of the sites dwellers to recognize their opinions, using the interview method, the interviews were undertaken with different range of people.

Female Shaikha, said: "I've lived here all my life, this is considered to be my home. It feels safe in this area and there are absolutely no conflicts between the Druze and the Shi'aa."

Male garage owner, said: "Never prejudge an area before actually visiting it. People in Hay Al Tanak are very nice and are just living to make ends meet."

Male taxi driver, said: "Mark my words, this area is going to become more fancy and expensive than downtown Beirut."

Female house owner said: "The Druze and Shi'aa here are friends and support each other. We never fight, even if our children sometimes do.

"We would definitely sell our house if a good price was offered."

"We need better services in this area, for us and our children."

Female Syrian refugee, said: "Life here is normal", in a sarcastic tone. "I just want to go back home."

Most children's there drop out in middle school to find a job to help out their families, some of the dwellers reject to be interviewed because of fear and unstable feeling in the area. Inhabitants opinions framed the proposed design strategy and humanities the topic, the aim to is to bring hope, peace and dignity for these community.

Site photos:

Fig. 5. The photo show the Political indication. Source: Author's figure

Fig. 4. The photo show the Interior environment. Source: Author's figure

Fig. 6. The photo show the Narrow passages, play grounds. Shelters material, local shops.. Source: Author's figure

4. INTERVENTION-REVITALIZATION

The design aims to reconstruct the existing structure, by demolishing the core of the settlements and create multifunctional public spaces and green areas. Improve the remained structure which located mostly in the corner. making it livable. Propose a wooden extension structure function as vertical farm, providing a programme consists of living, working, education and cultural spaces, promote sustainable design solution support both layers (remained reconstructed structure and the extension).

5.1. Existing material and structure

Hay-Al Tanak structure based on tin material, wood panels, cement block, plastic sheet, water tanks and car tiers. Those materials can be used partially in new design. Also the existing structure has been evaluated as the follow: building located in the core of the settlement-one floor are extremely poor and unlivable. Therefore, easy to be removed due to its instability, in addition to the lack of light, ventilation and accessibility, however buildings which stand on the edges- consist of three/two floors has good accessibility, well ventilated, light access, stable and more livable then the core structure.

Fig. 7. Section present the existing structure of the Slum. Source: Author's figure

5.2. Climate factors in Beirut

The climate factors in the area, given the opportunity to promote sustainable design solution, depending on natural resources. Climate in Beirut is typically Mediterranean, winters are very mild and rainy, average temperature 14 °C, summers are constantly sunny, hot and muggy, average highs 28/30 °C (Climate., 2019, p. the coast).

THE AVERAGE TEMPERATURE DURING THE YEAR IN BEIRUT												
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MIN (°C)	11	11	13	15	18	22	24	25	24	21	16	13
MAX (°C)	17	18	20	23	25	28	30	31	30	28	23	19
MIN (°F)	52	52	55	59	64	72	75	77	75	70	61	55
MAX (°F)	63	73	68	73	77	82	86	88	86	82	73	66

Fig. 8. The average temperature during the year in Beirut. Source: (Climate., 2019).

IN THE AVERAGE YEAR BEIRUT RECEIVE 825 MM -(32.5 IN) OF RAIN FALL, WITH HEAVY RAINFALLS IN THE WINTER TIME											
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
PREC.(MM)	180	150	90	50	10	0	0	0	0	40	110	170
PREC.(IN)	7.1	5.9	3.5	2	0.4	0	0	0	0	1.6	4.3	6.7
DAYS	15	13	10	7	4	0	0	0	2	6	9	14

Fig. 9. In the average year, in Beirut, 825 mm (35.5 in) of rain fall, with heavy rain fall in winter. Here is the percentage precipitation. Source: (Climate., 2019).

THE SUN SHINES REGULARLY IN SUMMER, WHILE IN WINTER THERE IS AN ALTERNATION BETWEEN CLOUDY AND SUNNY DAYS											
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
HOURS	5	5	6	8	10	12	12	11	10	8	7	5

Fig. 10. In Beirut, general in Lebanon, the sun shines regularly in summer, while in winter there is an alternation between cloudy and sunny days. (Climate., 2019).

5.3. Metaphor and thinking strategy-sense of space

A sense of space relies upon people's correlation, community network, and environment connection. Those elements create a vibrant and livable spaces, which can easily realizable and noticed by its identity and natural character. Therefore, developing a design strategy assure people integration, without demolishing the sense of the place and its traditional spirit, is crucial decision in this discussion. Upgrading Hay- Al Tanak is a transformation process - from informal settlement in to iconic socio-ecological village. The living symbiosis, an expandable logic and a catalyst for the future development in the area aim to settle community not to replace it.

