



IUCN  
WORLD PARKS  
CONGRESS  
SYDNEY 2014

*Parks, people, planet:  
inspiring solutions*

## *Inspiring tools for enhancing sustainability*

**A participative approach to assess socio-ecological trade-offs and achieve sustainability**

Zafra-Calvo, N. & Moreno-Peñaranda, R.

**YNU** 横浜国立大学  
YOKOHAMA National University



UNITED NATIONS  
UNIVERSITY

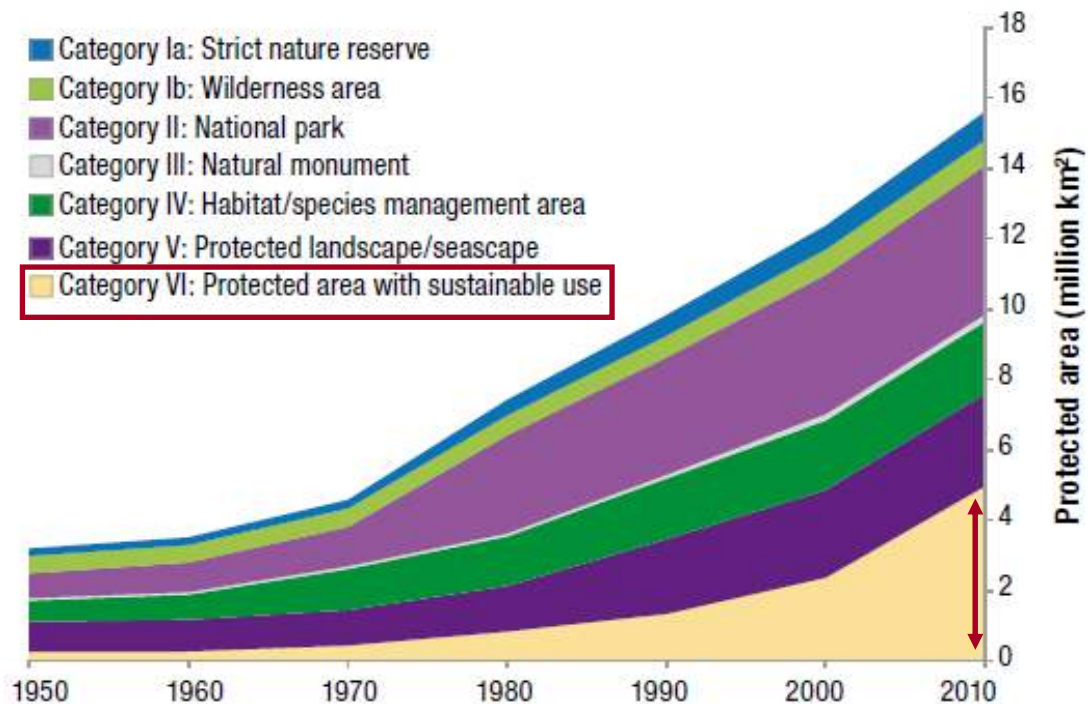
**UNU-IAS**

Institute for the Advanced Study  
of Sustainability



日本学術振興会  
Japan Society for the Promotion of Science

## Assessing socio-ecological trade-offs and achieving sustainability



**Lack of conceptual framework and tools to assess local ecological and socio-economic trade-offs leading towards most relevant **sustainable use of natural resources and conservation outcomes** for a given community**

Total extent of nationally designated protected areas in each of the IUCN management categories, 1950-1990 – Protected Planet Report, 2012

# Assessing socio-ecological trade-offs and achieving sustainability

Actions to preserve biodiversity require a change in the use of the natural resources by local communities which affects their livelihoods (+ / -)



