NATURAL INFRASTRUCTURE AND THE WATER-ENERGY-FOOD NEXUS

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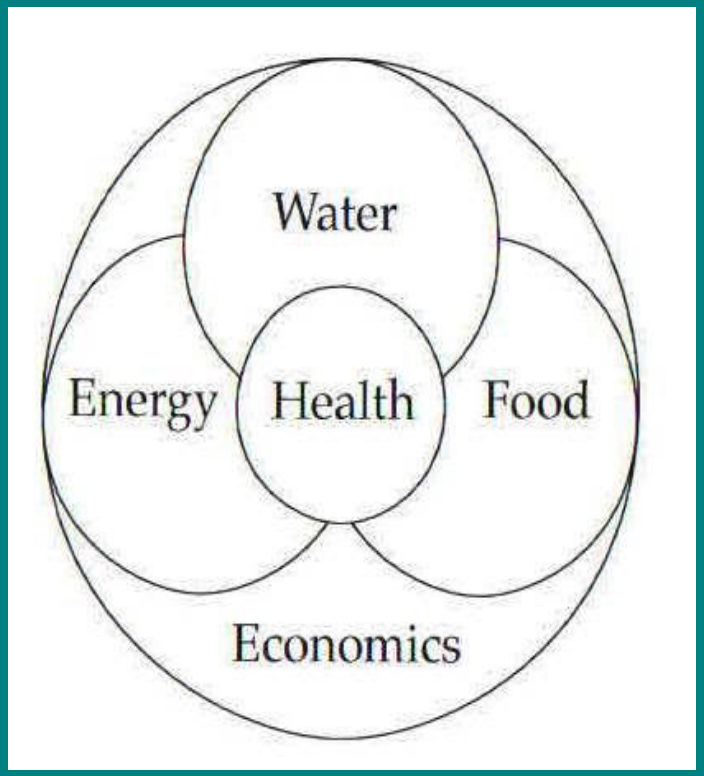
Modified NEXUS of Water, Energy and Agriculture



PEOPLE ARE PART OF ECOLOGY!!!!!

