PECUS | EUROPEAN LANDSCAPES OF TRANSHUMANCE

PECUS

(European landscapes of transhumance)

Methodological guidelines for FCM-based transdisciplinary teaching practices

(Intellectual output O3)

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Leading organisation for output O3: **U-Space srl**

URBAN SPACE

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Contents

Foreword

The project PECUS – European Landscapes of Transhumance, financed by the Erasmus+ Programme of the European Union, intends to develop, test and disseminate a method for increasing trans-disciplinarity in higher education teaching practices.

The overall objective is to define methods and tools based on cognitive mapping, able to convey the complexity and trans-disciplinarity of the issues related to the conservation, management and promotion of tangible and intangible cultural assets – in particular, focusing on the European transhumance heritage. For this purpose, PECUS combines two elements:

- the active involvement of teachers and students in workshops centred on transdisciplinary planning for the conservation and management of transhumance landscapes and the sustainable development of related environments and economies;
- the use of Fuzzy Cognitive Mapping (FCM) as a tool to facilitate the representation and understanding of complex problems, and foster transdisciplinary decisions.

Fuzzy Cognitive Maps are symbolic representations of complex systems in terms of concepts and their mutual interactions. Their construction requires inputs of human experience and knowledge on the system under consideration; therefore, the outcome is an integration of the experience and knowledge accumulated by the persons involved, concerning the underlying causal relationships amongst factors, characteristics, and components of the same system.

This document describes the teaching and learning method developed and tested through the following project activities:

- analysis of literature on Fuzzy Cognitive Mapping;
- analysis of features and testing of Mental Modeler application;
- first drafting and testing of method in the intensive course for teachers;
- refinement of method after the intensive course for teachers;
- application of method in local courses;
- application of method in the intensive course for students.
- final considerations and suggestions on the use of FCM in a higher education environment.

Literature analysis

FCM has been used since the 1980s within different applications where the expression and interpretation of the people's knowledge, preferences and values need to be combined in a complex representation. This is typical of participatory activities such as community planning and environmental decision making, but FCM is also used in educational contexts as a tool to promote learning of complex issues.

The following key characteristics of FCM have emerged from a literature analysis (see reference list):

- a mental model is an individually and internally held cognition of external reality, used to code, filter, and interpret the external world, allowing individuals to reason, explain, and interact with their surroundings;
- fuzzy cognitive maps are an effective way to represent, share and discuss mental models, enabling participants to identify knowledge biases and feedback processes, combine different sources of knowledge, improve communication, reduce collaboration barriers, and interpret complexity;
- changing one's mental model about a given phenomenon is in itself a type of learning; since FCM helps participants to change their mental models through group work, discussion and analysis, it is an effective tool to generate new knowledge;
- FCM enables participants to model the system represented, analyse its reactions to changes, and evaluate the effect of different policy options.

The literature analysis has also been useful for defining a first idea of how to apply FCM to a trans-disciplinary workshop with higher education students. The following key elements and steps have been singled out from the analysed papers and adapted to the needs and purposes of the PECUS project:

- the first exercise should be preceded by an introduction to the principles and procedures of FCM;
- the scope of the map, or a focus question, should be clearly stated and explained before starting each exercise;
- a discussion phase is the first step in the process of defining the concepts to be mapped;
- the initial list of concepts deriving from the discussion phase should be collectively refined by clustering similar concepts, removing duplicates, and/or adding other concepts;
- participants can be divided in small groups, which will draft their own maps using only the shared concepts;
- the maps can be analysed and compared using indices describing their structure;
- the single groups' maps can be aggregated merging the associated matrices and normalising the resulting values;
- based on the aggregated map, different scenarios can be modelled by assigning values to one or more concept and analysing how the system reacts to changes.

Analysis and testing of software

The Mental Modeler software has been developed by the staff of the Human-Environment Interactions Lab at the University of Massachusetts. It was chosen as the FCM tool supporting the project educational activities. It is a free, on-line application that allows to build fuzzy cognitive maps easily and intuitively, to modify the values of components and their relations, to build and visualise scenarios, to export and import the maps in matrix format.

The functions of Mental Modeler have been tested in order to check their usability and potentials within the project activities. One peculiarity of this tool is the possibility of setting scenarios based on the maps and to monitor how these scenarios change by modifying the values of the map components and their relations.

The Mental Modeler tool includes five working tabs:

- the Model tab provides the main graphical input interface where components and connections can be added with simple drag-and-drop operations;
- the Matrix tab shows components and connection values in matrix form, and is automatically updated as the user modifies the map on the Model tab;
- the Preferred State & Metrics tab shows several statistics and indices about the map, such as number of components and connections, density, and complexity; and about each component, such as indegree, outdegree, and centrality values;
- the Scenario tab allows the user to modify the values of one or more components, showing how the other components react to changes;
- the Info tab can be used to insert a textual description of the map.

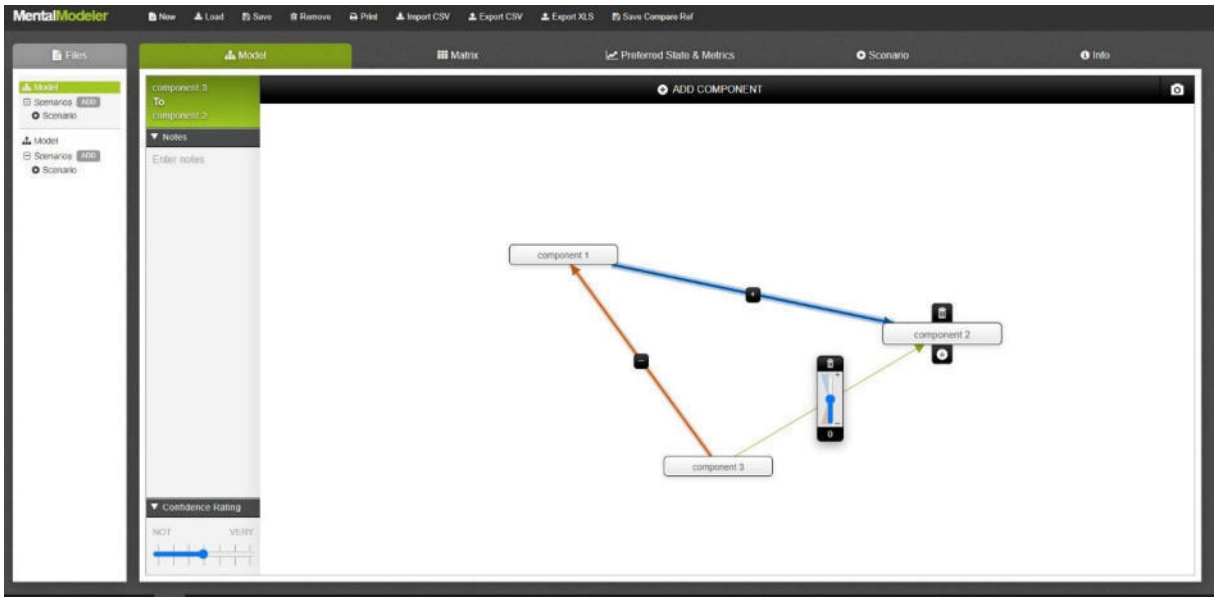

Figure 1. Mental Modeler: model tab with graphical input interface.

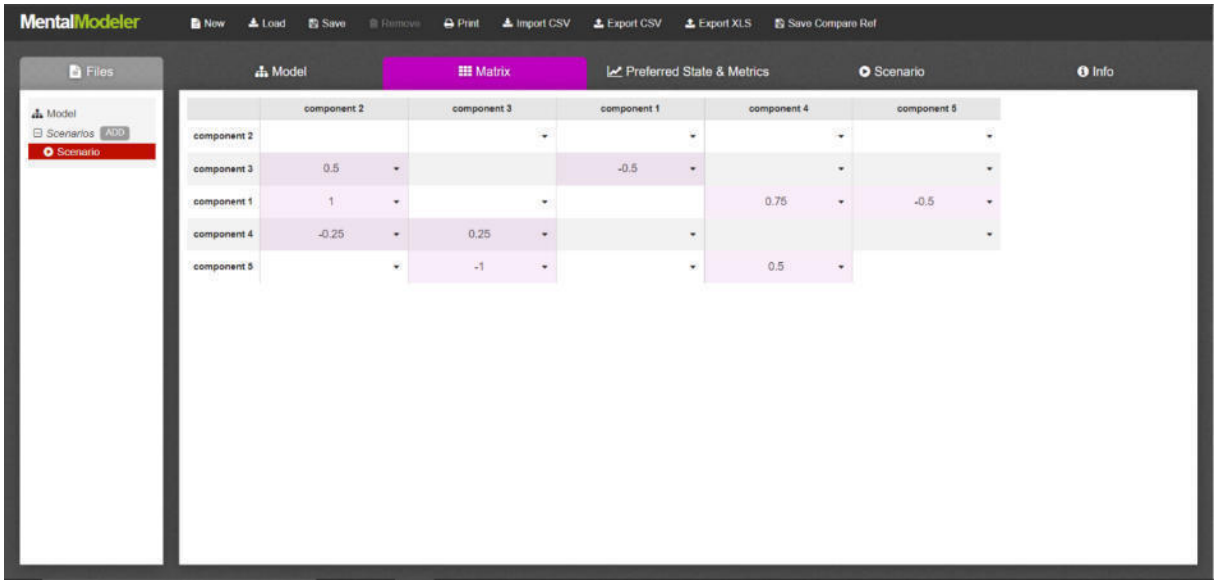

Figure 2. Mental Modeler: matrix tab displaying the map in matrix form.

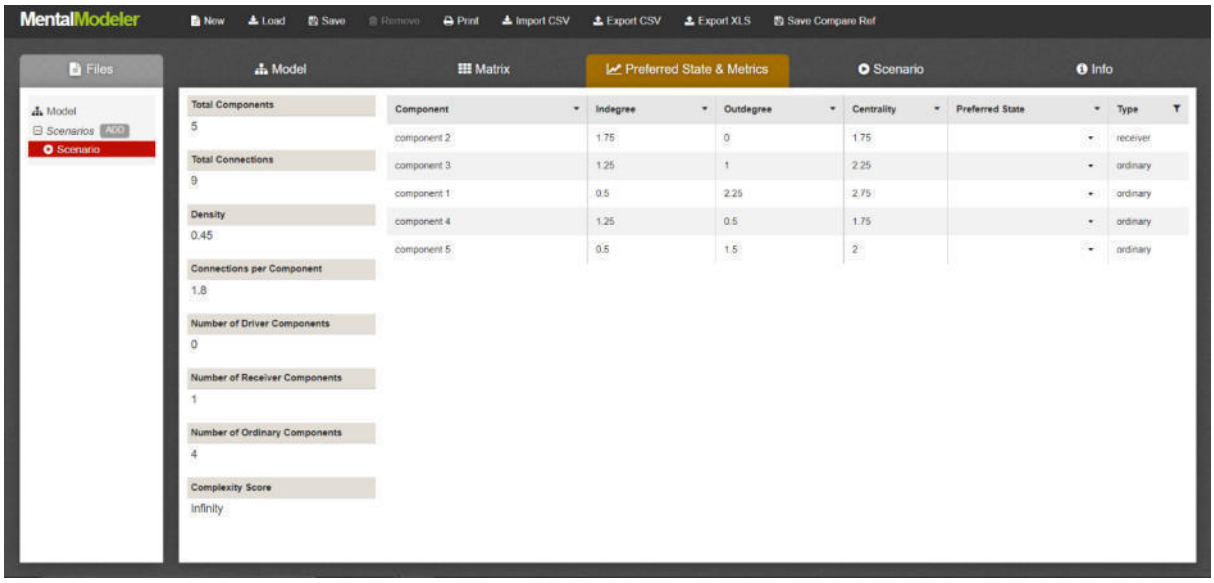

Figure 3. Mental Modeler: metrics tab displaying indicators on map and components. The definitions of these indicators can be found in Gray S., Zanre E., Gray S. (2013).

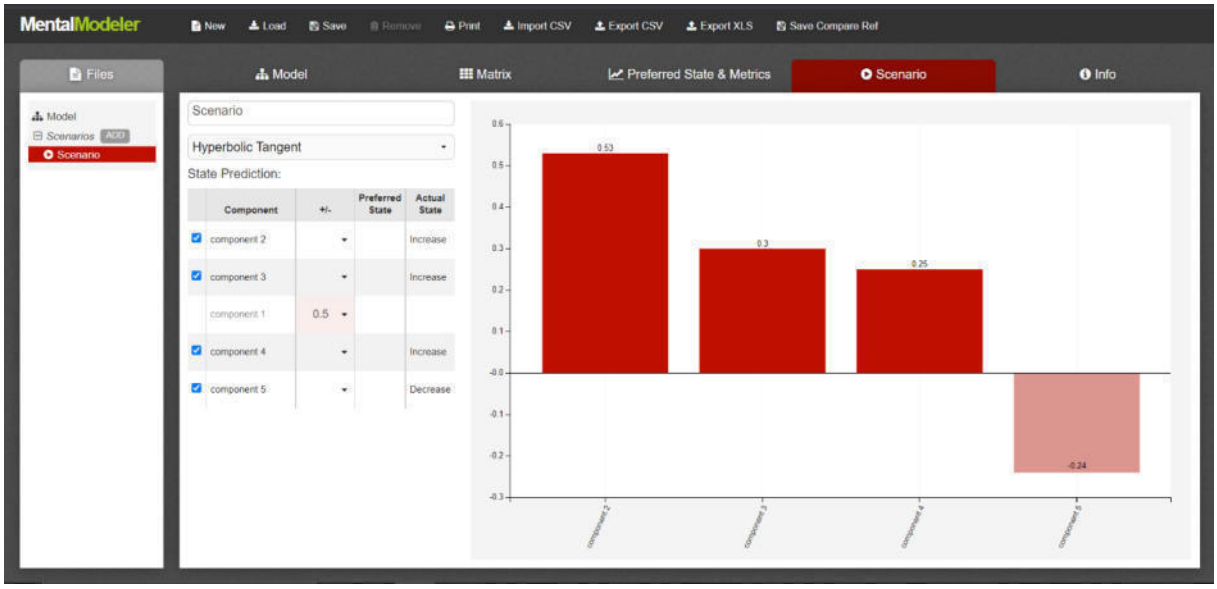

Figure 4. Mental Modeler: scenario tab showing expected system changes under given conditions.

The maps can be saved and stored locally as an ".mmp" file, which can be loaded again into the tool to be viewed and modified. The maps can be exported as .csv or .xls files as well: this is useful for aggregating maps, which can be done by using a common spreadsheet. Aggregated maps can be then re-imported as .csv files, to be viewed and modified again.

The Mental Modeler website (mentalmodeler.com) contains some useful resources explaining the purposes and use of FCM and the Mental Modeler tool itself, as well as links to relevant research papers and examples of applications.

Intensive course for teachers

This course was intended as a collective testing of the use of FCM as educational tool supporting trans-disciplinary, higher education teaching and learning. Due to the travel restrictions caused by the COVID pandemic, the course was held online in webinar form. The general objective of the course was to train teachers in view of a future application of this method to a course targeted to higher education students. Specific objectives were:

- testing and understanding the use of FCM in a higher education environment, making the most of its potentials for structuring and representing the learners' knowledge, fostering meaningful learning, decision making, and trans-disciplinarity, and modelling complex systems where uncertainty is high;
- applying FCM to the topic of conservation of traditional landscapes, in particular those shaped over time by the practice of transhumance;
- testing and understanding the use of the Mental Modeler tool and its functions;
- testing a workshop format where experts of different disciplines participate in an alternation of plenary and parallel group sessions, in a process of progressive acquaintance with both the FCM tool and the topic addressed.

Leg 1

The first intensive course for teachers was divided in two legs. The first leg was held in five half days between April and May 2020.

Exercise 1

The first exercise was aimed at becoming familiar with the use of FCM and Mental Modeler. It was conducted in plenary session with a coordinator collecting the inputs from all participants and displaying them on a shared screen. The following instructions were given to the participants.

```
Exercise 1: Mapping a general topic

TOPIC: National strategies to contain the coronavirus outbreak: factors,
drivers, actions
(Waiting for a vaccine)

STEPS:
1. Discussion and listing of concepts
2. Clustering of concepts
3. Mapping (please limit weights of relationships to +/-0.25, 0.5, 0.75,
1; plus 0)
```

The topic of the COVID pandemic was chosen as being well known to all participants from direct experience. This choice was made in order to enable them to concentrate more on the FCM tool.

The proposed method for building an FCM entailed:

- a discussion phase, where participants were asked to provide loose concepts related to the topic;
- a clustering phase, where similar or related concepts where clustered and duplicates deleted, in order to reduce the list to around 20 concepts;

- a mapping phase, where concepts where input in the Mental Modeler application and linked to each other according to each participant's suggestions; each relationship was given a value chosen from a discrete set between -1 and 1.

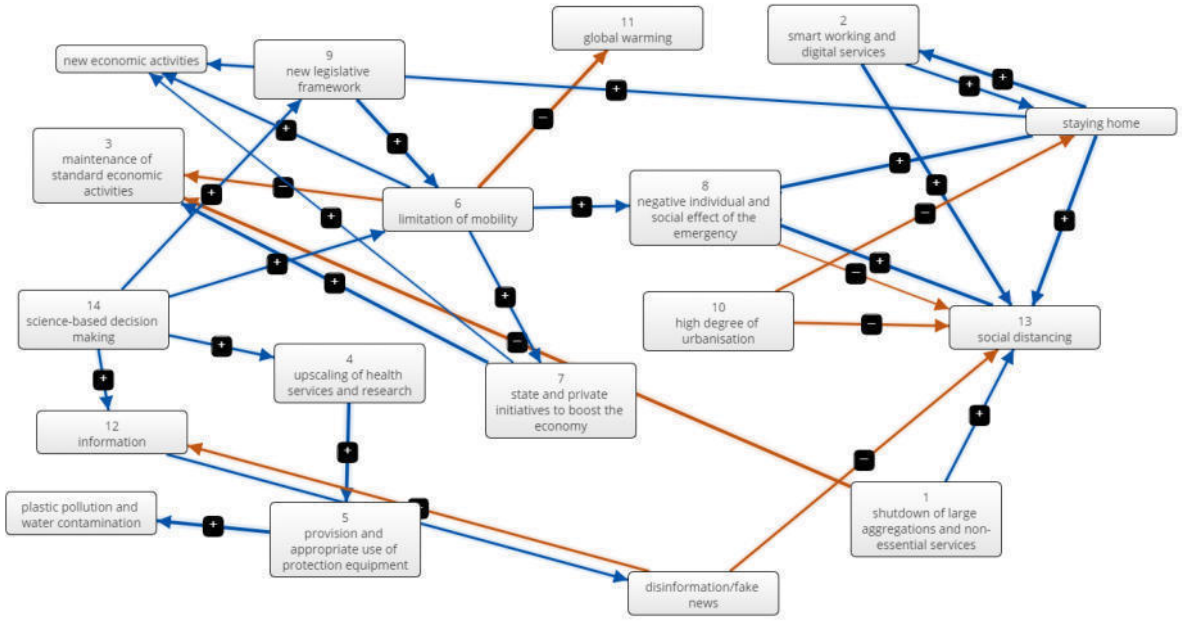

Figure 5. Map from Exercise 1. Plus and minus signs indicate whether the interactions are positive (direct proportionality) or negative (indirect proportionality), while arrow widths illustrate stronger or weaker interactions.

