Bioclimatic principles in design for built environment of "Lura" touristic village, a contribution towards sustainable development of Lalzi Bay, Durres County, Albania

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Abstract

The study conducted refers to the important role of the bioclimatic principles in design for the built environment of "Lura" touristic village, which realized through the construction of buildings and its needed infrastructure, is in harmony with the natural surroundings and local climate, ensuring conditions of thermal comfort inside. This study has been in view for the biodiversity conservation principles and wise use, supporting the well-being for poverty reduction of the indigenous and non-indigenous local community in it, ecotourism development and its principles, as well adaption to climatic change, as an example for sustainable development in Lalzi Bay, Durres County, Albania. It is a contribution that has given a successful impact to the environment as a social, healthy and economic sustainable development in Lalzi Bay, Durres, Albania. This is realized in order to improve the *microclimate* and the *comfort conditions* there. Its goal is to illustrate the importance of implementing bioclimatic principles design in the open spaces, which can lead to more sustainable development in Lalzi Bay (villages, agro-forest villages etc.). The redesigned open space in a residential area of Lalzi Bay, Durres County, Albania (lat: 41°32' 08"N and 19° 30' 07"E), adjacent to the sea, has been analysed. The case study aims at presenting the bioclimatic principles in design, as well the design procedure, which contributes to an upgrade of the environmental conditions in the open spaces of "Lura" touristic village, a study for the summer and winter period, in the mentioned site. The study underlines the objectively verifiable environmental, social, healthy and economic factors and impacts, given through the relevant indicators, which are examined during the analysis of the site and describes the design-process to the final proposal by taking into consideration both the various requirements of the area and the microclimatic profile. The bioclimatic principle in design for built environment of "Lura" touristic village is a contribution towards sustainable development in Lalzi Bay, Durres County, Albania.

KEYWORDS*:* biodiversity conservation, design, ecotourism development and its principles, adaption to climatic change, open spaces, outdoor comfort and microclimate**.**

1 Introduction

During the last decades, bioclimatic architecture appears as an essential mean for the environmental improvement, as is the case of the built environment of "Lura" (Lura 1) touristic village, while the contribution of the bioclimatic approach to outdoor design for

the achievement of better living conditions has not been evenly accentuated. The acceptance and wise use of open spaces has been in view of biodiversity conservation principles and wise use, supporting the well-being for poverty reduction of the indigenous and non-indigenous local community in it, ecotourism development and its principles, as well as adaption to climatic change, as an example for sustainable development in Lalzi Bay, Durres County, Albania. This is influenced to a great extent by the thermal, visual and acoustic comfort conditions offered to people, thus, microclimate and the natural and made man environment in the open spaces for to all those mentioned above for sustainable development in the Lalzi Bay, Durres County, Albania are of great importance with the ultimate goal of the landscape and seascape design should be the creation of the best microclimatic conditions. An essential aspect of the bioclimatic design process aiming at the microclimatic improvement that is to exploit the positive and eliminate the negative influences of the climatic factors and the special characteristics of the site are of important as well. Our study encountered both open spaces as well as now for built environment of “Lura” (Lura1) touristic village and in near future for other Lura 2, 3 villages, agro-forest villages etc, at Lalzi Bay, to include ground surface characteristics and other study forms; under which, urban morphology was given of first its order of significance for the outdoor microclimate; namely, orientation, adjacency to a water volume, existence of slopes and other natural elements, buildings, materials used. These parameters were considered to determine the microclimatic profile of the area to be taken into account during designing of outdoor spaces. We ascertain that landscape and seascape designs need to be based on the factors as above to aim at for solar access and solar shadowing; regulation of air temperature and relative humidity; alteration of wind movement and improvement of air quality. In the current study there has been an effort shown to combine an array of bioclimatic strategies for design procedure of an open air space in Albania with an exuberantly, lovely seacoast in order to improve the microclimatic conditions that face in summer season.

2 Bioclimatic principles in design of open spaces in the built environment, at “Lura” touristic village

2.1 Bioclimatic principles design

Bioclimatic design aiming at the built environment, that realized through the construction of buildings and its needed infrastructure, that is in harmony with the natural surroundings and local climate, ensuring conditions of thermal comfort inside. The bioclimatic design of the buildings serves four main objectives:

a. ***Saving conventional energy***. Thrift in oil consumption through renewable energy sources (RES), that leads to energy saving;
b. ***Saving money***. Using inexpensive solar energy for heating and / or cool wind for cooling. This is an economic challenge resulting in cutting down heating and cooling expenses by 50%, possibly more.
c. ***Protection of the environment***. Less usage of fossil fuels and electricity reduces the waste which harms the environment and cause air pollution.
d. ***Improvement of the indoor living conditions***. Bioclimatic design ensures thermal comfort and air-quality thus creating a healthy living environment.

