Adaptability of small ruminant farming facing global change. A north south analysis in Mediterranean (France/ Egypt).

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GLOBAL CONTEXT

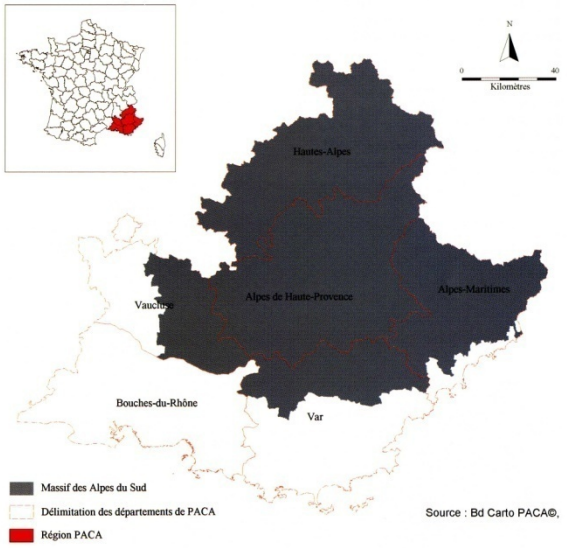
Hypothesis on the roles of livestock faced to global change

- **Main common changes**
  - **Population and urbanization growth in the coastal zones**
  - **Uncertainty on rainfall→ can be exacerbated with climatic changes (Christensen et al)?**

❑Livestock at the regional level in interaction with natural resources in PACA:

•use of rangelands and marginal lands, maintaining activities and landscapes :increasing ecosystems <u>resilience</u> (biodiversity, fire hazards), natural resource management

Global change and vulnerability → PACA



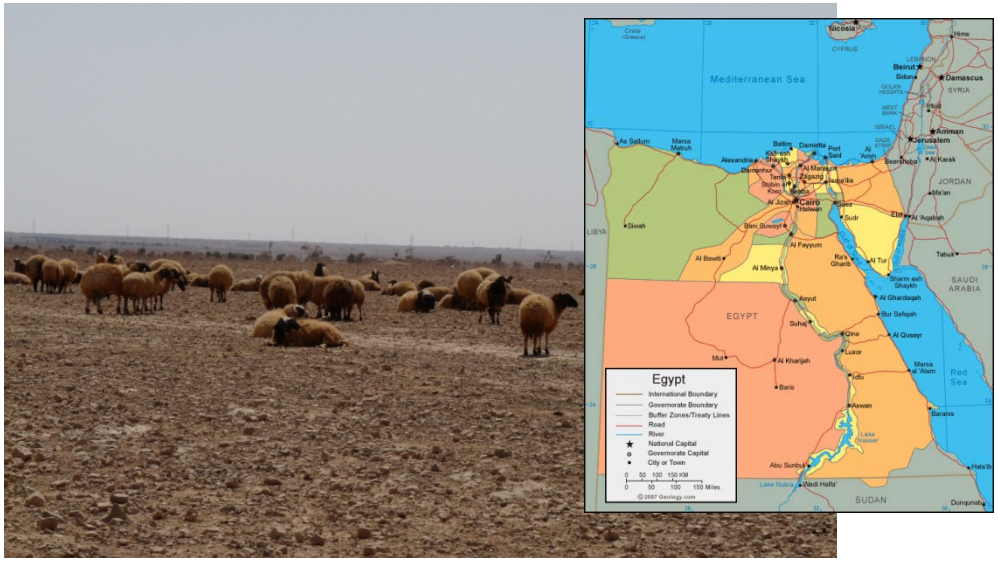
1. Demographic contrast (coast/hinterland)
2. Landscape management
3. Biodiversity, fire hazards
4. Market
5. Climatic change?

Hypothesis on the roles of livestock faced to global change

- Main common changes
  - Population and urbanization growth in the coastal zones
  - Uncertainty on rainfall→ can be exacerbated with climatic changes (Christensen et al)?

