

# Transition to Green Economy in Biosphere Reserves

Systemic Analysis and Diagnosis of Livelihoods'  
Strategies of Forest Dependent People in the UNESCO  
Biosphere Reserve of Luki (DRC):  
the Livelihoods Approach enriched with a Spatial  
Dimension and Mapping



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United Nations  
Educational, Scientific and  
Cultural Organization



Man and  
the Biosphere  
Programme



United Nations  
Development  
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Kingdom  
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European  
Union



Democratic  
Republic  
of the Congo



University  
of Kinshasa



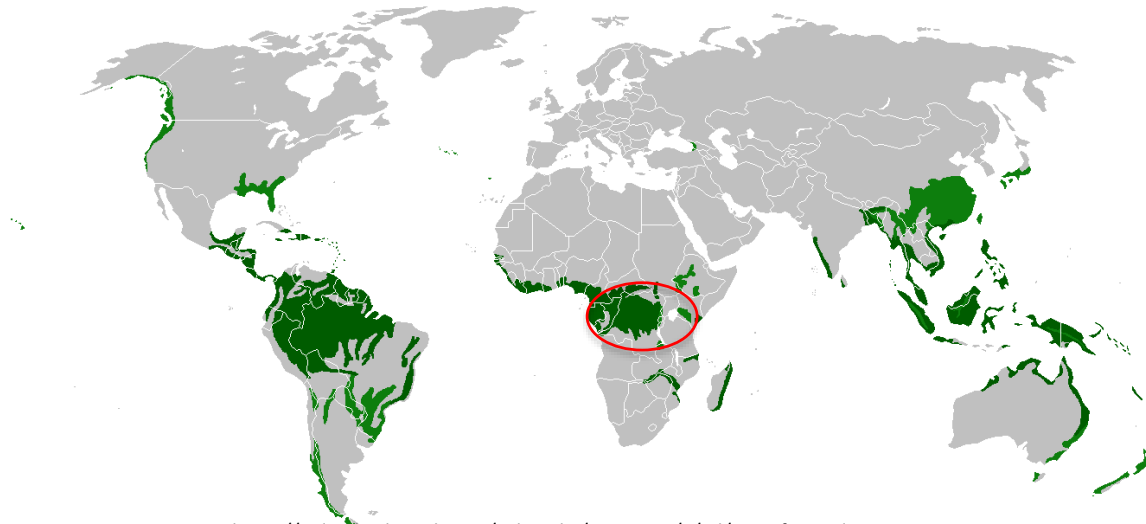
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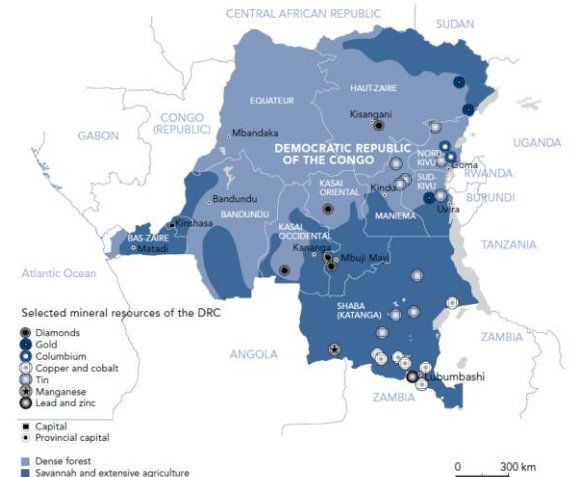
**Regional Post-graduate Training School  
on Integrated Management  
of Tropical Forests and Lands**

# DRC Environmental Context (1)

DRC has a huge environmental potential



[https://upload.wikimedia.org/wikipedia/commons/8/8d/Rain\\_forest\\_location\\_map.png](https://upload.wikimedia.org/wikipedia/commons/8/8d/Rain_forest_location_map.png)



<https://www.newsecuritybeat.org/wp-content/uploads/2012/07/Minerals+and+Forests+of+the+DRC1.jpg>

## Tropical Forest

- Congo Basin is the second biggest forest basin in the world (more than 100 million hectares)
- DRC is home to 60% of the forests of the Congo Basin;
- The DRC's forests occupy about 67% of the country (2.345.374Km<sup>2</sup>).

