

NELSON MANDELA
UNIVERSITY



**Sustainable Green Settlements:
A Path to Sustainable Cities in South Africa and Beyond**

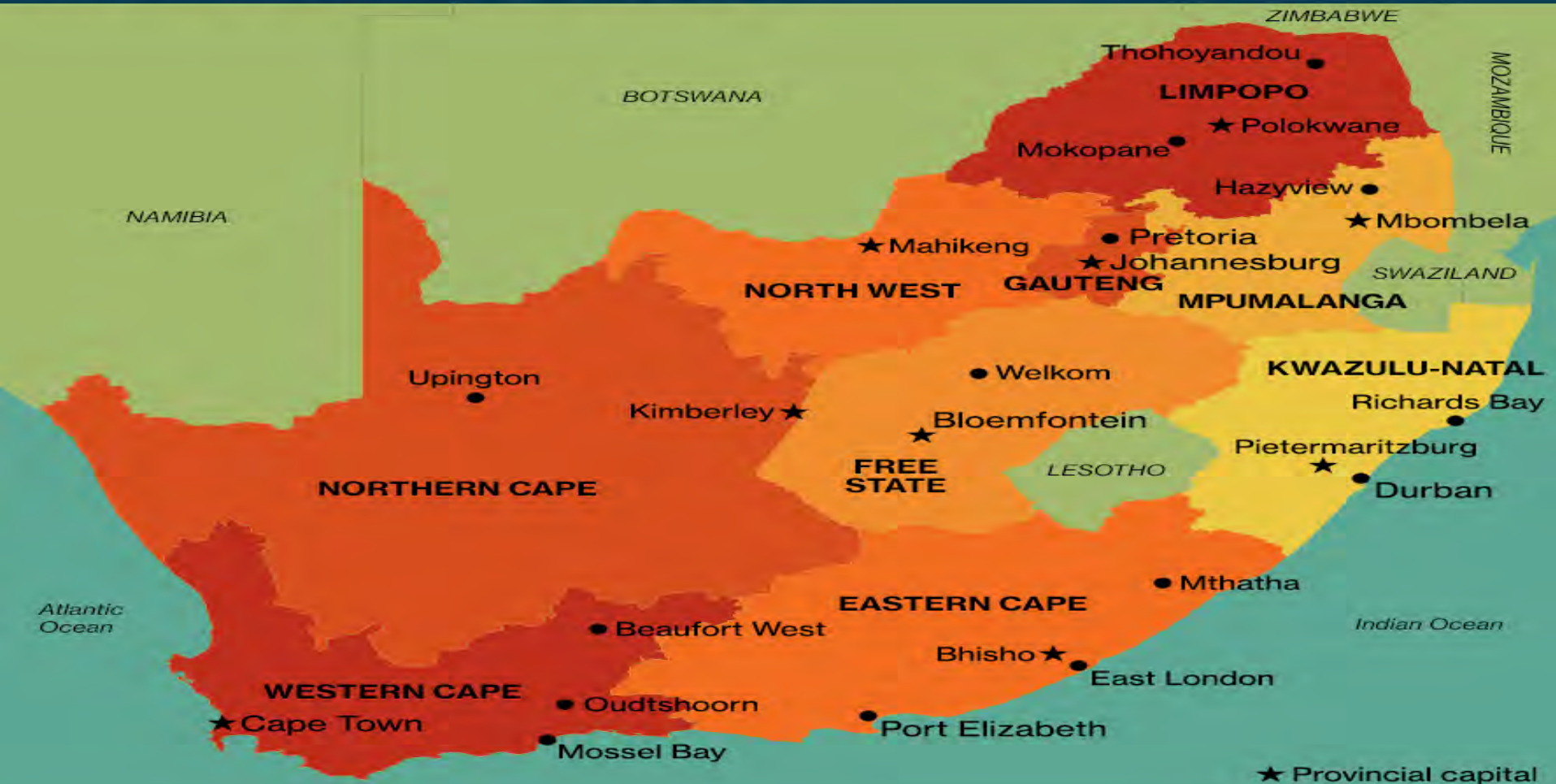
Prof Sijekula Mbanga, PhD

Chair for Sustainable Human Settlements

City Centre Sustainable Housing Design Students Competition: Workshop 2

27th March 2024

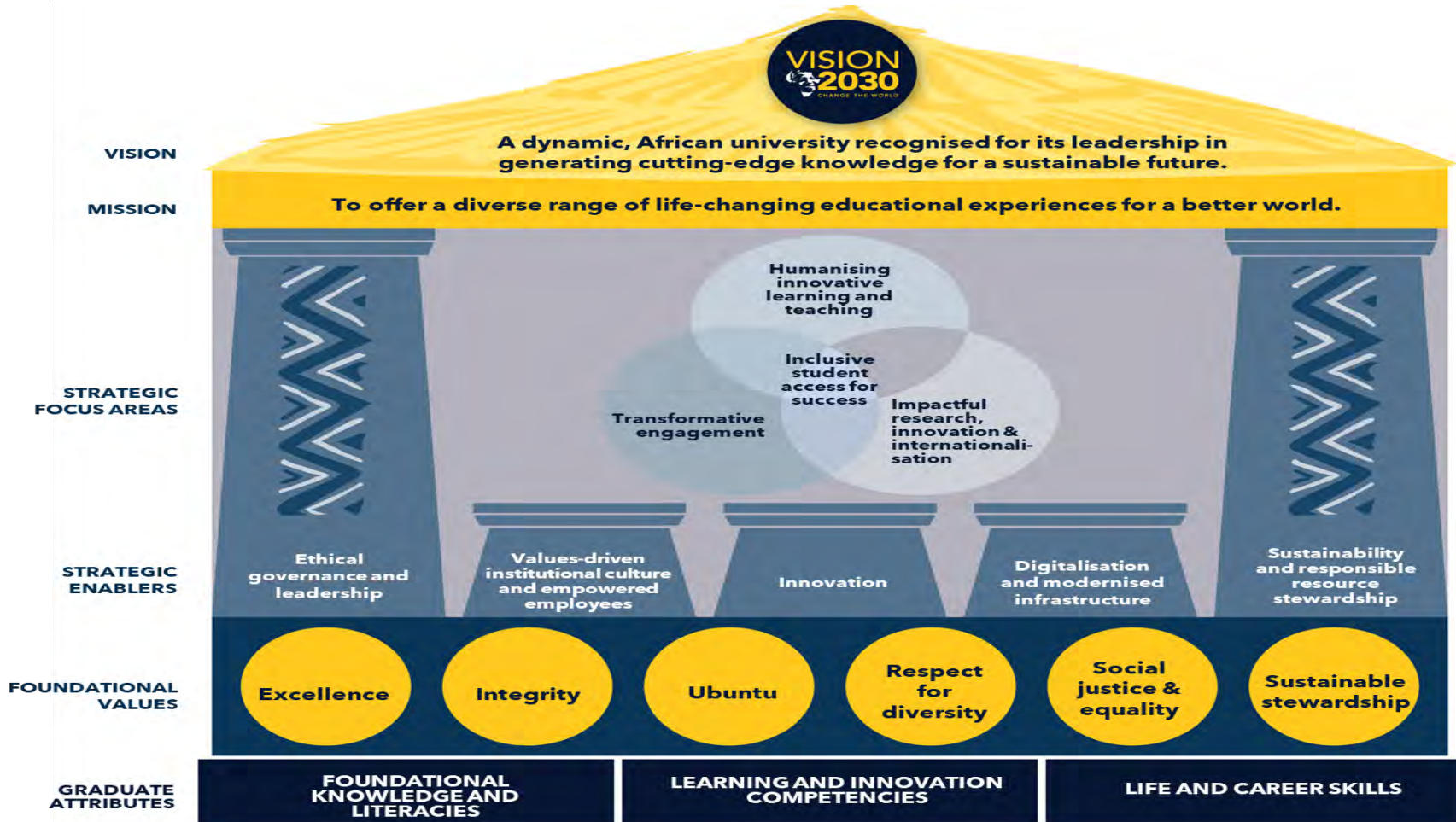
South Africa's nine provinces



★ Provincial capital



Vision 2030 strategic framework



Nelson Mandela University: current research themes and strategic trajectories

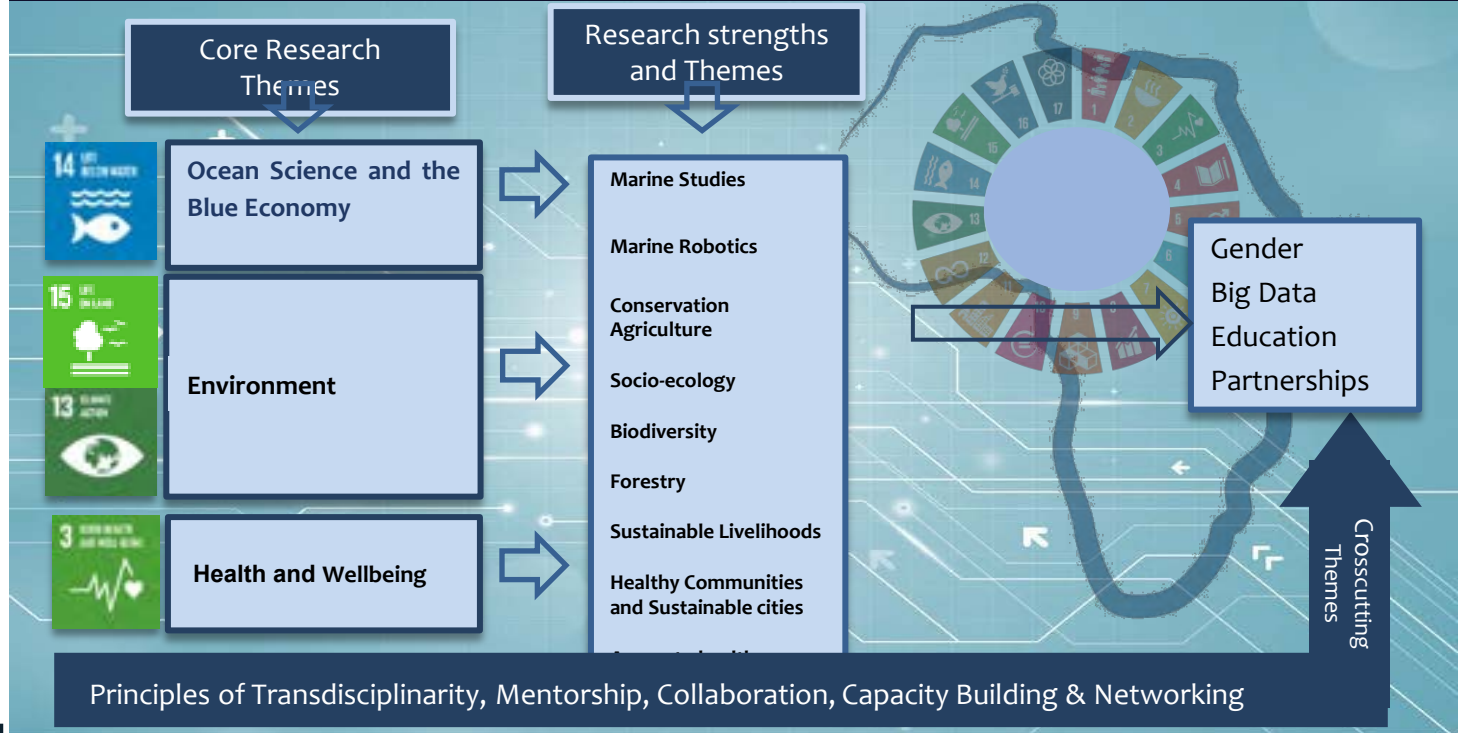
Six research themes

- Ocean and coastal sciences
- Social justice and democracy
- **Environmental stewardship and sustainable livelihoods**
- **Innovation and the digital economy**
- Origins, culture, heritage and memory
- Humanising pedagogies

Strategic Trajectories

- Medical School
- Ocean Sciences
- Revitalization of the Humanities and **fostering transdisciplinarity**
- Expansion of the African footprint

Focus on Sustainability and Adaptation



National Development Plan

Principles for Human Settlements Vision 2030

Principles underpinning spatial development

- **Spatial justice** – The historic policy of confining particular groups to limited space (ghettoization and segregation) and the unfair allocation of public resources between areas must be reversed.
- **Spatial sustainability** – Sustainable patterns of consumption and production should be supported, and ways of living promoted that do not damage the natural environment. Walkable neighborhoods, for example, reduce the need to travel and limit greenhouse gas emissions.
- **Spatial resilience** – Vulnerability to environmental degradation, resource scarcity and climatic shocks must be reduced. Ecological systems should be protected and replenished.