- Main role of livestock at the regional level in interaction with natural resources:
  - use of rangelands and marginal lands, maintaining activities and landscapes increasing ecosystems resilience (biodiversity, fire hazards), natural resource management.
- Livestock at the household level in NWCZ:
  - significant contribution in food security and livelihood improvement
  - Livestock: creation of links between families, communities and regions through transhumance and migration→ social capital (protection, insurance, cement between the Mediterranean cities and its hinterlands)

Global change and vulnerability → North Coastal zone



1. Climatic change → Drought events
2. Demography → Urbanization
3. Market change at regional/local levels
4. Tourism and migration → employment, land pressure and access, market dev.
5. Biodiversity

Objectives….

- Different roles at different levels
- How to assess the role of livestock in adaptation process on these two contrasted zones?

CONCEPTS AND METHODS

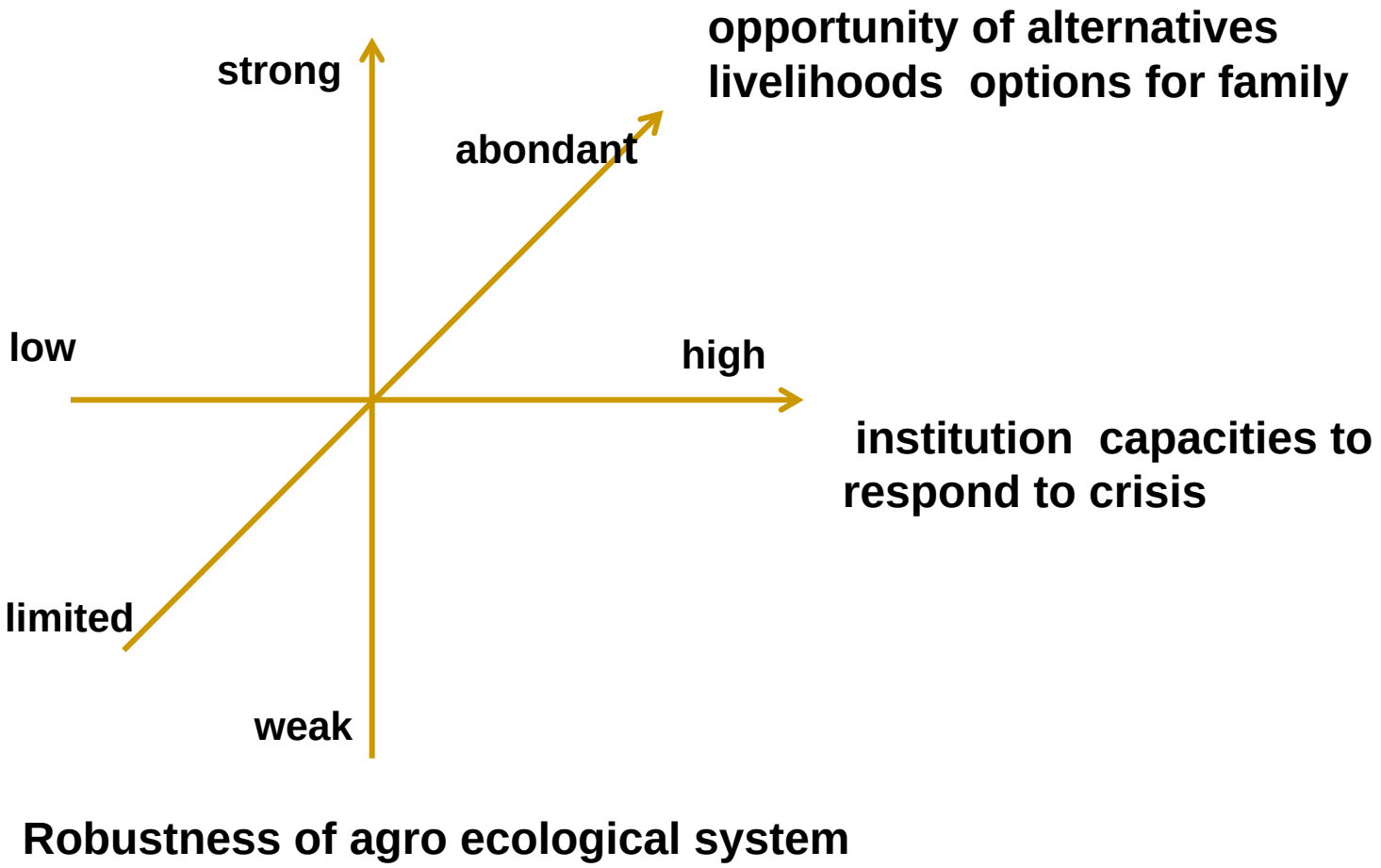
Some points to be highlighted

- Adaptation toward uncertainty instead of adaptation to a known future

- Analysis articulating short term/long term, multiscales, multidisciplinarity

- Vulnerability and Resilience are major concepts to address adaptive capacity

A general framework to analyse adaptive capacities/ resilience/vulnerability



From Frazer 2007, Dong 2011

Alternative livelihood options

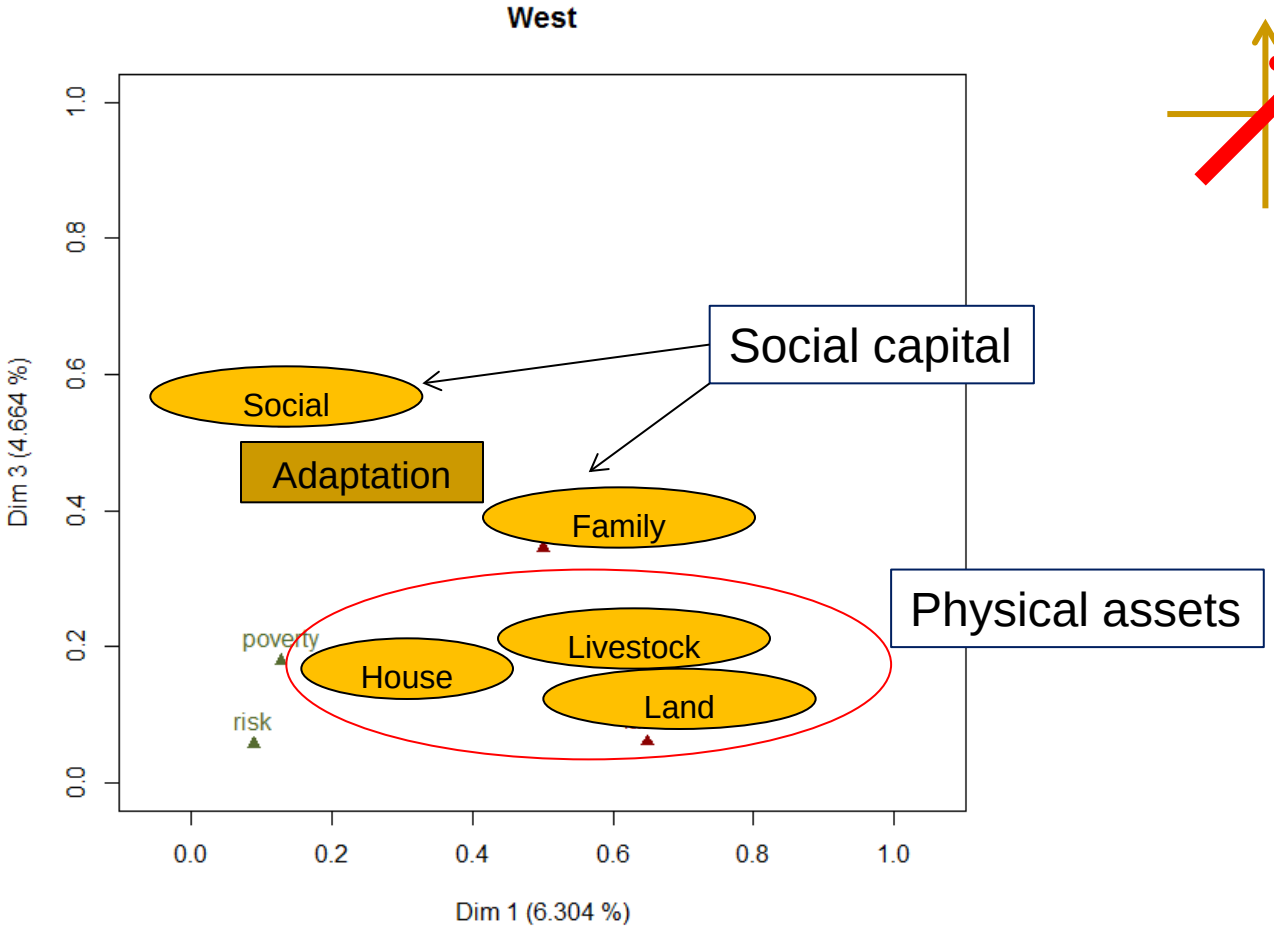
- understanding the differential capability of rural families to cope with crises such as droughts (close to vulnerability concept) and understanding strategies of families to adapt

