



# Defaunation, resilience and tropical forests

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THINKING beyond the canopy



# Resilience, adaptability

- The ability to absorb disturbances, to be changed and then to reorganize and still have the same identity (retain the same basic structure and ways of functioning). It includes the ability to learn from the disturbance.
- Adaptability is the capacity of a socio-ecological system to manage resilience in relation to alternate regimes.



# Importance of wildlife

- Ecological
  - Keystone species
  - Ecological services
- Economical
  - Local livelihoods, food security
  - Income generation
- Cultural
  - Social bonding,
  - Redistribution
  - Traditional ceremonies,
  - Taboos



# The “Bushmeat Crisis”

- Empirical evidence
  - Historical: hunting-related extinctions (passenger pigeon, American buffalo...)
  - Today: local extirpation because of hunting (for food or trade in wildlife parts)
- Is “doomsday” coming?
  - Not sure but there is a clear sustainability problem
- Biodiversity but also livelihoods of local people are at stake



# Bushmeat hunting in Congo Basin



- Estimates of the value of the bushmeat trade range from US\$42 to US\$205 million per year in West-Central Africa.
- Current harvest in Central Africa alone may well be in excess of 2 million tons annually, equivalent of over 1.3 billion chickens or 2.5 million cows!
- 30 to 80% of the protein intake of many rural populations

# Indicators of defaunation

## ■ Direct:

- Hunted populations
- Large mammals (e.g. duikers)

6 species co-existing in north east Gabon

Blue duiker



*C. monticola*

Red duikers



*C. callipygus*

*C. dorsalis*



*C. leucogaster*

*C. nigrifrons*



Yellow back duiker

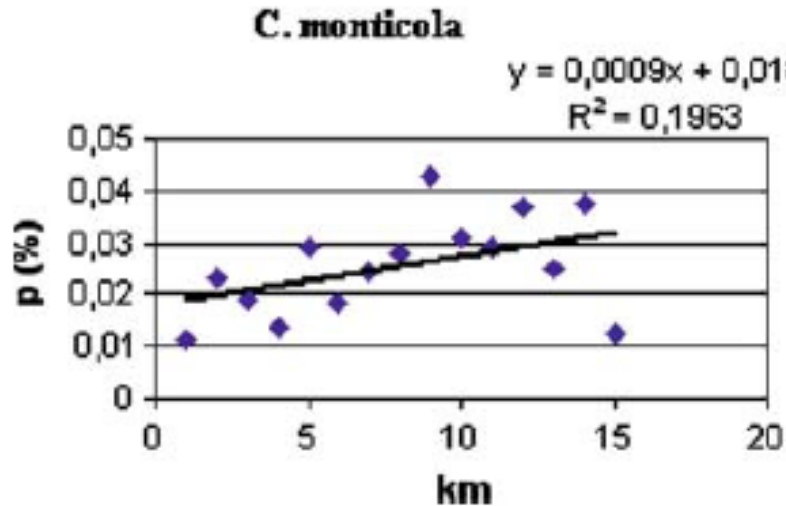


*C. sylvicultor*

## ■ Indirect:

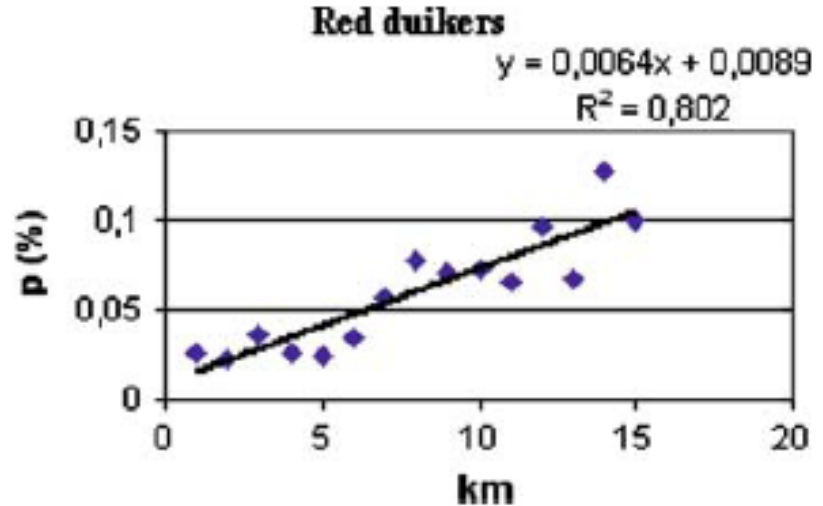
- Road network
- Hunter surveys
  - ✓ Hunting profiles
  - ✓ Hunting effort
- Household surveys
  - ✓ Meals with meat
  - ✓ Sales/consumption
- Market surveys
  - ✓ Fresh/smoked
  - ✓ Quantities

