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BIOMIMETIC INNOVATIONS FOR SUSTAINABLE AND EFFICIENT ARCHITECTURE: Designing a community recreation Center in Sétif

Presented by:

Berchi Abdelkrim

supervised by: Dr. TEDJARI Farouk Abdelmalek

Dr RAHMANI KELKOUL Leila

Jury members :

President : Mr. BELASSEL

Examinator : Mme. KENTACHE

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Abstract:

The application of biomimicry principles in the architectural design of a recreational facility in Sétif, Algeria, is examined in the thesis "BIOMIMETIC INNOVATIONS FOR SUSTAINABLE AND EFFICIENT ARCHITECTURE: Designing a community recreation center in Sétif." Drawing inspiration from nature, the project intends to develop a sustainable space that solves the city's lack of well-designed recreational facilities. To promote community interaction, well-being, and environmental stewardship, the recreation center integrates diverse functions cultural, social, sports, and leisure activities.

The thesis emphasizes how biomimetic architecture can transform urban environments into vibrant, restorative spaces that improve residents' quality of life while fostering ecological balance. Through a detailed analysis of local challenges, such as urban heat islands and limited green spaces. Additionally, by fusing theoretical investigation with useful design solutions, this study underscores the importance of reconnecting humans with nature through architecture, offering a pathway to a more sustainable and harmonious future.

Keywords: Biomimetic architecture, nature-inspired strategy, sustainability, community recreation center, public spaces, energy efficiency, and climate resilience.

Résumé:

L'application des principes du biomimétisme à la conception architecturale d'un centre de loisirs à Sétif, en Algérie, est examinée dans la thèse « INNOVATIONS BIOMIMÉTIQUES POUR UNE ARCHITECTURE DURABLE ET EFFICACE : Conception d'un centre de loisirs communautaire à Sétif ». S'inspirant de la nature, le projet vise à développer un espace durable qui pallie le manque des equipements de loisirs bien conçues dans la ville. Afin de promouvoir les interactions communautaires, le bien-être et la protection de l'environnement, le centre de loisirs intègre diverses fonctions : activités culturelles, sociales, sportives et de loisirs.

La thèse met en évidence la manière dont l'architecture biomimétique peut transformer les environnements urbains en espaces dynamiques et réparateurs qui améliorent la qualité de vie des habitants tout en favorisant l'équilibre écologique. À travers une analyse des défis locaux, tels que les îlots de chaleur urbains et le manque d'espaces verts, cette étude souligne

l'importance de reconnecter l'homme à la nature par l'architecture, ouvrant ainsi la voie à un avenir plus durable et harmonieux.

Mots-clés: Architecture biomimétique, stratégie inspirée de la nature, durabilité, centre de loisirs communautaire, espaces publics, efficacité énergétique et résilience climatique.

ملخص:

تُدرس أطروحة "ابتكارات المحاكاة الحيوية من أجل عمارة مستدامة وفعالة: تصميم مركز ترفيهي مجتمعي في سطيف" تطبيق مبادئ المحاكاة الحيوية في التصميم المعماري لمنشأة ترفيهية في سطيف، الجزائر. يستلهم المشروع من الطبيعة، ويهدف إلى تطوير مساحة مستدامة تُعالج نقص المرافق الترفيهية المُصممة جيدًا في المدينة. ولتعزيز التفاعل المجتمعي، والرفاهية، والمحافظة على البيئة، يُدمج المركز الترفيهي وظائف متنوعة: ثقافية، واجتماعية، ورياضية، وترفيهية. تُركز الأطروحة على كيفية مساهمة العمارة المُحاكيَة للطبيعة في تحويل البيئات الحضرية إلى مساحات نابضة بالحياة ومُجددة تُحسّن جودة حياة السكان مع تعزيز التوازن البيئي. ومن خلال تحليل التحديات المحلية، مثل الجزر الحرارية الحضرية ومحدودية المساحات الخضراء. بالإضافة إلى ذلك، ومن خلال دمج البحث النظري مع حلول تصميمية فعّالة، تُؤكد هذه الدراسة على أهمية إعادة ربط الإنسان بالطبيعة من خلال العمارة، مما يُمهد الطريق لمستقبل أكثر استدامة وتناغمًا.

الكلمات المفتاحية: الهندسة المعمارية الحيوية، استراتيجية مستوحاة من الطبيعة، الاستدامة، مركز الترفيه المجتمعي، الأماكن العامة، كفاءة الطاقة، والمرونة المناخية.

Table of content:

Introductory Chapter.....Error! Bookmark not defined.

I. Introduction: **1**

II. Problem statement: **2**

III. Hypothesis: **3**

Chapter one: Theoretical Framework.....Error! Bookmark not defined.