- focuses attention on the assets of rural people, and how different patterns of asset holding (land, stock, food stores, savings etc.) can make big differences to the ability of families to withstand shocks.

4 types of assets are recorded

- The financial capital that covers all resources including savings or borrowing;
- The physical productive assets such as land, agricultural equipment, livestock (structure, composition, health), household assets (housing, transportation, ..) that constitute stores of value and therefore savings in the event of external shocks;
- The human capital refers to the personal resources such as education, training, health, nutrition, housing;
- And finally, social capital refers to social resources.

Mains variables (assets) affecting adaptation (strategies)



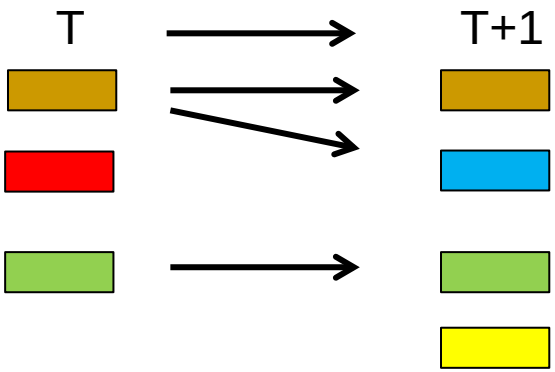
Agro-ecological system axis (1)

- Main elements determining robustness :
  - Diversity of farms, his renewal
  - Consistency between farming activities and resources availability
  - Contribution in maintaining resilience of ecosystems

- Multi scale analysis : farm and local scale.
  - local meaning sensitive toward social network (community) and farming systems definition

Agro-ecological system axis (2)

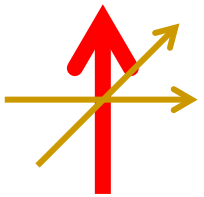
- The farm diversity and his renewal (agrarian diagnosis, ex post analysis at local scale)



- Main elements to characterize the system :

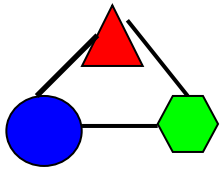
  - **Physical resources the system rely on and main practices**
  - **Social insertion (network)**
  - **Integration in economy (market, public policies)**

Agro-ecological system axis (3)

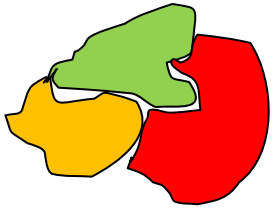


- A special interest on describing co-evolution between the farming systems and land use/land cover changes

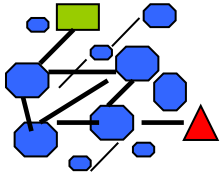
farm diversity and networks



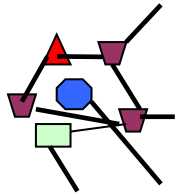
Land cover mosaics

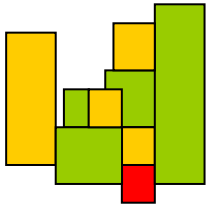


Provence hinterland1950



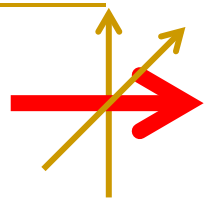
Provence hinterland 2010





Arable land **Rangelands** **Forest**

Institution axis (1)