Principles for spatial development

- **Spatial quality** – The aesthetic and functional features of housing and the built environment need to be improved to create more liveable, vibrant and valued places.
- **Spatial efficiency** – Productive activities and jobs should be supported, and burdens on business minimized. Efficient commuting patterns and circulation of goods and services should be encouraged, with regulatory procedures that do not impose unnecessary costs on development.

Indicators for **positive** spatial development

- Integrating rural and urban areas;
- Accommodating social diversity within the built environment;
- Creating more dense settlement without raising the cost of land and housing for the poor;
- Integrating transportation systems and land use;
- Broadening the economic base of towns and cities through supply of reliable infrastructure;
- Suitable land and property;

Overarching principles for spatial development

- Connectivity;
- Skills and logistics;
- Building community involvement and partnerships;
- Generally supporting the development of vibrant;
- Diverse;
- Safe;
- Green and valued places;
- And ensuring that governance arrangements and leadership deliver equitable and efficient decision-making.

African Union Agenda 2063



AGENDA 2063 The Africa We Want

Aspiration 1

A prosperous Africa based on inclusive growth and sustainable development

Aspiration 2

An integrated continent, politically united and based on the ideals of Pan Africanism and the vision of Africa's Renaissance

Aspiration 3

An Africa of good governance, democracy, respect for human rights, justice and the rule of law

Aspiration 4

A peaceful and secure Africa

Aspiration 5

An Africa with a strong cultural identity, common heritage, values and ethics

Aspiration 6

An Africa where development is people-driven, unleashing the potential of its women and youth

Aspiration 7

Africa as a strong, united and influential global player and partner

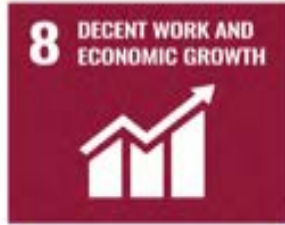


*The Future
we want for Africa*

AGENDA 2063
Unity, Prosperity & Peace



Sustainable Development Goals 2030



Rapid Urbanisation: A Global Reality and Challenge



Urbanisation: Global Challenge

- The global trend of rapid urbanisation has seen to more than half of the world's population of 7 billion people, by today, living in cities.
- According to the United Nations Habitat Programme about 1 billion of urban dwellers live in slums across the world, and this number is projected to increase to 3 billion by 2030.
- To date about 55% of urban dwellers in Sub-Saharan Africa cities live in slums and informal settlements, a figure than is significantly higher than the current global average of 30%.

Urbanisation: A Global Challenge

- **Unguided** urbanisation has fueled the continuous increase in the number of informal settlements globally.
- Socio-economic inequality remains the universal concern within urban cities and across world territories.
- Informal settlements are characterized by poor housing conditions, lack of basic services such as water, sanitation, energy supply and waste removal.

Urbanisation: A Global Challenge

- There is also lack of access to healthcare and other social services.
- Makeshift houses that are built on unlawfully occupied land utilizing a development process that fails to follow pre-determined national building regulations and urban planning authorizations are a prominent feature of informality.
- Informal settlements are not offering security of tenure to inhabitants.

Urbanisation: A Global Challenge

- Informal settlements are established on environmentally sensitive spaces, flood-plains and sinkholes.
- Lack of security of tenure by informal settlement residents,, suggests that there cannot be public and private sector investment in those areas.
- Poverty, climate change related disasters, violence, crime and conflict are fast-becoming urban phenomena and mostly felt in vulnerable communities.



Pictorial view of some areas at Rolihlahla/Vistarus in Nelson Mandela Bay

Vistarus (Rolihlahla) Informal settlement cont'd



Vistarus (Rolihlahla) Informal settlement

- Map of the area :
<https://goo.gl/maps/1GzctGXAhPcR9w9s9>
- GPS location : 33°52'29.3"S 25°33'16.6"E
- Description of site physical and environmental conditions:
 - The area is a community of unplanned settlements at Vistarus next to the Missionvale campus of the Nelson Mandela University
 - The features are as with other South African informal settlements.
- Demographics / size and number of affected people:
 - Vistarus has a population of approximately 1200 households on a land size of 43646 square meters.
 - Approximately 400 households are being relocated out of Missionvale precinct.