2.1.1 The design of the building

The design of the building must comply with the following bioclimatic principles of operation:

The building as a natural solar collector in winter:

- The proper location of the building - Orientation (the largest face of the house facing SOUTH);
- Shape of the building;
- Size of the openings are depended on the orientation of the building;
- Interior design according to bioclimatic principles of orientation.

The building serving as a heat trap:

- Protection from cold winds;
- Thermal protection – insulation.

The building serving as heat storage:

- Thermal mass - heat capacity.

The building serving as a natural cooling trap / storage:

- Sun protection of the building and its openings;
- Color and texture of the outer surfaces;
- Sufficiency of thermal mass;
- Thermal protection – insulation;
- Natural ventilation;
- Outgoing heat radiation during night.
- Microclimate.

2.2 Achievement of thermal comfort

Thermal comfort at Lalzi Bay is crucial for the wise use of open space for build environment in "Lura" (Lura 1) touristic village, taking into account the biodiversity conservation principles and wise use, supporting the well-being for poverty reduction of the indigenous and non-indigenous local community in it, ecotourism development and its principles, as well adaption to climatic change, as an example for sustainable development in Lalzi Bay, Durres County, Albania, which requires different actions/activities in order to successfully provide pleasant environment, according to the seasons, to make use of available open space routinely. As per the studies, for bettering of comforts during summer period the achievements are too improvised in the sectors of *temperature control, permissible solar exposure, airflow modification and regulation of relative humidity*. Similarly wind *channeling* is of significance for heat extraction from the open space for conserving biodiversity conservation and ecotourism management, as well adaption to climate change on sustainable development of the Lalzi Bay, Durres County, Albania. As per the earlier studies undertaken it has shown that the Mediterranean climate based on past records needs to be considered, while designing open spaces especially of summer and winter measures to assure the most best habitable conditions during hot and cold weather climates respectively (Dimoudi A. and

Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

The *control of isolation* aims at the definition of shaded/sun exposed areas in accordance to season; time slots for all things mentioned above for the existing open areas that are dependent on the user requirements. Similarly, shade-providers according to the season of heat/cold are of utmost prerequisites. The observations revealed the consideration of the built environment with the existing vegetation that played in control of adverse influence of sun exposure.

Henceforth modification of the isolation of the area needs to be achieved by using indoor and outdoor vegetation and availability of urban equipments, in accordance to the dry/heat/cold/icy climates in an annual climatic cycle. Few workers have anticipated and implemented a desirable seasonal shadow pattern, taking into account potential restrictions in designing of open space ventilation. Movable shading devices and deciduous trees are often the best solution (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

The *control of air temperature* is very important for the creation of thermal comfort. However, it cannot normally be significantly modified through design. Shading is the most important factor for temperature control in summer. The wise use of vegetation, the selection of appropriate materials that enhance and maintain cooling effects by use of eco-friendly natural materials and recyclable water utilization with special features can modify adverse temperature as well, especially during the cooling season (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

The *airflow modification* aims at the creation of comfortable outdoor living spaces in summer by deviating cooling breezes and guiding them to the habitable areas. At the same time it aims at the creation of protected areas via redirection and reduction of the velocity of the unfavorable winds in the winter. An array of plants of herbs/shrubs/trees and landscape constructions can be used to redirect/circulate the natural wind. As a prime factor, modifications in topography can alter the wind's velocity and can eliminate its turbulence as well (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

The *regulation of relative humidity* is extremely important for the cooling season and can be accomplished through vegetation and the wise use of water surfaces (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014 Arben Petto et al. 2014).