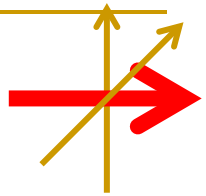


- Implementation of policies at different scales : from national (or supra for EU.) , regional, local level
- Market organisation for livestock products , access to these market for producers

Analysis are dealing with :

- Governing mecanism (actors involved : livestock farmers)
- Translation, adaptation of rules operated at each level
- Regulations operated (access for farmers to resources)

Institution axis (2)



- In our situation applied relatively to question pointed out through analysis about other axes (agro-system robustness mainly). As example for Provence region :

  - Implementation of european environmental policy and land use (access to resources , innovation concerning farming know-how)
  - Settlement of young farmers and renewing of diversity
  - Choices operated for segmentation of products in marketing channels :emerging marketing channels, commitments with diverse farming systems.

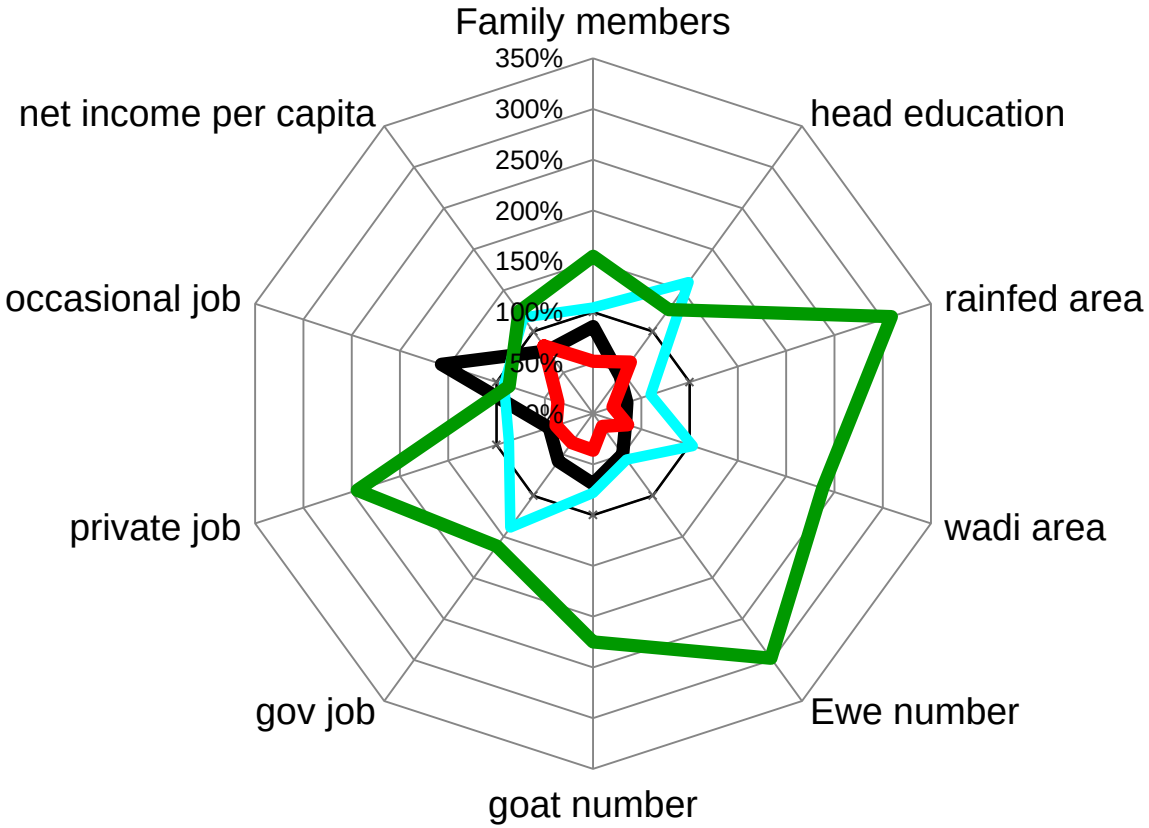
SOME RESULTS

Results : livelihoods and agro-systems in Egypt (1)

