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THE SUSTAINABLE TRANSFORMATION OF ENVIRONMENTAL AND SOCIAL NEIGHBORHOOD IN THE HOT CLIMATE, CASE STUDY BISKRA CITY, ALGERIA

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ABSTRACT

Urban sustainability is a contemporary concern that emerged in the late 20th century following international awareness of environmental and social context deterioration. Sustainable transformation is a solution proposed to offer a adequate scale of new development principles adapted to the new challenges of society. This research addresses the issue of urban sustainability in the hot climate at the city of Biskra in south east of Algeria, at the neighborhood level.

KEYWORDS

Sustainable Transformation, Hot Climate, Environmental and Social Context. Biskra Algeria

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1. INTRODUCTION.

One of the main objectives of environmental design in an urban context warm is the creation of comfortable spaces. We will try to clearly demonstrate in the neighborhoods of the city of Biskra, the sustainable transformation of neighborhoods has an impact on the change in the living conditions of residents.

2. OBJECTIVE.

Determine the evolution of the sustainable transformation of neighborhoods in an environment hot urban defined by a basic layout and its impact on the city. This study uses a digital approach, including monitoring methodology.

3. INVESTIGATION METHOD.

Ideas for warm urban design solutions are proposed. We create a tool sustainable transformation of neighborhoods in this hot context. Composed of 28 indicators separated into three major axes considering the specificities of the hot terrain, it allows you to draw up an overall portrait of the level of sustainable transformation with respect to three levels: Basic, transform, Very transform. A second part of the research makes it possible to apply this grid on the El Alia district, located in a hot climate, this, with respect to the criteria of sustainable transformation.

4. PRESENTATION OF CONCEPTS.

The concept of sustainable urban planning is recent and under construction. It is not stabilized and is in constant theoretical evolution. Due to this character, the proposed vision of the different principles although common to a number of publications, however, remain fluid. Of many actors establish specific grids according to their vision of sustainable development urban. Here we offer five entries to understand the concept. these points are a fundamental basis allowing us to understand in a fairly completes the concept of sustainable urban planning and sustainable neighborhood transformation.

To summarize, the 4 factors of controllable approaches in urban space promote following effects:

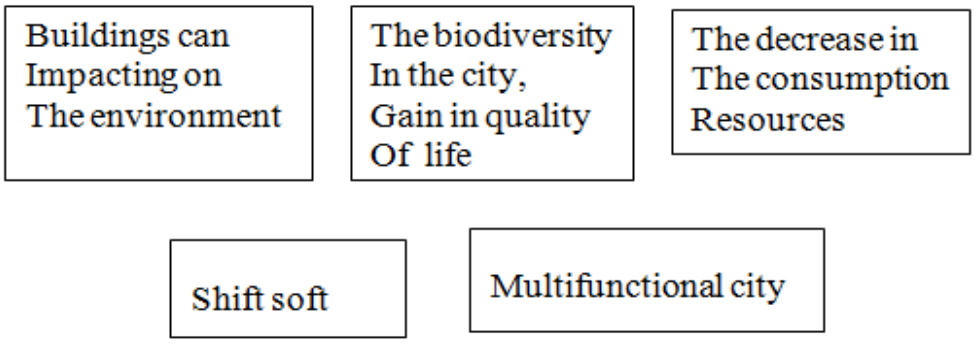


Fig. 1. *Major principles of sustainable urban planning.*

To introduce the impact of the sustainable transformation of neighborhoods we use this table.

Table 1. Positive impact in terms of thermal comfort of the 4 controlling factors proposed by (Rizwan et Al, 2008).

Optimum urban structuring	Reflective urban materials	Vegetation	Additional sun protection
-Improvement of ventilation flow. -Reduction in heat capture from buildings. -Promotion of shadowy spaces	Low heat capture in the soils and building envelopes	-Solar filter on buildings and soils -Solar filter for pedestrians -Improvement of air humidity	User comfort

5. PRESENTATION OF INVESTIGATION SITE.

This study applies to the case of the city of Biskra, belonging to arid regions with a climate hot and dry in Algeria. Its arid climate is characterized by: Annual fluctuations and significant daily difference between maximum and minimum temperatures. Between the month most cold and the hottest month, the thermal amplitude exceeds 20°C. Daily amplitude for the hot season is around 22°C. Solar radiation is intense and is of the order of 10 hours/day. The average relative humidity is around 47% and remains low, not exceeding 60% in winter.

Precipitation is irregularly low (120 mm). (Cote, 2OO5). The situation of the investigation site in the town of Biskra is a basic principle for the treatment of sustainable neighborhood transformation in the hot climate.