2.2 Improvement of visual comfort

The creation/establishment of natural, eco-friendly, sustainable *visual comforts* determine the wise use of outdoor-space, taking into account the biodiversity conservation principles and wise use, supporting the well-being for poverty reduction of the indigenous and non-indigenous local community in it, ecotourism development and its

principles, as well adaption to climatic change, as an example for sustainable development in Lalzi Bay, Durres County, Albania, to a great extent. Control of glare caused by an unusual clear façades of the surrounded buildings/extremely white and shiny surface materials is appreciative in order to avoid/divert more intense/high sun's radiation. The selection of the suitable materials and vegetation can contribute to the creation of visual comfort (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

2.3 Creation of acoustic comfort

The soundscape design aims the elimination of traffic noise and certain annoying sounds, and the preservation and reinforcement of sounds that give character to the location that can be accomplished with defensive/offensive/creative interventions in the area. The wise use of thick vegetation and street furniture are of much requirement to diffuse noise; acoustic-musical notes and cascading water flows can dissipate/mesmerize the existing diffused vehicular noises. (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

2.4 Possible sources of sustainable renewable energy

Albania and in particular Lalzi Bay being favorably situated in Mediterranean Basin has great potentialities to harness renewable energies from wind, solar, water, tidal, biomass and geothermal ways. As per the studies already done by the team that has shown for every sqm of land in Lalzi Bay can provide 1500 -1700 kWh/m^2 of solar energy and 1500-1700 kWh/m^2 of solar energy in Albania (Arnisa Lushaj, Arvjen Lushaj and Bashkim Lushaj; 2011; Arvjen Lushaj and Bashkim Lushaj, 2012). The interventions made in the outdoor space on conserving biodiversity, ecotourism management, as well adaption to climatic change on sustainable development in Lalzi Bay, Durres County, Albania influence at a high level the energy behavior of the buildings as well. Trees and shrubs used around buildings influence their exposure to the sun and the wind, and consequently the energy consumption for heating and cooling and sometimes the amount of electricity used for lighting. The effectiveness of the energy-saving role of the plants depends on their characteristics and their position in relation to the building (Axarli K. and Eumorfopoulou E., 2001; Dimoudi A. and Nikolopoulou M., 2003; CRES, 2004; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

2.5 Improvement of air quality

As a well-known fact, human interventions in the light of science and technology has been the cause of greenhouse emissions with the build up of CO_2 is certain from industrial, transport and domestic sources. Fossil-based energy is a sure greatest contributor of greenhouse gas emissions, with the maximum consumption of cheaper fuel that has its limitations of supply due to increasingly growing demand. In order to draw a line, we need to improve air quality for human well-beingness; airflow modification and selection of suitable vegetation could greatly contribute to issues of air pollution. Decrease of air pollution by natural ventilation and CO_2 absorption by the vegetation are of paramount important (Dimoudi A. and Nikolopoulou M., 2003; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

3 Ecotourism Definition & Principles

The International Ecotourism Society (TIES). **Announces Ecotourism Principles Revision.** Submitted by on January 7, 2015

The International Ecotourism Society (TIES) has revised its **Definition and Principles**, created by the founding members in 1990. Leading up to the 25 year anniversary celebration in 2015, ecotourism experts from around the world connected to re-evaluate TIES principles of ecotourism as an initiative led by Hitesh Mehta, Judy Kepher-Gona, and Dr. Kelly Bricker. TIES has implemented small changes and additions to both the principles and the definition to provide more clarity, eliminate the ambiguity, and therefore reduce the green washing and wrongful interpretations being practiced by in the tourism industry (The International Ecotourism Society (TIES) (2015).

3.1 Ecotourism Definition

As the TIES existing definition included only two (Conservation and Local Communities) of the three pillars of ecotourism, the inclusion **Interpretation** now holds a place. Therefore, TIES revised definition is *"responsible travel to natural areas that conserves the environment, sustains the well-being of the local people and involves interpretation and education"* with the specification that education is to staff and guests (The International Ecotourism Society (TIES) (2015).

3.2 Principles

It has been 25 years since TIES was started, it was important to re-visit three principles found in the literature – that ecotourism:

- is **non-consumptive / non-extractive**
- creates an ecological **conscience**
- holds eco-centric values and **ethics** in relation to nature

TIES hopes this gives clarity to those activities that are considered consumptive / extractive and which cause behavioral and psychological impacts on non-human species.

TIES consider non-consumptive and non-extractive use of resources for and by tourists and minimized impact to the environment and people as major characteristics of **authentic ecotourism.**

With respect to the TIES Principles, since 1990, when TIES first created the principles, we now know much more about the tourism industry, through scientific and design related research, and we are also better informed about environmental degradation and impacts on local cultures and non-human species. It is important that this knowledge is reflected by these principles (The International Ecotourism Society (TIES) (2015).

