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**DESIGN BASED ON SUSTAINABLE ENVIRONMENTAL ARCHITECTURE EMPHASIZING
MAXIMUM NATURAL LIGHT OUTPUT IN MOUNTAINOUS CLIMATES.**

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Resumen: Lo último en arquitectura, sostenibilidad y diseño medioambiental. La sostenibilidad ambiental no puede lograrse sino dirigiendo las actividades humanas de tal manera que los recursos energéticos se preserven para el futuro. Una mayor sostenibilidad ambiental hace hincapié en el desperdicio de energía en el medio ambiente, reduciendo la producción de factores nocivos para la salud humana y el uso de recursos renovables. Al mismo tiempo, la sostenibilidad arquitectónica debe ir a las normas que subrayan el uso de energía renovable, el mantenimiento y la renovación de la energía sin contaminación, en contra de un consumo mínimo de energía. Mientras tanto, debido al uso inexplorado de las energías no renovables y al daño ambiental, la situación energética del mundo se encuentra en una fase crítica, que proporcionará una solución para la supervivencia y preservación del medio ambiente para la próxima generación. El enfoque de edificios verdes que trabaja para mejorar el medio ambiente en el edificio, así como la industrialización de las actividades de construcción, hacen importantes ahorros en el sector de la energía y el agua, que es una valiosa contribución a los objetivos económicos de los países. Esta actitud, que surge de los conceptos de desarrollo sostenible, es una de las necesidades humanas básicas en el mundo industrial actual, siguiendo la armonización y la coordinación con el medio ambiente. Hay temas polémicos en la arquitectura, el tema de la vida y el desarrollo sostenible, en el que se presentan diversas ideas y estrategias. Por lo tanto, el presente estudio es una arquitectura sostenible basada en el aprovechamiento máximo de la luz natural en climas montañosos que, a su vez, pueden utilizarse para lograr una arquitectura sostenible como símbolo de reducción de consumo de energía y disfrute de luz natural dentro del sitio, la ciudad de Kermanshah. En esta investigación, los datos son cualitativos y objetivos, utilizando un enfoque de correlación-analítico-interpretativo, que es una herramienta de recolección mediante la observación, la fotografía, la preparación de textos, la preparación de mapas y ... la recopilación de información sobre el campo y la biblioteca. Los campos se utilizan para recopilar datos e información de un método de biblioteca. En la sección de la biblioteca se han utilizado textos escritos, disertaciones, revistas científicas, revistas profesionales, conferencias, informes de investigación, estudios y encuestas anteriores e información sobre Internet.

Palabras clave: Sostenibilidad, Sostenibilidad ambiental, Kermanshah

Abstract: The latest in terms of architecture, sustainability and environmental design. Environmental sustainability can not be achieved except by directing human activities in such a way that energy resources are preserved for the future. Greater environmental sustainability emphasizes the waste of energy in the environment, reducing the production of harmful factors for human health and the use of renewable resources. At the same time,

architectural sustainability must go down to standards that underscore the use of renewable energy, the maintenance and renewal of energy without contamination, contrary to minimum energy consumption. Meanwhile, due to the untapped use of non-renewable energies and environmental damage, the world's energy situation is in a critical phase, which will provide a solution for the survival and preservation of the environment for the next generation. The green building approach that works to improve the environment in the building, as well as industrialization of construction activities, make important savings in the energy and water sector, which is a valuable contribution to the economic goals of the countries. This attitude, which comes from the concepts of sustainable development, is one of the basic human needs in the current industrial world, following harmonization and coordination with the environment. There are controversial issues in architecture, the issue of living and sustainable development, in which various ideas and strategies are presented. Therefore, the present study is a sustainable architecture based on the maximum use of natural light in mountainous climates, which in turn, can be used to achieve sustainable architecture as a symbol of reducing energy consumption and enjoying natural light within the site, the city of Kermanshah. In this research, the data are qualitative and purposeful using a correlation-analytic-interpretive approach, which is a collection tool by observing, photographing, preparing texts, preparing maps and ... collecting field and library information. Fields are used to collect data and information from a library method. In the library section: In this way, written texts, dissertations, scientific journals, professional journals, conferences, research reports, past studies and surveys and Internet information have been used.

