

3rd AIEEA Conference, Alghero (SS), 25-27 June 2014

"FEEDING THE PLANET AND GREENING AGRICULTURE: CHALLENGES AND OPPORTUNITIES FOR THE BIO-ECONOMY"

A Spatial Analysis to evaluate the Farm's structure and the Geography of Rural Areas: the case study of Mugello Area

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Support the design of a proper agricultural policy in Mugello

- **a diagnosis of territorial and environmental framework of Mugello**
- **an analysis of the socio-economic conditions of farms in Mugello**

- Introduction
- Methodology
- Data
- Results
- Conclusions

INTRODUCTION

In order to promote rural development **public policies** constantly **need to be adapted** to the changing **socio-economic conditions of rural areas** at individual and territorial level.

Socio-economic information are not sufficient to explain the dynamics of the agricultural sector in a specific area → due to their **relationship with the physical characteristics of land** (altitude, slope, etc.).

The Geographical Information System (**GIS**) may **help handle the issue** localizing all the cadastral parcels of farms.

METHODOLOGY

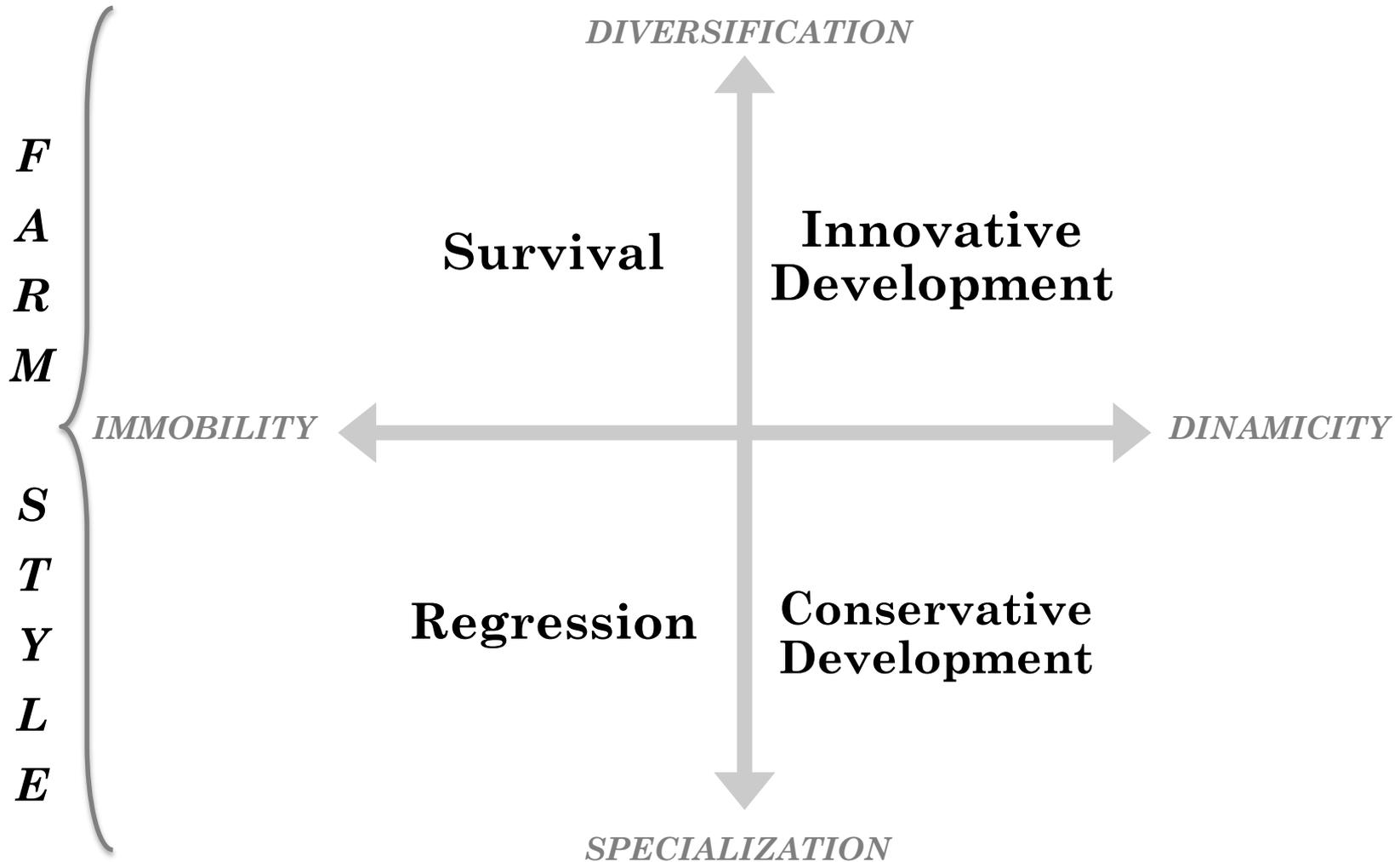
In order to classify different farm styles we split the entrepreneurship index (Rocchi and Landi, 2013) in **two** different **scores** of *Multifunctionality* and *Dinamicity*.