REALISTIC ECOSYSTEM MANAGEMENT MUST BE CONSERVATION NOT PRESERVATION

Ecosystem Structure vs Function

Advantages of Green Infrastructure

Unlike engineered solutions, they have no finite life expectancy

Low cost, highly effective treatment

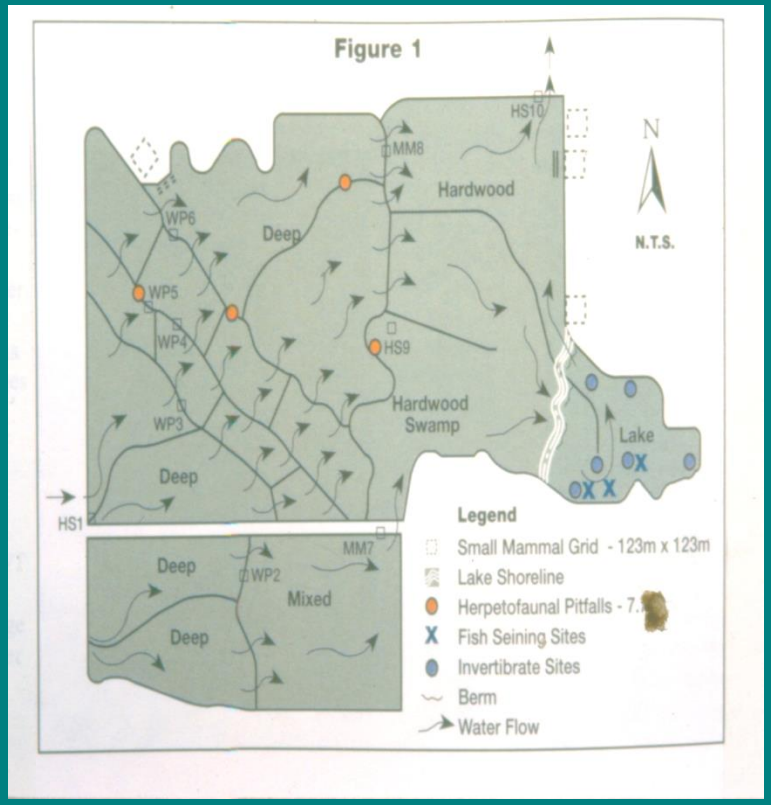