Keywords: Sustainability, Environmental sustainability, Kermanshah

1. INTRODUCTION

Today, the demand for successful solutions to environmental protection and prevention of waste of energy resources, given the prevailing crises and intensity of energy consumption, especially in cities for achieving sustainable urban development, are among the most important challenges faced by professionals Knowledge of urbanization. Frequent problems such as high per capita energy consumption, waste and hazardous waste production, climate change and global warming all lead to acute environmental crises and eventually environmental instability and loss of available resources and search for a multi-purpose model, Flexible and practical is inevitable. One of the most important goals of sustainable development is to preserve nature and to modify its look, and the manifestation of sustainable development in the built environment is called sustainable architecture. What is considered in this thesis is a sustainable architecture approach to environmental issues, although it is difficult to separate this from other economic, cultural and social aspects. What is considered in this thesis is a sustainable architecture approach to environmental issues, although it is difficult to separate this from other economic, cultural and social aspects. Although the results of today's crisis have been well recognized, many of the solutions presented to the environmental problems in sustainable architecture seem ineffective and incomplete. Because, despite the presentation of solutions that resolve environmental problems, their approach to nature remains disconnected, and the eternal value of the restored nature remains. The human's view of nature is the same worldview or insight that reflects on his method. The thought of the inexhaustible nature of

the natural resources existed until decades before the end of the twentieth century. But the paths of the events of the last decades of this century did not leave a way to seriously rethink this thought. That is, at this time it became clear that the land resources are limited and belong to the current generation and future generations, and no one has the right to use more than its share of land resources. At present, the natural resources of the world are divided into "renewable" and "non-renewable" groups. Obviously, a renewable source, if it is severely degraded, becomes an unrepeatable source.

2. STATEMENT OF THE ISSUE

Sustainable development is sought after by the reconciliation between man and his environment, in order to have the least destructive effects on himself and the natural ecosystem of the earth, in order to guarantee the survival of his life and his life. Sustainable development, in the context of its stated objectives, is more in the interests of humanity and is a human-centered approach. Sustainable development The process of improving social life without growth is beyond the capacity of ecological carriers. It should be noted that, despite the weight that determines environmental issues, social and economic sustainability is also strongly sought. Sustainable development means social sustainability (with the aim of social justice) and economic sustainability (with the aim of economic survival) and environmental sustainability (with the objective of ecological balance). Sustainable development is a kind of development that can balance the three factors of the economy, society and the environment in the functional field, and sustainability can be considered as a local, participatory and balance-seeking process that takes place in an environmental area. And it does not create a problem for a range beyond itself and for future generations. And the creation of such a partnership, for the balance and

excellence of urban community development, is realized in a sustainable cultural landscape. Sustainable development means the integration of economic, social and environmental goals to maximize the current welfare of the human being without compromising the ability of future generations to meet their needs. It defines concepts such as generational equality between future generations and social justice, and ultimately reduces environmental degradation. In addition to the general interest in the issue of sustainability, architects have also been working with other scholars to find new solutions for the desirability of human life. Without exaggeration, all human activities take place from eating and sleeping to work and worship in spaces designed by architects. And since the strengths and weaknesses of the artificial environment will have a direct effect on the quality of the environment, social relations and cultural relations, science and art of architecture will play a fundamental role in achieving the goals of sustainable development. In other words, energy experts estimate the cost of excessive and inadequate energy consumption in the country more than five billion dollars a year, which is the residential and commercial segment of the most important consumer sector. Today, it is suited to the conditions of the world and the state to use unreleased resources in its special and least-wattage, and to consider energy supply in sustainable ways, which should be done through proper construction and strict implementation of the principles and The criteria are fulfilled, and in turn depends on extensive research in this field. The issues and facts highlight the importance of the issue in preventing energy waste and its optimal use in architectural spaces, and the need for cooperation and intervention of architects and urban planners of the community in the field of bio-create.