Pictorial view of some areas at Chris Hani Informal Settlement

Chris Hani Informal settlement

- Map of the area :
<https://www.google.com/maps/place/33%C2%B053'48.2%22S+25%C2%B034'53.8%22E/@-33.8967083,25.579428,607m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d-33.8967083!4d25.5816167>
- GPS location : 33°53'48.2"S 25°34'53.8"E
- Description of site physical and environmental conditions:
 - The area is a community of unplanned settlements at New Brighton and it is on a deposit of Methane Gas
 - The community is resisting relocation
 - The features are as with other South African informal settlements and the stench from waste in this area is very offensive
- Demographics / size and number of affected people:
 - Chris Hani has a population of approximately 654 households.

Chris Hani Informal settlement cont'd

















Transforming Duncan Village in East London into Reeston



RDP / BNG homes in Dimbaza, eQonce



Rurality

- Traditional Xhosa Home vs Modern Xhosa home



Urbanisation: South Africa's Spatial Transformation Challenge



South African Context

- The persistent challenge of **poverty**, **unemployment** and **inequality** with its historical spatial dimensions confronts the South African democratic state.
- About 53% of the South African population lives below the generic poverty line (R992 per month) – these are concentrated in **rural areas** and **informal settlements** in Cities and secondary towns (Statistics South Africa, 2016).
- Infrastructure investment, since 1994 in several municipalities co-exists with lack of household **income** and **livelihoods** programmes.

South African context

- The continuing dilemma of **urban fragmentation and sprawl** is enforcing disintegration in the South African urban landscape.
- By 2019, about 2.4 million South African households (13,6% of national population) including **foreign nationals** occupied informal settlements.
- Most '**housing**' development projects are situated on the outskirts of urban areas where limited social and economic services exist.
- Availability of suitable, well-located **land** including funding for **bulk infrastructure** to service available land remains a challenge.

A Sustainable Green Village

HUMAN SETTLEMENTS

(United Nations Habitat definition 😊)

Cities, towns and villages that are **liveable**, **integrated** and **multi-functional**, in which all settlements are **well-connected** to essential and social services, as well as to areas of work opportunities.

Sustainable human settlements

are well managed entities where economic growth and social development are in balance with the carrying capacity of the natural systems on which they depend on for their existence and result in sustainable development, wealth creation, poverty alleviation and equity. The present and future inhabitants of sustainable human settlements, located in both rural and urban areas, live in safe and secure environments, and have access to economic opportunities.

The overarching goals of development are
“**integration**’ and “**sustainability.**”

□ Integration Dimensions

Integration follows the three dimensions or designs: physical / functional, social and economic.

1. Functional: The aim is to create lively and interactive living and working areas where all dimensions of activity including cultural, educational, economic are catered for. Mixed use areas with good infrastructure.

2. Social: The aim is to facilitate a diverse and vibrant population mix in a community catering for different cultures, ages, abilities and beliefs.

3. Economic: The aim is to create a community that reflects a diversity of income groups, and a range of different scales of economic activities, possibilities and opportunities.

The overarching goals of development are
“**integration**’ and “**sustainability.**”

☐ Sustainability Dimensions

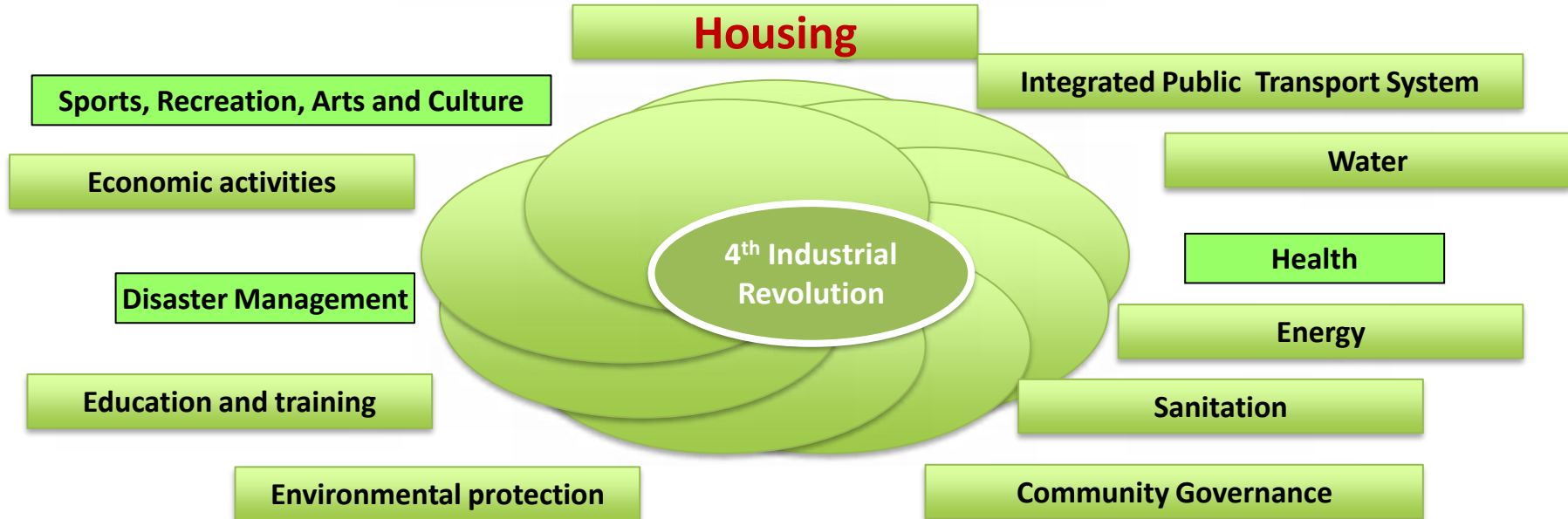
There are environmental, social and economic considerations that must be taken care of when planning and developing communities.

