



Will PES schemes produce optimal environmental and social outcomes?

The potential limitations of PES interventions in the Baviaanskloof World Heritage Area of South Africa.



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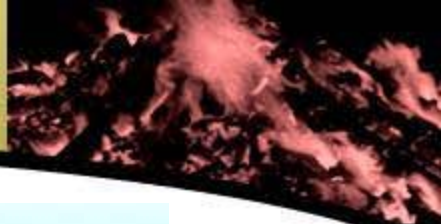
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Where leaders learn









Neoclassical PES Theory

- Problem: Environmental degradation and compromised ecosystem services are a result of missing markets (for Ecosystem Services)
- Solution: Create markets – clear tradable property rights and prices for ES
- Assumption: individualistic ‘utility’ maximising behaviour will produce the desired outcomes
- Is this correct? Many concerns raised in PES literature (Muradian *et al.* 2010)
- Lets look at the Baviaanskloof

PES in Baviaanskloof

- Existing land uses
 - Livestock grazing
 - Ecotourism
 - Some cultivation (minimal)
- Potential Ecosystem Services
 - **Carbon** from revegetation
 - **Water** from revegetation & the restoration of the wetlands & alluvial fans
 - **Biodiversity** - revegetation and riparian restoration




Potential Earnings from ES

Returns to ecosystem services	Baseflow Maximisation		Revegetation	
	Amount	%	Amount	%
Above ground carbon / ha	R 71.10	50	R 72.95	52
Avoided loss :soil carbon/ ha	R 1.72	1	R 1.72	1
Water: Value of sales / ha	R 22.93	16	R 22.48	16
Land use change : (Agric., biodiv & tourism)/ ha	R 44.18	31	R 42.80	30
Sediment reduction / ha	R 1.39	1	R 1.39	1
Total benefits: R/ha/yr	R 141.32	100	R 141.35	100
Total management cost: R/ha/yr	R 43.20	31	R 35.89	25
Net returns: R/ha/yr	R 98.12	69	R 105.46	75

Current returns from livestock farming estimated at R37 & R80 per hectare per annum