## TRADE-OFFS

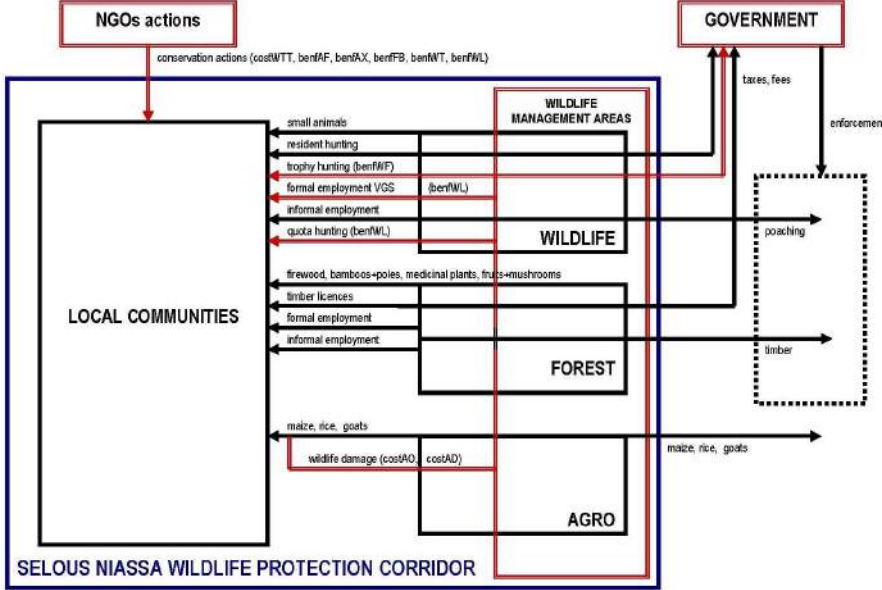
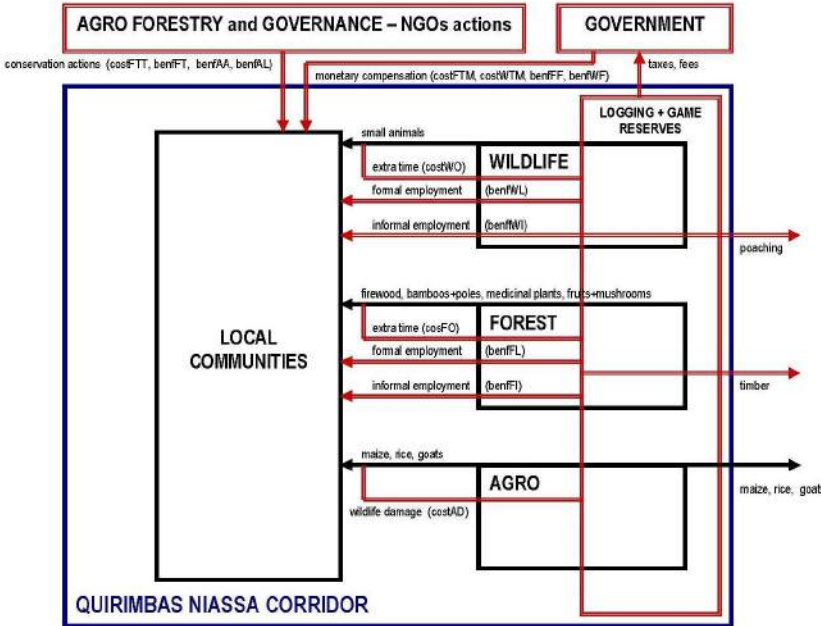


Local communities change their use of the natural resources in response to conservation actions and it influences conservation outcomes (+ / -)

## PARTICIPATIVE ASSESSMENT APPROACH

- (1) Characterize the **natural resource management systems**
- (2) Define **indicators** to assess critical socioeconomic and natural aspects of the natural resource management system and measure it as **monetary costs and benefits**
- (3) Integrate indicators through multi-criteria tools and present the **level of sustainability** achieved, as **perceived by local communities**

