Green and Sustainable Buildings Status in Palestine

Palestinian Energy and Natural Resources Authority

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PEC - Main Areas of Work

Renewable Energy

PEC focuses on the development of renewable energy sources in Palestine

Energy Economics

PEC coordinates all aspects related to the development of energy economics in the region, emphasizing efficiency and sustainability.

Energy Efficiency

Part of PEC's mission is to promote energy efficiency through research, development, and policy implementation, contributing to the safeguarding of the environment.

Introduction to Green Building

1

Global Population Growth

The world population is projected to reach 9 billion by 2050, increasing demand for life's essentials and impacting ecosystems.

2

UN's Call to Action

For over two decades, the UN General Assembly has urged global strategies for long-term environmental issues.

3

Urban Energy Consumption

Cities, occupying less than 1% of Earth's surface, are responsible for 75% of global energy use and significant greenhouse gas emissions.

Evolution of Green Building Concepts

1

1970s Oil Crisis

The concept of green buildings first appeared during the oil crisis of the 1970s, gaining continuous attention.

2

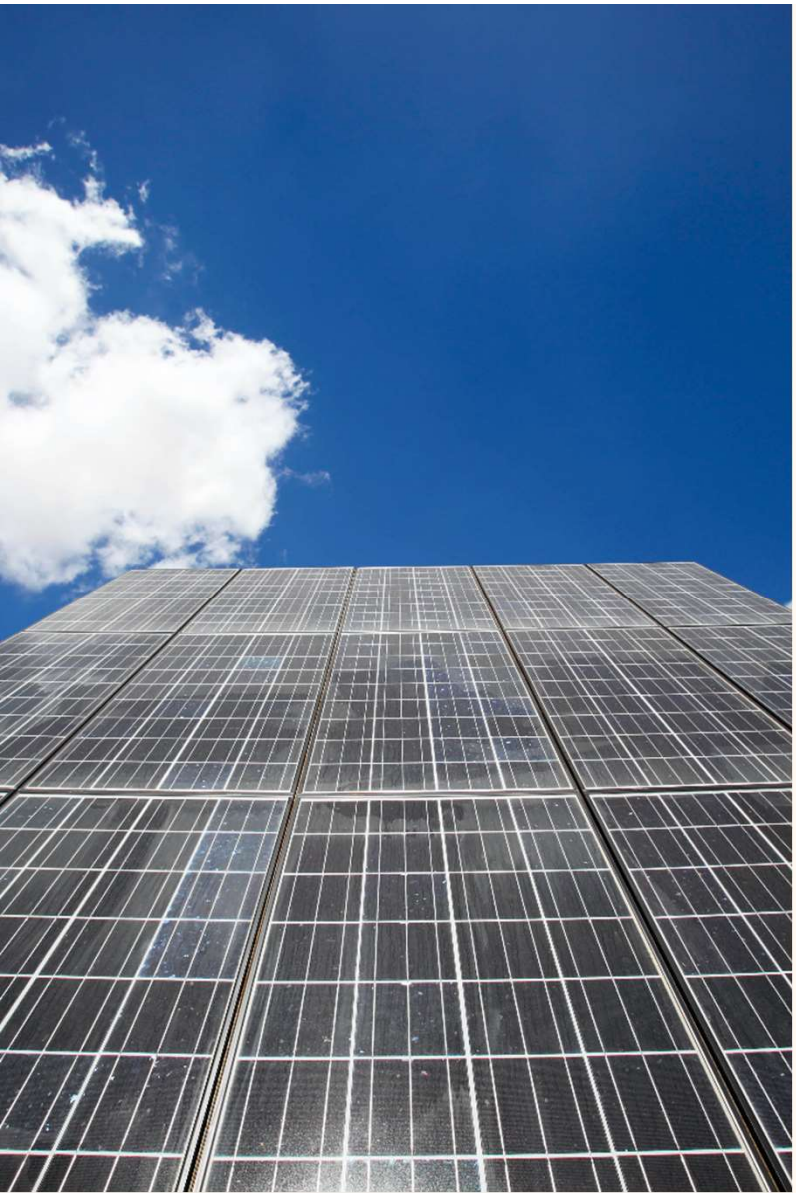
Stockholm Conference

The concept of building was included in the agenda of the Stockholm Conference, emphasizing energy saving.

