Stacking payments for ecosystem services

Risks & opportunities for landowners and the conservation community

Dr. Joël HOUDET
jhoudet@synergiz.fr
jh.a@l.co.za

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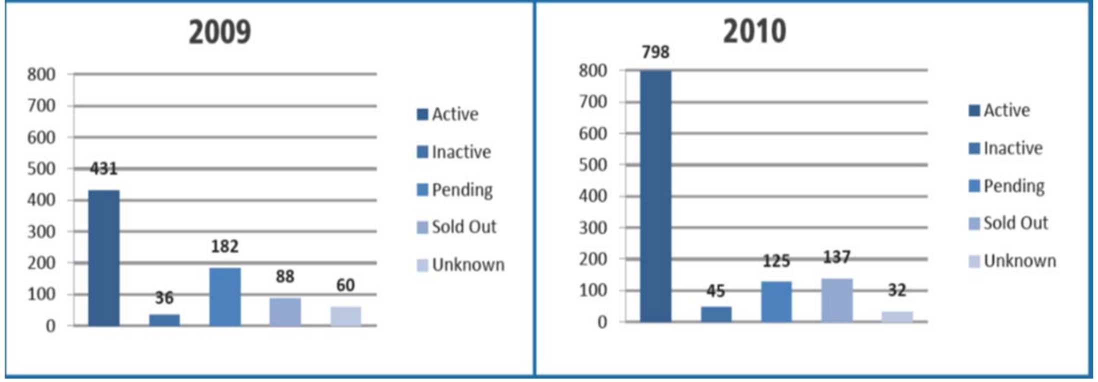
1. Emerging markets related to biodiversity & ecosystem services

Market opportunities	Market size (US$ per annum)		
	2008	Est. 2020	Est. 2050
Certified agricultural products (e.g., organic, conservation grade)	$40 billion (2.5% of global food & beverage market)	$210 billion	$900 billion
Certified forest products (e.g., FSC, PEFC)	$5 billion of FSC-certified products	$15 billion	$50 billion
Bio-carbon / forest offsets (e.g., CDM, VCS, REDD+)	$21 million (2006)	$10+ billion	$100+ billion
Payments for water-related ecosystem services (government)	$5.2 billion	$6 billion	$20 billion
Payments for watershed management (voluntary)	$5 million Various pilots (Costa Rica, Ecuador)	$2 billion	$10 billion
Other payments for ecosystem services (government-supported)	$3 billion	$7 billion	$15 billion
Mandatory biodiversity offsets (e.g., US mitigation banking)	$3.4 billion	$10 billion	$20 billion
Voluntary biodiversity offsets	$17 million	$100 million	$400 million
Bio-prospecting contracts	$30 million	$100 million	$500 million
Private land trusts, conservation easements (e.g., North America, Australia)	$8 billion in U.S. alone	$20 billion	Difficult to predict

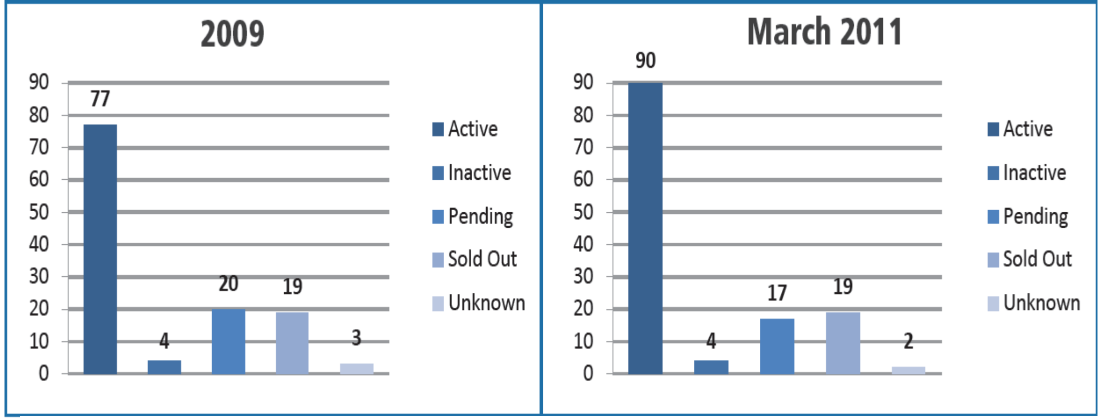
Source : IUCN / TEEB 2010

1. Emerging markets related to biodiversity & ecosystem services

Status of US Wetland and Stream Mitigation Banks



Status of US Conservation Banks



By the numbers	
Number of active programs:	45
Number of programs in development:	27
Total known global payments per annum:	USD 2.4-4.0 billion
Land area protected or restored per annum:	>187,000 hectares