In light of what has been said, the necessity of addressing such an issue comes from the following dimensions:

- The energy of the world
- Increasing environmental pollution
- Exploitability of non-renewable energies
- The need to use modern technologies as a necessary condition for the health and spatial dynamics
- The excessive energy consumption and unnecessary consumption in the country's settlements due to incorrect and non-principled construction. For a long time, researchers have always tried to provide appropriate solutions and recommendations with the analysis and technical calculations of the prototype and executive structures. Principles for proper and economical construction and construction in architectural spaces.

So, the first step in accessing sustainable architecture is energy efficiency optimization, accurate analysis of climatic data and the use of all the tools that make it possible to understand the climatic conditions. Because the number of climatological data in each climates is very high, climates should be used to understand a climate. These diagrams include the biology of the building, the diagrams of the pyramid, the earth colors, the solar charts, and the shading patterns.

Energy efficiency is a parametric method of energy efficiency optimization and maximum use of daylight as an innovative energy saving method that studies the effect of different architectural indices on energy consumption of buildings. In this method, the focus is on modeling energy dynamics to determine the optimal level of architectural indices in terms of energy consumption. The use of this method of energy efficiency in building design architecture can lead to energy savings without significantly increasing the cost of building construction. . Therefore, it could be argued that the use of daylight in architectural spaces is an effective way to reduce resource consumption, as well as building costs and, ultimately, to achieve sustainable architecture. Therefore, the present study is a design of an architectural house with a sustainable architecture approach based on the maximum use of natural light in mountainous climates. In turn, this design can be used to achieve sustainable architecture as a symbol of reducing energy consumption and utilizing natural light.

3. **IMPORTANCE AND NECESSITY OF RESEARCH**

Due to the growing number of population and the increase in construction, demand for the use of new materials in the construction industry has also increased due to limited resources and consumables. With the development of materials, innovations and methods of production, it is essential to move towards higher, more economical, and environmentally friendly buildings. We are now on the verge of next-generation buildings; buildings of varying degrees of new technology that are fully ecological and able to respond to direct and indirect changes in their environment by utilizing consistent materials and proper functionality. Adapt themselves to the appropriate conditions. One of the greatest modern technologies in the present century is to optimize energy consumption in architectural spaces, which can be used to address the needs of the building industry. The benefits of using this

technology can be to save energy and, consequently, economical savings.

-Research Questions:

1. What indicators should be considered to achieve a sustainable architecture?
2. What factors contribute to sustainability and in architectural spaces, especially in educational settings?

-Research hypotheses:

1. The design of stable architectural spaces with specified standards and the use of modern methods can be based on the foundations of sustainable architecture.
- 2- By designing the space and its elemental elements, a sustainable space can be created with modern methods.

-Ecological sustainability

The concept of ecological sustainability refers to the management and protection of ecological systems in a condition and degree that environmental functions and the ability to provide goods and services over time are sufficiently preserved and avoid potential dangers and disasters, reduce their threat to Future generations will have the opportunity to enjoy at least equal resources from environmental resources. The ecological sustainability that relies on protecting the integrity of the ecological sub-systems focuses on the ability of the environment to stabilize the present and future human habits, and emphasizes the continuity of this ability in economic activity and the provision of related inputs, To ensure human well-being, environmental well-being is also provided. Anthropologists are concerned about the impact of human activities on ecological resources. They are worried about preserving something that the economies call it natural capital. According to them, maintaining the global ecosystem for future generations and, at least, destroying it, is an absolute principle for everyone, and they consider that any living creature on earth is dependent on the initial production of green plants. While the preservation and production of these plants on the ground is in critical condition and the continuation of the current process is associated with a limitation of its use for human beings. Environmental sustainability means maintaining the base resources (and related types) at levels that do not deprive future powers and maintain or enhance the capacity, quality and flexibility of the ecosystem. After sustaining through reducing resource and energy consumption, reducing the amount of waste, contamination And retrieving them and finding suitable technologies. In other words, a sustainable

environmental system should be able to maintain the base resources as established. Avoiding excessive exploitation of renewable resources or pressure on natural functions and, at the same time, utilizing non-renewable resources to the extent that they can be replaced by existing investments.