Can be used for multiple purposes

Can be “owned” by local community

Can yield products to support local economy

Treatment Systems as Passive Recreation in Cities

Orlando Treatment Wetlands and Natural Park



Curitiba, Brazil: Drinking Water Pretreatment

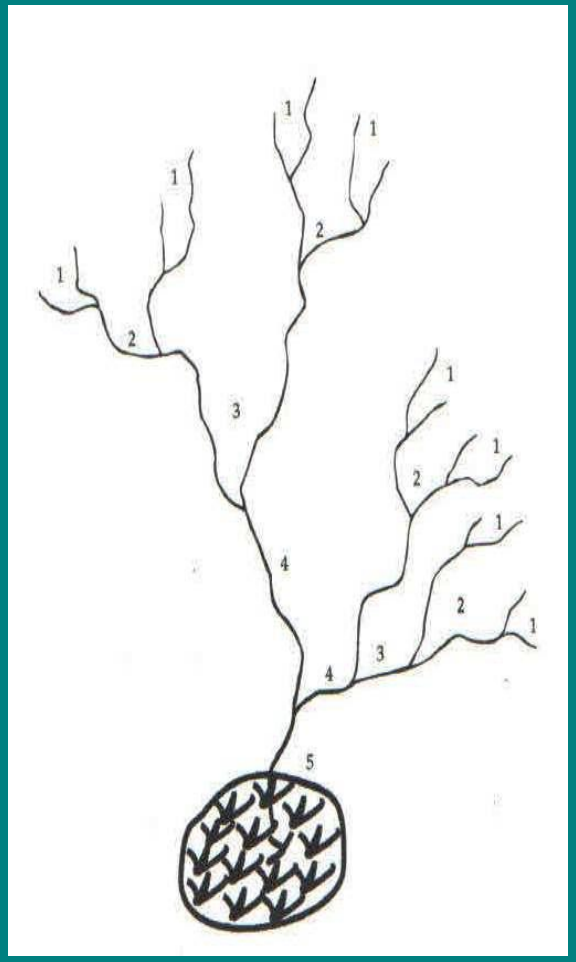
PRODUCT DEVELOPMENT FROM WASTE WATER

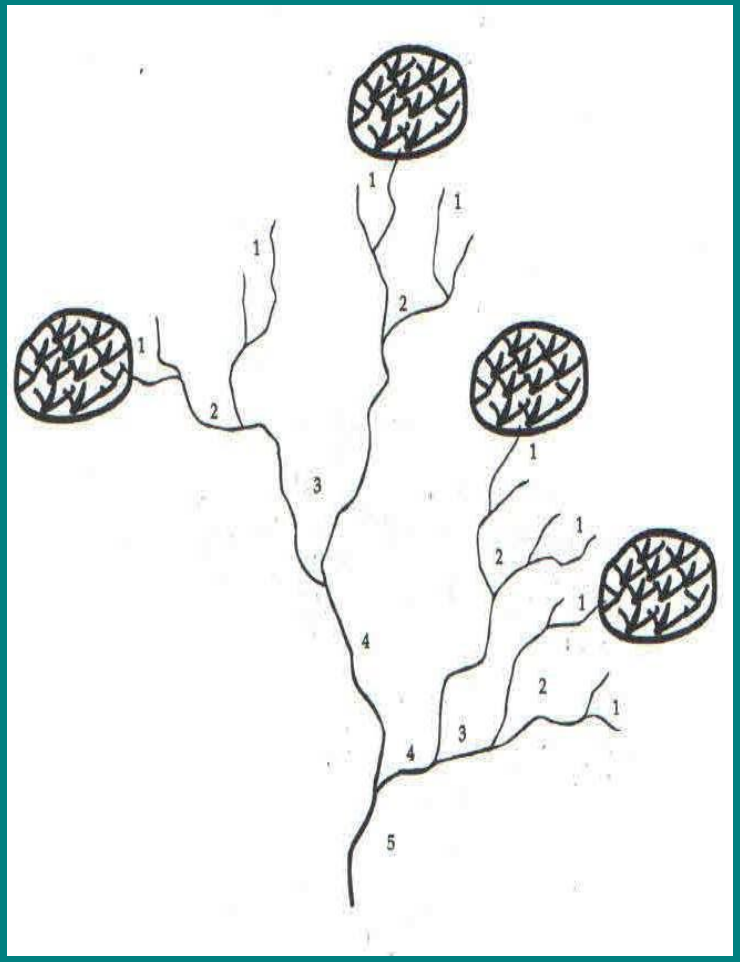
GOOD ECOLOGY IS GOOD BUSINESS

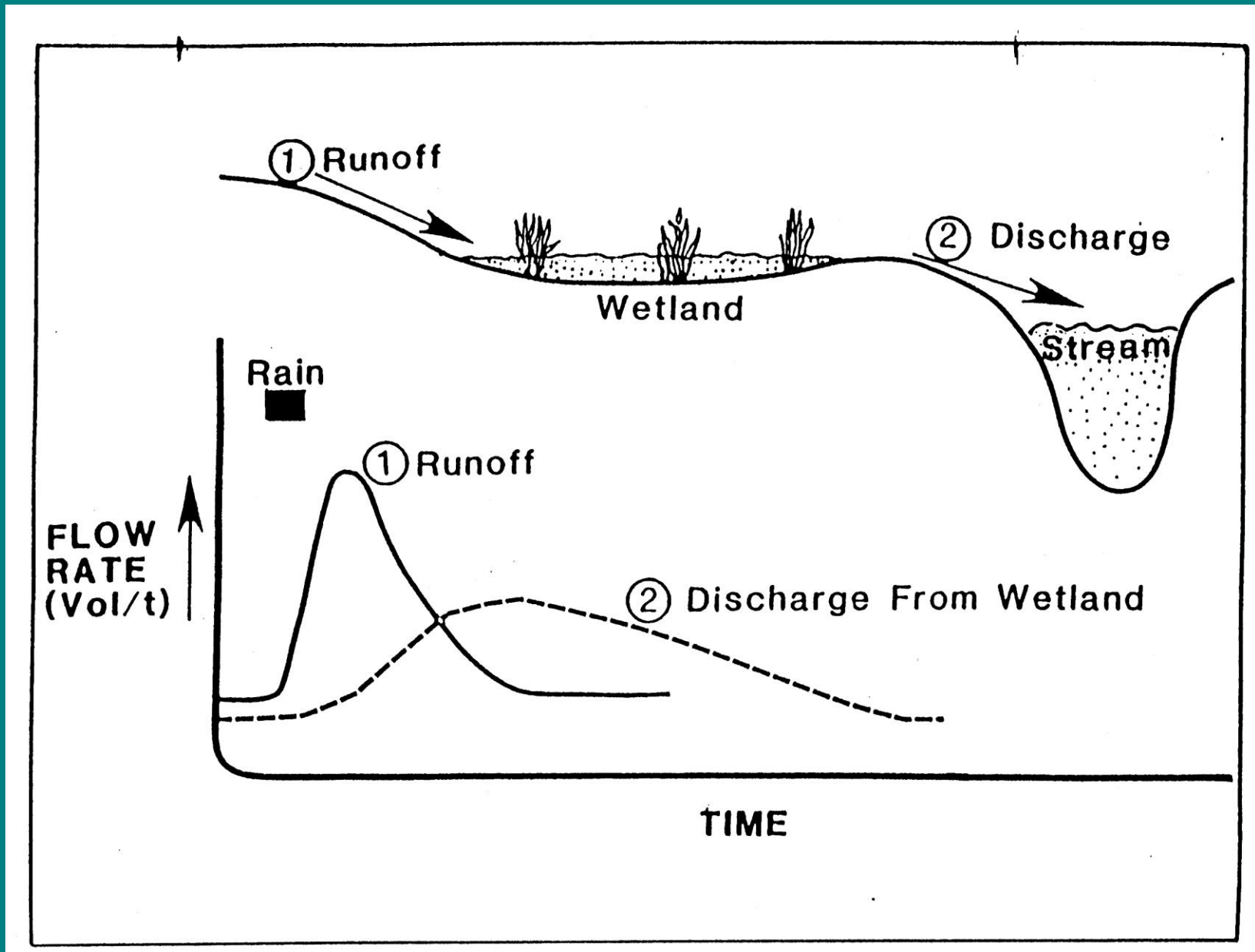
Role of the Private Sector in Green Infrastructure Development