## Congo River (second biggest river of the world)

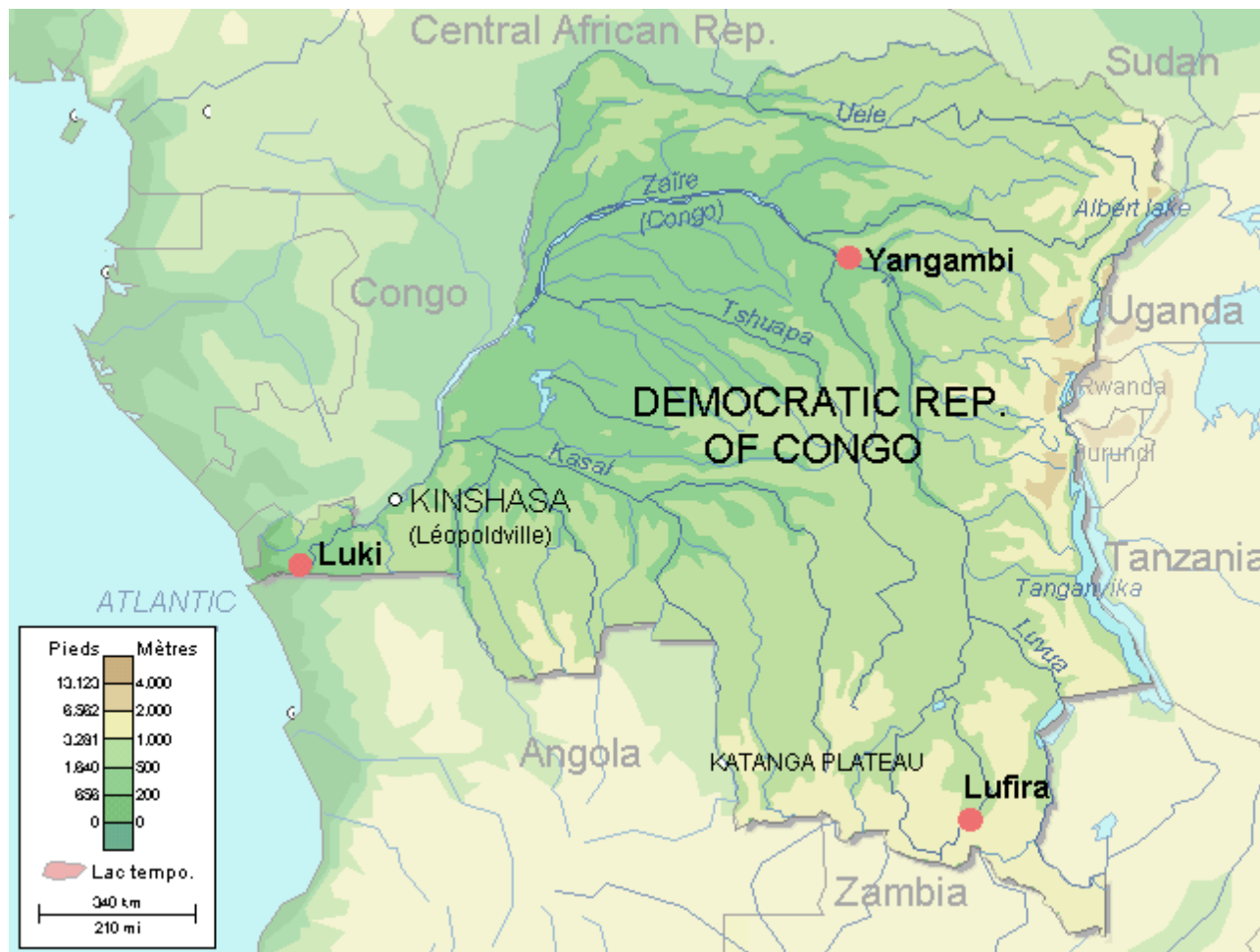
- Hydroelectricity (LRMC:1ct/Kwh)