Environmental / Ecological: Involves the protection and conservation of non-renewable natural resources.

Social: Involves meeting the basic needs of all communities and ensuring diversity in communities as well as democracy and participation.

Economic: Means adequate employment and livelihood opportunities in a community as well as economic growth and increasing general and individual prosperity.

A SUSTAINABLE GREEN VILLAGE

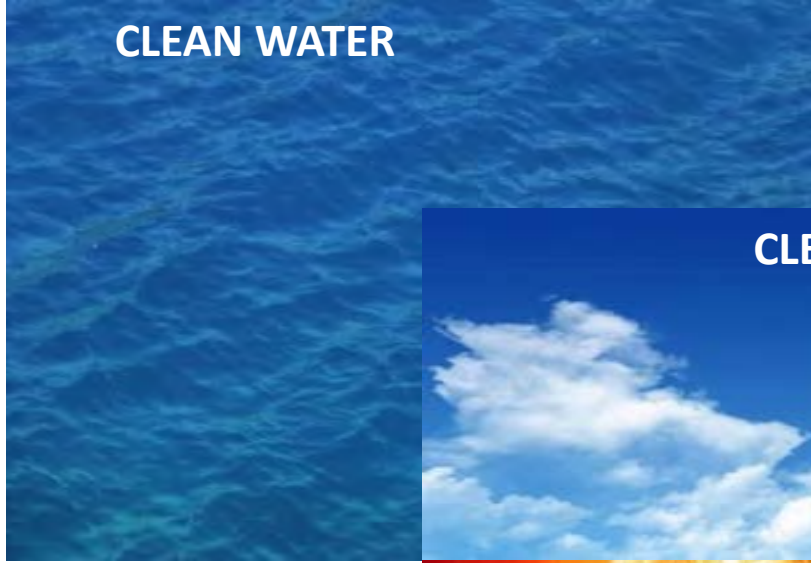


More than just housing...water...sanitation...energy.. crèches
....schools ...clinics ... economic livelihoods ... sports and recreational
facilities ... churches ... social services cemeteries

transforming residential areas and building **safe, just,**
resilient, equitable, prosperous and **happy**
communities with access to work and social amenities, and
active in local and global economy...

A “GREEN” VILLAGE

CLEAN WATER



WASTE RESOURCE



CLEAN AIR



CLEAN ENERGY



Green Village DEFINED

- **Natural places and spaces where people can live , work and play.**
- **Is about mainstreaming environmental issues in development programmes and projects**
- **A village that can be developed utilizing natural resources without harming the natural environment**
- **Creates a win-win situation for the environment, economy and community**
- **‘Smart’ Green Villages refers to incorporation of appropriate Information and Communication Technology (ICT) capabilities to benefit the local community**