a) definition of variables and attributes

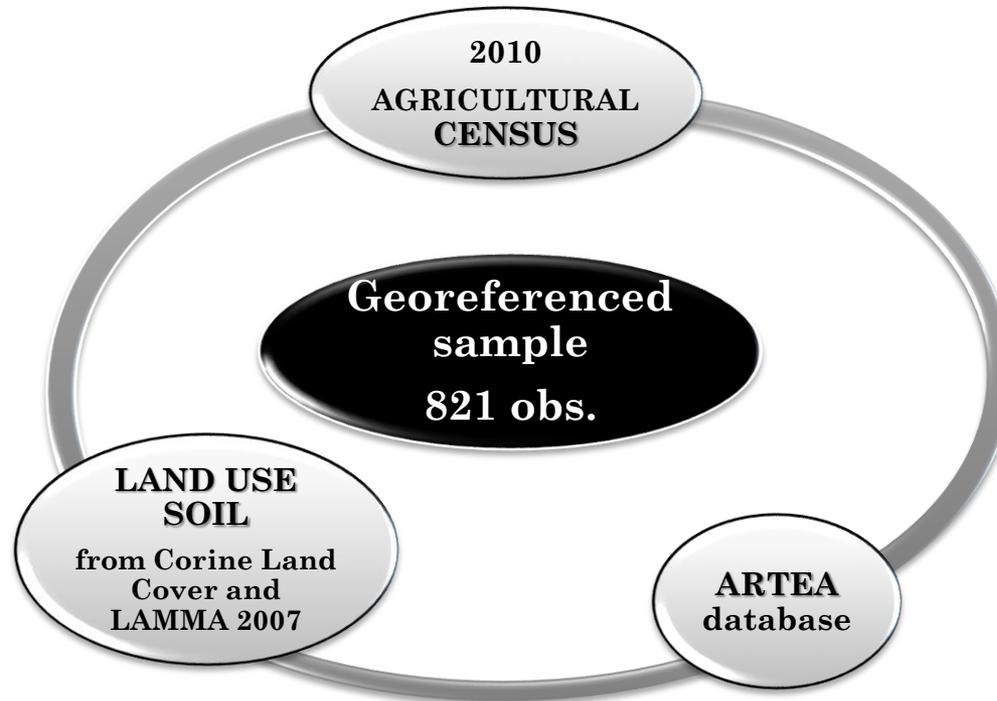
MULTIFUNCTIONALITY	DINAMICITY
Cultivation practices	Accounting
High quality products	Information Technology services
Number of non agricultural activities	Courses
Share of rents stemming from non agricultural activities	Outsourcing
	Presence of the entrepreneur
	Sale channels

- b) assigning scores to the **attributes in a scale from 1 to 10** points
- c) pairwise comparison to assign **weights to the variables**
- d) Assigning the **weighted scores** related to *Multifunctionality and Dynamicity* to each farm
- e) definition of the **farm styles**