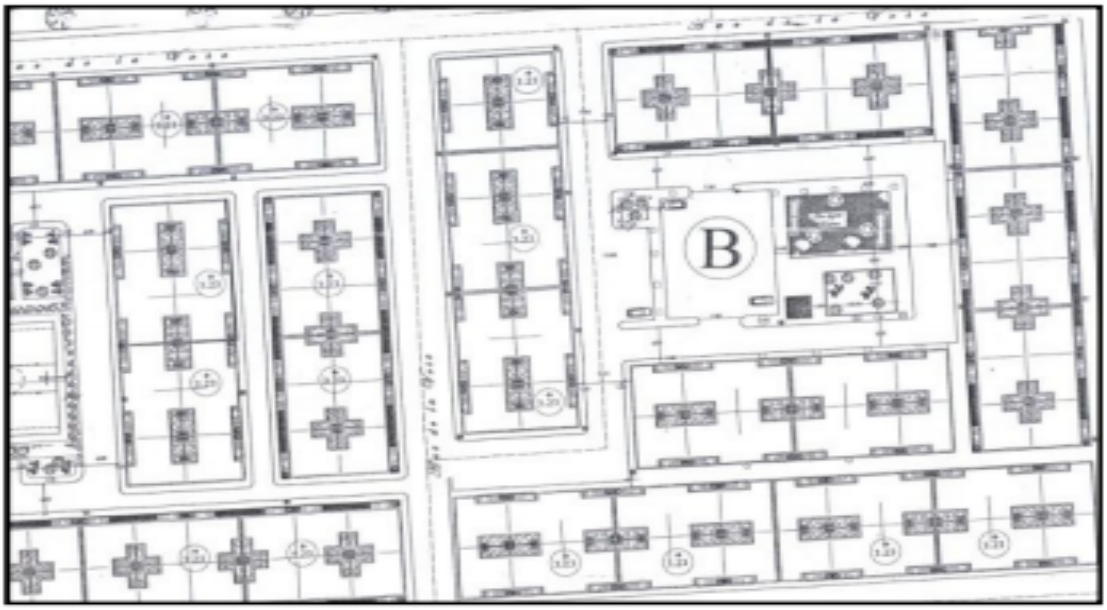


Fig. 2. *The investigation site.*

6. RESULTS AND DISCUSSIONS.

6.1. Presentation of the grid

We have chosen to structure the grid in a simple way, around three axes major:

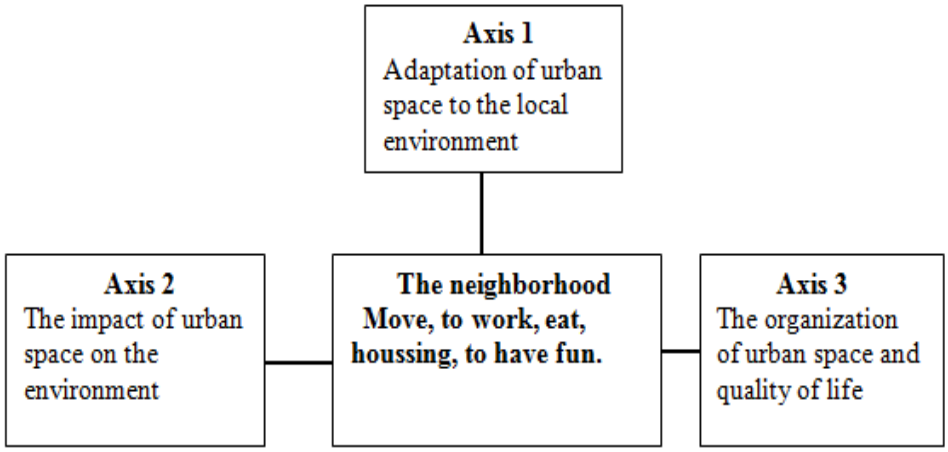


Fig. 3. *Relational diagram: Sustainable transformation structured around three major axes.*

Axis 1: adaptation of urban space to the local environment:
Indicator 1: urban porosity
Indicator 2: level of thermo-aeraulic reflection
Indicator 3: plant environment of buildings
Indicator 4: solar protection of roofs
Indicator 5: solar protection of glazing
Indicator 6: solar protection of facades
Indicator 7: solar protection of passage spaces
Indicator 8: solar protection of waiting areas
Indicator 9: soil permeability
The chosen Strategies allow us to think about adaptation to the hot climate, according to 3 scales:
-Promote ventilation in urban space

-Create buildings adapted to hot climates
-Limit direct solar radiation on urban space