Classification of families in rain-fed (From Sidi Barani to Marsa Matrouh)

Clusters	Human asset	Land asset	Livestock asset	Non-agricultural jobs	Social asset	Monetary poverty (per capita)
Most vulnerable (profile 1)	18 mb < read and write	Rainfed: 12 F Wadi: 3 f. Pasture: 6 F. Trees: 122	Ewe/goat : 45 Camel:1-11	occasional	Weak social link → Solve pb.	2571 EGP
Highly vulnerable (profile 4)	22 mb < read and write	Rainfed: 7 F Wadi: 3 f. Pasture: 1.5 F. Trees: 73	Ewe/goat : 17	Gov job	Strong tribal link -> loan	2775 EGP
Less vulnerable (profile 2)	23 mb Read and write	Rainfed: 20 F Wadi: 10 f. Pasture: 8 F. Trees: 327	Ewe/goat : 53	Gov job/ business	Strong tribal link	3945 EGP
Least vulnerable (profile 3)	24 mb < read and write	Rainfed: 103 F Wadi: 23 f. Pasture: 110 F. Trees: 735	Ewe/goat : 256 Camel:12	Gov. job Lybia migration Business	Strong link with tribe and MRMP	4188 EGP

Results : livelihoods and agro-systems in Egypt (2)



average

profile 1. Most vulnerable with very weak tribal links

profile 4. highly vulnerable with strong social tribal links

profile 2. Less vulnerable with only tribal links

profile 3. Least vulnerable with strong out and in-tribal links

Results : livelihoods and agro-systems in Egypt (1)

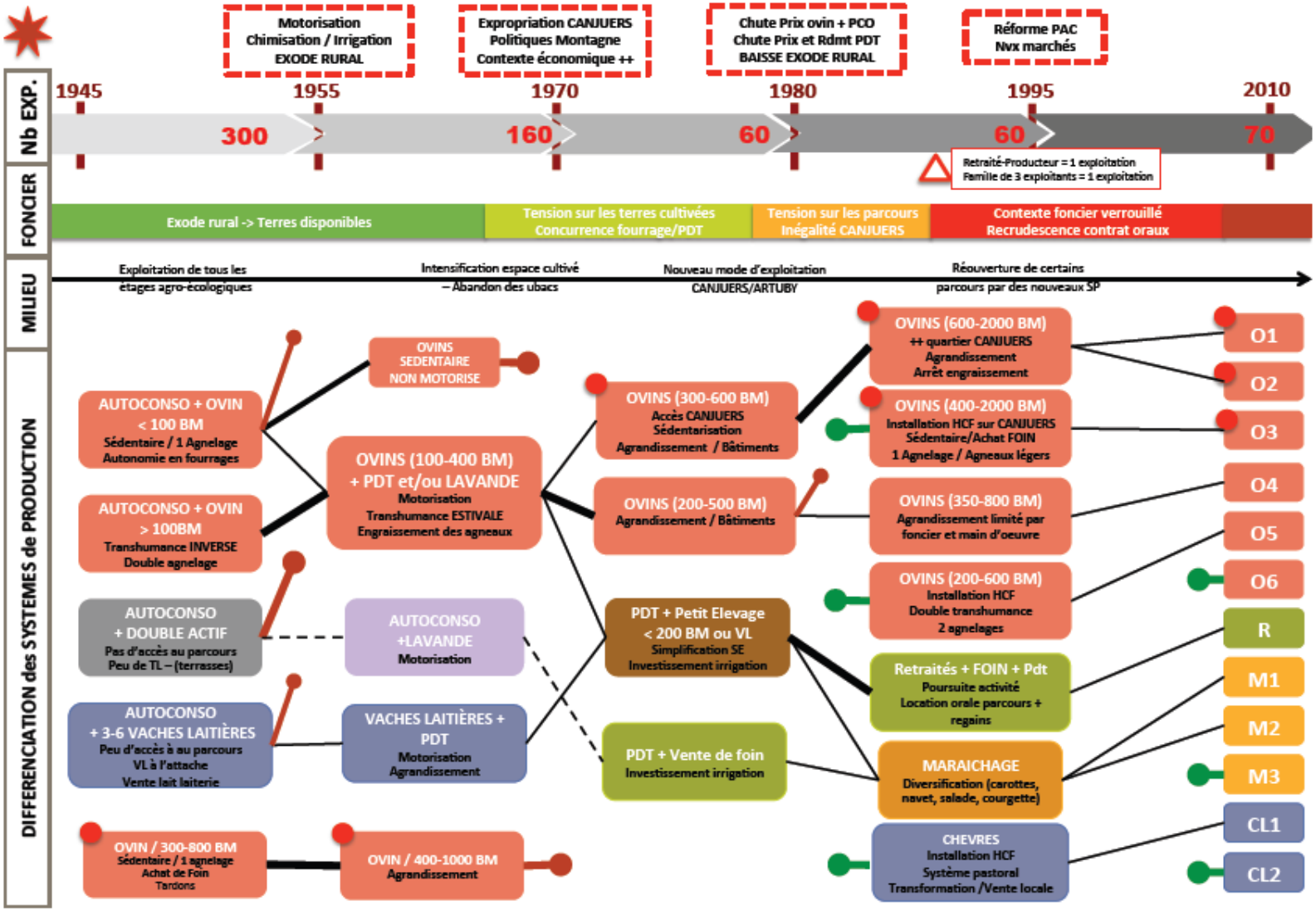
Abilities for families to find outside farming jobs according agro systems

