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# SELF-PRODUCED NEIGHBOURHOODS IN TUNISIA: FROM VULNERABILITY TO RESILIENCE, WHAT ARE THE RESILIENCE VARIABLES?

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**Abstract:**
The self-produced housing phenomenon emerged all over Tunisian cities at the beginning of the twentieth century under the impetus of the rural exodus, under the pressure of exclusion mechanisms linked to economic policies and housing policies. Thus, this form of housing has unfortunately become a real sector of popular housing production evolving explosively in the world. It reflects real forms of precariousness and social exclusion challenging the established urban order. Nowadays, this form of production increasingly attracts the attention of all stakeholders in the city. It combines several limits both at the spatial organization level and at the economic and social level. The requalification attempts have relatively improved living conditions in many neighbourhoods. The built environment which undergoes major transformations is largely neglected.
In this paper, we will firstly present the situation of these self-produced neighbourhoods and then: State interventions. From concrete examples in Tunisia, we will question the future of self-produced forms of habitat and how to intervene in a context of resilience to ensure their sustainability. Several issues have to be discussed related to the way of inhabiting these spaces, the architecture produced, the consensus town planning, and the participation of residents. We will try, using an analysis grid, to outline the resilience variables. The resilience variables allow us to overcome these self-produced quarters' urban and social marginalisation**.**

**Keywords:** Tunisia, Self-produced, neighbourhoods, Resilience variables, Housing policies.

## Introduction

Nowadays, one of the major challenges for local authorities is to ensure the resilience of the territory. The whole difficulty lies in defining the determinants on which the local public authorities will rely. Recent research has dealt with this problem, we cite: (Sharifi, Yamagata, 2016), (Suárez, Gómez-Baggethun, Benayas, Tilbury, 2016). However, a relatively small number of studies have focused on implementing an approach to improve urban and architectural resilience in self-produced neighborhoods. To study the resilience of urban systems, several studies have addressed the issue of urban resilience by focusing on the risks

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of natural hazards (Preferment & Lloyd, 2015); Sustainability (Blackmore, Plant, 2008) and disasters (Cariolet, Vuillet, Diab, 2019); (Simpson, 2006). To deal with urban resilience; most publications are based on key components, such as social resilience, economic resilience, natural or ecological resilience, and resilience of infrastructure and resources. The researchers proposed for each component an evaluation through several indicators. [Cutter, Barnes, Berry, Burton, Evans, Tate, Webb, 2008), Kusumastuti, Husodo, Suardi, Danarsari, 2014), (Joerin, Shaw, Takeuchi, Krishnamurthy, 2014), (Kim, Lim, 2016), (IPCC, 2014), (Bozza, Asprone, Manfredi, 2015).

This paper aims to ensure urban and architectural resilience through the definition of indicators from the study of self-produced neighborhoods in Tunisia. Several questions arise. What are the variables for resilience? Which Tunisian actors can be involved to contribute to the implementation of the continuous improvement of resilience? Our diagnosis of self-produced neighborhoods will make it possible to set out pillars used by local public authorities to measure urban resilience. The objective is to develop a methodology for improving urban resilience based on methods and tools. The experimentation is carried out by studying the context of the Bhar Lazrak district. It belongs administratively to the municipality of Marsa -Tunis-Tunisia.

**Methodology**

We develop a methodological framework to measure urban resilience in informal settlements, define an urban resilience index and apply it to an informal neighborhood as a case study in Tunisia the use of qualitative and quantitative methods will ensure the objectivity of the results obtained. On the one hand, the qualitative method is based on analyzes of interviews with specialists and actors working at Bhar Lazrak. On the other hand, the quantitative method is practiced through questionnaires sent to residents. A preliminary preparation phase preceded the in-situ survey; it is based on documentary observation, reading of the work studies as well as urban diagnosis and analysis.

Based on the literature and the resilience indicators developed by our predecessors, this research proposes a conceptual framework for an assessment of urban resilience in the context of informal productions, which is presented in the (figure1)

(Zhang, Yang, Li & van Dijk, 2020) propose 6 dimensions of urban resilience: economy, society, community capacity, infrastructure, ecological environment and institutions. Our conceptual framework of urban resilience in self-produced neighbors can be assessed by 4 resilience indicators. Each indicator is divided into several specific indicators that can be assessed by several statistical indicators (e.g., the social dimension can be further divided into 4 sub-dimensions: Unemployment rate, percentage of Violence and crime, social mix and social cohesion). In total 14 sub-dimensions, as presented in the next Figure.