# Effect of roads...



Spearman correlation matrix

Variables	dist road	<i>C. monticola</i>	p= 0.065
dist road	1	0.489	
<i>C. monticola</i>	0.489	1	



Spearman correlation matrix

Variables	dist road	red duikers	p < 0.0001
dist road	1	0.875	
red duikers	0.875	1	

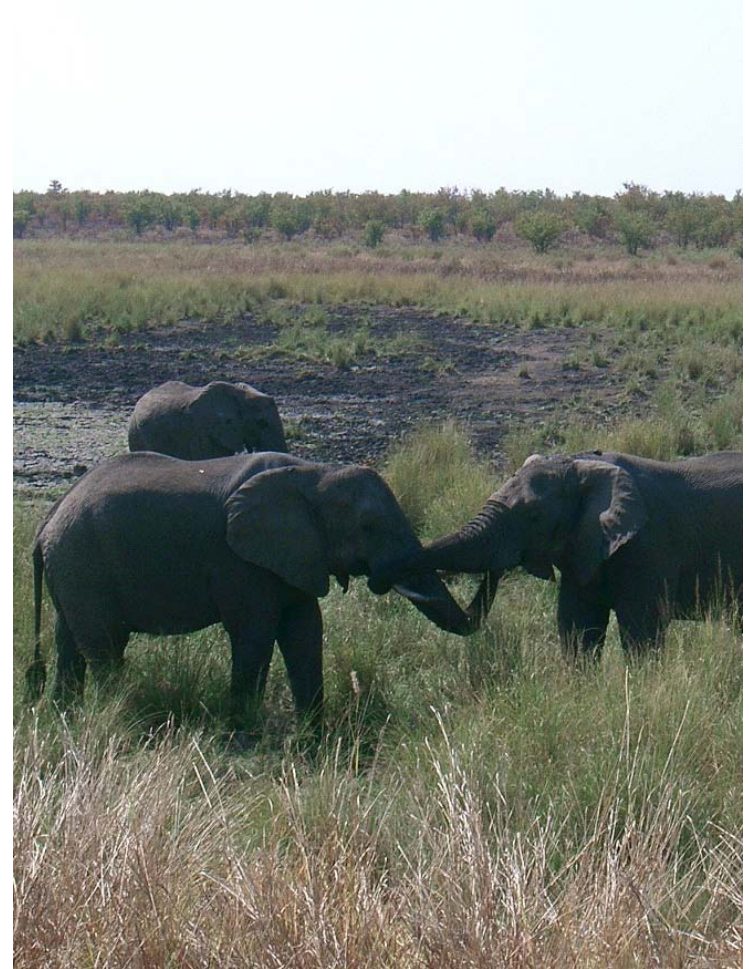
# Consequences of defaunation



- Not restricted only to environmental or conservation issues
- Livelihoods issues are at least as important
- “Bushmeat hunting” needs to be approached as a socio-ecological system

# Ecological aspects

- Extinction or extirpation of hunted species
- Food chain feed-back and Allee effects
- Potential pest outbreaks
- Changes in pollination patterns
- Changes in seed predation / dispersion patterns
- Modification of vegetation dynamics and biomass fluxes