Green Village DEFINED

- **Is about using technologies in an integrated manner in order to achieve efficient, effective, equitable and sustainable use of natural resources.**
 - **Energy efficiency**
 - **Water self-sufficiency**
 - **Pollution reduction (“fresh air”)**
 - **Sustainable solid waste management solutions**
 - **Appropriate ICT solutions**
 - **Car-free (safe pedestrian, Going Electric Cars / Uber)**
 - **Sustainable land-use and Agricultural practices**
 - **Innovative Materials and Building Systems**
 - **Sustainable Sanitation solutions**

Green Village Design DEFINED

- **Is about creating beautiful (aesthetically) living spaces (built environment) where luxury and comfort fit into the natural landscapes, with one impacting on the other in a positive and sustainable manner.**
- **Integrates the environmental sustainability principles, approaches and actions into development activities in order to achieve poverty reduction and economic transformation**
- **Includes sensitization, awareness raising and training of community and beneficiaries to manage, own and sustain project benefits.**

Green Village Design OUTCOMES

- **Sustainability**
- **Eco-sensitivity**
- **Energy efficiency**
- **Climate responsiveness**
- **User-friendliness**
- **Cost-effectiveness**

Green Village Design DEVELOPMENT OBJECTIVES

- **Conserve energy, water and other resources**
- **Preserve the environment**
- **Strengthen local economy**
- **Promote quality of life (general well-being) of citizens**

Green Village Design DIMENSIONS

- **Social development**
- **Economic development**
- **Environmental management**
- **Institutional management**