Source: Madsen et al., 2011 (Ecosystem Marketplace)

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1. Emerging markets related to biodiversity & ecosystem services

Baseline Calculation	
Baseline Length (lin ft)	2,930
Functional services	23%
Baseline total	671
Project Work	
Reconnected length (lin ft)	1,500
New total length	4,430
Functional services	29%
Restored total	1,291
Credits generated	**620**

Stream	3rd field basin	Area	Baseline*	Restored*	Total credits*
Lousignont	North Coast	17.1 acres	317 fa	326 fa	9 fa (+3%)
Owens	Willamette	2.7 acres	36 fa	41 fa	5 fa (+14%)
Winchuck	South Coast	39.8 acres	301 fa	315 fa	14 fa (+5%)
Holcomb	Willamette	.22 acres	2 fa	4 fa	2 fa (+100%)

*Credit currency calculated in functional acres (fa)

Stream	3rd field basin	Stream length	Baseline*	Restored*	Total credits*
Lousignont	North Coast	3,000 linear ft	1,651 wlf	1,780 wlf	129 wlf (+8%)
Owens	Willamette	2600 linear ft	929 wlf	1,100 wlf	171 wlf (+18%)
Winchuck	South Coast	4,430 linear ft	671 wlf	1,291 wlf	620 wlf (+92%)
Holcomb	Willamette	1,665 linear ft	19 wlf	958 wlf	938 wlf (+490%)

*Credit currency calculated in weighted linear feet (wlf)

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1. Emerging markets related to biodiversity & ecosystem services

	BENEFICIARY PAYS	POLLUTER PAYS
Ecosystem services	**Direct PES** Beneficiary pays for ES that flow to them. ES are not wholly public, but can be captured to some degree by paying beneficiaries. Bilateral arrangement *e.g. Payments for watershed services*	**ES Markets** Polluter pays for damage they have done by buying an offset/credit. The beneficiaries are the population that receive the ES and are usually different from the population that is paying. Bilateral/Market arrangement *e.g. Water quality trading, forest carbon*
Biodiversity	**User Fees** Beneficiary pays for access to/use of in situ BD. Direct use BD benefits accrue to those who pay for access. Single payments *e.g. Eco-tourism, hunting licenses*	**Biodiversity Markets** Polluter pays for damage they have done to biodiversity by buying an offset/credit. The beneficiaries are the population that enjoy BD as a public good. Bilateral/Market arrangement *e.g. BD offsets/banks, tradable fisheries quotas*

Source : Parker & Cranford, 2010

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1. Emerging markets related to biodiversity & ecosystem services

Positive outcomes

* Brings costs to biodiversity / ecosystem degradation (e.g. mitigation markets)
* Incentives for landowners to change to ecologically-responsible land management practices
* New skills / job opportunities => investments in natural capital

Challenges

* Lack of control / assurance on outcomes => Net loss of biodiversity / high quality wetlands in the USA
* Focus on lucrative ES markets => e.g. investments in voluntary carbon markets with due regard to biodiversity & other ES (*Houdet et al., 2011*)