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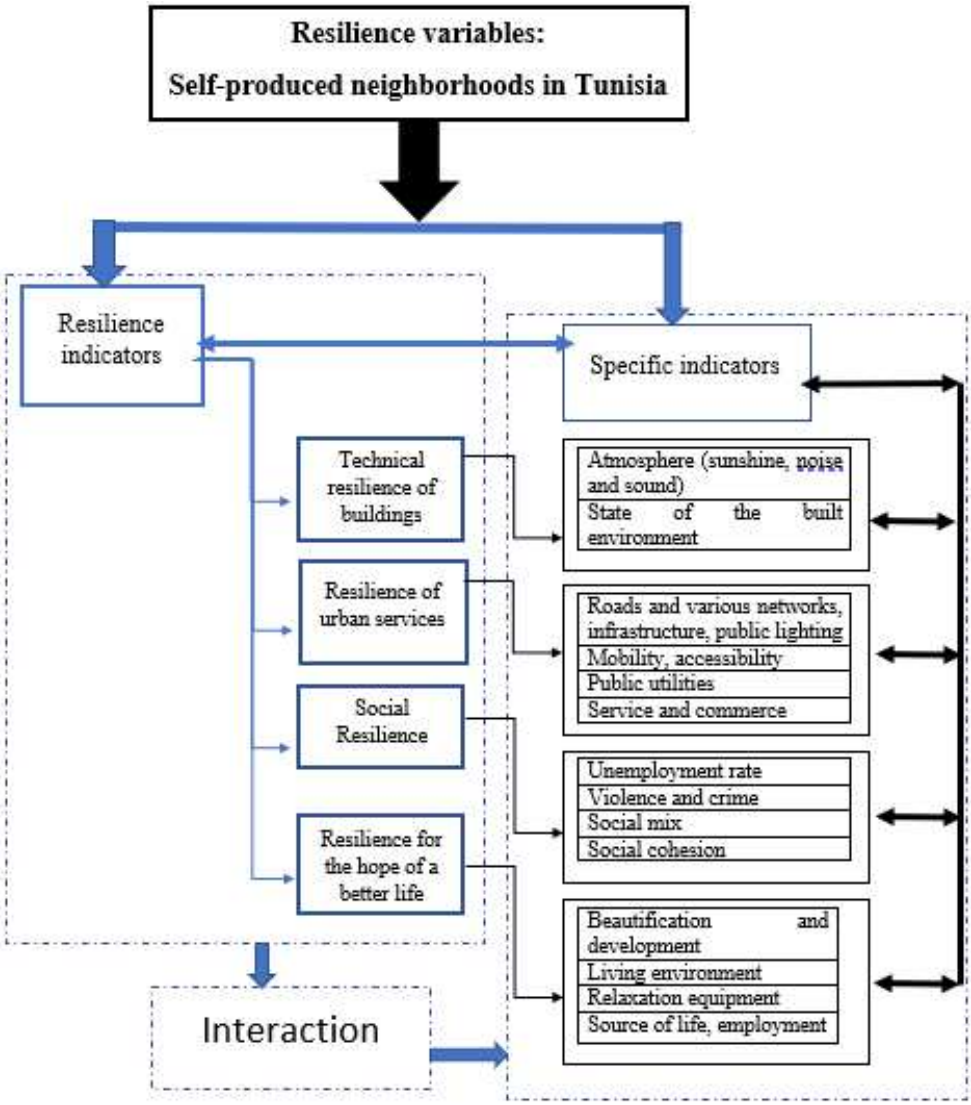


Fig1: Conceptual framework for assessing resilience indicators in Self-produced neighborhoods. Source: SOUISSI H. & ZRIBI A.A.

## I. Self-produced habitat: the relevance of the Tunisian corpus

### 1. Self-produced habitat and urban evolution

According to the United Nations Department of Economic and Social Affairs, reviewing the outlook for global urbanization in 2018, 55% of the world's population live in urban areas, a proportion that is expected to rise to 68% by 2050. According to the World Population Prospects 2019, today more than 4 billion people now live in cities and slums rather than in the countryside. Africa is no exception to the rule, in turn; Tunisia shows an important urban evolution of its cities closely linked to the changes that have crossed them since their formation.

