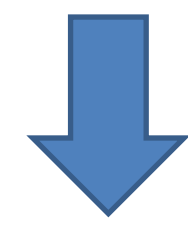




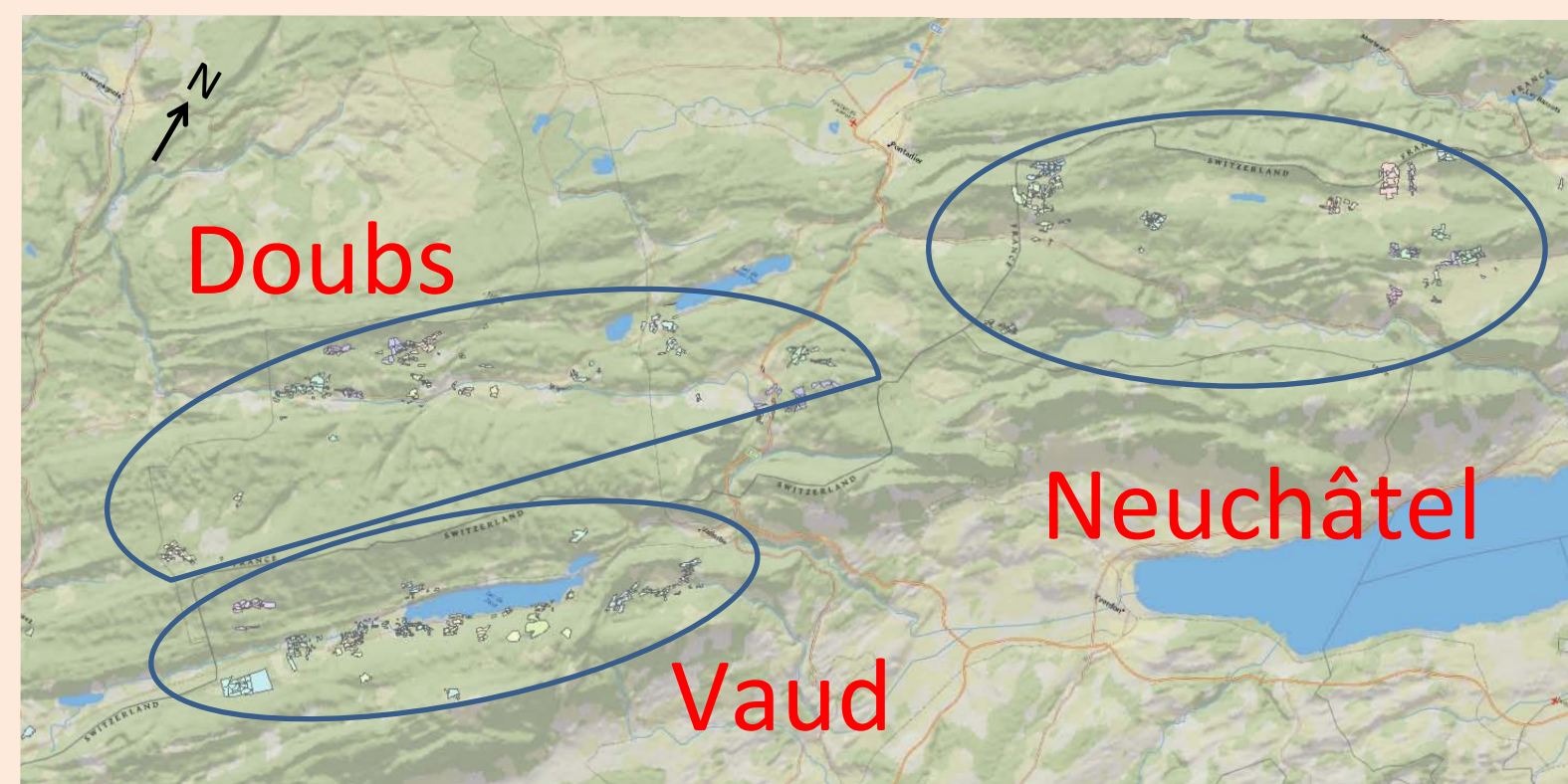
- Landscape complexity in mountains is enhanced by the diversity of grassland management
- Natural factors (slope, soil...) do not explain all the diversity of management