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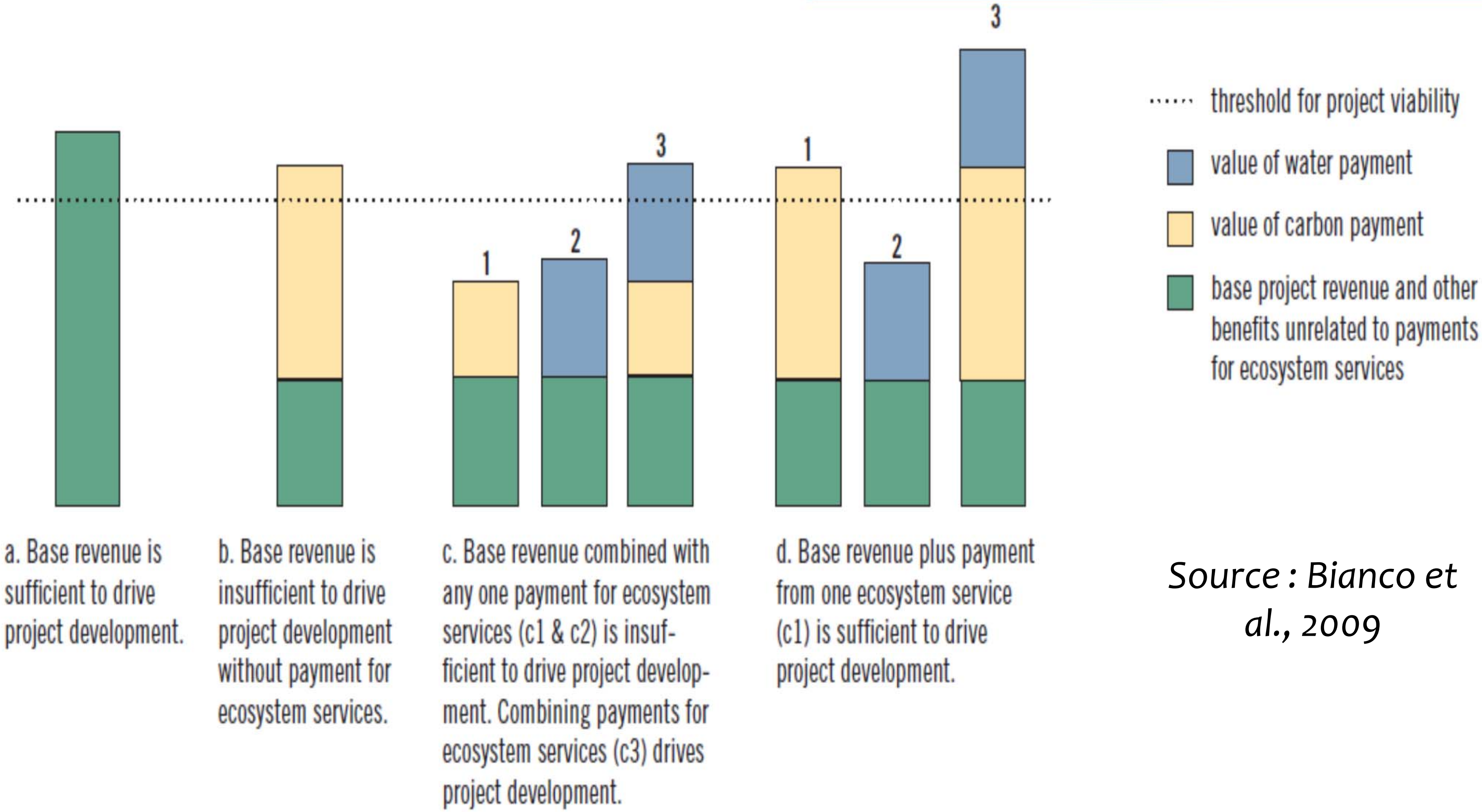
2. Stacking payments for ecosystem services: *principles, opportunities & challenges*



Source : Bianco et al., 2009

2. Stacking payments for ecosystem services: *principles, opportunities & challenges*

What is being / could be stacked ?

- *Multiple* **Payments for ecosystem services** (PES)
- 1 or more **PES** with 1 **offset or mitigation credits**
- *Multiple* **offsets** or **mitigation credits**

≠ bundling : single payment with different ES outcomes

Source: Cooley & Orlander, 2011

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2. Stacking payments for ecosystem services: *principles, opportunities & challenges*

How could landowners
stack credits ?

1. Horizontal stacking

Selling credits from distinct, non-spatially overlapping parts of a single property parcel

2. Vertical stacking

Multiple payments for a single management activity on spatially overlapping areas (i.e. in the same hectare). E.g. a project involves planting a forested riparian buffer to receive both water quality credits and carbon credits.

3.Temporal stacking

1 management activity, but payments are separated in time. E.g. Restoring habitat to receive endangered species credits, and then later receiving carbon offset credits (or *vice versa*).

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2. Stacking payments for ecosystem services: ***principles, opportunities & challenges***

Yet, offsets / mitigation markets differ significantly from PES schemes :
*i.e. offsets relate to a damage / impact => **Accountability**?*

When it is ok to stack:

Horizontal stacking - providing there is no competing ES on the same piece of land

When it may be controversial to stack:

Where **offset and mitigation programs** are part of the stack, there is potential for negative ecosystem service outcomes, because these credits allow others to impact the environment.

