CREATING A HEALTHY SUSTAINABLE ENVIRONMENT TO MAINTAIN BAHRANI WOMEN' RIGHTS

Islam Elghonaimy  
*Professor, Department of Architecture and Interior Design, College of Engineering, University of Bahrain, Bahrain, eelghonaimy@uob.edu.bh*

Shatha Najeeb Gharbal  
*Undergraduate Student, Department of Architecture and Interior Design, College of Engineering, University of Bahrain, Bahrain, 20163243@stu.uob.edu.bh*

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CREATING A HEALTHY SUSTAINABLE ENVIRONMENT TO MAINTAIN BAHRAINI WOMEN' RIGHTS

Abstract
The idea of having a Healthy, Sustainable Environment is a challenge for designers while they think about creating such an urban complex. Designing a resort that gathers, supports, entertains, treats, educates and empowers women mainly adds more challenging. The performance of women in life gives them dual responsibility and efforts in both fields. As well know that women are an essential figure in Arab societies due to their power and potentiality to improve the quality in all fields around the world. Nevertheless, some women were suffering from harsh environments and violence in which they need a place for consultant and therapy. A place that can feel secured and with privacy while having relaxing time. Therefore, the Ladies Eco-Beach complex aims to create a healthy, sustainable environment to release all the stresses and pressures undertaken through the daily routine. Creating a Healthy Sustainable Environment (HSE) is needed for women as gender in Bahrain in different benefits that positively impact Islamic cultural value. Moreover, this idea of having HSE will support the ecological systems and sustainable solutions in Bahrain, which will change the perspective to use water frontage and comply with Bahrain Vision 2030.

Keywords
Healthy sustainable resort, Bahraini women’ rights, Cultural Islamic values.
1. INTRODUCTION

Women became an important figure in Arab and International Societies after the world knows their power and their potentiality to improve the quality in all fields around the world. However, women are playing two important roles in their life, one at work and society and the other part being a mother, wife, and teacher for her family. On that basis, the performance of two roles in life gives them dual responsibility and efforts in both fields. Nevertheless, some women were suffering from harsh environments and violence in which they need a place for consultant and therapy and to empower them and make them even stronger than before. Therefore, now is the time to appreciate women for their efforts and achievements worldwide by establishing the Ladies Eco-Beach complex that aims to create a healthy, sustainable atmosphere to release all the stresses and pressures undertook through the daily routine. (Sassi, 2006)

Likewise, the suggestion conceptual project is more than just a resort; it is a complex that gathers, support, entertain, treat, educate, and empower women (Worldwide, the Middle East and North Africa MENA, GCC, and Bahrain). Besides, establishing this project will positively impact the world to discover and be aware of women’s power, sacrifices, and responsibilities. The proposed project is an In-Front Eco-Beach Complex that combines all activity zones (Residential, Social-Cultural, and Entertainment Zones). Thus, the project goal is to create a place where women can express themselves without feeling restricted to any traditions and enhance their social relationships to achieve social sustainability.

Bahrain is an island (surrounded by sea from all sides) were most of the citizens have a strong relationship, and lots of memories associated with the beach. However, most of the women in Bahrain have a special relationship to the beach, but unfortunately, their movement is limited, they cannot feel free on the public beach, as well as they cannot practice most of the beach activities due to the cultural aspects and traditions (Al-Khaja, 2012). Therefore, the proposed project results from Women’s effort in society, which is needed in Bahrain, to create an equal sustainable environment between men and women, encourage women to stand up again, face all challenges, and treat women the same treatment as men. However, this project is needed for Bahrain to positively impact how a Muslim country maintains, considers, and raises women’s position and care about women’s needs regarding Islamic cultural values. Furthermore, Bahrain will become an example to follow by all other Muslim countries. Moreover, the project will give Bahrain a powerful impact on constructing this type of project, which supports the ecological systems and sustainable solutions, which will change the perspective to use land in front of a beach and will comply with Bahrain Vision 2030 that aims to “embrace the principles of sustainability, competitiveness, and fairness” (SCW, 2015)

Nevertheless, by observation, no place encourages women to socialize and incorporate with each other, so most of the women in Bahrain isolated, and the social relationships eliminate because no project supports the social aspect in a meaningful way. Therefore, the proposed project will solve this issue by encouraging women to re-socialize again in a sustainable healthy environment with lots of outdoor gathering points to achieve social sustainability that will create a friendly environment. The proposed aims to create a healthy, sustainable environment for raising Bahraini women’s rights and maintaining their Islamic cultural values. “Ladies Eco-Beach Complex” is a place that combines four main zones, Entertainment, Social, Wellness and Residential Zones. The proposed project consists of two parts; the first part is for women only (Ladies Resort), including Eco-Beach, SPA, Social Clubs, Chalets, and Cultural Zones. Simultaneously, the second part (Public Courtyard) is open for the public (All Genders), which includes Public Beach, Exhibition, and Public Spaces. The project will create a sustainable ecological environment that will allow women to experience beach activities in healthy ambient without limitations. Moreover, the project will encourage women to express themselves and their talents positively and, also, it seeks to achieve an inspirational social atmosphere by accommodating cultural, educational, and social zones. However, to provide successful research about this topic, the research methodology followed the theoretical and analytical approaches by discovering the theoretical issues regarding Bahrain’s climate, environmental issues in Bahrain, and sustainability. Besides, analyzing of Investigated Data via Interviews and Questionnaire Survey. This paper’s results give solutions to sustainable ecological techniques that might improve the sustainable healthy environment’s quality.
2. GOALS AND OBJECTIVES

