



NATAE
North African Transition
to AgroEcology

Agropastoralism in the Mediterranean

From externalities to agroecology

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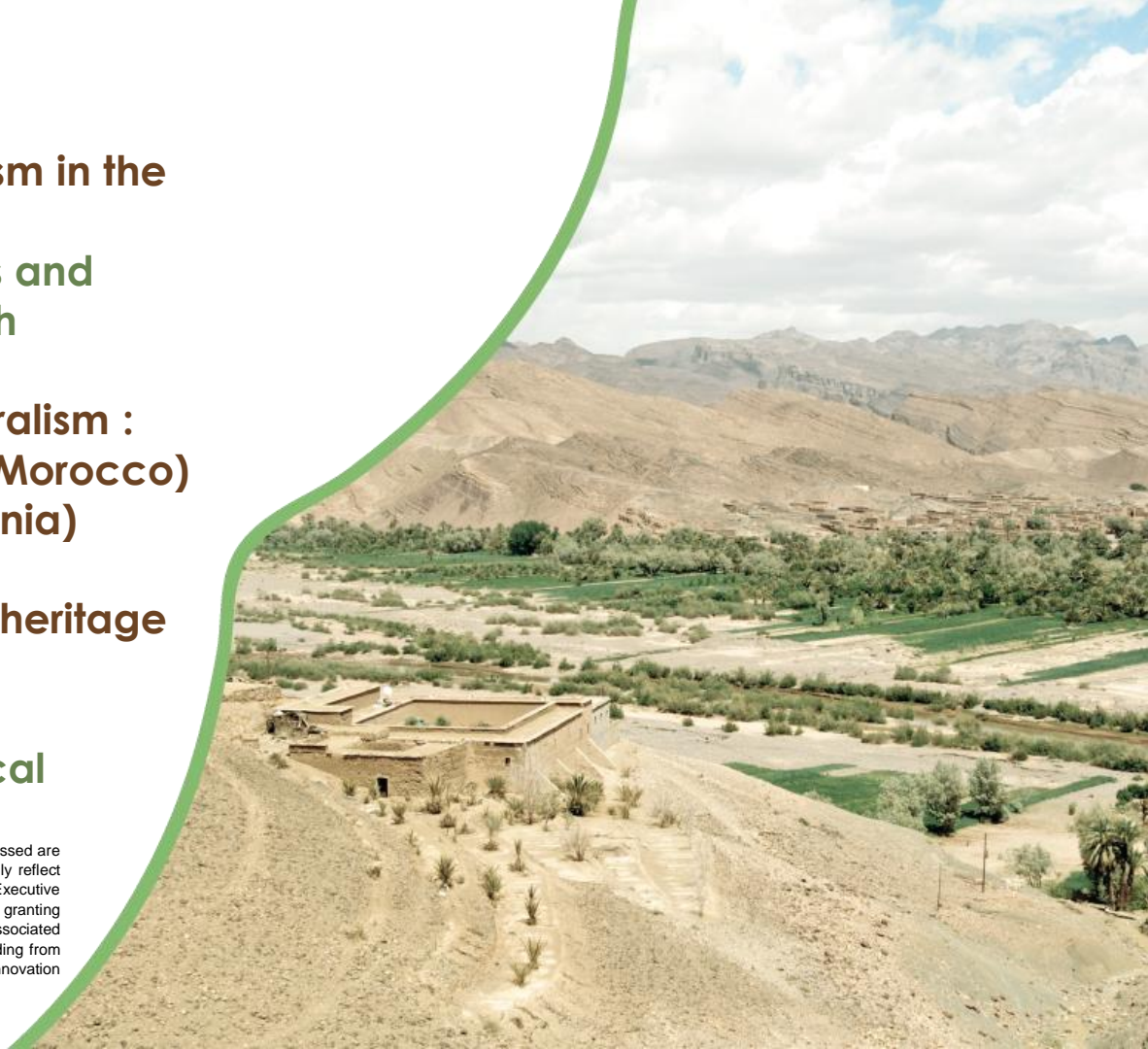


Introduction

- **Brief overview of agropastoralism in the Mediterranean**
- **Agropastoralism from territories and landscape perspectives : which externalities?**
 - **Social capital of agropastoralism : from a network approach (Morocco) to land management (Albania)**
 - **Cultural landscape of agropastoralism and world heritage (France)**
- **Agropastoralism from farming perspectives : an agroecological practice?**



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Agropastoralism in the North Mediterranean : resilience

Main features and tendencies in the North Mediterranean (Albania, France)

Montaineous areas mainly
Mainly sheeps, and some cows

Sharp decrease in the second half of the XXth due to high migration rate towards plains and urban centre (rural exodus)

Recent revival with public policy support (CAP 2nd pillar on rural development and agro-environmental measures)

Mobility of animals i.e. transhumance and the use of collective grazing land except in winter
Commercial breeding, with valorization through specific products, « produits de terroir » : quality meat and dairy products

New pastoralisms (France)

- Peri-urban pastoralism (fire, landsdcape closure)
- Winter pastoralism in wineyard plains
-



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Agropastoralism in the South Mediterranean : mutations

Main features and tendencies in the Southern Mediterranean (Algeria, Morocco, Tunisia)

In all countries :

Live capital

The use of collective land

Mobility of animals
transhumances

Integration with
agriculture

Arid and semi arid areas including oases : mainly sheeps and camels

Mountaineous areas : mainly sheeps

Semi arid rainfed cereal plains and piemont : sheeps and some cows

Strong mutations since the Independance :

- Decrease of nomadism and transhumance due to sedentarisation policies
- Privatisation of collective lands dynamics in all countries (public policies and herders strategies)
- Increasing exposure of grazing land to drought, desertification and climate change

Resilience with little / no policy support
Diversification of agropastoralism systems

Mediterranean territories and landscapes of agropastoralism

From temperate (northern part) to sub-humid, semi-arid and arid zones (southern part)

VULNERABLE TERRITORIES

- Forests and open pastures in the mountains (Mediterranean)

- Arid and semi-arid rangelands near the desert (Southern Mediterranean)

- Semi-arid rainfed cereal plains and piemont (Southern Mediterranean)



Remote areas with rough climate,
lack of services and lower income



Climate change and desertification



High migrations rates
Diversification

VULNERABLE TERRITORIES, EXCEPTIONAL LANDSCAPES

MOUNTAINS



Causse et Cévennes, France, 2024



Gjirokaštër, Albania, 2024




Boudedja K. Tizi Ouzou, Algeria,
2023



Skoura, Morocco, 2023

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CEREAL PLAIN



Dougga, Tunisia, 2024

ARID PLAIN



Amsidder L., Tan Tan,
Morocco, 2019

Agropastoralism is based on common pastures use

From seasonal transhumance to local herd movement

- Forests and open pastures and in the mountains (Mediterranean)
- Arid and semi-arid rangelands near the desert (Southern Mediterranean)
- Semi-arid rainfed cereal plains and piedmont (Southern Mediterranean)



Common pastures are mostly used, with herds mobility
+ food for cattle from markets



Local common pastures and
vain pastures on fields
+ food for cattle from markets



The need for local and collective arrangements / management (Ostrom, 1990 ; 2009)

Landscapes built by agropastoralism / cultural landscapes (UNESCO, 1992)

Common-property resource land tenure framework

« The bundle of rights » : social capital as a basis to access collective land

Rights of action	Owner	Proprietor	Claimant	Authorized user	Authorized entrant
Access	X	X	X	X	X
Substraction	X	X	X	X	
Management	X	X	X		
Exclusion	X	X			
Alienation	X				