**Other natural resources (minerals: Diamonds, Gold, Columbite, Copper & Cobalt, Tin, Manganese, Lead & Zinc, etc.)**

**High potential... but, deep poverty** (HDI value for 2014 is 0.433 (rank 176), GNI per capita (2014) in PPP US\$ equals 680, Poverty Incidence in 2015 = 71%) ([http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/COD.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/COD.pdf))

# DRC Environmental Context (2)

DRC Biosphere Reserves (BRLuki, BRYangambi and BRLufira)



Source: UNESCO, 2016 - <http://www.unesco.org/mabdb/br/brdir/africa/DemCongomap.htm>

# **Transition to Green Economy (1)**

**From crisis to opportunity....**

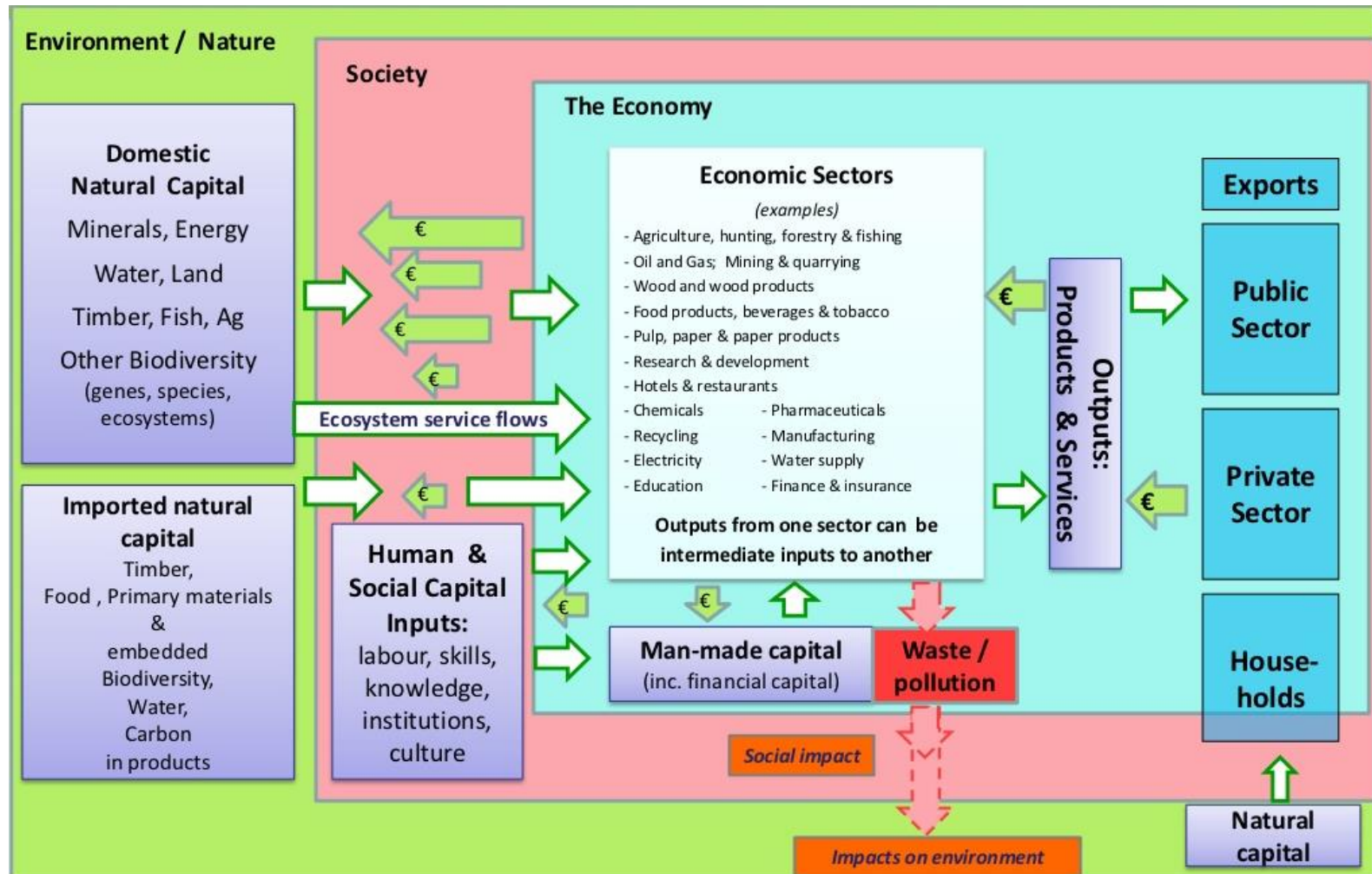
**... for transitioning to a green economy...**