Ecotourism is about uniting conservation, communities, and sustainable travel. This means that those who implement, participate in, and market ecotourism activities should adopt the following ecotourism principles:

- Minimize physical, social, behavioral, and psychological impacts;
- Build environmental and cultural awareness, and respect;
- Provide positive experiences for both visitors and hosts;
- Produce direct financial benefits for conservation;
- Generate financial benefits for both local people and private industry;
- Deliver memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates;
- Design, construct and operate low-impact facilities;
- Recognize the rights and spiritual beliefs of the Indigenous People in your community and work in partnership with them to create empowerment (The International Ecotourism Society (TIES) (2015).

4 Adaption to climatic change

Adaption means anticipating the adverse effects of climate change, everywhere and on everything, bio and non bio, and taking appropriate action to prevent or minimize the damage/s they can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives later (Bashkim Mal Lushaj, 2016).

Concretely, we are giving to you some activities carried out for the adaptation measures to climatic change, including:

- as every family have had and have a wise use of scarce water resources more and more efficiency, no wastage;
- builders and owners have carried our all activities having such immediate requiring for adapting to building codes to future climate conditions and extreme weather events;
- building flood defenses and cleaning and raising the levels of dykes;
- developing drought-tolerant crops;
- choosing tree species and forestry practices less vulnerable to storms and fires; and
- setting aside land corridors to help species migrate (Bashkim Mal Lushaj, 2016).

5 Case studies

5.1 Location of the site

The site named Lalzi Bay is located in the NW part of Durres conurbation (centering Albania, lat: 41°32’ 08”N and 19° 30’ 07”E), including and the Lura (Lura 1) touristic village, in a short distance from the sea, see the map (Fig.1).

Figure 1. A site map, where is situated the Lalzi Bay

Lalzi Bay is situated between Tail Paddle (Bishti i Pallës) in the South, and Rodon Cape (Kepi i Rodonit) in the North, on the Adriatic Coast and consist of many natural splendors of panorama (landscape and seascape) with total surface cover 1700 ha. The Lalzi Bay consists of shallow marine waters, estuarine (delta) waters of the Erzeni River, Tarini torrent, salt and brackish marshes (Bishtaraka Marsh, 65 Ha), sand dunes, shrubs, tree-dominated wetlands (alluvial forests) and coastal brackish lagoons (Bishtaraka Lake, 90 Ha). Bishtaraka Lake constitutes in fact a lagoon by having a connection to the Adriatic Sea through a channel with the width of 5-6 m and a length of 30-40 m. The Bishtaraka Lake has salinity similar to that of the Adriatic Sea. During the high tide phase, the seawater enters the Bishtaraka Lake and ensures its existence. The Bishtaraka Marsh, lying in the North of the Bishtaraka Lake, is flooded temporarily by the latter during the wet period of the year and during the tide phase (see photos 1, 2 and 3) (Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

Photo 1. Rodon Cape (Kepi i Rodonit), the North part landscape & seascape of Lalzi Bay

Photo 2. Tail of Paddle (Bishti i Pallës), South part landscape & seascape of Lalzi Bay

Photo 3 "Lura" (Lura 1) touristic village, in 2016

5.1.1 Historical and archeological site

At this place there were built heritages, as well, Redon Cape castle (Castle of Skenderberg), Church of Saint Anthony (Shën Anton) and Church of Saint Pjetro (Shën Pjetër), but at the same time those are and historical and archeological sites (see photos 1 and 2), (Arnisa Lushaj et al. 2013).

Photos 4, 5 & 6. ***Redon Cape castle (Castle of Skenderberg)***

Photos 7 & 8. Church of Saint Pjetro (Shën Pjetër)

Photos 9, 10 & 11. Church of Saint Anthony (Shën Antoni)

5.1.2. The monuments and natural sites

In the territory of Lazi Bay there are the monuments and natural sites of historical significance, approved by Competent Authority (MoEFWA, 2006; MoEFWA, 2010; MoEFWA, 2012), as below:

- Cape and Praying of Rodon, ex-Ishmi Commune (today Durres Municipality);
- Beach of Shenpjeteri-Ishmi Commune, ex-Ishmi Commune (today Durres Municipality);
- Forest of Kolndrekaj, ex--Ishmi Commune - ex-Ishmi Commune (today Durres Municipality); and
- Managed Nature Reserve of “Rrushkull” Working Circle.