Urban sprawl has been increasingly favored by the proliferation of self-produced habitats and fabrics. It impacts negatively city planning, architectural cachet as well as society and its citizens. Indeed, the percentage of the urban population living in shanty towns in North Africa increased significantly between 2000 and 2018 as shown in the graph below (Figure 2).

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"Slums represent one of the most enduring faces of poverty, inequality, exclusion and deprivation1”

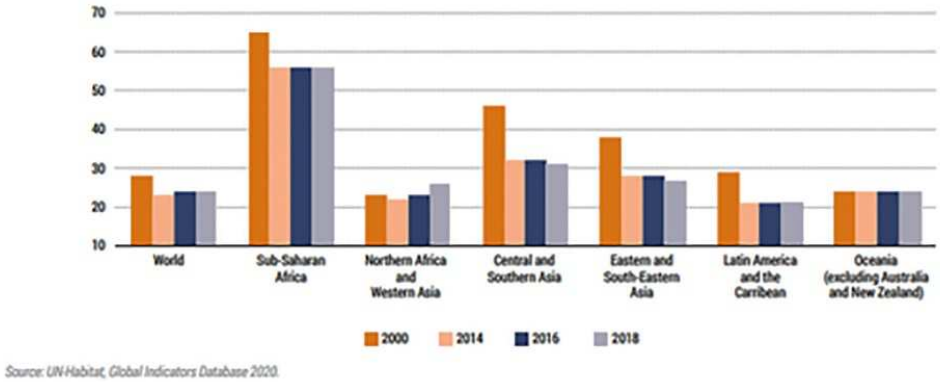


Fig2: Evolution of informal settlements in North Africa; Source: https://unhabitat.org/sites/default/files/2020/10/chapter_1_urbanization_and_cities.pdf p.26

## 2. Genesis and evolution of self-produced housing in Tunisia

You have to go back to the 1920s to see the first precarious settlements called slums or gourbivilles settling around the big Tunisian cities. Driven mainly by the rural exodus from the countryside bled dry. This form of habitat marginalized and excluded from colonial urban growth did not attract the attention of the colonial planner in terms of enhancing the living environment.

This form of habitat has solidified over the years. They disturb the urban order. Large human concentrations were in extreme poverty, thus forcing a real threat to power during the 1960s, just after the event of independence. The political order was to "clean" these powder kegs around the cities and impose a clean urban order bringing the power of the time, enamored with modernism and rationality, to give the order to demolish these small towns, real legacies of colonization. Clashes with the security forces led residents to resist for a while to give in and leave their homes to destruction.

It was not until the 1970s and 1980s to see the emergence of a new form of self-produced housing in a liberal economic context, producing exclusion mechanisms linked to the economic model and housing policies. This form of permanent housing with legal land tenure will spread to urban perimeters. The actors at work are inhabitants excluded from the labor market and kept in extreme poverty. Although lacking in infrastructure and urban services neighborhoods, are of better quality than slums. However, the built environment shows significant dilapidation.

Since the 1990s, we witnessed the proliferation of self-produced neighborhoods in all Tunisian cities. Its share in urban growth exceeds 50%. The State has deployed several actions with donors and national actors aimed at improving the living environment of many families. However, the register of recognition of this form of housing remains intact; at the same time the State does not have the means to ensure decent housing for these populations kept in precariousness. Zribi (1991) teaches us that: "Under these conditions a consensus was found between the State which turns a blind eye to a dynamic and efficient form of self-

[1] https://unhabitat.org/sites/default/files/2020/10/chapter_1_urbanization_and_cities.pdf, p25.

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produced houses and a population which have no other solutions than to build itself in dignity a roof; tomb of life. "

Until today, this form of housing functions as a popular pathway. The resulting production shows significant deficiencies in terms of the organization of neighborhoods and the health indicators are red: urban services, infrastructure, the dilapidation of the built environment, pollution, atmospheres, etc. The state intervenes in an attempt to improve living and working conditions in these urban areas known for marginality and exclusion. These interventions in these living spaces do not integrate issues of health, education, employment and citizenship.

Today, more than ever the issue of self-produced housing is on the agenda. Its promotion as an integral part of the built heritage is more necessary than ever. The situation which prevails in these districts is almost alarming everywhere on the territory. Populations are kept in extreme distress. This situation calls for the mobilization of resources and actors to progress these neighborhoods out of urban poverty.