# (1) Characterize natural resources management systems



- before conservation actions
- after conservation actions

## (2) Define indicators to assess critical aspects of the natural resource management system

### COSTS

Opportunity	Agricultural opportunity lost	Monetary value of the harvest of one acre of rice in the Wildlife Management Areas; that local communities have not taken (\$ PPP)
Opportunity	Forestry opportunity lost	Monetary value of the number of hours of travelling to reach a new location to take products from the forest (\$ PPP)
Opportunity	Hunting opportunity lost	Monetary value of the number of hours of travelling to reach a new location to hunt (\$ PPP)
Damage	Agricultural damage	Monetary value of the crops and livestock that local communities have not gained by damage from wildlife: maize, gardening, goats (\$ PPP)
Transaction	Time spent in meetings	Monetary value of the number of hours spending in meetings (\$ PPP)
Transaction	Time spent in trainings	Monetary value of the number of hours spending in trainings (\$ PPP)

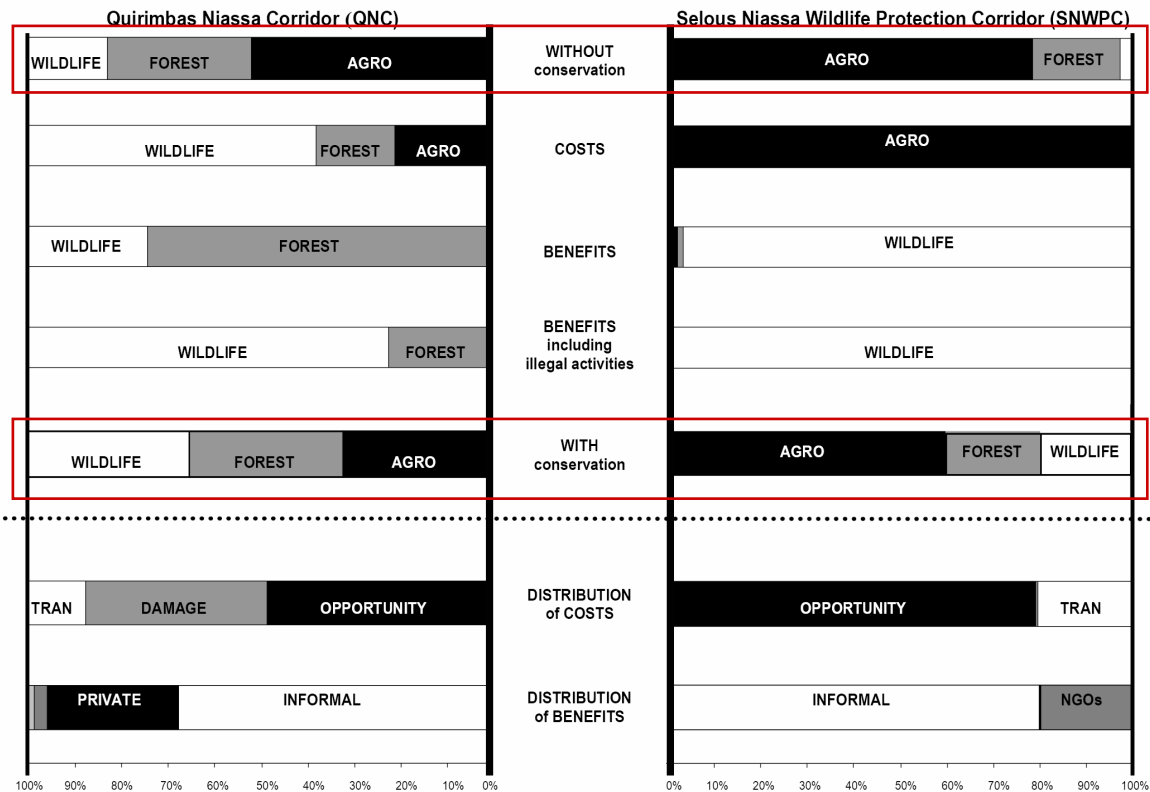


## (2) Define indicators to assess critical aspects of the natural resource management system

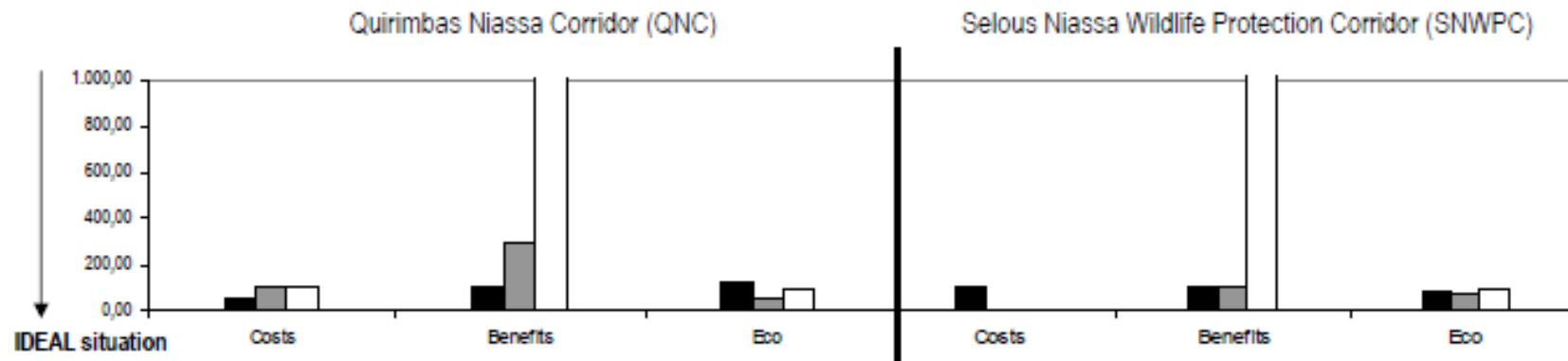
### BENEFITS

	Agro actions	Monetary revenues that local communities are taken from agricultural activities: gardening, cashew nut trees, pineapples (\$ PPP)
	Livestock actions	Monetary revenues that local communities are taken from livestock activities: goats (\$ PPP)
	Fish-farming actions	Monetary revenues that local communities are taken from fish-farming activities (\$ PPP)
	Beekeeping actions	Monetary revenues that local communities are taken from beekeeping activities (\$ PPP)
	Other NGOs actions	Monetary revenues that local communities are taken from other activities related to WMAs; as building chilli fences (\$ PPP)