3

Modern Challenges

Despite global trends, awareness and future operational costs of buildings pose challenges to the spread of green building.



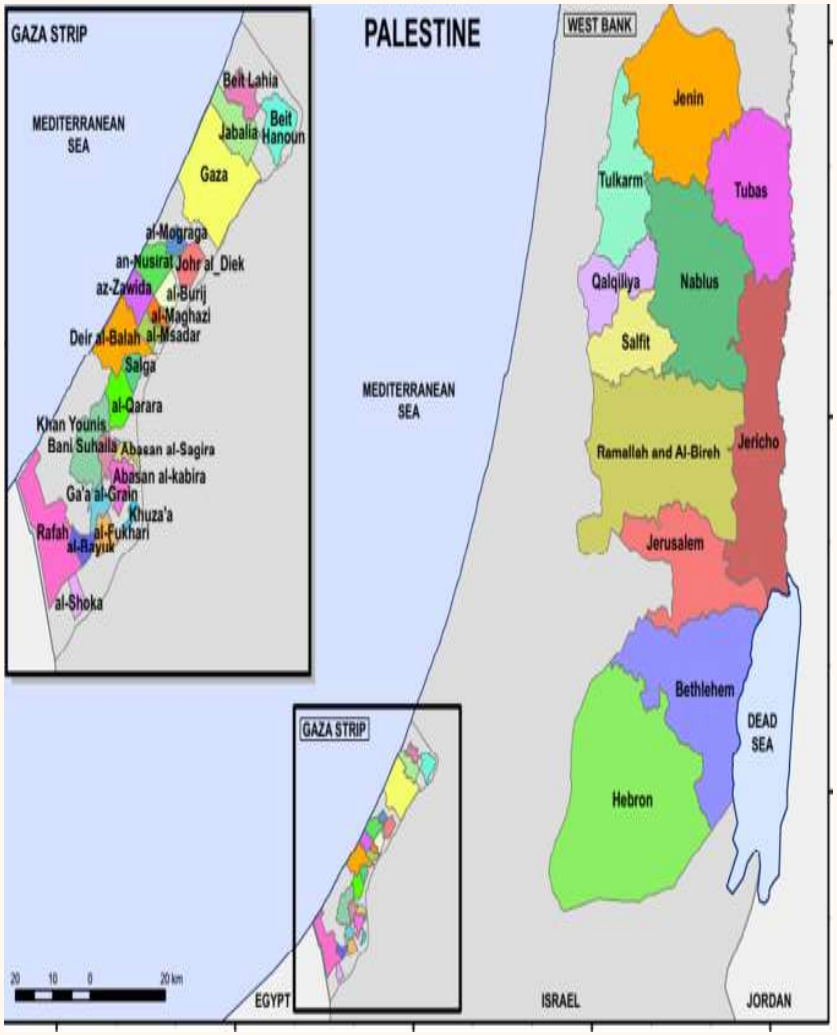
Green Building in Palestine: A Path to Energy Independence