- The design of climate design suitable for the cold and mountainous climate

The relationship between climate and human is the same as the relationship between the cradle and the newborn. Due to the cradle's condition, that it is warm and delicate and provides a suitable bed for the baby, the baby will be nurtured in peace and well-being. Architectural art in Iran has an ancient background, and at any time, the mighty hands, the creative mind, and the taste and taste of the people of the art of this country have created phenomenal phenomena that in many cases its foundations are the root of the art of world architecture. Some of these works in the corners of the vast country of Iran, reflecting the magnificent architecture of the millennium, are held in steadfast monuments. In the traditional architecture of Iran, the buildings have been formed with respect to Iranian and ethnic identity and culture, and the combination and architecture have never been the religious and religious beliefs of the people of this region, contrary to cultural beliefs. Even decorations, which are considered to be part of the architecture, are not the exception. In these buildings, while preserving cultural identities in the construction, there are always five principles of people's religion, avoiding futility, introversion, use of decorations in the building, and the use of bombs. Therefore, using the materials in the environment and the wise use of the land and the environment, the construction of these houses is also finally attentive and economic in terms of the religious and cultural beliefs in the prevention of extravagance, the extreme care and the ability to act It was said that no additional work or additional costs would be imposed on the worker. What is noteworthy here is that, more of the principles that emerged in the modern architecture of the 20th century, the traditional and ancient architecture of this boundary and canvas was observed in different climates, which itself confirms the correct effect of culture, religion and The traditions of the Iranian people have been about the construction and architecture of the past centuries.

Design based on the climatic environment

Climate design is a way to reduce the overall energy consumption of a building and the first line of defense against external climatic factors. In all waters and buildings constructed in accordance with the principles of climate design, the need for

mechanical heating and cooling is minimized, and in contrast to They use natural energy. Climate as a natural phenomenon has always been of interest to urban planners and architects. The goal of climatology is to discover and determine the natural behavior of the atmosphere and exploit it for the benefit of mankind, almost all human activities for the continuation of the life cycle in full direct Or indirectly influenced by air and climate. Throughout the history of architecture and construction, designers have always sought to respond to climate conditions, even the so-called "traditional" designers of the climate design have a precise and elaborate expression. Whether buildings built in mountainous cities protected by the wind and facing the south, or in the plans of the traditional courtyard houses designed to keep the night cold in a warm and dry climate. In these indigenous buildings and local styles, climate and climate are considered as the basis of human life and activities, which ultimately results from the formidable buildings of the buildings. Climate design, also known as the "Building Bioclimate", includes a series of scientific and applied principles that consider these principles in the design of buildings by designers and architects, which can lead to the design of optimal spaces for human comfort and saving. Consume energy. Climatological design is a method for reducing the total energy of a building, designing the building of the first line of defense against the external climatic factors of the building.

Factors such as heat, humidity, wind, etc., are effective in the architecture and style of the city's buildings. In tropical areas, buildings are built in windy conditions, their windows open to the wind, urban ventilation systems are considered. In cold areas, the external surfaces of the buildings should be in the opposite direction of the wind direction of the area, double windows and walls of the appropriate thickness to minimize the heat exchange. Moisture also affects the way of construction and selection of materials, so environmental factors affect precisely how form of buildings, directions, streets, urban streets and selection of materials affects.

