

# Methodology to Value the Natural Assets of the City of Cape Town

Presentation at Environmental Resource Economic Conference, 21 May 2009

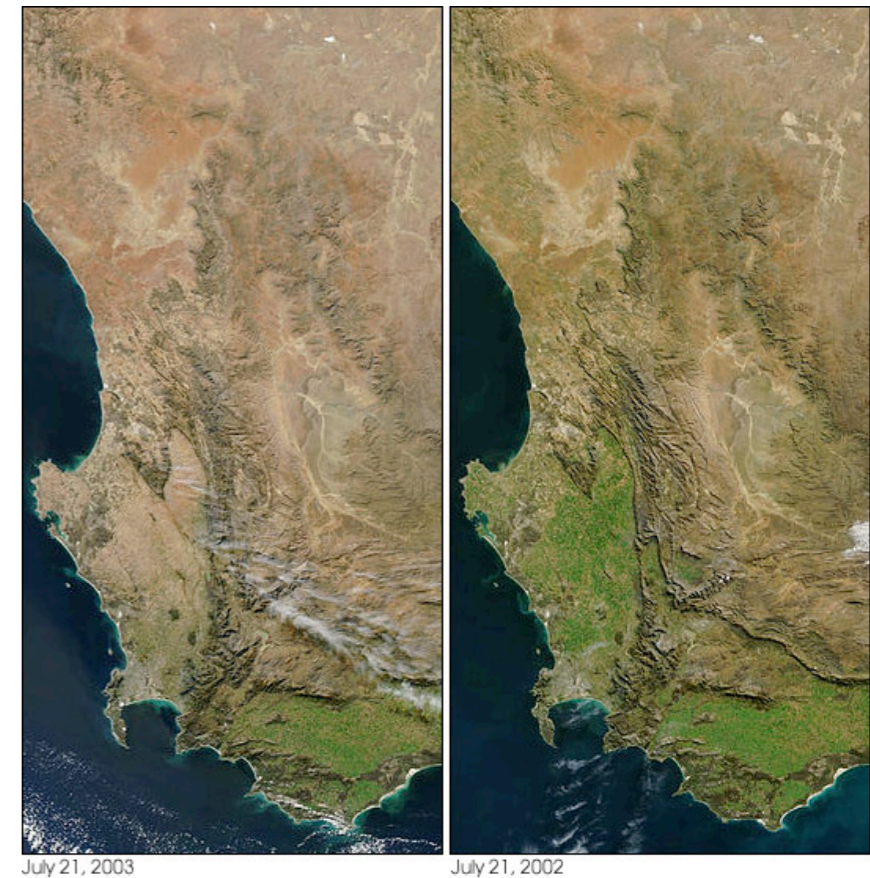
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# Problem and rationale

- In contrast to earlier development approaches and models, the steady supply of cheap natural and environmental resources cannot be taken for granted anymore, and in some cases have already become the limiting factor to further growth and development.
- An argument on the economic value of Cape Town's natural and environmental resources would contribute to shaping sustainable economic trajectories for the city.



