



# Interactions between organizations and biodiversity : a new accountability framework

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# Introduction

- Millennium Ecosystem assessment in 2005
- Awareness that biodiversity is complex
  - interactions and dynamics are at the base of its functioning and its evolution.
- Biodiversity is primarily useful for itself : supporting-service.

# Introduction

- “ecological efficiency” of supporting services has an impact on the level and quality of services that will benefit humans
  - provisioning services (picking, wood, ...)
  - regulating services (quality of land, water, air, ...)
  - cultural services (beauty of a species and/or landscape, link with religions ...).
- Dynamic interactions because the supporting services depend on services used by humans ...

# Introduction

- Biodiversity is no longer seen as a simple environmental issue where the objective is to minimize costs to achieve an imposed reduction
- Biodiversity becomes a strategic element for the actors
  - Minimize costs to achieve a reduction of impact expected today may cause additional costs tomorrow
- To change perceptions that the policy actors in their relationship with biodiversity is the most efficient both economically, ecologically and socially.

# Introduction

- Analysis of the case study of PUMA
- Indicator of Business and Biodiversity Interdependence
- The case study of sewage treatment plant Veolia in Berlin
- Some elements of reflection on the relationship between biodiversity and accountability framework

# Case study-PUMA

- The case study on the business company PUMA takes into account GHG emissions, water consumption and land uses ...
- This work focuses on both PUMA as such and all of the actor's of the supply chain.
- PUMA's direct effect on pollution is low compared to the other actors of the supply chain
  - a large part of the chain is outsourced, including production

# Case study-PUMA

- In this context, PUMA proposes the establishment of guidelines and standards for environmental, social, health and safety characteristics.
- The company also communicates on the responsibility of each actors and for an equitable cost sharing between all of the actors of the production chain
  - Providers should make efforts to reduce the impact without the PUMA shareholders suffer.
- PUMA involved in clearing operations philanthropic or job creation.
  - It remains in a weak sustainability approach.

# Case study-PUMA

Impact	Measurement
Climate change	Tonnes of GHG emissions
Water scarcity	Volume of water used
Loss of biodiversity and ecosystem services	Area of ecosystem converted
Smog and acid rain	Tonnes of particulates, ammonia, sulphur dioxide, nitrogen oxide, volatile organic compounds (VOCs) and carbon monoxide
Leachate and disamenity affects from landfill and incineration of waste	Tonnes of waste to landfill and incineration

source PUMA

# Case study-PUMA

- Porter approach : win / win analyzing
- Economic efficiency of the management of inputs
  - Energy
  - Water
  - Land
- environmental issues
  - Reducing input consumptions are environmentally friendly and also for biodiversity
- Limitations/MEA
  - Quality water output
  - Waste Management
  - ...

# Business and biodiversity interdependence indicator

- The first step was to raise awareness of the dependence of the various actors with biodiversity.
- In a second step to identify interdependencies between an actor and biodiversity.
- In a third analyze: what are the options to make the system more efficient?
- For the future, we propose a more prospective analyze, it is to see how the accounting system should be developed to allow to take into account the interactions between actors and biodiversity and to propose a new decision tool support

# Business and biodiversity interdependence indicator

- The objective of the first phase was to highlight the dependence
  - between economic activity (business) and / or social (local authority, ...) and biodiversity based on the work of the MEA on ecosystem services
  - this does not exclude the notion of reduction of impact but put it in perspective with other objectives:
    - For example, the creation of value added, thus turnover.

# Business and biodiversity interdependence indicator

- Expresses the perception of companies on their dependence to the living world
  - Direct links to the living world
  - current market
  - Impact
  - Compensation
  - Strategy of the organization (future markets)
- Co-construction of the indicator
  - More than 30 organizations
  - 25 have agreed to the publication of their feedback with 4 local authorities

# Business and biodiversity interdependence indicator

- Co-viability Business and Biodiversity
  - The two are not antagonistic
  - Consideration of biodiversity is compatible with competitiveness
- Coexistence of various indicators that require to co-construct a common language
  - Interdependence between socio economic and ecological indicators (BBII)
  - Consensual indicators for mainstreaming biodiversity strategy

