

The course of health: A sustainable landscaping for more sustainable city. Case of El Basatine-Sfax-TUNISIA

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Abstract:

Spatial planning aims, adapting sustainable development, training of the sustainable city for well-being, vitality and prosperity of the people. Therefore, the need for green spaces in cities is becoming a necessity and city dwellers seeking relaxation, rest, recreation, and sport activities in the open area. It is in this strategy that the Tunisian government by drawing strategic development plans insisted to reconnect man with his original life that is the nature by increasing the number of parks, public gardens, squares, ecotourism circuits and natural tourist areas. This study aims to develop a fitness trail in the city of Sfax specifically in the area of El Basatine. This development fits into the concept of the sustainable city. From a detailed diagnosis of the study area, the strengths and constraints of the site are highlighted in order to develop the project concept called "Sport and Nature for good oxygenation." Indeed, the proposed development has an environmental, ecological, social, economic, health, sports and recreation goals. It is made with a rich architectural conceptual style and varied in its constituents to the improvement of urban health, beautification and sustainability of Sfax city. So the landscaped path contains 10 sports stations: Relaxation trunks ground layers, plots to jump, slalom, double climbing ladder, hurdles to jump, horizontal

scale, triple beam, oblique beam and balance beam with three entities sacrificed for walking. Also it contains two rest areas, an initial and one final, and a public square.

Key words: landscape, recreation, green space, management, station

1. Introduction

The concept of sustainable cities was simultaneously defined the concept of sustainable development which ensures the basic needs of the members of current generations, especially the poorest of them, while preserving the ability of future generations. It aims to focus on the links between poverty, environmental degradation and growth, that is to say between the three pillars of sustainable development namely: social, economic and ecological. (Guyonnet 2007). However, the goals of sustainable urban landscape design at the territorial level fits into the concept of sustainable cities. The path to sustainable urban landscape through sustainable development and reveals importance of feeling of the city by its inhabitants, for the consideration of the figure of human living, as an actor perceiving the quality of their living environment, and its ability to produce the city. Moreover, the landscape sustainable urban thus into the existing heritage while allowing the diversity of architectural forms. Moreover, sustainable urban landscape offers a generous up to the vegetable and soft traffic and knows how to make visible in the architecture of buildings, capacity the city to produce the energy it consumes with sobriety. The water management and waste rain also allows a controlled consumption and offers processing capabilities in situ. It reflects the new urban solutions to the basic needs of inhabitants by offering them a good quality of life in a friendly, lively and shared. These responses can be translated by gardening or recreational areas.

Recreational space in the city are involved in the formation of "sustainable city" and to improve the image of a city and they are defined as a recreational urban and outdoor entertainment for possibly being receive public, sport touring, tourist, recreational, leisure or walk. This area can participate in the creation of a "green lung" in the urban fabric.

The fitness trail is a recreational and sporting landscape in rural, peri-urban or urban area and territorial attractiveness factor. Created since the seventies, it is also defined as a sporty drive punctuated by a series of physical activities within specific workshops, usually located in a pleasant natural setting. It is an obstacle course that allows civilized people to have a physical equivalent to the tribes (CATANIA, 2012). It allows to practice various exercises like walking, jogging, fitness exercises, fitness, climb, jump, etc. (BUTTERFLY, 2014). However, 238 fitness trails have been built in Tunisia which 16 are located in the city of Sfax and it is under the development strategy of the Grand Sfax which is a landscaping project as part of the strategic development scenario having as a master axis: Remediation activities and improvement of the living environment.

2. MATERIAL AND METHODS

2.1. Study Area

The site to be developed belongs to the delegation of Sfax city, the town of Sfax and specifically to El Basatine sector, 500 m from the national road (P1) and 35 m from the regional road (C 82) going towards Mahdia. The town of Sfax covers 5600 ha, contains 285,218 inhabitants and includes 7 boroughs. The borough El Basatine, where is localized the study site occupies an area of 315 ha with 15,707 inhabitants.



Fig.1. Geographical location of the project site support in the city of Sfax

The site runs along 1 km and has a width varying between 6.15 m and 18.80 m. The course is characterized by a continuous linear geometry which follows the linear plot of Fadhel Ben Achour Street and that of the railway. Keeping this aspect, the site consists of two straight linear pieces alternated with a small curved piece. The presence of the curved shape is a highlight because it intercepts, breaks the rigid geometry of the two straight parts and offers to the site the flexibility and fluidity.