Bundles of rights (Schlager and Ostrom, 1992) associated to status (Ostrom 2000)

Social relations as enabling agropastoralists (Niamir-Fuller, 1999; Scoones, 1995)

- to access resources
- as a factor in managing risk and uncertainty

Social capital as a basis to access collective land

The case for « open-property regimes » (Moritz, 2016)

Typology of access modes

Access type	Shared access		Private access	
	Without exclusion		With exclusion	
	Open access	Authorized access	Exclusive collective access	Exclusive individual access
Main rules	Anyone can access freely	Anyone with « socially organized » autorisation	Claimant	Individual or entity

Source : Lavigne-Delville et al., 2022

A study on social capital, transhumance and access to grazing land in the province of Tan Tan (Amsidder L., 2022)

Social investment strategies as a proxy for social capital (Bourdieu, 1980)

Context :

- Camel breeding as dominant in this region
- Open-ownership land tenure system (Moritz, 2016)
- New pastoral law 113-13 currently being implemented (2022), which introduces the State as an actor regulating the practice of mobility (“pastoral transhumance authorization”)

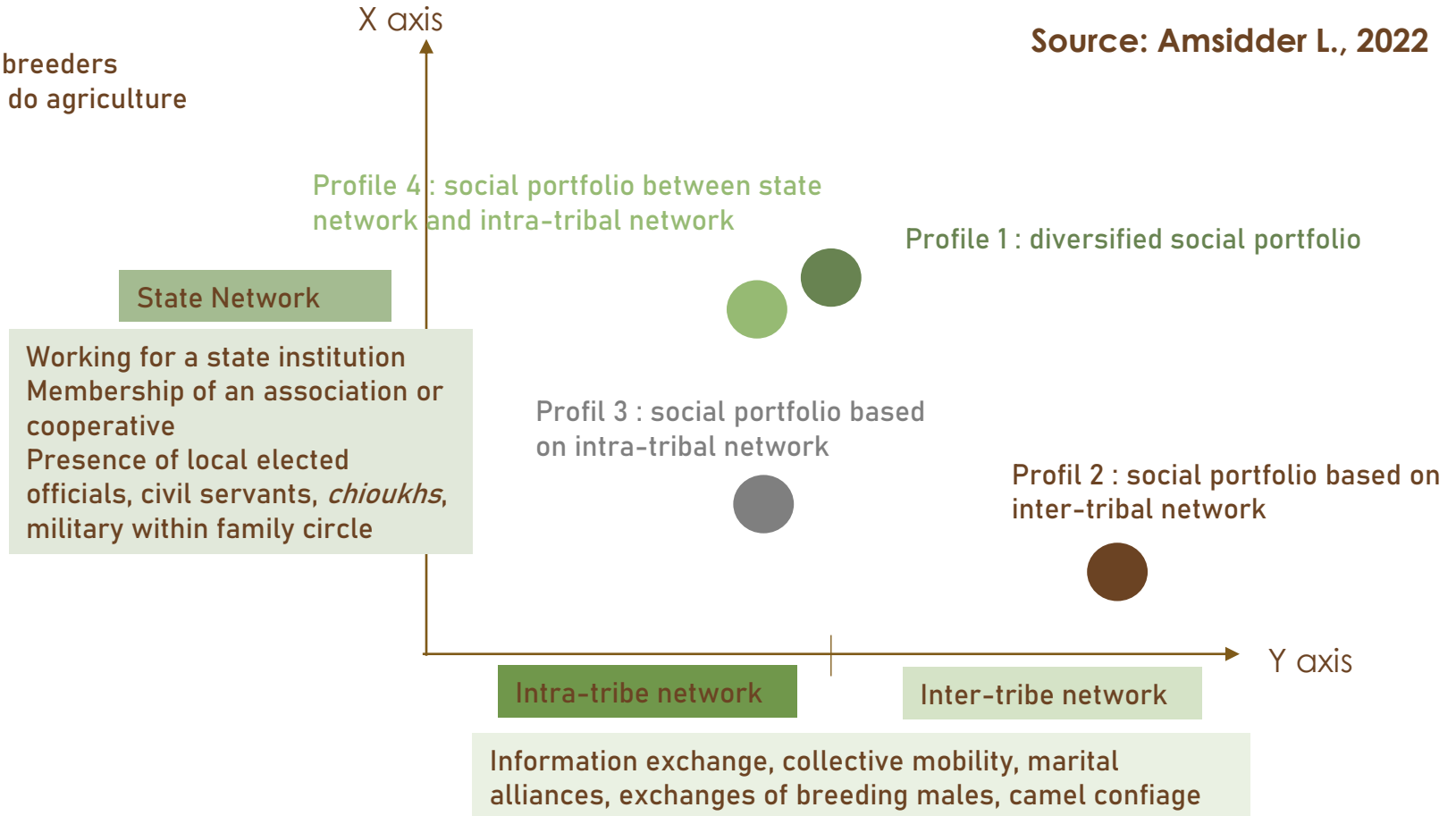


Objective : To characterize different profiles of breeders according to their social investment strategies

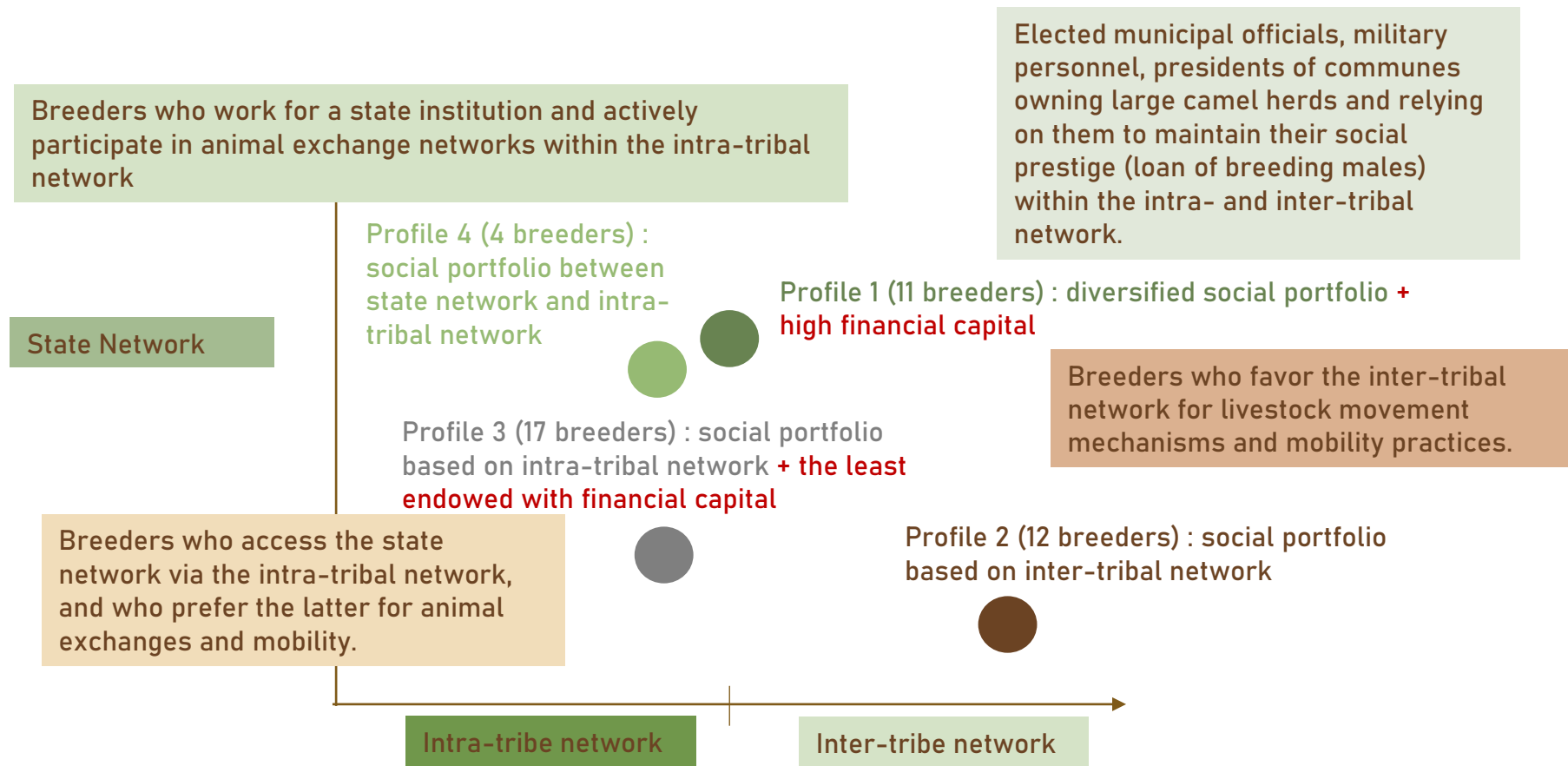
Assumption : pastoralists are not a uniform community, and there is a diversity of social investment strategies, mobilizing more or less different types of social networks to secure the practice of mobility and avoid conflicts