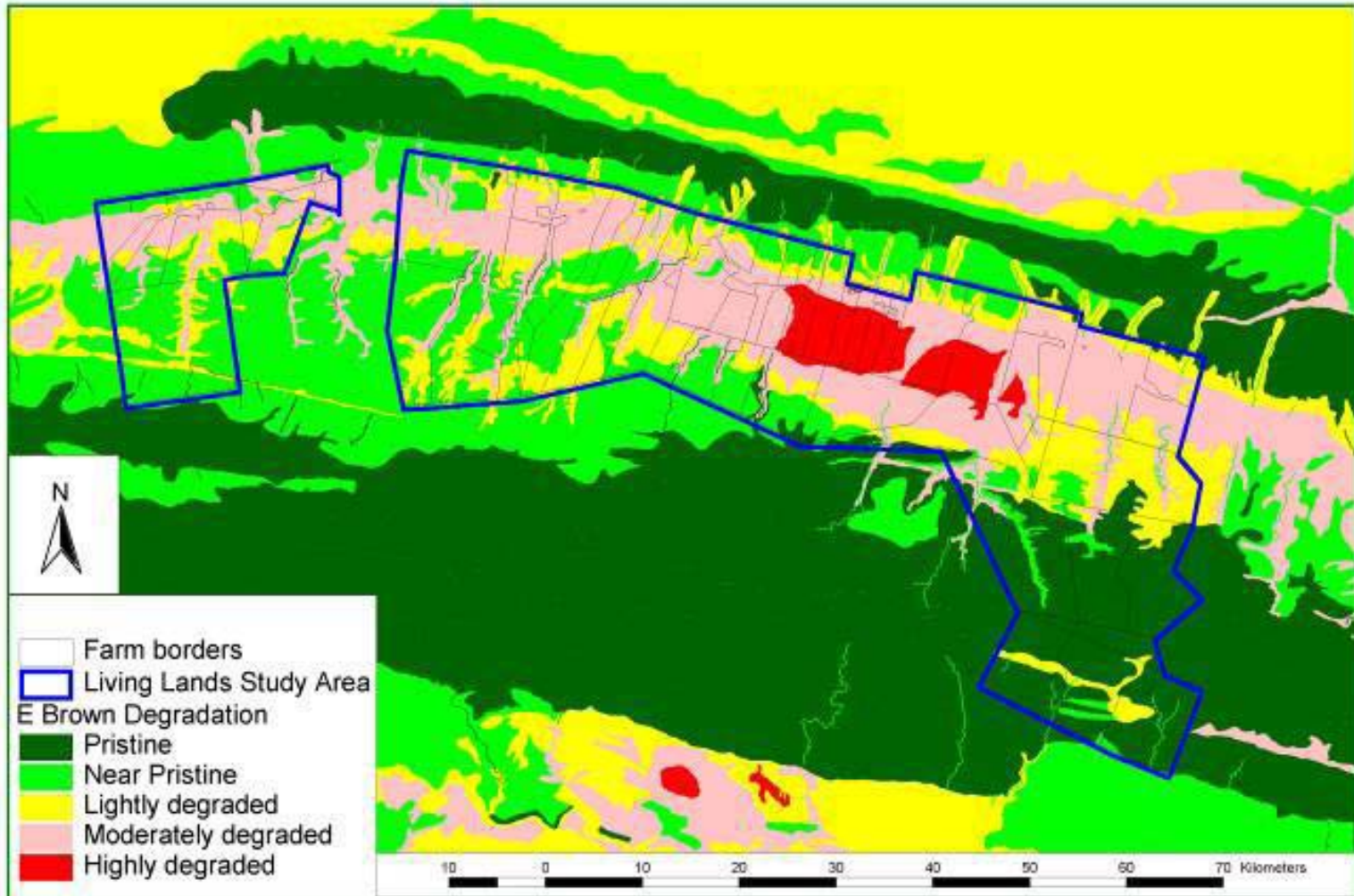
Source: Manders et al. 2010



Assuming the ES market is created:
what outcomes would it produce?

The outcomes will depend on the local context & the distribution of assets and power amongst the stakeholders

Characteristics of the Land and Users






Characteristics of the Area

- +/- 46 500 ha area of private land in valley bottom surrounded by nature reserve
- 27 different farms (Range = 0.4 – 9887 ha)
- 3 small disadvantaged rural communities
 - (+/- 120 poor households)
- Between 10-15 000 ha (23-33%) of spekboom veld is degraded
- +/- 2 390 ha of intact spekboom remaining (potential REDDS)
- Isolated, rugged and semi-arid area
- Most farmers struggling financially & many absent landowners
- Unemployment very high amongst poor households



Uneven distribution of Spekboom Veld

Degraded Spekboom veld Area per farm (ha)	# Farms	Total Spekboom Area degraded	% of total degraded land	Area of Intact Spekboom Thicket	% of total intact Spekboom thicket
4000+	1	4719	32	523	23
2000-3999	1	2 288	16	757	33
1000-1999	2	2 345	16	295	13
500-999	4	2 316	16	303	8
250-499	4	1 513	10	355	16
100-249	6	1 050	7	155	7
1-99	9	384	3	0.2	0
Total	27	14 615	100	2389	100



Potential PES outcomes assuming traditional individualistic and income maximising market behaviour occurs

- Carbon brokers target farmers with largest areas of degraded land
- Targeted farmers enter individual contracts with carbon brokers



Potential Environmental Outcomes

- Less than 15% (4) farmers could be targeted by brokers, so
- Less than 64% of the degraded land could be targeted for revegetation
- Only the largest blocks of the most degraded land targeted - rest would probably be ignored
- The contribution of re-vegetation to base water flows would be reduced to at least 2 thirds of what it could be.



