

Assessment of Livestock Farming Systems in Harsh Environment

Approaches adopted by farmers through management practices

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Severe environmental constraints in harsh environment (source: FAO/IIASI 2002)

Severe constraints	Developing countries	Developed countries
Too cold	2.7 %	29.6 %
Too dry	34.4 %	15.8 %
Too steep	12.8 %	10.2 %
Poor soils	60.9 %	70.7 %
Total constraints?	76.3 %	80.9 %
Uncertainties		

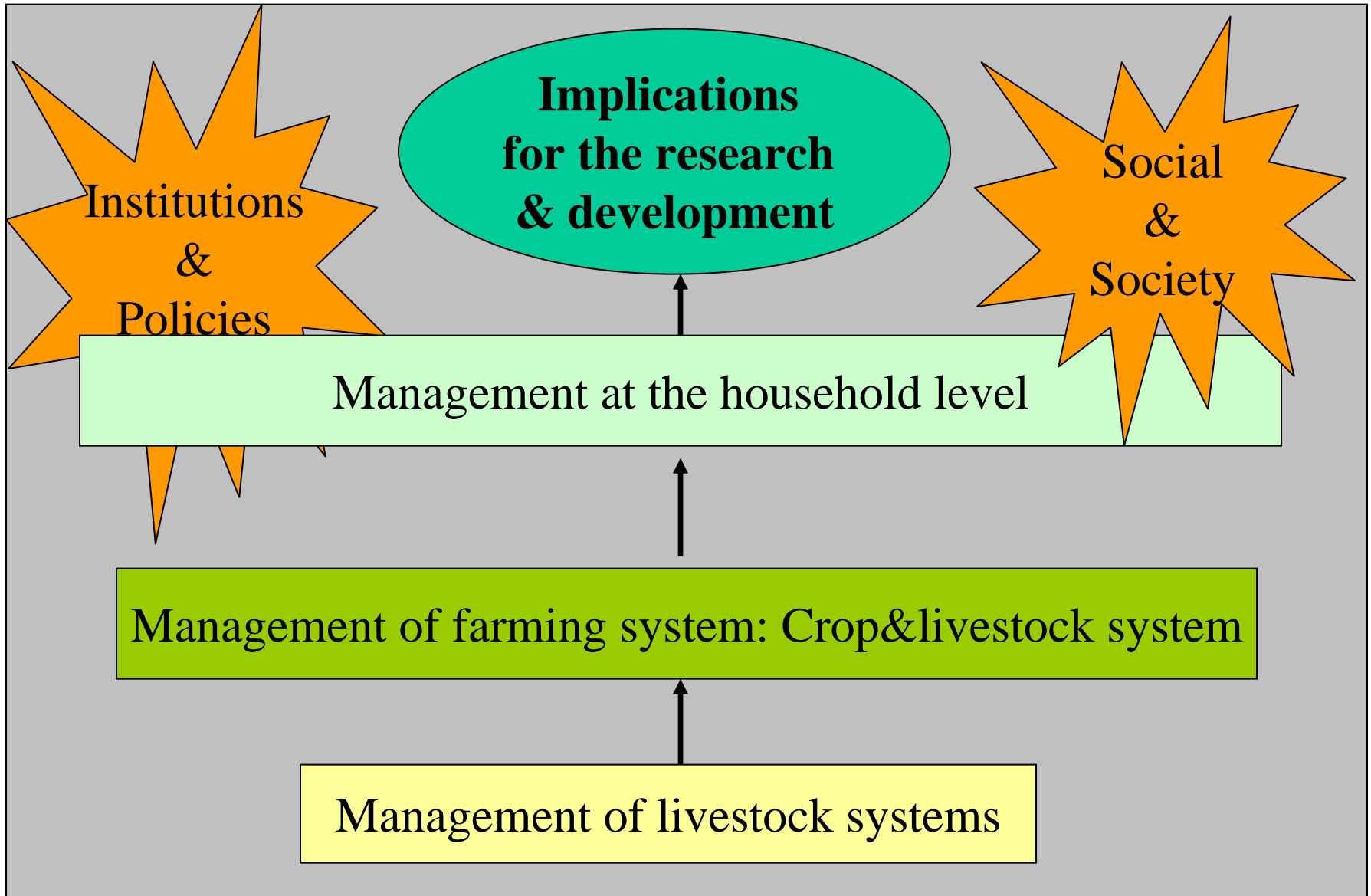
Why focusing on such environments considered as marginal ?