Exercise 2

The second exercise was aimed at applying FCM to topics related to transhumance. It was conducted in parallel sessions with groups of around five people, each coordinated by one of them. Each group was assigned three of the case studies concerning the project partners' research activities, which had been previously collected and described using specific templates[1]. The groups had to choose one of the case studies and describe it through a fuzzy cognitive map, following the same steps of Exercise 1. The following instructions were given to the participants.

[1] The descriptions of the case studies are available in Annex 3.

```
Exercise 2: Mapping a case study

Group 1
CASE STUDIES:
- Alpine Landscapes: Pastoralism and environment in Val di Sole (UK)
- Strategies of active custody for the territories of the Province of
Chieti. Pilot project in the town of Arielli (Italy)
- The conservation of the cultural heritage associated with the Andorran
livestock routes (Spain)
TOPIC: Factors, drivers and actions for promoting and enhancing the
heritage of traditional pastoralism through modern uses

----------------------------------------
Group 2
CASE STUDIES:
- Ancient pastoral practices in the Limnakaro plateau (Greece)
- A surviving practice of transhumance in Linares de Mora (Spain)
- Study of shielings in Eyjafjoerdhur county (Iceland)
TOPIC: Factors, drivers and actions for the conservation and promotion
of traditional sheep farming activities endangered by extinction

----------------------------------------
Group 3
CASE STUDIES:
- Ethnoarchaeology of western Alpine upland landscapes (UK)
- Recovery and Management Plan for livestock routes in Andalusia (Spain)
- Bronze Age occupation of Mt. Ditki in connection with animal husbandry
(Greece)
TOPIC: Factors, drivers and actions for protecting and restoring the
physical infrastructure of traditional pastoralism

----------------------------------------
PLEASE REMEMBER:
1. Discussion and listing of concepts
2. Clustering of concepts
3. Mapping (please limit weights of relationships to +/-0.25, 0.5, 0.75,
1; plus 0)
```

The maps from this exercise were presented and commented by each group during the following plenary session.

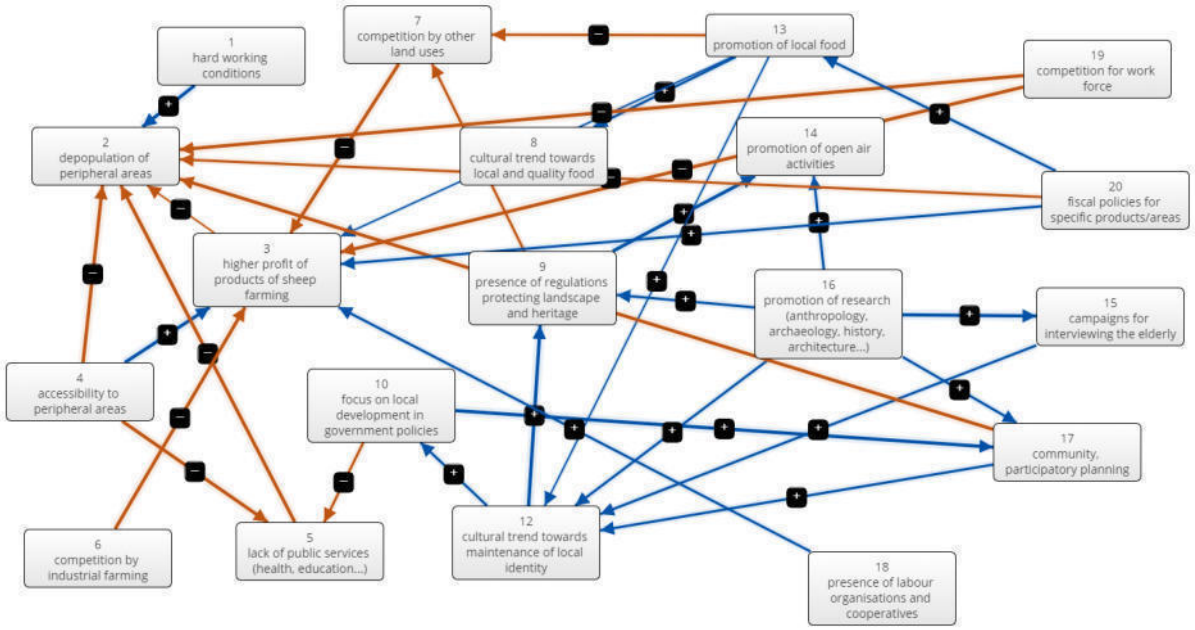

Figure 6. Map from Exercise 2.

Exercise 3

Once the participants had gained familiarity with both FCM and its application to a topic related to landscape, pastoralism and transhumance, the third exercise aimed at working on the main project topic from a wider point of view. The first part (discussion and clustering) was conducted in a plenary session, while the proper mapping activity was entrusted to the different groups working in parallel sessions. This approach enabled the participants to define a common list of concepts drawing from the widest possible range of disciplines, compare different maps originating from the same shared concepts, and merge them in order to get a "social" map representing the knowledge and beliefs of all groups in a more balanced way.

```
Exercise 3: Mapping a transhumance-related topic

TOPIC: Factors affecting transformation of transhumance landscapes today

STEPS:
1. (plenary) Discussion and listing of concepts
2. (plenary) Clustering of concepts
3. (parallel) Mapping (please use only shared concepts; please limit
weights of relationships to +/- 0.5, 1; and 0)
```

Merging maps requires having two or more maps that share the same concepts. Each map is generated by Mental Modeler based on a square matrix, therefore this operation implies aggregating two or more matrices that must be of the same size. Once each matrix element has been added, the resulting values must be normalised to fall within the range -1, 1. The merged matrix is then imported into Mental Modeler, which will generate the resulting "social" map[2].

[2] The matrices of the maps of the working group and the merged matrix are available in Annex 4.

The process of merging maps manually is rather time consuming. It can be performed by using a spreadsheet, but it implies a series of manual operations and checks, namely:

- importing the .csv files generated by Mental Modeler,
- homogenising cell values and the positions of rows and columns if necessary;
- setting the decimal separators to points if necessary;
- eliminating any inverted commas from the cell values;
- inserting 0 values in void cells;
- summing the values from the spreadsheets into a new spreadsheet;
- normalising summed values to a -1/1 interval;
- saving as a .csv file and importing into Mental Modeler.

In order to speed up this process and making it easily usable during workshops, it would be desirable to develop a code to automate such procedure.

The “social” map was presented and discussed during the last plenary session. The scenario function of Mental Modeler was then tested over this map. This function allows to illustrate how policy actions made on one or more single component of the map can affect all the other components, based on the several direct and indirect relations between them. When a single component is assigned a value between -1 and 1, all other components will vary by a certain amount and the result will be shown on a chart. This method is useful for helping complex decision making where the views of many different stakeholders have to be taken into account. This can be applied to an educational environment in order to foster the students’ ability to deal with complex issues, reconsider their original views, gain new knowledge, and get accustomed to work within a trans-disciplinary environment.

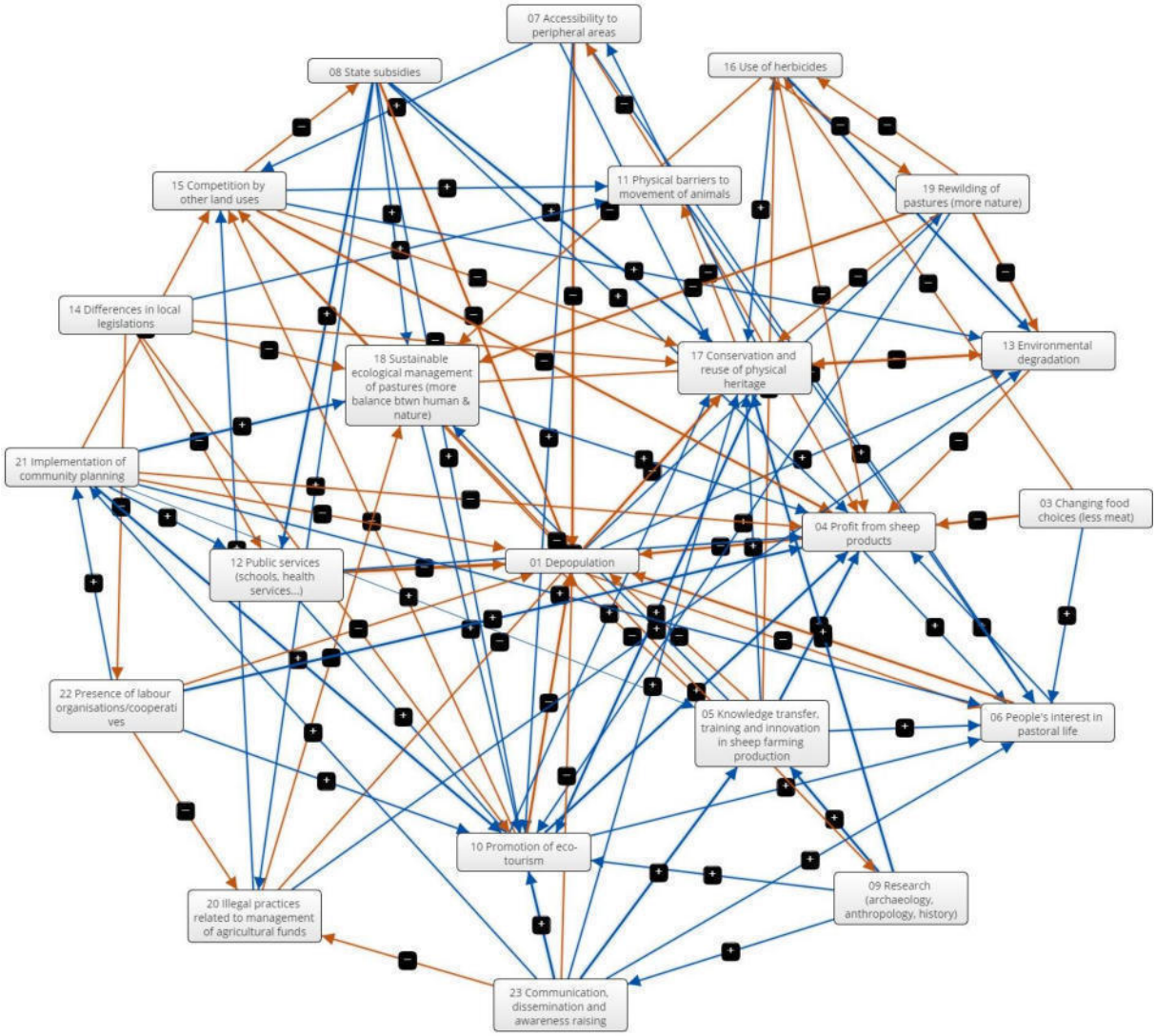

Figure 7. The "social" map from Exercise 3.

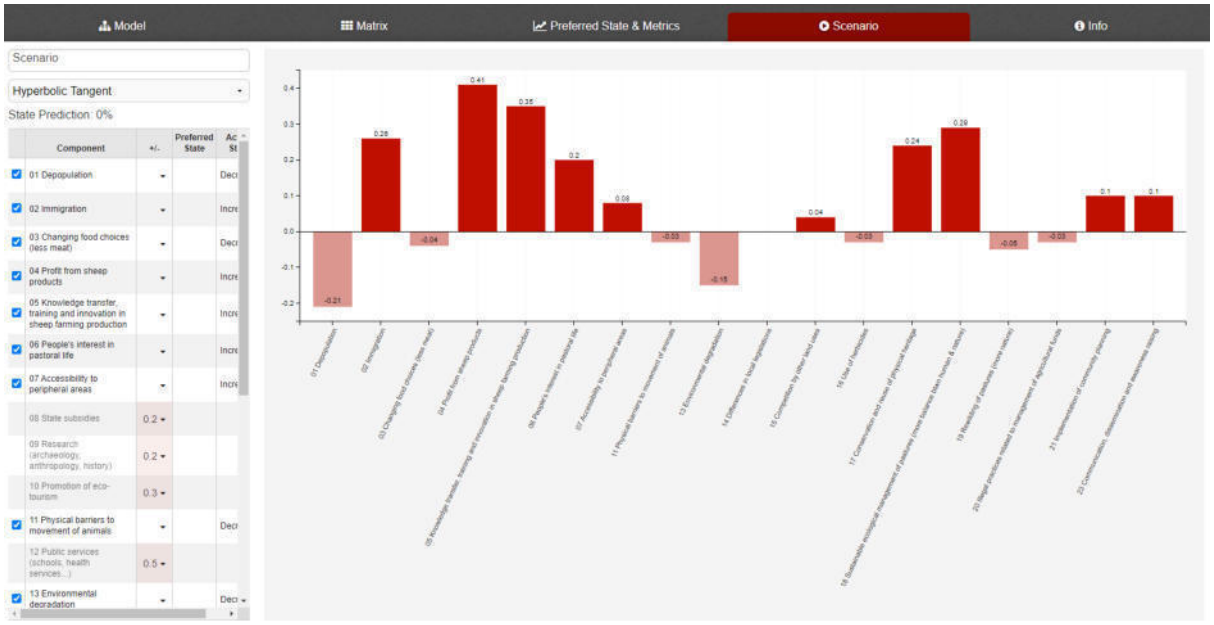

Figure 8. Scenario building tool from Mental Modeler

Leg 2

The second leg of the intensive course for teachers was held in three half days in December 2020. The exercises were based on one of the case studies already presented during the first leg, namely, the EthWAL research project.

The EthWAL project was funded by the Marie Curie IEF programme and carried out between 2013 and 2015. It was aimed at understanding how changes in pastoral practices contributed to changing the character of mountain landscapes during the last three centuries; it was based on the assumption that modernity and capitalistic economy have radically transformed not only pastoral practices that are still regarded as traditional, but also landscapes that are still largely perceived as marginal and pristine. The outcomes have also provided an ethnoarchaeological analogue for interpreting the material evidence of pastoral practices and their relationship with mountain ecosystems. The project has compared two study areas in the Italian and French Alps: Val Maudagna and Vallée de Freissinières, which share ecological and geological similarities, but different histories of land managements that created two very different landscapes.