The research goal is to propose design guidelines for a resort that will promote, merge, and appreciate women in Arab and international societies. This will accrue by offering a socially sustainable environment via the following objects:

a. Environmental Sustainability via:
   - Setting up a Sustainable Eco Environment by using the Passive Environmental Control Techniques and Sustainable Renewable Energy Systems.
   - Improving the air quality by developing the climatic control strategy such as dehumidification techniques to make people visit the proposed project at any time and any season comfortably.
   - Enhancing Low-Carbon Lifestyle and Zero Waste.
   - Reducing energy consumption and heat gain.
   - Creating a place that is friendly to the environment and people.

b. Social Sustainability via:
   - Improving women's qualifications by providing social zones that will support, empower, and re-build woman personality.
   - Increasing People's Conciseness about famous women worldwide, their accomplishments, contributions, and imprints on societies.
   - Developing the social, cultural, and psychological issues related to the project, users, and society.
   - Boosting the Bahraini Women’s rank regionally, locally, and internationally.
   - Enlightening the importance and power of women in the community.
   - Improving user’s satisfaction and comfort.
   - Evolving the social life and friendly environment as well as encourage people to re-socialize.
   - Empowering women to practice their role in public life and merge their knowledge and efforts to the social programs without discrimination against them.

c. Economical Sustainability via:
   - Using of renewable energy systems will reduce the energy costs, as they are in a longer lifespan with less maintenance, and the benefits of these technologies will come in return positively.
   - Encouraging women in Bahrain to perform their activities to be a powerful example for all women worldwide, which will increase Bahrain’s economy.

d. Cultural Sustainability via:
   - Maintaining the image of Muslim Women, by achieving a suitable place for them to practice the activities in a very comfortable way that reflects the Bahraini Muslim Culture.
   - Increasing women’s Islamic knowledge and Cultural values by accommodating a Religious Knowledge Center.
   - Raising the Bahraini Culture and Customs and Traditions in a way that is not harmful and limits women's movement.
   - Achieving a Suitable Equal Life Practice between men and women, considering Bahraini Muslim Cultures.

e. Political Sustainability:
   - Following the political agenda and laws in Bahrain about the proposed project and the cultural aspect of society.
   - Solving the environmental issues in Bahrain such as climate change.

3. METHODOLOGY

To achieve complete confidence in the proposal concept, the methodology of the research followed the theoretical and analytical approaches as follows:

a. Theoretical Issues: to understand the project's functionality, it is crucial to discuss and analyze the issues related to Bahrain. The proposed project will achieve sustainability, so it is essential to discuss in depth the environmental and women issues in Bahrain.

b. Analysis of Investigated Data (Questionnaire Survey): a research method to investigate the problems, shortage, and needs in Bahrain Society to fulfill people’s needs in an advanced way. The survey targets families, friends, colleagues, and others.
3.1. Theoretical Issues

3.1.1. Environmental issues and sustainability

Resorts are not only for human well-being, but it is also for the earth's well-being via accommodating sustainable solutions that will improve the environment and human health. Therefore, this topic will explain Bahrain's Climate and Environmental Issues. Likewise, illustrate the concept of sustainable architecture and how sustainability will achieve all sustainable pillars related to the proposed project objectives.

3.1.2. Bahrain climate

Bahrain is a small archipelago that consists of 33 islands, only 5 of them used by inhabitants, located in the west-central Arabian Gulf. The topography of Bahrain is flat, where the highest point is Jebel al Dukhan hills 440 feet (134 meters), in the center of Bahrain. However, there is no river, lake, or stream in Bahrain’s islands; the expected thing to notice in Bahrain is flooded that came out after winter rains (MCIA, n.d.). Bahrain’s climate extremely hot and humid, and there are only two main seasons: a moderate winter and sunny and hot summer. Therefore, from June to September (Summer) and from December to March (Winter) also, there are two transition periods, from April to May (Spring), while October to November (Autumn) (Al-Aali, 2012). According to the Ministry of Transportation and Telecommunications, Bahrain climate is an arid type, which means that the rainfall is too low and irregular (70.8mm) (Telecommunications, 2020). Nevertheless, there is a notable difference between nowadays and ancient temperatures, in which the temperature gets higher as time is moving on (figure 1).