How can green infrastructure support the private sector

Placement of Green Infrastructure

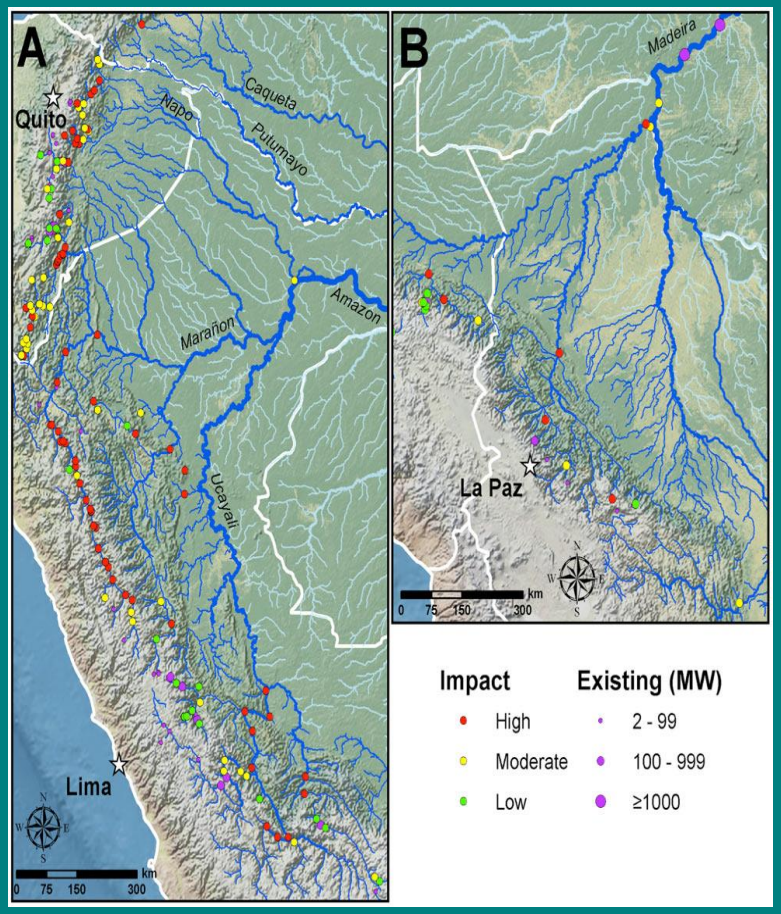




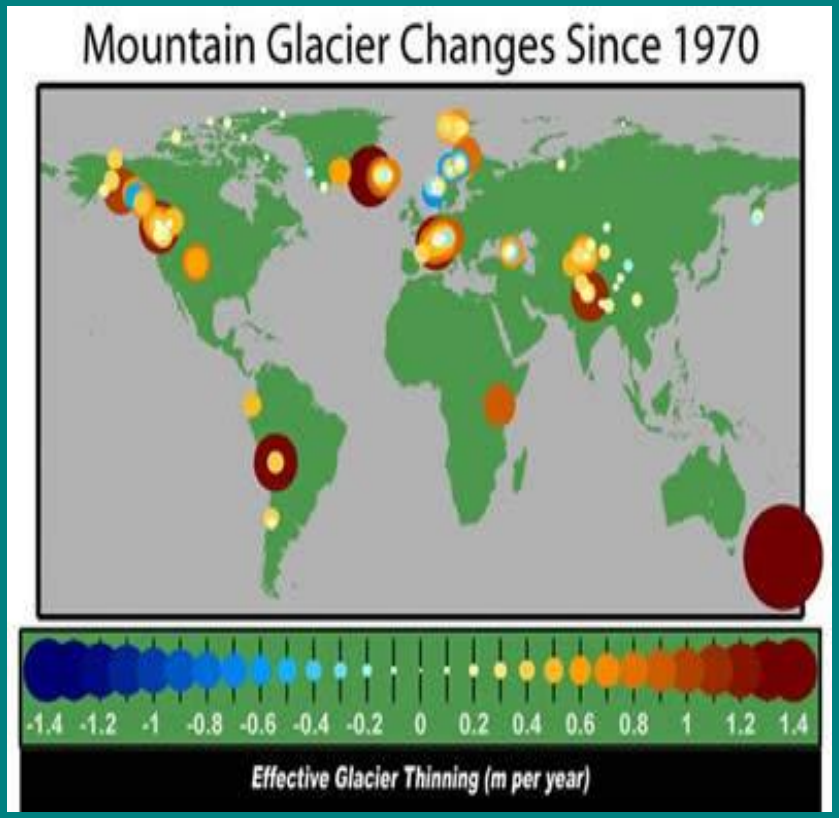

1 Runoff
2 Discharge
Wetland
Stream