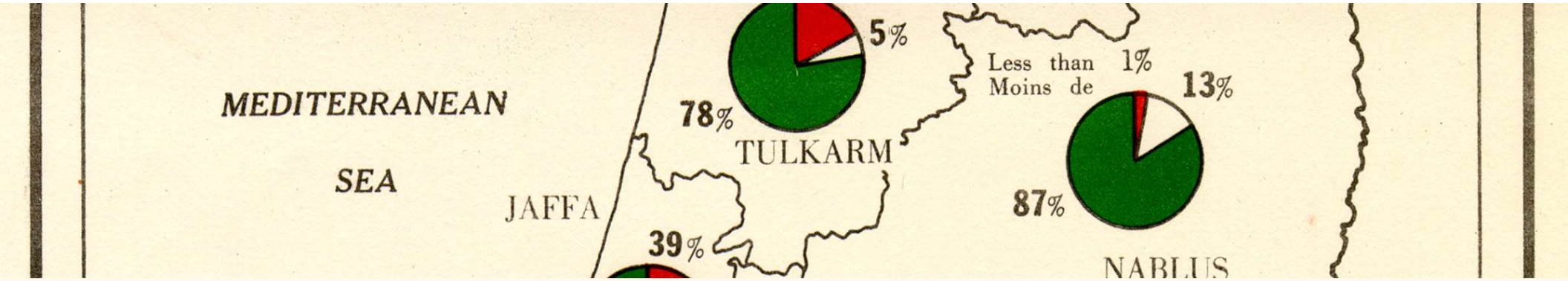
Independence

- Palestine, a developing country under occupation, faces unique challenges in its growth and development.
- With limited control over natural resources and an energy sector under strain, the green building practices is necessary
- The integration of energy-saving designs and renewable energy sources, particularly solar energy, is not just an option but a necessity for sustainable development.
- This presentation view the state of green building in Palestine, projects, and obstacles within this sector, and the potential it holds for the future.

Political Instability and Its Impact

- Political instability in Palestine affects all sectors, including energy and the local economy.
- The control of natural resources, including energy and water, is complicated by the occupation, making the concept of green buildings and sustainable alternative energy more than just a strategy.
- Renewable Energy Sources if implementing effectively, can regulate energy consumption and pave the way for energy independence





Geographic and Demographic Description of Palestine

1

Geographic Location

Palestine is located on the western edge of the Asian continent, with a length of 430 km and an average width of 70-80 km.

2

Climate Diversity

Despite its small area, Palestine encompasses a variety of natural and human geography elements, with diverse climates and altitudes.

3

Population Density

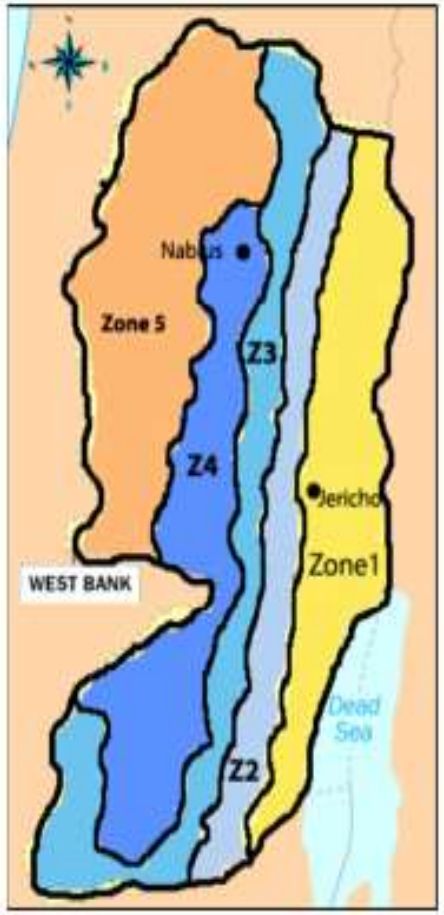
With a population density of 794 people/km2, Palestine's political instability severely impacts all sectors, including energy and the local economy.

Climatic Zones in Palestine

Zone1:
Occupies an area of 1103.3 km2, Hot and dry in summer, warm winter.

Zone 2:
This area is characterized by a hot, dry climate in the summer and mild winter, with area 823.2 km2 which extends along the eastern slopes of the West Bank.

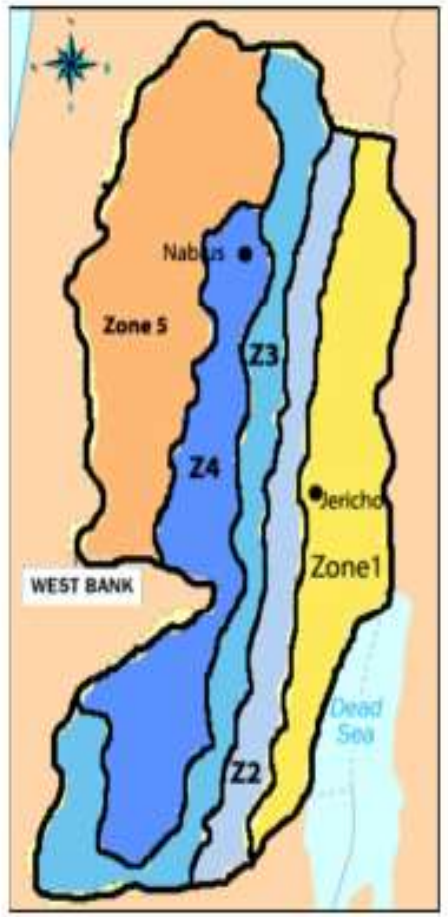
Zone 3:
It has a Mediterranean climate, a hot summer for half a year, and a mild winter, Stretching over 969.1 km2, of the entire area of the West Bank, a semi-arid region.



