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Designing Shiraz Salt Lake hydrotherapy Complex with the Approach to Promoting Physical and Mental Health

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ABSTRACT

The present study aimed to create a health-promoting hydrotherapy complex at Shiraz Salt Lake. This is an applied study that was conducted using library research and field observations. Experts, psychologists, inhabitants of Sarvestan City, and visitors to Maharloo Lake are among the statistical population analyzed in this study. For this investigation, six centers were chosen from among the centers to achieve the requisite sample size. The findings of inferential statistics, student's t-test, binomial test, and analysis of variance were all subjected to inferential analysis. Friedman's technique was used to rank the most important components in the process of regaining physical and mental vigor. The findings revealed that hydrotherapy exercise promotes mental clarity, a sense of security, freshness, and vitality while also controlling psychological stress and making you feel healthy by creating a fun and invigorating environment, reducing muscle tension, and eliminating laziness and boredom. In major cities, noise pollution appears to have a substantial role as one of the most significant environmental contaminants. The Maharloo Lake area in Shiraz, which is tranquil and free of noise pollution, might be one of the most beneficial aspects of the creation of a hydrotherapy complex. The therapeutic powers of Maharloo Lake in Shiraz, as a healthy environmental substrate, appear to be able to improve physical ailments while also creating a great economic potential in the region's economic cycle.

Keywords: Hydrotherapy complex, salt lake (Maharloo), physical and mental health

INTRODUCTION

Because exercise is one of the simplest, safest, least expensive, and most natural ways to deal with physical and mental problems, experts have begun to use it as a vaccine to treat physical and mental illnesses as a result of the stress and stressors that are increasing every day with the mechanization of life and the stresses of daily life (Ghasemi Nejad Dehkordi, 2007). Physical ailments impede a person's physical capacity and function, causing anxiety in a difficult situation and loss self-confidence and optimism.

Since the patient cannot engage in regular physical exercise due to his medical condition, and many of his activities are restricted, this circumstance causes her worry, rage, sadness, and stress and psychological crises. In these situations, the person becomes mentally susceptible, and mental illness is not uncommon. People who are physically and psychologically fit are happier, and happy persons are less likely to be sick or die than people who are miserable (Collection of Articles on Public Mental Health Education, 2010).

When compared to land-based exercise, water-based exercise lowers heart rate, cardiac working load, and oxygen consumption during movement. For persons with problems like back

pain, joint discomfort, muscular pain, or those who have had surgery, this approach provides both maintenance and prevention effects (Ghaffari et al., 2008). People who are physically and psychologically fit are happier, and happy persons are less likely to be sick or die than people who are miserable (Omidvar et al., 2015). Hydrotherapy can help with pain, musculoskeletal strength and flexibility, performance, confidence, balance, and fitness, as well as reduce the recurrence of attacks in chronic diseases like rheumatism and back pain, as well as central nervous system diseases like MS and stroke (Ghaffari et al., 2008). Water treatment service centers have been located in the lower reaches of the city for easy disposal of surface water, based on land use indicators compatible with hydrotherapy complexes, access to urban thoroughfares, proximity to residential centers, and appropriate distance from industrial and workshop centers. The recommended locations will next be incorporated on the city map based on the location of the present hydrotherapy centers and the current land use situation. The majority of the time, transportation to hydrotherapy institutes is done in groups. Large numbers also go to hydrotherapy centers on particular days. As a result, effective and secure access to these institutions is critical, and hydrotherapy complexes should be positioned near major passageways to achieve this purpose.

One of the essential requirements for the site of hydrotherapy complexes is their distance from obstructive uses such as repair shops, industrial-workshop centers, and polluting uses. As a result, the weight of land for the building of hydrotherapy complexes will be enhanced in proportion to the distance from these centers in the current research (Weiss et al., 2014).

As a result, it is important to pay attention to the fact that sporting facilities should be strategically placed across the city. Construction of new sports facilities necessitates scientific and detailed location studies, which, in addition to the inefficiency of the built facilities, wastes money, time, and energy and, most importantly, has a direct impact on future performance, particularly the quality of healthy sports programs and recreation. By legalizing signs and relevant elements in decision-making and giving rational answers, optimal location aims to assist decision-makers and planners in selecting optimum locations to perform our tasks (Azimi Dolarstaghı et al., 2016). Accordingly, the present study aims to develop the Shiraz Salt Lake hydrotherapy complex to boost physical and mental wellness. Consequently, the goal of this research is to develop the Shiraz Salt Lake hydrotherapy complex with the goal of boosting physical and mental wellness.