Potential Social Outcomes

- Less than 15% of farmers (1-4 farmers) could benefit from the scheme (in short-term)
- Only large land owners would benefit
- Rest may go out of business and sell to carbon farmers, conservation agents or 'urban' holiday land seekers
- In long-term, farms may be consolidated into larger blocks for carbon farming or conservation



Potential Employment Creation

- How much employment could revegetation with spekboom create?
- That depends on the area re-vegetated and the duration of the revegetation work
 - The more land revegetated the more employment
 - The slower the revegetation process the more economic benefits for the poor (workers)
- Employment estimates based on 1 team of 12 people plant 7 ha of spekboom in a month (20 days) on severely degraded land & half that much labour for moderately degraded land



Employment Creation Potential

Revegetation Scenarios	% Degraded land	Years of full time employment for specific number of persons			
		Local labour		Import labour	
		100	120	200	300
All degraded spekboom land re-vegetated	100	10.5	8.7	5.2	3.5
9 largest farms re-vegetated	80	8.9	7.4	4.4	3.0
4 largest farms re-vegetated	60	6.6	5.5	3.3	2.2
2 largest farms re-vegetated	43	4.9	4.1	2.5	1.6
Only the 1 largest farm re-vegetated	34	4.0	3.3	2.0	1.3

Unskilled labour estimates for one round of planting. Likely to need replanting if survivorship is lower than desired



Efficient Individualistic Scenario

- **Brokers target a few large farmers and get them planted as quickly as possible.**
- A maximum of 120 local people could be employed in planting, but this may have negative effects on labour supply for other existing livelihood activities
- A rapid planting programme requires importing at least half the labour needed & employing for a short period of time (1-3 years)
- This will encourage temporary in-migration and increase social tensions
- Undermine the long-term sustainability of local livelihoods and encourage rural-urban migration
- Increase urban water demands, as well as pollution, poverty and crime problems – spatial redistribution of problem



Maximisation Group Scenario

- **Re-vegetating almost all degraded land using local labour only**
- Can ensure full employment for +/-100 local residents for at least 10 years but probably much more
- Collaboration facilitates the bundling of ES and increases total incomes and improves long-term income security
- Cooperation and more considerate behaviour by farmers and capacity building amongst poor can create opportunities for the poor to benefit from the new economic activities
- Long-term sustainability is enhanced
- Collective participation in the process of designing PES institutions can facilitate this outcome



Challenges Ahead

- How to create incentives for farmers (and carbon brokers- buyers) to buy into the long term goals, collaborate with one another and participate in the market in a considerate and responsible manner
- How to organise the trade in ecosystem services
- How to extend participation in restoration & conservation to farmers who are engaged in more profitable agricultural activities where the PES schemes are less viable.