**What is the role of local policies on farm strategy and of these strategies on grassland management ?**

## Material and Methods

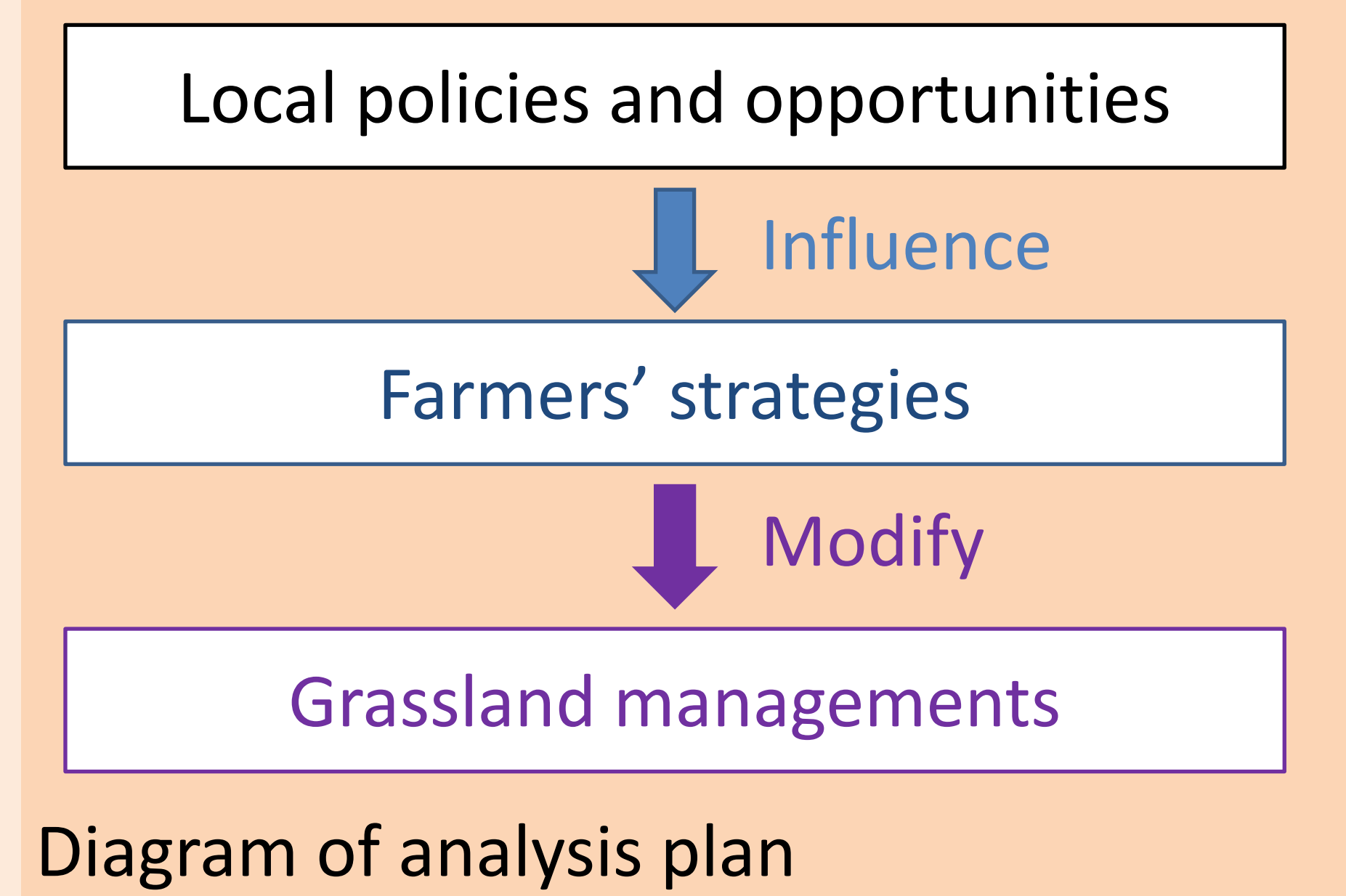
- 3 areas in the same pedoclimatic context of the folder Jura: Doubs (F), Vaud (CH), Neuchâtel (CH)
- Differences in local policies and opportunities:
  - Protected Designation of Origin (PDO) cheeses
  - Specific policies on mountain pasture (fertilization, stocking rate)
  - Ecological policies



- Multifactorial analysis followed by hierarchical clustering:
  - For strategy analysis we used data of 33 farms on:
    - number and kind of animals bred and sold;
    - area managed;
    - periods of production;
    - multiple variables on intensity of animal production (age at first calving, animal production expectations, quantity of concentrate...)