- **At world level:**
 - extensive animal production is still providing more than 40% of animal protein (1995)
- **In the South:**
 - drylands areas support 20% of the global human population
 - Risk of desertification
 - Protein deficit
- **In the North:**
 - New consumers needs such as environment preservation, animal welfare, quality food, etc.

Objective

- **LFS approach and its hypothesis:**
 - Improvement of livestock production systems must be consistent with farmers' strategies and the environmental constraints at the whole farm level
- **Objective:**
 - **To assess advantages and limitations of LFS approach to understand & suggest appropriated solutions for Livestock Production Systems in harsh environment**
 - **To assess the potential ways for their improvement in a development prospective**

Methodological approach



NORTH

Mountaneous area in Central Pyrenees

- Pastural highland
- Seasonal transhumance



- Abandon of highland
- social change:
environmental
conservation,
quality food

(INRA)

SOUTH

WANA

- **Grazing rangeland**



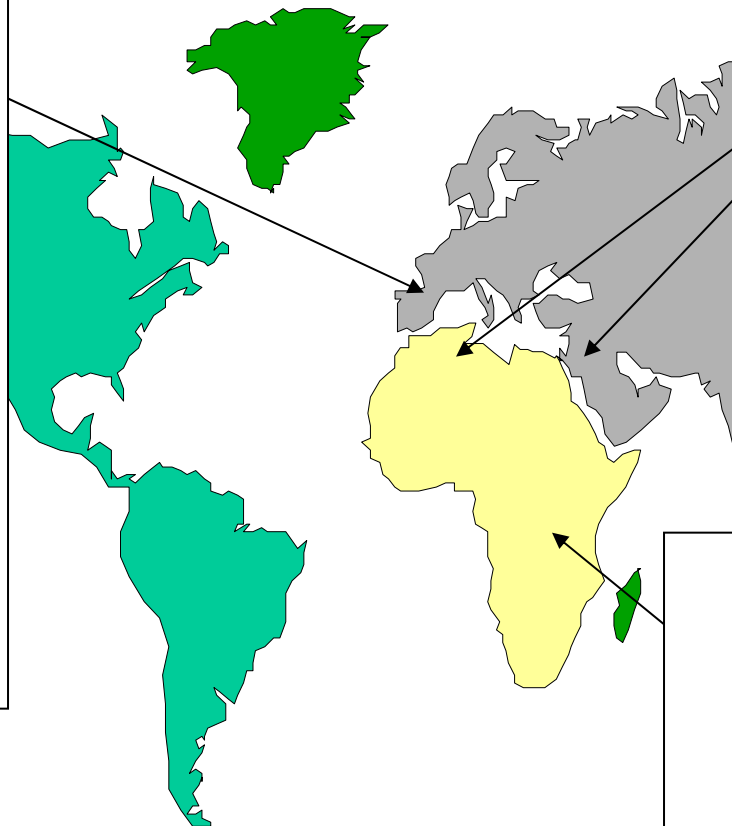
- degradation of range land
- occasional transhumance
- increasing importance
of alternative resources
&
purchased inputs

(ICARDA, NARS)