Source: Amsidder L., 2022

Sample : 44 breeders
More than 1/4 do agriculture



Southern Morocco



Source: Amsidder L., 2022

Externalities of agropastoralism : from social to cultural capital in Albania (Muco E., 2024)

Agropastoralism and production of cheese in Gjirokastër

Context :

- Gjirokastër, a border district with Greece
- Region of ancient immigration (Greece)
- Cheese-making know-how linked to Greek migration
- A cheese renowned throughout the country
- A national market with supply always below demand
- A region of recent emigration: young people return to settle in Greece
- Know-how and production on display



Characteristics of agropastoralism in Gjirokaštër (Muco, 2024)

A traditional activity / a specific product

- Small livestock farming (sheep)
- The breed used is autochthonous, adapted to the mountainous territory of Gjirokaštër.
- Livestock farming in Gjirokaštër is extensive, with summer transhumance
- Livestock production is mainly dedicated to milk marketing and cheese production is more important than meat production
- Specific quality of milk for a unique cheese
- But major production constraints for cheesemakers: access to milk

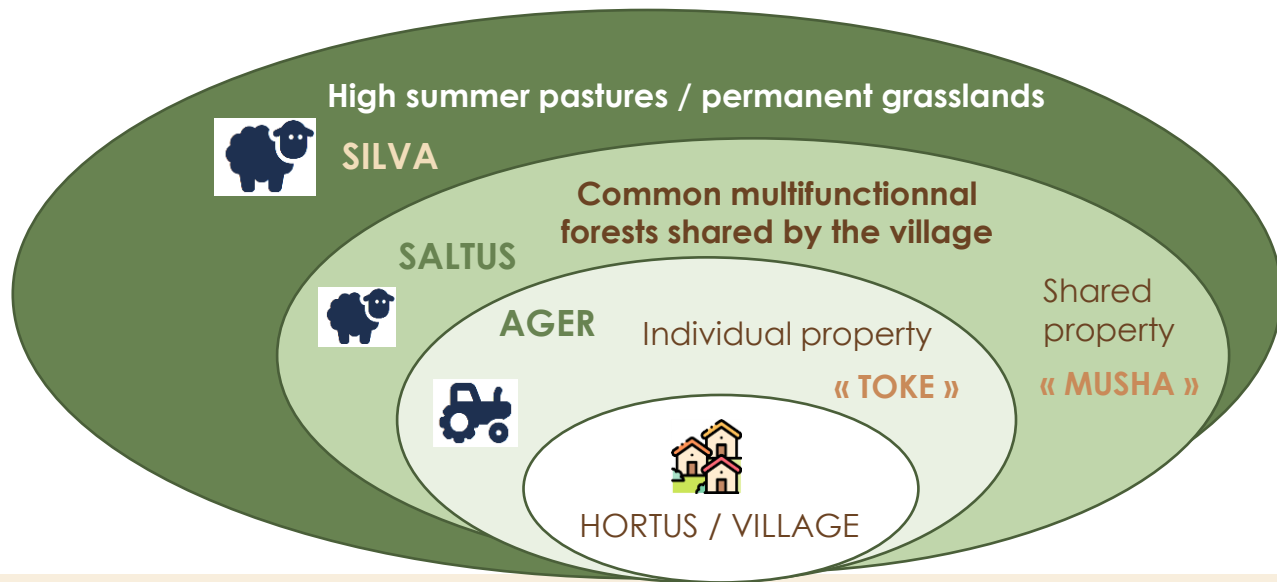


Gjirokastër, Albania : land rights on pastoral resources

Source : Muco, 2024



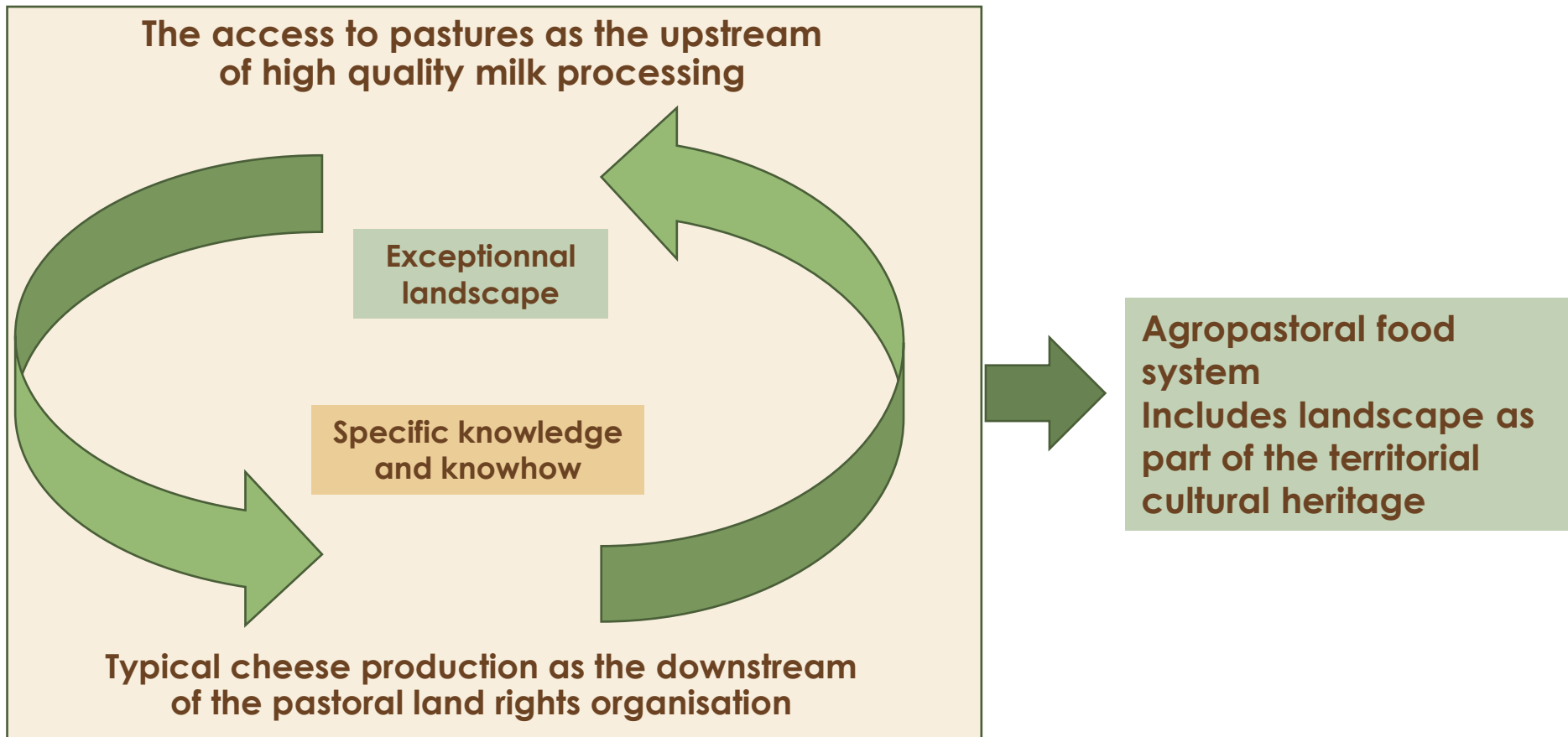
Territorial rights as a mix of legal and customary rights