**3. Scope and limitations of the intervention**

To meet the critical challenges of the twenty-first century, Tunisian cities have become laboratories of public policies. The major concern is the management of self-produced neighborhoods. Basic actions are essential in particular to fight poverty, inequalities, unemployment and inadequate housing and improve living conditions. Various public actors have already mobilized to manage a heavy legacy which continues to grow. According to Souissi (2019) “Urban policies in Tunisia have taken into account the issue of informal settlements through the establishment of a legislative structure, urban programs and the realization of construction sites, urban rehabilitation and renovation with the contribution of national and international stakeholders.”

In fact, since the 1980s, the Tunisian state has adopted a strategy for rehabilitation and renovation of self-produced fabrics. The main actor is the Urban Rehabilitation and Renovation Agency (ARRU) under the supervision of the Ministry of Equipment and Regional Planning (MEHAT). The agency was created in 1981. After the eradication policy undertaken in the 1960s, the 1970s saw attempts to integrate the informal fabric. Several intervention programs in self-produced neighborhoods took place, we cite the Urban Development Program (PDU) which is succeeded by the Integrated Urban Development Program. (PDUI) then, the Residential Neighborhood Rehabilitation and Integration Program (PRIQH), after that the National Program for the Rehabilitation of Popular Neighborhoods (PNRQP), the National Program for the Rehabilitation of Popular Neighborhoods in Large Cities (PNRQPGV) and finally the National Urban Requalification Program (PNRU)… etc.

All intervention programs in self-produced neighborhoods were carried out with a purely curative logic on the part of the public actor. We have confirmed in recent studies that this proliferation is all the more accentuated in the rehabilitated areas. This same observation was finally noted by the specialized institutions. Indeed, as we affirm (Souissi, 2019) "the rehabilitation of informal settlements is often a call for air favoring either the extension of the treated neighborhood or the emergence of new anarchic nuclei in the municipality concerned. “To control the urban expansion of self-produced neighborhoods, the agency ARRU has recently launched a second generation of the "PRIQH2" program. It is a purely preventive

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approach through the production of serviced lots at affordable prices and social housing accessible to the underprivileged. This new program constitutes a new means to limit informal. The implementation period will run between 2018 and 2022. The cost of the project is around 235 thousand euros. It should be noted that the sources of funding are distributed as follows; 23% is the contribution of the Tunisian state, the subsidy from the European Union is estimated at 12%; while AFD's contribution is around 33% that of the BEI is equal to 32%.

## II- Case study and applications: Bhar Lazrak, a real powder keg

### 1- Urban situation and diagnosis

The city of Marsa is a predominantly residential Tunisian suburb, well known for its rich heritage, culture and history. Nowadays, it is gradually losing its cultural and historical importance. Indeed, several historical monuments in La Marsa are classified nationally. We quote among others the Abdellya Palace: a Hafside monument built-in 1500 ensuring the summer residence of the Husseinites XVII and Mouradites XVIII. Ksar ESSADA or the palace of happiness, in the mid-19th century, became a residence of the Husseinite dynasty. Finally, Ahmad Bey Palace, a listed historic monument, is nowadays in a poor state of conservation.

The city is now experiencing a huge change from its original character. It is constantly changing due to informal urbanization and metropolitan influence. In recent years, the focus has been on the proliferation of informal settlements south of Marsa and more specifically on the genesis of a neighborhood called BHAR Lazrak at the expense of fertile agricultural land (Figure 3). Our study area covers 550 hectares.