Climatic Zones in Palestine

Zone 4:

- It features a warm, partly humid summer, cold winters, Mediterranean Sea climate.
- approximately 47% of the total population of the West Bank lives on 1314.6 km2.
- Including Nablus, Jerusalem, Bethlehem, Ramallah, and AlBireh.
- it is considered to be the heart of the West Bank. It is inhabited by most of the buildings. The building materials are natural stone, concrete, concrete blocks.



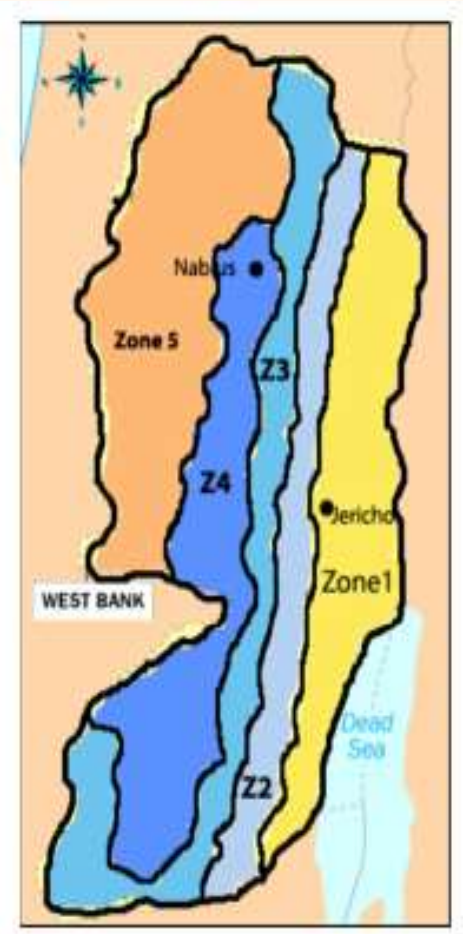
Climatic Zones in Palestine

Zone 5:
Warm sub-humid summer, temperate winter – Mediterranean climate, the area covers an area of 1461.2 square meters, including Jenin, Tulkarm, Qalqiliya and Salfit .

Zone 6:
This area covers the entire coastline and most of the northern, southern and central areas of the Gaza Strip, where more than 97% of the Gaza Strip's population lives. Its climate is humid, the average temperature is 18°C.

Zone 7:
A desert climate, inhabited by about 2.8% of the total population of the Gaza Strip.

It is clear that Palestine has many climatic zones, which means different temperatures, demographics, and different environmental conditions. This is a challenge to the design of the green building.



Energy Sector Complexity

- The reality of energy in Palestine is deteriorating, Israel control of the Palestinian border and buffer limits the prospects for open trade of electricity and petroleum products .

- And makes Israel able to impose non-competitive prices on energy tariffs in Palestine, crippling the ability to develop the energy sector.

Renewable Energy Sources

1

The political, economic and geographic conditions of Palestine make us always think of prioritizing renewable energy sources and their preference for fossil fuels, especially since Palestine is characterized by high indicators of the availability of renewable energy sources as Palestine has more than 3000 hours of sunshine during the year .

2

The rate of solar energy in Palestine varies from 5.4 kW h/m2/day to 6 kW h/ m2/day This energy is very promising if it is compared to other places in the world

Some Achievements in the field of Renewable Energy and Energy Efficiency in Palestine

- Renewable energy projects have been implemented, reaching over 220 megawatts from renewable energy sources, covering 5% of the total energy needs.
- Several renewable energy projects have been executed in Gaza, including schools, healthcare facilities, care homes, and government institutions.
- Through initiatives like the Revolving Fund, over 300 energy audit studies have been conducted across various sectors. Over 350 Gigawatt Hours have been saved by 2020 through implemented activities related to energy efficiency.
- Issuance of energy efficiency guidelines and licensing of energy auditors, with mandatory periodic energy audits for high-consumption institutions.
- Issuance of guidelines for integrating 250 off-grid energy systems with various capacities projects into the electrical system.