Architectural features of cold and mountainous regions in Iran

These regions have an average temperature of more than 10 in the warmest month of the year and the mean air temperature in the coldest month is less than 3 degrees centigrade. From the characteristics of these areas, cold and hard, for several months from the year of the earth covered with snow and ice, the cold season continues from the beginning of December and begins to wintry and continues until late April. The amount of precipitation in the

summer is low and in winter it is much more snowy. Due to the high air cooling in most parts of the year, maximum use of sunlight, daily fluctuations in temperature, heat preservation, and the prevention of winter cold wind in residential environments are essential.

General characteristics of urban texture in mountainous regions of Iran

- 1- Small and enclosed urban spaces
- 2- Dense and monolithic urban texture
- 3- Sunshine and ground effects. The determinant factor in the establishment, extension and general view of the townships and main roads along the low-lying and low-latitude lines is due to the high temperatures in the urban areas in most parts of the year. Objects are interconnected so that the level of contact between hot and residential spaces with external cold environment is lowered.

Urban spaces are as small as possible so that the cold winds penetrate into these spaces. In addition, the heat radiation from the external surfaces of the warm walls of the buildings to some extent causes moderate weather in the urban spaces, and the small spaces of these spaces The view also has the advantage.



Picture 1. Village of Palangan-Kamyaran-Kurdistan

Methods of controlling the water and air of the building according to the climate of the Sardohist region:

To control the climate of the building, it is necessary to control the heat transfer from outside to inside and from inside to outside. We know that heat transfer occurs in three ways: radiation, convection, and conduction.

In the context of climate and comfort conditions, surface evaporation also plays an important role in reducing temperature.

The following table shows that in warm and cold seasons, which natural factors should be taken into account for decreasing or increasing the temperature. Therefore, methods of utilizing natural energy and facilities for creating comfort conditions in the building can be divided into several categories:

- Use of sunlight or escape from high sunlight.
- Radiation cooling, or radiation exposure at night.
- Escape from the wind.
- Use of wind and mild air currents.
- Reducing the thermal conductivity of the snowfall building and its accumulation requires a fairly high resistance of the structures.

In monuments of mountainous areas and high latitudes, roofs should be so tight that heavy snowstorms are created. Snow cover on other horizontal surfaces creates an extraordinary weight, in which case the construction of additional and additional aids to prevent them from falling. It is necessary to note that buildings that are full of ice and snow are more vulnerable to other atmospheric factors such as wind.

The sun is the only important source of natural energy to heat the building without consuming electric or fossil energy. The intensity of the solar radiation in most parts of the earth is significant. Of course, this value depends precisely on the latitude and area of the sky. Also, the intensity of the engagement varies in different seasons of the year and at different times of the day. However, the intensity of radiation energy is also related to the surface angles. If the surface is perpendicular to the sun's rays, the highest adsorption occurs, and the higher the level is, the better the absorption rate than the beam's direction.

Orientation of the building

The orientation of the building can determine the amount of absorption of the sun. Building designers, by calculating the solar charge for different hours of the day and the different days of the year (which changes the location and angle of the sun) can be selected for building so that the amount of radiation absorbed does not cause excessive heat build-up. . In cold areas, the building is selected so that the greatest amount of solar energy absorption occurs.

The colors and the walls of the walls

In the cold areas, the exterior of the house is trying to be glamorous and sexually attractive. In these areas, the level of sunshine walls is the highest and

the orientation of the building is selected in such a way that in the winter, more levels of exposure to radiation.

Greenhouse effect

In cold areas, to use more energy than the sun, in the southern part and the sunshine, porches with wide windows are designed. The sunlight shines through these windows into the porch and attracts the walls and the floor of the porch (usually made up of dark dots). Beams that are reflected from these surfaces have a wavelength higher than the initial waves and the glass does not allow them to pass. As a result, the sun's rays are blocked on the porch and slowly absorbed into different levels. This effect, known as greenhouse effect, causes the environment to be protected with glass.