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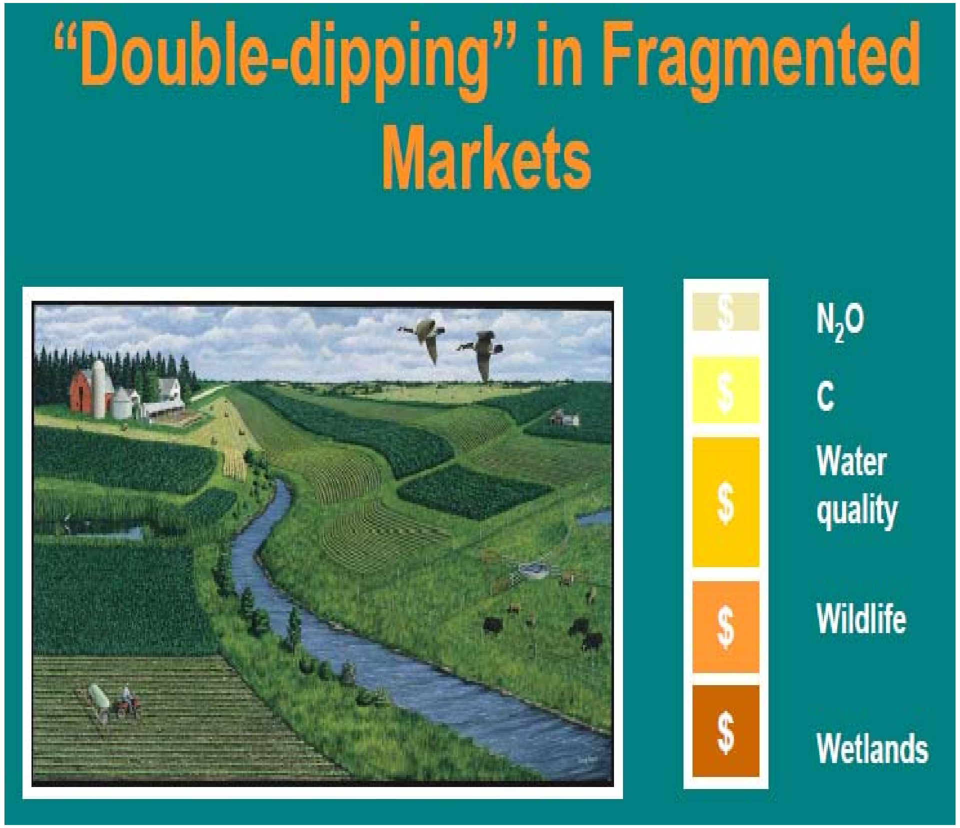
2. Stacking payments for ecosystem services: *principles, opportunities & challenges*



Risks of Fragmented Markets (McLellan)

- **Uncoordinated activities**
- **At the wrong scale – both in space & time (permanence of ecosystem benefits?)**
- **May not address real threats to ecosystems**
- **Miss opportunities to engage wider array of stakeholders**
- **"Double-dipping" => being paid twice for no extra-work / no additionnality**

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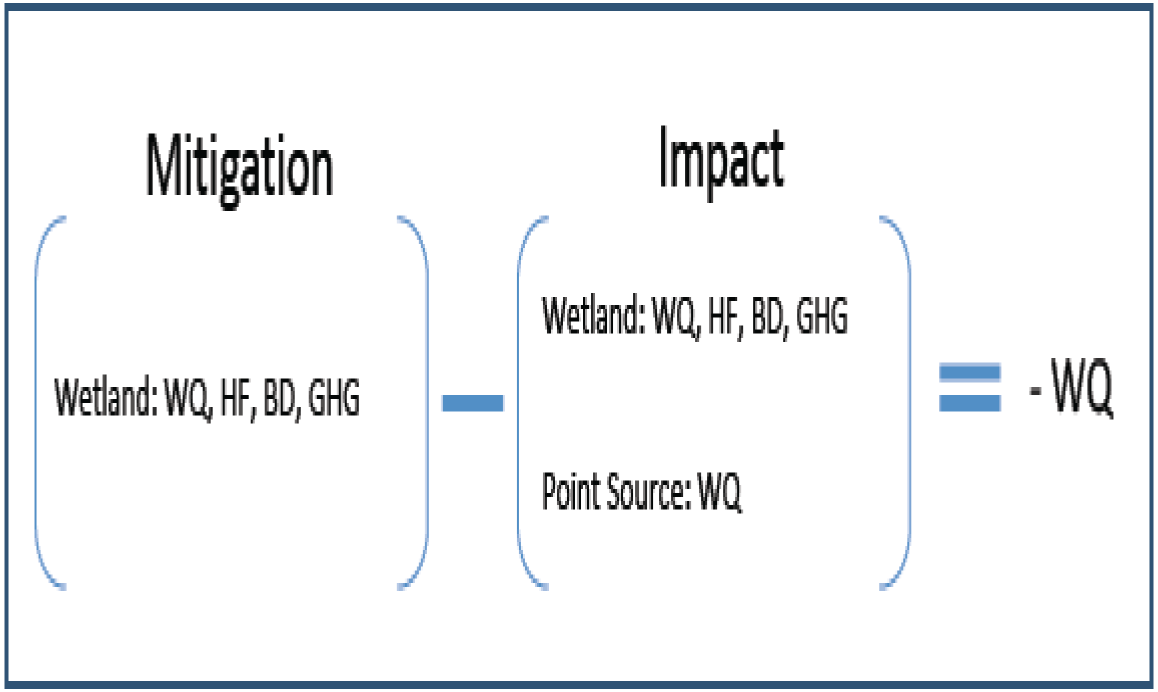
2. Stacking payments for ecosystem services:
principles, opportunities & challenges