The issue in Bahrain’s climate is hot-dusty humid weather, which disturbs all kinds of outdoor activities, especially in summer, in which people cannot stand the weather without Air-Conditioning. According to the Ministry of Transportation and Telecommunications Charts (Telecommunications, 2020) regarding Temperature, Wind, Relative Humidity, Dust, and Precipitation. First, the Temperature in Bahrain is keeping go higher because of global warming issues that the mean annual temperature huts the highest degree temperature in 2018. Secondly, the wind speed was 10.8 knots prevailing from the Northwest. The long-term average wind speed for June is 11.1 knots. The highest gust was 36 knots that occurred on the 17th. Thirdly, Relative Humidity, Bahrain has very humid weather as it is an island, which the mean daily maximum relative humidity in January from 1961-1990 about 88%, and the mean daily minimum

![Image: Mean Daily Temperature for February 2019]

Fig.1: The difference in temperature between 1990 to 2020
Source: (Telecommunications, 2020)
relative humidity in June about 39%. Fourthly, Dust or called Visibility; most of the time, the roads are not visible because of the dusty and hazy weather. The last weather condition to be discussed is Precipitation, Bahrain is not a tropical country, so the rainfalls are low.

3.1.3. Environmental issues in Bahrain
A. Climate Change

It is one of the important phenomena caused by the accumulation of greenhouse gases GHG in the lower atmosphere. However, many factors that increase greenhouse gases and emissions into the atmosphere, which are industrialization, fuel combustion, intensive agriculture, land-use change, waste disposal, and de-forestation. The climate nowadays increased in a way that harms human activities, and the global environment “Average worldwide surface temperature has warmed by about 0.74°C over the past century (IPCC,2007b). The atmospheric concentration of CO2, the main greenhouse gas (GHG), is estimated to have increased by 30 per cent since pre-industrial times” (Abraham, 2010). The world set up an alarm that the sea level is expected to rise between 15 to 95 centimeters by 2100 because of the thermal amplification of oceans and the thawing process on the mountains worldwide. Particularly in Bahrain, the temperature raised more than the average temperature due to the large industrial applications such as aluminum, petrochemicals, refineries, and all possible applications that generate heat and energy. Moreover, the primary mode of transportation in Bahrain is typically vehicles that increase CO2 emissions that occur alongside high fuel consumption. Based on Eng. Zahwa M. S. Al-Kuwari, the low-lying geology of Bahrain’s islands, coupled with high land rehabilitation and extensive industrial, commercial, and residential activity in coastal zones, highlights the island’s serious vulnerability to climate change-induced sea-level rise (SLR). To face this risk, Bahrain implemented a geographical information system (GIS) in the most usable and active islands, such as Muharraq. The result of this study gave an evident indication of Bahrain’s coastal zone management challenges and insights into national strategies for proactive adaptation. The impact of SLR immersion will face unexpected world challenges such as harmful marine life and biological diversity, financial crisis, displacement of people, and lots of damages. (Abraham, 2010)

B. Air Pollution

The cause of retrograde air quality in Bahrain is due to the energy generation and conveyance, car exhausts, noise, and industries, which Bahrain’s policymakers, environmentalists, and administrators consider the air pollution is one of the significant concern issues in Bahrain. Nevertheless, the main problem is air cannot be controlled in a specific region due to its statement (Gas), which the toxic gas can quickly transfer to the residential areas and other public spaces. On that basis, it will increase the residents’ risk to exposure from air pollutants and opportunities of rising inhalation of minute particles due to industrial activities, factories, construction processes, limited vegetation, desertification, and regional sand storms. The Public Commission for the Protection of Marine Resources, Environment & Wildlife (PMEW) came out after the worldwide pollution issues, which aim to organize and protect the environment controlled by several orders. However, these orders helped Bahrain establish a functional air monitoring network as part of its air monitoring program. The system allocated to the country’s five governorates - Muharraq, Capital, Central, Southern, and Northern, to check the air quality. Additionally, the significant air pollution sources are oil production, aluminum smelting, power generation industries, vehicles, airport, sewer systems, and feedlots. After accommodating the systems all over the five governorates, the noticeable prime source of air pollution were vehicles. (Abraham, 2010)
C. Marine Pollution

According to (Abraham, 2010), Mr Mirza Salman Khalaf, the Sources of Marine Pollution in Bahrain can be divided into three parts:

i. Coastal construction, dredging and land reclamation: They are considered the primary marine pollution, affecting the marine environment and groundwater resources, and blocking the natural agricultural drains in Bahrain.

ii. Industrial Facilities: are located on the eastern coast of Bahrain, which their waste could be gases, liquid (industrial effluents), and solid waste. However, many industries in Bahrain harm the marine environment and creatures, such as Petrochemical industries, Aluminum industries, Shipbuilding and Repair Yards, etc.

iii. Sewage Treatment Facilities: Domestic sewage effluent discharged into the sea that causes marine pollution