Theoretical foundations

Hydrotherapy

Hydrotherapy refers to the use of water to treat ailments, which both primitive tribes and developed civilizations have used. This issue has been widely overstated, and drinking a lot of water has been suggested in medicine for a few conditions such as kidney stones, diarrhea, and heatstroke, but it just compensates for lost water and dilutes the urine. Water has been utilized for healing by both primitive tribes and cultured societies since the dawn of time. Even wild and domestic animals have discovered that they must drink water when they become ill. By removing waste materials from the body, proper water consumption preserves our health and restores it in the case of illness or disturbance.

Barker et al. (2003) found that eight weeks of hydrotherapy with two sessions per week reduced tiredness in individuals with chronic back pain who were experiencing discomfort, muscular



spasms, and incapacity to do everyday duties. In a hot water treatment center with a restricted budget, the emphasis on peace of mind is replaced by simpler activities and basic amenities, and simpler activities and basic facilities replace the emphasis on the naturalness of the hot water treatment center. For non-natives who are unfamiliar with the surroundings, appealing marketing for hot water treatment centers is often enticing.

The World Tourism Organization (WTO) defines health tourism as the use of services to improve or enhance a person's health and well-being in a location other than the person's usual residence for more than 24 hours (using mineral water, climate, natural and environmental factors, or medical interventions). In other words, "health tourism" is the provision of cost-effective medical facilities and services for individuals who travel to other nations for surgery, relaxation, or other treatments while balancing the tourism sector. Indeed, it must be noted that health tourism encompasses more than just medical tourism; it also encompasses relaxation of the body and spirit, use of natural amenities, and hot and mineral waters.

Physical and mental health


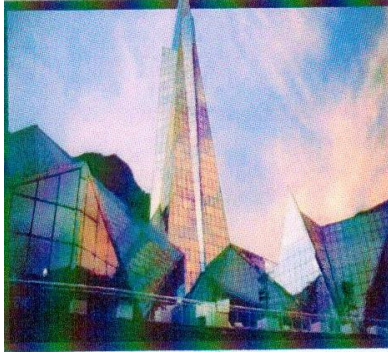

Mental health, according to the World Health Organization (2004), is a condition of well-being in which a person realizes his or her own potential, uses it successfully and productively and contributes to the community. Generally, mental health is created by avoiding mental disease, managing the effective elements that cause it to arise, early diagnosis, preventing the causes of mental illness recurrence, and building a healthy environment in which normal human interactions may be established (Milanifard, 2007).

The pleasure of whole physical, mental, and social well-being, not merely the absence of sickness and impairment, is what health is all about. It is indeed fascinating that Hakim Nezami, in his book *Panj Ganj*, uses Persian poetry's brevity to represent the World Health Organization's extensive statement with just two words: health = comfort (health is a comfortable climate). According to this definition, the World Health Organization's concept of health is idealistic and realistically unattainable because no one can be perfectly well in physical, mental, and social health aspects. Indeed, however, there is no distinction between health and sickness; in fact, this definition is akin to a high peak that no one can reach but that everyone should aim for, and on the other hand, a degree of health should be regarded (Nejat, 2008). Exercise is also being explored as a therapeutic option for mental and psychological illnesses. Because exercise is one of the simplest, safest, least expensive, and most natural ways to deal with physical and mental problems, experts have begun to use it as a vaccine to treat physical and mental illnesses as a result of the stress and stressors that are increasing every day with the mechanization of life and the stresses of daily life (Mirkamali, 1998).


People with mental health have the following traits, according to a study by the National Mental Health Association: they are comfortable, accept themselves as they are, use their gifts, have minimal stress, fear, anxiety, or jealousy, and have self-confidence. Their life experiences have shaped their value system. They have a positive attitude toward others, are concerned about their well-being, and feel responsible for them. They do not try to take control of others. They are confronted with difficulties and feel responsible for their conduct. They try to alter their surroundings as much as possible while also adapting to it as much as feasible (Aghajani et al. 2002).