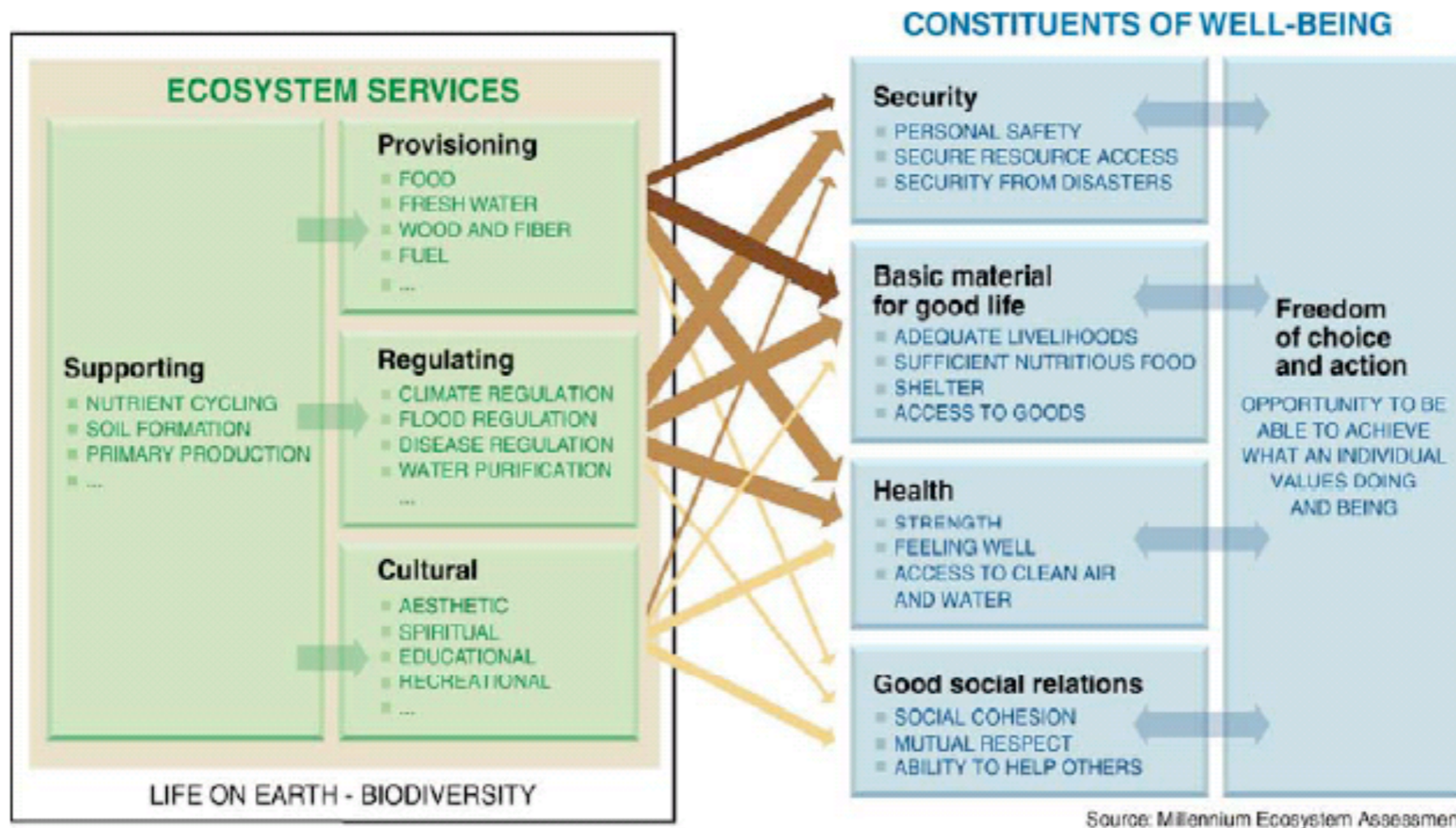
# Purpose

- The focus of the overall project is to influence **budget allocations** by developing focused economic arguments for investing, maintaining and expanding the City's natural assets.
- The development of a methodology is important as this allows for a **clear and logically repeatable framework** for the valuation and the building of a business case.
- At the heart of the methodology is the need to **prioritise assessment** in order to optimise on both the return and the risks of using the City's natural resources.
- It is neither practical nor desirable to value all goods and services generated by natural assets in the City, necessitating a logical and replicable methodology for prioritising natural assets for valuation.

# Definitions

- Natural assets are the stocks of environmental resources owned by the City (the City's natural capital).
- Environmental goods and services (EGS) are the flows of benefits derived from these assets (the interest or services generated by the capital).

# EGS and human well-being



# Why valuation?

*The fact that something is “valuable” does not in itself justify the decision to attempt to value it. The need to value the natural environment arises from the need to better integrate natural and social sciences in managing the natural environment and helping the policy-making process. Thus, **valuation aims to provide means by which the contributions that the natural environment makes to human welfare can be better taken into account in decision-making procedures** so that more efficient, effective and/or equitable decisions can be made.*

Source: Eftec, 2006. *Valuing our Natural Environment*. Final Report NR0103 for Department for Environment, Food and Rural Affairs.

# Project tasks

Inventory  
of natural  
assets

Flow of  
Ecosystems  
Goods and  
Services

Prioritise  
Flows for  
the City

Economic  
Value of  
Prioritised  
Flows

Financial  
cost-  
benefit  
modelling

Business  
Case for the  
Environment

Increased investment in and maintenance  
of urban natural capital

# Considerations in methodology development

- Need broad scoping and comprehensive listing of the City's natural assets and flows from these assets.
- Focus on key EGS
- Differentiate between an economic valuation technique and an economic valuation methodology
- Link between specific natural assets and the specific flow ecosystem goods and services needs to be defined.
- Links between different EGS and beneficiaries need to be clearly defined
- Importance of EGS to socio-economic development needs to be clear
- Better understand the chances of successful interventions - City management focus and environmental mandate
- Ecosystem thresholds suggests that sustained supply of EGS need to be screened for ecological and resulting socio-economic risks

# Six-step Methodology

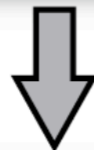
1. Assess the relative importance of different natural assets (e.g. nature reserves, wetlands, near shore environment, etc.) for the generation of EGS