Sub-sahara

- Traditional system based
on common rangeland
- Permanent transhumance

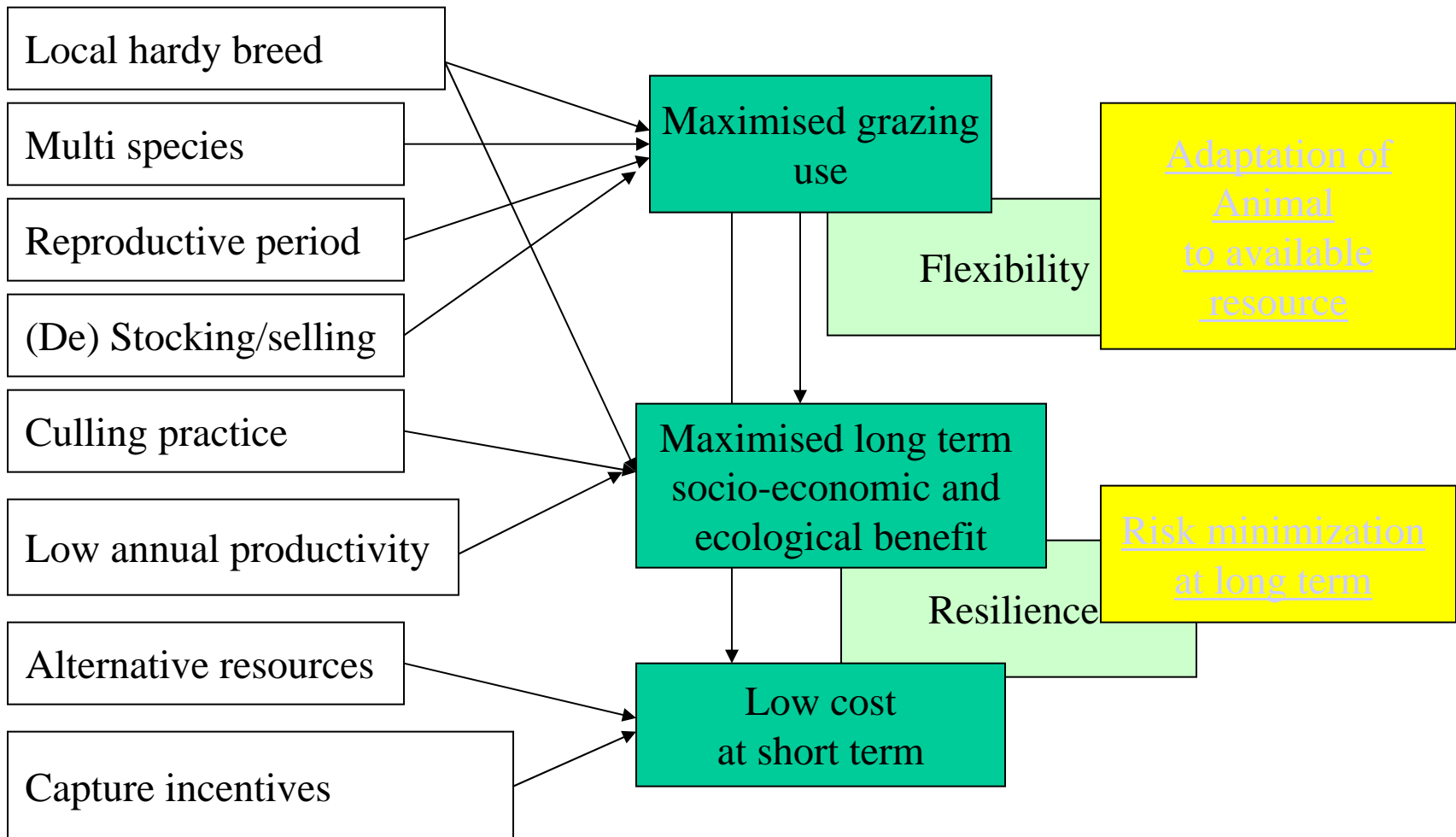
(CIRAD-Emvt)



Herd management - Similarities and Contrasts (1)