Table 1. Some examples of hydrotherapy



Row	Name of complex	
1	Baden Baden hydrotherapy complex in Germany	
2	Calda hydrotherapy complex	
3	Mineral waters of Ardabil province	



4	Shabil Complex	Hydrotherapy	
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Method

This is an applied study that was conducted using library research and field observations. The current study falls within the descriptive research category in terms of type and approach. Experts, psychologists, inhabitants of Sarvestan City, and visitors to Maharloo Lake are among the statistical population analyzed in this study. Given that each center had an average of 40 patients, six centers were chosen from among the centers for this investigation to achieve the requisite sample size. As a result, 248 patients were chosen using Cochran's formula, a basic random selection approach.

The library approach was utilized to gather information regarding this study's research history and research literature. Articles, dissertations, and Internet databases were utilized to collect information on the literature of the study subject in this part, referring to the achievements and documents. Various procedures and instruments, such as surveys, interviews, and observations, are utilized to acquire the needed information from the statistical community about the research. A questionnaire approach was employed to obtain data from the statistical population in this investigation (sample).

Cronbach's alpha coefficient was utilized to assess the questionnaire's reliability. Cronbach's alpha coefficient values were 0.842 and larger than 0.7, based on the findings. As a consequence, the questionnaire's dependability has been proven. In terms of validity, experts' opinions were considered to create the questionnaire, resulting in a satisfactory degree of validity. Student's t-test, binomial test, and analysis of variance test are used to determine inferential statistics conclusions. Friedman's technique is used to rank the most important components in the process of regaining physical and mental vigor.

Study area

One of the functions of the Koohanjan part of Sarvestan city is Maharloo village. Maharloo Lake, which is also known as the village and is located nearby, is the most important natural attraction in the region and one of the country's natural attractions. Some of the most magnificent tourist attractions in this area include the mineral water spring, Khadijeh Banu holy site, Shah Abbasi Caravanserai, Sharghi Tal, Shahrokh Castle, son of Timur Lang, and Bibi Sharifa Khatoon mausoleum. Other tourist attractions in Maharloo village include the Maharloo mineral water



spring, which is located in the settlement's southern section and has therapeutic properties for most skin problems. Chenar Mountain, in the southern section of the Maharloo Mountains, is covered in old and old sycamore trees, giving this location a unique picture. Garden of Haidar is one and a half kilometers away and located in the southwest. The Maharloo area's blood water aqueduct, which irrigates the region's gardens, is located in the western section of the region. Ab Brami is located in the village's southern section. Dengki Water is located in the village's southern section. Among the Kamab springs (Baghak water in the southeast, Qarjeh in the south, Shamsu spring in the middle of the mountain, Mohammad Khaloo in the west).

Maharloo Lake (other names: Mahloo, Mahlouyeh, and Mahlouyeh; historical name: Jankal, or Salt Lake) is a lake in Iran's Fars region, situated in Sarvestan city. In the province of Fars, Maharloo Lake is situated at N2927 E5248. Maharloo Lake is 18 kilometers southeast of Shiraz. The lake's highest depth is 3 meters, and its maximum height is 1460 meters above sea level. As a result, the rate of evaporation is significant, and part of the bed is coated with a layer of salt, with water only present in the northern and central regions, where the depth is relatively shallow (maximum 50 cm), and the salinity is high. Rivers and streams draining from the northwest and southeast are the lake's major sources of water. Its size changes with the seasons and is dependent on rainfall. Aside from considerable evaporation, the Sachun Formation's gypsum deposits and the two salt domes to the east of the lake have a substantial impact on the lake's unfathomable salinity. Lake Maharloo is fed by the two seasonal rivers "Sultanabad" and the dry river. Water from a number of springs also enters the lake, mostly from the west and north.

This lake's water contains sodium chloride, magnesium, and sodium sulfate ($4 \text{ SO } 2\text{Na}, 2 \text{ MgCl}, \text{NaCl}$), and its salt is used in the petrochemical industry. Aside from the high quantities of potassium and magnesium in the Lake Maharloo brines, there is the prospect of economically extracting magnesium salts as the main product and potassium as a by-product.