The exercises were based on the research carried out in the study area of Val Maudagna, which was presented to participants by the University of Newcastle. The discussion, listing and clustering of concepts were carried out in a plenary session; then, two separate working groups developed their own maps based on the same, shared concepts. The two maps were then merged in order to obtain a representation of the different results in a single, "social" map.

```
Exercise: Mapping a transhumance-related topic based on a case study

TOPIC: What changes in pastoral practices lead to mountain landscape
transformation?

STEPS:
1. (plenary) Discussion and listing of concepts
2. (plenary) Clustering of concepts
3. (parallel) Mapping (please use only shared concepts; please limit
weights of relationships to +/- 0.5, 1; and 0)
4. (plenary) Explanation of process for merging matrices
5. (plenary) Setting scenarios
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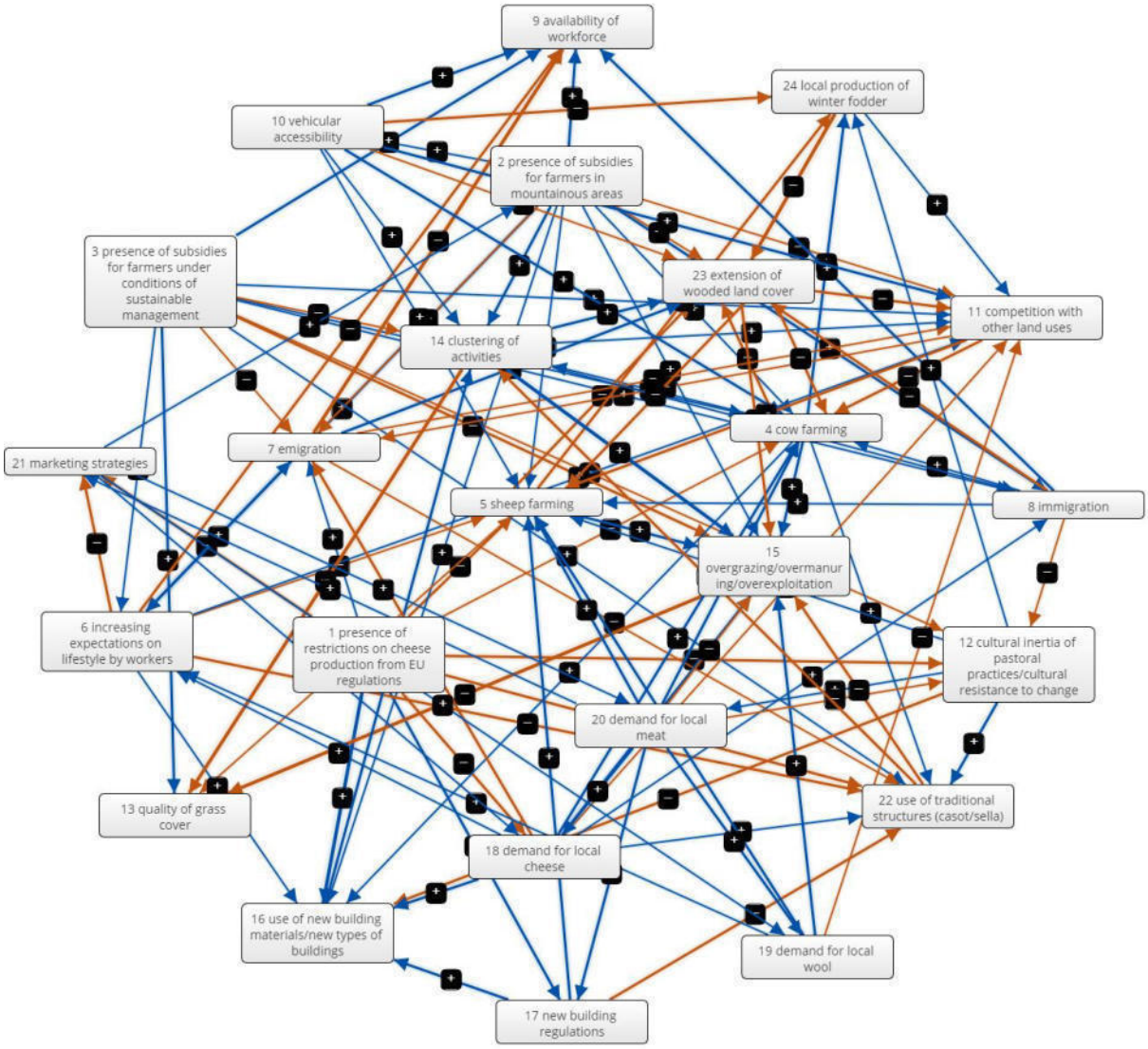
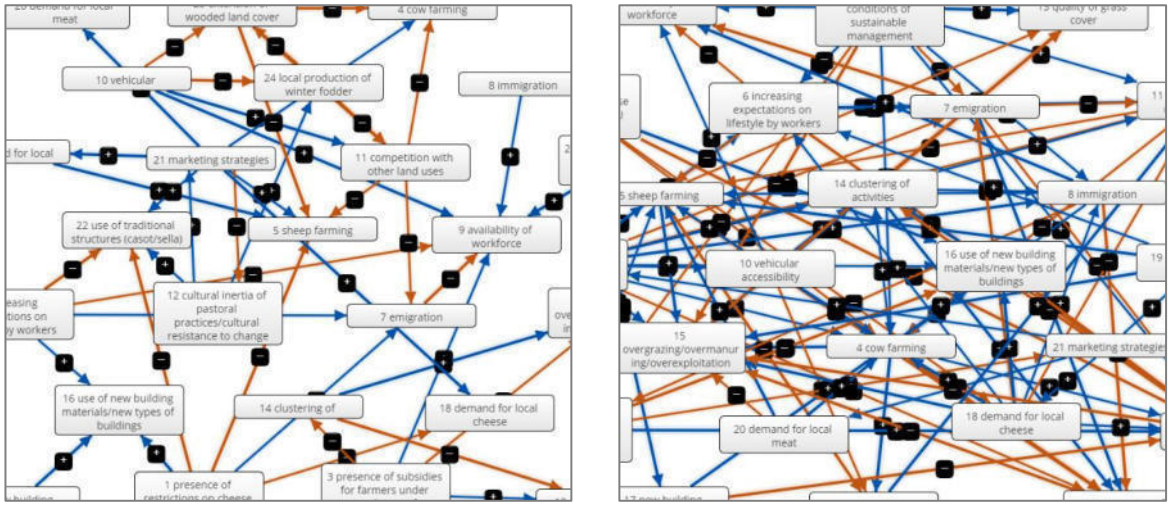


Figure 9. The "social" map from the second leg of the workshop.

The comparison between the maps developed by the two working groups showed how different methods for building a map from a list of concepts can lead to different densities of connections. The "density" of a FCM can be defined as the number of connections compared to the number of all possible connections. "Density scores are associated with the perceived number of options that are possible to influence change within a system" (Gray, Zanre, Gray 2013). But different densities can also derive from different mapping methods: using a method that encourages participants to reason about the possible connections will result in a richer discussion and, therefore, a denser map.

The second map in the image below has a considerably higher density compared to the first one. In fact, while the first group started making connections between concepts only after having deployed all the concepts on the mapping space, the second group started adding small sets of concepts at a time and exploring all the possible connections before adding more concepts. In this way, they had more time and occasions for adding as many connections as possible, resulting in a denser map.



Total connections: 43
Density = 0.08

Total connections: 96
Density = 0.17

Figure 10. Maps from the two working groups. The map on the right shows a higher density, resulting from a different mapping method.

Local courses and activities

Following their first experience with FCM in the intensive course for teachers, project partners tested the method by involving their own students within specific local courses or seminars. The table below shows the types of applications and the number and types of students involved by each partner.

Partner	Sessions	Type of course	Number of students involved	Level of students involved	Method applied Credits assigned (if applicable)
Pablo de Olavide University	1st session	Complementary course for Environmental science students, based on a study case in Málaga	Around 80 students	Undergraduate students from Environmental sciences	PECUS methodology *No credits*
	2nd session	Complementary course for Environmental science students	Around 80 students		Introduction and presentations (5 hours) Team work (5 hours) *No credits*
University of Newcastle	One session	Workshop "Fuzzy Cognitive Mapping and Landscape Research. A multidisciplinary workshop". Organised with the support of the Newcastle University Centre of Research Excellence for Landscape	24 participants	4 undergraduate, 4 masters, 13 PhD, 2 postdoc, 1 academic member of staff 3 from architecture and planning, 7 from arts and cultures, 2 from business school, 1 from engineering, 7 from history and archaeology, 1 from modern languages, 2 from environmental sciences and 1 from medical sciences	PECUS methodology One full day + assignment *No credits*
Catholic University of Valencia	One session	Complementary activity	12-15 students	Undergraduate students from Veterinary	Intro (2 hours) 4 days in the mountains 1st group: 2 days 2nd group: 2 days Final meeting with all students using the FCM methodology *No credits*
University of Iceland	One session	As part of a seminar organised for the Faculty of Iceland University (Medieval Seminar: 6 weeks, 4 days)	50 or more	Undergraduate students from History	PECUS methodology Introductory lecture Work in groups *No credits*
National and Kapodistrian University of Athens	One session	Specific course on FCM within a Master Course on "The Primary Sector of Economy during Prehistory" (15 credits)	15 MA students	Master Course students (prehistoric archaeology)	PECUS methodology steps (15 hours) Students used the FCM for their essays – working hypothesis (as an educational tool) *15 ECTS assigned*
U-Space srl	One session	Role play exercise for U-Space staff	7 professionals from U-Space staff	Professionals (architects, engineers)	One day (6 hours) Community planning role play exercise: drafting of action plan for improving water quality in a natural reserve.

Partner	Sessions	Type of course	Number of students involved	Level of students involved	Method applied Credits assigned (if applicable)
					Interviews to participants about the use of FCM Video recording of session edited for Output O2 *Credits not applicable*

Comments and opinions by project partners on their first approaches to FCM

This section contains comments and opinions by the project partners' staff about their first experiences with FCM within the intensive course for teachers and the local courses involving their own students.

Interview with the organiser: Newcastle University

According to the original work plan, Newcastle University was supposed to organise and host the first intensive course for teachers. This was not possible due to the SARS-CoV-2 pandemic; therefore, the course was rearranged in online form as described above.

U-Space asked Francesco Carrer, archaeologist, responsible for the organisation of this course, to answer some questions about this experience.

Have you ever used FCM or other forms of cognitive mapping (such as mental maps, concept maps, etc.) before?

The training courses organised as part of the PECUS project were my first experiences with FCM. I had never heard of FCM before, and although I knew about mental mapping as a tool to investigate complex systems (largely used in computer modelling) or to enable group decision-making, I had never used this either. On the other hand, I was familiar with the concept of "Fuzziness". In landscape archaeology "fuzzy logic" is often used to analyse spatial patterns, as it enables a more nuanced understanding of neighbour relationships. However, this was only tangentially relevant to understand the functioning of FCM.

Do you think FCM is useful for educational purposes? Why and how?

I found FCM very useful for educational purposes. The identification of the key concepts, carried out in groups, is extremely important for the students to define the objectives of the exercise and to think about the driving forces that contribute to transforming the landscape. This phase is paramount to develop critical thinking. The identification of connections between the concepts and the collective assessment of the direction, force, and sign (negative or positive) of this connection enable the student to acquire a holistic approach to the analysis of their landscapes. Landscape change is no longer perceived as the product of the cumulative influence of independent factors, but as the result of a systemic interaction between all these factors and of the feedback generated by these interactions. The last phase of FCM, where scenarios are modelled, provides the ideal platform for students to generate hypotheses, develop theories and make inferences. Students can compare the outcomes they expect with the outcomes produced by the model, assessing whether their assumptions were accurate or explaining why the two outcomes differ. This is a perfect practical framework to grasp the mechanisms behind complex systems.

Is there any particular outcome of this kind of exercises that impressed you positively and that could be useful for your educational or research activities?

All the phases of FCM are particularly useful for educational or research activities. Since I work in computer modelling, I find the scenario simulation phase particularly compelling. The main advantage is the possibility of tweaking the parameters, which enables the development of alternative scenarios. More explicitly, driving forces can be altered to test how their variation affects the whole system. This shades new light on the importance of each driving force and on what might happen to the landscape if even one driving force changes its trajectory. As educational tool, scenarios development gives the student a solid platform to question their perception of landscape change, thus transforming their perspective and influencing their ideas. Students will understand that even the most insignificant change can have important consequences in the future and that landscape change is often difficult to predict if we look at the different driving forces in isolation. As research tool, on the other hand, scenarios development is a very good platform for participatory work. Non-modeller can contribute to the simulation alongside computer experts, because the relationship between the different

concepts is defined by the group rather than by some obscure equations. Participatory modelling is increasingly used to design new policies that integrate scientific understanding of landscape dynamics with the needs and plans of local stakeholder. The scenarios created through FCM can be very appropriate for this purpose.

What is your opinion on the Mental Modeler tool? How would you improve it?

Mental Modeler is a very effective online tool to produce FCM. The graphic interface is very intuitive, with a lot of handy options to customise and differentiate the concepts. From this point of view, it is perfect for group work where not all the participants are particularly confident with sophisticated computer programmes. The creation of the scenarios is quite easy, but at the same time it provides sufficient adaptability to all the different FCM formats we may want to create. The outcomes are very easy to read and interpret, even if the users are not particularly familiar with computer simulation techniques. The two main downsides of Mental Modeler are the management of complex maps and the combination of different maps. Since the cognitive map is created through a sort of digital canvas, a large number of concepts can make the production of the map quite difficult. This problem can be mitigated by visualising the connections between concepts as a matrix, but this makes the identification of additional connections more cumbersome. A possible solution could be reducing the size of each concept and enabling the description of each concept to pop-up when we move the cursor on top of them. This would save some space. The second issue is that, in order to combine different maps, we need to export each individual map and merge them in Excel. This extra step is a bit time consuming and could be incorporated directly into the online platform.

What is your opinion on the suggested method for the exercises? Is there anything you would improve?

Our FCM exercises went well, and all the participants understood immediately the idea and the potential of FCM. The main difficulty was not on the creation of the maps themselves, but rather on the identification of the concepts, and particularly on the identification of the key research questions we would like to answer. I think it might be useful to define at the beginning of the exercise a very specific goal and based on this goal we can discriminate between driving forces and local processes that are influenced by these forces. For example, if the goal of our map is to protect the ecosystems of our pastoral landscape, the driving forces can be intensification of agriculture, depopulation or mass tourism, and the local processes can include abandonment of summer dairies, change in demographics and ski resorts. The driving forces influence the local processes, but the opposite is very difficult to justify. Therefore, in the scenario development phase, the driving forces can be tweaked to see how these overarching phenomena influence local processes and in turn the ecosystems. This structure would bring FCM much closer to other complex system modelling workflows (known as ODD protocol: Overview, Design concepts and Detail), and would potentially make the results of different FCMs more reproducible and comparable.

Comments and opinions by other partners

Pablo de Olavide University *(María del Pilar Ortiz Calderón, Department of Physical, Chemical and Natural Systems)*