**... with economic and social justifications...**

**... and inclusion of the economic value of  
natural capital.**

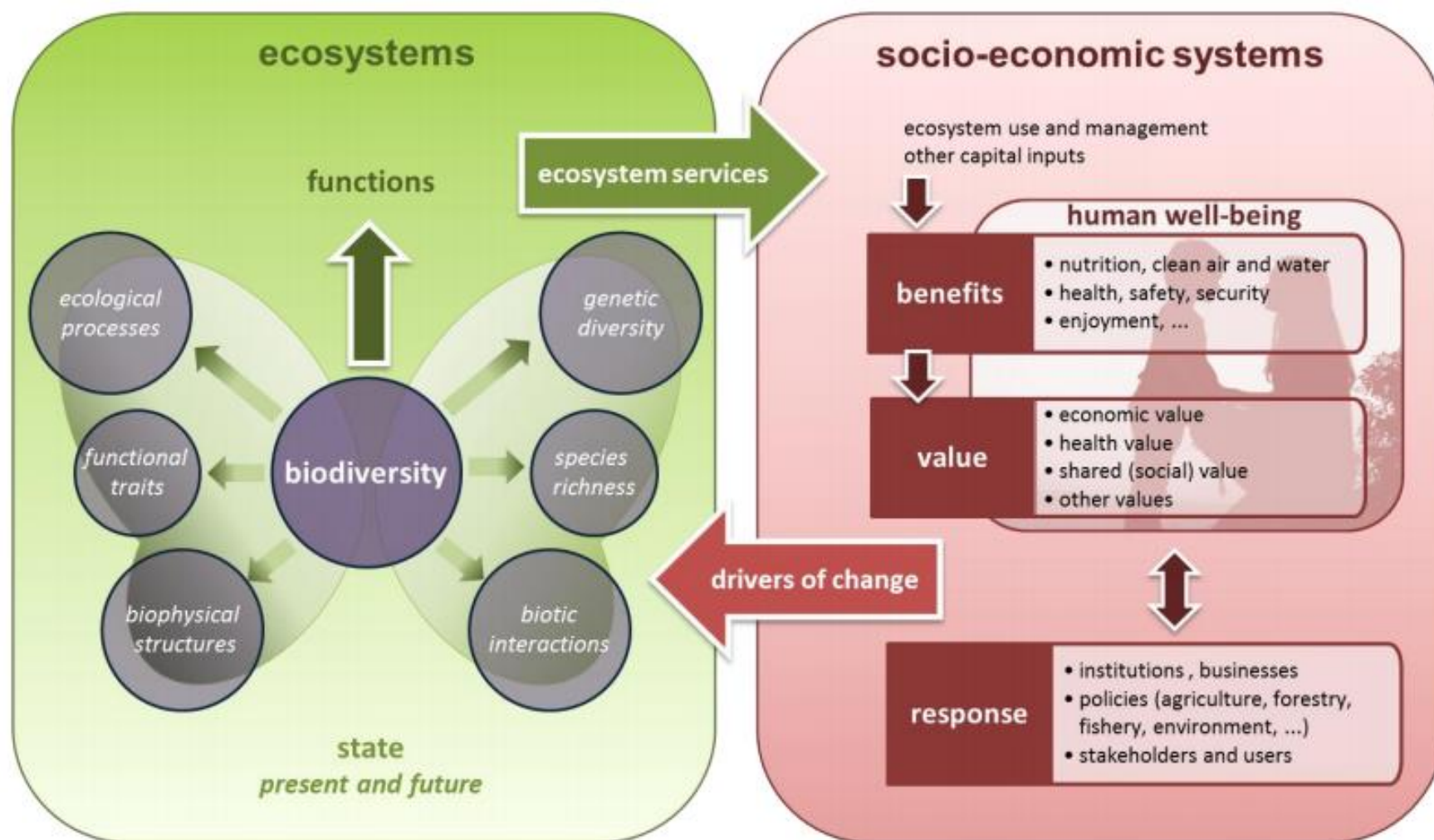
# Transition to Green Economy (2)