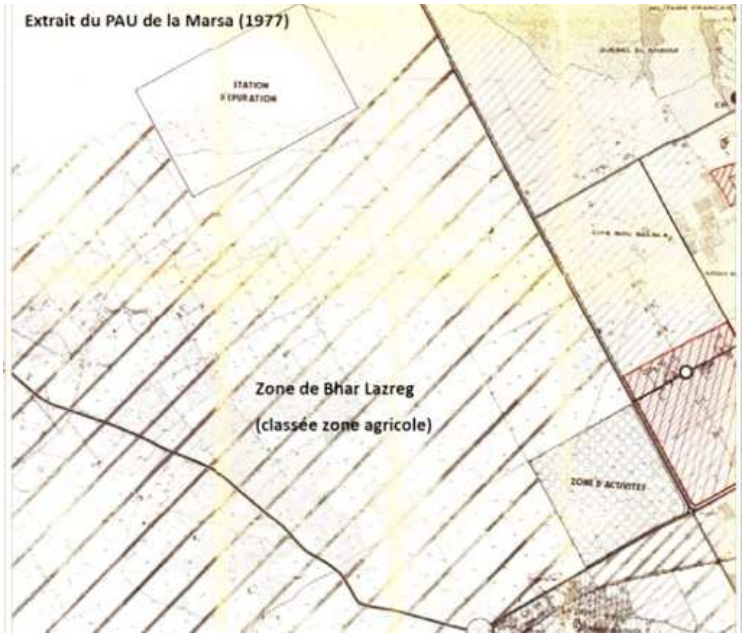


Fig3: The agricultural area of Bhar Lazrak Marsa 1977, Source: AUGT 2020

The area occupies a strategic position (Figure 4). It is bounded to the north by the tourist area of Cap Gammarth, to the east by the village Sidi Bou Said and the archaeological site of Carthage, to the south by the new area of Ain Zaghouan and the west by Soukra and Sebkha de Ariana.

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Fig4: Bhar Lazrak land intervention scope, Source: SCRT Tunisia & Urban plan 2020

The Bhar Lazrak area has long been considered an important land reserve for urban expansion due to its flat relief, strategic location and easy accessibility. Self-produced neighborhoods were the source of radical changes. Thus, the regulatory context, as well as the operational tools, have been adapted to the increase in the number of self-produced neighborhoods.

The development of the first urban planning document: the urban development plan of Marsa PAU dates back to 1977 when the influence of the BHAR LAZKAK district is included in the municipal perimeter as an agricultural area. From satellite images, we can see that until 1974 the site was occupied only by a few farming families. The orthogonal grid is due to the divisions of agricultural land.

During the first revision of the urban development plan, PAU de la Marsa in 1981, the area of Bhar Lazrak saw the creation of a detailed layout plan PAD covering an area of 14 hectares. Then, during the second revision of the urban development plan PAU de la Marsa in 1995, there was an extension of the area of the detailed layout plan PAD to 45 hectares. It was with the creation of a land intervention perimeter for the benefit of the housing land agency that the area of the district increased to 550 hectares. Following the approval of the detailed layout plan PAD Bhar Lazrak II in 2005 as part of the third revision of the urban development plan PAU de la Marsa. The Tunisian State intervenes through its specialized institutions the agency ARRU undertook various interventions and projects with a view to the improvement and integration of self-produced neighborhoods in an intervention perimeter. Spread over 62.5 hectares as shown in the attached figure (Figure 5). The National Program for the Rehabilitation of Popular Neighborhoods in Large Cities PPQPGV initiated in 2008 concerned 7 neighborhoods in the Bhar Lazreg area.

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Fig5: Rehabilitated neighborhoods, source: ARRU

It is from the promulgation of the PAU in 2019 that the self-produced neighborhoods is assimilated into an urban area. The strengthening of governance capacity was achieved with the creation of the Bhar Lazrak 2030 Project Management Unit (PMU). To frame the Informal urban extension and better improvement of the living conditions of the inhabitants, the municipality of Marsa has engaged in the revision of the PAU to develop an urban project which aims to reorganize the urban space according to technical standards, taking into account the current state and future needs in terms of infrastructure equipment and green spaces.

**2- Survey: presentation, progress, interpretations and results**

To make extrapolate information available to the entire population of Bhar Lazrak, we have launched an investigation. The establishment of a direct survey of a representative sample revealed the following information (Figure 6). First, the sanitary condition of the accommodation is very satisfactory. The accommodations are equipped with a kitchen. Then, the electricity connection is 90%, Used Water services (ONAS) is 50% of housing and drinking water drains more than 70% of housing. Very few accommodations have a garden. The internet connection is very weak.

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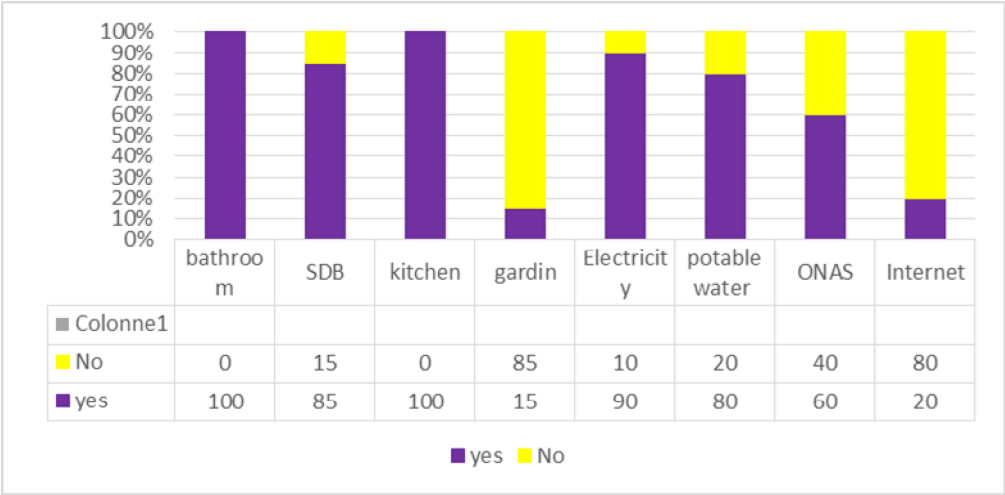