The site is bounded on the south side by the Avenue Abderrahman El Ghafki and on its north side by the Avenue El Boustan. On the east side, it is tangent to the railway and along the west side there is Avenue Fadhel Ben Achour. Several other paths lead to the site ensuring easy accessibility to it. These roads limit the site and form a small road network, giving it an asset and act as a spatial link between the route and several areas such as the approximate center of Sfax, the region of Sidi Mansour, etc. which facilitates and promotes opportunities to visit this site. This causes a large traffic which is characterized by a very severe movement generated continuously by a high number of vehicles. Hence, the above conditions induce the

deterioration of the quality of life at the environmental aspect and human health in this sector which is exposed to noise and air pollution. The site is also limited by two built spaces tight to each other forming a dense urban model with various equipment with different types of services: residences, hotels, clinics and shopping, sporting, educational and administrative.

The environmental analysis of the site shows that it has some advantages such as the presence of Phoenix canariensis planted with linear and regular manner, thus contributing to the beautification of the environment and forming a natural physical interruption between inside the site and Avenue Fadhel Ben Achour. Furthermore, by the presence of the railway line between the two areas, a bridge built of reinforced concrete provides the pedestrian transition and acts as a liaison and continuity between the path for conversion and his side. Nevertheless, the site shows a high pollution caused by uncontrolled abundance and anarchic distribution of waste throughout its length. Moreover, social analysis shows that the site belongs to a rich urban fabric and the variety of its equipment operations induces its use by all social categories such as neighborhood residents, students, patients and athletes.

2.2. Methodology

The concept of the landscaping project "Sport and Nature for good oxygenation" aims to create a "green lung" in the urban area El Basatine -Sfax, seeking to intercept and break the camouflage created by built-up areas, mitigate Pollution in the environment and stop the dumping of waste into the site for the beautification and liveliness of the area. This concept develops a design that meets the needs of citizens in terms of green space promoting relaxation and for sport. It seeks to obey the needs of users with their different age groups as it will be a place for the practice of sports physical activity in the service of

students, schoolchildren, students and families. It is a place of oxygenation and deliberation in the nature of all vastitudes the agitated city life. Thus the objectives of the organization of health course in the city of Sfax and particularly in El Basatine contain several functions (Fig.2).

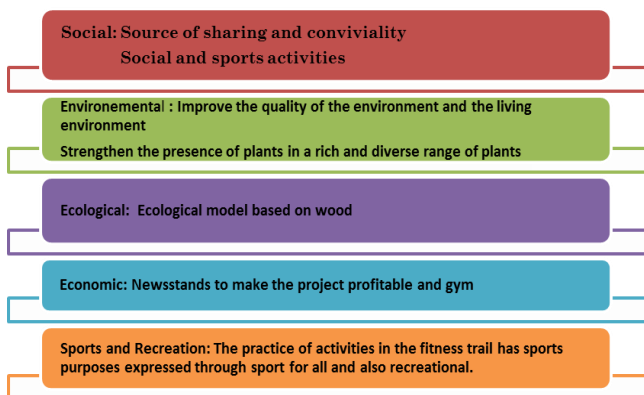


Fig.2. Objectives of the development of the fitness trail

3. RESULTS

The fitness trail contains 10 organized sport stations that start with moderate exercises followed by strength exercises to finish with low intensity movements. Physical workshops are separated by shrubs. They are also planted by Phoenix canariensis to create a physical separation between the fitness trail and Avenue Fadhel Ben Achour. The layout is based on the ecological model based on the use of wood for physical area, signs, street furniture and newsstands.

3.1. Beginning of the health trail

The course begins with a rest area that plays a role of protection and physical break between the road network limiting the south side of the site and the fitness trail. The area is bypassed by wooden bollards on which Mimosa floribunda rest their elongated leaves. A cohesion between the two

varieties of Ficus and Ficus Australis Nitida with their dense dark green foliage will help mitigate noise and air pollution from road traffic noise by absorbing and fixing certain polluting molecules like CO₂. This area also offers cheerfulness through a massif floral distributed in a hexagonal shape, the center of which water flows from a fountain. The latter is surrounded by two controversial triangles forming a star. A lodge keeper is also equipped for carrying out checks on visitors and ensure user safety. A starting general information panel declares the beginning of the sports movement. This panel contains the layout of the sports course with the ten sports stations, location and length of the circuit.