	NORTH	SOUTH WANA	SOUTH Sub Sahara
Breed	Gasconne/ Tarasconnaise	Barbarine, Awassi	Ankolé
Herd composition	Goat & sheep With Cattle	Sheep & Goat	Cattle + Sheep & Goat
Products	Fattened and store lambs, cheese	Fattened or non lamb + milk & cheese	Milk, meat, wool, manure, drought power
Reproductive period	Autumn -→ winter	Autom/ spring	All the year
Culling practices	Depending on reprod. performance over the years	Depending on drought conditions	Absence
Grazing land	+++	+	+++++
Feeding reserve	++	+	+
Supplementation	+	+++++	+

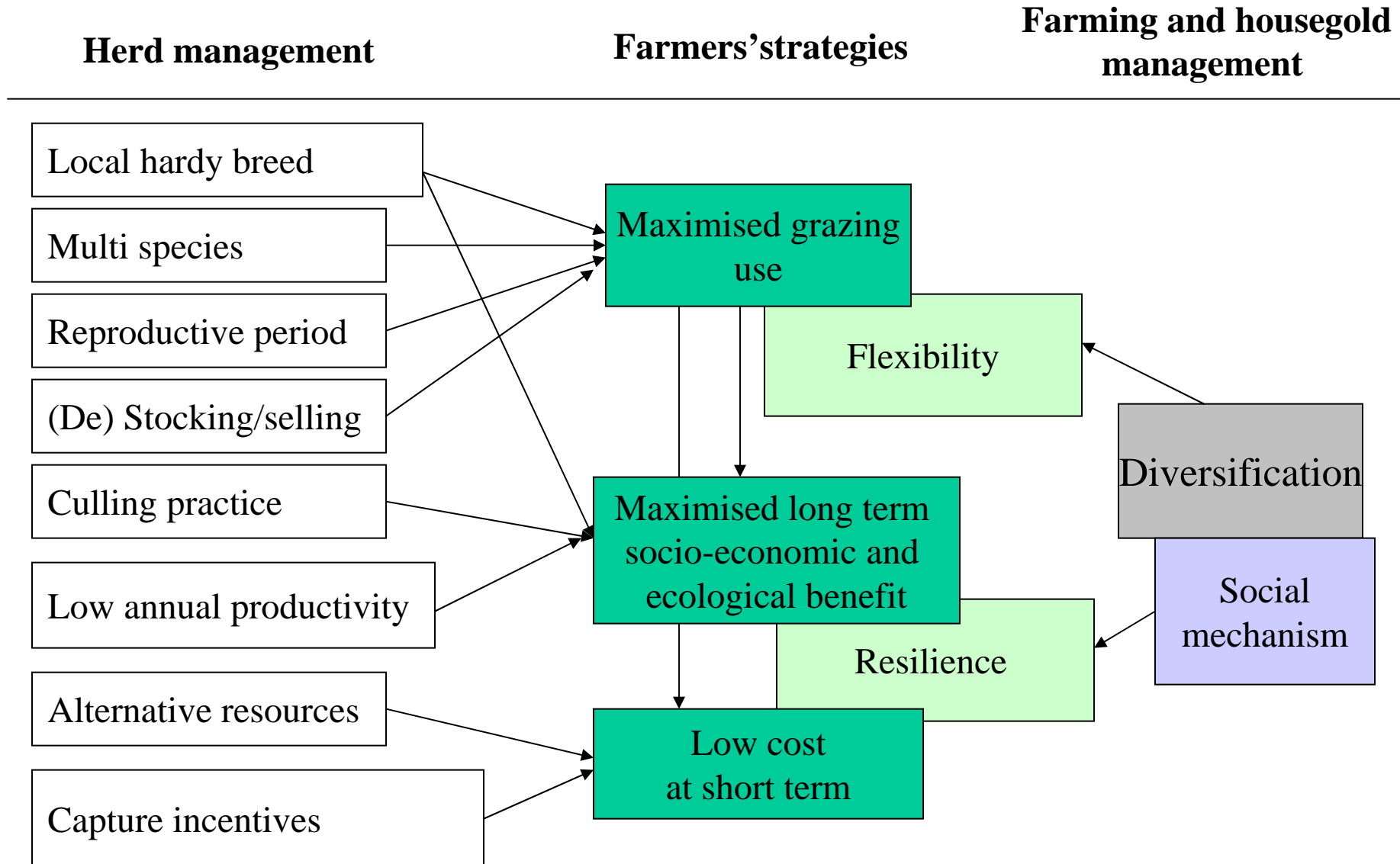
Attributes of sustainable herd management in harsh environment