Fig6: housing utilities, Source: Authors

We can understand from this information that self-produced housing guarantees an acceptable built environment. On another note, the survey sheds the following light on life in the neighborhoods (Figure 7). First, the unemployment rate remains high at 20% (the national average is 14%). Then, Violence and insecurity present a high rate of 45%. After that, the various road and network (VRD) problems affect 40% of neighborhoods. Pollution has fallen by 30% of the inhabitants. Basic equipment has fallen by 30% of residents. Finally, leisure spaces are fallen by 40% of inhabitants.

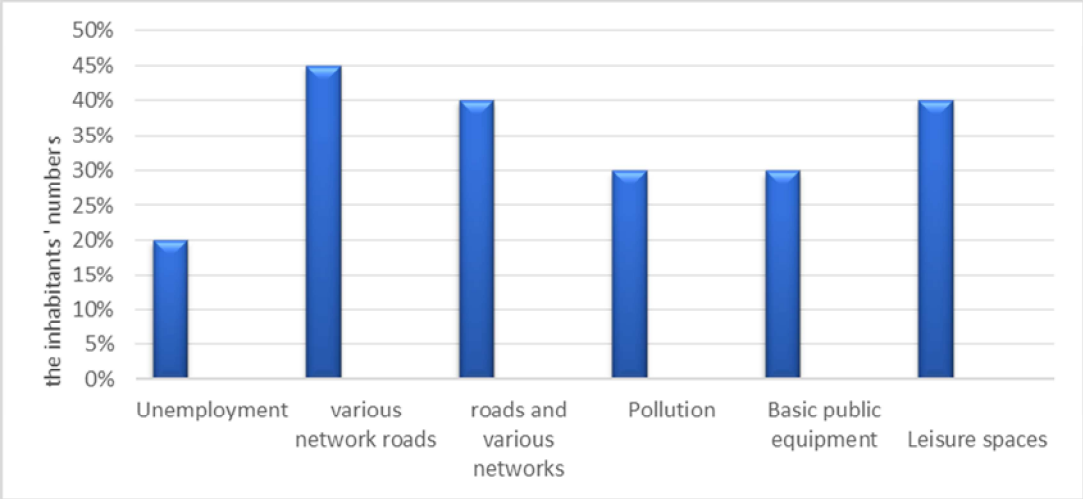


Fig7: Quarter's problems; Source: Authors

Regarding the aspect of residents' expectations (Figure.8); 35% of residents are demanding road improvements. 40% of residents are disappointed by the lack of sports and cultural facilities. 20% claim educational equipment. 40% claim green and leisure spaces. Finally, 15% claim a source of work.

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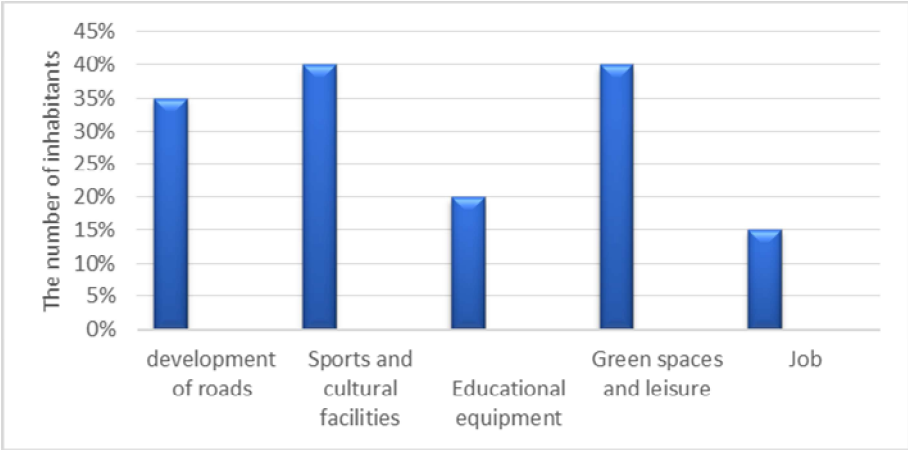

