Being Smart!

- Increasing urbanization puts pressure on our ecological resources
- Conventional urban expansion disregards environmental and ecological values
- Increases climate impacts and risks from natural disasters
- Reduces resource availability and creates economic and social stresses
- Being Smart: Is about using our resources in a smart, resource efficient manner. And the role of technology is to help us better visualize, plan, anticipate, and manage.
Regional Challenge of Urban Growth

Expansion of existing urban settlements may not be the best approach to urban growth.
The challenge is to find the most suitable areas for urbanization, either as extensions of existing towns, or as new urban areas that are more climate resilient and responsive to Green Growth.

To achieve this, we need more effective use of Geospatial Technologies.
What is Ecological Planning?

- A planning approach that
  - builds up from nature, respecting the environmental relationships in the landscape
  - makes provisions for human activity in consonance with ecology of the region
  - addresses air, water, and land management as individual resources as well as an integrated whole
  - Identifies and values natural systems to support and shape urban development patterns

- **Ecological Planning**: Planning the management and urbanization of the landscape in harmony with the underlying landscape ecology
Key Concepts - Planning Process

- **Process:** Create map “layers” to represent all physical, natural, ecological, and anthropological information; then assimilate and analyze them using Geographic Information Systems (GIS).

- **Decision Models:** Create multi-criteria decision models in the GIS to preferentially allocate land use based on suitability of use type to ecological setting.

- **Temporal Scale:** A forward and backward linkage in time to understand and address changes in the urban and regional landscape.

- **Iterative Analysis:** Using GIS as urban development and landscape settings change, using forward rolling time intervals in planning that look at next 5 years, 10 years, 20 years and more.
Schematic: Ecological Planning Process

- Regional Climate Change Scenarios
- Regional Growth Plans
- Institutional and Political Directives

- Physical and Natural Resources
- Environment and Ecology
- Human Settlements and Infrastructure
- Spatial Planning and Analysis

- Recommended Development Framework

- Sustainable Green Urban Development

Temporal and Iterative Review
Benefit: Stronger, More Sustainable Cities

- More sustainable urban development
  - Less likely to affect water, land, and ecosystems
- More resilient to climate change
  - Protection of natural drainage networks protects from peak storm flooding events
- Lower cost of urban infrastructure
  - Green infrastructure leverages natural systems, costs less to construct
- Strengthened socio-economic setting
  - Better drainage, greener spaces, along with urban management, results in better living conditions and a healthier society with less loss of economic productivity
- Improved livability
  - More open and green spaces for fresh air, carbon sequestration, recreation
Methodology: Theory

- Our planning approach is driven by environmental principles.
  - Identify and clearly document **environmentally sensitive** areas
  - Understand **ecological associations** between land-water-nature and factor these into the decision making process
  - Seek out ways to **minimize** adverse development impacts

- To reduce development impacts and conserve resources, the following principles were adopted into regional planning:
  - **Balanced spatial arrangement** through reasonable land use placement
  - Promote **environmental resource conservation** by adopting responsible development practices
  - Creation of different **growth centres** to ensure uniform regional growth
  - Create **economically sustainable** region by adopting diversified and multiple economic sector plan
Methodology: Process

Procedurally, the ecological planning process requires:

- A clear and simplistic organization of data layers, and
- Decision criteria to evaluate and prioritize land use planning
- This is achieved by using map data layers in a GIS, assembled together to identify locations that are suitable and unsuitable for urban development
- The GIS layers are assembled together using a set of decision criteria, with numerical values assigned for each criteria, collectively providing a “Cartographic Model”
- The decision criteria and the values can be iteratively revised and the model enhanced to improve the planning process
- The data layers can be improved and enhanced to refine the geospatial selection of suitable and unsuitable areas
Cartographic Modeling

- The criteria for decision making are used to create **decision zones** on map data layers.
- These layers cartographically represent the decision criteria.
- These cartographic representations are then "mathematically integrated" together to provide areas that are **suitable** (green) and **unsuitable** (red) for urban development.
Replicable Decision Models

- The GIS data layers and the suitability scoring is integrated into a geospatial cartographic model.
- This model can be revised, re-processed, and re-applied, making it a systematic and replicable process.
This map graphic represents the final suitability map for **Urban Growth Suitability**.

It has been displayed in a gradation of green to red.

The **green** areas represent the **most suitable** locations for urban development while the red patches denote the least suitable.

The derivative suitability model can be replicated for more refinement for ecological resource management.
ZONE OF INFLUENCE FOR URBAN GROWTH

Regional Development Plan
Eastern Quang Nam

Legend
Transportation
- National Highway
- Other Roads
- Railway Line
- Air Port
- Sea Port
- Railway Station

Landuse
- Govt. Land
- Green Areas
- Industry
- Market
- Open Land
- Settlement
- Water Bodies

Districtwise Population
- 0 - 32,000
- 32,001 - 65,000
- 65,001 - 100,000
- 100,001 - 160,000
- 160,001 - 240,000
- 240,001 - 620,000

ZONE OF INFLUENCE FOR INDUSTRY

DA NANG

- Ho Chi Minh City
- Cam Ranh
- Mekong Delta

HA NAM

- Ha Lam

VINH DIENT

- Vinh Dient

HOI AN

- Hoi An

Vung Tau

- Vung Tau

HIGH INFLUENCE ZONE
- With transport connectivity from north to south and east to west.
- The surrounding agricultural land has good potential for agro-based industries.
- Availability of raw materials for woodwork industries such as bamboo, rubber, and building material.
- High silica sand for glass and ceramic industry.

HA LAM

- Ha Lam has growth potential.
- With transport connectivity from north to south and east to west.
- The surrounding agricultural land has a good potential for agro-based industries.
- Availability of raw materials for woodwork industries such as bamboo, rubber, and building material.
- High silica sand for glass and ceramic industry.

HA LAM

- Ha Lam requires an attractive incentive for investment such as subsidy, tax, and investment policies.

TAM KY

- Tam Ky
- Chu Lai
- Nui Tet Mountain

- Tam Ky is a strategic location for industrial development.
- Chu Lai is a major contributor to the economy of the region.

DUNG QUAT

- Dung Quat

The smaller town also has high influence due to:
- Agro-based and light industries
- Availability of labor and resources

HA LAM

- Ha Lam has a high influence on the surrounding areas.
- Necessary to protect for industrial development.

Regional Development Plan
Eastern Quang Nam
Conclusion

- An ecological planning approach provides a strong foundation for balance urban growth and environmental considerations.

- It is a clear, logical, and systematic process, enabled by the use of Geographic Information Systems.

- The GIS facilitates the integration of multi-criteria decision parameters allowing for complex inputs yet simple and clear planning outputs.

- The cartographic modeling process provides a replicable decision process for ecological planning that can be applied across the country, including in it localized variations.

- This process helps identify most environmentally suitable locations for urban development activity in a focal manner as opposed to a sprawl across the region.
THANK YOU FOR YOUR ATTENTION!