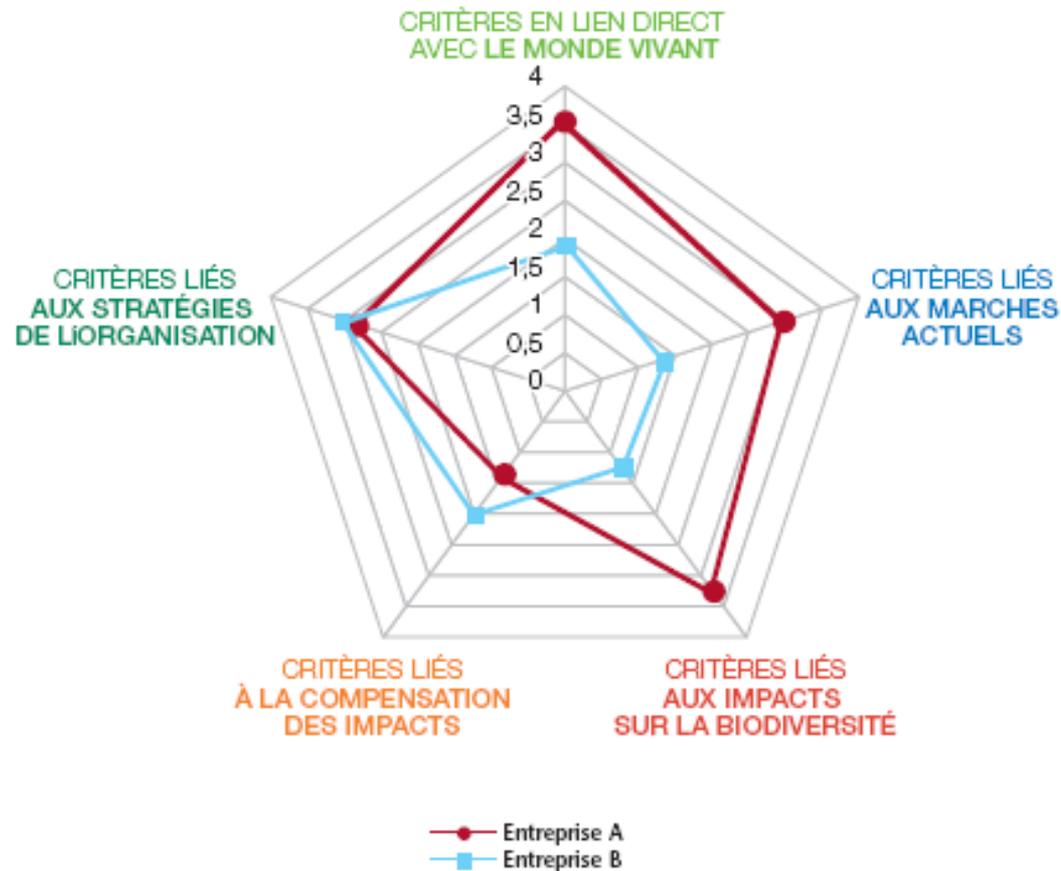
# Business and biodiversity interdependence indicator

Categories	Design to asses	criteria
Criteria Directly related to Living Systems	Dependence on raw material	Percentage of raw material derived from living organism Percentage of raw material derived from living organism from past era
	Dependence on services and technologies derived from living systems	Utilisation of ecological services (including biotechnologies) Bio/eco mimetism
	Management of the variability health and complexity of ecosystems	Ecosystem variability Ecosystem health Ecosystem complexity

# Business and biodiversity interdependence indicator

Categories	Design to asses	criteria
Criteria related to business strategies	The company's strategic positioning	Importance of biodiversity for the viability of the company (going concern) Social pressure Increase competitiveness Effects of public relation efforts Creation of new market Corporate cuture