D. Land Pollution (Solid Waste)

Due to the high population growth in Bahrain, solid waste expands, creating land pollution that affects agriculture and the human lifestyle. The main issue nowadays is waste management that has a shortage of waste segregation, awareness of people, indiscriminate waste throwing, and lack of commitment by the stakeholders. However, other challenges associated with this significant issue include the random mixing of industrial and municipal waste with a lack of recycling facilities, and there is no comprehensive approach in waste management led to an inadequate chaotic environment. The improper waste management (Pollution) adverse impacts could result in the environment and population as well as in an indirect way causing the economy, public welfare, aesthetics, and tourism. Nevertheless, this can lead to various environmental impacts such as air, soil, water, dust, noise pollution, and inconvenience odors because of the fouls and cause diseases. However, the Bahrain government starts to accommodate recycling bins that considered a top priority in the waste management process. (Abraham, 2010)

3.1.4. Sustainability

After learning and analyzing the Environmental issues in Bahrain, it is crucial to accommodate sustainability to solve these issues. However, to comply with Bahrain Vision 2030, it must use sustainable strategies and technologies to achieve the proposed project goal. The word sustainability entered into the consciousness of architects, designers, doctors, teachers, etc., at the end of the twentieth century, which became essential in architecture. Besides, the sustainable architecture will positively impact the environment, buildings, and humans (Elghonaimy, 2018). However, sustainable architecture aims to create and design a society that meets the present’s needs without compromising future generation abilities. In another meaning, sustainable architecture is “is the interaction between natural systems (the regenerative capacity of the Earth’s biosphere) and human demands for natural resources” (Iyengar, 2015). As a result, there are five main pillars of sustainable architecture expected to achieve in the proposed project:

A. Environmental Sustainability

Related to environmental issues, such as pollution, non-renewable resource depletion, and other impacts that affect the environment should be continued indefinitely. This could be achieved by accommodating renewable energy systems such as solar panels, wind towers, etc., and passive building design techniques. (Jadhav, 2016)

B. Economic Sustainability

Achieve by enhancing the economic production to the next generation efficiently by accommodating agriculture in a high-tech way, improving the economy, and developing sustainability. However, benefit from the sun and wind and human movement via installing renewable energy systems and kinetic tiles that convert the kinetic energy to electrical energy.
The ecological solutions will enhance the low-life carbon, develop the air quality, and decrease energy costs, producing a sustainable economy. (Al-Khalifa, 15-16 October 2018)

C. Social Sustainability

Achieve by developing the social life, social well-being and connection between the users indefinitely. Nowadays, especially in the Middle East, most Women tend to be in their home, working alone, and there are no gathering points that happens between neighborhoods in comparison to ancient times, which dissociated from the society and this will lead to a decrease the social sustainability that does not work with the vision of 2030. Therefore, the proposed project will gather and re-socialize women in one place and will increase social sustainability. (Elghonaimy, 2018)

D. Cultural Sustainability

UNESCO said, “Culture is who we are and what shapes our identity. No development can be sustainable without including culture” A culture is a group of values, aspirations, traditions, and memories gained from society; each country has its own culture. Furthermore, culture and society are very connected, which is predominately mistakenly confused. Likewise, both culture and social refer to different terminologies, in which culture typically has specific values, customs, beliefs, and social behavior. At the same time, society reflects people’s common lifestyle, territory, behavior pattern, and organization. Therefore, to achieve cultural sustainability in the proposed project, cultural conditions within the society should be fulfilled. “developing, renewing and maintaining human cultures that create positive, enduring relationships with other peoples and the natural world.” (Hosagrahar, 2017).

As Bahrain is an Islamic Arabic Country, there are lots of cultural aspects to consider. But two main factors are related to the project, such as the traditional dress code for men and women. (Thob & Abaya) It is not mandatory, but people tend to dress modestly; also, men and women could not afford marge in one place, which most of the areas around Bahrain are available for men and non-Muslim women, while the Bahraini Muslim women deprived of the most activities in Bahrain. The proposed project will be available for women to enjoy as much as men with all considerations of privacy, policy, and security, which will obtain an equal environment and will produce cultural sustainability. (Elghonaimy, 2020)

E. Political Sustainability

The main issue in the world is that the climate changed due to economic activities and GHG emissions. Therefore, design cost-effective adaptation policies, improve local government, societies, and national policies will boost political sustainability. Although, by accommodating the Eco-Beach, which functions to control the climate inside the space, improve the air quality, and using passive energy to reduce energy consumption. (Elghonaimy, I., Al-Haddad, M. H., 2018) (Al-Khalifa, 15-16 October 2018).

