Green Industrialization for Developing Nations

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Overview

- Introduction and Justification
- Scope and Limitations
- Industrial Development
- Technology Examples
- Fitting it all Together
Fundamental Concept

Development of a scheme that an undeveloped nation can follow to enable economic development in an environmentally friendly and sustainable way.

Initial research generates a general structure with interchangeable options to achieve goals. Second stage of research produces tailor made solutions on a country by country basis.
Why is this an Issue?

- Standard of living in undeveloped nations
- Scarcity of resources
- International environmental legislation
- Traditional routes to economic development are unsuitable
- Little economic incentive for developed nations to uptake environmentally friendly technologies
Scope and Limitations

- Development must be at a minimum stage
- Start from subsistence living (economy is effectively primary sector only)
- End once an eco-friendly resource production and processing base is established (economy is a mix of primary and secondary sectors with tertiary sector beginning to form)
How might it be done?

- Development of a dependency tree for technology and information
- Development of an overlay for technology tree that shows potential synergies
- Development of an economic model that allows external investment without exploitation
Development Stages

1. Subsistence Living
2. Improve Farming Technology
3. Freed Land and Labour can be used for Industrial Crops
4. Labour freed from food production
5. Transport and Trade Network Development
6. Energy Network Development
7. Education to support Service Industries
Driving Industrialization

- Traditionally occurs by Innovation
- Available population to provide labour
- Raw material available for use
- Capital investment
- Opportunity for trade and associated transport network
Achieving Continued Sustainability

- Education about long term planning
- Helix of sustainability
- Energy Neutral
- Environmental legislation

The Helix of Sustainability

Total Energy from converting Plants to CO₂ ≤ Total Insolation captured from the Sun
Example: Organic Farming Techniques
Example: Corn or Maize

- Starch
  - Packing
  - Insulation
  - Disposable Goods

- Green Waste
  - Compost
  - Domestic Solid Fuel
  - 2nd Gen. Biofuels

- Protein
  - Films
  - Textiles
  - Plastic
  - Varnish/Resins
Example: Solar

Biomass

Solar Energy

Stirling Engine (Captured Heat for Mechanical or Electrical Energy)

Photovoltaics

Heat Energy used directly
Example: Waste Stream Processing

Bioreactor

Compost

Combustion

Why So Simple???
Fitting it all together

- Transport
  - Starch
    - Packing
    - Moulded Goods
  - Protein
    - Films
    - Moulded Goods
    - Textiles

- Energy
  - Consumer Energy
  - Solar
    - Thermal/Electrical

- Food
  - Consumer Crops
  - Industrial Corn
  - Industrial Hemp

- Waste Processing
  - Compost
  - Second Gen Bio-fuel

- Industrial Crops
  - Paper/Cellulose Products
    - Fibre
      - Textile
      - Composite Renforcement

- Second Gen Bio-fuel
  - Energy

Areas without solutions

- Stepwise establishment of transport, energy and trade networks
- Source of capital investment
- How to classify technologies so that a dependency tree can be easily established
- How can education be implemented so it is effective
Thankyou for your time

Suggestions?