Axis 2: The impact of urban space on the environment :
Indicator 10: Solar water heater equipment
Indicator 11: Energy consumption of buildings
Indicator 12: Wastewater management
Indicator 13: composting of waste
Indicator 14: Waste sorting
Indicator 15: Land occupation by buildings
Indicator 16: Land occupation by parking lots
Indicator 17: Quality of green areas
Indicator 18: Maintenance of green spaces
Indicator 19: Shaft frequency per channel

Axis 3: organization of urban space and quality of life :
Indicator 20: Linear dedicated to gentle movement
Indicator 21: Clean site for public transport
Indicator 22: Public parking spaces
Indicator 23: Parking spaces per dwelling
Indicator 24: Functional diversity
Indicator 25: Social diversity
Indicator 26: accessibility to local services
Indicator 27: Architectural diversity
Indicator 28: Participation of residents

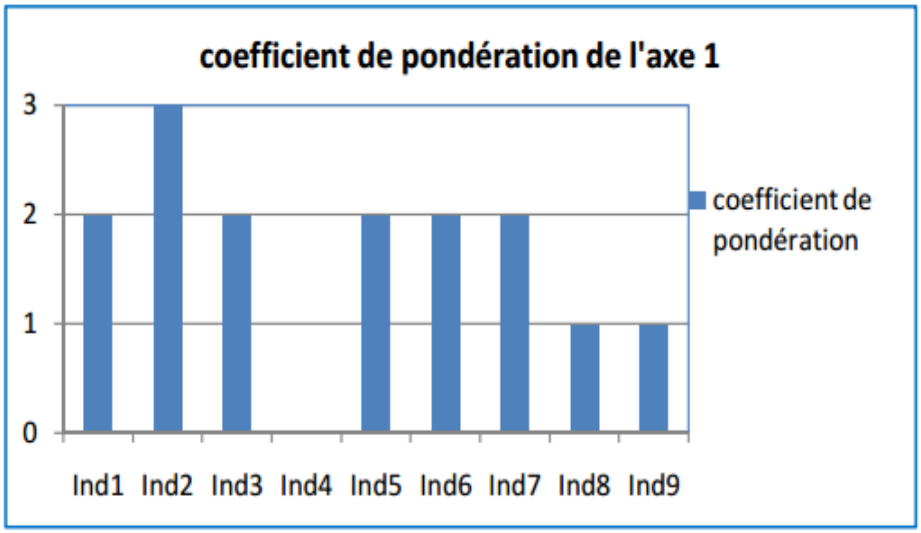
6.2. Analysis and observation

-The roads are damaged, the sidewalks are not functional (narrow sidewalks or non-existent).
These spaces are even less suitable for People with Reduced Mobility.
-Common areas in poor condition and unwelcoming, unsanitary and damaged.
- Housing not adapted to the hot climate and lifestyle: no sun protection, no terraces and outdoor living spaces.
-Poorly designed housing that is sometimes equipped with air conditioning. Therefore they are either energy consumers or unpleasant in terms of thermal comfort.
-Bus stops are not equipped with sun protection. So people waiting their bus, some are forced to use makeshift means to protect themselves.
-The surroundings of the buildings are not very diversified (grass and parking lots).
-The exterior space is poor in terms of structures and amenities.
-Proximity activities and services for residents are rare because the structure urban does not favor their location (buildings surrounded by parking, no space provided for services).
-Few public spaces are clearly identified. The public spaces observed and used are rather spontaneous public spaces (chairs placed outside, discussions in the shade of a tree).
-Outdoor spaces are little respected and often littered with waste.