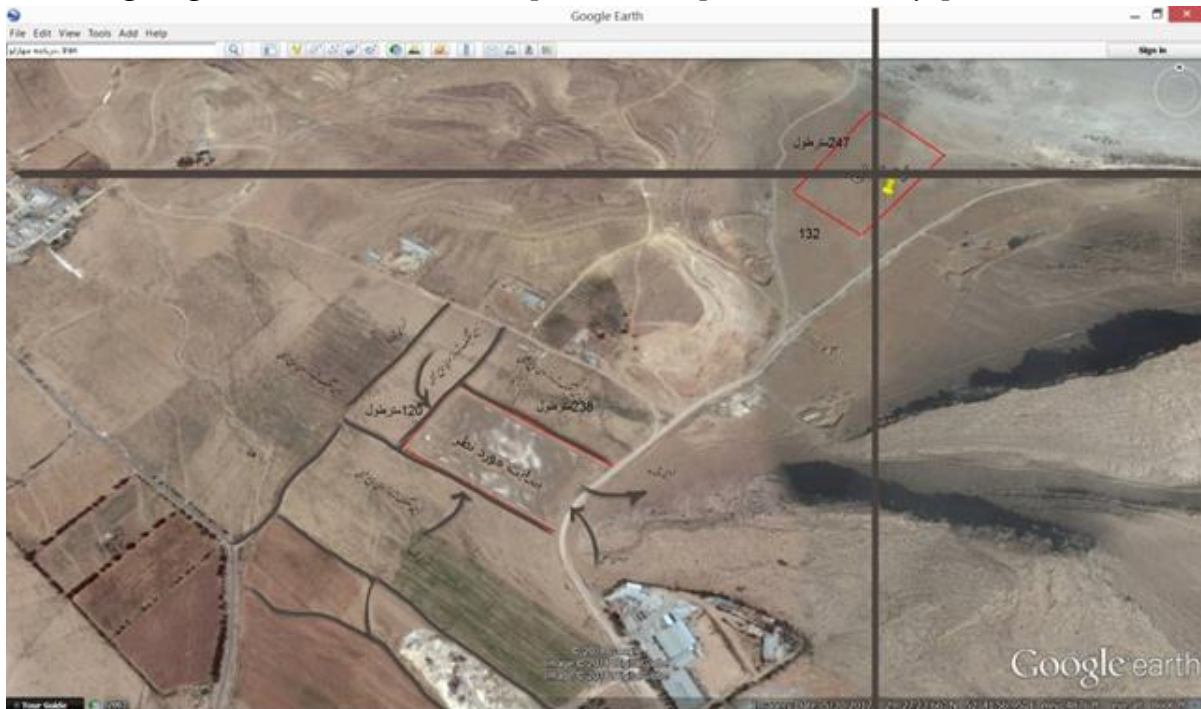


Figure 1. Location of the studied site

Ninety-seven people (39.11 percent) were women, while 151 people (60.89 percent) were men, according to the results. The age group of 31 to 35 has the highest frequency, with 70 people (28.23 percent) falling into this category. The most prevalent reasons for going to the entertainment option have been identified. The Kolmogorov-Smirnov test was utilized to analyze the normality of the data distribution, and the results are shown in Table (2).

Table 2. Kolmogorov-Smirnov and Lyon test results

Index	Kolmogorov-Smirnov test	
	Statistics	Significance level
First hypothesis	1.071	0.201
Second hypothesis	0.863	0.446
Third hypothesis	1.201	0.112

The assumption of normal data distribution is confirmed by the lack of significance of the test for all variables (p-value 0.05).

1. It seems that hydrotherapy exercise creates a fun and invigorating environment by reducing muscle tension and eliminating laziness and boredom, and on the other hand, it controls and causes psychological stress by creating a fun and invigorating environment by reducing muscle tension and eliminating laziness and boredom.

Table 3. Results of one-sample t-test to test the first hypothesis (mean criterion = 3)

Mean	Standard deviation	t	Degrees of freedom	Significance level
3.1309	0.74331	3.450	383	0.001

The index's mean was 3.130 ± 0.743 , according to Table (3) data. The t-statistic value is 3.450, and the significance level is 0.001. The test is significant at the 95 percent confidence level since this value is less than 0.05, indicating that there is a substantial difference between the mean of the index and the mean of the criteria. Given that the index's mean was higher than the criterion's mean, the current hypothesis may be regarded to be verified by the sample persons.