Fig.3. Sketch of the rest area

3.2. The track of the fitness trail

It is designed in soft clay for walking and running. It is formed by a first layer of unsorted 12 cm thick on which a second layer of sand, composed of crushed sand of diameter 0.4 mm to a thickness of 5 cm. A thin rim bypasses the track. The shape of the track follows the geometry of the path and extends over its entire length to the end of the course. The track width is 2.20 m satisfactory for a practical and an easy walk to the users. To the left of the track *Phoenix canariensis* are linearly located along the route and on his right are appointed sports resorts with their sport apparatus.

3.2.1. First sport station

The practice in the course of health begins with physical preparation phase based on easing physical exercises used for the heating of the body. A panel placed on top of the station, on which are indicated the heating and stretching movements to exercise with descriptive drawings of each action. To obey this requirement, units, sand in the form of diamonds are arranged. The units are separated by ordinary white gravel lanes, each 1m wide to avoid duplication of athletes. On the side of the railroad tracks are planted *Ficus benjamina* cut and forming a curtain. Other ficus are pruned in rounded offering shade and in the axils of which are installed wooden benches each taking the form of a half diamond.

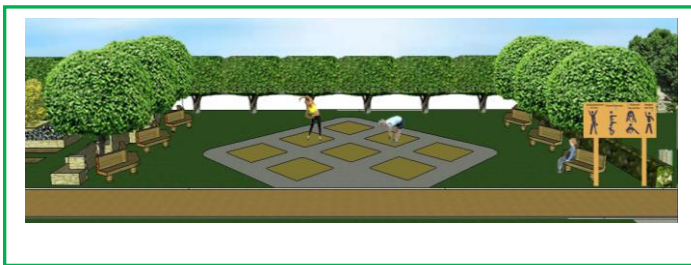


Fig.4. Sketch of the first easing station

3.2.2. Second sport resort

It's exercising of low intensity movements, performing simple passages on parallel rectangular trunks. In order to get a relaxing and harmonious physical architecture of the workshop apparatus is integrated in a rectangular sand bowl and rectangular architectural model is adopted for all sports station. A rectangular wooden pergola is juxtaposed with the Apparatus *Bougainvillea glabra*. Rectangular trays flowers and benches made of natural stones develop a beautiful ecological model. The bins are placed overlapping at their ends with three heights and three different sizes. The benches form two opposed "Z". Other benches placed in the axils of *Ficus benjamina* in the form of a "Z" are alternated by a controversial bench. *Mimosa*

dealbata by their bright yellow flowers with are planted in trays form a harmony with the beige color of gravel slabs. Blue color of the *Plumbago capensis* grows a little contrast and feed the charm of the scene.



Fig.5. sketch of the second sport station trunks ground layers

3.2.3. Third Sport station

This station contains 22 blocks to jump from varying diameters introduced along a semicircular path. *Ficus nitida* surrounded by white *Pervenches* are planted and half circular wooden benches are deposited allowing users to rest and enjoy the shade. The space complements its attraction by the *Bougainvillea glabra* forming a plant screen alternating white cream color with bright red bougainvillea. The red color offers hot weather placed on the cold weather presented by the dominant white. The charm is amplified by the planting of *Phormium Pourpe* which, with their purple color, will contrast with the green of the grass.



Fig.6. Sketch of the third sport station blocks to jump

3.2.4. Fourth sport resort

With "Slalom" physical movement intensifies. This is to pass between 16 log 1,80 m high and the passage takes the form of a labyrinth. The panel figure bears the name of the Apparatus 'Slalom' with a descriptive phrase 'pass between logs'. A bench of wood extends to the right and along the plot with its maze shape, allowing the rest of users enjoying both the shade provided by *Olea europea* olive trees and many other by a little sunshine at times temperate. *Semprevirens Cypressus* are planted between the trees and throwing a nice contrast between their fastigate port and spreading habit of these. In the left corner, *Araucaria excelsa* feeds this beautiful contrast with its pyramidal habit and orthotropic trunk wearing plagiotropic whorled branches in tiers. Along the railway, a hedge *Hibiscus mutabilis* with dark green leaves and flowering single or double flowers with a variant color between white and pink. A beautiful landscaped vegetation characterizes this table space in which the olive blossoms appear on this background.