3.1.5. The need for private women resorts in Bahrain

An article titled “Bahraini women deprived of typical clubs and private parks” published in Al-Watan newspaper on 23 June 2012 (Appendices No.1) argues women in Bahrain need their own recreational spaces due to the culture and traditions that are associated with Bahrain society which eliminates their freedom. Besides, all the resorts in Bahrain do not have a special private place for women. Usually, some resorts provide only one day for women, which is not convenient in terms of design. Therefore, Bahraini women are looking for places that feel independent and detached from men. However, providing entertainment recreational private resort for women in Bahrain will positively affect their mental health and performance. Also, there is a shortage of particular clubs for women to practising the social life between them. Not even walking routes, in which they practice sports while keeping their cover reassurance of their children. “they hope that the Supreme Council for Women will launch a plan regarding recreational places, praising the parliament’s proposal regarding model clubs for women, indicating that it meets an urgent need.” (Al-Khaja, 2012)
Women are deprived of jogging and do the same activities that men do in public spaces due to the obligations and regulations related to Islam in terms of women’s movement. Therefore, because of the restrictions and constraints, women need a private resort that achieves all women’s needs in terms of health, sport, recreation, privacy, etc. Nevertheless, designing for a private recreational resort for women will positively reflect society, which according to Head of the Women and Children Committee in the House of Representatives Latifa Al-Quoud, “We submitted this proposal after we saw the need for such matters. This proposal gives the woman a space to take care of herself and her health, and she will be able to focus more on her family and her work, as it will have an impact on her performance and family and social relations, so a healthy mind is in a healthy body. Also, these clubs will be a place for people of the same region to meet and exchange views.” (Al-Khaja, 2012)

3.2. The Analytical Part - The Questionnaire Survey

Likewise, The Survey consists of 19 Questions and can be classified into three categories: General Info, The Interested in the Project, and About the Project. (Appendices No.2)

a. First Category is the General Info that asked people about their Age, Gender, Current Status, Nationality, and Education background (Appendices No.2):

i. Age: the majority of people are at the age between (15-24) years old (61.3%). While the second one is (11.9%) at the age of (45-54). However, 11.3% of people are at the age between (25-34) and 10.6% of people at the age between (35-44), and the remain percentage refer to the people above 55.

ii. Gender: Females were the most interested in the project as it is for them, which get (74.4%), while males account for 25.6%.

iii. Current Status: This can be divided into Five Categories:

- The majority of people are Students (56.9%)
- Employee (23.7%)
- Retired (7.5%)
- Business Man/Women (4.4%)
- Others such as job seeker, unemployed, graduated and housewife account for (7.5%)

iv. Nationality: 92.5% of people are Bahraini, while (7.5%) of people from GCC, Egypt, Lebanon, India, UK and Sri Lanka.

v. Education background: This can be divided into Three Categories:

- Bachelor’s Degree (70%)
- High School (20.6%)
- Postgraduate (9.4%)

b. The second category in the project was to ask people about the places provided for women and how Bahrain treats women. The majority of people thinks that there is a special relationship between women and the sea (45%), most of the comment below this question where clarify the strong relationship between them. Although, there are (47.5%) vote for maybe there is a special relationship. Most of the people said that women are not neglected in Bahrain society (52.5%) which they justify that women are having the best reputation and treatment in Bahrain, but no such a project empower Bahraini women, and most of the time, the beach is only for males to enjoy. However, (15.6%) of people think that women are neglected. The majority of people don’t have a background of famous women and their accomplishments worldwide, which account for (73.7%), that clarify the need of museum to educate and aware people of the power behind women in worldwide MENA, GCC, and Bahrain. Therefore, (26.3%) only know about women’s history and mention more than one celebrity or well-known women such as Mother Theresa, Zaha Hadid, Oprah Winfrey, and more. (80.7%) of people said that in Bahrain there is no such a place that fully private for women only, which seems that privacy is something essential to design this type of project, to give the freedom and safety for women. (Appendices No.2)
c. The Third and Last Category to be discussed is About the Proposed Project, which asked people what the project expected to achieve and if there is one project in Bahrain similar. (65.6%) of people know that in Bahrain, no such a place empowers women and simultaneously entertains them in one place, with considering eco-sustainable solutions, Person says, “In general, Bahrain has not yet made a real entry in the field of a sustainable environment”. Most people vote for all aspects listed under the question (Privacy, Security and Cultural aspect). However, most people believed that privacy is an essential aspect of this project, which accounts for (89.4%). Furthermore, (84.5%) of people think that the project's idea will empower, encourage, and support women. Last but not least, because human behavior and their psychological and sociological aspect changed, most of the people prefer the contemporary sustainable architectural styles, which (59.6%) of people prefer sustainable architecture, while only (6.8%) of people prefer the traditional styles. (Appendices No.2) Based on the questionnaire survey, most of people agreed that privacy is the main factor that should be considered in the proposed project. Moreover, most of them believed that Bahrain needs this project to be in real life where they admit that Bahrain has no shortage of women position, but some of the women’s need still incomplete, especially, Ladies Resort.

4. Result
To create sustainable healthy development, there are several sustainable ecological techniques used which are:

4.1. Passive Environmental Control Techniques
4.1.1. Passive cooling techniques
a. Shading Devices
Shading Devices are a simple structure serves as an envelope that prevents the heat and glare coming from direct sunlight incident on windows, walls, and roof. However, they also decrease the over-reliant on insulation and high-performance glazing, especially in hot climates. Therefore, shadings could be as external shading fixtures and internal shading fixtures. (Jadhav, 2016) (Table 1)

