GREEN CONSTRUCTION: INTEGRATING GREEN TECHNOLOGICAL INNOVATIONS FOR SUSTAINABLE ECONOMIC DEVELOPMENT IN DEVELOPING ECONOMIES

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Introduction / Background

- The construction industry accounts for over 30% of the global greenhouse gas (GHG) emissions.

- Green Building design, green transportation, green energy and green IT can be integrated to reduce this environmental burden caused by this sector

Statement of the problem

- The construction industry is projected to grow rapidly in the next decade especially in Africa and other emerging economies

- This means that the environmental footprint of the construction industry will rapidly grow unless sustainable construction is adopted

Study objectives

. To evaluate the level of integration of green technologies in smart buildings

. To identify the potential benefits of adopting smart buildings in the building sector

. To develop a framework for green construction adoption

Brief literature review

- Good environmental practices ensure a sustainable economy while a sustainable economy protects the environment (Terdiman, 2012)

- sustainable development embodies integration, and understanding and acting on the complex interconnections that exist between the environment, economy, and society(UN, 1992).

Brief literature review

. Green design: eastgate mall in Harare (Biomimetic design)

. Designed to reflect the termite moulds of zimbabwe which self-regulates its temperatures

. Building consumes less than 10% energy of a typical building

. Rent cost is 20% less than other buildings

Brief literature review

- UNON new building (UNEP)

- Case example of green construction in practice

- Houses over 1200 staff, Utilizes solar energy by producing about 750,000kwh of solar energy from solar panels that cover entire rooftop; maximum utilization of daylight; in green design, the building is designed with open windows facing East and western side; light wells to tap on the day light; rain water tapped and sewage treated and used to irrigate; maximises cooling natural airflows
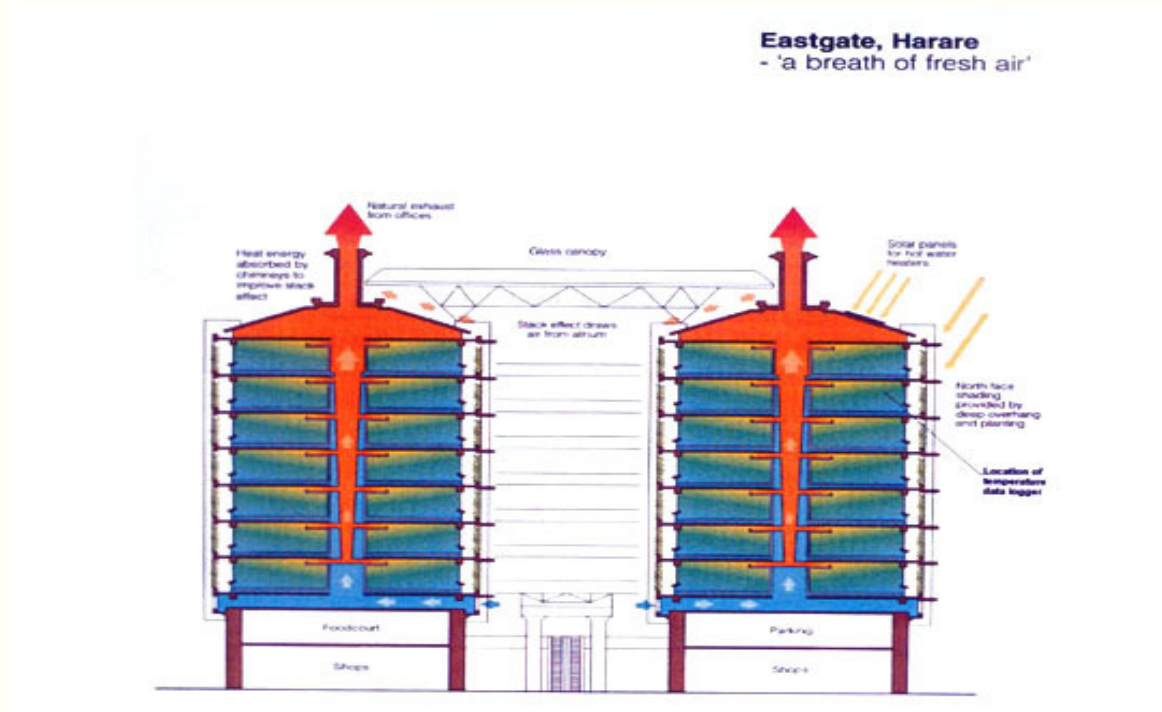
- Green transportation (local materials were utilized)

- On green IT: notebook computers; server cooling done outside (Microsoft); green purchasing / maintenance (local vendors)

UNEP green building

EASTGATE CENTRE

Eastgate, Harare
- 'a breath of fresh air'