The narrow Economy... enlarged to Human society and then to Ecosystems





# Ecosystems' assets and services



# Biosphere Reserves are ‘*ECOSYSTEMS*’

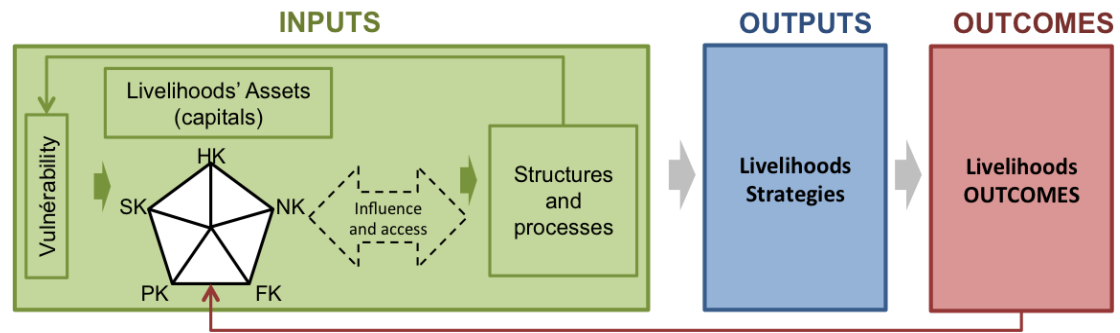
*« Ecosystems are capital assets. Like reproducible capital assets... ecosystems depreciate if they are misused or are overused. But they differ from reproducible capital assets in three ways :*

- Depreciation of natural capital is frequently irreversible;*
- Except in a very limited sense, it isn't possible to replace a depleted or degraded ecosystem by a new one; and*
- Ecosystems can collapse abruptly, without much prior warning ».*

(Partha Dasgupta (2008) cited in Towards a green economy, UNEP, 2011)