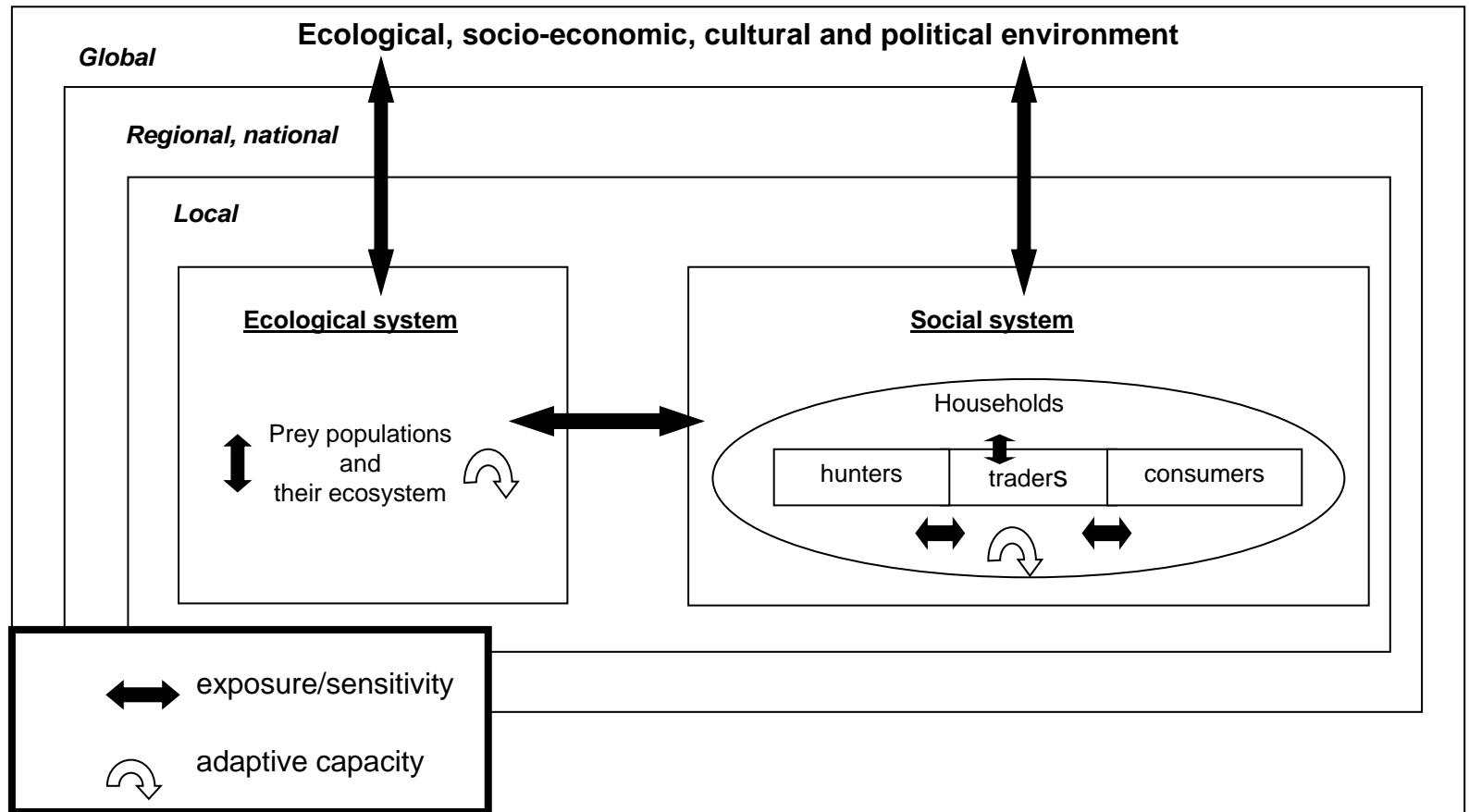


# Socio-economic aspects

- Potential food crisis; malnutrition
- Deforestation or forest degradation for alternative sources of protein
- Unsustainable harvesting of other wild resources (e.g. fish)
- Public health issues
- Loss of income
- Loss of cultural identity