# Business and biodiversity interdependence indicator



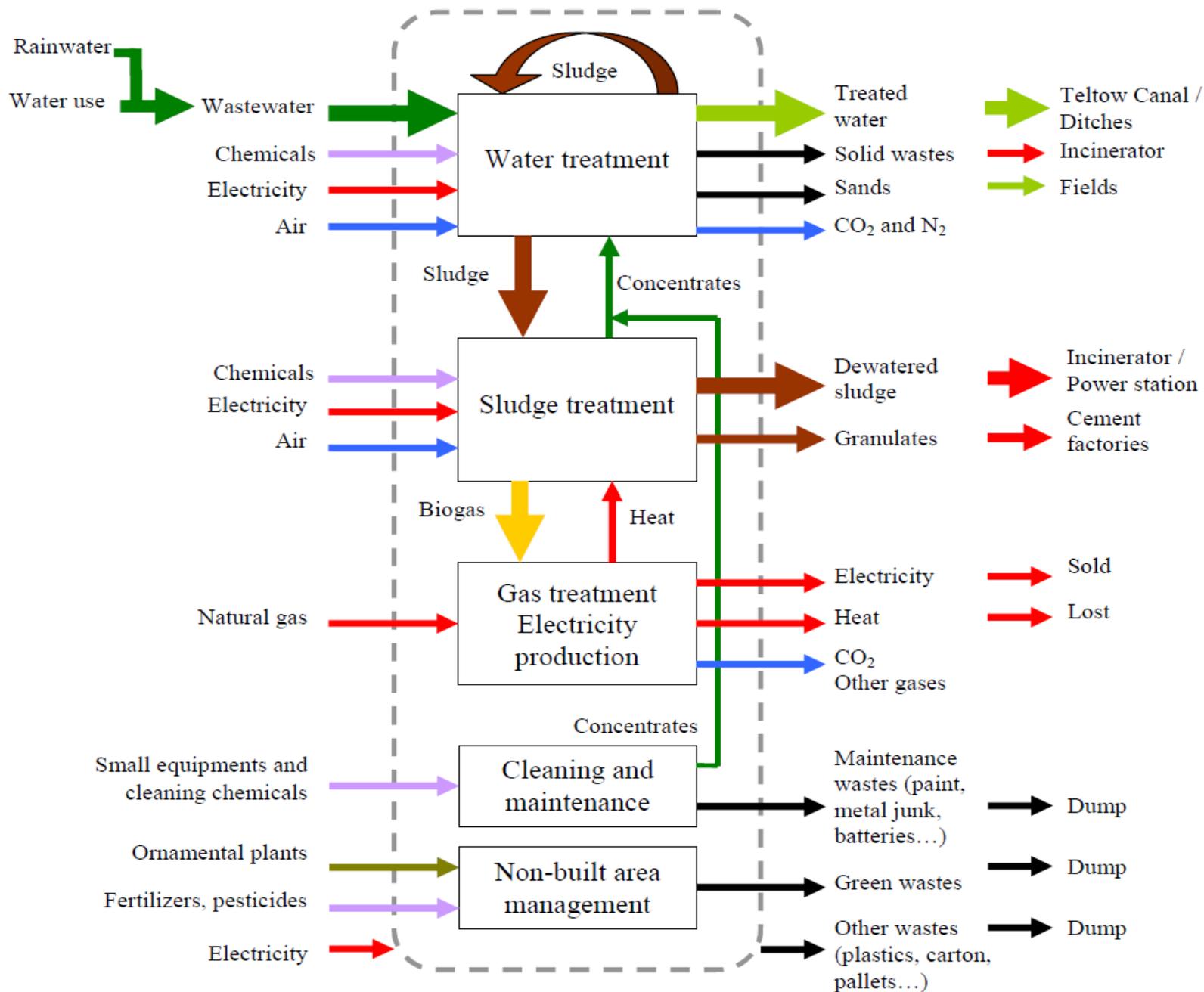
# Case study – BwB Berlin

- General information about the contract between the Land of Berlin and BWB obtained by the consortium RWE - Veolia Water over 30 years