- Territorial reform : since 2016, municipalities are responsible for the management of the local natural resources
- Seasonal contracts apply for :

- both external and internal herders in high summer pastures (silva)
- Internal big herders only for common forest shared by the village (saltus)

From land rights to food system, the case of agropastoralism in Gjirokastër



World heritage (UNESCO, 1972) of humankind : cultural landscape (1992)

Universal value : transcend national boundaries and to be of common importance for present and future generations of all humanity

1972

Cultural heritage

Natural

**Mix
(combined)**

According to science

Monuments, groups of buildings, sites as combined works of nature and of men

Natural features, physical and biological / geological and physiographical formations, habitats of threatened species, natural sites of specific beauty or conservation

Cultural landscape as part of common heritage 1992

- Combined works of nature and of man" designated in Article 1 of the Convention.
 - Illustrative of the evolution of human society and settlement over time their representativity in terms of **a clearly defined geo-cultural region embraces a diversity of manifestations of the interaction between humankind and the natural environment**
 - Reflect **specific techniques of sustainable land use** and **support biological diversity**
- 3 types = Created intentionally, **Evolutionary landscape**, associative landscape

Environmental externalities of Mediterranean agropastoralism

POSITIVE EXTERNALITIES = no over, no under GRAZING = management of (mobility + size of herds)

Environmental Externalities	Source consulted
Avoid forest fires (natural hazards)	Balanche, 2007
Maintain grassland quality in mountains (open spaces or « pelouses »)	Chassany, 2010
Maintain floristic biodiversity	Secretariat de la convention sur la diversité biologique, 2010
Disseminate seeds through mobility	
Maintain cattle biodiversity and autochtone races	
Fertilisation of land	Landais 1991

LANDSCAPE
DIVERSITY

EVOLUTIVE
LANDSCAPE



Interaction with
agriculture

World Heritage : the added value of the cultural landscape category

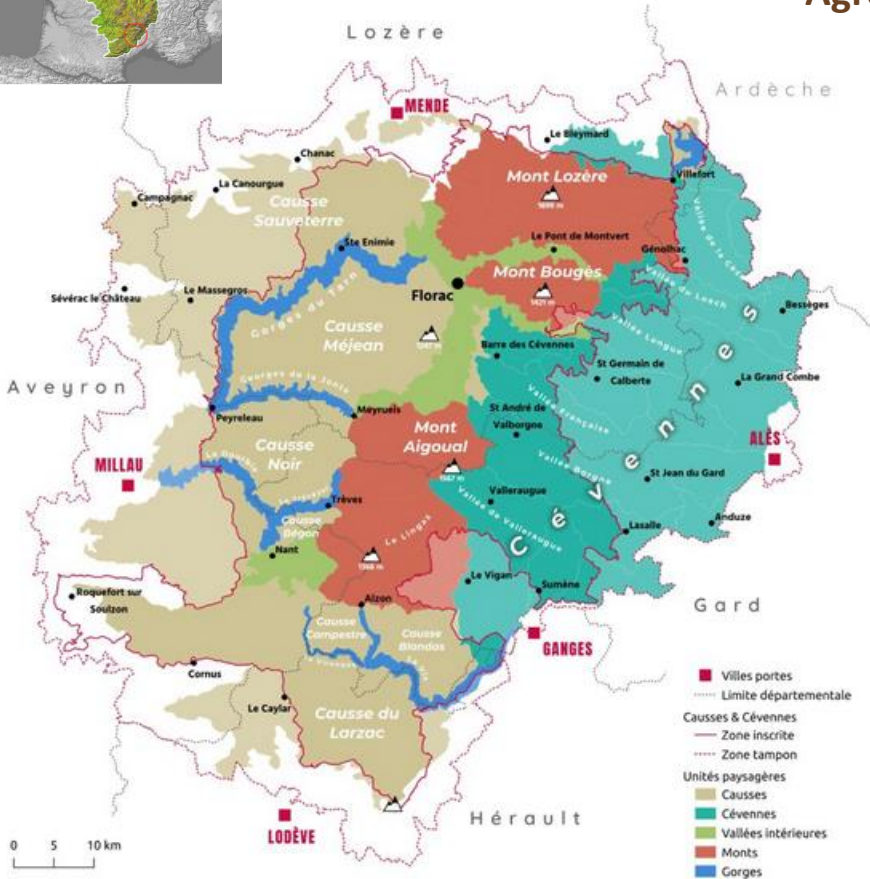
The notion of culture makes it possible to describe landscapes as places of life and social reproduction

Donadieu in Merueys international expert meeting on Mediterranean agropastoralism, 2007



Landscape units of the Causses et Cévennes

Agropastoralism as linking diverse exceptional landscapes



the steppe-like rangelands of the **Grands Causses**, on high, barren limestone plateaus. Catholic

the deep, narrow and forest-dominated parallel valleys of the **Cévennes** of schist and granite. Protestant

Causse and Cevennes, cultural landscape of mediterranean agropastoralism

CAUSSES LANDSCAPES



CEVENNES LANDSCAPES



The Causses material attributes of agropastoralism

Landscape as reflecting human activity : agropastoralism

“**Lavognes**” : natural depressions created by man to water herds (clay and limestone pavement)



Roof tanks to collect rainwater



The “**clapas**”, or piles of stones left over from the removal of stones from the fields



The “**cazelle**” or “**capitelle**”, shelter built by shepherds to protect themselves.