	Fees and compensation	Monetary revenues that Village Government take for fees related to logging activities (\$ PPP)
	Trainings in forest related activities	Monetary revenues that local communities are gain from forest governance trainings: per diems. travelling costs (\$ PPP)
	Formal employment in logging companies	Monetary revenues corresponding to the salaries that local communities earn from employment in logging companies (\$ PPP)
	Formal employment in hunting companies and WMAs	Monetary revenues corresponding to the salaries that local communities earn from employment in hunting companies. including the maintenance and opening of roads (\$ PPP)

## (2) Estimating the distribution of costs and benefits to local communities



### (3) Multi-criteria tools to define a strategy of sustainable use



What would be an ideal situation as perceived by local communities?

$S = (d/n) * 100$ , where

S = score

d = distance between the empirical and ideal sustainable values, as defined by the communities

n = empirical value of an indicator for the specific corridor



# Finally

- **Novel approach to assess perceived socio-ecological trade-offs** regarding communities living in and managing protected areas and wildlife corridors **based in sustainable use.**
- The approach has been **applied** to understand and assess socio-ecological trade-offs in the **Ruvuma Landscape** (North Mozambique and South Tanzania).
- This novel approach facilitate the development of relevant **sustainability strategies**. These strategies are aimed to ultimately **support a bottom-up, adaptive management strategy** and learning process, with potential positive outcomes for conservation and the local communities.

**THANK YOU**