METHODOLOGY



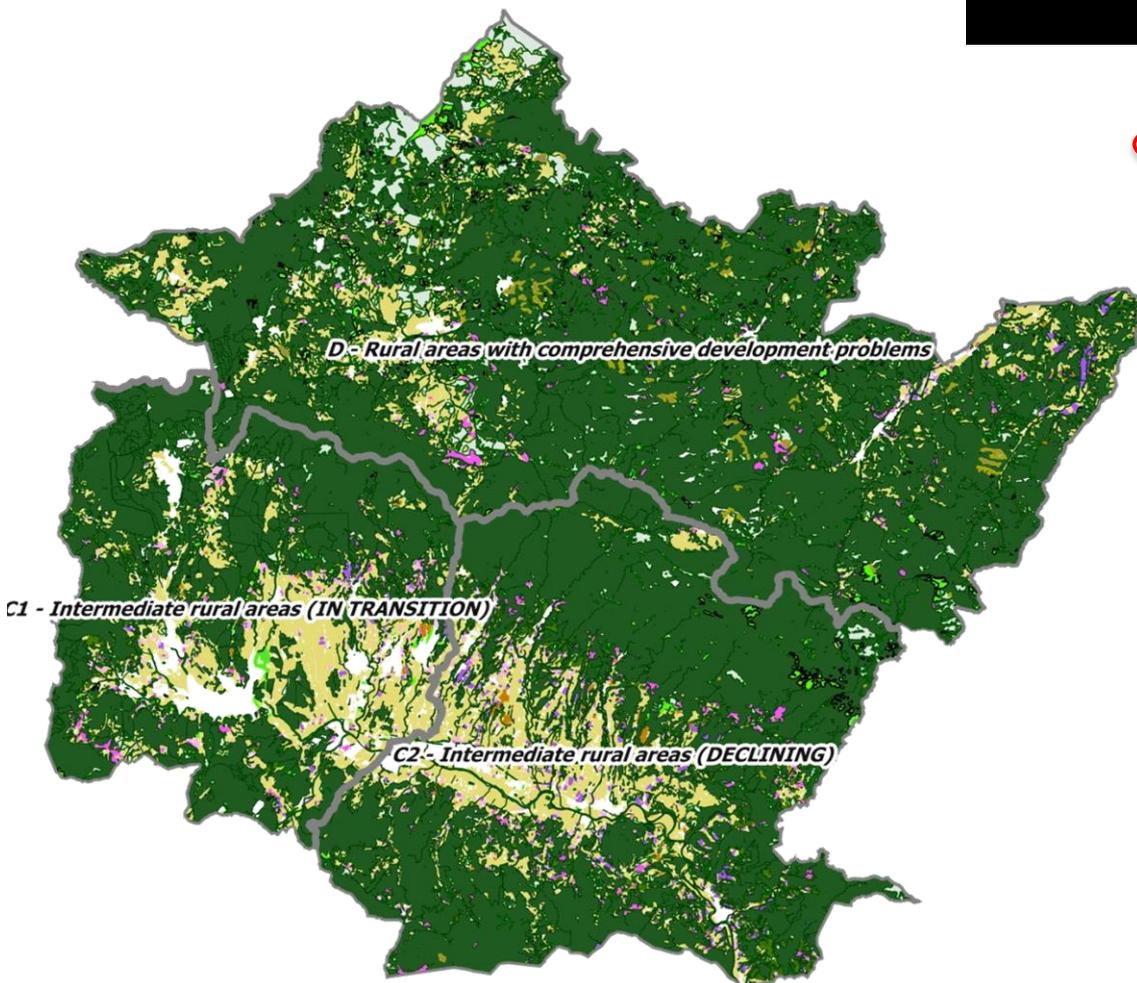
METHODOLOGY



The sample covers **49,966 ha** which represent:

- **56% of the farms**
- **81% of the total agricultural area surveyed by ISTAT in 2010**
- **94% of the total area has been georeferenced**