Photos 12, 13 & 14 Cape and Praying of Rodon-Ishmi Commune

Photos 15 & 16. A part of beach surface of Shën Pjeteri in the territoty of the Lalzi Bay

Photos 17 & 18. A part of the Forest Beech of Kolndrekaj-Ishmi Commune

For implementation of bioclimatic principles in the design of open space on conserving biodiversity conservation, ecotourism management, as well adaption to climatic change on sustainable development in Lalzi Bay, Durres County, Albania our study is performed in one part of it. It is an elongated of NE-SW orientation, which extends in an area of 120000 m^2 (12 Ha), and serves various activities. The continuity of the open space on conserving biodiversity, ecotourism management, as well adaption of climatic change in sustainable development in Lalzi Bay, Durres County, Albania is interrupted by some roads which cross through the area and create some distinctive sub-areas providing space for recreational activities, playground and relaxation. A schools, churches and cultural centre in the nearby area define additional needs for the wise use of the open space (see Figure 2 and Photo 19) (Arnisa Lushaj et al. 2013).

Figure 3. Plan of "Lura 1" turistic village, in Lalzi Bay; Photo 19. A part of forest vegetation before the construction of "Lura 1" turistic village, in Lalzi Bay in 2001

The hard surfaces dominate the site, while the permeable surfaces are limited. There are lots of planted spaces but they are randomly located and do serve the need for shading, cooling, or wind modification. But, many areas are overheated during summer because of the lack of shading and cooling. Also, traffic from the adjacent streets, the air conditioning systems of the surrounding buildings and some restaurants which are located close to the area charge the open space with extra heating load (Arnisa Lushaj et al. 2013).

5.2 Climate

Solar radiation represents as a crucial factor of creation of weather change and the climate. Energy gained from solar radiation is the only source for Earth atmosphere, because all the other energy sources are unsignificant in front of the energy gained from the sun such as: cosmic radiation, radiation from the other planets, inner heat of the earth etc. Overall quantity of energy gained from the solar radiation at first is due to reciprocal position of Sun and the Earth surface. For Durres station there is the spread of overall radiation in clear sky in k kal/cm^2. Based on our data we see that solar radiation is represented as a crucial factor of creation of weather change and the climate (Yannas S.,

Station	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Durres	8.16	10.96	16.59	19.74	22.82	23.45	23.12	21.07	17.18	12.93	9.18	7.18

2001; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013).

	Janua	Feb.	Mar.	Apr.	May	June	July	August	Sept.	Oct.	Nov.	Decem.		Average
Temp.	11	12	15	18	23	28	30	30	26	22	17	12	**Ø**	**20,3**

Max. (°C)														
Temp. Min. (°C)	4	5	8	11	15	19	21	21	17	14	10	6	**Ø**	**12,6**
Precept. (mm)	91	103	99	83	63	50	31	43	118	80	146	140	**Σ**	**1.047**

Tab. 1. Spread of overall radiation in clear sky in k kal/cm ^{2}

Tab. 2. Durres – An average monthly temperature and an average monthly precipitation

The Lalzi Bay, Durres County is developed along the coast of a closed gulf (from Bishti i Pallës to Kepi i Rodonit); it is surrounded to the north and the east by low-rise hills and to the west torrents and river discharges their waters into the gulf. The climate is highly related to the village's geographical position. The proximity to the sea and the presence of the hills and rivers influence the local climate. Durres's temperate – Mediterranean climate is characterized by rather cool and wet winters and hot summers. Sometimes the high level of temperature and sunshine in summer create uncomfortable living conditions to the inhabitants (Arnisa Lushaj et al. 2013).

The coolest month in the Lalzi Bay, Durres is January with average monthly temperature of 5.2 ^{o}C and 180 hours of sun-shinning, while the highest temperatures appear in July and August. The highest temperature recorded is 42°C in July, a month with 342 hours of sun-shinning. The months with the highest average monthly precipitation are: December; November; May; October and Mars, which means that the rain protection at open spaces used in winter is essential. The wind that mostly affects the climate of Lalzi Bay, Durres County during winter is a dry and cold wind with NW direction and an average speed of 2.0 m/sec. In the summer, due to the proximity to the sea, cooling breeze blows towards the city marked at SW and SSW direction with a speed of 1.5 m/sec. Furthermore, the sea increases the humidity levels in the area affecting the comfort conditions in the summer (Arnisa Lushaj et al. 2013).