The involvement of the team from "Universidad Pablo de Olavide" in the PECUS project has been widely fulfilling, since they had the opportunity to become acquainted with cognitive maps as a new analysis tool. The team has experience in the use of artificial intelligence to evaluate the conservation status of movable and immovable cultural heritage. The use of cognitive maps can complement such experience by setting correlations between different variables, and allowing to analyse how the changes in one variable influence the rest of the elements in the cognitive map.

The employment of cognitive maps is not only useful for the aims of UPO's research group, but it has been also implemented in the syllabus of subjects taught during the academic course 2019/2020. This teaching corresponds to different educational levels (Degree and Master), and, in each of them, the

integration of the use of cognitive maps has been adapted to the students' requirements and to their level of autonomy.

In the case of Degree students, cognitive maps have been applied to an interdisciplinary experience around an application for implementing studies related to the ISO 14001:2015 standard of Environmental Management Systems. This experience, carried out in the fourth year of the degree in Environmental Sciences, has allowed students to evaluate the most significant features and impacts associated with a sheep farm located in the livestock trail of "Cañada Real", in the municipality of Pizarra (Málaga). Thus, the students have identified the different variables, establishing weighed relations between them. The analysis of different scenarios has allowed students to understand the direct and indirect influences that exist among the different variables. This allowed to foresee which indicators would be affected under specific emergency situations, or how the ISO 14001:2015 standard application can help to minimise them.

In the case of Master students, through a research associated with a master's final project, it has been possible to evaluate the different variables that influence the preservation of cultural heritage related to livestock trails. The development of this cognitive map allows to foresee the impact exerted by changes in different variables on the preservation of this heritage, from tourism to conservation programmes adopted by the authorities in charge of its protection.

Therefore, this tool makes possible an easy transposition to different contexts, showing a high versatility. Its ease of use allows a quick comprehension of complex models by simplifying the most important variables. Moreover, the relation among variables can be weighed in a positive or negative sense, which enables to obtain a wide approach to the problem under significant changes in one or several variables. Nonetheless, it would be interesting to set connections with other study systems with interdisciplinary nature, which allow a better definition of all the variables in the system, easing the work of determining the relations among them and their weighing. Despite this, some errors could be observed in the analysed scenarios, in which some of the changes in the variables were not very logical.

As a recommendation for applying this tool to study and research cases, it is important to establish an interdisciplinary network for assessing which variables must compose a cognitive map, and for discussing about how they are interrelated. Setting defined criteria for weighing these relations helps to avoid inconsistencies at the scenario's studies. For this reason, the work made before the actual drafting of a cognitive map is highly important for a correct execution of the exercise.

In the case of study of livestock trails, it would be interesting to evaluate them from different perspectives and with different maps, as well as to establish connecting models among them. In other words, we can assess the different elements at macro level, for example, economy, social features, heritage preservation, environmental impact, etc. and then, we will be able to unify maps, to set truly interdisciplinary studies that approach all the circumstances involved in the conservation of this system.

Catholic University of Valencia *(Pablo Vidal, Anthropology Research Institute)*
I had never used FCM or other cognitive mapping tools for my research, as I tend to conduct my analyses with a quite different qualitative methodology. In that sense, I believe that this analysis methodology is very useful for working with students, as it allows the elaboration of cognitive maps, which offer an important visibility to present mental ideas in graphs.

When I have used it with my students, it has been a practical and useful tool for them to carry out complex analyses and to propose clear and easily explainable conclusions.

In particular, for teaching and research in the social sciences, it allows to combine numerous elements of analysis, to establish priorities, interactions and key points. Experience has shown that it allows us to combine different categories of analysis, arriving at rapid conclusions. In the specific field of work, we have combined the analysis of transhumance with the traces it has left in the landscape and the contemporary uses of these livestock infrastructures for recreational and sporting use.

Combining different categories, even conceptually advanced ones, might seem to pose complicated challenges. Landscape, livestock, sustainability, recreational uses or survival of traditions have been some of the elements that have been put on the table.

It was very easy for the students to establish and participate in a collective debate and to elaborate interrelationships between these various elements.

We were able to conclude which were the priority axes and the result was intuitive, clear and didactically relevant for the students.

I hope to be able to work more intensively with this interesting methodological tool, both as a teacher and as a researcher, in the confidence that it will allow me to propose analyses of results and concept maps. I am sure that this will help my projects and presentations to be clearer and more intuitive.

University of Iceland *(Árni Daníel Júlíusson, Faculty of History and Philosophy)*
In the course of my work as teacher or in my activities as a political activist I have sometimes done something similar on paper or drawn with writing chalk in front of the class. However, I have never used the digital form used in the PECUS project before.

I think that FCM is very useful for educational purposes. It is a great tool for creating a discussion which is structured by the participants in a way that is not easy to do in any other way. I think it looks like a very nimble and versatile tool with endless possibilities for utilization for any public, scholarly or educational purpose.

The intensive course for teachers of spring 2020 had to be conducted online because of limitations due to the outbreak of COVID. Even so, I was impressed by how good a discussion it was possible to conduct with the use of FCM, engaging all participants in very many ways and aspects of discussion, discussing policies having to do with transhumance and problems related to the practice and knowledge of transhumance in Europe.

The Icelandic PECUS team will soon conduct a FCM exercise with students at the University of Iceland. From the little experience I have made with the Mental Modeler tool so far, it seemed very responsive and versatile and I really do not have any suggestions at this time.

The method suggested within the PECUS project activities seems appropriate. During the intensive course for teachers, I thought that the differences between the transhumance cultures in each of the PECUS participant countries, especially between Iceland on the one hand and Spain and Italy on the other were rather big, because of the fact that transhumance in Iceland is extinct and is researched through disciplines and policies very different from the other countries, where transhumance is still practiced. This makes it tricky to create a discussion around transhumance, where on one hand there is active transhumance and scholarly disciplines such as geography, political science, administrative analysis etc. that can be activated in the discussion, whereas research on transhumance in Iceland is

mostly the domain of archaeology and history. However, FCM seems to be an effective way to overcome such differences, make the most of them, and facilitate interdisciplinary discussions.

National and Kapodistrian University of Athens *(Yiannis Papadatos and Tina Kalantzopoulou, Department of History and Archaeology)*

For us at the NKUA this was the first time to use any kind of mental or concept map and we were completely unaware of this methodology before our participation in this Erasmus+ project. Based on our first experience with the tool, which was explained to us through several exercises during the two legs of the teachers' course, we realized that it could prove useful for learning activities, for several reasons explained below.

First, we thought that FCM helps to familiarize students with decision-making, collaborative work, breaking-down and representing complicated concepts and finally testing their assumptions through scenarios. Second, FCM could assist the students to develop semi-quantitative models and get acquainted with interdisciplinary work and multifactorial systems. However, the most important feature, in our opinion, is that the practical exercises could help the students to define which are the central components in a system and test their impact on it. They could learn to recognize relationships between these components and how to asses implications between different or contradicting components.

On the other hand, we do not believe that FCM is a tool suitable and useful for academic research, at least not in archaeology, because it cannot be used as a scientific argument in order to prove theories, ideas or archaeological interpretations. It is a helpful tool for raising discussions, testing working hypotheses and engaging many different people in a project or a scientific question, but the outcomes of a mental map do not have any proving value, especially when dealing with the study of past human societies. However, we were impressed about how fast and easily the software can be understood and learned and how quickly one can engage in building such mental maps. This procedure makes very clear that there are certain components more important than others in any given system and brainstorming to define such concepts and the assessment of their values and relations involves a practical dimension that makes the procedure particularly memorable. Therefore, we strongly suggest the tool as a way to introduce student with new concepts and make them think and discuss their importance for human decision-making in the past.

As for the particular software we used, we believe it is user-friendly and effective. A possible improvement would be to add the option to include graphic components such as info-graphics, charts or images that could be incorporated under any element to make the mental map a bit more interactive. This could result in a more visually appealing outcome.

The methodology followed for the exercises was very effective in our view. The selection of current social issues for the first maps (such as the effort to contain the Covid-19 pandemic outbreak) was very instructive and provided a perfect opportunity to quickly create a reference map based on common experience. The homogeneity of our input in this map was striking and it facilitated our grasping of the procedure that required to create connections between the components and evaluate them positively or negatively. Thus, when we proceeded to map concepts related to our academic research work we had in mind a scenario in which everything worked almost perfectly, only to realize that in this case things were not as easy. We knew how the mapping was supposed to work and we immediately discovered that when it had to do with our disciplines the input was much more diverse. This contrast was revealing about the bias each of us had regarding his/her own research area and the fact that we

needed to work harder towards a common ground, even on matters of terminology. One of the things that became apparent was the effort we needed in order to explain certain crucial terms and to establish common definitions. But still, this could be considered as a major advantage of the tool, from an educational point of view.

Finally, we would like to stress that one of the major advantages of the exercises we did was their interdisciplinary character, seen particularly in the diverse background of the participants. Actually, interdisciplinarity helped us to understand of the advantages of the FCM methodology as an educational tool because it offers a potential that is usually lacking from established teaching methods: the all-inclusive-ness. For this reason we believe that the ability of a mental map to incorporate extremely diverse input and to integrate the evaluation of the connections between dissimilar elements in plausible scenarios is the most important advantage of the tool.

