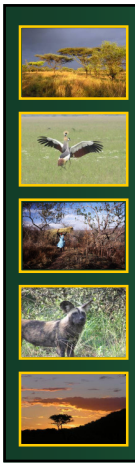


The Value of Environmental Goods and Services in KZN

Steve McKean
Steve@KZNWildlife.com

Debbie Jewitt

Joe Phadima
Myles Mander

Ezemvelo KZN Wildlife

Presentation Structure

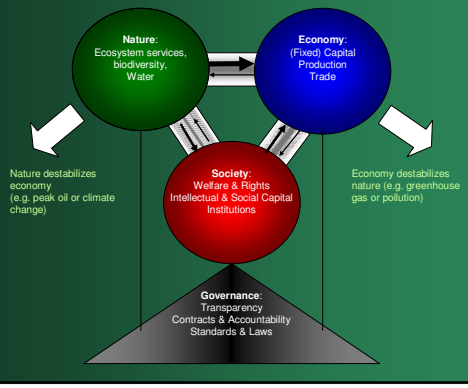
- International, national, regional, local thinking and context.
- What are "ecosystem goods and services"?
- How does "biodiversity" fit in?
- Value of biodiversity, ecosystem goods and services to people.
- Rate of ecosystem service loss.
- Some implications of ecosystem goods and services loss.

Introduction to Natural Capital and Ecosystem Services: Some background.

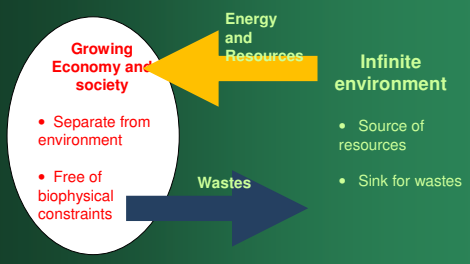
The 4 capitals…..

- **Built capital** is the infrastructure (buildings, roads, houses, etc.) that make up the material structure of human society.
- **Human capital** is the physical bodies of individual humans, their health and education, and the information stored in their brains.
- **Social capital** is the web of interpersonal connections, institutional arrangements, rules and norms that facilitate human interactions.
- **Natural capital** is the land and the resources it contains, including ecological systems and services.

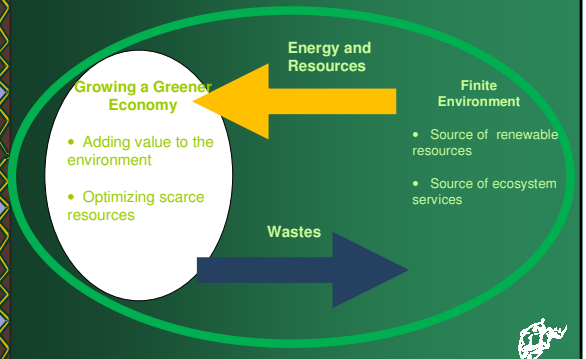
Capitals and their connections



Business as usual – natural environment is infinite….



Emerging economic realisation – natural environment is FINITE….



A safe operating space for humanity. *Nature* 461:472-475

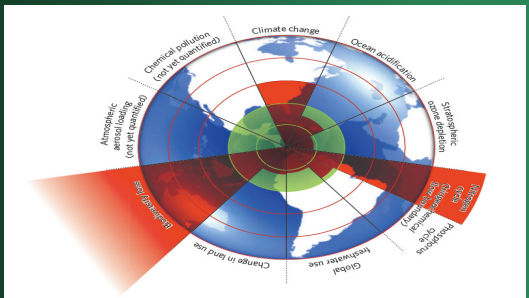


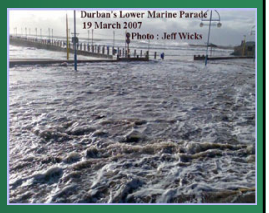
Figure 1 | Beyond the boundary. The inner green shading represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable. The boundaries in three systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle), have already been exceeded.

Operating outside the safe space at the local scale.

- Water quality trends in Albert Falls Dam (1999-2009) – **132% increase** in Phosphorus; **215% increase** in chlorophyll 'a'
- Water quality trends in Nagle Dam (1999-2009) – **668% increase** in TP; **738% increase** in chlorophyll 'a'
- The limitations of built infrastructure
  - 28 out of 800 waste water works operating with acceptable standards means huge reliance on natural capital to supply services

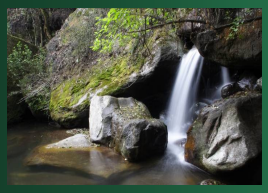
Operating outside the safe space - HEADLINES.