The Cévennes material attributes of agropastoralism



The « **drailles** »
or roads of
transhumance



Stone bridge to
allow herds to
cross rivers



The « **calades** » to
reinforce paths



the « **aiguiers** »,
small ditches to
protect the terraces

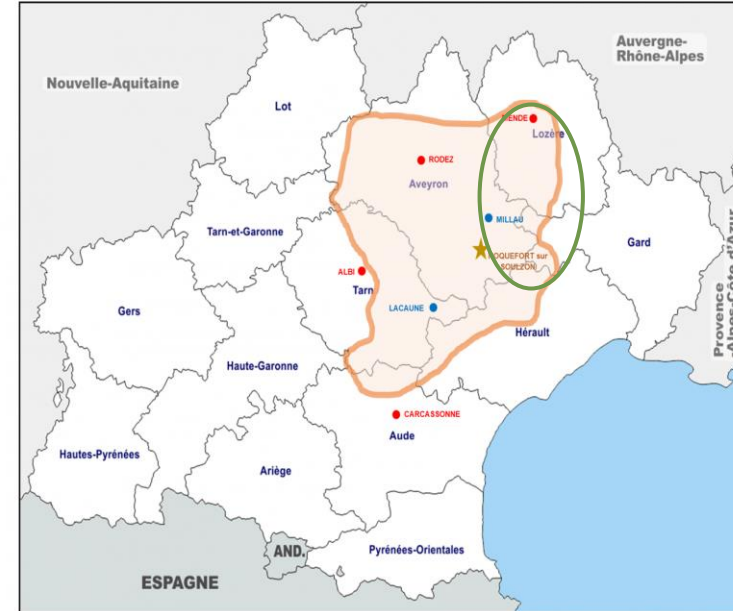


The « **faïsse** »
(terraces) to
cultivate land

Béals, irrigation
canals to bring
water to the fields



Local breed : LACAUNE race / Local cheese : ROQUEFORT



Causse et Cévennes, a long process towards UNESCO label

- 2005 : France submits a first demand for the inscription of the Causse et Cévennes property as part of the World heritage cultural landscape, in the sub category evolutive landscape
 - 2006 : this first submission is rejected
- ➔ The universal value is not evident enough :
- Agropastoralism is not enough developed as a basis for this universal value
 - the Mediterranean value of the landscape is missing
 - the focus is too centered on the specific history of the site (resistance to central power / nazism, religious wars)
- ➔ The Merueys expert meeting in 2007 is organised to develop the focus on Mediterranean agropastoralism

Mediterranean agropastoralism definition

Conclusions of the Merueys international expert meeting, 2007 gathering 40 experts from north Mediterranean, Balkans, Near East and Maghreb

- One of these large groups of pastoral systems
- Characterized by
 - **the influence of the Mediterranean climate** (dry to very dry summers, mild to cold winters) ;
 - A relief that gives way to **medium and sometimes high mountains**, resulting in a **wide variety of environments** depending on substratum, altitude, exposure and vegetation, and providing conditions for transhumance;
 - **Soils of generally low productivity;**
 - **Mainly sheep farming**, often combined with goats, and locally cattle, equines or camelids : some of these herds have preserved **local domestic breeds**, products of the know-how of their identity;
 - One of the **most biodiverse regions** on the planet, spanning 3 continents, yet at the same time a **highly anthropized** ;
 - a **multi-millennial history of interactions** within this ensemble, resulting in a mosaic of agrarian systems and more or less open environments;
 - the **birthplace of the three great monotheistic religions**, with **shepherd and his flock as a strong symbolism**

Source : les paysages culturels de l'agropastoralisme méditerranéens, réunion internationale d'experts, 2007

Conclusion of the Merueys meeting of experts

The creation of a Mediterranean multi-actor network on agropastoralism with regular meetings



Universal value criteria (UNESCO)

Source : Operational Guidelines for
the Implementation of the World
Heritage Convention, 2023

Universal value of properties in the UNESCO world heritage convention

- (i) represent a masterpiece of human creative genius;
- (ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- **(iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living** or which has disappeared;
- (iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- **(v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;**
- **(vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);**

Causse et Cévennes as a cultural landscape

Universal value of the Causse et Cévennes

Criteria V - Representativeness and richness of a heritage of landscapes shaped by three millennia of agropastoralism, (...) inspired by the three emblematic figures of the Shepherd, the Lamb and the Earth, threatened with extinction by a hundred years of rural exodus and reforestation, but revitalized over the past four decades by a management allowing their preservation and adapted to the new socio-economic conditions.

Criteria III - Agro-pastoralism in the Causses and Cévennes could be presented as an exceptional testimony to **a cultural tradition, Mediterranean agropastoralism**

From landscape perspectives, the area is characterized by multiple material attributes such as :

- the steppe-like paths of the Grands Causses,
- the terraces and associated hydraulic systems of the Basses-Cévennes,
- the transhumance estives of the Hautes-Cévennes,

+ Criteria VI → and a rich intangible heritage (social practices, festivals, etc.)

Source : Les Causses et Cévennes, candidature à l'inscription sur la liste du patrimoine mondial, mémoire en réponse aux observations du Comité du patrimoine mondial, l'unité et la valeur exceptionnelle du bien proposé à l'inscription, 2008

Causse et Cévennes, a long process towards UNESCO label

- 2006 : first submission rejected

- ➔ The universal value is not enough evident : the Mediterranean value of the landscape is missing and the focus is too centered on the specific history of the site (resistance to central power / nazism, religious wars)
- ➔ The Merueys expert meeting in 2007 is organised to overcome this limit and to develop the focus on Mediterranean agropastoralism

- 2009 : second submission rejected

- ➔ Additional information is needed on a better definition of the perimeter and agropastoral activities (integrity criteria)

- 2011 : third submission accepted

- ➔ France was about to give some petroleum industries the permission to develop hydraulic fracturing in the search for shale gas deposits in the region
- ➔ The UNESCO label puts an end to this process

Integrity criteria in the World heritage convention (UNESCO)

PLUS the authenticity criteria

Source : Operational Guidelines for
the Implementation of the World
Heritage Convention, 2023

Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity, therefore requires assessing the extent to which **the property**:

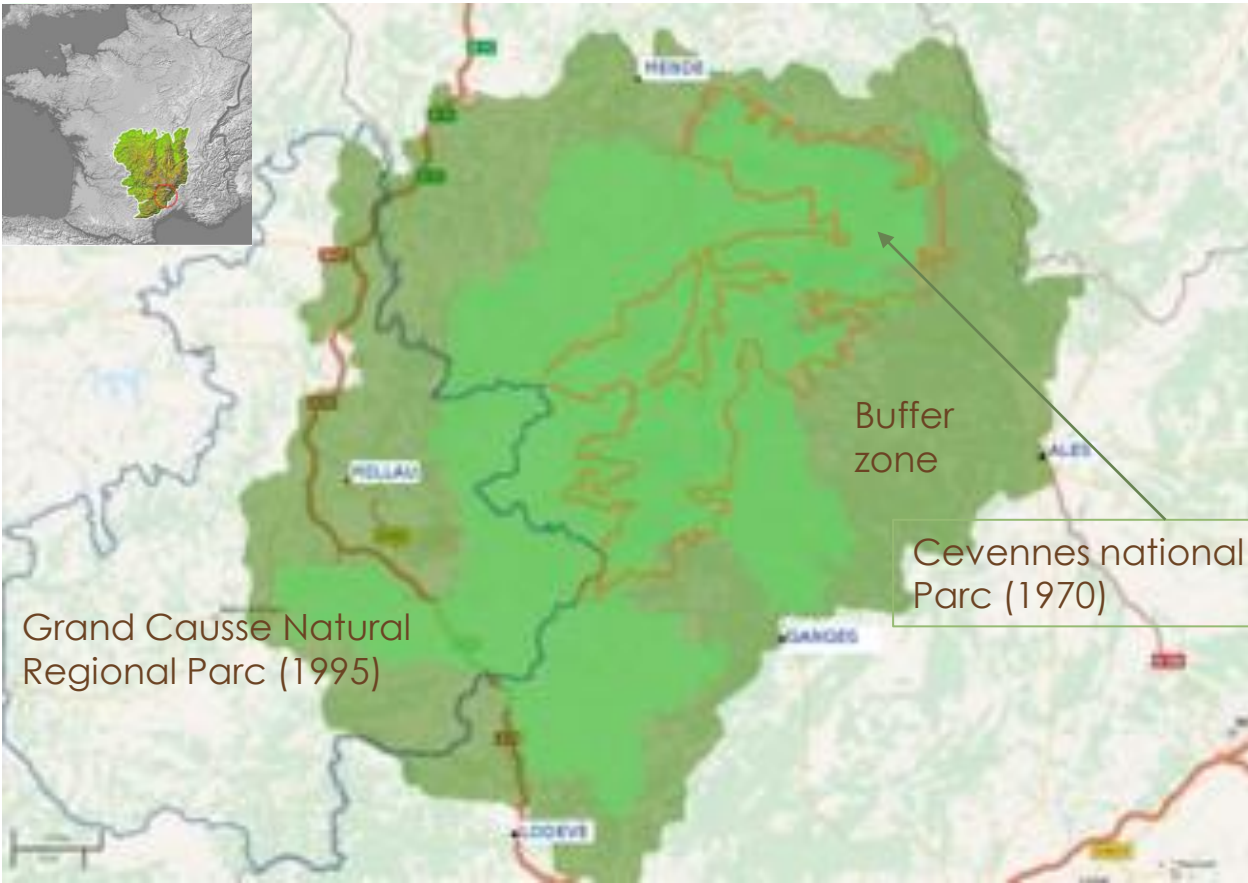
- a) includes all elements necessary to express its Outstanding Universal Value;
- b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
- c) suffers from adverse effects of development and/or neglect.