TERRITORIAL DATA

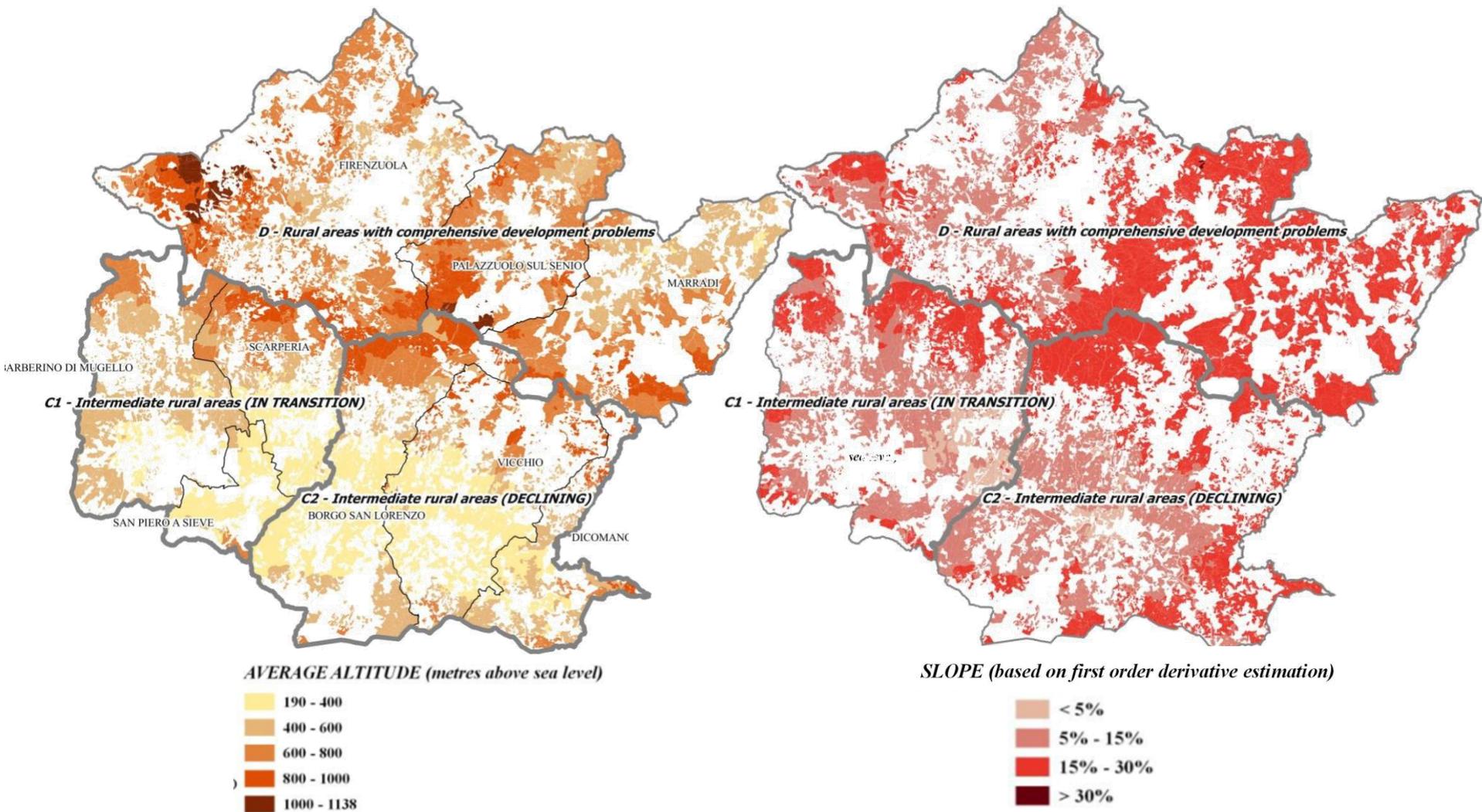


CLC classes (Land Use 2010)	C1 % TOT CLC	C2 % TOT CLC	D % TOT CLC	TOT CLC (Ha)	TOT CLC % TOT Area
211 Non-irrigated arable land	31.16%	33.35%	35.49%	20,720.33	19.21%
221 Vineyards	21.86%	57.86%	20.28%	629.66	0.58%
222 Fruit trees and berry plantations	21.63%	50.58%	27.78%	309.13	0.29%
223 Olive groves	25.32%	72.71%	1.97%	995.03	0.92%
231 Pastures	39.65%	28.80%	31.55%	422.24	0.39%
241 Annual crops associated with permanent crops	38.38%	41.88%	19.75%	169.18	0.16%
242 Complex cultivation patterns	45.41%	49.81%	4.79%	300.88	0.28%
243 Land principally occupied by agriculture, with significant areas of natural vegetation	20.71%	33.48%	45.82%	1,010.55	0.94%
311 Broad-leaved forest	17.93%	31.98%	50.09%	73,270.10	67.94%
312 Coniferous forest	45.43%	0.34%	54.23%	2,129.61	1.97%
313 Mixed forest	48.12%	3.87%	48.01%	910.11	0.84%
321 Natural grasslands	1.86%	19.99%	78.15%	1,058.96	0.98%
322 Moors and heathland	13.58%	27.61%	58.81%	150.13	0.14%
323 Sclerophyllous vegetation	0.00%	0.00%	100.00%	6.00	0.01%
324 Transitional woodland-shrub	14.16%	16.09%	69.75%	5,469.70	5.07%
333 Sparsely vegetated areas	0.00%	4.03%	95.97%	286.76	0.27%
TOT Area	21.19%	31.02%	47.79%	107,838.37	100.00%

AGROFORESTRY LAND USES

333) Sparsely vegetated areas	243) Land principally occupied by agriculture, with significant areas of natural vegetation
324) Transitional woodland-shrub	242) Complex cultivation patterns
323) Sclerophyllous vegetation	241) Annual crops associated with permanent crops
322) Moors and heathland	231) Pastures
321) Natural grasslands	223) Olive groves
313) Mixed forest	222) Fruit trees and berry plantations
312) Coniferous forest	221) Vineyards
311) Broad-leaved forest	211) Non-irrigated arable land

TERRITORIAL DATA



The upper Mugello is characterized by higher altitudes and slope

FARM DATA

	UAA HECTARES		TOTAL HECTARES		STANDARD OUTPUT	
	Sample 821 obs	Universe 1462 obs	Sample 821 obs	Universe 1462 obs	Sample 821 obs	Universe 1462 obs
MIN	0	0	0.24	0	0	0
1 ST QUART	4.87	2.38	8.12	4	5870	3397
MEDIAN	11.05	5.82	22	11.36	17370	9348
MEAN	28.34	18.67	64.37	42.32	47750	31690
3 RD QUART	30	16.59	56	35.58	42000	23600
MAX	775.75	775.75	6453	6453	3073000	3073000

Comparison between the sample and the universe

FARM DATA

farm structure according to the style

	REGRESSION 379 obs 13,539.33 ha	INNOVATIVE SURVIVAL 52 obs 2,097.84 ha	CONSERVATIVE DEVELOPMENT 193 obs 12,722.32 ha	INNOVATIVE DEVELOPMENT 197 obs 21,607.43 ha
Average UAA	16.29	25.71	27.9	52.22
Average SO	18,150	43,670	49,430	103,000
SO/UAA	1,769	1,781	2,209	3,309
SO/working days	268	174	214	260
days/UAA	0.61	0.76	0.38	0.33
Average age of household members working in the farm	61	55	53	47

Farms included in the **Innovative development** show **high levels of land and labour productivity** associated to a **lower average age of the household members working in the farm.**

RDP payments according to the farm style

	REGRESSION			INNOVATIVE SURVIVAL			CONSERVATIVE DEVELOPMENT			INNOVATIVE DEVELOPMENT		
RDP Axis	1	2	3	1	2	3	1	2	3	1	2	3
Share of farms	5%	4%	0.5%	11%	8%	0%	17%	9%	0.5%	35%	24%	7%
Total payments per year	227,340	15,691	27,900	82,170	9,527	0	156,276	77,436	1,501	393,659	207,894	157,332
Average payments	596	41	73	1,521	184	0	810	401	8	1,960	1,034	783