<table>
<thead>
<tr>
<th>Table 1: Shadings can achieve a potential attraction for both: the project (Resort) and the users (Women) (Author,2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resort</strong></td>
</tr>
<tr>
<td>Shading devices have the potential to beautify the outdoor experience and add quality and value to the internal spaces that will improve the place's sensation.</td>
</tr>
</tbody>
</table>

b. Green Spaces and Vegetations
Vegetation and landscaping are passive cooling techniques that play an essential role in the building’s efficiency, aesthetics, experience, and sustainability. However, they could be used in buildings not only for the means of aesthetic but also for the means of cooling techniques which can improve the air quality, as well as could be used as shading devices which can help to eliminate the heat gain such as Deciduous Trees reduces Air Conditioning costs by 30% (Hoang, 2020) (Anthopoulos, 2017). Nevertheless, their appearance and sound can give a positive and relaxed atmosphere. Likewise, using native plants such as local flowers and vegetables, which can reduce the amount of water used for irrigation (Hoang, 2020).

c. Water Features
Water is a natural and attractive element that can passively cool the air and reduce heat gain. However, water feature plays a splendid role in an architectural aesthetic where the reflected sunlight from the water to the roof creates a unique pattern. Nevertheless, water features can produce a sustainable environment and achieve social sustainability that the water produces soothing sounds function as therapy factor that can benefit people’s psychology. Moreover, a water feature can affect the environment’s micro-climate and remove humidity from the air. (OTL, 2019)
4.2. Passive Lighting Techniques - Skylights

Skylights are one of the most effective solutions for passive lighting techniques, where the sky is always available, and there is no obstruction to block the daylights. Skylights are a void or an opening on the roof that can catch the sunlight into the interior space. However, they are applied to produce a sustainable design solution by reducing the excessive use of artificial lights during the day, which led to reduce the energy consumption of the entire building. (Jadhav, 2016)

4.3. Technical Issues and Building Envelope Technologies (Passive)

4.3.1. Walls – structural insulated panels (SIPs)

Structural Insulated Panels (SIPs) is a high insulation performance used in the exterior walls to provide premium insulation for the interior space from the hot weather outside, which can offer energy saving from 12%-14%. (Jadhav, 2016)

4.3.2. Windows – triple glazing with argon gas fill

Window thermal insulation is measured by using the U-value intended for glazing materials. However, a lower U-value means better insulation and lower heat transfer. Nevertheless, to give a window a higher rate of insulation from the outside environment, more glass panels should be added to ensure high-performance glazing insulation. Triple glazing is consisting of three glass panes with two gas spaces in between. Gas fill (usually Argon) has the advantage of a lower heat conductivity performance than air, which in result can produce a lower U-value than the double glazing and will maintain the desired interior space temperature. (Jadhav, 2016) (Guide, n.d.)

4.3.3. Windows – electrochromic glazing

As privacy is the most important factor to consider in the proposed project and to ensure the freedom and flexibility of women’s circulation, Electrochromic Glazing is a perfect solution to be used for this purpose. However, Electrochromic Glazing is a tinted glass that can change its optical transparency and color when an electrical field is applied controlled by occupants (Jadhav, 2016). Electrochromic Glazing applied on windows, skylights, facades, and curtain walls. There are lots of benefits of using this glass such as (SageGlass, 2018):

a. Enhance the user’s satisfaction and comfort.
b. Easy to control via mobile app.
c. Save energy cost 20-26%.

4.3.4. Floor – smart kinetic floor tiles

To support the idea behind the proposed project of being a sustainable building, each part of the building’s component should be ecologically controlled, even the floor. Smart Kinetic Floor Tiles can be applied in the usable traffic areas, for example, public corridors, football court, tennis court, main entrance, dance area, and gathering points, where the kinetic energy converted to electrical energy that could be used directly or stored in a battery for later use. Moreover, these tiles generate between 2 and 8 watts per step, which is a smart way to create those tiles that each step lasts about half a second, where the collected energy will be higher than expected. Nevertheless, the smart tiles can work within the renewable energy that will improve the energy efficiency and will save the entire building’s energy by benefiting from human being’s movement. (Menec, 2020)

4.3.5. Roof – cool roofs and coating

Roofs are the most component of the building envelope that can absorb heat, as it is on the building’s highest point. However, conventional dark-color roofs can cause a higher cost to cool down the interior spaces as they are absorbed most of the sun's heat. Cool roofs are constructed from high solar reflectance materials that can effectively reflect the sunlight more than conventional roofs. Furthermore, cool roofs can reduce the reliance on insulation in hot climates. (Jadhav, 2016).
4.4. Active Environmental Control Techniques

4.4.1. Active cooling – dehumidification technologies

As Bahrain has very humid weather that sometimes led to human discomfort, Dehumidification Technologies is an essential active cooling that applied in conventional Air Conditioning units by cooling the air below its dew point and taking off the unwanted moisture by condensation. Furthermore, Dehumidification Technologies uses desiccant materials (solid or liquid), which solid are more effective than liquid materials, as they cause corrosion due to the chemical solutions used. However, the desiccant materials reduce the amount of moisture inside the space by releasing heat and warm the air and can be cooled up using evaporative cooling or other cooling techniques. Likewise, the wet/solid desiccant material is typically silica gel, which absorbs the air’s moisture and can be reused several times by heating it. (Jadhav, 2016)