I. Human and nature: **4**

1. Historical Human-Nature Bond: 4

1.1. First Shelters in Nature: 4

II. Biomimicry in architecture: **5**

1. Definition and origins of biomimicry: 5

1.1. Definition: 5

1.2. Origins and evolution: 6

1.3. Key principles: 6

1.3.1. Emulation of Nature: 7

- Organism Level: 7
- Behavior Level: 7
- Ecosystem Level: 7

1.3.2. Sustainability: 7

1.3.3. Efficiency: 7

2. Application of biomimicry in architecture: 7

2.1. Biomimicry Approaches: 7

2.1.1. Problem-Driven Biologically Inspired Design: 8

2.1.2. Solution-Driven Biologically Inspired Design: 9

3. Biomimetic Advantages: 10

3.1. Biomimicry Expands Design Possibilities: 10

3.1.1. Structural Efficiency: 10

3.1.2. Dynamic Aesthetics: 10

3.1.3. Cultural Adaptability: 11

3.2. Biomimicry vs. Repetitive Modernism: 11

3.2.1. Rejecting One-Size-Fits-All: 11

3.2.2. Celebrating Regional Identity: 12

4. Biomimetic Challenges: 12

4.1. Challenges to Aesthetic Diversity in Biomimicry: 12

4.1.1. Perception of Uniformity: 12
4.1.2. Complex Implementation: 12
4.1.3. Cultural Sensitivity: 12
4.2. Challenges & Future of Biomimicry: 13
4.2.1. Technological Limitations: 13
4.2.2. Interdisciplinary Collaboration: 13
4.2.3. Economic Constraints: 13
III. Biomimicry and Sustainable Development: 14
1. Definition and principles of sustainable development: 14
1.1. Definition of Sustainable Development: 14
1.1.1. Social Well-being: 15
1.1.2. Economic Growth: 15
1.1.3. Environmental Protection: 15
1.2. Principles of Sustainable Development: 15
1.2.1. Interconnectedness: 15
1.2.2. Global Cooperation: 15
1.2.3. Long-Term Thinking: 15
1.3. Integration into Urban Design: 16
1.3.1. Holistic Planning: 16
1.3.2. Participatory Processes: 16
1.3.3. Innovation: 16
2. Biomimicry for sustainable architecture and urban development: 16
2.1. Addressing Sustainability Challenges in Architecture: 16
- Energy Efficiency: 16
- Adaptive Systems: 16
- Energy Harvesting: 16
- Passive Cooling/Heating: 17
- Resource Conservation: 17
- Circular Design: 17
- Lightweight Materials: 17
- Self-Healing Systems: 17
- Climate Resilience: 17
- Thermal Regulation: 17
- Flood and Disaster Resilience: 17
- Modular Adaptability: 17

IV. Recreational Infrastructure in Residents' Environment: 18
1. Definition of Recreational Infrastructure: 18
1.1. Types of Recreational Facilities: 19
1.1.1. Parks and Green Spaces: 19
1.1.2. Sports Facilities: 19
1.1.3. Trails and Pathways: 19
1.1.4. Playgrounds and Play Areas: 19
1.1.5. Cultural and Event Spaces: 19
2. Role of Recreational Infrastructure in Urban Areas: 20
2.1. Health Benefits: 20
2.1.1. Physical Activity: 20
2.1.2. Mental Well-being: 20
2.1.3. Social Cohesion: 20
Community Engagement: 20
Inclusivity: 20
2.2. Environmental Impact: 20
2.2.1. Green Infrastructure: 20
2.2.2. Biodiversity Conservation: 20
2.2.3. Economic Contributions: 20
Property Values: 20
Tourism and Investment: 21
2.3. Urban Planning and Development: 21
2.3.1. Integrated Urban Design: 21
2.3.2. Sustainable Development: 21
3. What makes a great place: 21
3.1. Accessibility & Connectivity: 21
3.2. Comfort & Safety: 21
3.3. Activities & Uses: 21
3.4. Sociability & Inclusivity: 22
3.5. Aesthetics & Identity: 22
3.6. Management & Programming: 22
Chapter two: analysis and synthesis.....Error! Bookmark not defined.
I. Biomimetic example: 24
II. Parte 01: 32

1. analysis of the existing: 32
1.1. Development of the city of Setif: 32
1.2. recreational public spaces in the Sétif agglomeration: 33
1.3. Questionnaire: 35
1.4. Synthesis: 42
III. Part 02: 43
1. The study area: 43
1.1. Location and limits: 44
1.2. Accessibility: 45
3. Intervention site (the former Hachemi farm, 2nd part): 46
3.1. location and limits: 46
3.2. Landmarks and structuring buildings: 47
3.3. Accessibility: 48
3.4. Traffic: 49
3.4.1. Mechanical circulation: 49
3.4.2. Pedestrian traffic: 51
3.5. The topography of the site: 52
3.6. Climate of the site: 54
3.6.1. Wind: 54
Summer Winds: 54
Winter Winds: 54
3.6.2. sunlight: 55
Summer Sunlight 55
Winter Sunlight 56
SWOT analysis: 57
Strengths: 57
Weaknesses: 57
Opportunities: 57
Threats: 58
IV. Conclusion: 58
Chapter three: the project Error! Bookmark not defined.
I. Project and inspiration: 59
1. Our project: 59
.2 Intentions: 59

2.1. Urbain: 59
2.2. Functional: 59
2.3. Architectural and aesthetic: 59
2.4. Technological: 59
3. Biomimetic inspiration: 60
II. Architectural Part: 62
1. Program: 62
2. Relationship between spaces: 64
3. Special diagram: 65
Principles: 65
4. Project process: 66
4.1. Design steps: 66
III. Technical and Technological: 69
1. Smart kinetic façade (dynamic facade): 69
1.1. Definition: 69
1.2. Materials 69
1.2.1. Panel Materials: 69
1.2.2. Actuators & Motors: 69
1.2.3. Sensors & Control Systems: 69
1.2.4. Dimensions & Panel Design: 69
1.3. Working System: 70
1.3.1. Data Collection: 70
1.3.2. Algorithm Processing: 70
1.3.3. Actuation: 70
2. Geodesic dome: 71
3. Solar trees: 72
General conclusion : 76
Bibliographic list: 77