Fig8: Neighborhood problems; Source: Authors

In light of the required observations, Bhar Lazrak has currently several deficits affecting both the living environment and also the social component. We will, from the results of the survey, identify some relevant indicators that will be investigated in increasing the resilience of this developing neighborhood. These indicators are likely to guide the development of this neighborhood. It is within the framework of an urban observatory that these indicators must be inserted in the service of actors acting in favor of urban resilience. The inhabitants are a centerpiece in this commitment as well as the public authorities. Measurements of the indicators should be carried out by qualified agents. The self-produced neighborhood must be well defined, and its development must be well controlled.

## 3. Discussion

### 3.1. Definition and application of resilience indicators

First of all, our defined urban resilience indicators are closely related to self-produced neighborhoods in Bhar Lazrak. Indeed, the shortcomings in terms of urban services, social services, public facilities, services and shops have already been raised by the inhabitants of this district. Our urban policies must therefore exceed these deficits. Then, it is thanks to the results of the survey that we tried to operationalize the concept of resilience (urban, architectural and social) through the modeling of indicators and the construction of a spatial support system decision. Relying on these indicators will allow better governance of the Bhar Lazrak district and that self-produced in general. To ensure that the benefits of urbanization are fully shared and inclusive, urban policies need to ensure access to infrastructure and social services for all. It must also focus on other needs of housing, education, health care, decent work and a safe environment. To help self-produced cities to adapt transformations, we propose these indicators.

#### 3.1.1. Technical resilience of buildings relates to environmental indicators and the built environment

The atmosphere of the living space must be taken into account. This sensitive approach to the built environment involves sound, light, olfactory, thermal, tactile and kinesthetic world. In the context of our experiment, we limit ourselves to sunshine, noise and sound systems

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with quantitative measurements (low index, medium index and high index). Likewise, in this prism, we have used the built environment as an indicator of the appreciation of the inhabited space. This indicator is qualitatively estimated: the dilapidated, average and satisfactory built environment.

### 3.1.2. Resilience of urban services

Urban services include various road and network (VRD) components, infrastructure, public lighting and connection. Let's add mobility in self-produced neighborhoods as well as accessible from the outside. This indicator is preponderant in the resilience of the district. Overcoming the dysfunctions and vulnerable urban services associated with them were strongly recommended by the respondents. Finally, it is the generalization and installation of equipment that will improve the resilience of urban services.

### 3.1.3. Measure social resilience

The step of measuring social resilience is important, as it will make it possible to translate the cohesion, the contradictions and the memory of the whole community. Urban and architectural planning of self-produced housing constitutes a capital social indicator, an index that describes the society that was designed and implemented. The evolution of the urban fabric reflects the society that produced it and the one that continues to manage it, the mode of governance as well as the associative institutional actors involved. This indicator is estimated qualitatively, through the unemployment rate, delinquency and crime rate. As for social cohesion: it is quantifiable concerning the middle-class rate. To ensure resilient urban development, the first step is to put in place the right conditions and the right indicators to ensure long-term sustainability. Referring to our survey, these indicators are at the same time social, economic, environmental and cultural.

### 3.1.4. Resilience and hope for a better life

This unprecedented prism reveals among populations the desire to access a better living environment through four indicators. These are embellishment and development, living environment, relaxation equipment, and source of life (employment). The survey yielded numerical responses translated into percentages. The interest of these indicators lies in measuring the dynamics of the appropriation of space expressed in the form of demands and wishes.

## 3.2. Data Gaps and Methodological Limitations

Although we limited the case of study to only bhar Lazrak, this work represents an introduction to the research to propose indicators that improve urban resilience. We offer indicators as a theoretical framework for measuring resilience in informal settlements. We develop a methodology and apply it to an informal neighborhood as a case study.

Our survey, which aims to be representative, covers several aspects affecting both the organized social and facilities in the neighborhood. In turn, we discussed the health status of the housing considered satisfactory, the equipment of the housing is satisfactory, and the connection to the various networks is also satisfactory. We can consider that the state of good health of the district is acquired. At the level of life within the district, the survey reveals

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deficits attested by the rate of high unemployment (20%) and the rate of violence and insecurity (45%). Similarly, the problems felt by the inhabitants, namely roads (40%), pollution (30%), basic equipment (30%) and leisure spaces which are largely lacking estimated at 30%.