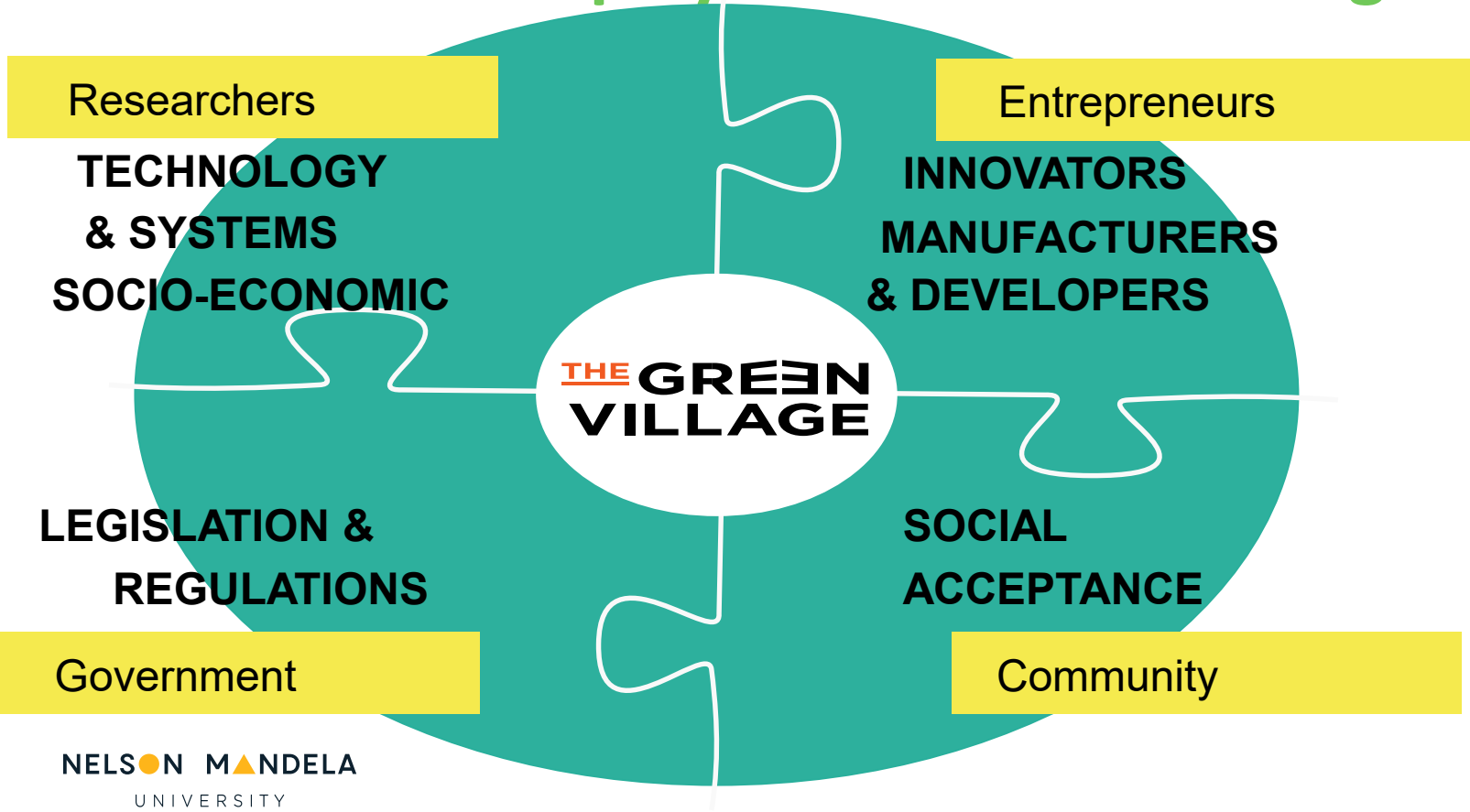
Green Village Design PRINCIPLES

- **TRANSFORMATIONAL** in character
- **DEMONSTRATIONAL** in evolution
- Designed to be **FLEXIBLE** and **MODULAR**
- Conceived to be **SCALABLE**
- Be a **CATALYST** of existing economic activities in a community
- Centered on and driven by strong **COMMUNITY PARTICIPATION AND ACCEPTANCE**
- Appropriately aligned to **SPECIFIC NEEDS OF A COMMUNITY**

Green Village Technologies' known CHALLENGES

- **Green technologies are generally expensive (at introduction)**
- **Lack of political will hinders adoption and circulation (dissemination)**
- **Cultural stereotypes on use of some green technologies**
- **Lack of knowledge and skills for installation and maintenance**
- **Uncertainty about performance impacts (suppliers, users)**
- **Unknown alternative raw materials or chemical inputs (imported products)**

Role-players in a Green Village



Sustainable Development Goals PROMOTED

SDGs impacted upon:

Goal 2: Achieve food security and improve nutrition through introducing small-scale urban agriculture and 'green' roofs at household and communal levels.

Goal 6: Ensure availability and sustainable management of water and sanitation through grey water recycling and composting sanitation solutions

Goal 7: Affordable and reliable energy through innovative energy provision and reducing pressure in the grid

Goal 8: Job creation and inclusive economic growth through people-centred approaches to science, technology and innovations.

Goal 9: Foster innovation in infrastructure provision and industrialization

SDGs impacted upon:

Goal 10: Reduce inequality within and among countries through technology transfer, joint high-level research, knowledge exchange and resource mobilization across territorial boundaries

Goal 11: Make human settlements and cities resilient to climate change and be environmentally sustainable

Goal 12: Ensure sustainable consumption and production patterns in use of natural resources such as water and land

Goal 17: Global Partnerships for Sustainable Development through domestic resource mobilization and international support including promoting North-South cooperation in science, technology and innovation, and enhance knowledge sharing and capacity building.

Like slavery and apartheid, poverty is not natural.

It is man-made and it can be overcome and eradicated by the action of human beings.

Overcoming poverty is not a gesture of charity, it is the protection of a fundamental human right, the right to dignity and a decent life.

Dr Nelson Mandela



Sub-Theme 1: Informal Settlements and Sustainable Urbanisation

- **Sustainable human settlement management models:**
 - **vulnerabilities and survival strategies of urban poor,**
 - **efficacy of urban housing regulations, policies, plans and delivery systems,**
 - **urban space production for socio-economic inclusivity**
 - **public space contestation and urban economies**
 - **municipal service provision (energy, waste, water, sanitation)**
 - **rural-urban interface dynamics /peri-urbanism**
- **SASUF linked project on ‘Tools for legitimacy, governance and resources for rapidly urbanising societies.’ Visit: <https://sasuf2019.mandela.ac.za>**

Sub-Theme 2: Climate Change and Placemaking

- **EU/STINT and RSA funded Green Village Development Research (embracing technologies and innovations for the sustainable built, water management and renewable energy. Visit www.ecosun.com.de and <https://sbe.mandela.ac.za>)**
- **TIA/DSI funded Community of Practice on Science, Technology and Innovations for Sustainable Human Settlements.**
- **EU/DAAD funded Participatory Design and Joint Action Research for Sustainable Development Practice (low-tech solution for mitigating environmental and socio-economic challenges in low-income communities.**

“It always seems impossible until it’s done.”

Dr NELSON MANDELA



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ENKOSI
THANK YOU
BAIE DANKIE

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Change the World



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