- Flood costs KZN R715m
  - January 25 2011 at 12:36pm
- KZN storm damage hits R40m
  - Thu, 18th Feb 2010 12:13:36
- R617m for KZN flood damage
  - 2009-01-28 07:27

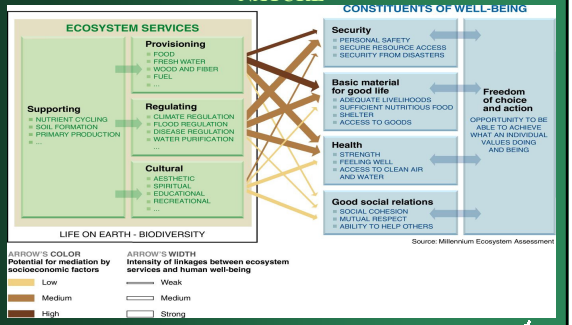


- Storms, floods, tornadoes and weather conditions never seen in KwaZulu-Natal before cost the provincial government close to R4-billion in 2007.

WHAT DO NATURAL ASSETS SUPPLY?



GREEN INFRASTRUCTURE AND ECOSYSTEM SERVICES: THE BENEFITS PEOPLE DERIVE FROM NATURE



Why value ecosystem goods and services?

- Inadequate political and economic support as full value to society not recognised – failure to recognise economic value of natural systems underlie their decline.
- Need for full roles and values of natural areas in society to be valued and explained in relevant terms.
- Need a compelling economic case for biodiversity and ecosystem conservation.

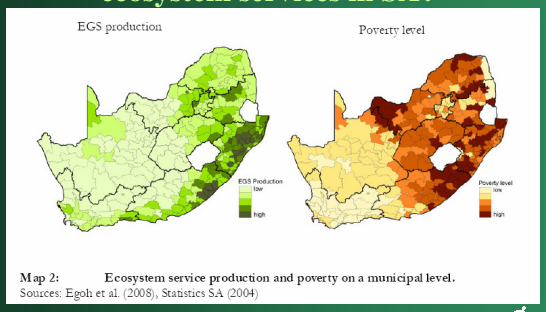
In business, you are what you measure". So we need to assist the economic agencies to measure "natural wealth". The value of services we derive from ecosystems shouldn't be assumed to be zero...."

World Bank President Robert Zoellick

BIODIVERSITY? HOW DOES THIS FIT IN??

- Biodiversity is the "engine" which produces services to society which society often takes for granted.
- Biodiversity "engine" made up of many components e.g. animals, plants, different species…..etc.
- Each "engine component" is crucial to the reliable and efficient performance of that "engine".

Where are the important areas for ecosystem services in SA?



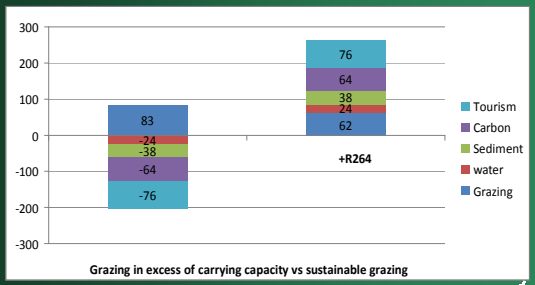
Map 2: Ecosystem service production and poverty on a municipal level.
Sources: Egoh et al. (2008), Statistics SA (2004)

Demand for ecosystem services?

Some examples

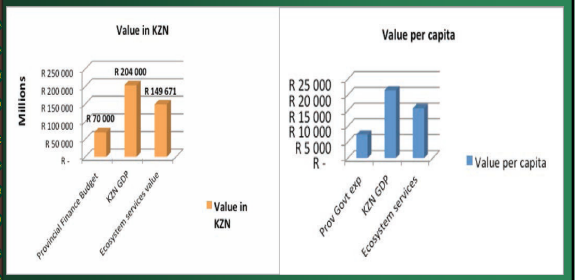
- Some 9.5 million rural people in KZN depend on ecosystem services for livelihood support.
- More than 4 million people in KZN depend on savannas and forests for energy needs.
- More than 4.5 million people depend on water from natural systems.
- The uMngeni river alone supplies more than 1000 million litres of potable water every day to communities as far as Wartburg, PMB, Vulindlela and much of Durban.
- RSA has a growing water demand but only 1% still available
- EThekwini municpality
  - benefits by R4.2 billion per annum
  - Incl. 95 000 traditional homesteads each benefiting by R10 000 pa from resource use = R950 million pa