2. It means that, on the one hand, hydrotherapy exercise creates a fun and invigorating environment by reducing muscle tension and eliminating laziness and boredom, and on the other hand, it controls and causes psychological stress by creating a fun and invigorating environment by reducing muscle tension and eliminating laziness and boredom. In major cities, noise pollution appears to have a substantial role as one of the most significant environmental contaminants. The Maharloo Lake area in Shiraz, which is tranquil and free of noise pollution, might be one of the most beneficial aspects of the creation of a hydrotherapy complex.

Table 4. The results of the one-sample t-test to examine the second hypothesis (mean criterion = 3)

Mean	SD	t	Degrees of freedom	Significance level
3.7461	0.81471	6.107	383	0.000



As shown, the index's mean was 3.746 ± 0.814 . The t-statistic value is 6.107, and the significance level is 0.000. The test is significant at the 95 percent confidence level since this result is smaller than 0.05. This indicates that there is a significant difference between the index's mean and the criterion's mean, and because the index's mean was bigger than the criterion's mean, the current hypothesis can be considered to be verified by the sample. This implies that noise pollution, as one of the major environmental contaminants in large cities, appears to account for a considerable portion. The Maharloo Lake area in Shiraz, which is tranquil and free of noise pollution, might be one of the most beneficial aspects of the creation of a hydrotherapy complex.

3. It appears that the therapeutic powers of Maharloo Lake in Shiraz, as a healthy environmental substrate, can aid in the recovery of physical ailments while also providing a significant economic boost to the region's economic cycle. As a result, it might be one of the most important aspects in the development of a hydrotherapy complex in Shiraz's Maharloo Lake area, which benefits human physical and mental health.

Table 5. Results of one-sample t-test to study the third hypothesis (mean criterion = 3)

Mean	SD	t	Degrees of freedom	Significance level
3.1576	0.762380	4.050	383	0.000

As shown, the index's mean was 3.156 ± 0.762 . The t-statistic value is 4.050, and the significance level is 0.000, indicating that the test is significant at the 95 percent confidence level because the value is smaller than 0.05. This indicates that there is a significant difference between the index's mean and the criterion's mean, and because the index's mean was higher than the criterion's mean, the current hypothesis is stated to be verified by the sample persons. This suggests that the therapeutic characteristics of Maharloo Lake in Shiraz, as a healthy environmental substrate, may aid in the rehabilitation of physical ailments while also providing a significant economic boost to the region's economic cycle. As a result, it might be one of the most important aspects in the development of a hydrotherapy complex in Shiraz's Maharloo Lake area, which benefits human physical and mental health.

The following tables show the weights and rankings of the examined locations based on proximity, site view, site view, access, noise pollution, and topography.

Table 6. The final weight of the site 1

Site selection factors	Weight of indicators for the site 1	Index weights	Multiplying the weight of the index by the relative weight
Neighborhood	0.199	0.007	0.014
View from the site	0.227	0.116	0.026
Site view	0.448	0.213	0.095
Access	0.561	0.242	0.135
Noise Pollution	0.248	0.152	0.038
topography	0.517	0.161	0.83
Total	3.003	~	final weight=0.391

Table 7. The final weight of the site 2

Site selection factors	Weight of indicators for the site 1	Index weights	Multiplying the weight of the index by the relative weight
Neighborhood	0.678	0.117	0.079
View from the site	0.246	0.116	0.029
Site view	0.240	0.213	0.051
Access	0.305	0.242	0.074
Noise Pollution	0.381	0.152	0.058
topography	0.209	0.161	0.336

Table 8. The final weight of the site 3

Site selection factors	Weight of indicators for the site 1	Index weights	Multiplying the weight of the index by the relative weight
Neighborhood	0.212	0.117	0.0248
View from the site	0.476	0.116	0.0552
Site view	0.311	0.213	0.0662
Access	0.133	0.242	0.202
Noise Pollution	0.334	0.152	0.0507
topography	0.275	0.161	0.0442
Total	1.741	-	Total weight=0.261

Site 1 had the highest ranking among the examined sites as a consequence of the results.

Design process

The land is 213.140 * 87.55 meters in size, with access to the street on both sides and the mountain on both sides. The design began after understanding the earth's temperature and natural features, as well as the prevailing wind. The overall size of the land is 18660 square meters, with 1760 square meters on the ground level, 2438 square meters on the first floor, and 2194 square meters on the second floor being deemed land occupancy. At night, there are 1/5m between the beginning and the finish of the site.