This should be presented in a statement of integrity.

Authenticity as the reliability of the information provided on the site attributes
→ importance of science-based process for the inscription of the property

The delineation of the site

ICONOS and IUCN support, as the 2 advisory bodies of the World heritage Committee



3,000 km²,

50% agricultural area, 80% of which is pastureland

4 administrative departments

2 protected areas

3 “grands sites”

Protection and management criteria (UNESCO)

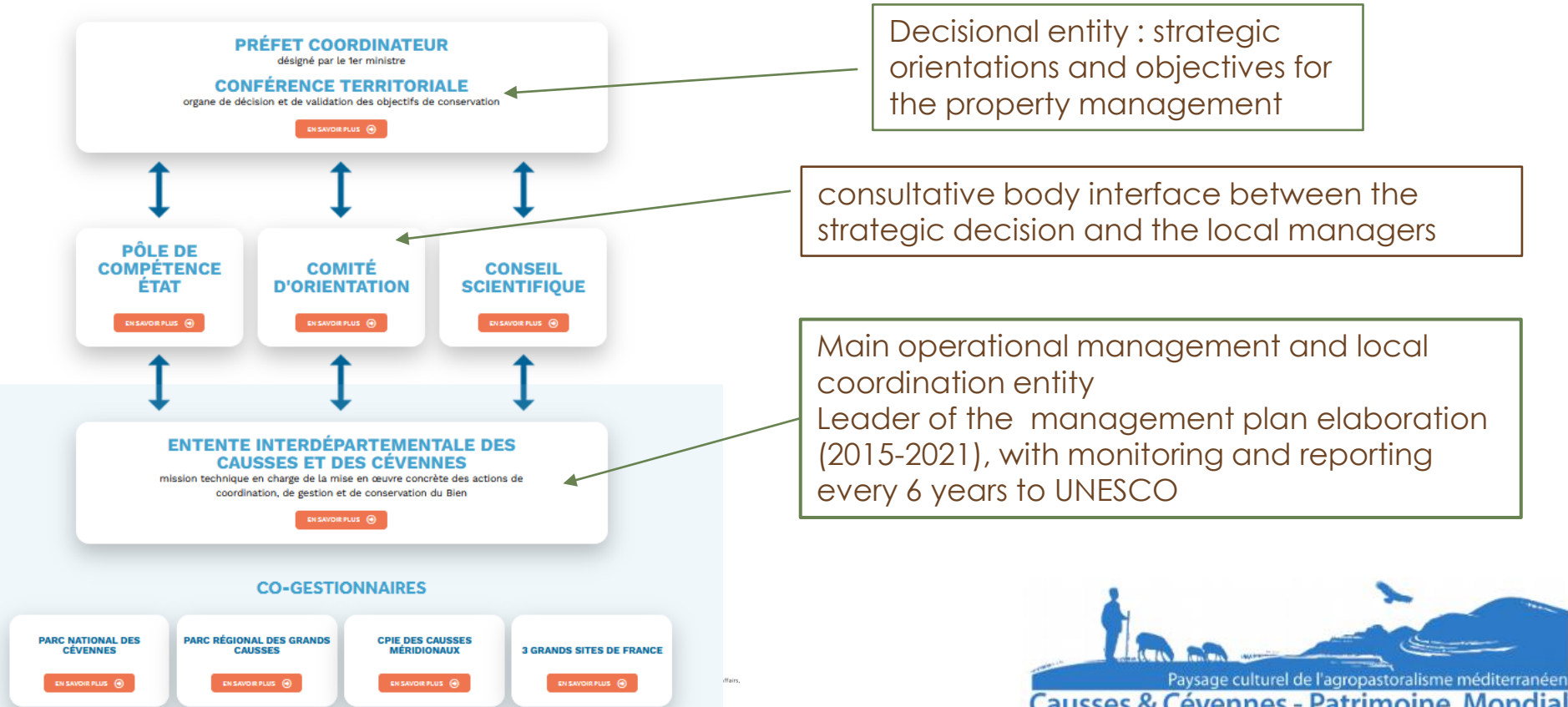
Source : Operational Guidelines for
the Implementation of the World
Heritage Convention, 2023

Comprehensive set of protection and management measures

- Protection and management of World Heritage properties should ensure that their **Outstanding Universal Value**, including the conditions of integrity and/or authenticity at the time of inscription, **are sustained or enhanced over time**.
- **All properties inscribed on the World Heritage List must have adequate long-term legislative, regulatory, institutional and/or traditional protection and management to ensure their safeguarding.**
- Boundaries for effective protection
- Buffer zone
- Management systems : **Each nominated property should have an appropriate management plan or other documented management system** which must specify how the Outstanding Universal Value of a property should be preserved, **preferably through participatory means**

A complex governance to protect the area

2012 : creation of the Causse et Cévennes entente inter departementale



Intangible cultural heritage (UNESCO, 2003)

Definition

transmitted from generation to generation,

constantly recreated by communities and groups in response to their environment, their interaction with nature and their history,

provides them with a **sense of identity and continuity**,

thus promoting respect for **cultural diversity and human creativity**

Immaterial attributes

- (a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
- (b) performing arts;
- (c) social practices, rituals and festive events;
- (d) knowledge and practices concerning nature and the universe;
- (e) traditional craftsmanship.