The reading of these data reveals deficits at the level of the general organization of the neighborhood and social structure. On another side and in terms of expectations formulated by the inhabitants, we notice predominance in terms of neighborhood development (roads and green spaces) and their miscellaneous equipment.

Finally, the inhabitants demand sources of work to ensure their survival. Finally, the data reveal notorious deficits at the level of the living environment and at the same time the existence of a close-knit and protesting community initiating legitimate grievances. In terms of experience, the inhabitants oppose resistance to poverty and precariousness. The space inhabited reflects the existence of a close-knit community challenging the urban order.

**Conclusion: Towards a new definition of resilience in the field of self-produced housing. The relevance of the indicators.**

While until recent years the term resilience has been associated with natural disasters, earthquakes and floods in high-risk countries. We were interested in our specific case in the application of resilience in the field of self-produced habitat. This new concern relates to how the living environment of populations in distress must be safeguarded. The survival and enhancement of self-produced neighborhoods require the application of a certain number of specific indicators supported by direct surveys covering four aspects: the technical resilience of buildings and atmosphere, the resilience of urban services, social concerns need and finally the resilience of hope for a better life.

The specific indicators are novel, insofar, as they are being deployed for the first time in the field of self-produced housing. They are the results of field investigations with the support of the various actors and the populations on the front line. The quantification of indicators based on a representative sample is both quantitative and qualitative reflecting the data collected. We have deduced that this is a first experience that will lead us to consolidate our technical knowledge in the field of habitat resilience. Likewise, the use and application of specific indicators on Bhar Lazrek will allow us to test the technical device and generalize it to other neighborhoods in other Tunisian cities. Saving, enhancing and improving living conditions in self-produced neighborhoods will remain dependent on the strength of the various actors involved in the making of the city, the will of the State and the dynamics of the populations concerned. Finally, opening up to other countries with experience in the field of urban resilience can only enrich our approaches and our mutual experiences. Likewise, a look at the many years of experience in practicing resilience in high-risk environments (Flood, earthquakes, etc.) can only strengthen our system geared toward self-produced housing.

We will end our experiment by presenting the different indicators as we sketched them from the survey on the locality of Bhar Lazraq. This first draft in the field of self-produced housing needs to be adjusted and consolidated to be tested in other neighborhoods. This first unprecedented experience does not claim to be exhaustive; it has the merit of revealing the intrinsic data of the living spaces of Self-produced neighborhoods.

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Table1: Summary table and estimation of resilience indicators relating to the study area: "Bhar Lazrak", La Marsa -Tunis-Tunisie; Source: Authors

| **Resilience indicators** | **Specific indicators** | **Percentage% or appreciation** |
|---|---|---|
| **1-Technical resilience of buildings** | Atmosphere (sunshine, noise and sound) | Satisfactory |
| | State of the built environment | Satisfactory |
| **2-Resilience of urban services** | Roads and various networks, infrastructure, public lighting | 80% |
| | Mobility, accessibility | 30% |
| | Public utilities | 30% |
| | Service and commerce | Unsatisfactory |
| **3-Social Resilience** | Unemployment rate | 20% |
| | Violence and crime | 45 % |
| | Social mix | Very Unsatisfactory |
| | Social cohesion | Very Unsatisfactory |
| **4-Resilience for the hope of a better life** | Beautification and development | 40% |
| | Living environment | 40% |
| | Relaxation equipment | 45% |
| | Source of life, employment | 20% |

This experience through its twists and turns of self-produced habitat was instructive. We were able to discover living spaces in gestation showing deep deficits. Resorting to the establishment of specific indicators has enabled us to better understand the intrinsic qualities of neighborhoods and lifestyles.

Although designed for the first time in the self-produced housing sector, these indicators, which should be consolidated and extended to other neighborhoods, revealed the reality of this form of housing and its constraints. In the future, we would like to join forces with the various players in self-produced housing, leading the inhabitants to define relevant analysis grids based on high-performance indicators to ensure the resilience of these sensitive space neighborhoods.

The resilience of self-produced housing will be a field of experimentation for many countries undermined by informal urbanization. In difficult times, the urgency of helping local communities becomes unavoidable and must be launched to save precarious neighborhoods and threatened lives.

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