In a public setting, you should replace the air at least twice an hour. The temperature limit in these areas is 18 to 25 degrees Fahrenheit, with a relative humidity of 20%-70%. Because hot water contains a lot of sulfur and is damaging to one's health, the pool area and the complex's wet space are continually expelling and conveying fresh air. The complex's stairwell is 18cm high on the outside and 17cm on the inside with the stairwell floor, the stairwell steps are inside to access the first level, and the stairwell is one-sided. The windows should be at least 2.5 × 1.5 meters in size. In busy situations, the doors open to the outside and are 1/10 the size of regular doors. The lobby is situated on the bottom level in such a manner that the revolving and rotating modes of the stairs, as well as the two entrances, one leading out and the other leading to the suites, are all visible. The waiting area is placed along with the foyer and has a capacity of 80 people, allowing for a direct connection. The greenery set inspired by the city of Sarvestan trees is placed in the outdoor space with a variation in the level of gorgeous and entertaining location for strolling.





Figure 2. Spatial communication plan



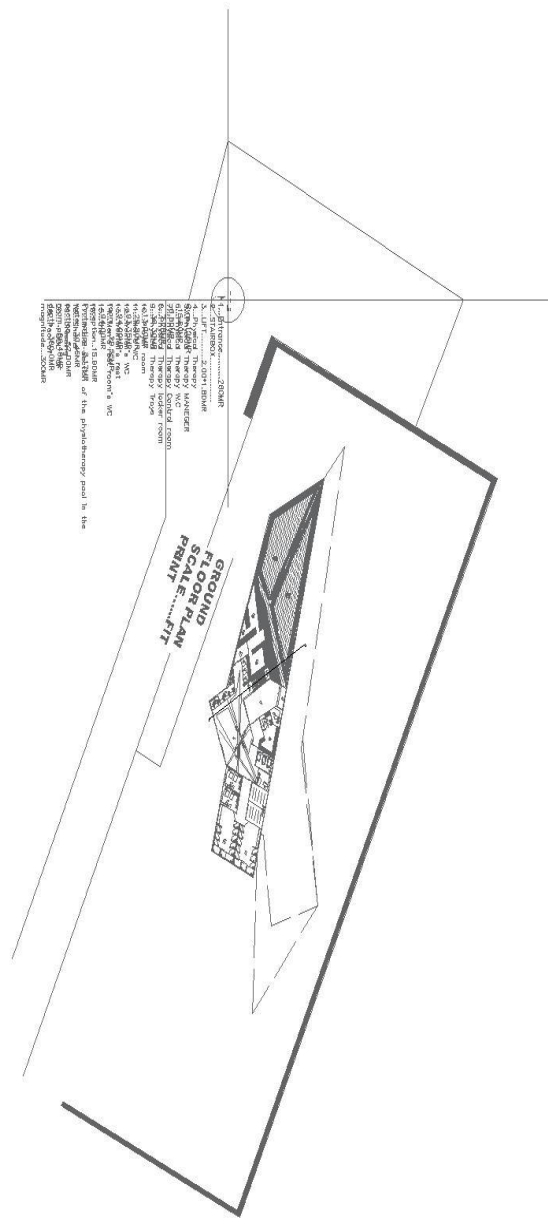


Figure 3. Ground floor plan



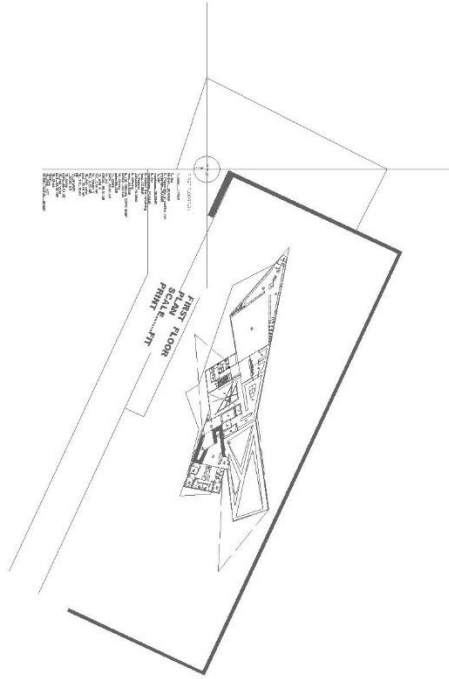


Figure 4. First-floor plan

Conclusion

The present study aimed to create a Shiraz Salt Lake hydrotherapy complex that will promote both physical and mental wellness. According to the findings, the study index's mean was 3.13074 ± 0.743. The t-statistic value is 3.450, and the significance threshold is 0.001, indicating that the test is significant at the 95 percent confidence level because the value is smaller than 0.05. This indicates that there is a considerable difference between the index's mean and the criterion's mean, and given that the index's mean was higher than the criterion's mean, the first hypothesis may be accepted by the sample persons. This implies that hydrotherapy appears to provide peace of mind, a sense of security, freshness, and vigor; on the other hand, it reduces stress and helps you feel healthy by providing a joyful and uplifting atmosphere, decreasing muscular tension, and removing sloth and boredom.

According to the study's findings, the index's mean was 3.746 ± 0.814 . The t-statistic is 6.107, and the significance level is 0.000, indicating that the test is significant at the 95 percent confidence level because the value is less than 0.05. This indicates that there is a substantial difference between the index's mean and the criterion's mean, and because the index's mean was bigger than the criterion's mean, the second hypothesis is supported by the sample. As one of the most serious environmental pollutants in major cities, noise pollution has a substantial proportion. The Maharloo Lake area in Shiraz, which is tranquil and free of noise pollution, might be one of the most beneficial aspects of the creation of a hydrotherapy complex.

The index's mean was 3.156 ± 0.762 based on the findings. The t-statistic value is 4.050, and the significant level is 0.000, which indicates that the level test's 95 percent confidence is significant since the value is less than 0.05. This indicates that there is a substantial difference between the index's mean and the criterion's mean, and because the index's mean was bigger than the