5.3 Analysis

The analysis examines the microclimatic conditions in the area of "Lura" (Lura 1) touristic village in Lalzi Bay, which are created by the interaction between the prevailing climatic factors and the urban environment.

Shading analysis: Insulation and shading of the space by the surrounding buildings and the existing evergreen and deciduous plants during summer was examined using a 3d model of the area. Insulation diagrams were produced for all the hours of the day (morning, noon, afternoon), (Photo 20),

Photo 20

and were overlapped to create seasonal shadow casting profile of the area, showing the spaces which are permanently exposed to sun (unfavorable) or shaded (suitable for wise use in summer). Since certain open spaces may be used at a different time of the day during summer, the maps give an indication for possible areas for development and identify areas that need design intervention (Givoni B., 1998; Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013).

Analysis of the prevailing winds: Estimation on how the buildings and the existing vegetation affect the velocity of the prevailing winds has been made wise using also the 3d model of the area and the wind speed/frequency rose for Lalzi Bay, Durres in order to map wind shadows. An important result is that the south west cooling breeze, which blows from the sea during summer, has a direction parallel to the main axis of the site which allows its guidance into the open space. From the study of the influence of vegetation on the wind pattern, it is concluded that in many areas trees and shrubs block the favorable winds. Another important observation, which refers to the heating season but is equally important, is the fact that the prevailing strong NW winds have the same direction as the streets which cross the open space. This means that the surrounding buildings may cause a channel effect, which affects the comfort conditions and the heating demands in the area and must be taken into account (Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013).

Acoustic environment: The sounds that dominate the open space are separated into wanted and unwanted, pointing out which areas receive the negative sounds and need interventions for sound elimination (Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013).

Air pollution levels: The basic source of pollution is the high traffic in the two arteries which cross the open space. In addition, the high density of the built environment and the narrowness of the streets do not allow the release of the polluted air masses to the atmosphere. The open space can contribute to the improvement of the air quality.

5.4 Proposal

The proposal is the result of the combination of the above analysis and the several socio-economic and cultural requirements of the area. The basic points, such as areas which

serve various actions/activities, recreational areas with a nice view, the access to the site, etc, were gathered in a map and were taken into account for the proposal. Different design interventions have been considered. The comparison and assessment between the alternative design conceptions was achieved with the overlapping of the isolation and wind diagrams which were created for different hours for each season. The proposed master plan is approved. *The outdoor space is reorganized* for the creation of comfort conditions and for best serving the great range of activities people are engaged in. New activity areas are designed and the existing ones are extended and relocated, so that the activities match with the season and the time of the day during which they mostly take place. The designed activity areas include: 1. the "Monument square"; 2. a playground at a lower level; 3. the "water square"; 4. the sheltered areas; 5. the "cultural square", 6. the sitting areas, 7. the offices and enlarged office yard, 8. greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, 9. parking, 10. swimming pools, 11. hotel suite, 12. commercial services environment, 13. bar-restaurant, 14. sports fields and finally 15. the pedestrian zone which provides access to all of them (Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

Vegetation, small scale constructions, shading devices, landscape equipment and different building materials are suggested in order to improve the thermal and visual comfort conditions during the hot summer period. Restrictions concerning the wise use of the open spaces during winter are also taken into account. The way of the materials, vegetation and constructions are used is described as follows: *Materials:* The surfaces covered with asphalt are significantly reduced by 90%, and replaced by other materials with better thermal properties. In the areas which receive a large amount of anthropogenic heat or they are surrounded by materials with high emissivity, the interventions aim at regulating air temperature during summer. Materials with high thermal capacity, high reflectivity and light color are applied to the overheated areas (with caution to avoid optical glare), especially in the places with large sky view, so as multiple reflections on the surrounding surfaces are limited. Also, the permeable surfaces are increased by 60%, in order to contribute to the decrease of temperature in summer and to the prevention of flooding in winter. *Vegetation:* Measures are taken using vegetation in order to funnel the cooling southerly sea breezes into the area and the urban tissue, during summer. Also, evergreen trees and shrubs are used to obstruct, deflect or filter the strong and cool NW winter winds without lowering the effectiveness of summer breezes. Thus, leeward and protected areas are formed for winter while are exposed to pleasant cooling wind in summer. Vegetation also satisfies the seasonal use of space. Shaded spaces are created to be used during summer, in different hours of the day according to activities taken place. The same areas planted with deciduous trees of multiple porosities can be also used during winter. Vegetation has an additional cooling effect through evapotranspiration. Other "cooling constructions", such as ponds or fountains, using water evaporation for increasing thermal comfort conditions during summer are proposed as well. Vegetation is suggested in a way that it improves the thermal behavior of the surrounding buildings as well, by permitting their exposure to sun in winter while shading their façades in summer. Plants are also used in order to eliminate the annoying unwanted sounds. *Constructions:* It is proposed landscape equipment which