The Construction Sector in Palestine

The Construction Sector in Palestine

Economic Impact

The construction sector in Palestine recorded a growth rate of 36% in 2010, with a 22% increase in workforce compared to 2009.

Environmental Concerns

Modern buildings have become more harmful to the environment, increasing energy consumption and carbon emissions.

Random Construction

Many Palestinians build homes without professional guidance, leading to random construction and neglect of thermal comfort.

Traditional vs. Modern Architecture in Palestine

Traditional Materials

Historically, construction materials were locally sourced and suited to the climate, embodying sustainability principles.

Modern Shift

Modern construction has moved towards materials like metal and glass, which may compromise sustainability for aesthetics.

Energy Efficiency

Traditional Palestinian architecture often featured elements that conserved energy, such as thick walls and courtyards.

Traditional vs. Modern Architecture in in Palestine

Heat Insulation

Traditional buildings offered better insulation with thick walls and clay materials.

Shading and Orientation

Historical buildings provided shading and were sensitive to southern orientation for sunlight optimization.

Ventilation

In coastal areas, individual buildings allowed for better ventilation, while mountainous regions had adjacent construction for heat retention.

Green Architecture and Planning

Voluntary Nature

Green architecture in Palestine is currently voluntary and not enforced by binding regulations.

Cooperation in Construction

Green building requires serious planning and cooperation among all stakeholders in the construction process.

Private Sector Role

The private sector can provide incentives such as green building insurance and preferential housing loans for green buildings.

Palestine Green Building Council (PalGBC)

(PalGBC)

The Palestine Green Building Council (PalGBC), is an organization leading the charge in promoting green building practices that was established in 2010

Mission and objectives

PalGBC plays a pivotal role in advocating for sustainable building design, construction, and operation across the region.

Guidance and Training

(PalGBC) provides guidance and training for human resources in the field of green buildings.

Palestine Higher Green Building Council (PHGBC)

PHGBC is a non-governmental organization , has emerged from the cooperation between the Palestinian Engineers Association and several governmental and nongovernmental organizations.

Mission and objectives

Supporting research and studies in the field of green buildings and clean energy, and employing them in the process of promoting this sector in Palestine.

Guidance and Training

Educating the community about the concept of green buildings.

Palestinian Energy Efficient Building Code, Ministry of Local Government, 2004

The Ministry of Local Government issued this code to deal with the modern construction legislation

Code Purpose

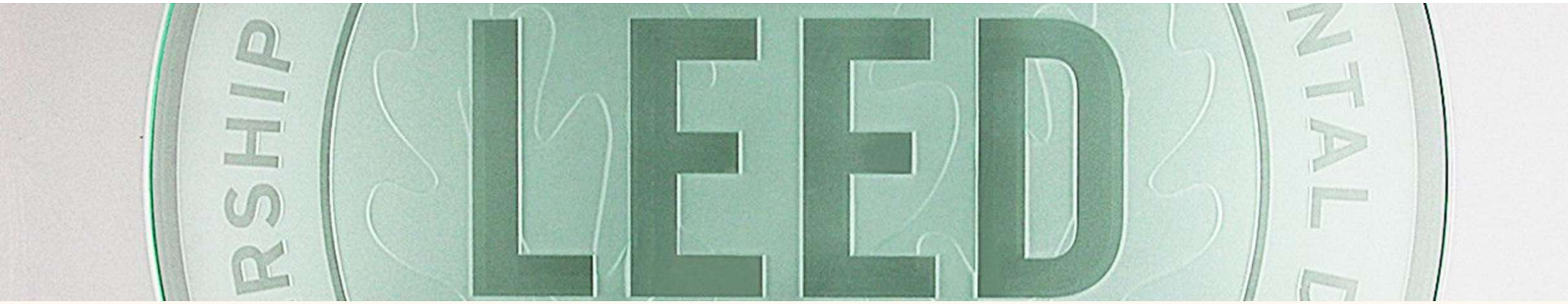
The code aims to reduce energy waste and develop Palestinian building systems through thermal design.