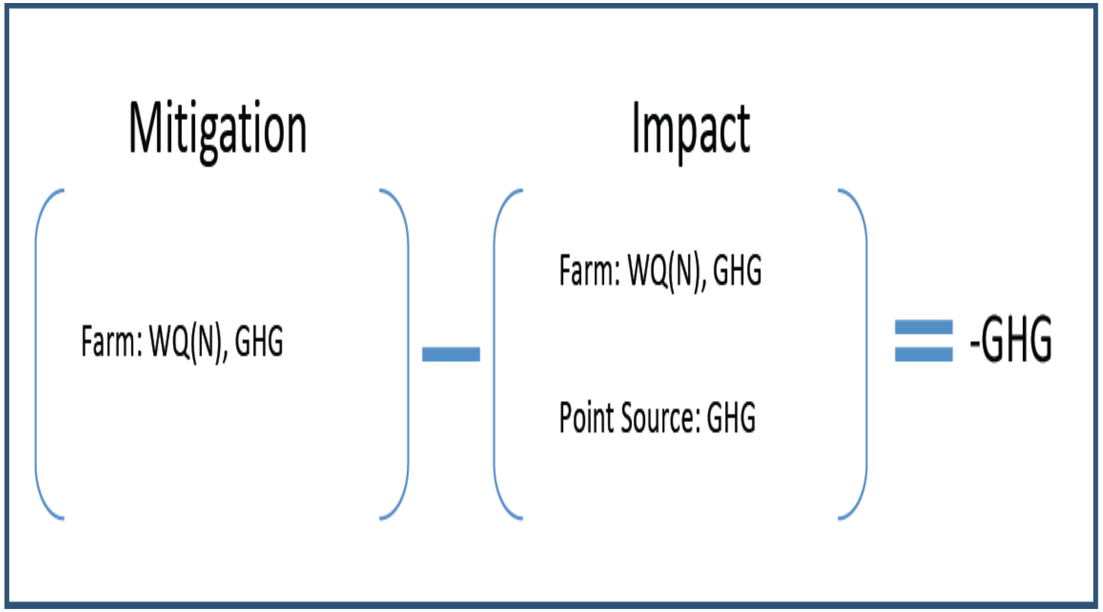
Overlapping credit types (cooley & orlander, 2011)



E.g. a project in eastern North Carolina to sell **wetland** and **stream credits** from **same mitigation site** to the N.C. Department of Transportation to offset impacts to wetlands and streams from road building

2. Stacking payments for ecosystem services: *principles, opportunities & challenges*

Incomplete coverage (cooley & orlander, 2011)



Hypothetical example:

- Non-point regulation for nitrogen releases into waterways (nitrogen fertilizer)
- No regulation for nonpoint GHG (nitrous oxide emissions from fertilizer use)
- Farmer A buys water quality credits from farmer B (non-point impacts)
- **BUT Farmer B also sells GHG offset credits to Industry C for reducing nitrous oxide emissions**

=> Supply of one action to reduce GHG reduction (Farmer B) does not cover the 2 different sources of GHG emissions (Farmer B & industry C)

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Additionnality (cooley & orlander, 2011)

a) Mitigation − Impact

(Buffer: WQ(N), GHG) − (Point Source: WQ(N); Point Source: GHG) = 0

b) Mitigation − Impact

(Buffer: WQ(N), ~~GHG~~) − (Point Source: WQ(N); Point Source: GHG) = -GHG

E.g. Stream buffer generating reductions in nitrogen for a water quality benefit & sequester carbon.