criterion's mean, the third hypothesis is supported by the sample. This suggests that the therapeutic characteristics of Maharloo Lake in Shiraz, as a healthy environmental substrate, may aid in the rehabilitation of physical ailments while also providing a significant economic boost to the region's economic cycle. As a result, it might be one of the most important aspects in the development of a hydrotherapy complex in Shiraz's Maharloo Lake area, which benefits human physical and mental health.

Sustainable recreation has been proposed as a new concept to deal with the destructive effects of tourism development. Today, sustainability is widely accepted as a fundamental approach for any type of development, including tourism development, and it has been proposed as a new concept to deal with the destructive effects of tourism development on social and environmental issues. In order to move toward the use of tourist attractions in accordance with today's needs and the preservation of these resources for the future, sustainability in the tourism perspective of recreational areas necessitates systematic attention to the technical, cultural, political, economic, historical, and environmental dimensions. With its tourist-recreational attractions and excellent ecological potential, the Maharloo Lake recreation area has a strong propensity to attract visitors. It goes without saying that leisure and recreational use of the environment necessitates the protection of natural resources, minimal environmental harm, and the principles of sustainable tourism development.

As a result, methods to enhance the recreational landscape of this region, taking into consideration its ecology and local circumstances, were established, taking into account the unique potentials of Maharloo Lake as well as solving and minimizing its challenges and difficulties. These strategies express fundamental concepts such as utilizing the site's unique and indigenous abilities and signs, establishing interaction between the site bed and users, revitalizing agricultural landscapes, and paying attention to the region's ecology and vegetation, which are the main areas of sustainable tourism in Maharloo.

Forghani et al. investigated the content of heavy metals in Lake Maharloo sediments in 2009. Nickel, chromium, zinc, lead, copper, cadmium, and arsenic had the greatest densities among the metals investigated, with densities of 78.3, 12.8, 38.2, 37, 29, 4, 4.4, and 2.26 mg/kg, respectively. They also claimed that the density of heavy metals in the northern regions of the lake is substantially higher. According to them, the major cause of the growth was the inflow of urban and industrial effluent from Shiraz into the northern portions of the lake via the Shiraz dry river. The results of the current study's comparison of densities demonstrate that metal densities in lake salt are lower than those in lake sediments. However, the findings of their investigation suggest that the density of these metals in the northern regions of the lake is higher than in the southern and central parts, with the exception of nickel.

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