Rain
1 Runoff
FLOW RATE (Vol/t)
2 Discharge From Wetland
TIME

IMPORTANCE OF WATERSHEDS AND HEADWATER STREAMS

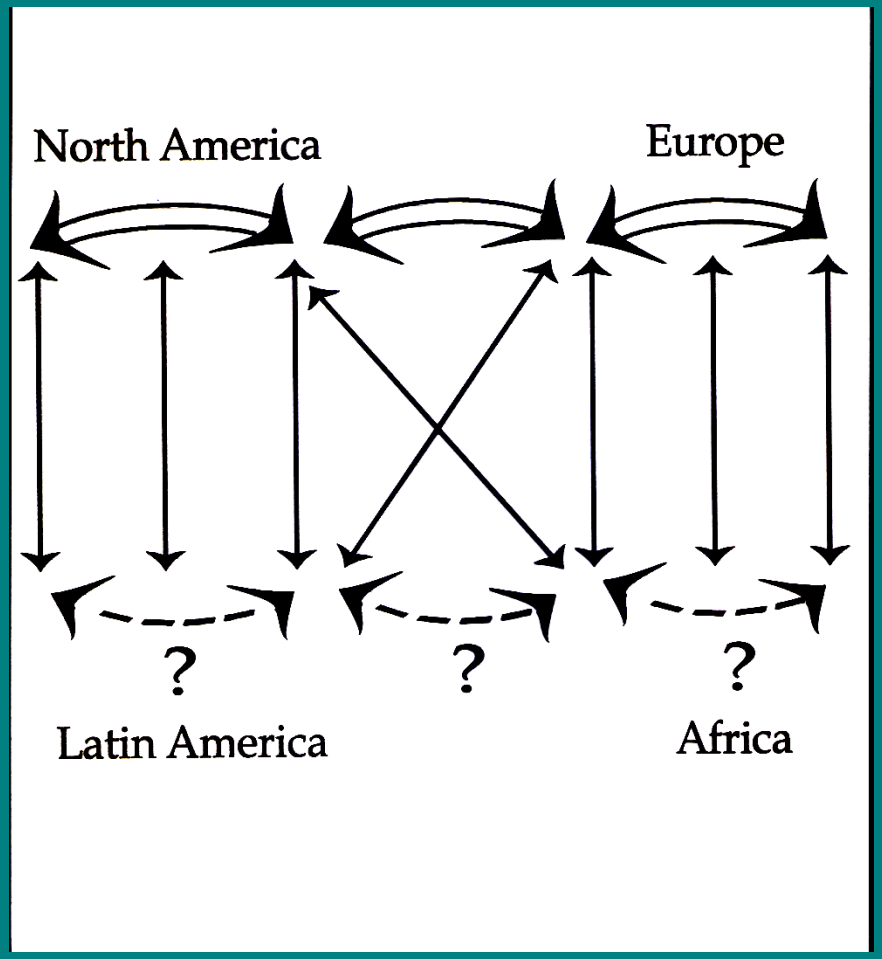
Dams of the High Andes



Glacial Loss