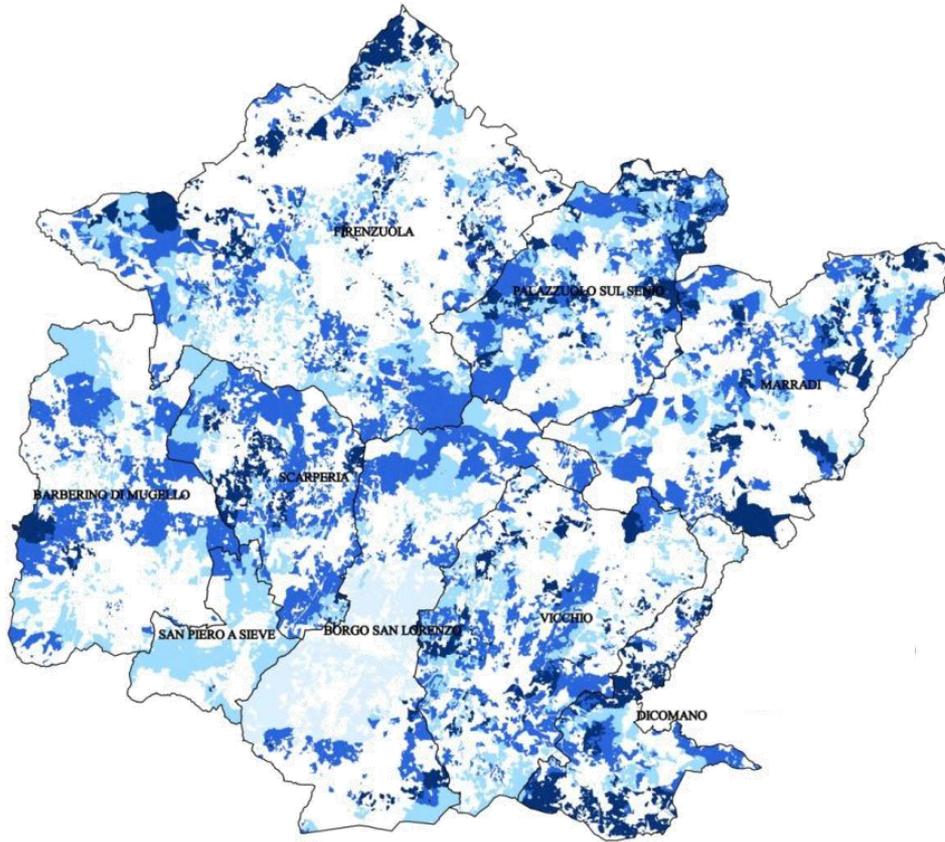
Farms included in the **Innovative Development** show the **highest level of access to RDP payments** in terms of **average payment and share of farms**

CAP payments according to the farm's style

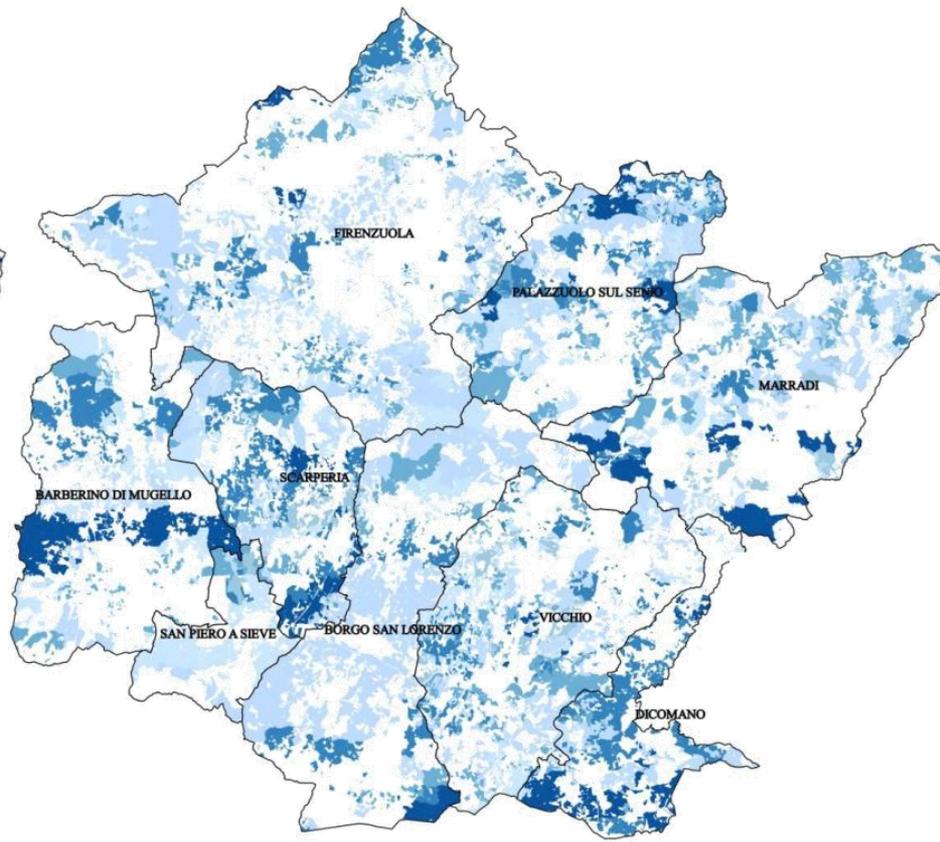
	PAYMENTS - PILLAR 1			
	REGRESSION	INNOVATIVE SURVIVAL	CONSERVATIVE DEVELOPMENT	INNOVATIVE DEVELOPMENT
Average Payment	2,212	3,624	5,708	8,410
Total payments per year	1031,567	195,752	1101,721	1690,515
Payment/UAA	0.3	1.22	2.6	1.3
Payment/SO	0.25	0.10	0.32	0.085
Payment/w. days	117	10.1	57.19	19.2

The payments per hectare are higher for the Innovative Development, whilst the share of public payment on the standard output is lower, implying that these type of farms are less dependent from the EU.

