Accounting for Wildlife Resources

Research idea presented at the

Workshop on Methodologies for Pricing National Park Products

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The Need for Environment and Natural Resource Accounts

System of National Accounts (SNA) widely used:

- Indicators to evaluate economic performance (GDP, NDP).
- Statistics for strategic planning.

But the SNA does not account for:

- Depletion of natural capital (minerals, fisheries, forests, wildlife).
- Environ degradation (soil erosion, pollution etc).
- Many non-market goods and services.

The Need for Environment and Natural Resource Accounts

However, SD must consider both economic and environmental aspects:

- ***Economic accounts*** cannot assess sustainability because they do not adequately represent natural resources.

- ***Natural resource databases*** cannot assess sustainability because they are not linked to economic accounts.

The Integrated System of Economic and Environmental Accounting (SEEA)

- Was developed in response to the shortcomings of the SNA.
- It provides structured accounts for the environment integrated with the SNA.
- It can be used to assess sustainability from an economic-environment perspective.

Components of Environmental Accounts

- **Asset/stock accounts:** physical + economic value of stocks of natural resources.
- **Flow/product accounts:** material flows, environmental services, and pollution by sector linked to input-output tables.
- **Environmental protection and resource management expenditure accounts:** resource user fees, subsidies, expenditures by govt to manage resources.
- **Environmentally-adjusted macroeconomic aggregates:** GDP, NDP, Savings, Wealth.

General uses of NRA

INDICATORS TO MONITOR SUSTAINABILITY

- Indicators of sustainability, macroeconomic & sectoral
- Improved indicators of macroeconomic performance
- Improved measures of poverty and poverty-reduction efforts to monitor PRSPs

DETAILED STATISTICS TO IMPROVE ECONOMIC ANALYSIS & NATURAL RESOURCE MGMT.

- Design better regulation & environmental instruments
- Design better resource management policies
- Assist with PRSPs, sector Master Plans, and other development planning

Target Audience

Government policy-makers:

- improve environment/NR info & management
- improve economic policy & planning

Business and the private sector:

- improve resource management and environmental performance

NGO's, private citizens:

- more effective environmental advocacy
- guide for action by individuals

Wildlife Resource Accounts

Basics of WL Resources Accounting:

- **WL resources:** all wild animals other than fish and forest dwelling invertebrates (Barnes et al 2011)**.**
- **Physical and monetary accounts that can be constructed for WL:**

i. Assets (#'s of larger WL species in the country).

ii. Flows (current annual use of the WL asset base).

Flows from WL Resources (Namibia, 2004)

- Wildlife viewing
- Hunting tourism
- Live game
- Small scale meat
- Ostrich farming
- Crocodile farming
- Guano harvesting
- Meat processing
- Taxidermy
- Crafts production

Physical WL Asset Account (Namibia 2004)

Species	Wildlife Utilisation Zone					Total
	1	2	3	4	5	
Buffalo	1,025	250	90	0	0	1,365
Cheetah	706	149	405	270	2,970	4,500
.	.	.	.	.	.	.
Total	107,634	13,576	67,865	48,779	1,800,706	2,038,560

WL Flow Account (Namibia 2004)

WL Use	Wildlife Utilisation Zone					Total
	1	2	3	4	5	
Direct contribution to GNP (N$'000, 2004)						
WL vie.	107,497	12,366	7,361	4,089	302,976	434,289
.	.	.	.	.	.	.
Crafts	0	0	2,148	3,436	3,007	8,591
Total	126,895	36,113	38,377	15,108	483,159	699,653
Direct and indirect contribution to GNP (N$'000, 2004)						
Total	236,025	67,170	71,382	28,101	898,676	1,301,354

Monetary WL Asset Account (Namibia 2004)

Value	Wildlife Utilisation Zone					Total
	1	2	3	4	5	
Current and anticipated RR generated (N$'000, 2004)						
2004	74,738	21,028	21,662	7,638	278,041	403,106
2034	251,135	52,110	59,641	22,614	872,908	1,258,409
Wildlife asset value @ 6% discount rate (N$'000, 2004)						
	2,034,485	448,913	525,427	194,136	7,249,271	10,452,232

Monetary WL Asset Account by Species (Namibia 2004)

Species	Wildlife Utilisation Zone					Total
	1	2	3	4	5	
Asset value by species @ 6% discount (N$000,2004)						
Buffalo	61,604	28,839	3,192	0	0	94,634
Cheetah	15,658	6,548	5,298	1,921	21,320	50,744
.						
Total	2,034,485	448,913	525,427	194,136	7,249,271	10,452,232

How can countries use WL accounts?

A. Total socio-economic value of WL in relation to the rest of the economy

1. What is total economic value of WL, including non-market values, and what are the benefits from sustainable WLM?
2. What is the distribution of WL benefits among different groups in society, especially the poor?
3. Is economic growth sustainable or based on depletion of resources, what is the cost of WL depletion?

B. Evaluate the impact of non-WL policies and projects

4. What are the trade-offs among competing users and how can WL use be optimized (CBA)?
5. What are the impacts of macroeconomic and non-WL policies on WL?

Comparative estimates of asset values (Namibia 2004)

Resource	Asset value (N$ million)
Wildlife	10,500
Fish	12,000
Minerals	14,300
Forests	18,700
Manufactured K	82,000
Total national wealth	137,500

Empirical Implementation

- **Where do we obtain the physical data for assets and flows?**
- **The theory for estimation of RR is clear; the challenge is the empirical data requirements.**

$$RR_t = TR_t - CP_t$$

$$CP_t = IC_t + CE_t + CFC_t + NP_t$$

Empirical Implementation

- **The theory for asset valuation is also clear:**

$$V_{\tau} = \sum_{t=\tau}^{T} \frac{p_t Q_t}{(1+r)^t}$$

- **The challenge is with the empirical data requirements.**