2. Estimate the importance of EGS to users/beneficiaries using a matrix



3. Establish links between EGS and development objectives



4. Assess the City's ability to influence the value of EGS through management



5. Assess the ability of ecosystems to yield a sustainable flow of EGS and prioritise them according to risks



6. Apply valuation techniques to selected case studies

Identify levels of dependency: low value/  
many (needy) people and high value/low  
number of people

Users at different levels (municipality,  
region, national, global etc)

Identify essential services and acceptable  
levels of service to meet legal standards,  
human needs and development objectives

Services that are beyond municipal mandate  
cannot be controlled and should not be  
selected for study

Prioritise those services that score high on  
ecological and socio-economic risk (signalling  
potential problems with a sustained flow of  
ecosystems goods and services and a  
potential high loss of social welfare)

# Step 1: Natural Assets in the City

Relative importance of natural assets as sources of EGS							
Biota (fauna and flora) and soils					Water environment		Atmosphere
Natural areas & reserves	Municipal parks	Sports grounds	Agricultural lands	Vacant land	Water courses, wetlands and dams	Near shore coast	

*Examples in the City:*

Blaauwberg Conservation Area  
 False Bay Ecology Park  
 City's 23 nature reserves  
 City Parks  
 Freshwater river systems  
 Coastal areas, incl. near shore  
 Watercourses and wetlands

# Flows of EGS

Environmental goods and services		
<p><b>Supporting services</b></p> <ul style="list-style-type: none"> <li>Photosynthesis</li> <li>Soil formation</li> <li>Primary production</li> <li>Nutrient cycling</li> <li>Water cycling</li> </ul>	Regulating	Water regulation (flows, etc.)
		Natural hazard regulation (floods, etc.)
		Water purification and waste treatment, assimilation
		Erosion regulation
		Pollination
		Disease regulation
		Pest regulation
		Climate regulation – local (air quality)
		Climate regulation – global
		Space for biota to live and reproduce (refugia)
	Provisioning	Fresh water provision
		Fuelwood provision
		Building materials provision (wood, sand, etc.)
		Wild flowers for harvesting
		Provision of plant and animal material for medicines and biochemicals
		Provision of materials for crafts, fashion (e.g. shells)
		Fish and marine resources
		Genetic resources with potential pharmaceutical and other biochemical uses
		Small-scale urban farming
	Cultural (information)	Recreation and tourism
		Provision of inspirational beauty
		Aesthetic values and sense of place
		Educational uses (e.g. school excursions, scientific research)
		Use in cultural and artistic practices and ceremonies
		Use in religion practices and ceremonies
		Use in productions (film and events), advertising and publications

# Beneficiary classification

	Local	National/Regional	Global
<b>Individual</b>	Local users (e.g. recreational users)	Tourists, consumers, students	Everyone (climate regulation, existence values)
<b>Commercial entity</b>	Local industry (e.g. entrepreneurs, farmers, traders, artisans)	Economic sectors, national and regional GDP	International enterprise (e.g. fishery and forestry industry)
<b>Public sector</b>	Local Government (e.g. tax revenue)	National Government (e.g. tax revenue, foreign revenue from sale of concessions)	International Community

Source: based on Eftac, 2006. Valuing Our Natural Environment. Report prepared for Department for Environment, Food and Rural Affairs, United Kingdom.



# EGS and development objectives

- Budget allocations are informed by the strategic objectives of the City's Integrated Development Plan (IDP)
- no specific high-level allocation to any specific environmental category.
- EGS need to be ranked according to their impact on the IDP strategic focus areas.
- Where key EGS are identified but not acknowledged in the IDP, a separate argument needs to be developed for the inclusion of these EGS in further planning updates.

## **Strategic objectives in IDP:**

- *Shared economic growth and development*
- *Sustainable urban infrastructure and services*
- *Energy efficiency for a sustainable future*
- *Public transport systems*
- *Integrated human settlements*
- *Safety and security*
- *Health, social and human capital development*
- *Good governance and regulatory reform*

# EGS and City mandate

- Some assets and flows may
  - i) be almost completely under the control of the City,
  - ii) be shared with other institutions and groups, or
  - iii) fall completely outside of the City's control.
- Assets and flows completely outside of the City's control will generally be less important when motivating for an increased allocation of financial resources.
- The City is currently reviewing its environmental mandate (in terms of Constitution, assignment, delegation and agency agreements)
  - will most probably have an influence on where funds will be allocated and what organisations the City will partner with (eg CapeNature, SANPARKS) through intergovernmental agreements between different organs of state.
- Implications:
  - “unauthorised expenditures” if no mandate - MFMA
  - Municipality as a service provider focussed on amongst others the nprovision of a safe and healthy environment

# EGS and risks

- Experience shows that one cannot necessarily rely on natural assets to provide sustained flows of EGS and the economic values associated with them.
- These are the environments where thresholds are important and exceeding these would have particularly onerous consequences in both ecological and socio-economic terms.
- The natural assets that could be on the brink of disaster and those that have a higher impact need to be given priority in assessment.
- Ecosystem services can provide an important role in disaster risk management.
  - If this is not managed properly it also poses a major risk to infrastructure and service delivery.
- Ecological risks to recreation and tourism include climatic changes and pollution.
- Ranking or screening EGS according to the level of ecological and socio-economic risks they face is, therefore, an important step before devoting resources to valuation.