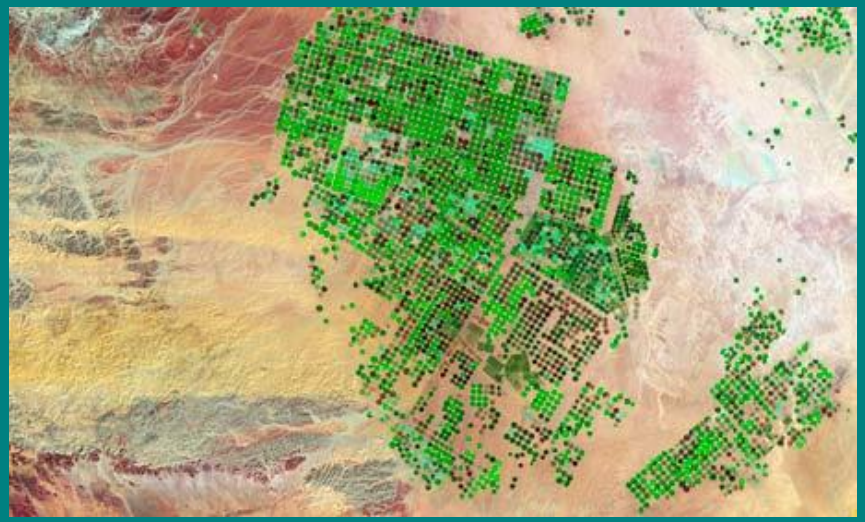


Routes of Green Infrastructure Experience Transfer



Traditional Green Infrastructure Worked: Yemen

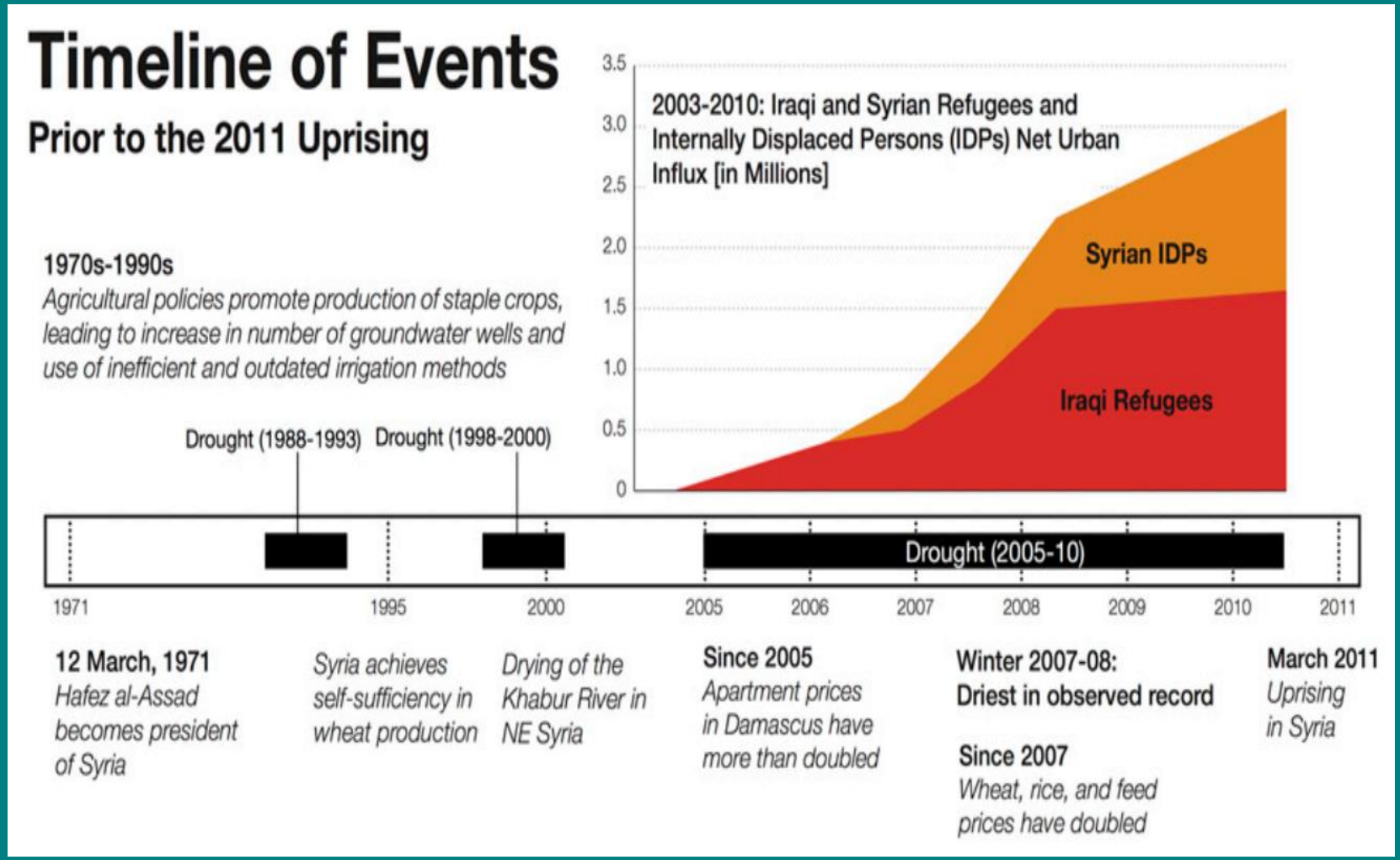
Modern Desert Irrigation Efficiency is 35-45%