A) Without taking into account additionnality

B) If water quality program provides sufficient for project viability => no need for carbon payment => no additional carbon storage to offset additional GHGs emitted

2. Stacking payments for ecosystem services: *principles, opportunities & challenges*

Credit #1	Credit #2	Overlapping Credit Types	Incomplete Coverage	Additionality
PES	PES			
PES	Offsets/Mitigation (Bundled)			M
PES	Offsets/Mitigation (Single service)			M
Offsets/Mitigation (Bundled)	Offsets/Mitigation (Bundled)	M		M
Offsets/Mitigation (Bundled)	Offsets/Mitigation (Single Service)	M		M
Offsets/Mitigation (Single Service)	Offsets/Mitigation (Single Service)		M	M

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3. The way forward for SA: pilot-testing in the Thicket ?

Key challenges for the conservation community :

- Proper ecosystem accounting : matching impacts with offsets (NO DOUBLE DIPPING)
- Rights sets of policy & regulatory frameworks
- **Permanence of ES benefits ??? / Assurance**

Key issues for landowners :

- Securing margin over opportunity costs
- Cash inflows / permanence of management actions & outcomes after contract timeframe

- **Biodiversity conservation / restoration payments as long-term solutions (horizontal stacking) ???**

=> see Green Development Initiative

Imbed PES stacking into strategic ecosystem planning

- Assess ecosystem condition
- Identify stressors / impacts (local, supply chain)
- Identify desired future conditions
- Translate to ecological targets (service caps, market drivers)
- Evaluate and prioritize restoration activities (ecological currencies)

In the Thicket!?!

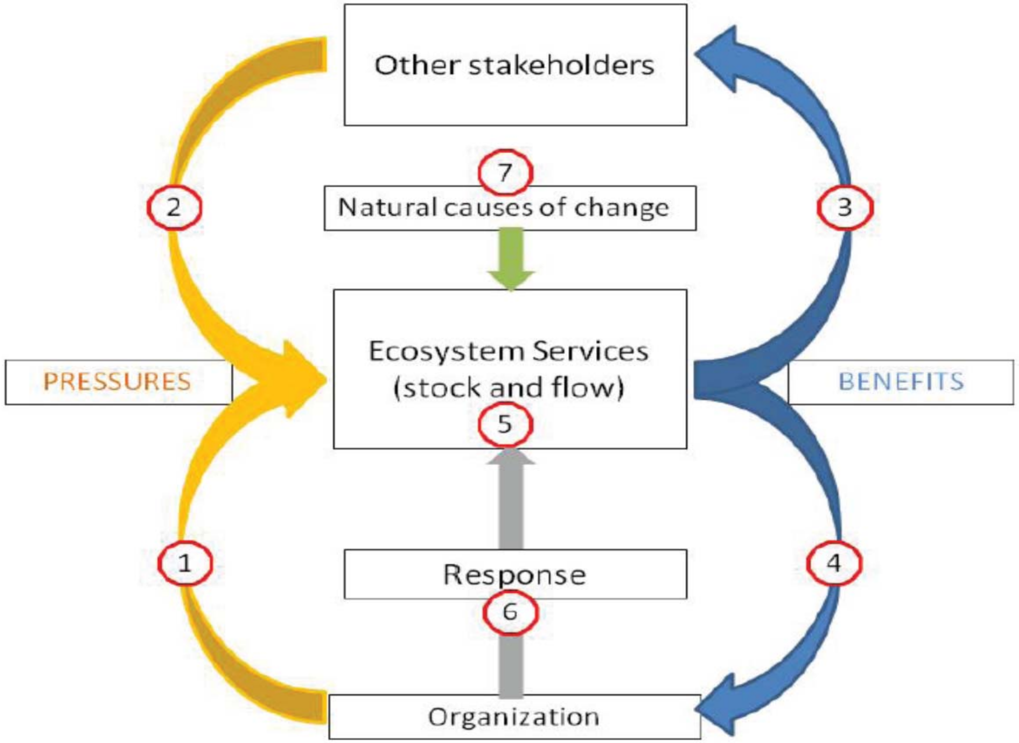
What about the demand side???