U-Space srl *(Flavio Camerata, architect)*
My previous experience with cognitive mapping was limited to the use of "concept maps" applied to educational projects. Concept maps are diagrams representing concepts and their relationships associated with a particular topic. The relationships are usually articulated in linking phrases – expressed in natural language – ensuring logical connections between the concepts. Concept mapping is a tool for organising and representing knowledge, and is often used for educational purposes. FCM is a rather different form of cognitive mapping, which I had never used before and which I tried to apply to an educational environment for the first time within the activities of the PECUS project.

Both concept maps and FCM are maieutic tools, in the sense that they can help users to express, represent, verify and "challenge" their knowledge based on their own experience; however, while in a concept map the connections between concepts are purely qualitative and logical, FCM allows using quantitative values – yet with a fuzzy approach – that make possible further operations such as semi-quantitative analyses and dynamic scenarios about the possible evolution of the system represented.

I believe that the application of FCM to educational purposes, especially in higher education, can be very fruitful for different reasons: it helps students to express their views on a certain topic, confront other students' views, and become aware of any personal knowledge bias (and the other students' biases); it allows and fosters team work and interdisciplinarity; it permits to grasp the complexity of any topic and to assess the importance of feedback processes. Moreover, the use of natural language with its imprecise nature, and the possibility to propose imprecise, or fuzzy, connections are a stimulus for the student to be proactive without the fear of making mistakes.

Landscape transformations are the result of the interaction of many human and natural processes, and the object of very diverse disciplines and practices; therefore, the topic of the PECUS project, with all its complexity and delicate state of balance, is particularly suited to the use of this method, which allows to combine different sources of knowledge without claiming to obtain scientific results.

The method used in the first intensive course, as described in the above sections of this document, proved quite effective; however, some details still need to be defined or adjusted. Firstly, the importance of a very careful definition of the scope of the exercise must be stressed: a poorly defined scope will necessarily end up in doubts and bottlenecks in the following phases. Secondly, a limit on the number of concepts should be set: while FCM can theoretically manage an unlimited number of concepts, working on a map with more than 15-20 concepts could be too demanding, and even detrimental to the students' understanding of complexity. Thirdly, teachers should be provided specific guidelines enabling them to guide the students in the process of understanding what kind of concepts

should be included in the map, when and why a concept is redundant or inappropriate for the purposes of the declared scope, how and why its value can be modified in the scenario building tool – these guidelines should not pretend to be universal, but could be discussed by the teachers' group prior to the exercise and tailored to the specific situation.

In any case, I find it important to make a first warm-up exercise on a very general topic, well known by all participants, so that they can easily focus their attention on the method and its purpose, before moving on to a more demanding topic. Since many participants might be at first perplexed by the apparent triviality of the tool, this first exercise can also be useful to earn their trust.

Since U-Space is the only non-academic partner of the PECUS project, we did not test the PECUS method with students, but with professional collaborators. Therefore, the local course originally planned within the project activities was rather a simulation of a participatory planning process based on one of the company's actual projects, concerning an action plan for the protection of a coastal wetland. The participation of stakeholders in spatial or community planning processes aimed at the improvement of environmental conditions is an approach used in several projects coordinated by U-Space, and this was an occasion to test the effectiveness of FCM as a decision support tool that can be applied and refined in many other occasions. In this case, the suitability of FCM is based on the same reasons expressed above regarding the educational context, with the additional advantage that FCM is also able to deal with a combination of expert and non-expert knowledge, typical of this kind of practices.

Each of the seven professionals involved in the exercise was asked to play the role of a stakeholder having an interest or jurisdiction over the area, and participate in the discussion about the factors influencing the wetland landscape and ecosystem and their interactions. As is often the case, participants were at first sceptical about the usefulness of the tool, but all of them gradually understood its basic principles and purposes, until becoming enthusiastic about it. After the mapping exercise, participants were interviewed about their opinions on FCM and its application in planning. The whole session was video recorded and the footage was used to edit an educational video, which can be found on the PECUS YouTube channel.

The Mental Modeler tool is rather user-friendly and provides a set of statistics and indices that are useful for comparing different maps and deriving some useful conclusions on the exercise. On the other hand, the operating principle of the scenario building tool is not fully clear, and no explanation is provided.

Another downside of Mental Modeler regards its graphical interface: the working space is too small and cannot be zoomed in or out allowing for more space in case of complex maps. Moreover, the graphic output is rather poor and does not allow to customise colours and dimensions of texts, concepts and connections, nor to export the map to an editable file format: this would be very useful for post production and presentations. Finally, it has been noted that after importing a .csv file, the scenario building tool will not work properly if the map is not saved to the .mmp format, downloaded, and then loaded again into Mental Modeler.

Intensive course for students

The intensive course for students was held between the 31st of January and the 4th of February 2021. It was the core educational event of the PECUS project, where the methodology refined in the previous project activities was tested with higher education students from several European countries.

The course involved 45 students from:

- Pablo de Olavide University;
- University of Newcastle upon Tyne;
- Catholic University of Valencia;
- University of Iceland;
- National and Kapodistrian University of Athens.

The students' backgrounds were as diverse as Archaeology, Arts, Geography, History, Natural and Environmental Sciences, Planning, Social Sciences, and Sport Sciences. They were divided into three groups of around 15 students, each with one coordinator and two tutors from the project partners' staff. Each of the groups was in turn divided into 4 subgroups of 3 to 5 students. The possibility of creating international and interdisciplinary subgroups was partially hindered by the safety measures related to the Covid-19 pandemic; however, the workshop agenda provided occasions of discussion between the subgroups.

The agenda (see Annex 4) replicated the format of the intensive course for teachers, featuring an alternation of plenary and parallel group sessions:

- on the first day, students were introduced to the use of metal models and their representations, fuzzy logic and Fuzzy Cognitive Mapping, the concept and definition of landscape, and the practice of transhumance; students were as well involved in a first collective FCM exercise;
- on the second day, students were divided into groups. Within each group, subgroups of 3-5 students were formed; each subgroup was assigned one of the PECUS case studies (see Annex 6) to be used as a basis for discussion to develop a Fuzzy Cognitive Map and different scenarios concerning the conservation of traditional pastoral landscapes. The subgroups were then asked to present their maps and discuss them with the other students and the tutors;
- on the third day, a field trip to the town of Vall de Almonacid was organised;
- on the fourth day, students groups worked again in parallel sessions on specific topic questions defined by the tutors. Each subgroup developed and presented a map including different scenarios based on the topic question; one map was then selected by the tutors, to be further developed and refined collectively with the aim of presenting it during the next day's plenary session;
- on the fifth day, the three selected maps were presented in a plenary session and discussed collectively.

A loose structure for the exercises was circulated among the group coordinators and tutors, but each followed a slightly different approach depending on the evolution of the exercises and the students' reactions. A few works are reported and commented below to illustrate some of the approaches by instructors and students. The full reports on the parallel sessions are included in Annex 5.

PECUS intensive course for students

Notes for the exercises

Monday

Plenary session: FCM exercise on landscape

- General discussion on the term and meaning of "landscape". The exercise is meant to investigate the students' previous knowledge and understanding
- FCM exercise on factors influencing landscape

Tuesday

Parallel sessions: FCM exercise on PECUS case studies

- Each group coordinator selects 2 or 3 case studies, print some copies, and distribute to students
- Each subgroup selects one case study and reads it carefully (30')
- Each subgroup makes an FCM describing the selected case study (2h). Please define carefully the topic before starting the exercise
- Each subgroup presents his case study and debates it with other subgroups (1h)

Thursday

Parallel sessions: FCM exercise on transhumance landscapes

- Suggested topic: What are the factors affecting the transformation of transhumance landscapes today? And how do they interact?
- Each subgroup makes one FCM addressing the topic (2h)
- Each subgroup presents his case study; coordinator chooses one of the maps to be integrated and improved collectively (2h)
- The three selected maps will be presented by group representatives on Friday

Friday

Plenary session: group representatives show their maps from the previous day

Please remember to follow PECUS methodology:

1. Definition of topic
2. Discussion and first listing of concepts
3. Clustering of concepts where needed (suggestion: reduce list to 15/20 concepts max)
4. Mapping (suggestion: restrict choices for connections values to ± 0.5 and ±1)
5. Scenario setting (remember: set mode to "hyperbolic tangent")

Figure 11. Suggestions for the instructors were circulated before the workshop in order to ensure homogeneity of results.

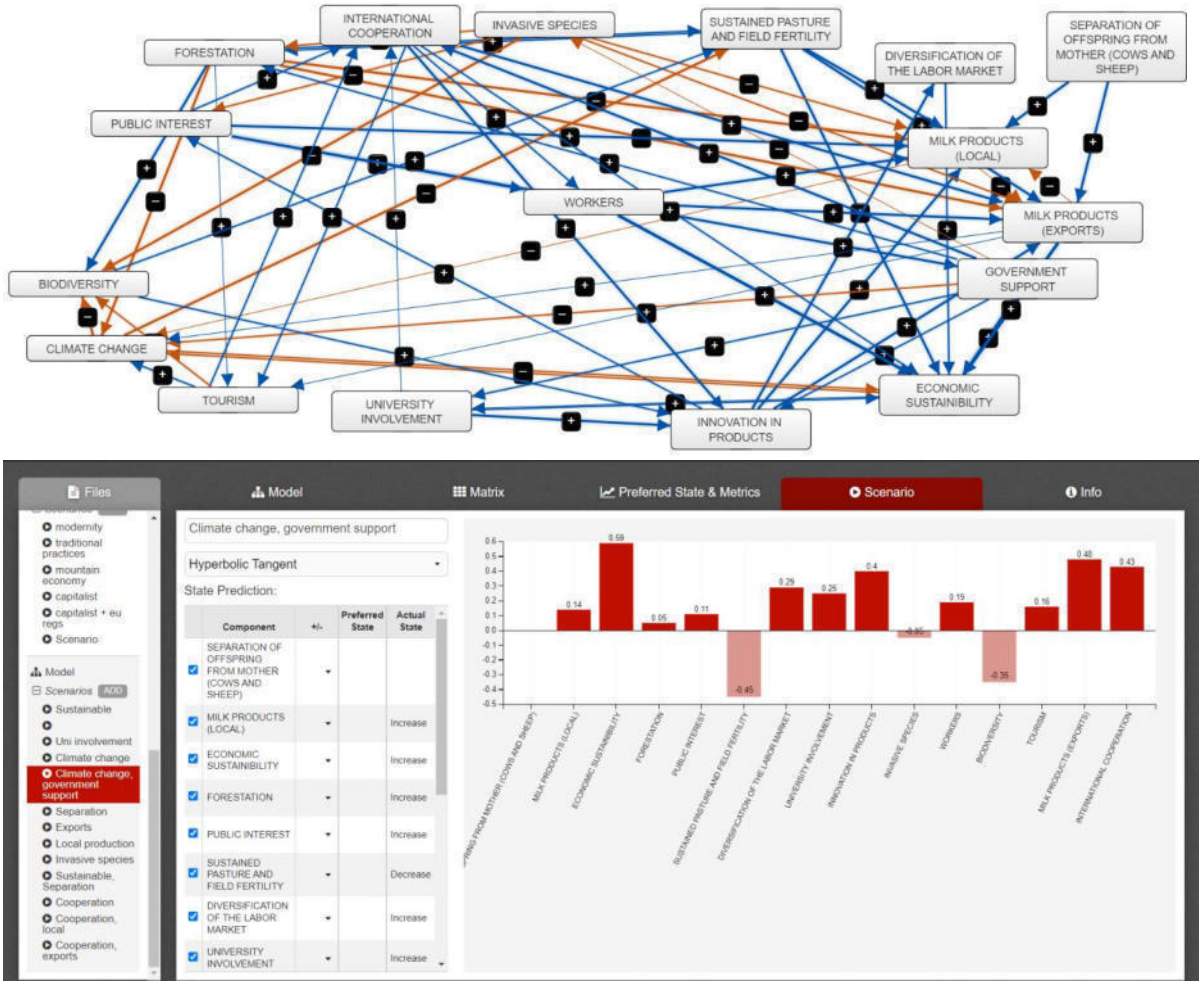


*Figure 12. This subgroup of four students was assigned one of the PECUS case studies (Study of shielings and earth walls in Eyjafjörður county, see sheet IS-01 in Annex 6) and asked to form a topic and build a map out of it. The group decided to explore the possibility and sustainability of reviving the practices of traditional pastoralism in Iceland under different policy and environmental conditions. The scenario tool was extensively used since the first steps of the mapping exercise, not only to test the reaction of the system under several different conditions, but also to constantly verify, refine or even correct the assumptions underlying the connections between the factors and their assigned weights. A similar approach was used by many of the groups, even spontaneously and independently from the teachers' indications (see "**Iteration**" in next chapter).*

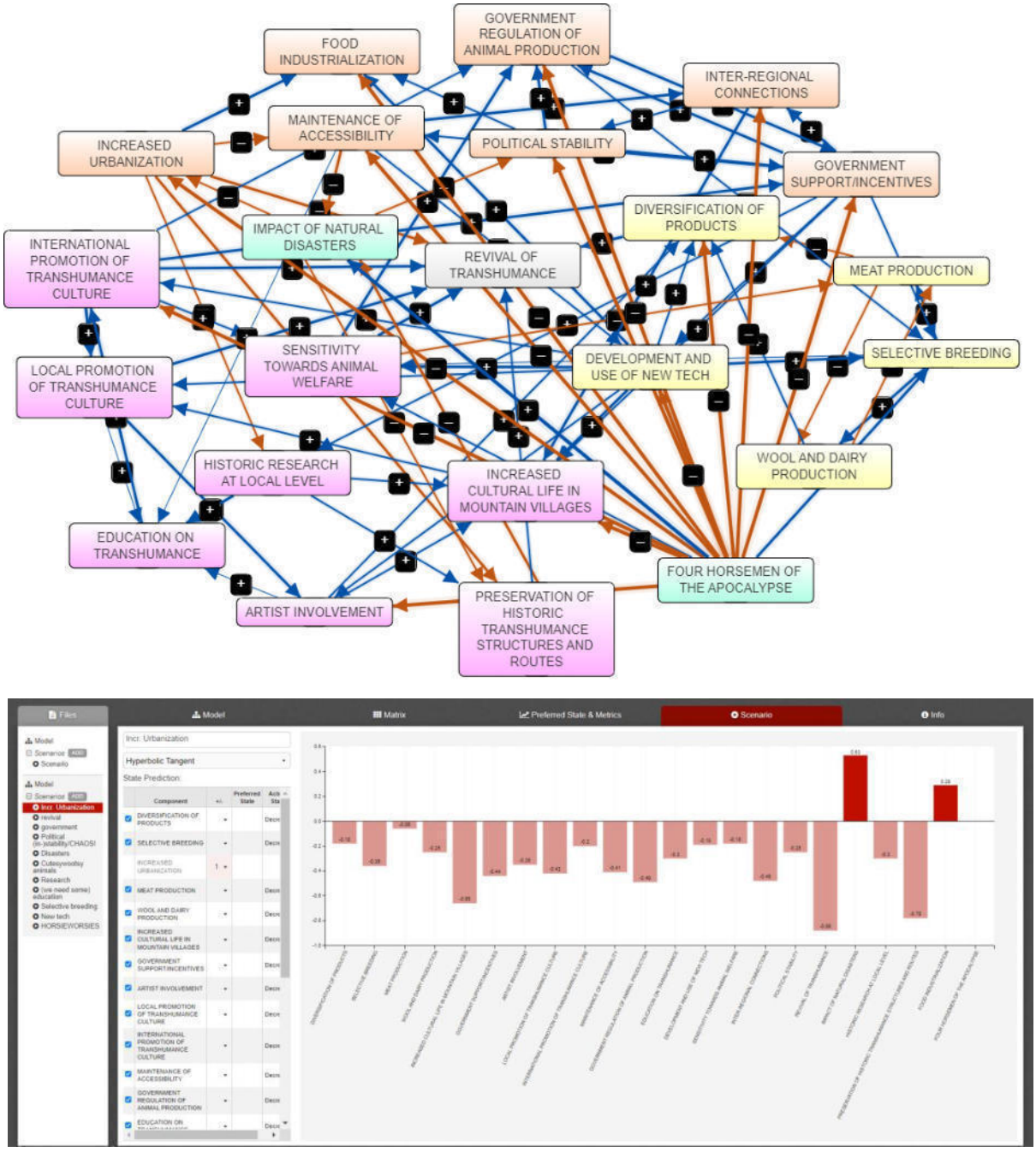
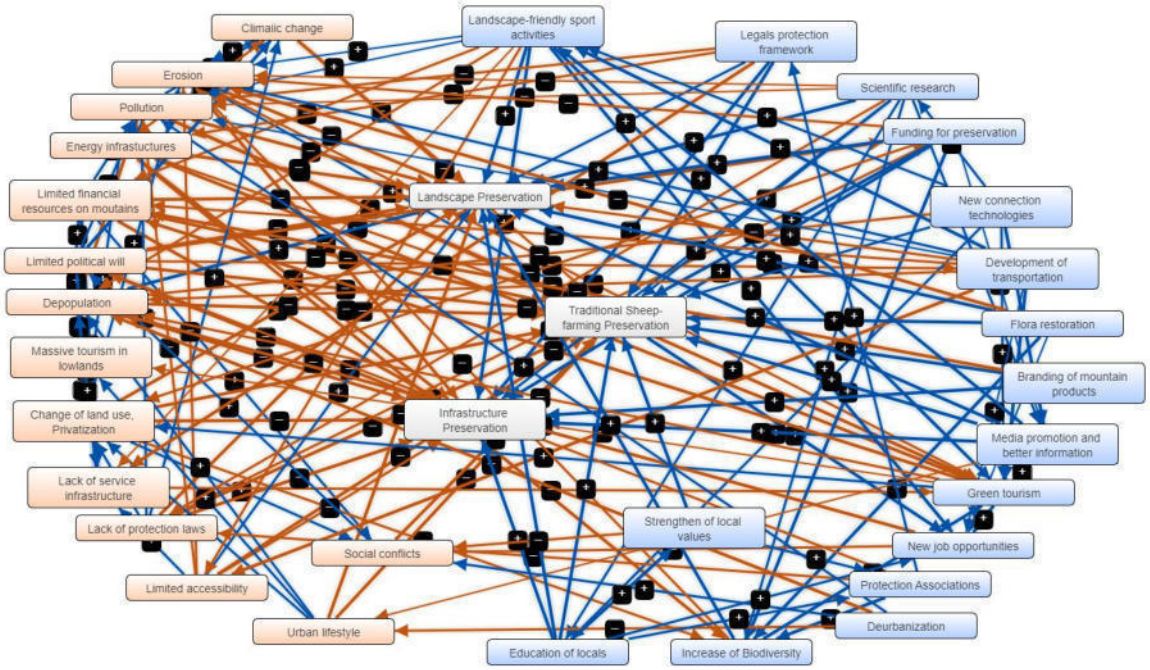


*Figure 13. This map from the second group session is based on the same topic as the previous one, i.e. the possibility of reviving transhumance in modern times. It was developed by a mix of students selected from different subgroups within the same group. The method for building the map while identifying a set of scenarios based on policy options (including some ironic wording…) is the same as in the previous map; however, after a suggestion by the teachers, the wording used for describing the factors was made more clear and effective, restricting their semantic spectrum and making the results more understandable by others (see "**Wording**" in next chapter).*