Societal benefits of sustainable land use

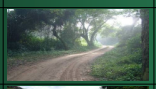


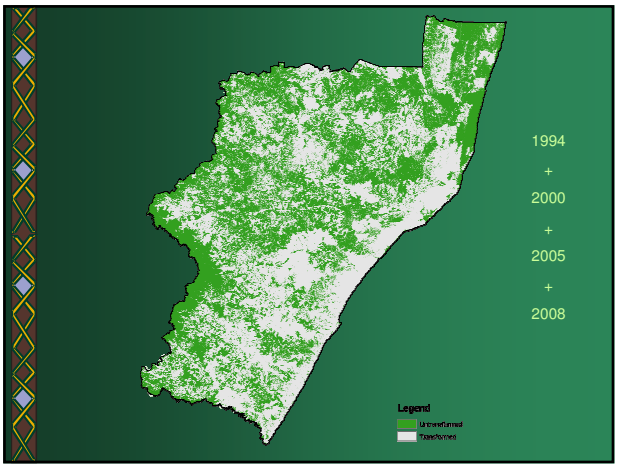
Grazing in excess of carrying capacity vs sustainable grazing

Value of Ecosystem Services in KZN



Ecosystem service value from different habitat types

Grasslands, with services such as soil erosion prevention, grazing, flood damage reduction **R11.4 billion**			**Wetlands**, with services such as flood reduction, water purification. **R38.4 billion**
Forests, with services such as carbon sequestration. **R2.9 billion**			**Estuaries** with services such as fish and prawn nurseries. **R10.8 billion**
Rivers, with services such as water supply, water purification. **R18.7 billion**			**Floodplains**, with services such as water quality management. **R43.5 billion**
Savannas, with services such as fuelwood provision, grazing. **R19 billion**			**Rocky shores and beaches** with services such as sea food and recreation. **R275 million**
Vegetated dunes, with services such as the protection of beach properties from coastal storms. **R596 million**			**Reefs**, with services such as tourism. **R4.2 billion**



Consequences of loss?

Some examples

- Alien plants reduce water supply by 7% already…..predicted to increase to 21% in 20 years.
  - Mvoti-Mzimkhulu water management area – current loss = 126 million m^3 - projected to grow to 420 million m^3
  - Replacement infrastructure - Spring Grove Dam 142 million m^3 - at a cost of R2.1 billion
- Reduction in the efficiency of built infrastructure due to sedimentation
  - Umzimkhulu produces 5 million m^3 pa due to land degradation – a Spring Grove dam would take 28 years to become filled with sediment

Consequences of loss?

more examples

- What would it cost rural households to replace fuel wood with paraffin for cooking and heating?
- What would it cost province to supply rural households with water, reticulated sewage systems, build only with commercially available building materials……etc?
- What would be the cost of only formal jobs in industry to replace current jobs associated with agriculture and tourism?
- If natural assets not managed, government would need to find R150 billion to substitute the services which ecosystem goods and services currently provide to maintain CURRENT livelihoods

Consider that……..

Ecosystem goods and services provided by <u>some</u> remaining untransformed natural systems in KZN is worth approximately <u>R150 billion</u> (at 2006 values)

KZN Wildlife is responsible for conserving these areas and has a budget of approximately

R320 million

What other investment by government provides a return of this magnitude?

- Ref: Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Naeem, S., Limburg, K., Paruelo, J., O'Neill, R.V., Raskin, R., Sutton, P., van den Belt, M., 1997. The value of the world's ecosystem services and natural capital. Nature, 387, 253-260

Way forward……..

Product improvement

- **Finer scale**
  - **Value ecosystem services of land cover types and areas in varying condition.**

- **Incorporating "ecosystem dis-services" (e.g. livestock disease, etc)**

- Planning - Taking it into planning – National, provincial, District municipalities, local municpalities, PGDS.

- Awareness and advocacy – decision makers, public.