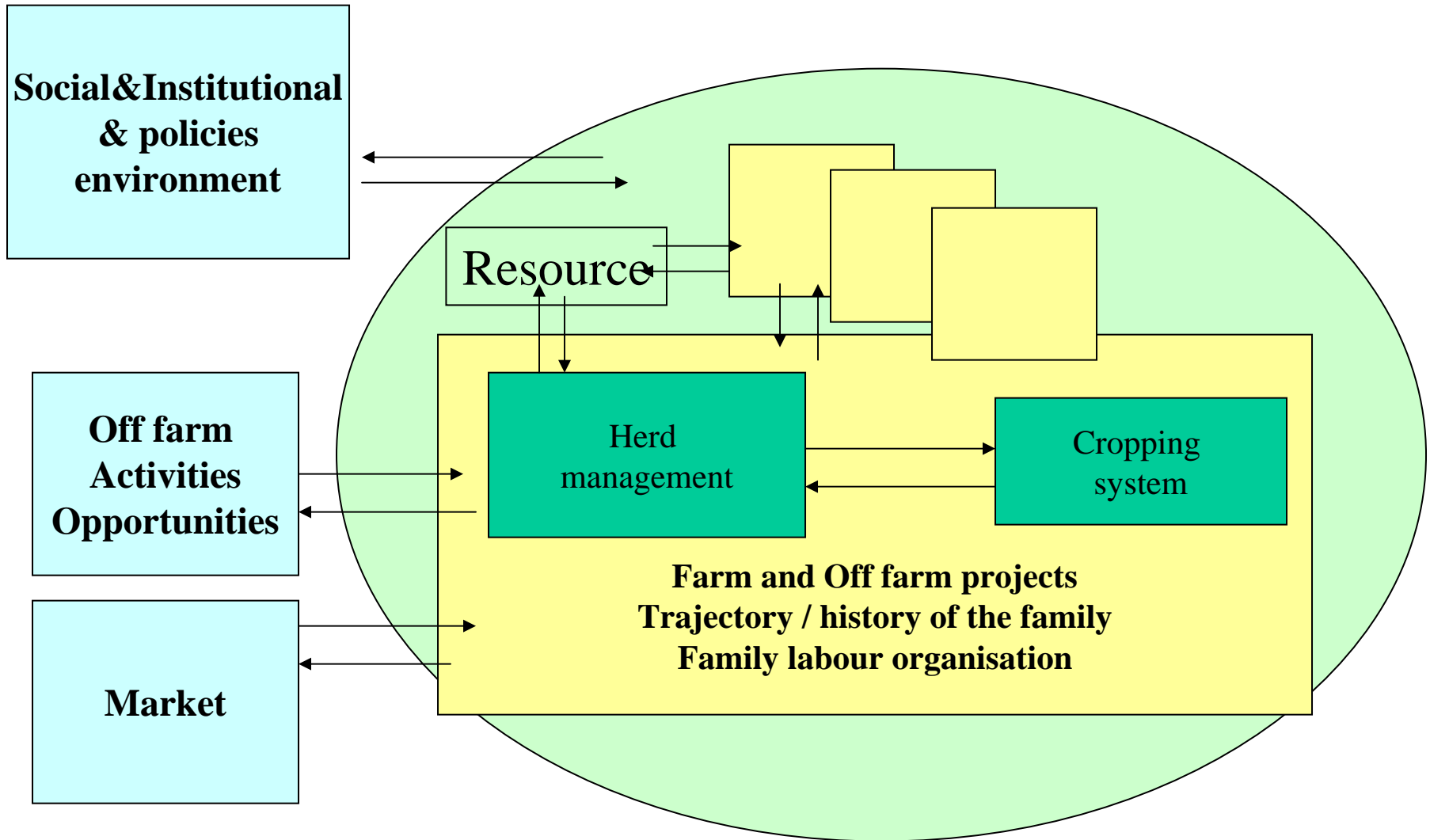
Farming & Household systems - Similarities and Constrasts (2)