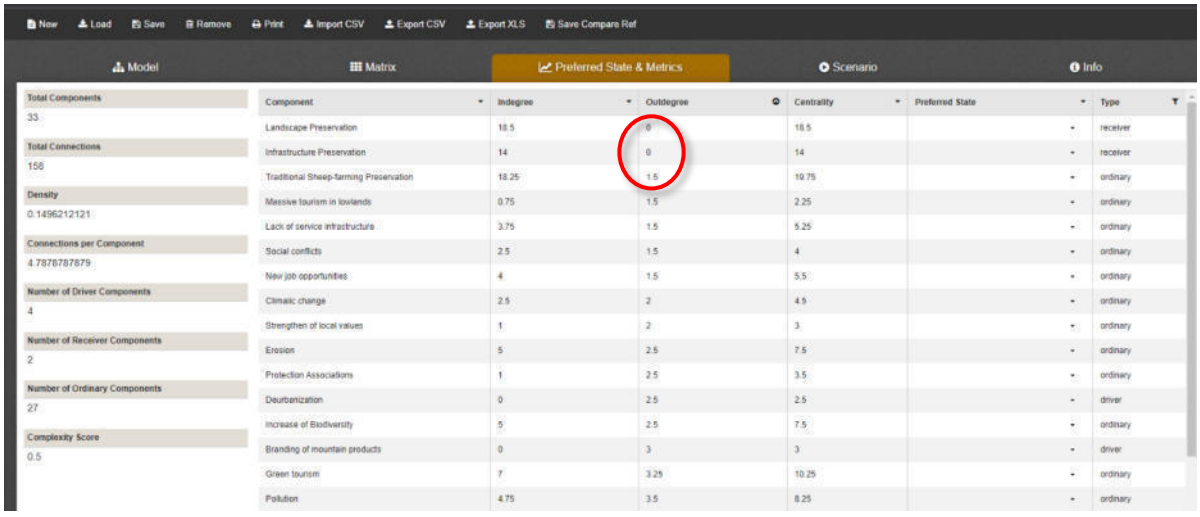


*Figure 14. Another map from the second group session. This one was developed around three main topics (physical landscape, traditional pastoral activities, and traditional rural infrastructure) and the factors that were considered likely to help or hinder their preservation. The main topics were placed in the centre of the map; the other factors were divided in groups, arranged around the centre, and highlighted with two different colours. This map was conceived with a "one-way" configuration: as shown by the "outdegree" value of the three main topics (zero or close to zero), these are only "receivers" of causal relationships, meaning that the group decided to discuss only on connections going towards the main topics, and not vice versa (see "**Drivers/Receivers**" in next chapter).*

Considerations on the use of Fuzzy Cognitive Mapping in higher education

The following keywords, considerations and suggestions summarise the results of the workshop experiences described above and the comments and reactions by teachers and students.

Fuzzy. Sharing a simple list of instructions among teachers before the workshop, without setting a strict method to comply with, proved to be a good solution in terms of variety of results achieved: every instructor tends to develop a personal approach to the method when faced with the students, and every student develops a personal understanding of the tool and its possible purposes. Therefore, enough time should be dedicated to the exercises in order for both teachers and students to adjust their approaches to FCM. Teachers and students should not be afraid to feel aimless at the beginning: the fuzzy approach is capable of making things converge and reach a point of equilibrium where students understand the purpose of the tool and instructors understand their role and how much they should intervene. There is no specific rule about this and instructors should adjust case by case. In other words, not only the procedure is fuzzy, but also its purpose and the rules for its application.

Maieutics. FCM can be considered a "maieutic" tool: rather than "providing" knowledge to students with a top-bottom approach, teachers can use FCM to help students form their own understanding of reality, drawing from their own previous knowledge, exposing it to their peers, enriching and modifying it through discussion. This is a very dynamic and meaningful learning process, opposed to traditional rote learning based on memorisation.

Comfort zone. The possibility given by FCM to use natural language with its imprecise nature, and at the same time propose quantitative yet fuzzy connections between factors, stimulates students to be more proactive without the fear of making mistakes, even when dealing with topics they are not usually comfortable with. For the same reasons, FCM is a method where interdisciplinarity in the composition of groups is particularly fit: no one is expected to provide exact solutions to given scientific questions, therefore it is easier to leave one's comfort zone and dive into the discussion.

Interventionism. The role of teachers and tutors is likely to change in time and adjust to the single situations and the students' reactions. Understanding how much to intervene in the students' discussions and to guide them in the mapping activity is up to the instructor. This also applies to the timing of the different steps of the exercise: it is a good idea to loosely set the timing of the session before it starts (discussion, listing and clustering of concepts, definition of connections, setting of scenarios), but it is again up to the instructor to adjust to the pace of the students and suggest when to proceed to the next step.

Medium. Some students felt that they wasted much effort in open discussions before starting to put components into the map, and that the results of such discussions did not really appear in the map in the end; whereas the discussion made later while generating the map was much more productive. In other words, the map is an effective medium through which the discussion leads to a fruitful modelling of the chosen reality. One student defined this as "thinking through model-making".

Scenarios. When building a map with Mental Modeler, users can define the weights of the connections between factors, but cannot assign values to the factors themselves. On the other hand, once the map has been defined to a certain degree, it is possible to use the scenario tool to assign values to one or more factors and verify how the entire system reacts to changes. These conditions should be made clear since the beginning, since they help to better understand the meaning and purpose of the mapping exercise.

Iteration. Many students quickly learned to use the scenario tool with an iterative approach. Rather than developing the map and the scenarios in a two-step process, they started setting multiple scenarios while developing the map itself. This allows to constantly verify the assumptions on which the map is being drafted, check for mistakes, refine research questions, spot unexpected influences between factors, and increasingly understand their causal connections and what a change in one factor implies for the whole system. The metrics tab, which dynamically displays several indicators about the map and its components, can also be used with similar purposes.

Equilibrium. An FCM exercise is never really concluded. Iterations and refinements are potentially unlimited – however, within a given team, there is eventually a point where changes become marginal and everybody feels that the map has reached a point of equilibrium.

Purpose. The first reaction by many students is often negative, because they cannot immediately understand the purpose of a procedure that seems trivial in terms of both inputs and outputs. But most of the times this feeling changes, as they gradually realise that FCM is not a tool for manipulating quantitative data, but rather a largely qualitative tool allowing to test what happens to a network structure when different quantitative weights are applied to qualitative nodes. For this reason, it is useful to set up the very first exercise as a warm-up, focusing on a very general topic that is well known by all, so the students can easily focus their attention on the tool and method before moving to a more demanding topic.

Scale. Many times, students soon realise that some local factors or processes are not able to influence other, more global factors that they have put in the same map. One clear example is climate change, which is uncontrollable through initiatives implementable at local level, and whose presence in a map can lead to improbable and inaccurate results, which might be difficult to understand especially for inexperienced users. Therefore, students should be warned since the beginning to identify the scale of the system: it is important that the instructor emphasizes that nodes remain within the relative scale to one another, that they remain within themselves things or processes from which a measurement may be taken, and that the connections are made with the questions asked in mind. Another way to address this point is to make a distinction between “external” and “local” factors since the first stages of the exercise. The nodes representing external factors (i.e. factors acting at a higher scale or from the outside, and therefore being uncontrollable at local level) could for example be highlighted with a different colour and excluded from being “receivers” of connections, since the cannot be influenced by local factors.

Progression. Inserting all factors in a blank map and then starting to make connections randomly is a common approach. However, some users might find it cumbersome to deal with too much complexity. One alternative method is working with smaller groups of nodes at a time and exploring their connections thoroughly before moving to the next group. Usually this method leads to more accurate discussions and to denser, more complex maps (see example at page 16). Some students even experimented adding groups of factors by sector, e.g. economic factors first and then environmental factors, exploring the connections each time within more narrow viewpoints. This helped gaining control over the process of building both the map and the scenarios.

Merge. Merging two or more maps made by different groups based on the same topic allows multiplying the number of points of view under consideration and increasing the complexity of the discussion and results. A merged map is an effective means for further discussion, analysis and review.

However, merging two or more maps requires a series of time-consuming manual operations[3] (see the procedure explained at pages 11-12); therefore, when planning an exercise or workshop including activities on merged maps, a sufficient amount of time should be dedicated to the merging operation.

Wording. At their first approach, during the discussion phase, many users often tend to propose terms of very broad meaning. After these concepts are included as factors in the map, it is sometimes difficult to make meaningful, causal connections and assign them a weight, or to make connections uniquely understandable by others. One way to avoid this circumstance is making sure that a correct wording is chosen for the factors, and that each wording denotes something that can be quantified. The map in Figure 15 below contains several vague concepts that are unfit for the type of connections needed in a Fuzzy Cognitive Map and for an effective definition of scenarios. "Transhumance landscape" and "Cultural heritage law", for example, could be reworded respectively "Effective conservation of transhumance landscapes" and "Presence of cultural heritage protection laws", being concepts that are more clearly understandable and quantifiable (a "higher" presence of cultural heritage protection laws usually leads to "more effective" conservation of transhumance landscapes, meaning the two factors are directly proportional). The use of quantifiable factors helps reducing the semantic spectrum of each concept – for the benefit of clarity and comprehension between group members – and at the same time making causal, semi-quantitative connections possible.

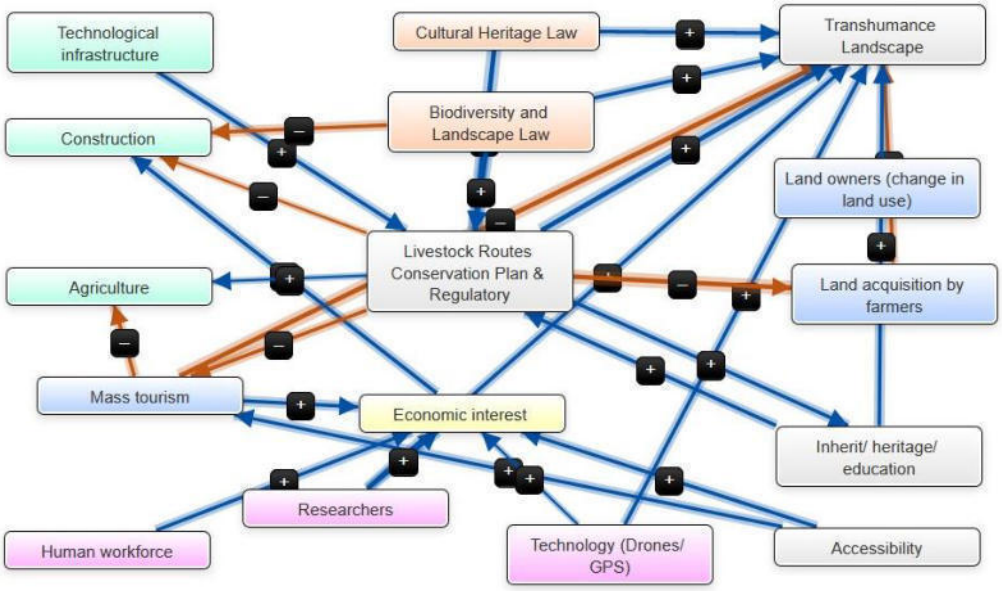


Figure 15. Example of map with presence of poorly defined factors.

Drivers/Receivers. A doubt often arises when working on FCM, i.e. whether including the main topic (or topics) of discussion within the map or not. Including the topic within the map allows exploring feedback reactions and achieving a higher complexity; on the other hand, the topic might as well be consciously kept out of the map in order to keep the exercise more tidy and linear. An intermediate solution is including the main topic in the map, but allowing only incoming connections from the other factors and excluding outward connections (see example at figure 14). In other words, the nodes can

[3] Currently, Mental Modeler does not provide a function for merging maps automatically.

be divided between “drivers” and “receivers” as a general rule before starting to make connections. Experience shows that no general rule can be defined on this aspect: the best approach is to be found through trial and error.

Stakeholders. The main application of FCM within the PECUS project was targeted to higher education students. However, this tool is very useful in other environments, and particularly suitable in participatory or community planning – this is indeed the purpose for which FCM was originally intended. Most of the above considerations are valid for this alternative type of use. In particular, the condition of “interdisciplinarity” in higher education applications of FCM can be replaced by the “diversity” of stakeholders involved in a participatory planning application, e.g. citizens of different ages, incomes, education level, or a mix of experts and laymen, policy makers and citizens, politicians and civil servants, etc. Depending on the topic and the purposes of the FCM application, different users can be mixed in the same group; or separate, thematic groups can be set and asked to work on the same topic before comparing and/or merging the respective results.

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Other resources available at https://www.mentalmodeler.com/#resources

Annexes

- Annex 1: Intensive course for teachers: agenda (leg 1)
- Annex 2: Intensive course for teachers: agenda (leg 2)
- Annex 3: Matrices from the group exercises and merged matrix with normalised values
- Annex 4: Intensive course for students: agenda
- Annex 5. Intensive course for students: reports on group activities
- Annex 6: Case studies

Annex 1. Intensive course for teachers: agenda (leg 1)

Monday 27 April		