Environmental Protection

It focuses on reducing greenhouse gas emissions and ensuring thermal satisfaction.

Thermal Building Design

Basic principles in the design of thermal buildings are outlined to improve energy efficiency.



Green Building Certification and Standards

- The green building certification process in Palestine is based on a point system that evaluates sustainability aspects such as site, energy, water efficiency, and innovation.

- Buildings are categorized into Diamond, Gold, Silver, and Bronze classes, promoting a competitive environment for sustainability.

Green Building Certification and Standards

- While international certifications such as LEED are valuable, there's also a significant emphasis on developing local standards and frameworks to suit the unique context of Palestine.

- One such example is the local rating system developed by a group of engineers affiliated with the Engineers Association .

- This local rating system has facilitated the certification of several notable projects in Palestine, demonstrating the commitment of local stakeholders to sustainability.

Green Buildings Projects in Palestine

1

Palestinian Museum

Palestine's first energy-efficient green building, the first LEED Gold Museum in the middle east.

2

M. Qattan Foundation

A multi-purpose cultural building in Ramallah, certified by the Palestinian Higher Green Building Council.

3

Aqqaba Green School

Rated by the Palestinian Higher Green Building Council, it is the first green school in Palestine.

4

Palestine Islamic Bank Archive Building

A financial Rated by the Palestinian Higher Green Building Council

Green Building Initiatives

Ministry of Education Efforts

The Ministry is working to improve school buildings to meet high-quality green design standards.

Individual Projects

Individual efforts are being made to design sustainable buildings that are harmonious with the environment.

Retrofitting Projects

The Palestine Green Building Council (PalGBC) has spearheaded transformative retrofitting projects that exemplify the principles of green buildings, earning global recognition for their innovation and impact

Retrofitting of Qaddoura Refugees Camp Households

- This project aimed to improve the living conditions of residents while minimizing environmental impact.
- Through strategic interventions focused on energy efficiency, water conservation, and sustainable materials.
- the project achieved remarkable success. Its innovative approach garnered international acclaim, earning several prestigious trophies worldwide.

PalGBC New House Project

Retrofitting a 65-year-old building in a state of disrepair, PalGBC transformed the structure into a modern, energy-efficient facility.

Strengths in Adopting Sustainable & Green Construction

Government Support

The Palestinian Government and related authorities are committed to advancing the sustainable building sector.

Clean Energy Resources

Palestine has access to alternative clean energy resources, such as solar and wind power.

Cultural Heritage

Traditional old buildings in Palestine were more sustainable, offering insights for modern construction.

Weaknesses and Challenges in Green Building Building

Financial Support

Limited financial support and high technological costs are major obstacles to green building projects.

Lack of Legislation

There is no governmental framework to enforce green building requirements.

Building Material Nature

The use of non-sustainable materials is prevalent, which is not in line with green building principles.

Public Awareness and Green Building

- The concept of green buildings as a way of living and integrating with nature, climate, and energy sources is not yet widely adopted by the Palestinian public.

- Raising awareness and implementing strict legislation and regulations with incentives for green building are essential steps toward sustainable construction practices in Palestine.

Conclusion: Green Building Sector in Palestine

- The green building sector in Palestine is at an evolving stage.
- The Ratio of buildings constructed according to green Buildings standards is very marginal , and could be considered 0%.
- There is a keen interest from the government, the Engineers Association and the Ministry of Local Government , in the sense of the sustainability of the buildings in Palestine and that there is full awareness among these parties that the green building combined with the abundance of clean energy sources in Palestine is a big step towards the independence of the energy sector.
- The modern construction is characterized by excessive waste ,buildings and apartments are adopted in a completely inefficient way.
- Financial incentives and binding legislation are needed to stimulate investment in green building and raise public awareness of its benefits.

...The first step towards a sustainable and independent future in Palestine is the laws and legislation that are binding on the conditions of sustainability in buildings

in addition to activating financial instruments that stimulate the private sector to invest in green building

in addition to raising public awareness of the economic and health benefits of the Palestinian people.

The current situation will not be overnight in Palestine, but there is always a first step in the march of a thousand miles.

Thank You