ACADEMIA & GOVERNMENT

- Think outside the box

Water Security Promotes Political and Social Security



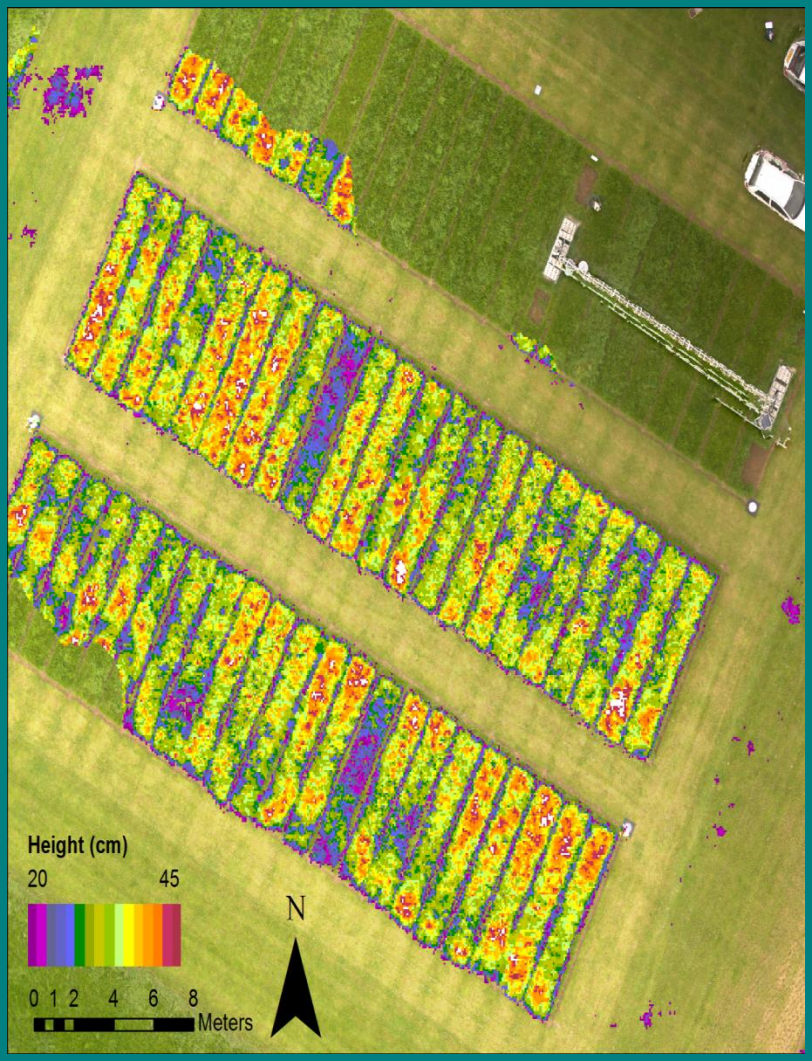
ADAPTIVE MANAGEMENT IS KEY TO SUSTAINABILITY

- How frequently to assess project?
- What parameters to measure: Earth Observation
- How to fund long term?

Climate and Landscape Changes Must be Recognized

Need to incorporate changes in both as part of adaptive management plans for infrastructure projects

Earth Observation Data



- Precision Farming
- Fires
- Drought
- Land use Changes
- Erosion
- Crop Type and Yield

One Model Does Not Fit All

Biomes as Management Units

- Montane
- Tropical Rainforest
- Savanna
- Dry Forest
- Desert
- Coastal

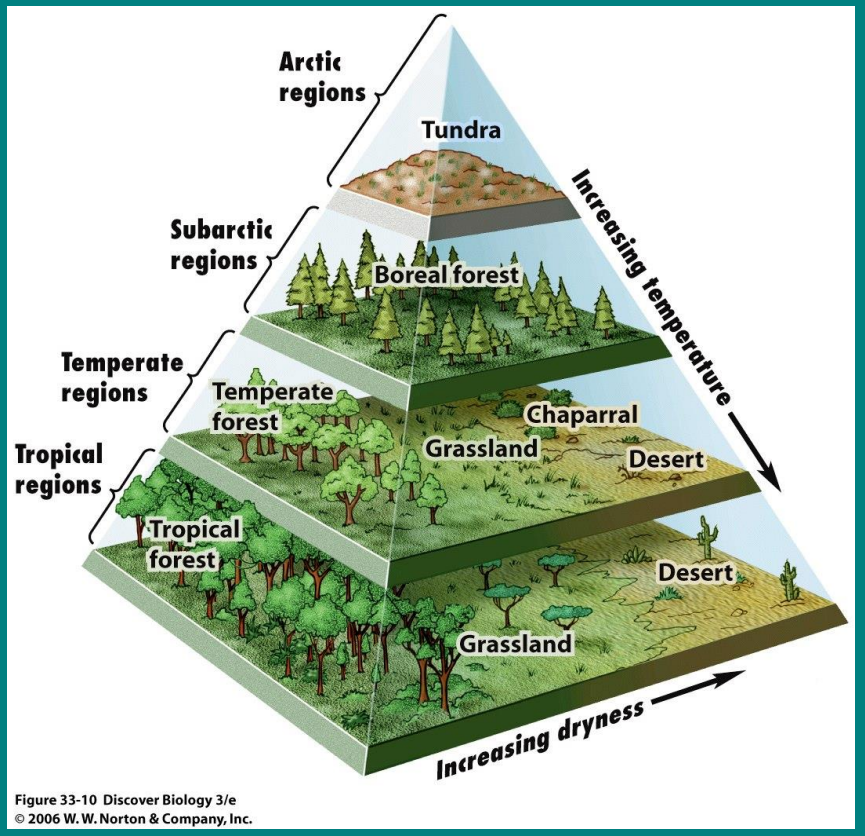


Figure 33-10 Discover Biology 3/e

Challenges for Green Infrastructure

- How to convince engineers of added value
- Demonstration projects
- South south cooperation
- Community engagement and ownership
- Product development
- Multipurpose uses for projects