RESULTS: DINAMICITY/MULTIFUNCTIONALITY



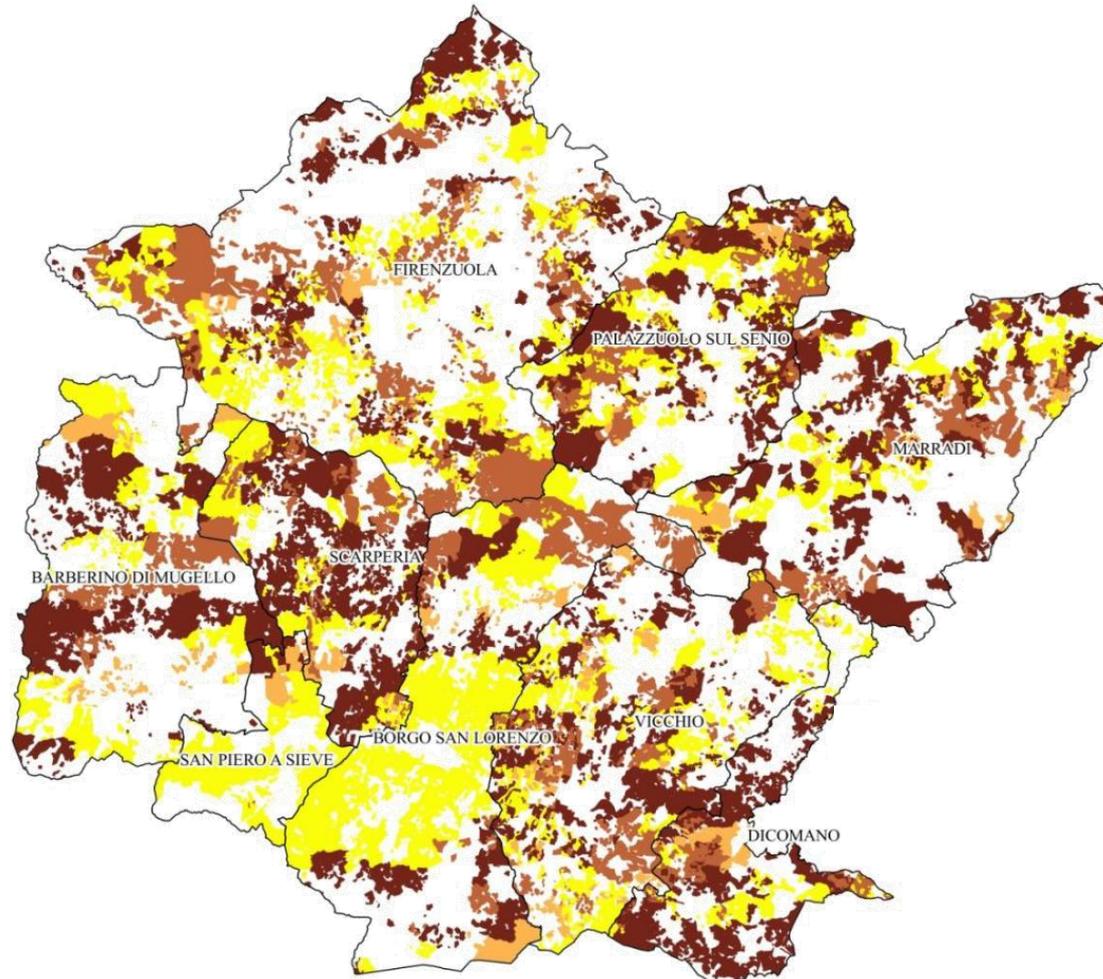
DINAMICITY



MULTIFUNCTIONALITY



RESULTS: ENTERPREUNERSHIP MAP