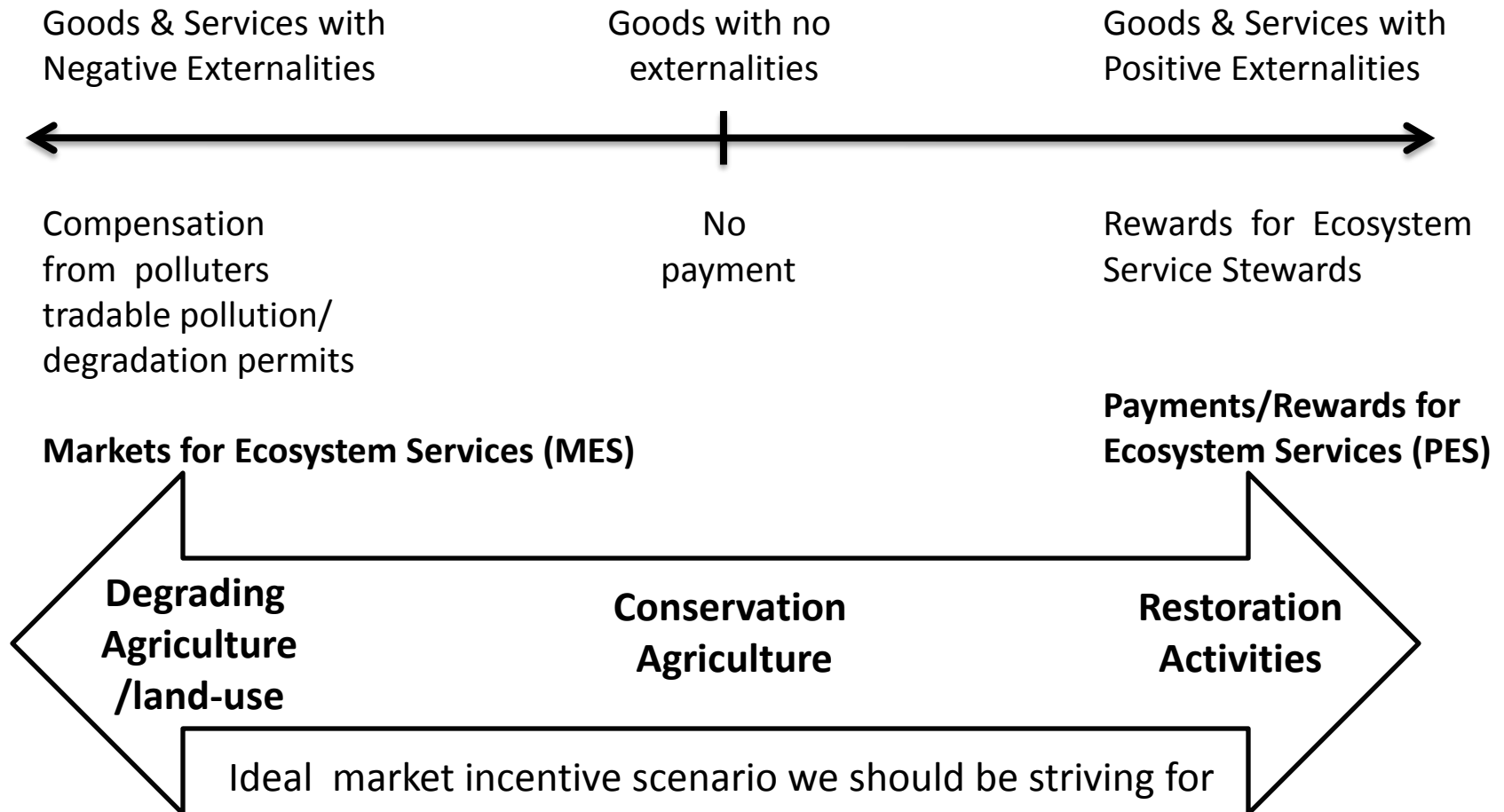


My Own Perspective

- PES (reward) schemes on their own will not be able to deal with the scale of our environmental and social problems.
- PES schemes ultimately need to be implemented in conjunction with MES (compensation) schemes that force farmers (and industry) to internalise the social costs (externalities) of their activities



MES – PES continuum (Shelley 2011)





The Problem

- It is not politically & economically feasible to implement a combined and economy wide MES/PES programme because it would:
 - escalate inflation hugely in the short-medium term
 - threaten food security and
 - undermine the competitive edge of participating national economies and businesses, resulting in disinvestment and capital flight



Implications for Way Forward

- Ultimately, we cannot implement the full suite of environmental policies required unless we
 - deal with the equity & growth issues at the same time, &
 - as part of a coordinated global effort.
- That broader set of objectives and programmes needs to become our national & international policy priorities
- Economic crisis is probably the only thing that will motivate us to do make these changes
- In the mean time we can design and test out PES schemes and demonstrate the potential of restoration activities, so they can be implemented across the board when society is ready to adopt the broader package of measures needed.



Thank You!

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