6.3. Preparation of weighting coefficients

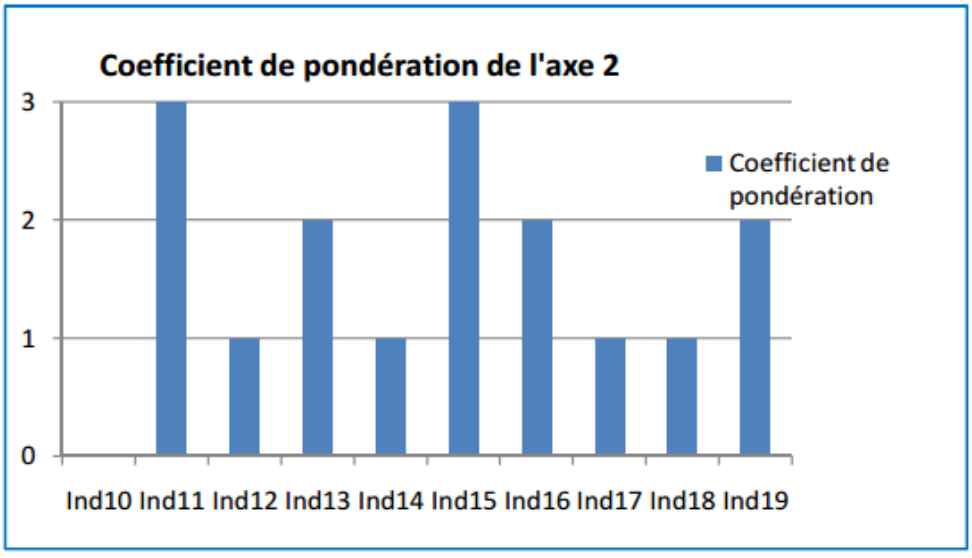
The chosen notation makes it possible to give meaning to the grid. The chosen notation makes it possible to give meaning to the grid. We have opted for a system allowing points to be assigned to each indicator in the grid, according to the levels of sustainable transformation achieved in the neighborhood. The variable issues of each indicator are integrated, in achieving sustainable transformation, by weighting coefficients depending on its weight. Each indicator in the grid gets a number of points according to the Transformation levels defined for each of them. These notes range from 1 to 3 points per indicator. When an indicator does not reach any of the proposed transformation levels, it is considered Not Transformed and no point is given counted in the final total.

Weighting coefficient of axis 1:



Indicator 1: urban porosity
Indicator 2: level of thermo-aeraulic reflection
Indicator 3: plant environment of buildings
Indicator 4: solar protection of roofs
Indicator 5: solar protection of glazing
Indicator 6: solar protection of facades
Indicator 7: solar protection of passage spaces
Indicator 8: solar protection of waiting areas
Indicator 9: soil permeability

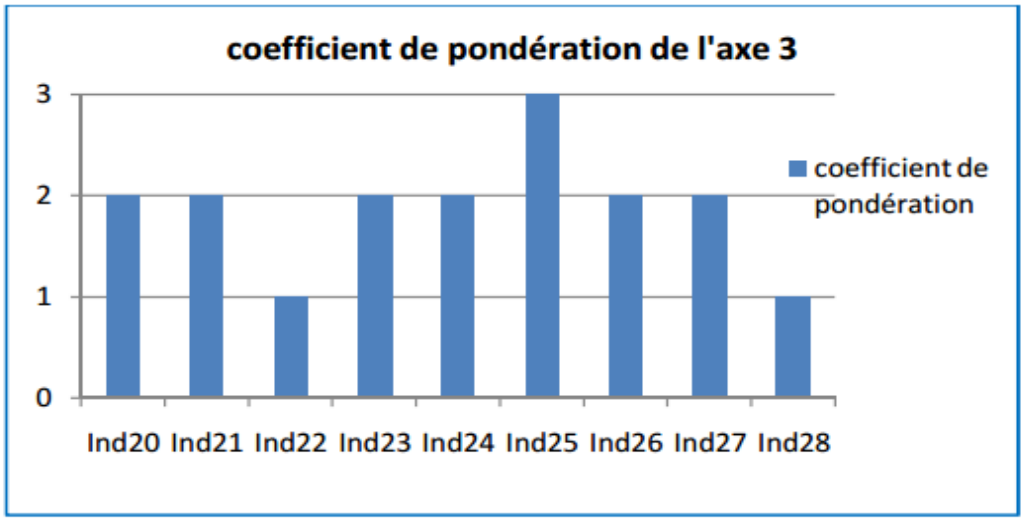
Weighting coefficient of axis 2:



Indicator 10: Solar water heater equipment
Indicator 11: Energy consumption of buildings
Indicator 12: Wastewater management
Indicator 13: composting of waste
Indicator 14: Waste sorting
Indicator 15: Land occupation by buildings

Indicator 16: Land occupation by parking lots
Indicator 17: Quality of green areas
Indicator 18: Maintenance of green spaces
Indicator 19: tree frequency by street

Weighting coefficient of axis 3:



Indicator 20: Linear dedicated to gentle movement
Indicator 21: Clean site for public transport
Indicator 22: Public parking spaces
Indicator 23: Parking spaces per dwelling
Indicator 24: Functional diversity
Indicator 25: Social diversity
Indicator 26: accessibility to local services
Indicator 27: Architectural diversity
Indicator 28: Participation of residents

7. CONCLUSIONS

The El Alia district is a functional basic district that allows for housing for residents, however sustainability is little thought about. Many elements could be improved to reduce the impact of the neighborhood. These are indeed sustainability measures that must become a common reference for the entire city.

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