Item	zone	Public employee	Private employee	Occasional worker	Agricultural worker	Private business	Job in tourist industry	migration to Libya (declared)	She-- pherd	Other
Percentage	Rain-fed zone	29%	18%	11%	13%	9%	1%	7%	2%	5%
	New reclaimed land	21%	21%	7%	7%	4%	0%	0%	0%	4%
	Siwa	13%	3%	13%	33%	3%	10%	0%	0%	3%

Zone	Income from livestock	Income from crops	Off farm income	Annual family income US$	Per capita income (US$)
Rain-fed zone	40%	45%	15%	14,262.43	1.85
New reclaimed land	62%	30%	8%	23,596.75	3.32
Siwa oasis	28%	49%	23%	9,669.26	1.70

Robustness of A. E. S. and institutions (C.S . inProvence)

Differentiating and renewing systems



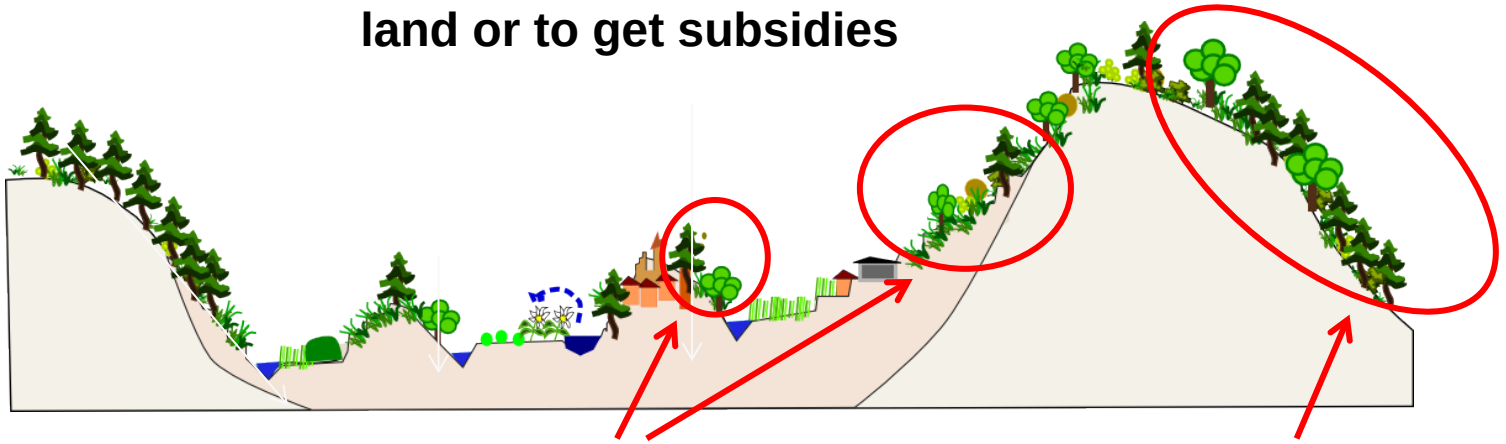
Robustness of A. E. S. and institutions (C.S. in Provence)