<b>Client</b>	Land of Berlin
<b>Operating Company</b>	Berliner Wasser Betriebe (BWB)
<b>Type of the contract</b>	Shareholding and Management contract
<b>Total population served</b>	4 000.000
<b>Volumes collected and treated</b>	224 000 000 m <sup>3</sup> /year
<b>Length of the combined system</b>	1 908 km
<b>Length of wastewater separate system</b>	4 206 km
<b>Length of rainwater separate system</b>	3 218 km
<b>Wastewater treatment sites</b>	6 WWTPs with capacities varying from 40 000 m <sup>3</sup> /day to 240 000 m <sup>3</sup> /day
<b>Total treatment capacity</b>	656 200 m <sup>3</sup> /day ; 239 513 000 m <sup>3</sup> /year

## Energy and material flows

## End-use



## Case study – BwB Berlin

- Identify interactions between the wastewater treatment plant BwB and ecosystem services
- ES1 - The (degradation) ecosystem services that directly and indirectly influence the activity of BwB (contributing to revenue)
- ES2 - The (degradation) ecosystem services affected by the activity of BwB:
  - (ES2-A) (degradation) ecosystem services affected by the infrastructure for collecting and processing BwB;
  - (ES2-B) (degradation) ecosystem services affected by outflows station Wassmannsdorf.

**ES1-A:** regulation of climate and water flows



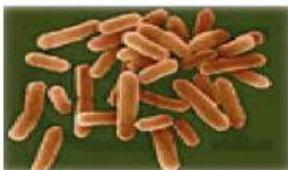
Water use



Wastewater volumes and pollution load

Perimeter of BWB's collection and treatment activity

**ES1-B:**  
Water purification and biological degradation of sludge



**ES1-B:**  
Provisioning services  
(electricity,  
natural gas,  
chemicals)

**ES2-A:**  
Ecosystem services  
influenced by  
infrastructures  
(sewer systems,  
WWTPs' buildings,  
green spaces)

Treated water  
Sludge subproducts

**ES2-B:** Ecosystem services  
influenced by activity's outputs  
(water discharges, gas emissions,  
sludge subproducts)



# Case study – BwB Berlin

- How sustainability of biodiversity can become a key strategic variable in the heart of the decision-making process BwB / Wassmannsdorf?
- How to develop the practices that promote remarkable biodiversity and BSE with other agents useful for all interfaces interactions?
- Contractual clauses do not directly address the BSE (lack of clear policy targets / quantified means)

## Case study – BwB Berlin

- Integrate land managed by the BwB ecological continuity: “green spaces” of the WWTP Wassmannsdorf could be managed to promote and outstanding ordinary biodiversity
- Promote ecological engineering techniques on the whole infrastructure
  - Objective BSE co-constructed with all stakeholders, including the Berlin Country and users / adjacent landowners.
- Include additional performance criteria dedicated to BSE in contractual clauses which is based on the activity of BwB:
  - negotiated with stakeholders, these new standards will involve appropriate funding mechanisms and could lead to changes in sources of income.

# Biodiversity and accountability approach

- Biodiversity regular source of costs and benefits for business companies and local authorities
  - although remarkable species and ecosystems can participate
- Various actors can reap the benefits of:
  - Supply services which are paid in their vast majority
  - Regulating services that can be paid or free (often free). We do not pay the bees or microorganisms.
  - You can pay someone maintaining access to the service either naturally or artificially:
    - ability to pay the actor who maintain bees on site;
    - ability to pay a player that comes with its own bees to pollinate a field.

# Biodiversity and accountability approach

- The use of these services is with or without impacts on biodiversity (resilience) and associated services used by the firm itself or by others.
- Various actors can have costs:
  - Impacts: these costs may be zero or related to compensation (notion of ecological equivalence).
  - The capacity for self-supporting services of biodiversity:
    - If well functioning : zero cost
    - Malfunction if the cost depends
      - The ability to restore service;
      - Cost of service substitution
        - » infinity (activity change or relocation)
        - » Less than infinity. If the cost is less than infinity, we find the example of bees

# Biodiversity and accountability approach

- The image of the company:
  - Maintenance or creation of cultural services
  - Eventually Green Washing
    - But not always, for example, in relation to the remarkable biodiversity

# Biodiversity and accountability approach

- Awareness that direct dependence on biodiversity and ecosystem services will immediately highlight the interdependencies between actors on biodiversity and ecosystem services
  - different stakeholders have benefits that can be a source of costs for other
  - self-sustaining today, will it always be tomorrow?
- These dynamic interactions between multiple actors can be:
  - direct externalities
  - indirect externalities
    - visible or invisible and unquantifiable

# Biodiversity and accountability approach

- It is at this stage that, for example, the maintenance or creation of cultural services can go beyond their primary objectives:
  - maximization of services and thus potentially reduce costs for others in a dynamic and territorial approach. Will they be compensated for it?
  - Disservices, services used by some can have negative impacts on their own future use and also on the uses by other actors. Will they be penalized for it?