addresses to bioclimatic criteria. For example, along the pedestrian zone, shelters for rain protection are provided. Small scale constructions are also used to redirect the wind. Furthermore, shading devices are proposed for the creation of good thermal conditions during summer. The design of the constructions is based on the wise seasonal use of the space, so ephemeral and movable equipment is suggested such as tents, pergolas or permeable shelters. The constructions are made from light or translucent materials in order not to block daytime natural light and at the same time to avoid hot air enclosure underneath. Finally, elimination or restriction of the annoying unwanted sounds is achieved with the implication of noise abatement and the use of structures, such as a "water wall" (Axarli K. and Teli D., 2008; Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

So. all mentioned above are performed through the study in the design for open space of built environment of "Lura" touristic village for biodiversity conservation and sustainable development of ecotourism, which was carried out for total area of 12 Ha in the "Lura" touristic village, studied with the area, as are concretely A, B, C, D, E, F, G and sub-areas within areas with different functions (Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

The study in the design of urban open space for biodiversity conservation and sustainable development of ecotourism was conducted by experts in all fields as architecture, construction, geology, forestry, agriculture, veterinary medicine, hunting, biology, zoology, environmental protection, economics, sociology, culture, ecotourism in full consultation with local government and central, taking into account the remark of their suggestions, these reflected in it, which was approved by the Council of Territorial Adjustment, Durres County and then the Council of Territorial Adjustment of Albania (Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).
In the study found functional zoning, which is such a reality, namely:
- Perimeter wall and parking lots from the outside it;
- Access to the "Lura" touristic village and the guard spot;
- Area A;
- Area B;
- Area C;
- Area D;
- Area E;
- Area F;
- Area G; and
- The area of sand (see the urban study), (Arnisa Lushaj et al. 2013; Arben Petto et al. 2014).

Functional zoning of the "Lura" resort village as follows:

- The perimeter wall and parking lots from the outside it;
- Access to the resort and place guards;
- Area A with the corresponding sub-areas, such as swimming pools, hotel suite, sports fields, "Monument square", a playground at a lower level, the offices and enlarged office yard, the sheltered sub-areas by residential (holiday) villas, type "A_4", 2 floors, commercial services environment , bar-

restaurant, internal roads paved with tiles, pedestrian streets, parking, greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the sitting areas, the "cultural square", the "water square" etc;

- Area B with the corresponding the sheltered sub-areas, such as residential (holiday) villas, type "A_2", 2 floors, internal roads paved with tiles, pedestrian streets, sidewalks, parking; greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the "cultural square", the "water square" etc;
- Area C with the corresponding the sheltered sub-areas, such as residential (holiday) villas, with blocks, the villas of type "A_1" and "A_2", 1 and 2 floors, internal roads paved with tiles, pedestrian streets, parking, sports field, greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the sitting areas, the "cultural square", the "water square" etc;
- Areas D and E with the corresponding the sheltered sub-areas, such as residential sub-areas with residential (holiday) villas, type "A_3", 2 floors, pools, commercial facilities and social-cultural services, internal roads paved with tiles, pedestrian streets, parking, greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the sitting areas, the "cultural square", the "water square" etc;
- Area F with the corresponding the sheltered sub-areas, such as residential (holiday) villas, type "A_4", 2 floors, internal roads paved with tiles, pedestrian streets, parking, greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the sitting areas, the "cultural square", the "water square" etc;
- Area G with the corresponding the sheltered sub-areas, such as the facility with administrative areas, aid and specified; residential (holiday) villas, the type "A_4"; internal roads paved with tiles, pedestrian streets, parking, greenery with evergreen or non evergreen decorative trees and shrubs (broadleaves and deciduous) and maintenance of existing forest and shrubs, the sitting areas, the "cultural square", the "water square" etc (see photos 20-21;
- Area of sand (Arnisa Lushaj et al. 2013).