Related changes in land use/land cover (1980- to day)

Winter moving of flocks for new farmers looking for forage

Summer moving of flocks to get subsidies alpine grasslands

Mobility to face problems of access to land or to get subsidies



New encroachment on rangeland

North oriented slopes “definitively” converted in forest

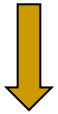
Robustness of A. E. S. and institutions (C.S. in Provence)

Main changes observed in farming systems

- A huge increase of flock size and specialization of systems during 1990's
- Renewing diversity : some new systems appears along time mainly depending on settlement of new comers into farming (1980's)
- Present PAC support increases vulnerability of new comers (land tenure)
- Increased use of grazed forage resources outside the area due to summer and /or winter mobility of flocks (adaptation)

Robustness of A. E. S. and institutions (C.S. in Provence)

- **Subsidies and regulation concerning land tenure encouraged flock increasing, mobility and released pressure on local rangelands.**



Forage availability is reduced on these areas and homogenezation of landscape becomes problem regarding fire hazards and environment

- **Decreasing of farmers number and increasing of their mobility limit commitment with social expectations and as response lower concernment of local actors toward livestock farmers**

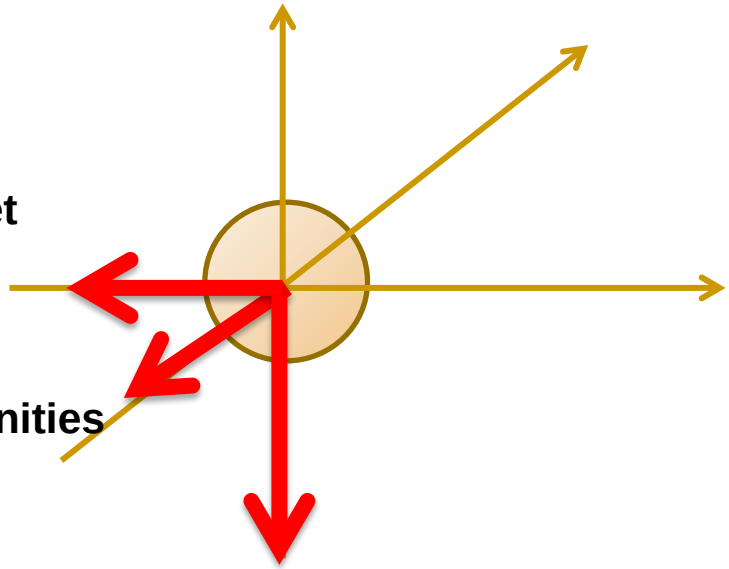
DISCUSSIONS

As a discussion (1)

- an holistic way to describe dynamics of adaptability/vulnerability of local farming systems?

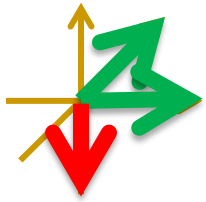
Livestock farmers set aside of institutions

Local spécialisation reducing alt.opportunities



Reducing consistency between farming systems and local resources

An other case study



…Need to be confronted to a set of contrasted situations…

As a discussion (2)

- **Main challenges for further research…**
  - **integrate family, territorial and extra territorial scales (with different time scale) in a pertinent research approach**…
  - **combine/integrate historical, anthropological, socioeconomic, geographic and agronomy approaches to elaborate pertinent scenarios of adaptation…**
- **Usefullness to increase local adaptive capacities**
  - **To help local actors to maintain adaptability toward uncertain future, need to be tested in partipatory research as a way to promote forecasting**


…Thank you…
And be sure that livestock remains at the core of adaptive process for rural society in the mediterranean