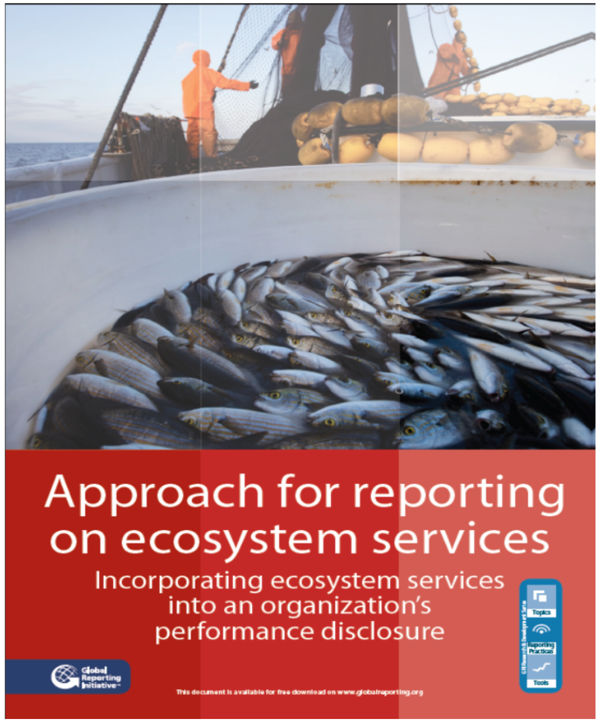
3. The way forward for SA: pilot-testing in the Thicket ?

1- **Biodiversity offsets are progressively becoming reality in RSA**

Provincial guidelines - Case studies

2- **Corporate sustainability & responsibility**





3. The way forward for SA: pilot-testing in the Thicket ?

Red zone High-risk sectors: Risks likely to be significant	Amber zone Medium-risk sectors: Risks may be significant	Green zone Lower-risk sectors: Risks variable and significance unknown
• Construction and building materials	• Beverages	• Aerospace and defence
• Electricity	• Chemicals	• Automobile
• ***Food and drink production sector***		
	• ***Financial services***	• Diversified industrials
		• Electronic and electrical equipment
• Forestry and paper	• General retailers	
	• Household goods and textiles	• Engineering and machinery
• Mining		
• Oil and Gas utilities	• Personal care	• Health
	• ***Pharmaceuticals and biotech***	• Information technology hardware
• ***Retail***		
• ***Tourism***	• Tobacco	• Media and entertainment
		• Software and computer services
	• Transport	
		• Steel and other metals
		• Telecom services

Source: F&C Asset Management

3. The way forward for SA: pilot-testing in the Thicket ?

		Dependencies on ES	Impacts on ES
1	Define the business scope	**Scope A** : direct dependencies of activities fully controlled by the business **Scope B** : direct dependencies on ES from ecosystems surrounding land assets controlled by the firm **Scope C** : Indirect dependencies through suppliers, joint ventures and / or clients	**Scope A** : direct impacts of activities fully controlled by the business **Scope B** : direct impacts on ES from ecosystems surrounding land assets controlled by the firm **Scope C** : Indirect impacts through suppliers, joint ventures and / or clients
2	Determine the ES involved	ES influencing the business activities according to the CICES (2010) classification	ES influenced by the firm according to the CICES (2010) classification
3	Determine the physico-chemical changes	Identify and quantify the relevant interactions with the company activities (e.g. production processes, emissions / discharges, land-use).	
4	Determine associated internal costs and revenues	Direct (expenses / sales of ES) and indirect (labour costs, capital investments for ES management) monetary flows associated to ecosystem	
5	Identify ES used by / important to stakeholders	Assess business impacts on the availability of ES used by other agents (competing uses of the same ES or degradation of other ES caused by the business activity)	
6	Ecocomic valuation of externalities (changes in ecosystem services availability / delivery)	Use economic valuation methodologies which are appropriate to specific ES dependencies or impacts	
7	Develop key performance indicators	Imbed KPIs in sustainability tools for internal (decision-making / trade-offs, management purposes) and external (accountability purposes) stakeholders	

Steps for assessing business dependencies and impacts on BES (Houdet et al., 2009; 2011)