Safeguarding intangible capital = inventory making, community-based documentation

Intangible heritage linked to the cultural landscape of Mediterranean agropastoralism

2018

Art of dry stone walling, knowledge and techniques

Croatia – Cyprus – France – Greece – Italy – Slovenia – Spain – Switzerland

Definition : knowhow related to making stone constructions by stacking stones upon each other, without using any other materials except sometimes dry soil. **Dry stone structures are spread across most rural areas**

Concepts

Apprenticeship (144) ▣

Associations (2) ▣

Building stones (3) ▣

Craft workers (138) ▣

Cultural cooperation (3) ▣

Disaster risk reduction (2) ▣

Landscape design (1) ▣

Oral tradition (162) ▣

Restoration (17) ▣

Technical skills (143)

Traditional tools (60)



Intangible heritage linked to the cultural landscape of Mediterranean agropastoralism

2023

Transhumance, the seasonal droving of livestock

Albania – Andorra – Austria – Croatia – France – Greece – Italy –
Luxembourg – Romania – Spain

Definition : An entire socio-economic system has been developed around transhumance, from gastronomy to local handicrafts and festivities marking the beginning and end of a season.

Concepts

Contests (34)

Family (181) ▣

Festivals (224) ▣

Handicrafts (170) ▣

Labour migration (2) ▣

Livestock (1) ▣

Peer teaching (3) ▣

Technical skills (143)



Agropastoralism from the agriculture perspective

Introducing the NATAE project, fostering agroecological transitions in North Africa through multi-actor design, evaluation and networking ; Horizon EU programme (dec.2022-Nov.2026)

Requier-Desjardins, M.; Boughamoura, O.; Lemaître-Curri, E. Characterizing Agroecology in North Africa, a Review of 88 Sustainable Agriculture Projects. Land 2024, 13, 1457.

- Study of 88 projects of sustainable agriculture throughout North Africa classified per main agrosystems ; project on livestock were excluded.
- Classification of sustainable agriculture projects according to the Giessmann level of transition framework

The projects per agrosystems

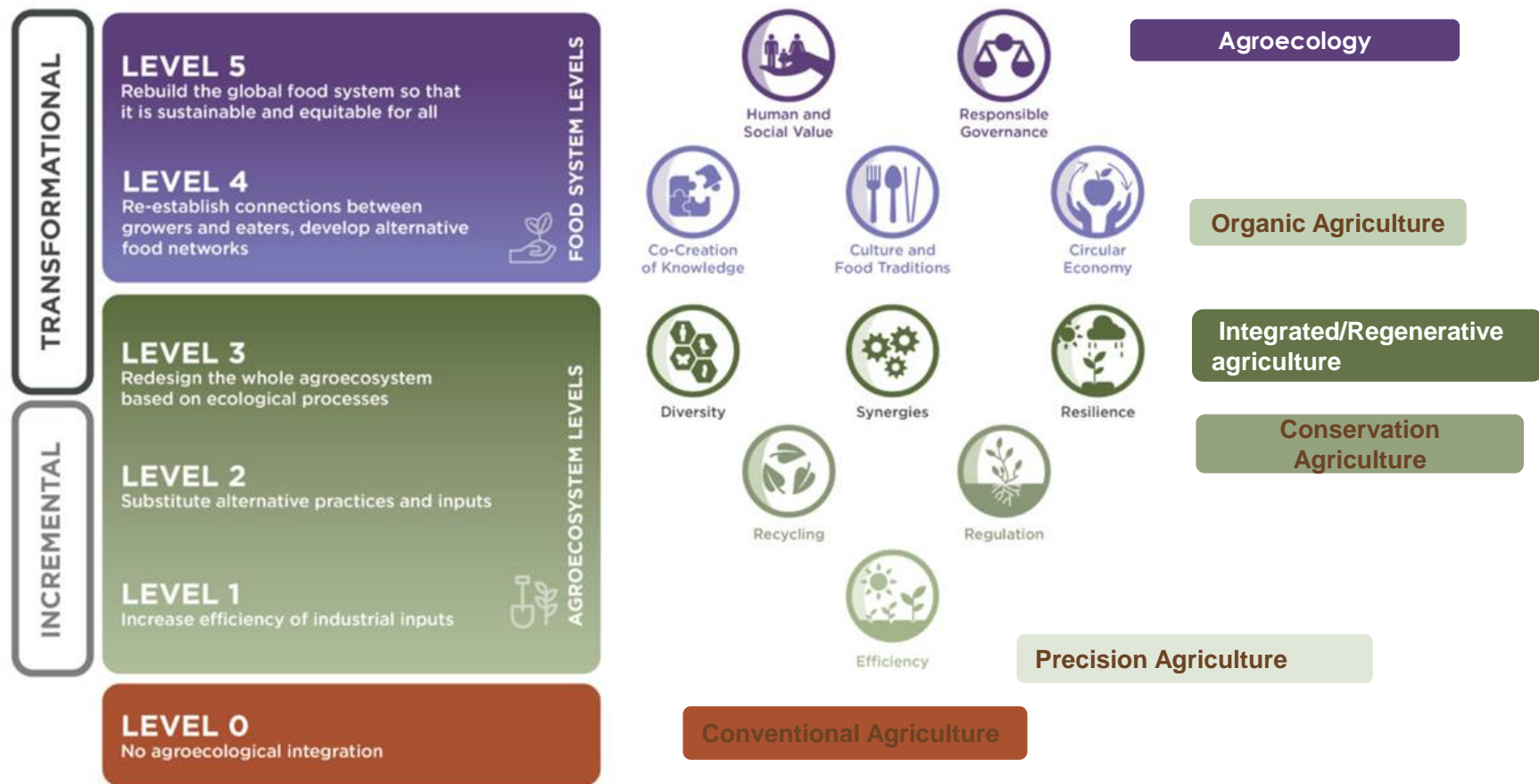
Sustainable Agriculture Projects (Number of Projects Identified)						Total
Rainfed Cereal Plains	Mountain	Oasis	Peri-Urban	Nile Valley and Other Irrigated Areas (Excluding Oases)	Cross-Cutting Projects	
13	3	20	12	19	21	88



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The sustainable agriculture main types according to the level of the agroecological transition and related FAO elements of agroecology



Agropastoralism from the agriculture perspective

Introducing the NATAE project, fostering agroecological transitions in North Africa through multi-actor design, evaluation and networking ; Horizon EU programme (dec.2022-Nov.2026)

- Examination of the HLPE principles (2019) covered by the projects per agrosystem
- Inventory of the agroecological practices introduced or fostered by these projects :
 - elaboration of a matrix according to the 4 level of agroecology (Gliessman, 2007; Hill and McRae, 1997 ; Gliessman, 1990) : efficiency, substitution, redesign, including value chain + territorial level
 - and main evolution of these practices through time (30 years)

➔ All types of sustainable agriculture include practices that relates from level 1 (efficiency) to 3 (redesign)

➔ In all agrosystems but peri-urban ones, redesign level practices includes integrated livestock farming



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→ To focus on agropastoralism as an agroecological (production) system