# Socio-ecological system



# Factors affecting sustainability

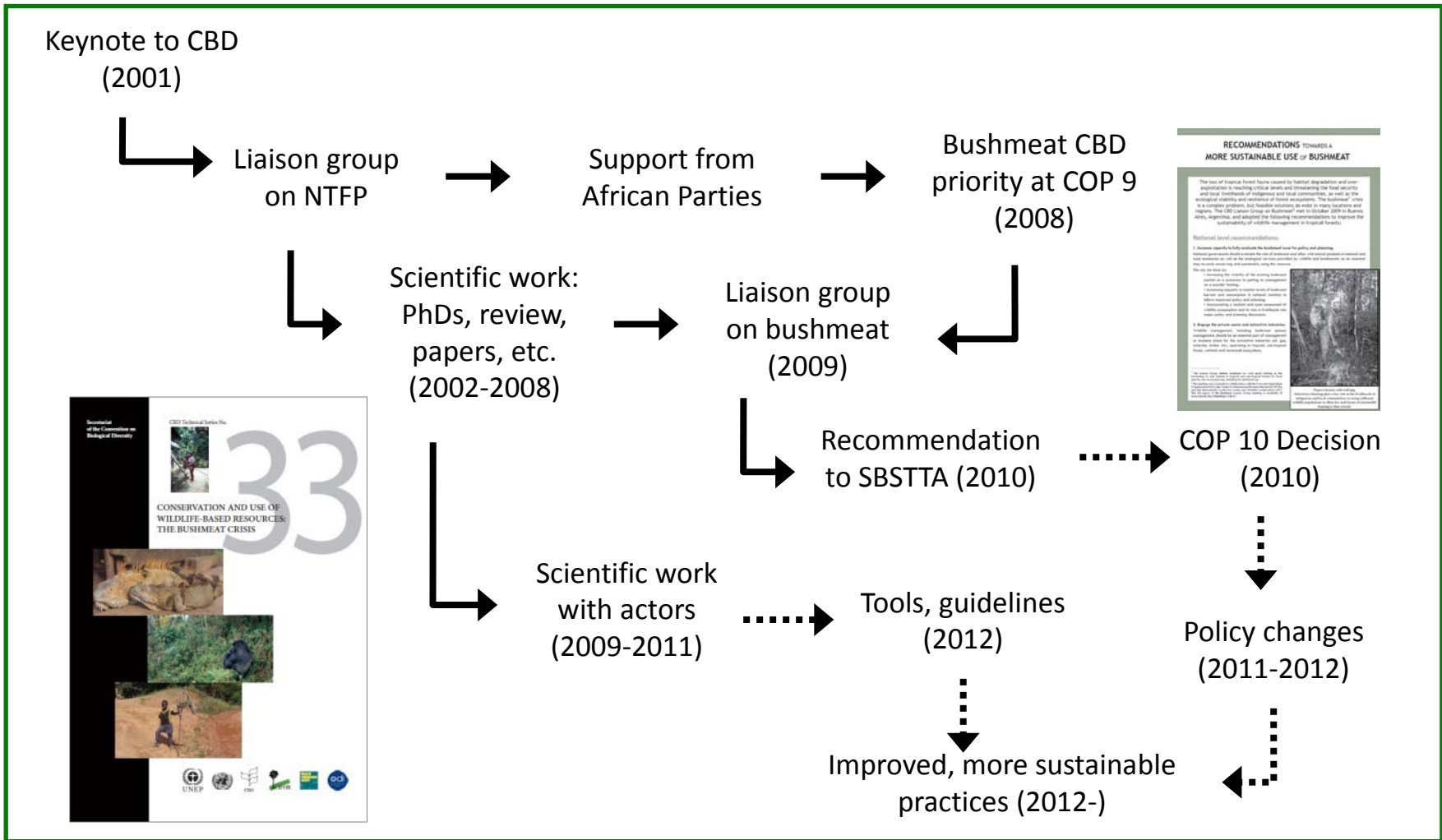
- Nature of the wildlife resource
- Inappropriate policies and governance
- Demography
- Poverty and hunger
- Increased commercialization of the wildlife harvest
- Logging and other resource extraction activities
- Fragmentation and land-use changes
- Agricultural sector



# Barriers to management

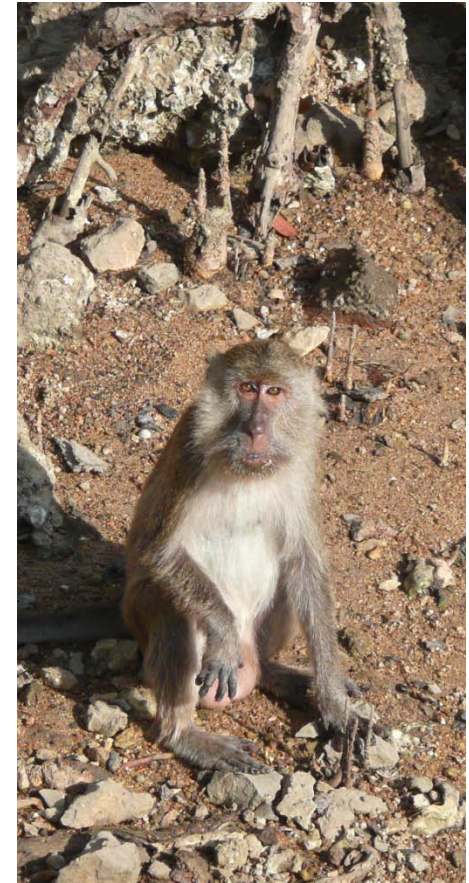
- Knowledge of the most hunted species is at best minimal
- Stocks are very difficult to monitor
- Tenure rights often unclear or disputed
- Substitution by other sources of proteins is often impossible