4.4.2. Active lighting – LED lighting

LED Lighting is the nowadays trend and the latest energy-efficient sustainable lighting technology. Therefore, LED lighting is more durable than the other conventional lighting technologies, where LED fixtures to use less electrical energy from 75% to 80% than incandescent bulbs. Furthermore, LED lighting has the most extended lifespan that 25 times more than incandescent bulbs. However, LED lighting can be easily dimmed on a range from 0 to 100%. Add to that, LED does not heat or burn out; it also can be available in different colors and forms. Besides, LED is the most expensive lighting technology, but in return will save lots of energy. (Jadhav, 2016)

4.5. Sustainable Renewable Energy Systems

4.5.1. Solar photovoltaic (PV) energy – rooftop solar PV

Bahrain has an intense sun and the summer period longer than the winter period, which can benefit from solar radiation to convert it to electrical energy most of the time. Rooftop Solar PV is applied on the roof with a bit of tilted angle equal to the latitude of the location, which catches the solar light and converts it into energy. However, it has a long-life span with lower maintenance. Nevertheless, solar panels roof installation using mounting systems attached to the roof and flat concrete roof solar panels is clipped-on. (Jadhav, 2016)

4.5.2. Solar thermal collectors – flat plate collectors

Flat Plate Collectors are used for heating the water by absorbing the heat coming from the sun. The location of these collectors is on the roof with large heat absorbing plates made of copper, steel, or plastic and the top surface coated with black high absorbance paint. Furthermore, Flat Plate Collectors can heat the water from 80–100 °C. (Jadhav, 2016)

4.5.3. Wind energy – vertical axis wind turbine

Wind energy is the second Important energy after solar, which the critical element is the wind turbine that converts the air’s kinetic energy to electrical energy. Furthermore, the taller wind turbine the most effective and more energy production. Besides, to ensure wind energy effectiveness, it should be located near the sea, where the winds are faster. Vertical Axis Wind Turbine is the preferred solution for wind energy, which their rotation axis perpendicular to the ground, that not consuming lots of space and no need to be higher to do its work. Add to that, Vertical Turbine could add an aesthetical value and could be placed in small to medium project. (Jadhav, 2016)

4.5.4. Water - greywater recycling

Greywater is wastewater produced in bathing, washing clothes, dishware, and others but not from toilets. Furthermore, Greywater has a lower level of contamination than black water (toilet water). On that basis, to achieve the means of sustainability, even Greywater could be recycled to reuse in washing, gardening, irrigation, and flushing toilets.
However, Greywater Recycling is one of the Important solutions for green building. After recycling, it can be reused again directly or stored in a short time because it could be contaminated again. (Jadhav, 2016)

5. CONCLUSION

The idea of having a Ladies Eco-Beach complex that respects women's privacy is a good sign of appreciation for women's role. Moreover, there are many positive impacts of having such a project upon the social, economic and environmental conditions and states of women in Bahrain as follows:

a. Socially culturally, it is a gratefulness indicator of women's performance to improve the quality in all fields in society life. In other words, it is considered as a result of their accomplishments and sacrifices; women deserved to be treated and grant a place to escape life's stress. Therefore, it will create an intimate place that gathers, supports, entertains, treats, educates and empowers women in a private area. It is a place that can feel secured and with privacy while having a relaxing time to release all the stresses and pressures undertaken through the daily routine in one complex equally and increase their consciousness about women’s achievements. Also, it is needed for women as gender in Bahrain in different benefits that positively impact Islamic cultural value.

b. Environment; this idea of having such a project will support the ecological systems and sustainable solutions in Bahrain, which will change the perspective to use water frontage and comply with Bahrain Vision 2030. However, the proposed project is expected to achieve a Sustainable Eco Environment by evolving the passive building design techniques and renewable energy systems. Nevertheless, the project orientation and layout (passive design techniques) could successfully achieve a sustainable environment, which will cut down the energy consumption and reduce the carbon footprint in the building. Besides, passive techniques will reduce the amount of using active techniques that consume more energy.

c. Economically, since the idea of the resort is unique, it should include attracting activities as a magnet for different customers from inside and outside Bahrain to enjoy the project's experience. For instance, it may include Aqua restaurants, a fashion hub, a fine arts gallery, sports facilities, etc, which will add value to its national economy. Innovative technology will play a significant role in economically running such a project as well.

To sum up, a healthy lifestyle and sustainable environment could be achieved via improving user’s satisfaction and comfort. Nevertheless, the project will enhance sustainability through the environmental aspect, but it will also develop and improve all sustainability aspects (Environmental, Social, Economic, Cultural, and Political). However, the privacy factor ensured through ecological solutions add an aesthetical and substantial value to the project.