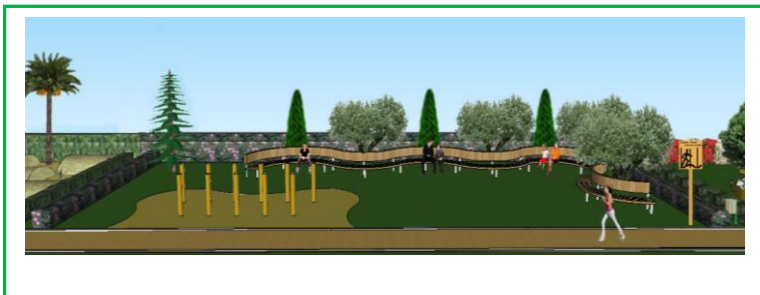


Fig.7. Sketch of the fourth sport resort slalom

3.2.5. Fifth sporty resort

Within this physical workshop, it is about gradually climbing an oblique ladder and descend. Cacti, yucca, dracaena of, agaves and *Phoenix dactylifera* palm trees are planted. Users sit on benches, wooden, with a half-circular shape and colored by the same color of the alfa. This beautiful ambience reflects the Tunisian desert landscape where land movements are

alternated by flat spaces embody the sharp image of desert dunes between which are born succulents and palms with stems crossing the horizon and its fins forming a greenery in the sky. Along the railway a *Miyoporum insular* hedge is planted.

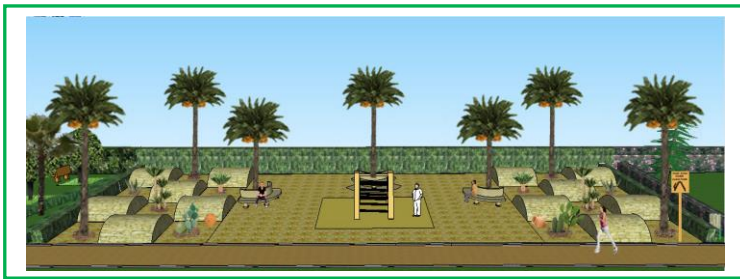


Fig.8. Sketch of the fifth sport station dual climbing ladder

3.2.6. Sixth sport resort

A row of *Thuja orientalis* cut in a spiral shape is planted and barriers are integrated into a bowl, sand, in the form of a parallelogram plain white gravel favoring the movement in the workshop. These units are planted by *Panadus veitchi*, the center of which are born *Brachychiton*, in the axils of which are arranged wooden benches for rest of sports. All of the units based on a green background that is the grass. The whole plot is bounded by two controversial triangles bordered by *Rosmarinus officinalis* and the center of which are born *Washingtonia robusta*. A green screen is planted with the vine *Jasminum officinale* side rail and feeds the space by its white flowering.

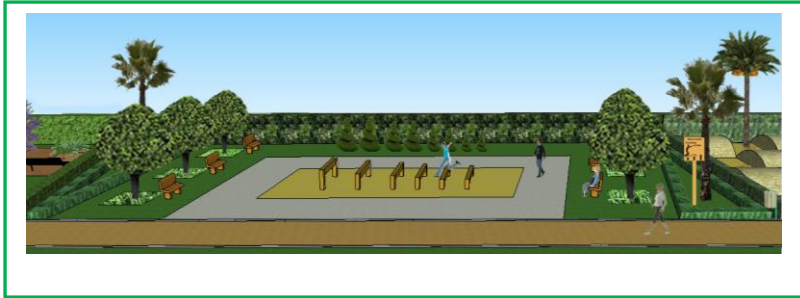


Fig.9. Sketch of the sixth sport resort hurdles to jump

3.2.7. Seventh sport resort

This beautiful sporty ambience is strengthened by the landscape atmosphere by choosing the square shape as a structuring element of space as it signifies the balance and stability. All the space is transformed to a beautiful square mesh containing, in addition to the area, 4 elements: the square in which are planted turf *Jacaranda mimosifolia* alternated with square wood and each having a square mesh planted by both *Lavandula officinalis* with *Jacaranda* forming a beautiful harmony shaped by the violet and by *Cycas revoluta*.

