CONCEPT AND PROCEDURES; INNOVATIONS AND METHODOLOGIES FOR ENSURING SUSTAINABILITY

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Guiding Principle

Balance infrastructure needs with environmental protection to enhance the quality of life for present and future generations.

Elements of Sustainable Infrastructure

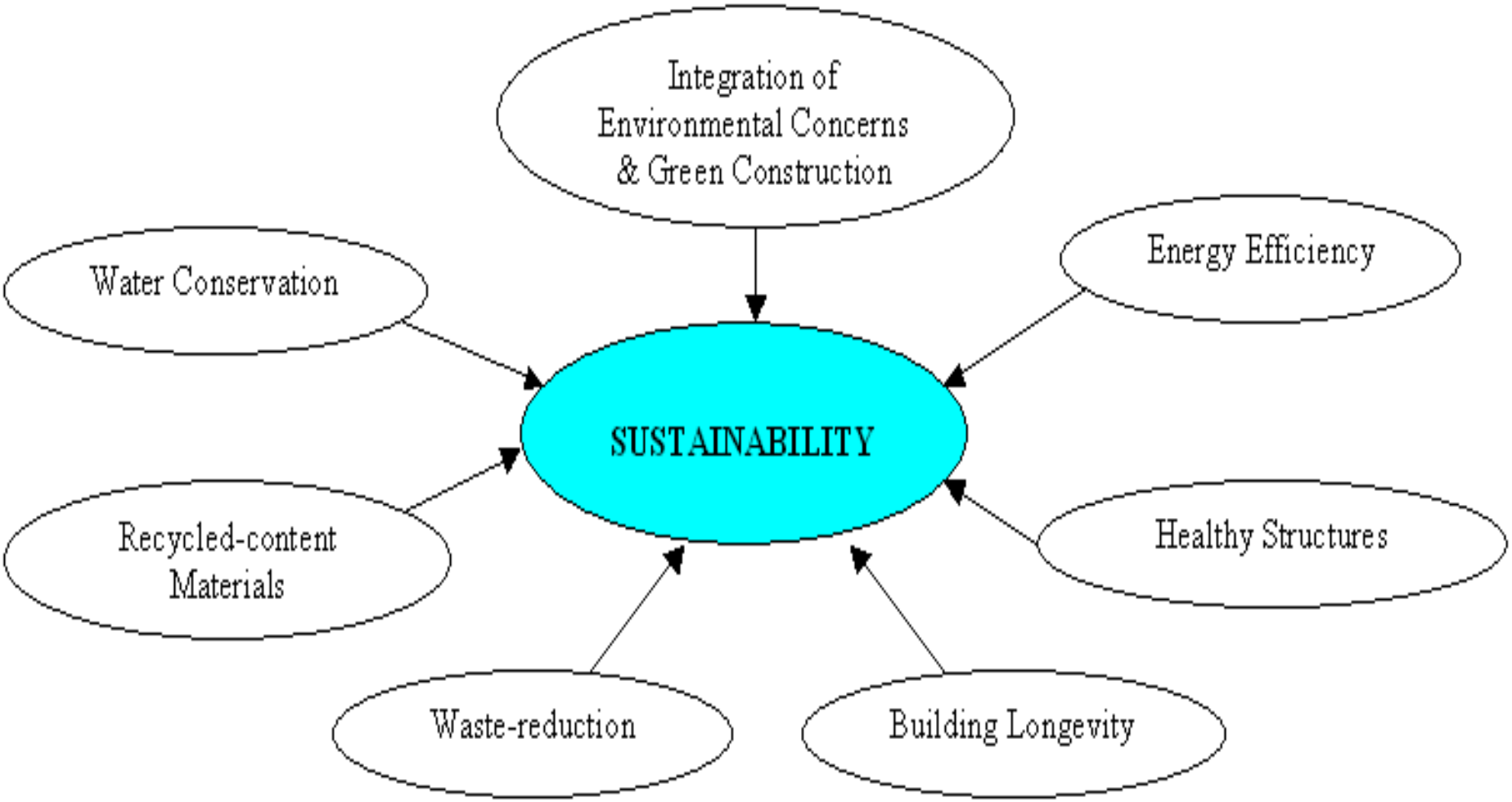
- Environmental protection
- Economic development
- Quality of life

Sustainability

SUSTAINABLE DEVELOPMENT

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs

(The Brundtland Commission,1987)



Working Principles

Goals of Sustainable Development

There are three primary goals of sustainable development:

- To minimize the depletion of natural resources when creating new developments.
- To create development that can be maintained and sustained without causing further harm to the environment.
- To provide methods for retrofitting existing developments to make them into environmentally friendly facilities and projects.

Importance of Sustainable Development

- Provides essential human needs
- Agricultural requirement
- Manage climate change
- Financial stability
- Sustain Biodiversity

Examples of Sustainable Development

- Wind energy
- Solar energy
- Green space
- Crop rotation

Advanced Features of a Sustainable Building

- Best Building Form
- Solar & Energy Efficient Design
- Improved Indoor Air Quality
- Usage of Green Materials
- Proper Mechanical Systems
- Efficient Lighting
- Proper Testing & Maintenance

Recommendations

- Recycling water from current and
  facilities
- Building new wastewater facilities “upstream”
- Reducing rainfall-dependent inflow and infiltration
- Increasing water conservation
- Reusing more wet weather urban runoff
- Finding beneficial reuses of biosolids

Global Energy Use

- Global energy use will increase 1.7% annually to 2030
- Fossil fuels will supply 90% of energy sources
- Carbon dioxide emissions will increase 1.8% annually to 2030

Solar Photovoltaic Systems

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- Convert sunlight directly into electricity
- Reliable, predictable electricity for peak power grid capacity

Sustainable Development for the Future

- Complex and long-term challenges will take sustained effort for generations
- No one approach, no one single formula
- A “blueprint” for sustainable development is neither possible nor desirable
- Every country, community, environmental steward, and municipality must take a proactive role in shaping the future

Green Materials

- Materials, production, use and disposal must be safe for the planet. Most of the materials have specific range of conditions in which they best work
- Sustainable building materials have the following features:
  - Durable and easily maintained
  - Less processing required
  - Low odor
  - Low emitting
  - Cost-effective
  - Aesthetic

Economics of Green Buildings

- Reduction in lighting energy requirements by at least 50 percent
- Cut heating and cooling energy consumption by 60 percent
- Reduced water consumption by up to 30 percent or more
- Lower building operating expenses through reduced utility and waste disposal costs
- Lower on-going building maintenance costs, ranging from salaries to supplies
- Increase worker productivity by six to 16 percent
- Higher property values and potentially lower lenders' credit risk
- Higher building net income
- New economic development opportunities

Benefits of Sustainable Construction

- Sustainable construction makes wise use of all the natural resources and a 50% reduction in energy use
- Improves occupant health, comfort, productivity, reduces pollution and landfill waste that are not easily quantified
- A sustainable building may cost more up front, but saves through lower operating costs over the life of the building
- Building is designed as one system rather than a collection of stand-alone systems with the help of the integrated system approach

Future of Sustainable Buildings

- Further research
- Successful examples of Sustainable buildings
- Newer, efficient and healthier technologies
- Availability of computer software programs to identify and evaluate options for a building project
- Governmental support
- An active participation from every sector of the society

THANK YOU