	NORTH	SOUTH WANA	SOUTH Sub Sahara
Farming systems	Fodder crops Intensive livestock systems	Cereal crop → Food & Feed Fruit trees	Cereal crop : food
Household System - off farm - intra household organisation	<ul style="list-style-type: none"> - Women : off farm activity ; take care of intensive system - Men : Extensive system 	<ul style="list-style-type: none"> - Men : emigration - Children : grazing - Women : care, milking, feeding 	<ul style="list-style-type: none"> - Men : grazing ; emigration - Women : milking, feeding, care, marketing ;
Community level	<ul style="list-style-type: none"> - Access to pasture highland 	<ul style="list-style-type: none"> - Access to communal/ collective rangeland 	<ul style="list-style-type: none"> - Regulation of access to range land - Traditional rules as inheritance - Agreement between community members - Saving club...

Attributes of sustainable farming management in harsh environment



Farming system management - Implications for R&D (3)



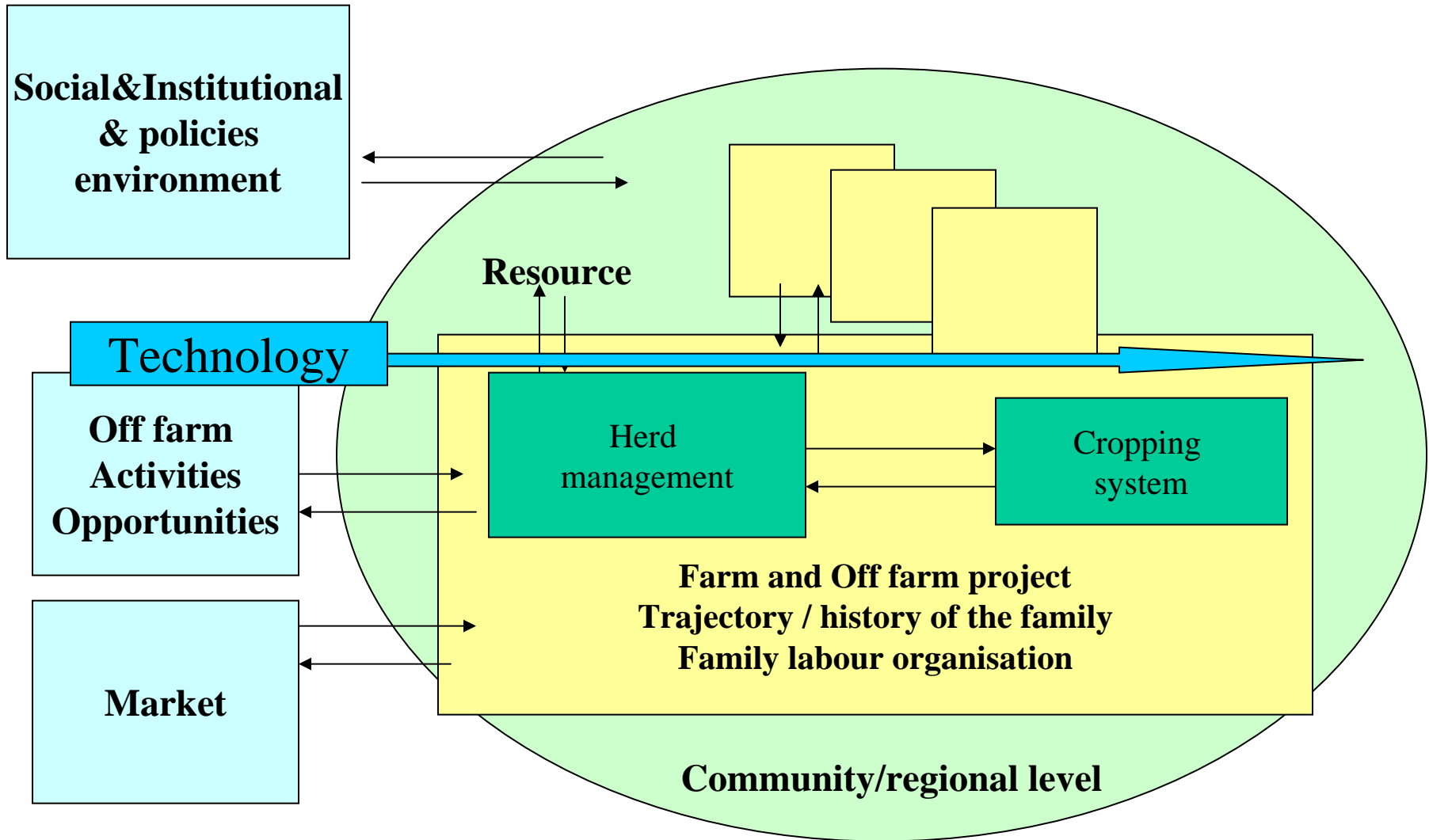
Herd management - Implication for R&D (3)