# The sustainable Livelihoods Approach applied on BR



INPUTS				OUTPUTS	OUTCOMES
Context, conditions and trends	Spatial Elements	Assets / Livelihoods' resources (capitals)	Institutional Processes and Organisational Structure	Activities / Livelihoods' Strategies	Sustainable Livelihood Outcomes
History Politics and Institutions Economics Trade Climate Agro-ecology Demography Socio-cultural differentiation	Households and Villages location  Accessibility  Distances to perform activities	Human Capital Social Capital Physical Capital Financial Capital Capital Natural Capital	Institutions and Organisations	Typologies  Access  Capacities and potentialities	Poverty Reduction Well-Being and Capacities Improvement  Livelihoods Adaptation Vulnerability Decrease and Resilience Increase  Natural Resources Protection
↓  Context, conditions and trends Analyses  Political Constraints Evaluation	↓  Accesses and Locations Analyses  Cartography	↓  Livelihoods Analysis: equilibrium, exchanges, combinations, sequences, trends, etc.	↓  Institutions / Organisations Analyses on resources access	↓  Livelihood Strategies and Changes Analyses	↓  Impacts and Equilibrium Analyses  Cartography

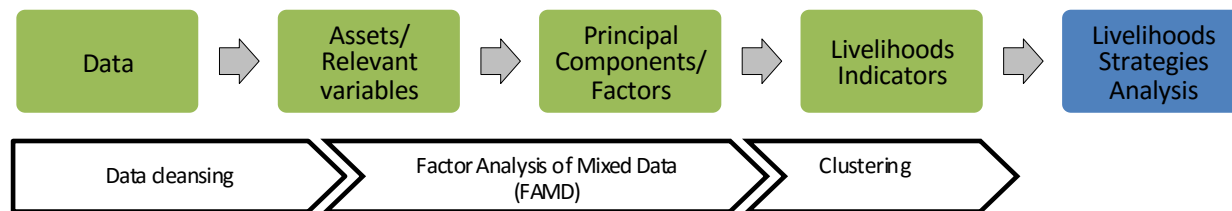
The Livelihoods Framework (Inspired from « Livelihoods perspectives and rural development », Journal of Peasant Studies, Vol. 36, No. 1, January 2009. or initially in IDS Working Paper 72 (1998)).

# Systemic Analysis and Diagnosis of Livelihoods' Strategies in the BR of Luki: Data Treatment

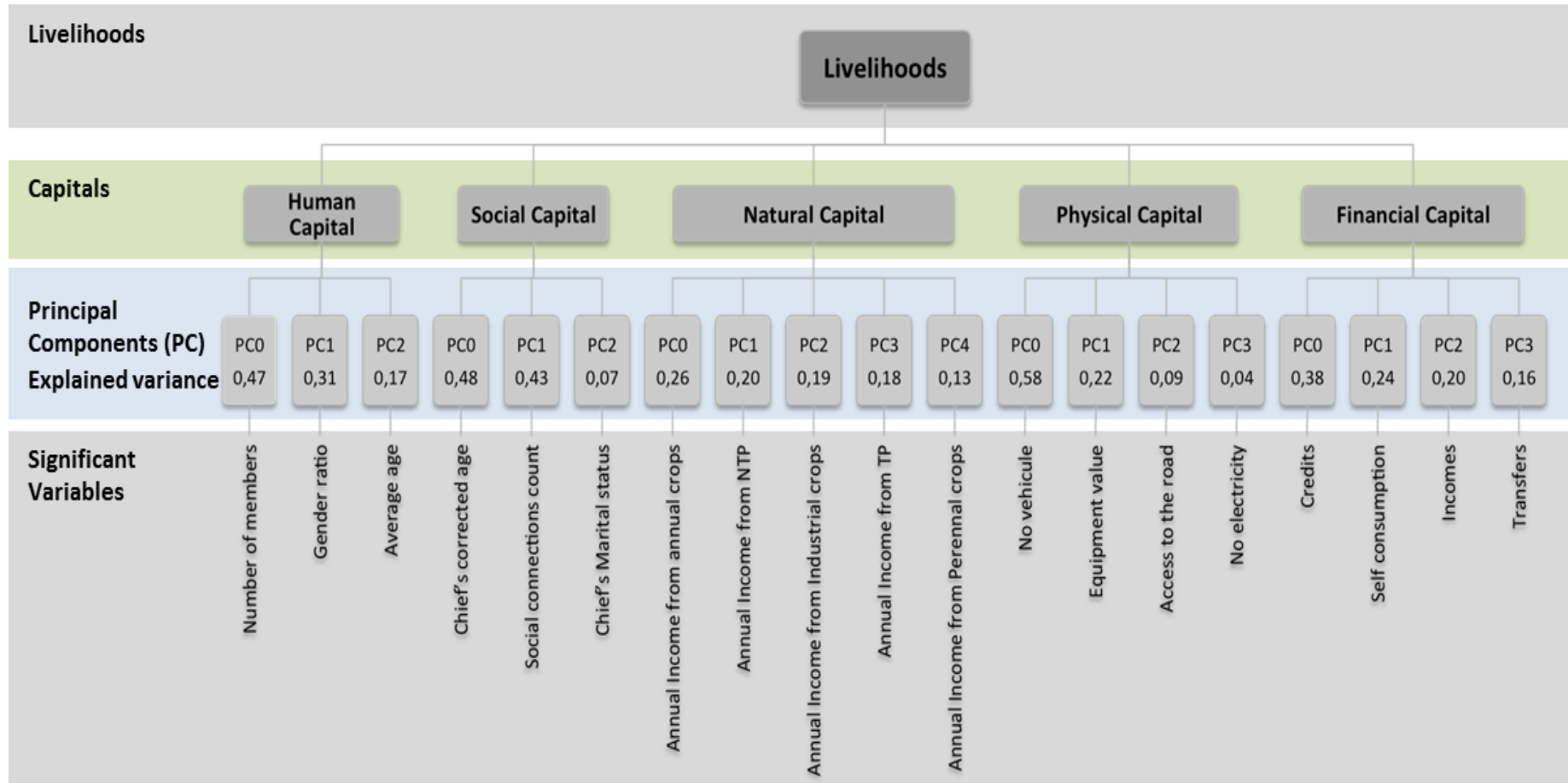
330 households multi-disciplinary survey conducted in 14 villages of the BR in June 2013