# Testing the methodology

- Prioritisation of EGS in the City was done in a participatory and facilitated workshop
  - City managers invited represented all functions related to environmental goods and services in the City.
    - environmental resources, parks, tourism, heritage, sports and recreation, wastewater, stormwater, solid waste and spatial planning
- Participatory rapid assessment
  - focus groups
  - identify and shortly motivate most important linkages between all identified EGS in the City and
    - beneficiaries,
    - development objectives,
    - City's environmental mandate and ability to influence and
    - ecological and socio-economic risks.
- Formal evaluation was done after the workshop
  - each group's discussion points, as contained in the minutes of the meeting, were used to rank importance within each of the four discussion focus areas in a spreadsheet matrix.

# Methodology application

Higher	High	Medium	Low
Natural hazard regulation	Water purification and waste treatment, assimilation	Climate regulation – local (air quality)	Climate regulation global
Recreation and Tourism	Space for biota	Small scale urban farming	Fresh water provision
	Aesthetic values and sense of place	Water regulation	Building materials provision
		Fish and marine resources	Provision of inspirational beauty
<p><b>Natural hazard regulation: Buffering ecosystems (e.g. reefs, kelp can reduce the impact of storms and large waves)</b></p>			Educational users
<p><b>Recreation and Tourism: People often choose their sites based on the natural or cultivated characteristics of an area</b></p>			Cultural and artistic practices
<p><b>Water purification and waste treatment, assimilation: Ecosystems can cause impurities but also help filter out and decompose organic wastes</b></p>			Religious practices
<p><b>Space for biota: Regulation of habitat and space</b></p>			Erosion regulation
<p><b>Aesthetic values and sense of place: Aesthetic values are reflected in support for parks, scenic drives and housing locations</b></p>			Disease regulation
			Harvesting
			Materials for craft and fashion
			Use in productions, advertising and publications

# Valuation application

<b>EGS</b>	<b>Valuation Technique</b>	<b>Notes to valuation argument</b>
Natural hazard regulation	Direct valuation techniques: Replacement Costs	Estimate damage costs: Infrastructure at risk (Flood, fire, storms, sea-level rise) frequency and severity
Recreation and Tourism	Revealed WTP: Travel Costs Expressed WTP: Contingent Valuation	Existing TCM and CVM studies on value of beaches, recreation at wetlands, expressed importance of natural environment to tourism behaviour and thus expenditure Case study: Blue Flag beaches. Case study: Visits to nature reserves incl. educational groups
Water purification and waste treatment, assimilation	Direct valuation techniques: Replacement Costs	Natural environment can only cope with a certain maximum of waste. Services provided by the natural environment before this maximum is reached are essentially seen as a free service. Cost of fixing such ecological infrastructure is generally more than the costs of proactive management. Case studies: Milnerton and Zeekoeivlei
Space for biota (globally important biodiversity)	No specific EGS to be valued	Qualitative argument on the importance of biodiversity as an intermediate to the sustained provision of other EGS's
Aesthetic values and sense of place	Revealed WTP: Hedonic pricing reflected in human capital and property values	Cape Town's natural asset allow for it to attract skilled entrepreneurs and others that help to drive economic development. Importance of Cape Town branding (clean city) Rely on existing research on how the natural environment adds to property values can also be consolidated to show this value. Case study on film and advertising industry

# Illustrative simplistic business case

<b>Natural Assets</b>	<b>Environmental Values (Rm pa, 2007)</b>	<b>City expenditure (Rm, 2007/8,</b>	<b>Other expenditure</b>	<b>Benefit: Cost (2007)</b>
Environmental resources	>274	64	??	>4.3
<i>Wetlands</i>	<i>180</i>	..		
<i>Nature Reserves</i>	<i>39</i>	..		
<i>Beaches</i>	<i>55</i>	..		
..	..	..		
Agricultural fields	95	0		

Note: Static analysis for illustrative purposes only.

# Conclusion

- Robust, tested methodology to value the natural assets of the City of Cape Town:
  - Best available national and international literature
  - Inputs local experts
  - Two external reviews
  - Participatory testing with city managers
- Prioritised environmental services for further work
  - Valuation case study used as demonstration
  - Based on inputs from city managers
- Basis for further development business case
  - budgeting process and timing
  - rules of allocation
  - organisational functions
  - randomly determined influences