- Maximized benefit from the natural resource & alternative resources & Minimized cost
 - **To question the appropriateness of technologies to:**
 - **synchronize the individual female production**
 - **Use higher feeding regime**
- Strategies related to herd management (selling, culling) are designed for coping with a wide range of climatic variations over the years:
 - **To question the appropriateness of technologies or policies that maximize short term profit**

Boost research on:

- A. Bio-technical systems: Technology that improve flexibility/ resilience in the time**
- B. Bio-economic: Social & institutional mechanisms /organization**
- C. Interaction between A and B → degree of acceptance of the technologies**

Farming system management - Implications of R&D (3)



Farming system management - Implications for R&D (3)

- **Whole farming system approach :**
 - Advantages:
 - Integrated research : biologists, agronomists, animal production scientists, socio-economists, even anthropologists ...
 - Integration between the bio-technical and bio-economical levels
 - Limitation:
 - « Community approach »: implication of all stakeholders
 - Constraints to implement « holistic » approach and approach the global dynamic (time dimension)
- **Modeling approach:**
 - Advantages
 - To formalise/ deepen the systemic approach in a prospect view
 - To assess impacts of technologies package & appropriated policies
 - Limitations:
 - Trade off between short term welfare and long term sustainability
 - Adoption of technology depend not only on technical and economic optimum
 - Off farm activities
 - Problem of full aggregation at the community level

Farming system management - Implications for R&D (3)

- **New indicators** to assess the efficiency and sustainability of these systems & to develop appropriated technologies
 - Productivity is not sufficient
 - Need to approach the flexibility/ resilience as main key factors or indicators of efficiency and sustainability -> time dimension

Farming system management - Prospects for the areas in question (3)

- **North/ Central Pyrenees:**
 - Highlands grazing neglected and abandoned: valorisation of traditionnal system and shepherd status
- **South/ Sub Sahara:**
 - Social conflict: need to revitalize vs institutionalize the complex social and traditional organisations;
 - New technologies to increase the flexibility/ resilience/opportunities (as Trypanosomiasis control techniques)
- **WANA:**
 - problem of degradation of pastureland + increasingly supplementation: need to valorize alternative resources to restore/ rehabilitate the natural resource, decrease the desertification process and decrease the market dependance & farmer vulnerability