- Multi-dimensional data base
- Factor Analysis of Mixed Data application
- Capitals and Livelihoods Indicators

Data Treatment Process:

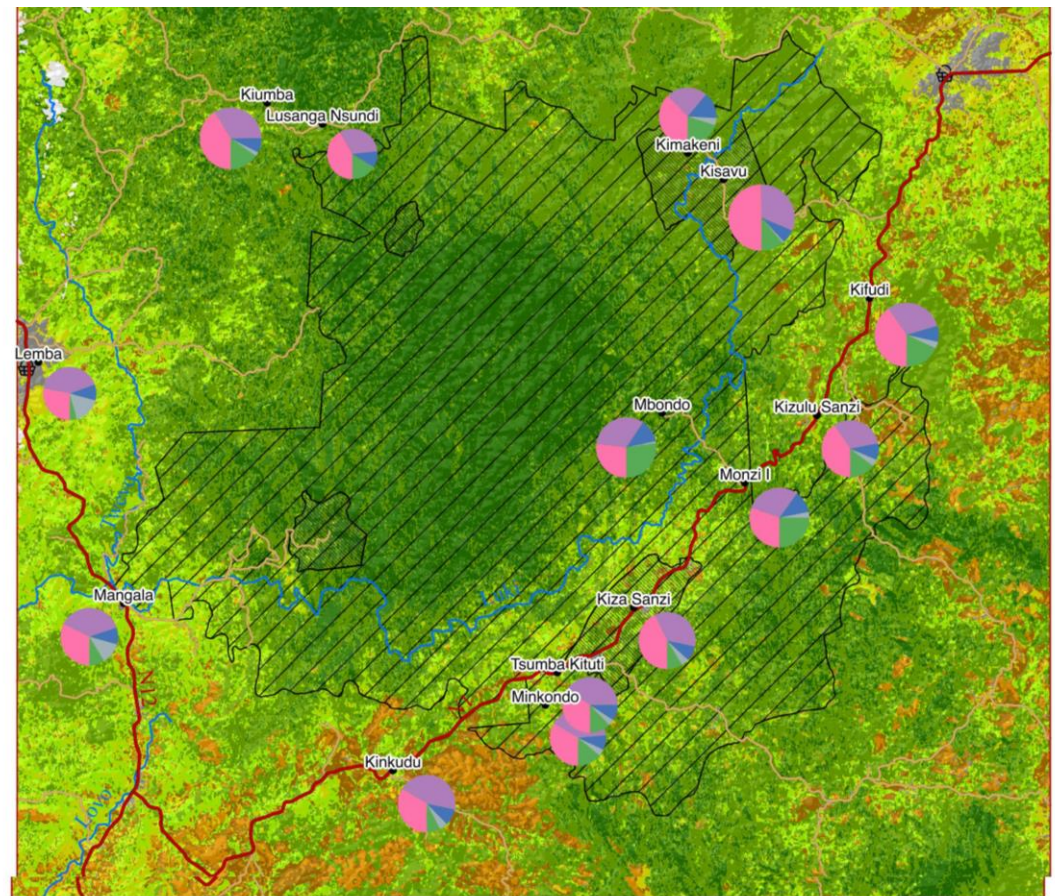


# Systemic Analysis and Diagnosis of Livelihoods' Strategies in the BR of Luki: Data Processing Results



# Spatial dimension and Mapping of Data Processing Results

Pie Diagrams representations of the five capitals (Natural, Physical, Financial, Human and Social) aggregated by village and normalized.



**Biosphere Reserve of Luki**

- National Road
- Secondary Roads
- Main River
- ▨ Limits of the BR
- ▨ Enclaves

Democratic Republic of Congo



## Land Use

- Shrubland
- Grassland
- Dense Moist Forest
- Urban Zone
- Secondary Forest
- Fallow
- Agriculture Mosaic
- No Data

## Livelihoods and Capitals

Village	Natural K	Physical K	Financial K	Human K	Social K	Livelihoods
Kifudi	0.24	0.05	0.11	0.41	0.55	1.35
Kimakeni	0.22	0.04	0.16	0.25	0.41	1.09
Kinkudu	0.08	0.05	0.1	0.48	0.36	1.08
Kisavu	0.16	0.01	0.1	0.46	0.73	1.46
Kiumba	0.19	0.03	0.1	0.42	0.52	1.25
Kiza Sanzi	0.09	0.05	0.09	0.38	0.45	1.06
Kizulu Sanzi	0.16	0.04	0.1	0.34	0.43	1.07
Lemba	0.04	0.15	0.09	0.39	0.26	0.93
Lusanga Nsundi	0.13	0	0.09	0.27	0.35	0.85
Mangala	0.09	0.13	0.1	0.41	0.35	1.08
Mbono	0.33	0.01	0.15	0.39	0.32	1.19
Minkondo	0.15	0.04	0.09	0.42	0.35	1.04
Monzi I	0.29	0.04	0.14	0.35	0.36	1.18
Tumba Kituti	0.12	0.04	0.1	0.42	0.35	1.02

- Natural Capital
- Physical Capital
- Financial Capital
- Human Capital
- Social Capital

# Conclusion

- The transition to Green Economy in Biosphere Reserves requires analyzing large multi-dimensional sets of data. It implies assessing assets and services provided by the BR. The Livelihoods Approach offers a relevant Framework for concretely applying Green Economy concepts in BR.
- Moreover, results presented on maps show that intuitively, spatial issues play a role in the analysis. We are convinced that when a relevant and systemic diagnosis is achieved on livelihoods, it would be very promising to enlarge the analysis with an assets' accessibility analysis.
- To think about sustainability involves including a dynamic dimension in the analysis. The introduction of a spatial dimension is very interesting and brings in another perspective to development sustainability and equity analyses.