NATAE 7 living labs in North Africa



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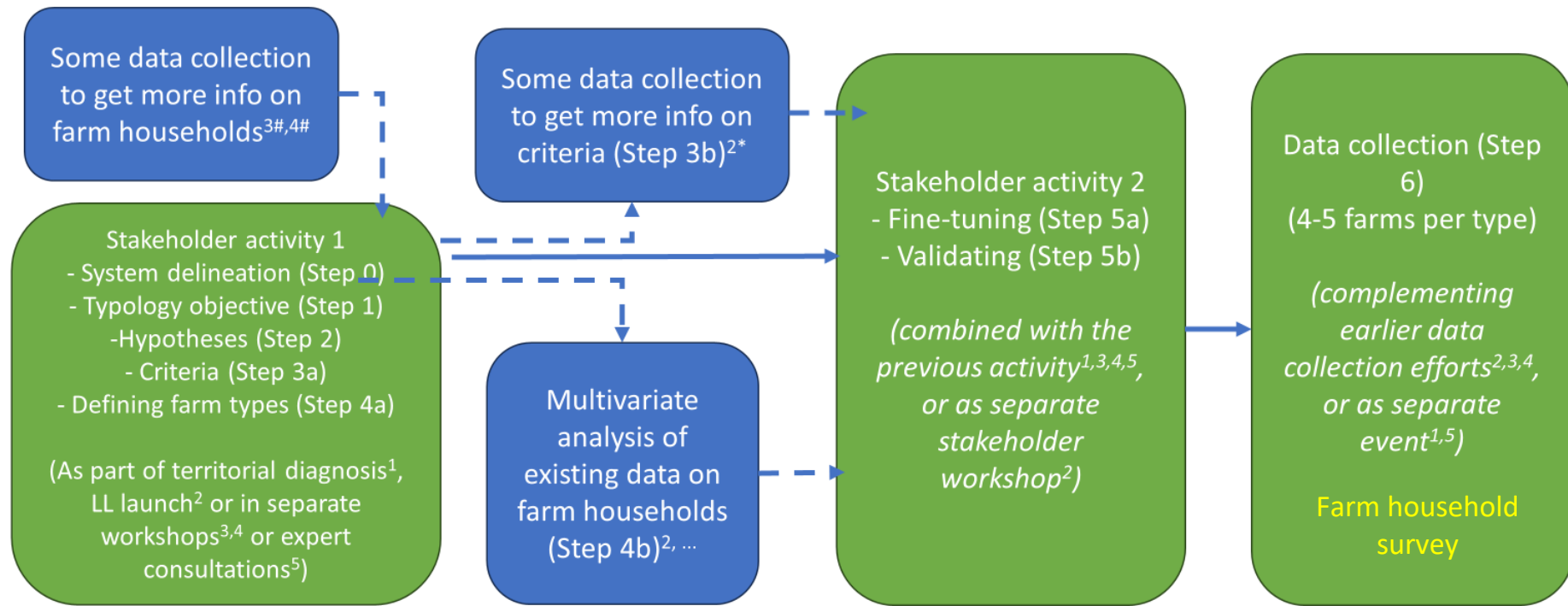
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Agropastoralism from the agriculture perspective

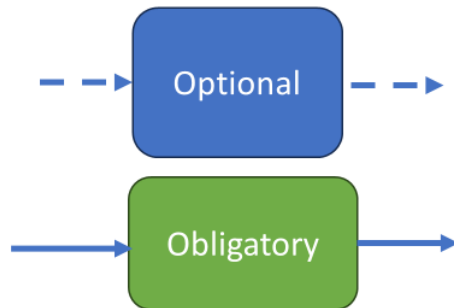
NATAE Specific objective 2 : Assessing multidimensional benefits of agroecological practices (AEP) and combinations through bioeconomic modelling

→ To introduce new module on livestock in the bioeconomic DABHSIM model **to improve the understanding of livestock farming interactions from a systemic perspective**

On going typologies elaboration in each living lab with farmers questionnaires and participatory workshops **to cobuild the typology criteria with the stakeholders** and to validate and refine the farm types : **livestock is a main criteria in all but peri-urban living labs**



1. Laghouat-DZ
2. El-Boghdady-EG
3. Ouislane-MA,
4. Skoura-MA
5. PK17-MR



* Selection of households was based on the preliminary stakeholder defined typology.
 # During the territorial diagnosis

Conclusion : Agropastoralism in the Mediterranean

Agropastoralism as a necessity in vulnerable Mediterranean areas (mountains and arid zones)

Agropastoralism from landscape perspectives

The role of social capital to maintain agropastoralism (management by competition)

The cultural sides of agropastoralism (heritage) through:

- contextualised and territorial land tenure systems
- the production of specific and qualitative (food) products
- the production of cultural landscapes heritage as an environmental externalities of agropastoralism

Agropastoralism from farming perspectives

Diversity of Mediterranean agropastoralism regarding the interaction with agriculture in farming systems

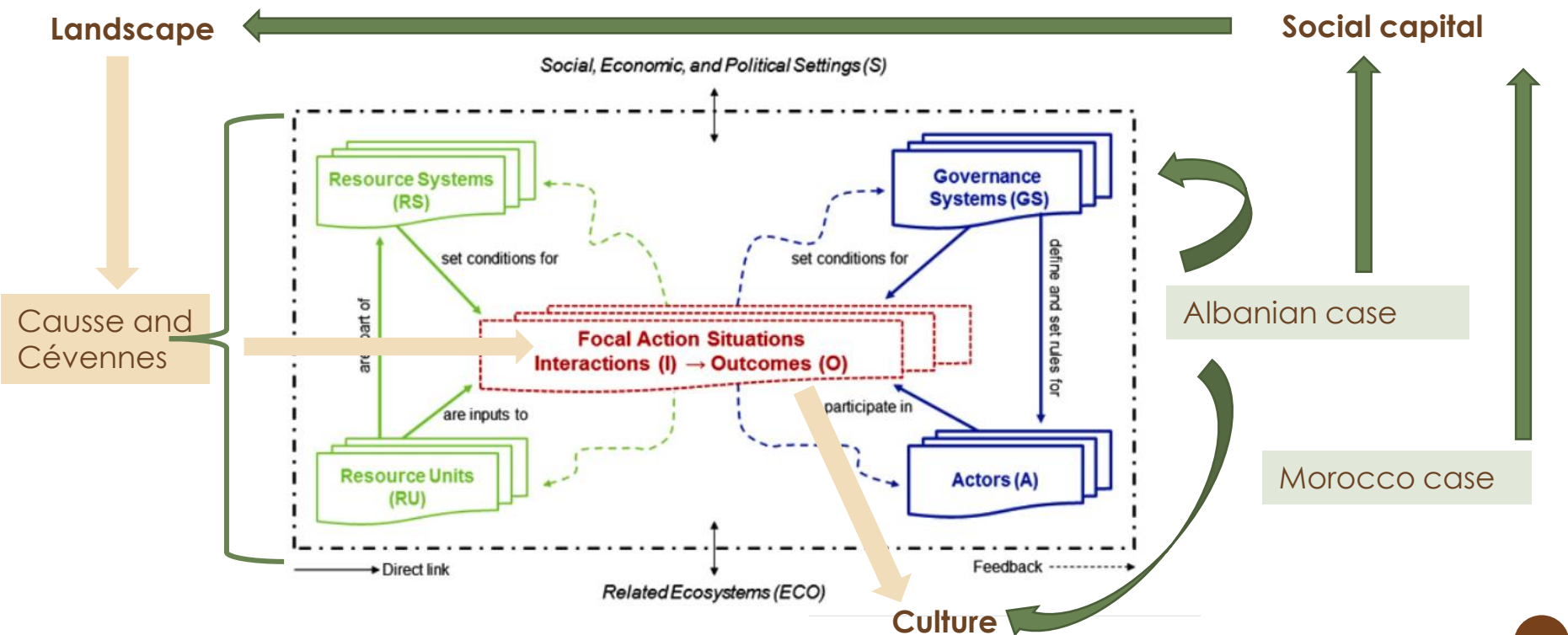
Agropastoralism as an agroecological practice

Necessity of a systemic approach integrating both activities, to improve our understanding of the interactions and their multidimensionnal benefits / trade-off

A NATAE research project objective

Social capital, culture, landscape and the SSE framework

How the SSE model helped to frame this presentation



Source : Michael D. McGinnis, Elinor Ostrom, 2014