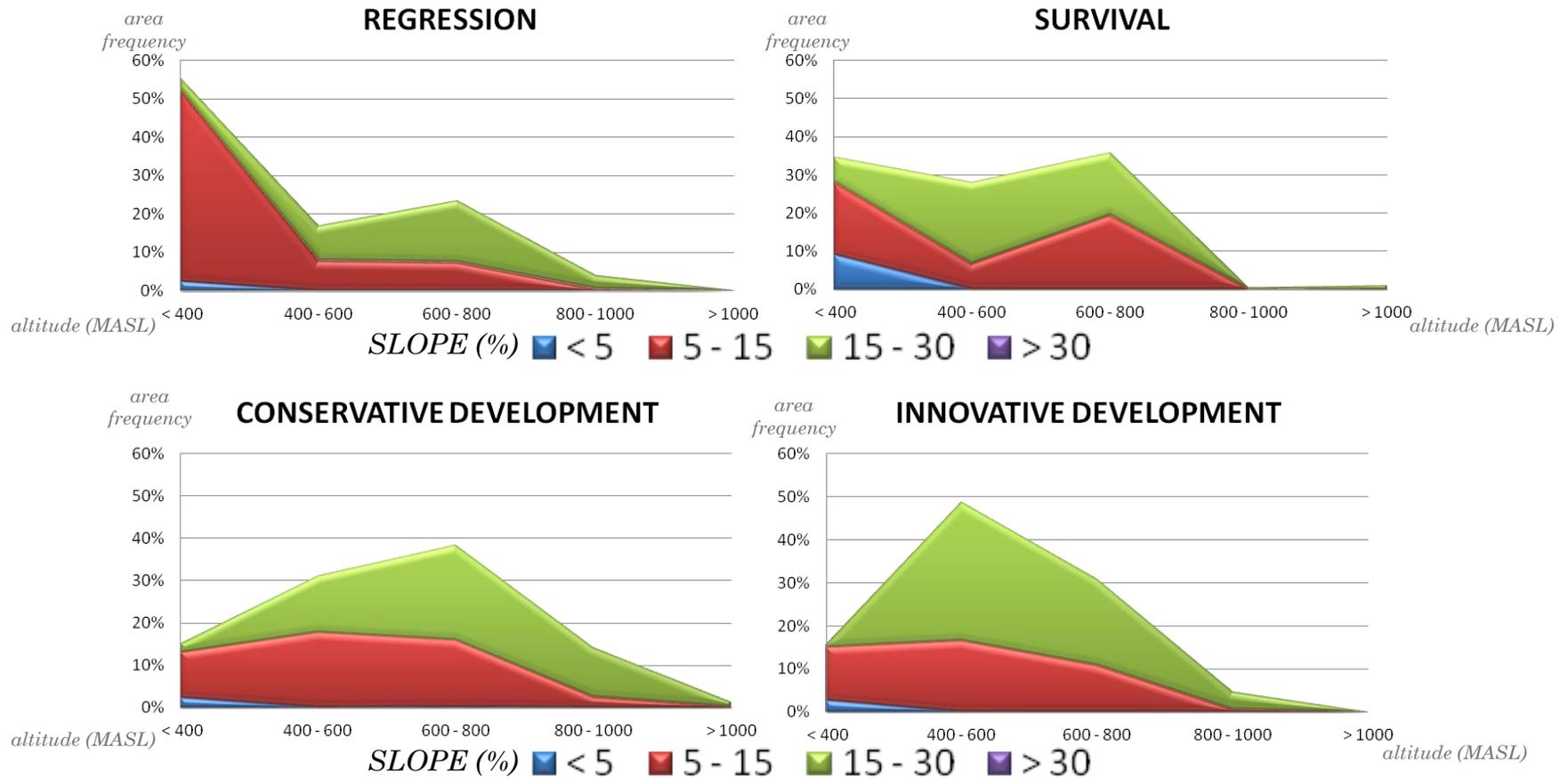


FARMS STYLES



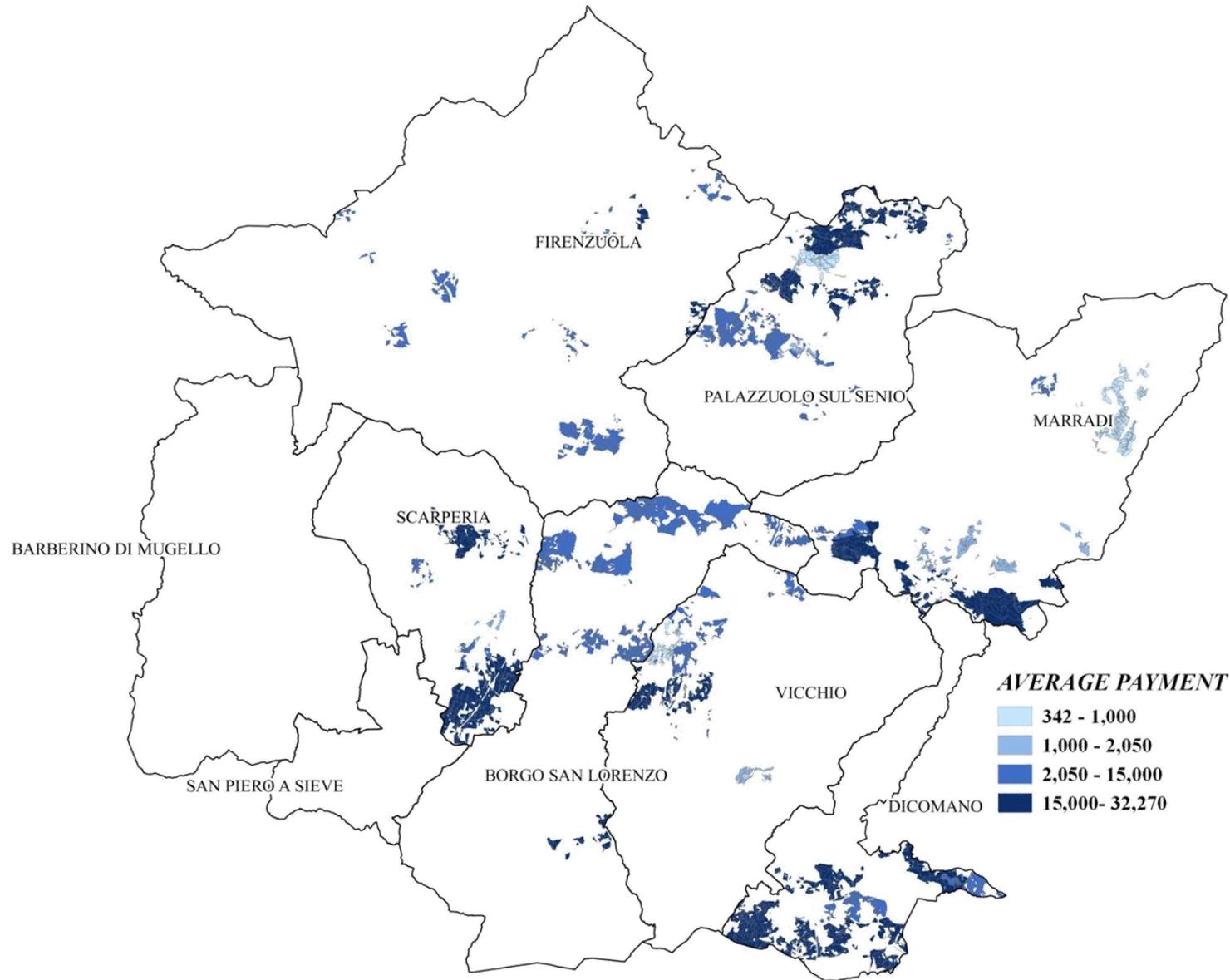
RESULTS: ACCORDING TO SLOPE AND ALTITUDE