## Conclusions

- In an area: both **ubiquitous and specific strategies**, due to:
  - Local dynamics of agriculture
  - Specifications of PDO cheeses
- Diversity of grassland management :
  - Inside each strategy despite preferred/avoided uses
  - Enhanced by a combination of strategies



- For grassland management we used data of 634 plots on:
  - Date of first and last utilization
  - Uses: number (0 to 4), type (grazing/mowing/depending on grass growth) and season (spring/summer/autumn)
  - Fertilization: type (liquid manure/manure/mineral or their combinations) and number (0 to 4)

- Interactions between strategy and area/grassland management have been studied by Chi-square test

## Results

(green : more used ; red : less used than expected by chi-square statistics)

- 9 strategies identified:

Strategies (Number of farms) description	Area		
	D.	Vd.	Ne.
1. Extensive on animals (4) older cows at 1st calving, low milk per cow	1	1	2
2. Beef cattle (4) don't produce milk (* not surveyed)	1*	2	2
3. Grass managers (5) change size of pasture each day	2	2	1
4. Part-time (1) don't have animals during winter	0	1	0
5. Mountain cheese makers (4) calving of heifers in fall, rotational pasture of mountainous plots	0	4	0
6. Grazing Milk (3) produce milk mainly in spring and summer	3	0	0
7. Intensive (3) high levels of complementation and milk per cow, several products	0	0	3
8. Minimizing unproductive times (5) only 15% replacement rate and want high fertility for cows	0	2	3
9. Big farms in area and animals number (4) lot of animals (53 cows) and area (125ha), breed beef, quite intensive	3	0	1

- Strategies 1,2 & 3: found in the three areas
- Strategies 4 & 5 in Vaud: related to mountain pasture
- Grazing milk strategy in Doubs: PDO cheeses specifications
- Intensive strategy in Neuchâtel: subsidies and local dynamics
- Minimizing unproductive times in Switzerland: market for heifers
- Big farms overrepresentation in Doubs: agricultural dynamics

- 16 grassland usages and their different use between strategies:

Management type	Grassland usage (nb of plots)	Strategies								
		1	2	3	4	5	6	7	8	9
No Fertilization	Abandonment (10)				/					
	Grazing (23)		■		/				■	
Grazing and inorganic fertilization	Grazing and inorganic fertilization (11)				/					
	With manure only (44)		■		/		■		■	■
	With several organic fertilization (41)		■	■	/	■				
Pastures	Pasture at each season (94)				/			■	■	
	Only use in summer for mowing (22)				/					
Manure Fertilization	Mowing in summer and grazing lately (30)		■		/	■	■			
	Early use (50)	■		■	/	■	■			■
Organic fertilization with mowing and pasture	Late first use (42)	■	■	■	/			■		
	First use in Spring (87)		■		/			■		
Frequent uses with organic and inorganic fertilization	Frequent mowing (46)				/	■	■	■		
	Topping (44)		■	■	/	■	■		■	■
Use depending on grass growth	Organic fertilization (25)	■	■		/					■
	Organic and inorganic fertilization (37)	■	■	■	/	■		■		
Liquid manure fertilization	Liquid manure fertilization (28)				/	■			■	

- Each strategy has under & overrepresented grassland management i.e.:
  - Grazing milk farms (n°6) need plots for grazing early and avoid fertilization with liquid manure. They don't need to stock grass (few mowing)

## Outlook

- Search for type of grassland management at the farm level
- Evaluate floristic diversity in plots of each management
- Test the strategies effect on floristic biodiversity at farm level
- Discuss with the local stakeholders of the results