The other two elements are wooden square containing a pergola in each one, with a lattice in its three sides, opposite which *Ficus* trimmed as bonsai planted in two square meshes grassed. The sporty station becomes more delightful by a planted *Ligustrum* hedge serving as plant screen.

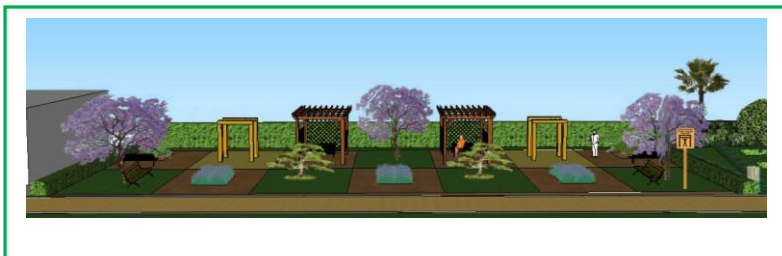


Fig.10. Sketch of the seventh sport resort

A jim is located in the fitness trail with 10 meters length and a width of 8 meters allowing users to practice many other sport activities such gymnastics lessons, aerobics, basket ball, volley Ball , Table tennis. Figure 12 shows the plot designed for rest and relaxation. The right side of the bench is designed for public toilets, which are mandatory elements in the fitness trail. The front part will be reserved for a cascade made of natural stone directly below the address of the gateway. The water with its lovely soft flow arrives in a small circular pool and its gentle fall noise offers great freshness and liveliness instead of energy to users.

The flower beds accentuate this beauty by covering a small circular embankment accompanying water basin, to his right and to his left are planted Phoenix dactylifera on a grassy lawn. Wooden benches under the palms are willing to serve motorists to admire the scene. The right side of the water stage contains kiosk made of wood logs and umbrellas with tables and benches for relaxation of users. A green screen made by Cupressus sempervirens is arranged on the side of the railway. Olea europea olive tree carved in the form of bonsai, a small hedge Laurus nobilis and two Waschingtnia Robusta are planted. A lodge keeper is placed right next to the bridge to passenger screening.



Fig.11. Sketch of the plot

3.2.8. Eighth sport resort

Both rigging are based on two hexagonal sand bowls. An hexagon centered in the space is planted by flower beds of different colors and itself centered by a water basin with a jet of water gushing. Covered hexagons are planted with colorful flower beds where *Brachyciton* and tinted wood benches by two colors are deposited. The whole landscape scene appears on a background composed of multicolored *Bougainvillea glabra* forming a plant screen.



Fig.12. Sketch of the eighth sport resort triple beam

3.2.9. Ninth sport resort

The intensity of the movement begins to define from this workshop. A triad combination component triangles formed by : wooden Triangles stained by dark brown color, in which *Tecomastans* are planted, white ordinary gravel triangles for moving and forming a beautiful contrast between the dark brown color of the wood and grassy triangle in the center which were planted by *Ficus benjamina* and in which wooden benches provide relaxation sports. The scene amplifies its beauty by forming a hedge *Pittosporum tobira* on the side of the railway and which enhance the charm of the scene by their white fragrant flowers harmonizing with the bright yellow of *Tecomastans*.



Fig.13. Sketch of the ninth sport station angular beam

3.2.9 . The curved part of the fitness trail

This piece is operated to perform a very beneficial and simple exercise: walking, and contains three different entities, with different atmospheres to avoid monotony during exercise. The first entity presents a simple circuit for walking. For the second entity, as soon as the site begins to increase width, porticos covered by colorful *Bougainvillea glabra* vines are planted. Benches are placed along this circuit.