Plenary session		
10.00-10.15	UPO	Introduction to workshop Presentation of platform functionalities
10.15-10.30	U-S	Introduction to method and agenda
10.30-11.45	UNEW: moderates	Exercise 1: mapping a general topic Discussion, clustering & sharing of concepts
Break		
12.00-13.30	U-S: moderates	Exercise 1: mapping a general topic Mapping shared concepts
13.30-14.00	UNEW	Exercise 2: mapping assigned case studies Assignment of case studies

Tuesday 28 – Wednesday 29 April
Parallel sessions
Exercise 2: mapping assigned case studies Each group works on its own (via Skype, Blackboard or other means). Estimated time: 2-3 hrs.

Thursday 30 April		
Plenary session		
10.00-10.15	U-S: moderates	Exercise 2: mapping assigned case studies Comments by participants on exercises of previous day
10.15-11.30	U-S: moderates	Exercise 2: mapping assigned case studies Presentation of case study maps by each group & discussion
Break		
11.45-12.00	U-S	Exercise 3: mapping a transhumance-related topic Presentation of focus question
12.00-13.30	NKUA: moderates	Exercise 3: mapping a transhumance-related topic Discussion, clustering & sharing of concepts

Friday 1 May – Tuesday 5 May
Parallel sessions
Exercise 3: mapping a transhumance-related topic Each group works on its own using shared concepts (via Skype, Blackboard or other means). Estimated time: 2-3 hrs. Each group sends map to U-S by Tuesday 5 at 15.00. U-S joins groups' maps and creates "social" map

Wednesday 6 May		
Plenary session		
10.00-10.15	U-S	Exercise 4: improving social map Presentation of social map
10.15-12.30	UCV: moderates	Exercise 4: improving social map Discussion & integration of social map

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Annex 2. Intensive course for teachers: agenda (leg 2)

Wednesday 2 December		
Plenary session		
10:00-10.15	Francesco Carrer (UNEW)	Welcome and introduction to the workshop
10.15-11.00	Flavio Camerata (U-S)	Recap of Fuzzy Cognitive Mapping (FCM)
11.00-11.15	Francesco Carrer (UNEW)	FCM matrix combination: manual approaches and new automatic methods
11.15-11.30	Francesco Carrer (UNEW)	Grouping, group leader designation and explanation of tasks
Break		
11:30-12:00	Francesco Carrer (UNEW)	Exercise 1: understanding the case studies EthWAL: Ethnoarchaeology of Western Alpine upland Landscapes
12.00-12.15	Flavio Camerata (U-S)	Exercise 1: understanding the case studies Spatial Framework of Apulian Drover Roads
12.15-13.00		Exercise 2: defining concepts FCM concepts are defined for the case study

Thursday 3 December		
Plenary session		
10:00-10.30		Exercise 2: defining concepts FCM concepts finalised
10.30-11.30	Each group	Exercise 3: creating a FCM for each case study Based on the concepts developed in Exercise 2
Break		
11:45-12:45	Each group	Exercise 3: creating a FCM for each case study Based on the concepts developed in Exercise 2
12.45-13.00	Flavio Camerata (U-S)	Instructions for the last day

Friday 4 December		
Plenary session		
10:00-10:30	Maria del Pilar Ortiz Calderon	Experience of student course at UPO
10.30-11:15		Exercise 4: presentations group 1 Group members present the results of FCM; other participants comment on the results
Break		
11.15-12.30		Exercise 4: presentations group 2 Group members present the results of FCM; other participants comment on the results
12:30-12:45	Flavio Camerata	Exercise 5: combining FCM Combining FCM maps of group 1 and 2
12:45-13:00	Francesco Carrer (UNEW)	Final remarks
13.00-13.30		Steering Committee meeting

Annex 3. Intensive course for teachers: matrices from the group exercises and merged matrix with normalised values

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GROUP 1

	01 Depopulation	02 Immigration	03 Changing food choices (less meat)	04 Profit from sheep products	05 Knowledge transfer, training and innovation in sheep farming production	06 People's interest in pastoral life	07 Accessibility to peripheral areas	08 State subsidies	09 Research (archaeology, anthropology, history)	10 Promotion of eco-tourism	11 Physical barriers to movement of animals	12 Public services (schools, health services...)	13 Environmental degradation	14 Differences in local legislations	15 Competition by other land uses	16 Use of herbicides	17 Conservation and reuse of physical heritage	18 Sustainable ecological management of pastures (more balance btwn human & nature)	19 Rewilding of pastures (more nature)	20 Illegal practices related to management of agricultural funds	21 Implementation of community planning	22 Presence of labour organisations/cooperatives	23 Communication, dissemination and awareness raising
01 Depopulation						-0,5									-0,5		-1						
02 Immigration	-0,5											0,5											
03 Changing food choices (less meat)				-0,5		0,5										-0,5							
04 Profit from sheep products																							
05 Knowledge transfer, training and innovation in sheep farming production						1																	
06 People's interest in pastoral life				0,5																			
07 Accessibility to peripheral areas	-0,5									1													
08 State subsidies	-0,5									0,5													
09 Research (archaeology, anthropology, history)					0,5																		
10 Promotion of eco-tourism	-0,5					1											1						
11 Physical barriers to movement of animals				-1																			
12 Public services (schools, health services...)	-1																						
13 Environmental degradation				-1													-1						
14 Differences in local legislations																						-0,5	
15 Competition by other land uses				-1													-1						
16 Use of herbicides				-0,5									0,5										
17 Conservation and reuse of physical heritage																							
18 Sustainable ecological management of pastures (more balance btwn human & nature)										1													
19 Rewilding of pastures (more nature)										0,5			-1										
20 Illegal practices related to management of agricultural funds																	-1	-1					
21 Implementation of community planning					0,4					0,5		1			-0,5			0,5					
22 Presence of labour organisations/cooperatives				1																			
23 Communication, dissemination and awareness raising					1					1							1						

GROUP 2

	01 Depopulation	02 Immigration	03 Changing food choices (less meat)	04 Profit from sheep products	05 Knowledge transfer, training and innovation in sheep farming production	06 People's interest in pastoral life	07 Accessibility to peripheral areas	08 State subsidies	09 Research (archaeology, anthropology, history)	10 Promotion of eco-tourism	11 Physical barriers to movement of animals	12 Public services (schools, health services...)	13 Environmental degradation	14 Differences in local legislations	15 Competition by other land uses	16 Use of herbicides	17 Conservation and reuse of physical heritage	18 Sustainable ecological management of pastures (more balance btwn human & nature)	19 Rewilding of pastures (more nature)	20 Illegal practices related to management of agricultural funds	21 Implementation of community planning	22 Presence of labour organisations/cooperatives	23 Communication, dissemination and awareness raising
01 Depopulation					-1								1										
02 Immigration	0,5				0,5																		
03 Changing food choices (less meat)				-1																			
04 Profit from sheep products	-1					1																	
05 Knowledge transfer, training and innovation in sheep farming production	-0,5			1													1						
06 People's interest in pastoral life	-1																						
07 Accessibility to peripheral areas	-1					1									1								
08 State subsidies	-1	0,5										1					1			0,5			
09 Research (archaeology, anthropology, history)					1					0,5							1						0,5
10 Promotion of eco-tourism	-0,5			1											-0,5								
11 Physical barriers to movement of animals						0,5																	
12 Public services (schools, health services...)	-1	0,5																					
13 Environmental degradation																							
14 Differences in local legislations											0,5							-0,5					
15 Competition by other land uses				-1					-1														
16 Use of herbicides													1				0,5	-1	-1				
17 Conservation and reuse of physical heritage							0,5			1													
18 Sustainable ecological management of pastures (more balance btwn human & nature)																							
19 Rewilding of pastures (more nature)																		-1					
20 Illegal practices related to management of agricultural funds																							
21 Implementation of community planning	-0,5			-0,5														0,5					
22 Presence of labour organisations/cooperatives	-0,5			1																			
23 Communication, dissemination and awareness raising	-0,5				1																		

GROUP 3

	01 Depopulation	02 Immigration	03 Changing food choices (less meat)	04 Profit from sheep products	05 Knowledge transfer, training and innovation in sheep farming production	06 People's interest in pastoral life	07 Accessibility to peripheral areas	08 State subsidies	09 Research (archaeology, anthropology, history)	10 Promotion of eco-tourism	11 Physical barriers to movement of animals	12 Public services (schools, health services...)	13 Environmental degradation	14 Differences in local legislations	15 Competition by other land uses	16 Use of herbicides	17 Conservation and reuse of physical heritage	18 Sustainable ecological management of pastures (more balance btwn human & nature)	19 Rewilding of pastures (more nature)	20 Illegal practices related to management of agricultural funds	21 Implementation of community planning	22 Presence of labour organisations/cooperatives	23 Communication, dissemination and awareness raising
01 Depopulation													0				-1		1				
02 Immigration	-1		-0,5	0																			
03 Changing food choices (less meat)	0			-0,5																			
04 Profit from sheep products	-0,5																						
05 Knowledge transfer, training and innovation in sheep farming production				1												-0,5		1					
06 People's interest in pastoral life	-1	0,5																					
07 Accessibility to peripheral areas	-1											0					0,5						
08 State subsidies	-1			0,5		0				0,5		1					0,5	1					
09 Research (archaeology, anthropology, history)					0,5					0,5							1						0,5
10 Promotion of eco-tourism	-0,5			0,5																			
11 Physical barriers to movement of animals							-1																
12 Public services (schools, health services...)	-1	0,5		0,5						0,5													
13 Environmental degradation																	-0,5						
14 Differences in local legislations										-0,5	0,5	-0,5					-0,5						
15 Competition by other land uses								-0,5			1		0,5										
16 Use of herbicides													1										
17 Conservation and reuse of physical heritage							0,5			1	-0,5												
18 Sustainable ecological management of pastures (more balance btwn human & nature)				0,5									-1										
19 Rewilding of pastures (more nature)													-1			-1	-0,5	-1					
20 Illegal practices related to management of agricultural funds													0,5		0,5								
21 Implementation of community planning	-0,5					1				1					-0,5			1					
22 Presence of labour organisations/cooperatives				0,5						0,5										-0,5	0,5		
23 Communication, dissemination and awareness raising					0,5	0,5				1										-0,5	1		

MERGED MATRIX WITH NORMALISED VALUES

	01 Depopulation	02 Immigration	03 Changing food choices (less meat)	04 Profit from sheep products	05 Knowledge transfer, training and innovation in sheep farming production	06 People's interest in pastoral life	07 Accessibility to peripheral areas	08 State subsidies	09 Research (archaeology, anthropology, history)	10 Promotion of eco-tourism	11 Physical barriers to movement of animals	12 Public services (schools, health services...)	13 Environmental degradation	14 Differences in local legislations	15 Competition by other land uses	16 Use of herbicides	17 Conservation and reuse of physical heritage	18 Sustainable ecological management of pastures (more balance btwn human & nature)	19 Rewilding of pastures (more nature)	20 Illegal practices related to management of agricultural funds	21 Implementation of community planning	22 Presence of labour organisations/cooperatives	23 Communication, dissemination and awareness raising
01 Depopulation	0,00	0,00	0,00	0,00	-0,33	-0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,33	0,00	-0,17	0,00	-0,67	0,00	0,33	0,00	0,00	0,00	0,00
02 Immigration	-0,33	0,00	-0,17	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
03 Changing food choices (less meat)	0,00	0,00	0,00	-0,67	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00
04 Profit from sheep products	-0,50	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
05 Knowledge transfer, training and innovation in sheep farming production	-0,17	0,00	0,00	0,67	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,17	0,33	0,33	0,00	0,00	0,00	0,00	0,00
06 People's interest in pastoral life	-0,67	0,17	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