# Bushmeat, the CBD & CIFOR



# How to maintain / increase the resilience of hunted forests?

- Diversity both of natural resources and human practices increase resilience
- Hunting for food or other wildlife products is one of the oldest human practices; it won't go away
- Repressive measures and protection alone won't suffice
- We need to manage the exploitation of the resource to maintain both the conservation and economic value of forest ecosystems



# Some facts



- Complex wicked problem, no simple solution
- Livelihood issues as important as biological ones
- Driven by many underlying causes similar to the ones that drive poverty
- Interdiction and enforcement only policies do not work
- Successful approaches exist in several locations - need to share experiences

# Recommendations

- Capacity building, incentives and alternatives must be implemented for hunters, traders and consumers to sustainably manage bushmeat.
- Mechanisms such as REDD+ should take into account the importance of wildlife for healthy ecosystems and for the permanence of forest carbon stocks and forest adaptation capacity.
- Management plans and certification schemes for sustainable forest management (SFM) must include wildlife management, to maintain healthy and productive forest ecosystems.
- Local communities should be empowered to manage, and be accountable for, managing local resources in their own – and the national – best interest.

# Recommendations

- Policies and legal frameworks need to be reviewed and strengthened with full stakeholder participation, including all relevant sectors.
- An effective and coherent network of protected areas is essential but not enough. The conservation and sustainable management of wildlife outside of protected areas is equally important.
- Effective collaboration among national and international actors is needed.
- Effective management, including law enforcement, requires capacity building at national and local levels.
- Decision-making should be based on best available scientific information, and
- further research and better management of information is needed

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**RECOMMENDATIONS TOWARDS A  
MORE SUSTAINABLE USE OF BUSHMEAT**

The loss of tropical forest fauna caused by habitat degradation and over-exploitation is reaching critical levels and threatening the food security and local livelihoods of indigenous and local communities, as well as the ecological stability and resilience of forest ecosystems. The bushmeat<sup>1</sup> crisis is a complex problem, but feasible solutions do exist in many locations and regions. The CBD Liaison Group on Bushmeat<sup>2</sup> met in October 2009 in Buenos Aires, Argentina, and adopted the following recommendations to improve the sustainability of wildlife management in tropical forests:

**National level recommendations:**

**1. Increase capacity to fully evaluate the bushmeat issue for policy and planning:**

National governments should evaluate the role of bushmeat and other wild animal products in national and local economies as well as the ecological services provided by wildlife and biodiversity as an essential step towards conserving and sustainably using this resource.

This can be done by:

- Increasing the visibility of the existing bushmeat market as a precursor to putting its management on a sounder footing;
- Increasing capacity to monitor levels of bushmeat harvest and consumption in national statistics to inform improved policy and planning.
- Incorporating a realistic and open assessment of wildlife consumption and its role in livelihoods into major policy and planning documents.

**2. Engage the private sector and extractive industries:**

Wildlife management, including bushmeat species management, should be an essential part of management or business plans for the extractive industries (oil, gas, minerals, timber etc.) operating in tropical, sub-tropical forest, wetland and savannah ecosystems.



Papuan hunter with wild pig. Subsistence hunting plays a key role in the livelihoods of indigenous and local communities securing sufficient wildlife populations to allow for such forms of sustainable hunting is thus crucial.

<sup>1</sup> The Liaison Group defines bushmeat (or wild meat) hunting as the harvesting of wild animals in tropical and sub-tropical forests for food and for non-food purposes, including for medicinal use.

<sup>2</sup> The meeting was convened in collaboration with the Food and Agriculture Organization (FAO), the Center for International Forestry Research (CIFOR), and the International Council for Game and Wildlife Conservation (ICG). The full report of the Bushmeat Liaison Group meeting is available at [www.cbd.int/doc/Inmeeting=LG8-01](http://www.cbd.int/doc/Inmeeting=LG8-01)



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