REFERENCES


Appendices No.1: The Need Private Women Resorts

Elghonaimy and Gharbal: CREATING A HEALTHY SUSTAINABLE ENVIRONMENT TO MAINTAIN BAHRAINI WOMEN’ RIGHTS
**Appendices No.2: Questionnaire Survey**

### First Category: General Info

#### Age

<table>
<thead>
<tr>
<th>Age</th>
<th>144 responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 and under</td>
<td>13.3%</td>
</tr>
<tr>
<td>18-24</td>
<td>16.6%</td>
</tr>
<tr>
<td>25-34</td>
<td>20.7%</td>
</tr>
<tr>
<td>35-44</td>
<td>18.9%</td>
</tr>
<tr>
<td>45-54</td>
<td>12.4%</td>
</tr>
<tr>
<td>55 and over</td>
<td>23.3%</td>
</tr>
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#### Current Status

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
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<td>13.3%</td>
</tr>
<tr>
<td>Employee</td>
<td>20.7%</td>
</tr>
<tr>
<td>Business/Owner</td>
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</tr>
<tr>
<td>Retired</td>
<td>6.3%</td>
</tr>
<tr>
<td>Criminal</td>
<td>2.1%</td>
</tr>
<tr>
<td>Active Military</td>
<td>2.1%</td>
</tr>
<tr>
<td>Business Owner</td>
<td>0.7%</td>
</tr>
<tr>
<td>Job seeker</td>
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</table>

#### Education Background

<table>
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<tr>
<td>High School</td>
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</tr>
<tr>
<td>University</td>
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</tr>
<tr>
<td>Postgraduate</td>
<td>0.7%</td>
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#### Gender

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Male</td>
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</tr>
<tr>
<td>Female</td>
<td>66.1%</td>
</tr>
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</table>

#### Nationality

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</thead>
<tbody>
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<tr>
<td>GCC</td>
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</tr>
<tr>
<td>Brit</td>
<td>2.1%</td>
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<td>Egypt</td>
<td>2.1%</td>
</tr>
<tr>
<td>Lebanon</td>
<td>2.1%</td>
</tr>
<tr>
<td>Lebanese</td>
<td>2.1%</td>
</tr>
<tr>
<td>Indian</td>
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</tbody>
</table>

### Second Category: The Interested in the Project

#### Do you think there is a special relationship between Women and the sea?

<table>
<thead>
<tr>
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<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.4%</td>
<td>31.0%</td>
<td>23.6%</td>
</tr>
</tbody>
</table>

#### Do you have any general information about the famous women's history and their accomplishments in society?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.2%</td>
<td>33.9%</td>
<td>32.0%</td>
</tr>
</tbody>
</table>

#### Do you think Women are neglected in Bahraini Society?

<table>
<thead>
<tr>
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<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.0%</td>
<td>24.5%</td>
<td>35.5%</td>
</tr>
</tbody>
</table>

#### In your opinion, do the places that are special for Women in Bahrain are fully private and secure environment?

<table>
<thead>
<tr>
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<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.4%</td>
<td>30.0%</td>
<td>23.6%</td>
</tr>
</tbody>
</table>

### Third Category: About the Project

#### Do you think Bahrain has this type of project that empowers women and at the same time entertains them in one place, with considering eco-sustainable solutions?

<table>
<thead>
<tr>
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<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.7%</td>
<td>48.5%</td>
<td>24.8%</td>
</tr>
</tbody>
</table>

#### Do you think the idea of the project will empower, encourage, and support women?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.6%</td>
<td>45.4%</td>
<td>31.0%</td>
</tr>
</tbody>
</table>
Do you think there is a special relationship between Women and the sea?

Whether the woman is a part of the society or not, she still has a special relationship with the sea. The sea is a source of peacefulness and a place to escape from the busy life. Women enjoy the sea because it provides them with a place to relax and express their emotions. Some enjoy calm waters, while others prefer wavy ones. Sea and sand have a big part in human energy, taking away the negative and cleaning our energy. It's especially important for women who don't have a public sea to enjoy the sea energy, unlike men who can go to any sea and enjoy the energy of the sea. Even though some women who wear the hijab may feel uncomfortable with the thought of going near the beach, there is a special relationship between women and the sea. Practice sports for women is important - for example, pregnant women need some water sports to help them in delivering. Women love the sea; some like calm ones and others like it wavy - possibly because of the energy formed by the waves and the feeling of being free.

Do you think Women are neglected in Bahraini Society?

There is no special relationship between women and the sea.
Most activities in Bahrain are for men, there isn’t much to look forward to as women. For instance, swimming pools for training and practice and to compete, however it’s very unlikely to see the same for women.

No enough activities for her

Muslim woman in Bahrain has complete rights according to the religion aspects

Due to religion restriction many women do not really enjoy the sea or beaches in Bahrain. This is nothing about the religion but there is not places which are dedicated for females only so they take their freedom.

In Bahrain, women have right in almost all fields, but when it comes to privacy in beaches, yes I agree that it would be nice to have a dedicated beach for them to be comfortable and enjoy the privacy.

Any Suggestions?

If it has an idea like sometimes it’s free if u could sign your name First of all, on site, often for people who can’t afford much money, and people who need the comfort of your self to be in therapy. Or if it possible to be free To be within women’s rights as a woman in her country, as men can go to sea and enjoy, i think it would be better if it was free for women as well.