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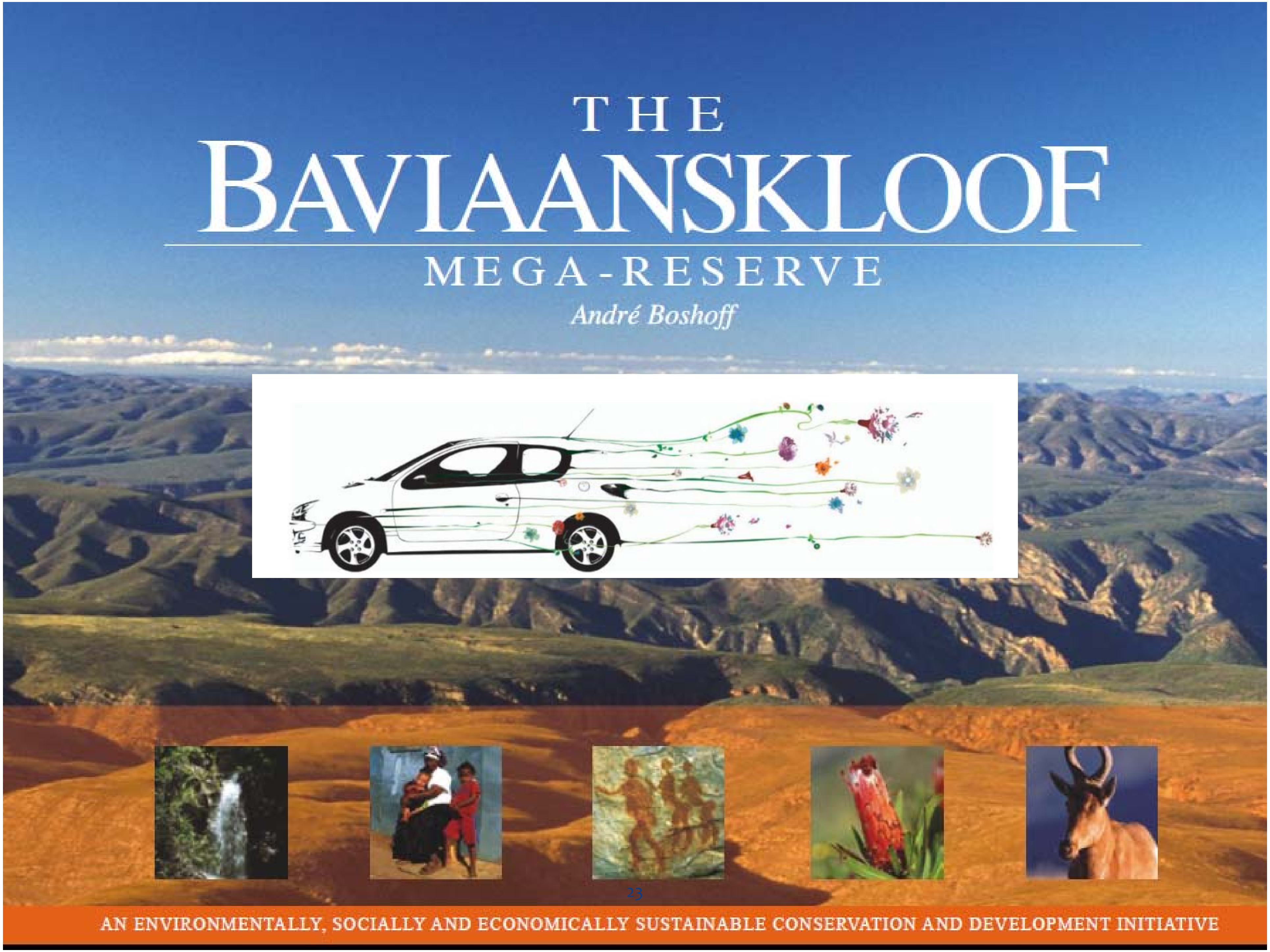
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Thank you !

Dr. Joël HOUDET
Integrated Sustainability Services

A partnership between GCS (Pty) Ltd and Accountants @ Law (Pty) Ltd

Physical:
Unit 22, Villa Toscana
25 Melville Road
Hyde Park Ext 2

Postal:
P.O. Box 653235
Benmore
2010

Contact details:
Mobile: 00 +27 (073) 446 2671
Email: jh.a@l.co.za
Tel: 00 +27 (011) 788 1138
Skype: joelhoudet
Fax: 00 +27 (011) 788 1161
Web: www.integrated-sustainability-services.com