6. PROPOSAL OF DESIGN SOLUTION-STUDY AND IMPLEMENTATION

Hay-AL Tanak deals with a hybrid program, combining new and old dwellings with a set **of flexible platforms for cultural and economic functions. The aim of this design was to promote a sustainable environment** through diversity of the spaces. The development plan was put according to its priority. Which is classified into three different phases: **analytic study, design and finance.**

6.1. First phase-analytic study

6.1.1. Urban planning adjustment

This phase was a primary stage in the revitalization development strategy. The main tasks in this part were:

–   Consideration of the history of the place.
–   Security of the existing settlement character.
–   Recognition of the location with respect to neighborhood.
–   Assertion of comfortable accessibility.
–   Improvement of road hierarchy.

6.1.2. Socio-economic development

This phase based on the analytic part coming from inhabitant's feedbacks and the observation of existing urban environment, despite the difficulties to enter the visit the slum and come close to local people, this method is the most valuable and inspiring part in proposing realistic program work in satisfying local community needs. To Improve economic and social issues in Hay- Al Tank, the designed program based on particular activities and function. This section draws attention to:

–   Support of the traditional lifestyle (villagers).
–   Presence of women/ no male dominance.
–   Striving to reduce population density.

- Solving health problems and promote a healthy environment.
- Accessibility to increase education.
- Promotion of the public spaces and playgrounds of kids.
- Increase of the incomes by offering work (depend on skills).
- Change of form employment forms - formal businesses instead of informal.
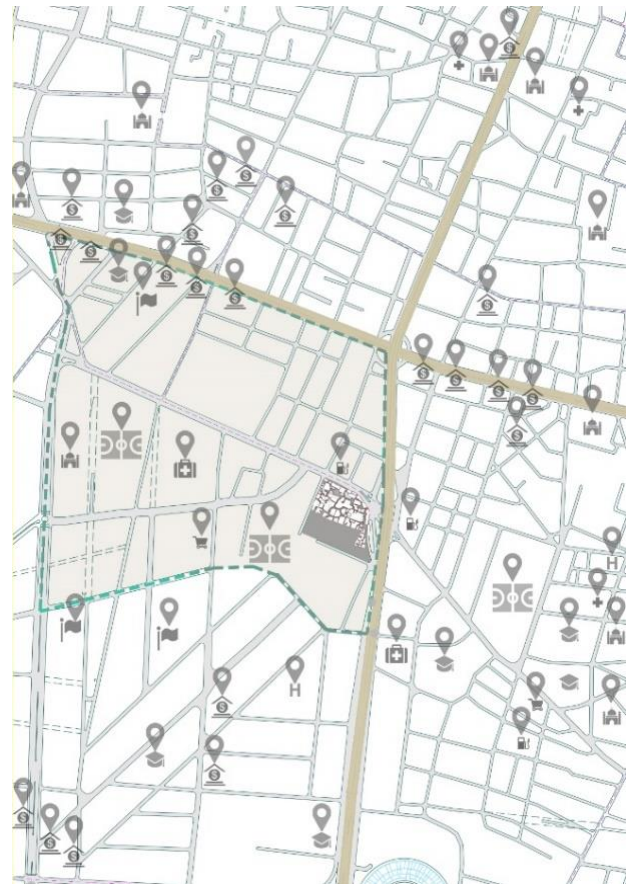- Change of street appropriation, their accessibility, and look.

Fig. 11. The scheme presents the exiting relation between urban structure and the slum. Source: Author's figure

Fig. 12. The two scheme presents the plan for Socio – Economic development, influence them activities and level of health education and income. Source: Author's figure.

6.2. Second phase-design

6.2.1. Existing structure adjustment-first layer

This phase includes the design strategy. Currently, the existing technical structure of the settlement is in very poor condition. It is important to understand the character of the space and its physical value. It is therefore important to determine further types of the existing structure (1,2 or 3 floors). This part is crucial to improve physical urban tissue which they consist of:

– Value of the building - decision to reconstruct or demolish

– Function of the building (residential or commercial)- how to make it efficient.

– Access inside the settlement (width paths and narrow streets) - how to improve inner streets for people and make it available for services (e.g. emergency services, stores supply).

– Increased level of the technical infrastructure (poor tools, illegal electric network, garbage spread everywhere) - how to improve infrastructure and implement the healthy sustainable program.