Radiation cooling

All bodies that absorb light and heat during the day, during the night, because they have a higher temperature than the atmosphere, begin to lose heat in the form of radiation. Architects use the same principle to cool buildings throughout the night and call this process a radiant cooling.

Counteract the negative effects of wind

The wind blowing on the exterior walls of the house increases the heat transfer rate to the outside, or the heat dissipation. For this reason, in the cold and windy areas of the houses, as much as possible, they should be protected from the wind. The orientation of the building against the wind and the cross-sectional shape of the building that is facing the wind can reduce the adverse effects of wind. It also tries to build the building in the shade of the tree, the hill, and Also, the level of the alleys is up to half a meter above the floor of the houses, so that the ground is another shield around the houses.

4. BUILDING DESIGNING

A. Design Method:

In designing a land plot, the following factors are recommended to prevent heat and cold waste: 1- To position the structure of the building: In order to optimally position the building to collect heat from the sun in the winter, it is in the position of the larger front. Computer studies have shown that the optimal economic state of the area and the direction of a building in order to receive the heat of the sun

would give a building with a ratio of the north to east or west aspect ratio of 1.5 to 1.6.

Materials used in building outer shells should have the highest thermal resistance, including light concrete (insulating concrete - concrete concrete - fine concrete, etc.)

3. Division of the house: In cases where only certain parts of a house should be heated, it will be useful if possible to separate those parts from other parts of the house that do not need to be heated. In this case, the parts are warmed up, which is really intended to warm up.

4) The ratio of the external shell surface to the useful volume and the ratio of the roof surface to the useful surface of the building and the ratio of the openings in the outer shell (the window groove) to the useful surface of the building.

5- Use of inactive systems of the sun: sunny window, sunny wall, sunny roofs, horizontal and vertical canopies, tree shades, wind turbines, heat of the ground, courtyard, underground

6. Use of solar active systems

7. Reduce leakage of seams and openings of external shell.

- Cool areas

1- To reduce the infiltration of the wind, as much as possible, the ratio of the height of the building to its length is reduced.

2. Use controlled inputs.

3. Cover the outer surfaces of the building with harsh materials and dark colors and light absorbent to absorb the sun's energy.

4. The level of windows and entrances is less than the level of the building.

Important points in building design

1. Planting evergreens and planting around the building could be a barrier to building a wind and use it as a windbreaker, but care should be taken not to create shading and sunblocking for the home.

2- In the summer, trees in the west and southwest are practically useful for entering the building Small-leafed trees are also good and they can be planted south of the building because they have leaves in the spring and summer, they decrease the amount of radiation entering the building, and in the winter they are without leaves and they can not prevent the sun from reaching the sun.

4. Living spaces overlooking the south

5. Reflective surfaces on the floor overlooking the

sunblind windows, porch and greenhouse attached to the empty spaces.

6- Build walls with heavy building materials on the south side of the building

7- Selection of appropriate thermal insulation materials depending on their thermal resistance

8- One of the other benefits of a building is its proper lighting, while it stores energy, it reduces power consumption (for lighting).

9. Approximate area of the window To use the daylight, the floor area should be 5% of the total area.

5. CONCLUSION

Technology development and community preservation in the top of today's societies require the provision of special equipment and targeted programs, based on deep knowledge of the subject. It can be said that the existence of scientific centers in every region, especially in today's modern world, is absolutely necessary. The movement of technology and technology, taking into account the type of activity at the center and the constructive interaction between youth, science and art, the use of technology in the path of transformation, Advancement can be very effective. But attention to the issue of environmental sustainability, which is the approach taken in this study, can be combined with the idea of movement and fluidity in the design of this project, because at least part of the discussion of the idea of the movement in this research is related to the sustainability and the end process The growth and order of nature in nature, or environmental sustainability. In fact, the proper fit between the form and the one on the one hand and the sense of moving in space are, on the other hand, important issues that the project can encourage and invite users and young people active in the center to produce and acquire science, the more the approach to be.

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