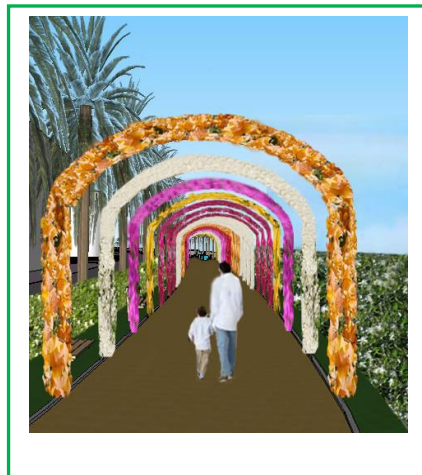


Fig.14. Sketch of The curved part of the fitness trail

The third entity begins when space becomes wider with a wooden kiosk located at its beginning. The track is bordered on its left side by shrubs and *Phoenix canariensis* planted along

the pavement. Directional signs panels are placed at the beginning of each entity indicating the rest of the route. Bins are also located at the beginning and the end of each entity. The right side is formed by an alignment of *Phoenix canariensis* between which water basins with fountains filling the space by the vivacity and freshness and benches are also located. Three pergolas are established for relaxation of users along the promenade.

3.2.10. Tenth sport resort

The forward beam is integrated into a bowl to balance and the whole plot is fragmented into individual plots using that form. They are all swept by grass. The space between them is composed by ordinary white gravel and *Bougainvillea glabra* creamy white color form a vegetation screen on the side of the railway. *Jasminum sambac* is planted in plots with white cream and fragrant flowers and also *Ficus alii* are planted under which benches are placed.

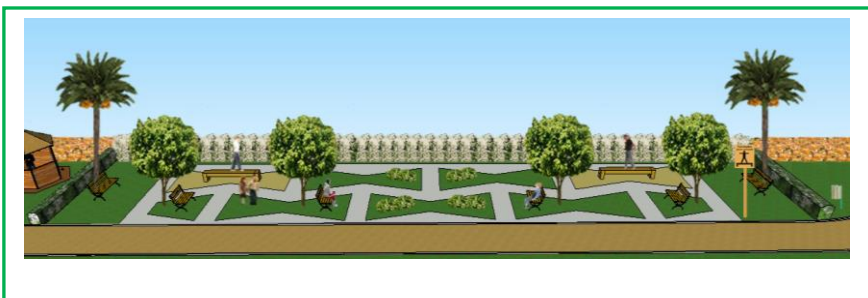


Fig.15. Sketch of the tenth sport station balance beam

3.2.11. End of exercise trail

A final signboard declares the end of physical workshops. The course ends with a rest area with the same objectives as the initial staging area. Trees with dense foliage, arranged in classified as *Ficus nitida* and *Ficus australis* are planted beneath which wooden benches are placed and the wooden bollards define the rest area with *Mimosa floribunda*. A

newsstand is located at the service of users and upann lodge keeper is located just across the crosswalk.



Fig.16. Sketch of the final resting place

5. CONCLUSION

The urban landscape in the city of Sfax is dominated by an industrial fabric, a non mastered increasing urban growth, a traffic lanes extension and pollution affecting all landscape components (air, sea and water). So development projects and ambitions in the city of Sfax want to improve citizens' quality of life and take a fresh healthy and clean breath for this agglomeration based on the concept of sustainable development to found a sustainable city ensuring easy and enjoyable life. This project is to create an environmental ecological model based on natural materials such as wood and a rich and diverse plant palette. It will provide citizens the practice of sport in natural environment to maintain good health and avoid a sedentary lifestyle. On the scale of this area, this course will contribute to the sustainability and beautification of « El_Basatine ».

REFERENCES

Hélène Guyonnet. H. 2007. Villes et quartiers durables : l'affirmation de nouvelles ambitions urbaines. Mémoire de recherche. Institut d'études politiques sciences de Toulouse. 166p.

Lucie CATANIA. L. 2012. Prise en compte du développement durable dans les projets urbains Volet social et écologique : Application à Montréal. Mémoire de Fin d'Etudes, Université d'AGROCAMPUS OUEST. 79p.

Pascal PAPILLON. P. 2013. Les forêts périurbaines : des espaces récréatifs à la fonction prophylactique: Le cas des aires urbaines d'Alençon, de Blois et du Mans. Université du Maine. Laboratoire ESO – Espace et société. École doctorale DEGEST. Thèse de DOCTORAT. Discipline géographie. 451p.

(Site 1): <http://www.projetsdepaysage.fr/editpdf.php?texte=566>

(Site 2): <http://siteslm.lillemetropole.fr/urba/PLU/plucd2/pdf/rpreglt/z23.pdf>