– Use of neglected green areas -how to transform to park and agriculture activity.
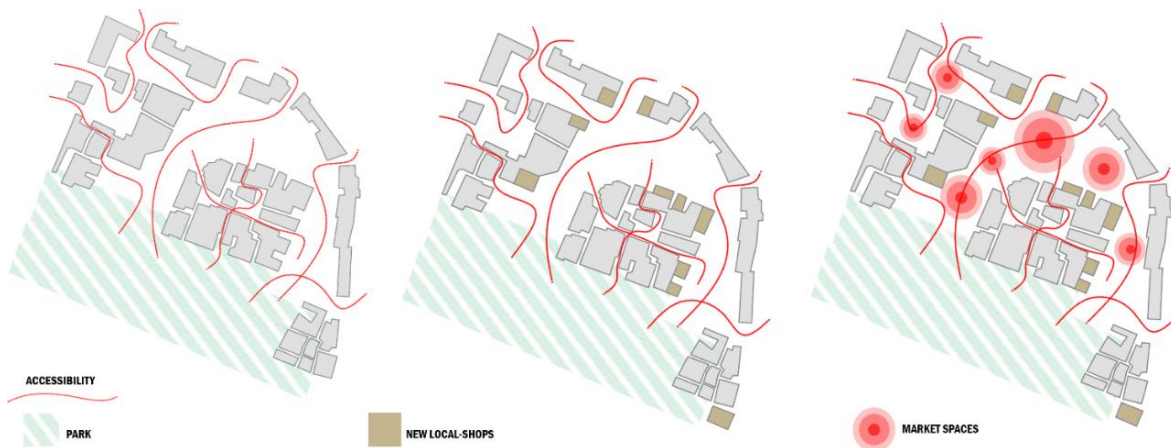

Fig. 13. The design purpose to transform the existing structure and create public spaces market and local businesses. Source: Author's figure.

6.2.2. Existing remained building adjustment-first layer

The main aim of this part was to define ways of improving the visual image as a whole. The idea was to change the existing building facades and improve the interior spaces under dwellers' desire. Using colors that give harmony and aesthetic to the place, by presenting the slum original character by focusing on:

– Existing materials and colors (e. g. tin material, wood, bright colors).

– The width of current elevations (connect and disconnect some blocks to make this complex more functional).

– The size of blocks (the control of roofs high will create opportunities to flat roofs which some can be the public spaces.

– The texture of materials (plaster paint on the façade).

– Dividing flats in to rooms (improve indoor circulation).

– The increase in the number of staircases (reconstruct the existing, improve access, improve safety).

– The increase in the number of windows (improve ventilation and natural light access).

6.2.3. Extension concept – second layer

The concept of vertical extension of the complex. Took place to increase space residential, commercial and green areas. Promotes sustainable living units suitable for different types of families. The new house blocks are connected to an outdoor platform that is designated to be cultivated by using simple local material like steel stands and plastic containers. Those containers on facades present vertical farm concept, to grow local vegetables. This green system is supplied and connected by roof facilities (water collectors and source of energy) by the external piping system. Every floor is connected to manual mechanism allow dwellers to exchange product manually intended to save energy. Living and working blocks are all connected to each by bridges and external staircases, make circulation so flexible and create traditional villager's life (less privacy more social integration and support). Cultural spaces are designed to practice Lebanese handcraft activities which is organized mostly by women's (e.g. carpets, cutlery, glass, soap, sewing, pottery). Also, education and kid's entertainment take place in one of the blocks. As support for all ages to have access to books, reading and studying spaces, intend to build an educated community was designed library. The program of the extension concept is:

– The new housing and living units.
– The outdoor platforms and agriculture activity.
– The sustainable system and support everyday activities and work.
– Sustainable elements like water collectors, wind turbines, solar panels.
– The culture facilities such as traditional Lebanese craft causes it to occur to support women's role in society, local trade (sell community goods), legal business.
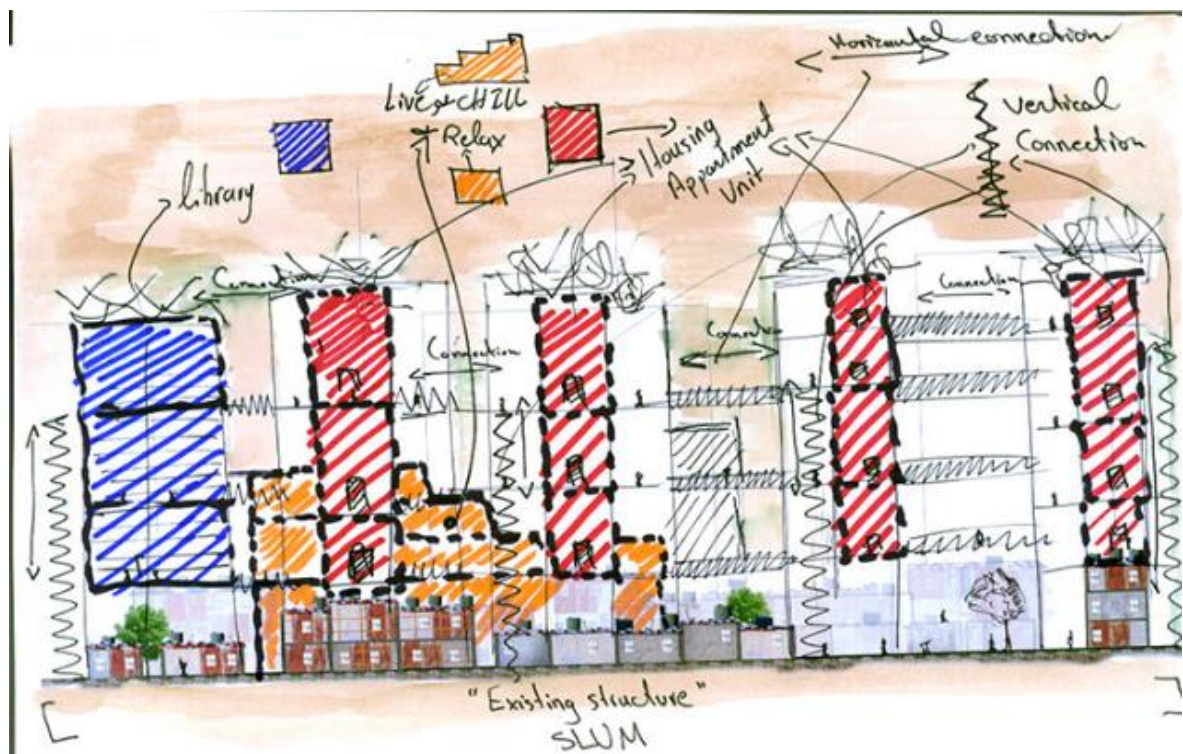– The building of the library (access to books, kids' activities, meetings, study spaces).

Fig. 14. The sketches present the development program for the extension concept. Source: Author's figure.

7. SUMMARY AND CONCLUSION

The magnitude of the slum problem worldwide is enormous, but there is also increasing awareness of this issue. The attempts are taken to upgrade slums by using the strategy of sustainable development. Innovate the nontraditional ways of investment are the chance to retrofit the slum structure. Investors do not see the potential for upgrading Hay- Al Tanak slum. Their actions are versus community rights and their self-benefits are far from concerning dwellers' right to live and shape the city Beirut. The investors propose several actions for the Hay- Al Tanak such as:

– Clean up the slum and build a shopping center.
– Leave the settlement with no action with unknown future.
– Relocate the dwellers to the suburbs for an unknown period, until they will build for them social housing, but the percentage for this proposal is to low, according to the poor councils and housing organization economy in Lebanon.
– Build luxury apartments in this strategic location of the city.

In this paper, a development strategy has been presented carefully, in upgrading one of the poorest slums in Beirut. An architectural model faces physical and environmental challenges, clarifying a sustainable process lead to holistic success in the area, in charge of human and city rights. The proposed method of improvement Hay-Al Tanak relies on using innovative tools, intended to help governments and councils, solve problems and find a solution for informal settlements. The aims of this design were pointed to facing the rapid urbanization and the growth of the urban population, avoiding the risk of living in precarious areas. The innovative tools that took place in the process are:

– Understanding the history and the establishment of the settlement.
– The innovative methodology aims to understand the current challenges.
– Community integration.
– Intervention present vernacular architecture.
– Sustainable design faces climate challenges.
– Implementation plan, clarify actions according to priority.
– Innovative finance and deal with the right actors.
– Improving city image and network by promoting social equity and economic growth.
– The long-term plan, meet the needs of future generations.

The proposal was influenced by several references from a theoretical and practical point of view. The hypothesis was formulated an undertaking local community, tradition, culture, politics, finance, and religion as the main consideration to achieve holistic success. This proposed intervention promotes a coexistence integration between formal and informal. Searching a respectful approach toward community through new methods and action plans. To approach resilient and vibrant cities. Prepared to face risks and challenges, that threating citizen's stability, mental and physical health, productivity and prosperity.

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