Methodology

. Research is based on a review of secondary data on successul cases of green construction as well as on UNEP research on business case for green economy

Findings / Results

- Green integration
- Green IT
- Green energy
- Green transportation
- Green design

Conclusions

- For maximum sustainability benefits from the building industry, there is need to integrate all the necessary technologies to maximise savings on the environment

- Green buildings costs 2% more but save up to over 18%

Green construction framework

sustainability Awareness

Green design

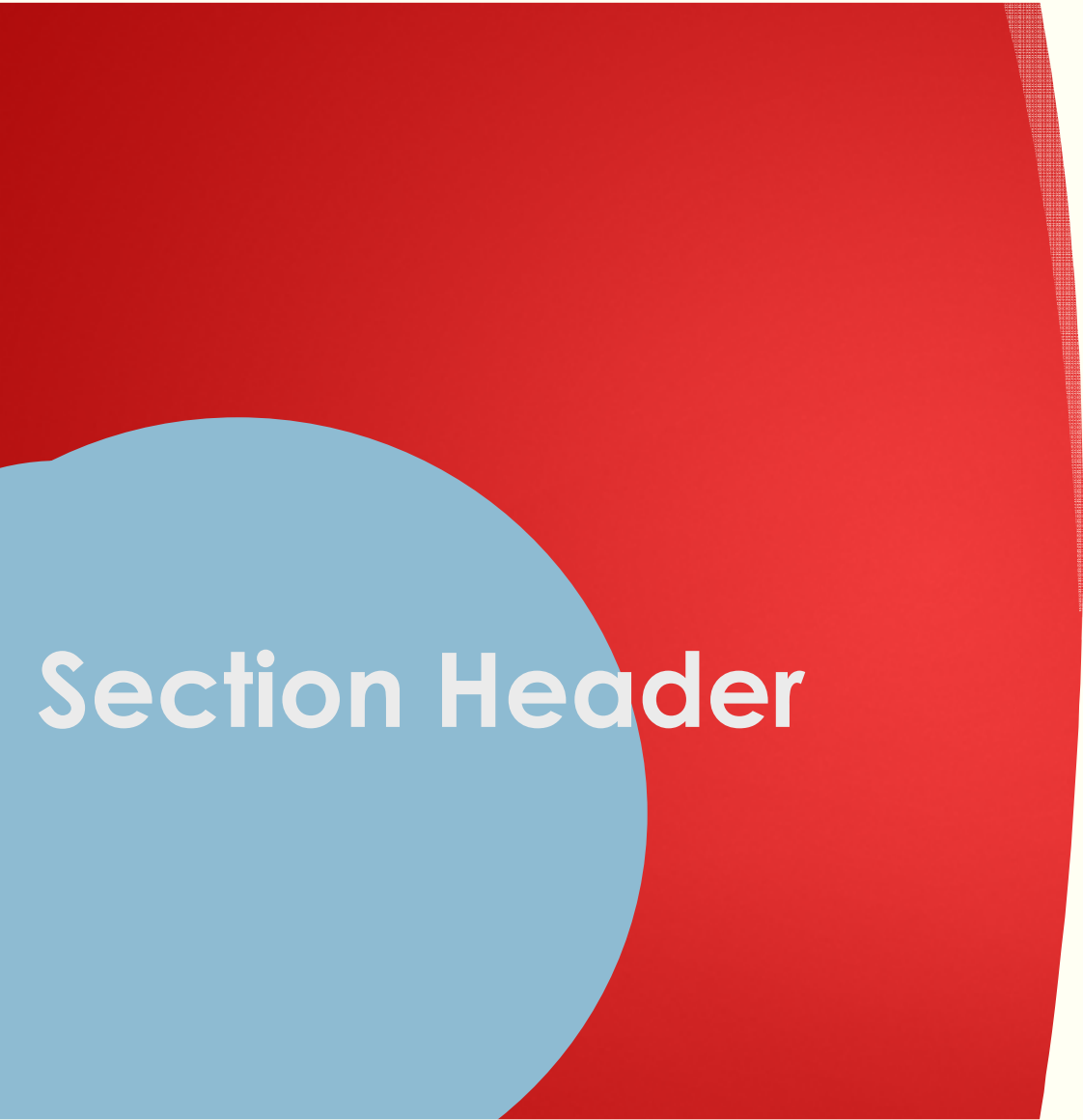Green transportation

Green energy

Green IT

Green IS

Case examples

. UNEP Green building in Nairobi

. Eastgate building in Harare (green design)

Recommendations

The government needs to take a lead role in driving green construction

Areas for further study

. Model validation

. Green construction metrics especially in developing economies

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