The main technical indicators of the project mentioned above are:

- Total land area 12 Ha;
- Busy with construction area of 13 762 m² or 11:45% of total area;
- Surface busy with sport 5 492 m² or 5:58% of total area;
- Area of 1020 m² with swimming busy or 0.85% of total area;
- Surface of busy streets, squares, parks etc.. 20 126 m² or 16.77% of total area;
- Occupied area on a green 79 600 m² or 66.33% of total area;
- Coefficient of exploitation of the territory will be 17.88%, and the
- Density would be 133 to 150 (200) inhabitants/Ha (Arnisa Lushaj et al. 2013).

Photos 21- 22

6 Conclusion

This study has reported the ways to achieve better living conditions in the environment through the bioclimatic design of open spaces for built environment in biodiversity conservation, indigenous or not local community, ecotourism principles, as well adaption to climatic change, as example for sustainable development in Lalzi Bay, Durres County, Albania, and concretely in “Lura” (Lura 1) touristic village in Lalzi Bay, Durres County, Albania. It focused on the summer period, which for many areas around the world is the most attractive period to live outside and at the same time the most uncomfortable period due to high air temperatures.

The study demonstrated that drawing several maps of climatic factors can lead to the appropriate decisions in the open air space planning process, which can decrease high air temperatures, increase the relative humidity, provide better ventilation and cooling, improve the air quality, reduce the noise levels, and affect the thermal comfort conditions in the outside habitable areas. With the design proposal for the amelioration of the microclimatic conditions of an open area for biodiversity conservation, indigenous or not local community, ecotourism principles, as well adaption to climatic change, as example for sustainable development in Lalzi Bay, Durres County, Albania, it is shown that in places where there is a strong seasonal variation as in the temperate climatic zones, it is possible to define certain outdoor spaces as having conditions appropriate primarily for summer and others for winter use. According to the main seasonal use, surface materials and urban equipment should be suggested. Also, it is necessary to provide suitable vegetation, and movable or ephemeral landscape equipment to offer shading and enhance cooling by evapotranspiration and by encouraging air movement in summer, while to permit the isolation of the site and create wind protected areas in winter. Furthermore, the good knowledge of the special characteristics and the use patterns of the area, along with the implementation of bioclimatic criteria during the design procedure lead to the design of outdoor spaces that allow different activities to be carried out, upgrade the urban environment and contribute to the improvement of social life. Ultimately the bioclimatic design of open air areas can contribute essentially to the sustainable development of cities.

Solar radiation represents as a crucial factor of creation of weather change and the climate. Energy gained from solar radiation is the only source for Earth atmosphere, because all the other energy sources are unsignificant in front of the energy gained from the sun such as: cosmic radiation, radiation from the other planets, inner heat of the earth etc. Overall quantity of energy gained from the solar radiation at first is due to reciprocal position of Sun and the Earth surface.

Based on what we have said above, we can conclude that the development of Ecotourism activities are concrete and living, would not affect the biodiversity conservation, contrary; well being of indigenous or local community, duke zbatuar Ecotourism Principles, as well adaption to Climatic change. Ky example eshte for sustainable development in all of villages of Lalzi Bay, Durres County, Albanial, so the the long term objective is fully achieved. At all times, step by step, day by day learning conclude that the built environment of "Lura" touristic village has been set up and fully operational, taking into account the principles of ecotourism, such as:

• Minimize physical, social, behavioral, and psychological impacts;
• Environmental and cultural build awareness, and respect;
• Provide positive experiences for both visitors and hosts;
• Direct financial produce benefits for conservation;
• Generate financial benefits for both local people and private industry;
• Deliver memorable experiences to visitors that interpretative help raise sensitivity to host countries is' political, environmental, and social climates;
• Design, construct and operate low-impact facilities;
• Recognize the rights and spiritual beliefs of the indigenous people in our community and work in partnership with empowerment mean to create.

In all of steps, both during construction and operation of complete “Lura" touristic village are considered and implemented requirements for adaption to climatic change. Concretely, we are giving to you some activities carried out for the adaptation to climatic change measures, including:

- as every family have had and have a wise use of scarce water resources more and more efficiency, no wastage;
- builders and owners have carried our all activities having such immediate requiring for adapting to building codes to future climate conditions and extreme weather events;
- building flood defenses and cleaning and raising the levels of dykes;
- developing drought-tolerant crops;
- choosing tree species and forestry practices less vulnerable to storms and fires; and
- setting aside land corridors to help species migrate.

Let’s believe and hope in near future for others …

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