Farm's total area according to slope and altitude

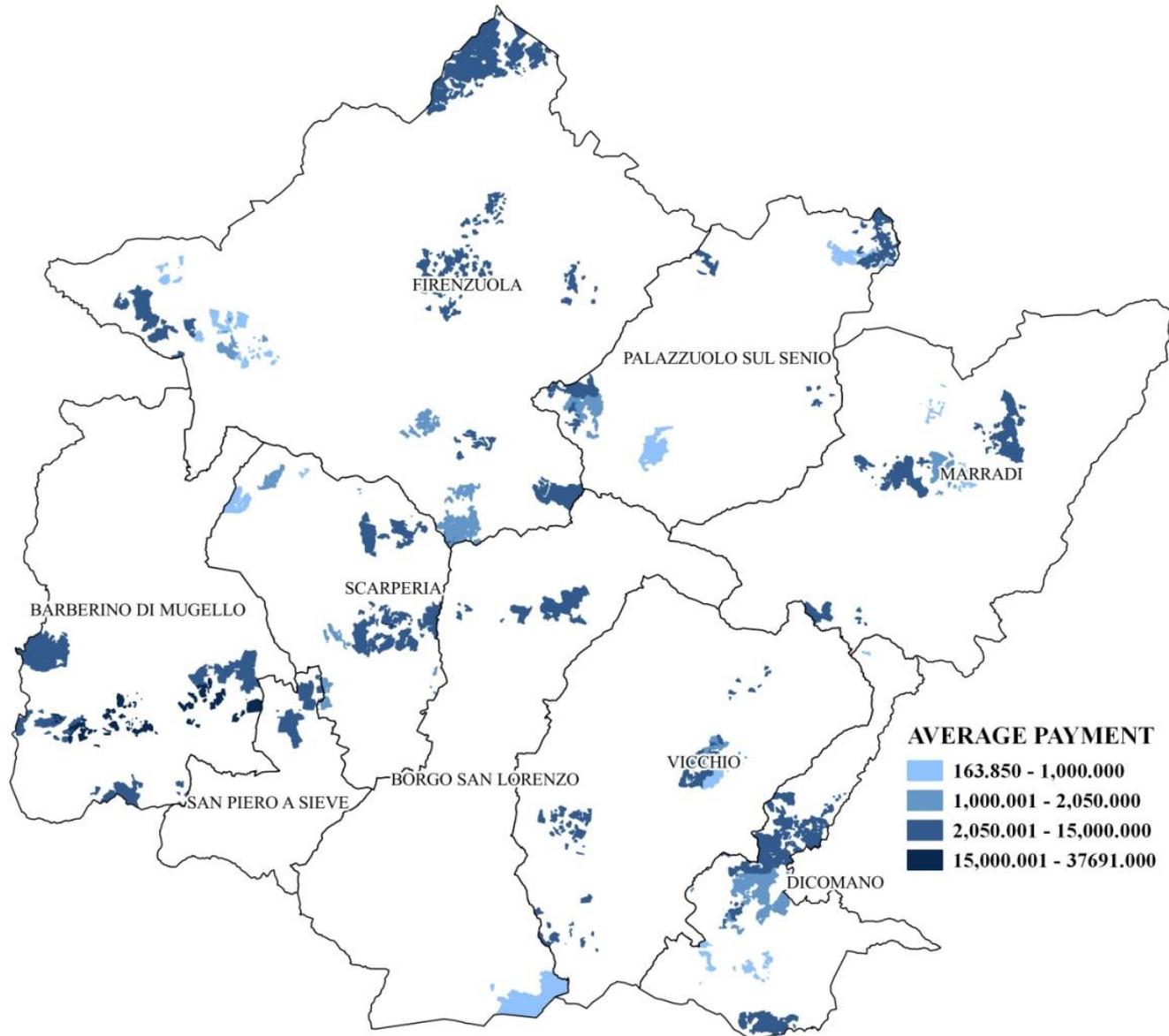


Farms included in the *Regression* operate in “better” areas since they are associated to lower altitudes and slope

RESULTS: AVERAGE PAYMENTS (MEASURE 211)



RESULTS: AVERAGE PAYMENTS (MEASURE 212)



CONCLUSIONS

FARM STRUCTURE

- Different land and labor productivity, associated to different age of the farm operator

AREA

- Different geography according to the farm style

CAP and RDP PAYMENTS

- Different access to the public payments

CONCLUSIONS

- Our results show a **significant internal differentiation** within the Mugello area which allow the survival of different farm structures.
- Especially almost **50% of farms** included in the sample seems to be **close to the exit**, as they are included in the *Regression*
- The **policy maker should use these information in order to design, monitoring and assess** the impact of the proper **local agricultural policy** which is able to fit the **needs of specific rural areas and farms**.

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THANK YOU FOR YOUR ATTENTION

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