# Biodiversity and accountability approach

- Faced with this situation where services are managed internally or not and with monetary transactions or not, we can propose the following table:

Services	Transaction monétaire	Pas de transaction monétaire
Gérés		
Non gérés		

Source indiggo



# Biodiversity and accountability approach

- We have to review the current regulatory system to maintain evolutionary potential in services
  - Dynamic
  - spatially
- Create new forms of regulation of access and use of these services and/or of biodiversity as a whole:
  - reduce impacts both internally and externally
  - maintain services both internally and externally
  - not necessarily the price but rather the value we can lose (cost of inaction)
- Create or rather promote services both for itself and for others who are potentially new sources of profits if the regulations follow!

# Biodiversity and accountability approach

- when we are interested in biodiversity , we exceeded then the search of regulatory tools for investors seeking regulatory tools for managers (both public and private).
- This happens, for example by reflections on the costs of inaction:
  - should we pay for a player to maintain a quality ecosystem service benefits that are now free?
  - Should we be paid for the maintenance or creation of services generated by other?
- How to take into account these dynamic interactions without harming the competitiveness of current while preserving the long-term

# Biodiversity and accountability approach

- Our objective is to study the interactions between multiple actors: business companies, local authorities, people,
  - All have the characteristic to use an accounting tool more or less sophisticated in terms of assets and liabilities.?
  - Accounting is a tool that allows us to compare and extend the analysis to all stakeholders, including those who are not in an area,
    - eg shareholders, outside the speculators
  - The goal is to better take in to account the evolution of natural capital in the business strategy
    - depreciation, supplies, ...)
  - The idea is to show that a depreciation of natural capital represented here by an impairment of ecosystem services can be a cost factor in the same way that a depreciation of financial capital.

# Biodiversity and accountability approach

- The accounting approach requires CFOs and more generally the managers of businesses and local authorities to take into account the issue of biodiversity.
- If it is an environmental issue among others financial help achieve a lower cost.
- If biodiversity is both a factor of costs and benefits, the entire production chain of the company may involved itself.
  - R & D strategy and business innovation
  - change in practices, processes and products on the market that will integrated these new constraints for business
  - natural capital is perceived as free and unlimited. the cost for companies to use are either zero or are based on the price of extraction of the resources.
  - Ever the price paid was not associated with the scarcity or risk of loss of service.

# Biodiversity and accountability approach

- For the future, we propose a more prospective approach,
- The objective is to see how the accounting system should be developed and refocused to take into account the interactions between actors on biodiversity and make a real tool support decision-making and help coordination among stakeholders.

Ciprian Ionescu Cifre thesis in the framework of the Association OREE

- [www.oree.org](http://www.oree.org)

# Conclusions

- We must look for indicators of intertemporal interactions:
  - this work is ongoing with case studies: Veolia, LVMH, seché environnement, INDDIGO, Saf, Solabia ...
  - This is to take into account both the monetary and the physical flows linked to ecosystem services
- What tools of regulation facing this new challenge?
  - Firstly, there are the traditional tools of regulation that will be from the taxes through subsidies, quotas, transferable quotas rights and markets.

# Conclusions

- Secondly to think about the definition of "new" rights of access and use;
  - the definition of property rights associated with (state, county, private)
  - the efficient allocation of the rent resulting from the different actors
    - service user,
    - maintainer and destroyer of Service
- Arbitration between the establishment of a polluter payer principle and the establishment of a beneficiary payer principle for the maintenance of ecosystem services.
- Thinking about accounting reform.
  - Must adapt or reform?



*Merci de votre attention*