07 Accessibility to peripheral areas	-0,83	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,00	0,33	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00
08 State subsidies	-0,83	0,17	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,67	0,00	0,00	0,00	0,00	0,50	0,33	0,00	0,17	0,00	0,00	0,00
09 Research (archaeology, anthropology, history)	0,00	0,00	0,00	0,00	0,67	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,67	0,00	0,00	0,00	0,00	0,00	0,33
10 Promotion of eco-tourism	-0,50	0,00	0,00	0,50	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,17	0,00	0,33	0,00	0,00	0,00	0,00	0,00	0,00
11 Physical barriers to movement of animals	0,00	0,00	0,00	-0,33	0,00	0,17	-0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
12 Public services (schools, health services...)	-1,00	0,33	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
13 Environmental degradation	0,00	0,00	0,00	-0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,50	0,00	0,00	0,00	0,00	0,00	0,00
14 Differences in local legislations	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,17	0,33	-0,17	0,00	0,00	0,00	0,00	-0,17	-0,17	0,00	0,00	0,00	-0,17	0,00
15 Competition by other land uses	0,00	0,00	0,00	-0,67	0,00	0,00	0,00	-0,17	-0,33	0,00	0,33	0,00	0,17	0,00	0,00	0,00	-0,33	0,00	0,00	0,00	0,00	0,00	0,00
16 Use of herbicides	0,00	0,00	0,00	-0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,83	0,00	0,00	0,00	0,17	-0,33	-0,33	0,00	0,00	0,00	0,00
17 Conservation and reuse of physical heritage	0,00	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00	0,67	-0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
18 Sustainable ecological management of pastures (more balance btwn human & nature)	0,00	0,00	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00	-0,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
19 Rewilding of pastures (more nature)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,00	-0,67	0,00	0,00	-0,33	-0,17	-0,67	0,00	0,00	0,00	0,00	0,00
20 Illegal practices related to management of agricultural funds	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,17	0,00	-0,33	-0,33	0,00	0,00	0,00	0,00	0,00
21 Implementation of community planning	-0,33	0,00	0,00	-0,17	0,13	0,33	0,00	0,00	0,00	0,50	0,00	0,33	0,00	0,00	-0,33	0,00	0,00	0,67	0,00	0,00	0,00	0,00	0,00
22 Presence of labour organisations/cooperatives	-0,17	0,00	0,00	0,83	0,00	0,00	0,00	0,00	0,00	0,17	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,17	0,17	0,00	0,00
23 Communication, dissemination and awareness raising	-0,17	0,00	0,00	0,00	0,83	0,17	0,00	0,00	0,00	0,67	0,00	0,00	0,00	0,00	0,00	0,00	0,33	0,00	0,00	-0,17	0,33	0,00	0,00

Annex 4. Intensive course for students: agenda

Workshop
Seminar
Visit or outdoor activity
Group 1
Group 2
Group 3

Monday, Jan 31 Aula Magna		
9.00	Registration of students	UCV
9.30	Welcome	Pablo Vidal – UCV Pilar Ortiz – UPO
10.00	Short partners' presentations	All partners
10.30	Introduction to workshop objectives and Fuzzy Cognitive Mapping method	Flavio Camerata – U-Space
11.00	What is the "fuzzy" approach?	Francesco Carrer – NCL
11.30	Break	
11.45	Plenary session: first FCM exercise (landscape)	Flavio Camerata – U-Space
13.30	Break	
15.00	Transhumance in the Valencia region	Pablo Vidal – UCV
17.00	End of first day	

Tuesday, Feb 1			
9.30	Parallel sessions: FCM exercise (PECUS case studies)		
	Group 1 (Seminar 2.2)	Group 2 (room 2004)	Group 3 (room 2001)
	16 students 4 subgroups	16 students 4 subgroups	16 students 4 subgroups
	Coordinator: Árni Júlíusson – NCL Tutors: Jorge Boehringer – NCL Flavio Camerata – U-Space	Coordinator: Yiannis Papadatos – UOA Tutors: Pilar Ortiz – UPO Javier Becerra - UPO	Coordinator: Victor Sanchez - UCV Tutors: Tina Kalantzopoulou – UOA Gylfi Helgason – HI
13.30	Break		
15.00	Visit to the Ethnological Museum in Valencia		
17.00	End of second day		

Wednesday, Feb 2	
9.00	Field trip to a transhumance landscape
17.00	End of third day

Thursday, Feb 3			
9.30	Parallel sessions: FCM exercise (transhumance landscapes)		
	Group 1 (Seminar 2.2)	Group 2 (room 2004)	Group 3 (Room 3033 INEDE)
	16 students 4 subgroups	16 students 4 subgroups	16 students 4 subgroups
	Coordinator: Árni Júlíusson – NCL Tutors: Jorge Boehringer – NCL Flavio Camerata – U-Space	Coordinator: Yiannis Papadatos – UOA Tutors: Pilar Ortiz – UPO Javier Becerra - UPO	Coordinator: Victor Sanchez - UCV Tutors: Tina Kalantzopoulou – UOA Gylfi Helgason – HI
13.30	Break		
15.00	New uses for transhumance roads (Aula Magna)		Víctor Sánchez – UCV
17.00	End of fourth day		

Friday, Feb 4 Veles e Vents building – La Marina		
9.30	Plenary session: presentation of selected group works and scenario setting	Francesco Carrer – NCL
11.00	Break	
11.30	Plenary session: gaming contest	Flavio Camerata – U-Space
13.00	Break	
14.30	Final debate and conclusions	Pablo Vidal – UCV
17.00	End of fifth day	

Co-funded by the Erasmus+ Programme of the European Union

Annex 5. Intensive course for students: reports on group activities

Co-funded by the Erasmus+ Programme of the European Union

GROUP 1 – REPORT ON PARALLEL SESSIONS

Parallel session 1 – Tuesday 1/2/2022

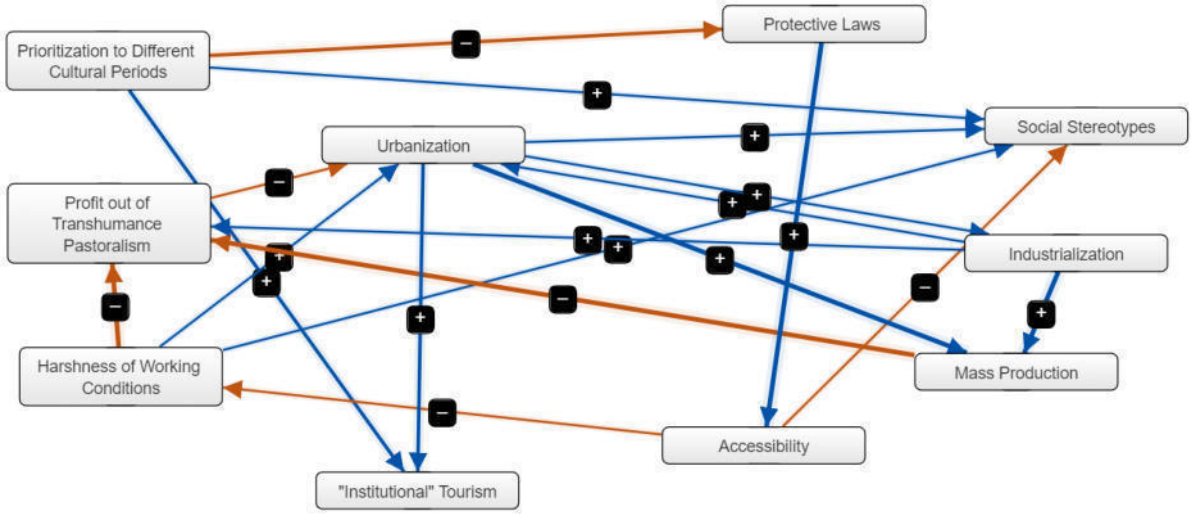
Each subgroup was assigned one of the PECUS case studies from their own country, and asked to form a topic and build a map.

All groups used the scenario tool while building the map, creating one or more scenario to constantly verify the assumptions on which the map itself was being drafted. This is indeed an active and effective way of using the scenario, rather than setting scenarios only at the end of the exercise.

One interesting method was introduced by one of the teams, who first inserted the factors related to economy in order to make sure that a revival of transhumance could be feasible, and then added the environmental factors in order to control its environmental sustainability.

Team: National and Kapodistrian University of Athens (Archaeology)

Case study: “Limnakaro mitato”. The group discussed the relations and effects of different approaches to conservation, and how policies being more “inclusive” of the different aspects of the cultural heritage can help in studying and reviving certain traditional practices.




Files
Model
Matrix
Preferred State & Metrics
Scenario
Info
Model
Scenarios ADD
Scenario
Model
Scenarios ADD
modernity
traditional practices
mountain economy
capitalist
capitalist + eu regs
Scenario
Model
Scenarios ADD
Scenario
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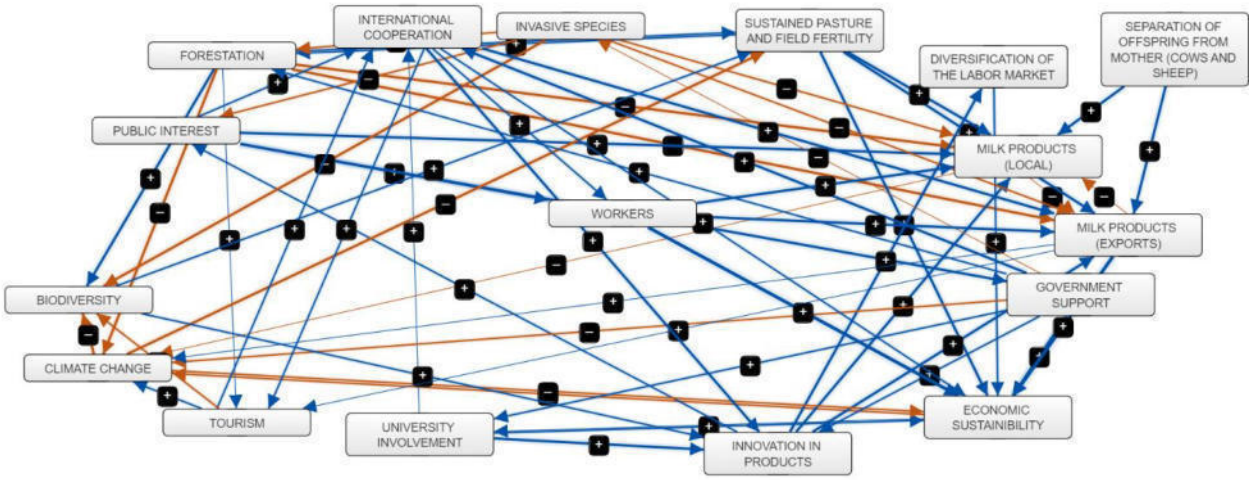
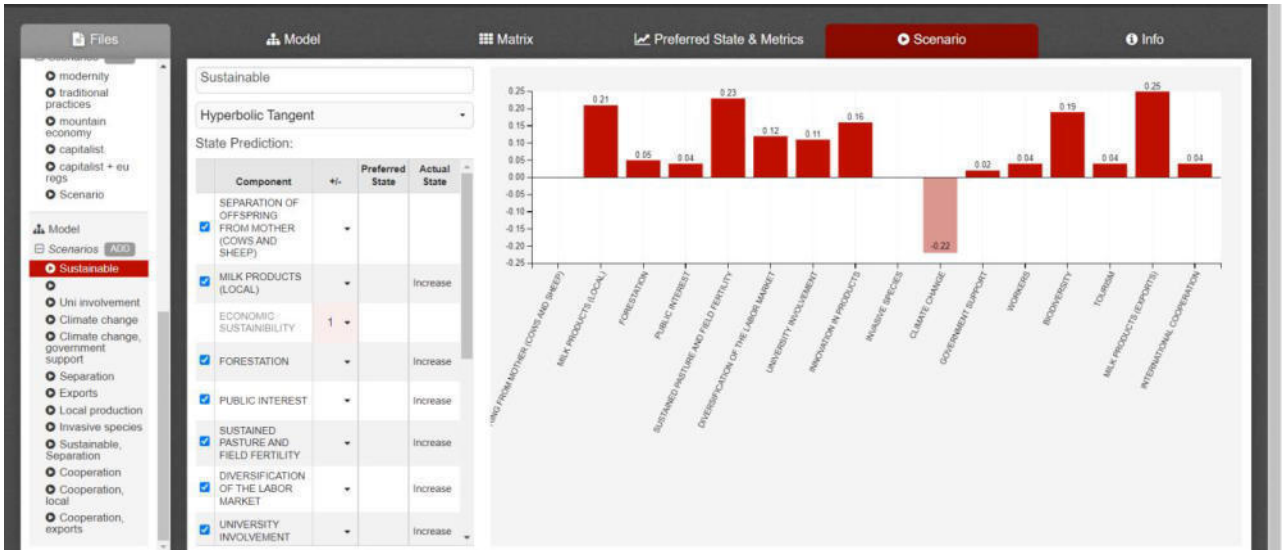
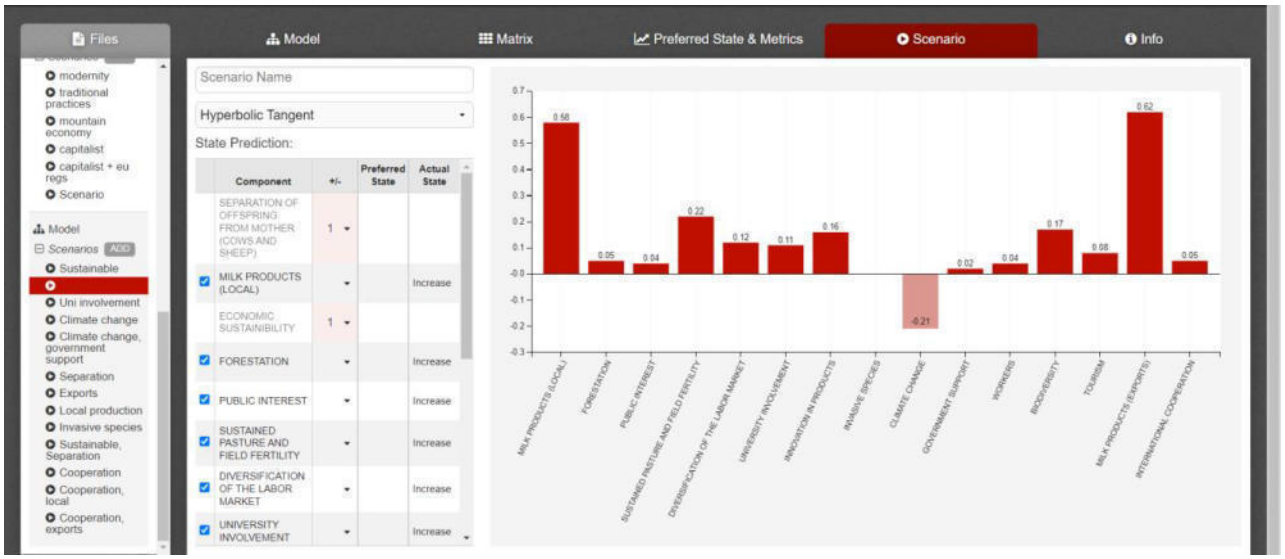
Scenarios ADD
Protective Laws
Prioritization of Different Cultural Periods
Mass Production
Mass Production
Hyperbolic Tangent
State Prediction:
Component
+/-
Preferred State
Actual State
Prioritization to Different Cultural Periods
Profit out of Transhumance Pastoralism
Increase
Harshness of Working Conditions
Social Stereotypes
Decrease
Mass Production
-1
Accessibility
Industrialization
Decrease
Urbanization
Decrease
"Institutional"
0.74
-0.07
-0.1
-0.22
-0.12
Prioritization to Different Cultural Periods
Profit out of Transhumance Pastoralism
Harshness of Working Conditions
Social Stereotypes
Accessibility
Industrialization
Urbanization
"Institutional" Tourism
Protective Laws

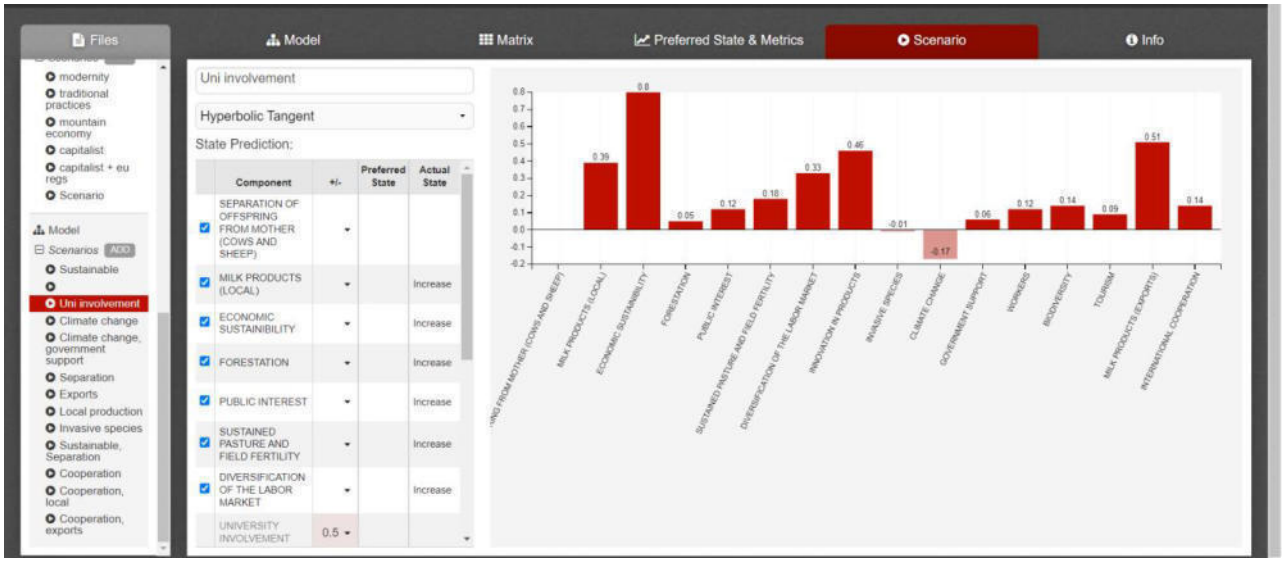
Team: University of Iceland (History, Archaeology)

Case study: “Eyjafjörður”. This group discussed about the possibility and sustainability of reviving the practices of traditional pastoralism in Iceland under different policy and environmental conditions.








Files
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capitalist
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Scenarios ADD
Sustainable
Uni involvement
Climate change
Climate change, government support
Separation
Exports
Local production
Invasive species
Sustainable, Separation
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Cooperation, exports
Uni involvement
Hyperbolic Tangent
State Prediction:
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Actual State
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Increase
FORESTATION
Increase
PUBLIC INTEREST
Increase
SUSTAINED PASTURE AND FIELD FERTILITY
Increase
DIVERSIFICATION OF THE LABOR MARKET
Increase
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FORESTATION
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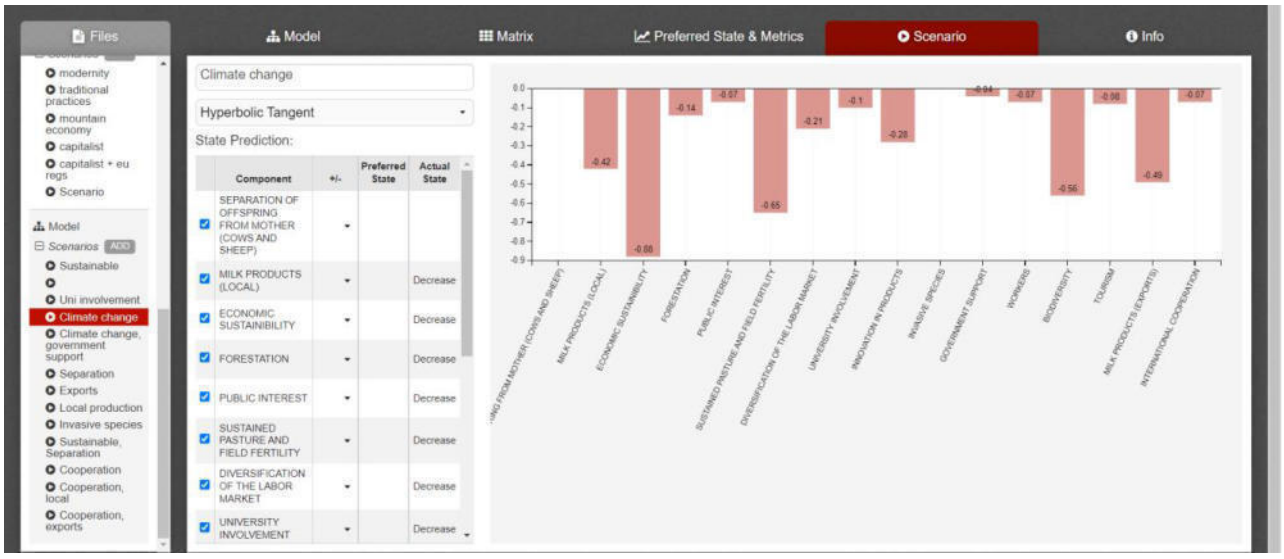
SUSTAINED PASTURE AND FIELD FERTILITY
DIVERSIFICATION OF THE LABOR MARKET
INNOVATION IN PRODUCTS
INVASIVE SPECIES
CLIMATE CHANGE
GOVERNMENT SUPPORT
WORKERS
BIODIVERSITY
TOURISM
MILK PRODUCTS (EXPORTS)
INTERNATIONAL COOPERATION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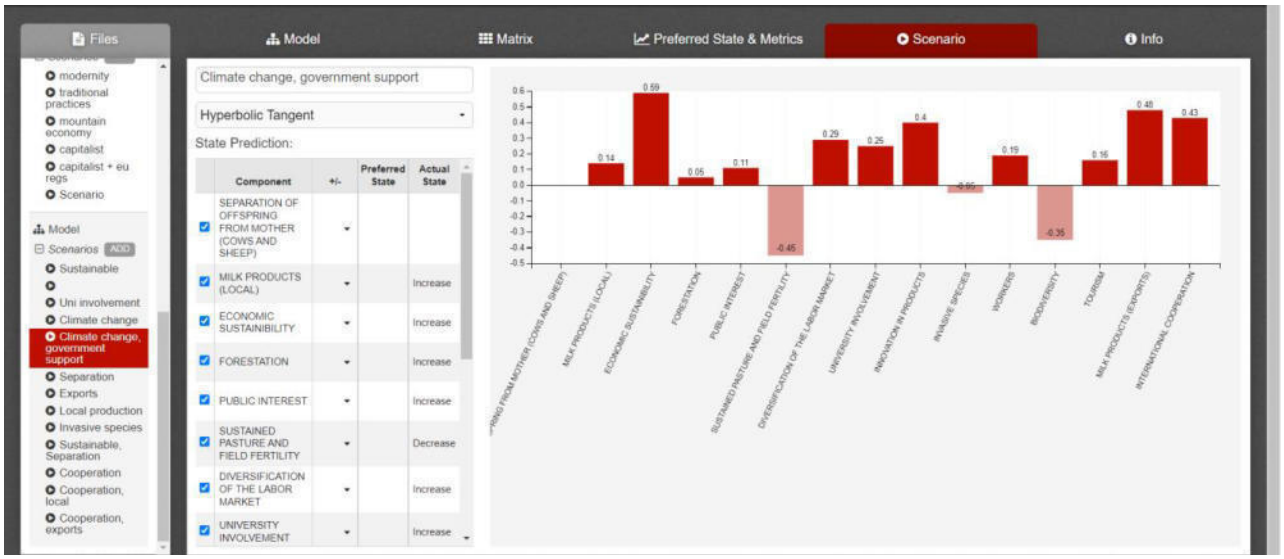
TOURISM
MILK PRODUCTS (EXPORTS)
INTERNATIONAL COOPERATION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PUBLIC INTEREST
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MILK PRODUCTS (LOCAL)
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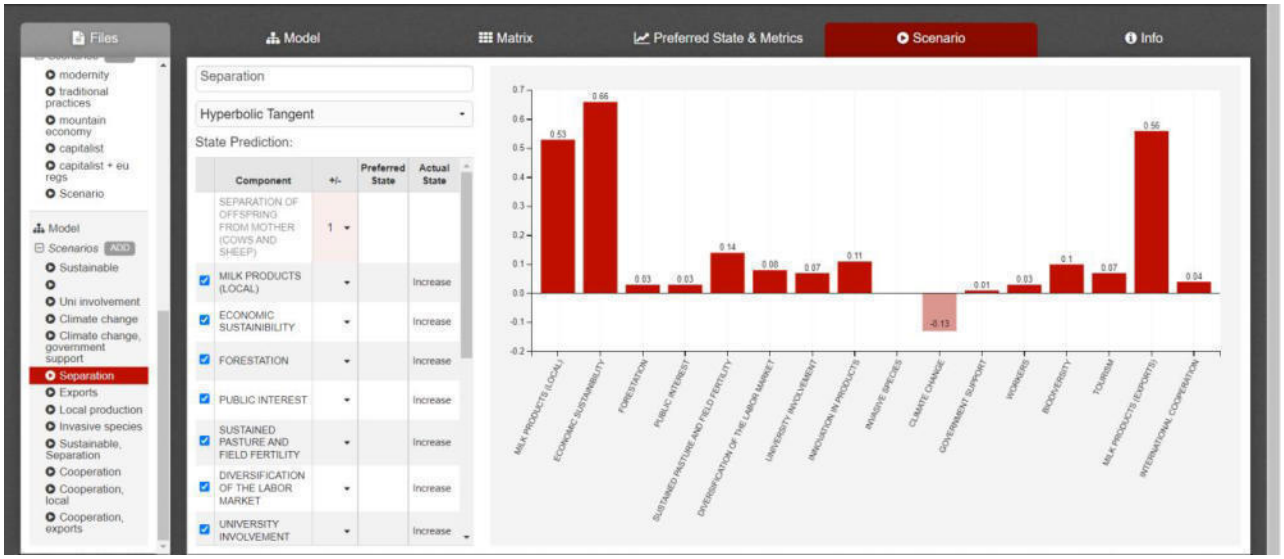
INTERNATIONAL COOPERATION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Climate change, government support
Separation
Exports
Local production
Invasive species
Sustainable, Separation
Cooperation
Cooperation, local
Cooperation, exports
Separation
Hyperbolic Tangent
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MILK PRODUCTS (LOCAL)
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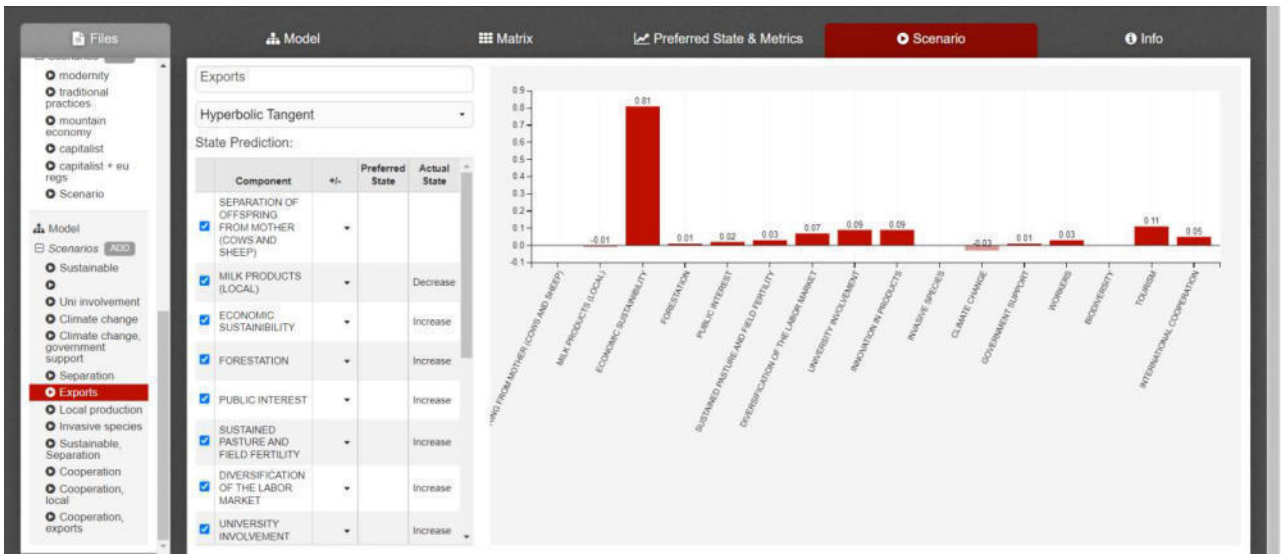
SUSTAINED PASTURE AND FIELD FERTILITY
DIVERSIFICATION OF THE LABOR MARKET
UNIVERSITY INVOLVEMENT
INNOVATION IN PRODUCTS
INVASIVE SPECIES
CLIMATE CHANGE
GOVERNMENT SUPPORT
WORKERS
BIODIVERSITY
TOURISM
MILK PRODUCTS (EXPORTS)
INTERNATIONAL COOPERATION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DIVERSIFICATION OF THE LABOR MARKET
UNIVERSITY INVOLVEMENT
INNOVATION IN PRODUCTS
INVASIVE SPECIES
CLIMATE CHANGE
GOVERNMENT SUPPORT
WORKERS
BIODIVERSITY
TOURISM
INTERNATIONAL COOPERATION


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Hyperbolic Tangent
State Prediction:
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Preferred State
Actual State
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SUSTAINED PASTURE AND FIELD FERTILITY
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ECONOMIC SUSTAINIBILITY
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PUBLIC INTEREST
SUSTAINED PASTURE AND FIELD FERTILITY
DIVERSIFICATION OF THE LABOR MARKET
UNIVERSITY INVOLVEMENT
INNOVATION IN PRODUCTS
INVASIVE SPECIES
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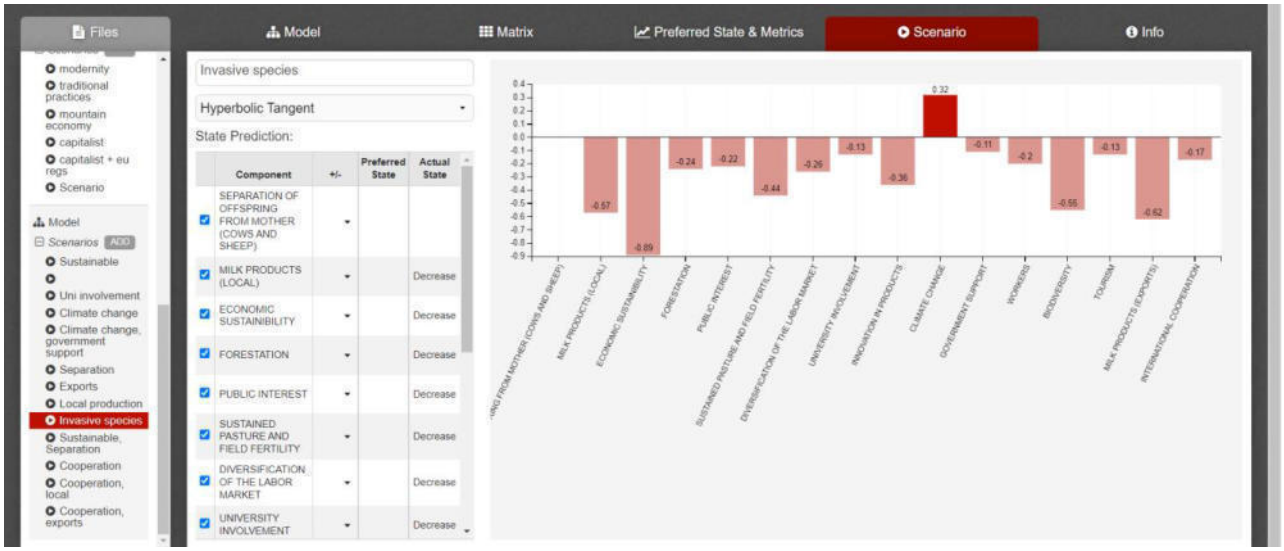
TOURISM
MILK PRODUCTS (EXPORTS)
INTERNATIONAL COOPERATION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Cooperation, exports
Invasive species
Hyperbolic Tangent
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UNIVERSITY INVOLVEMENT
INNOVATION IN PRODUCTS
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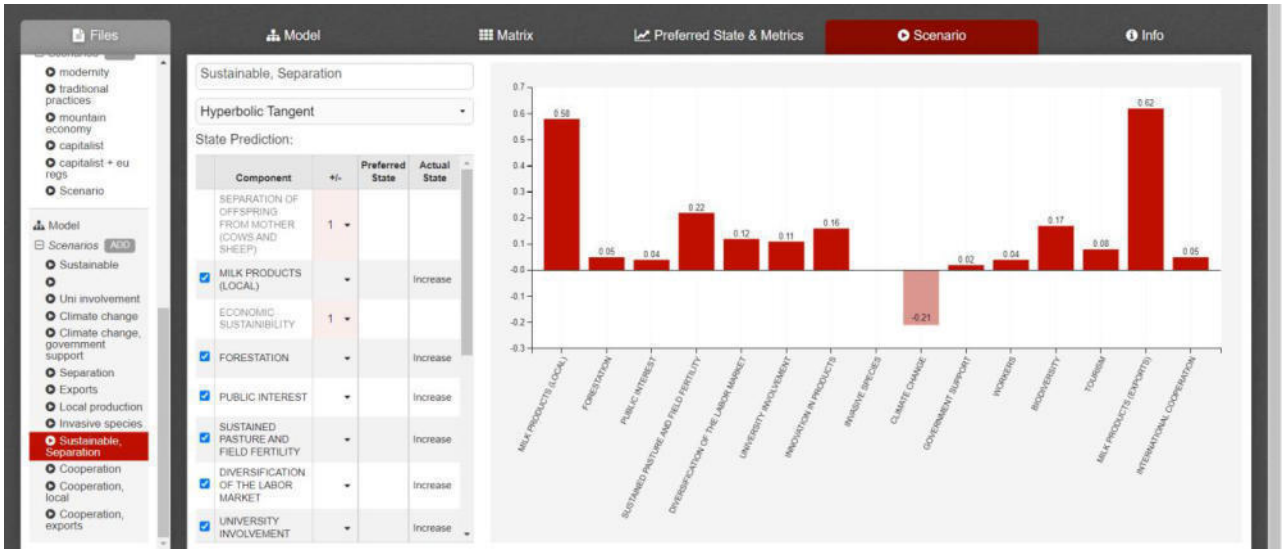
BIODIVERSITY
TOURISM
MILK PRODUCTS (EXPORTS)
INTERNATIONAL COOPERATION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State Prediction:
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UNIVERSITY INVOLVEMENT
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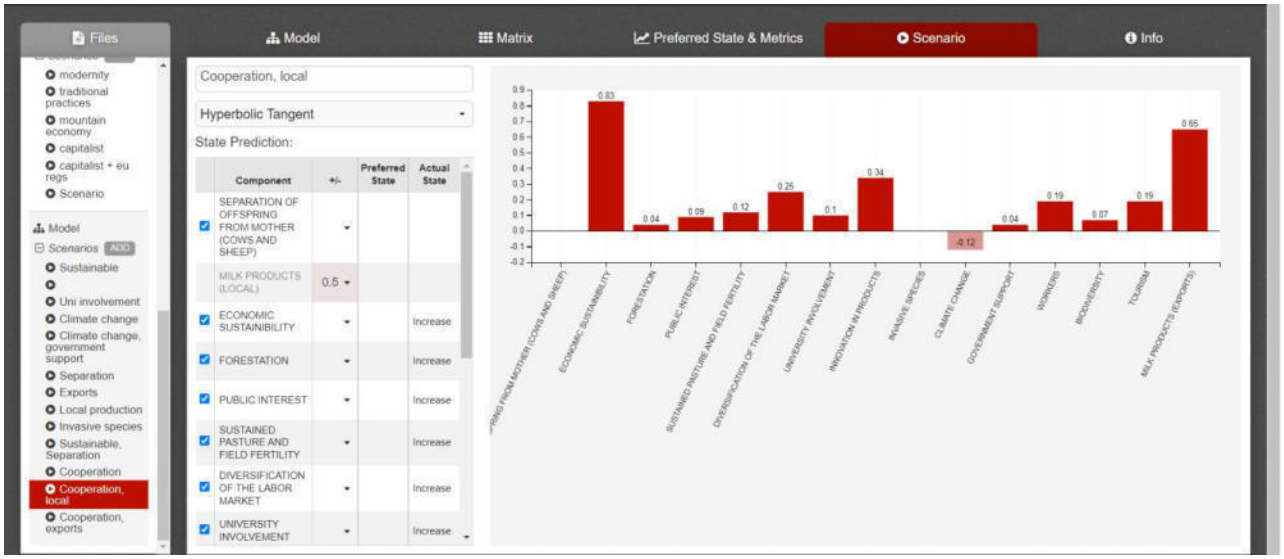
MILK PRODUCTS (EXPORTS)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modernity
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Scenarios ADD
Sustainable
Uni involvement
Climate change
Climate change, government support
Separation
Exports
Local production
Invasive species
Sustainable, Separation
Cooperation
Cooperation, local
Cooperation, exports
Cooperation, local
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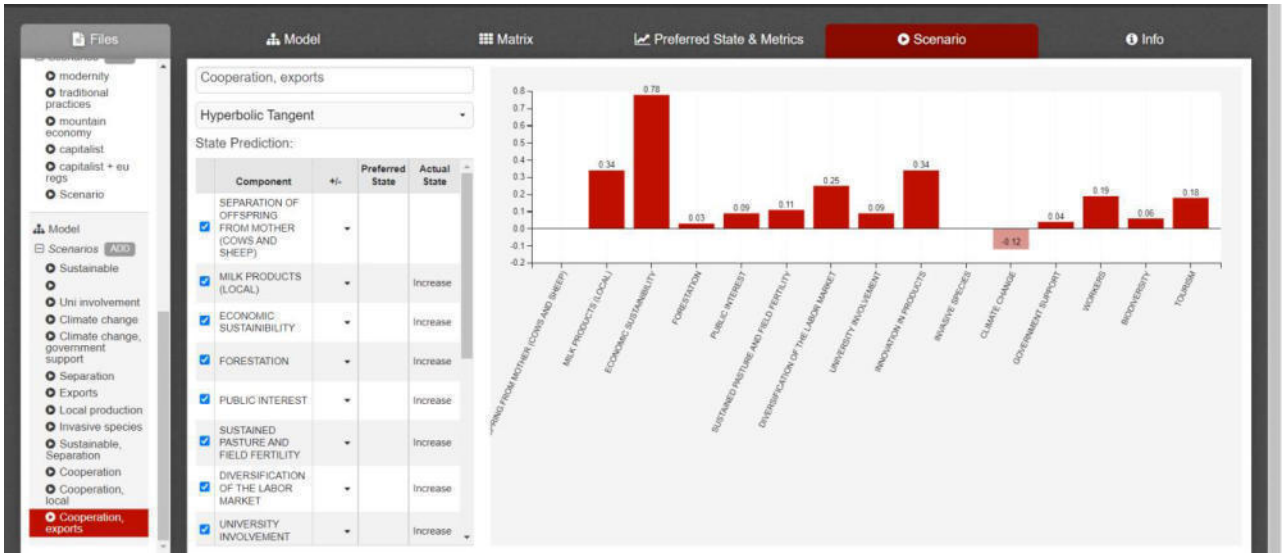
MILK PRODUCTS (EXPORTS)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capitalist
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Scenario
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Scenarios ADD
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Climate change, government support
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Sustainable, Separation
Cooperation
Cooperation, local
Cooperation, exports
Cooperation, exports
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State Prediction:
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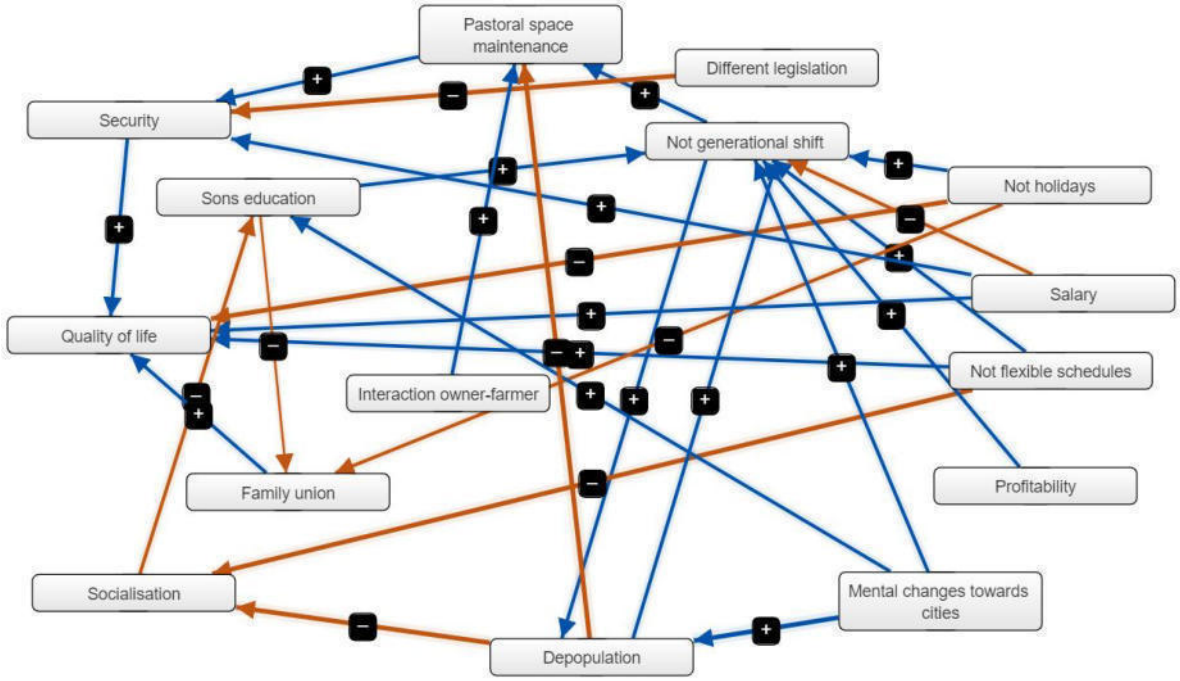
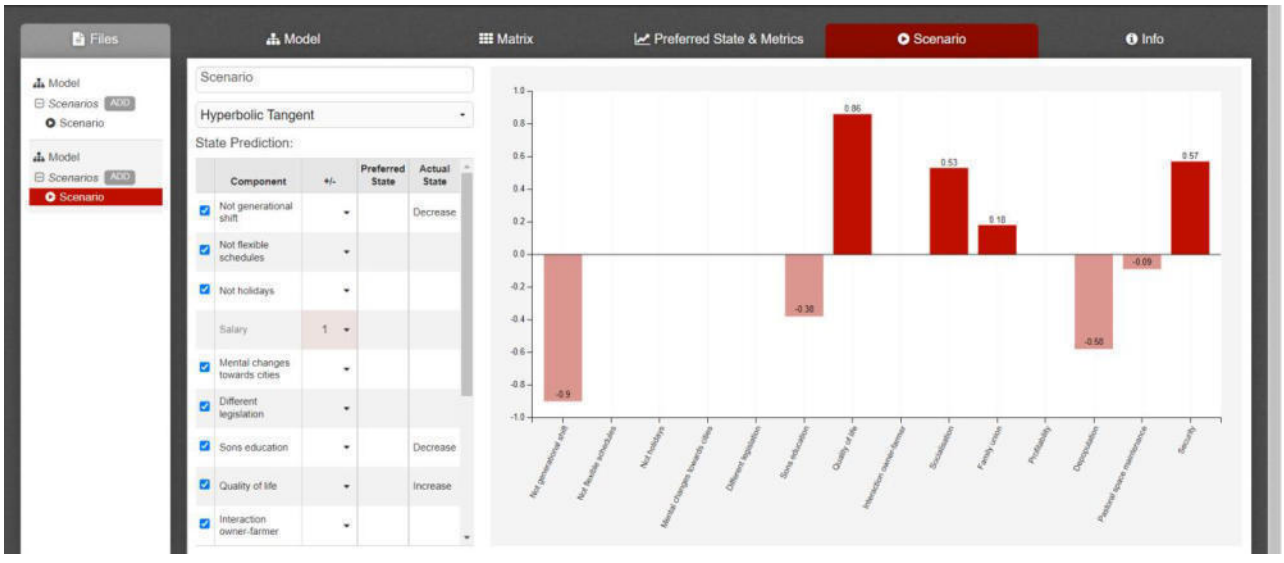
MILK PRODUCTS (LOCAL)
ECONOMIC SUSTAINIBILITY
FORESTATION
PUBLIC INTEREST
SUSTAINED PASTURE AND FIELD FERTILITY
DIVERSIFICATION OF THE LABOR MARKET
UNIVERSITY INVOLVEMENT
INNOVATION IN PRODUCTS
INVASIVE SPECIES
CLIMATE CHANGE
GOVERNMENT SUPPORT
WORKERS
BIODIVERSITY
TOURISM

Team: Catholic University of Valencia (Sport Sciences)

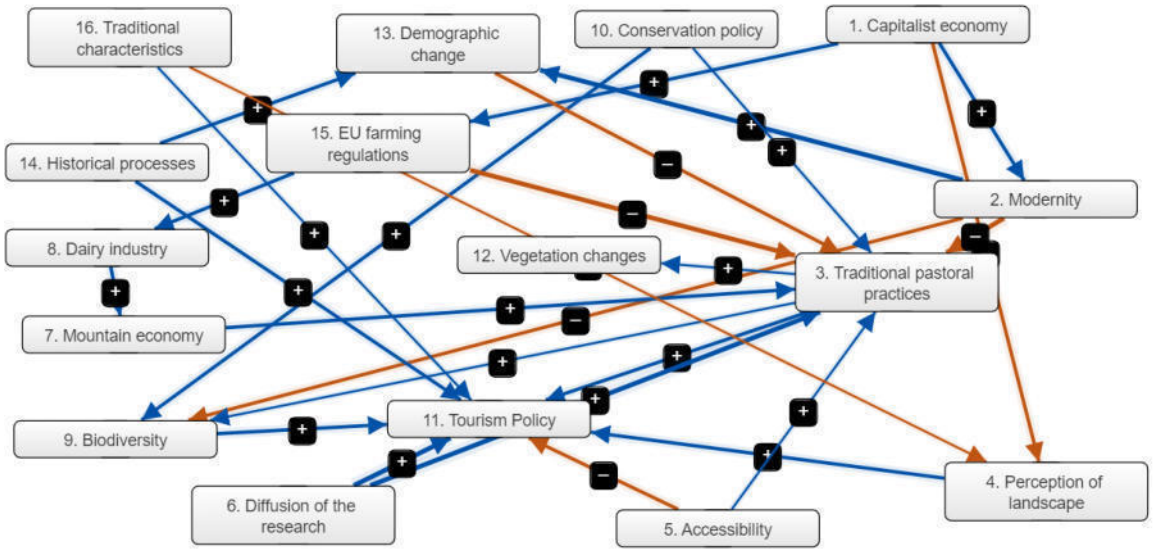
Case study: “A historical transhumance still alive”. Following the case of one of the few shepherds still practicing transhumance today, the topic discussed concerned the factors that can foster or limit such practice in modern times.

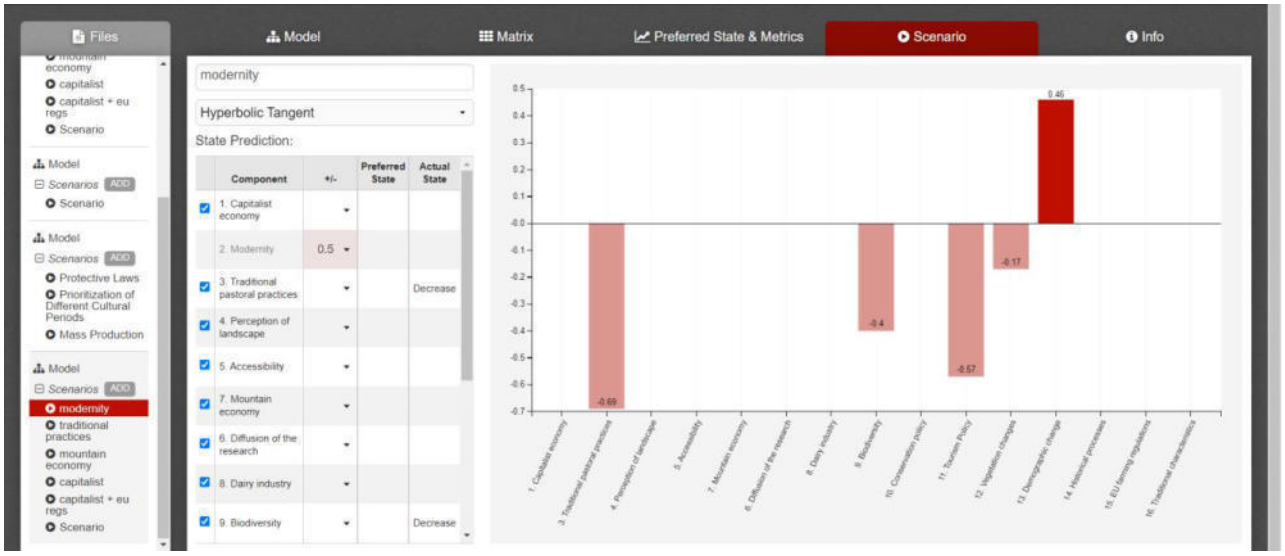


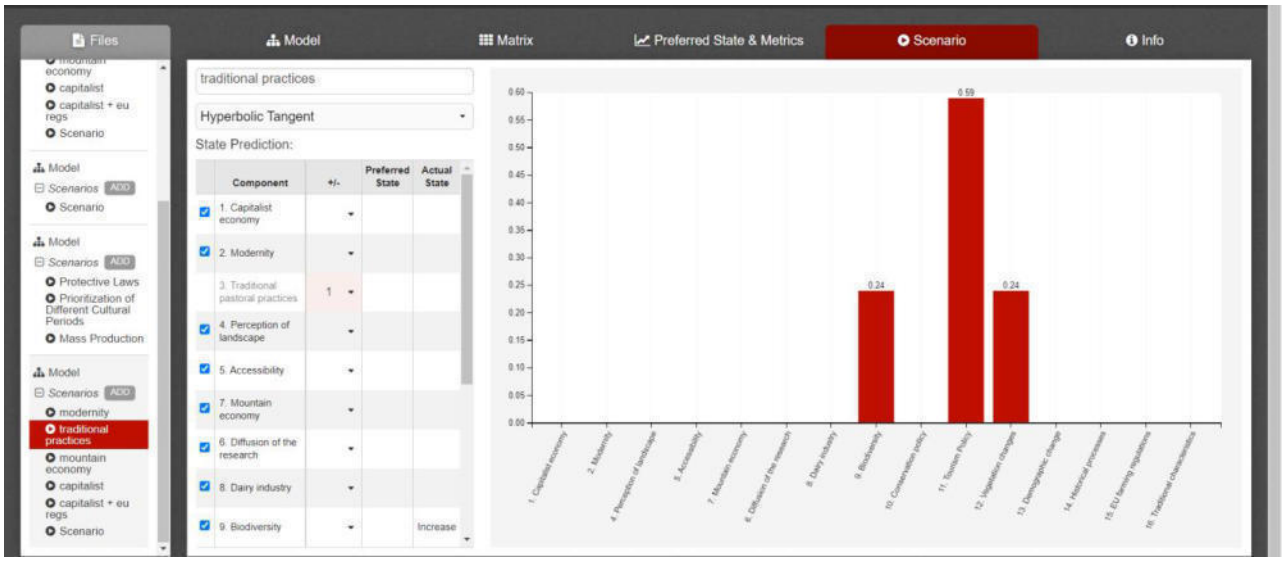


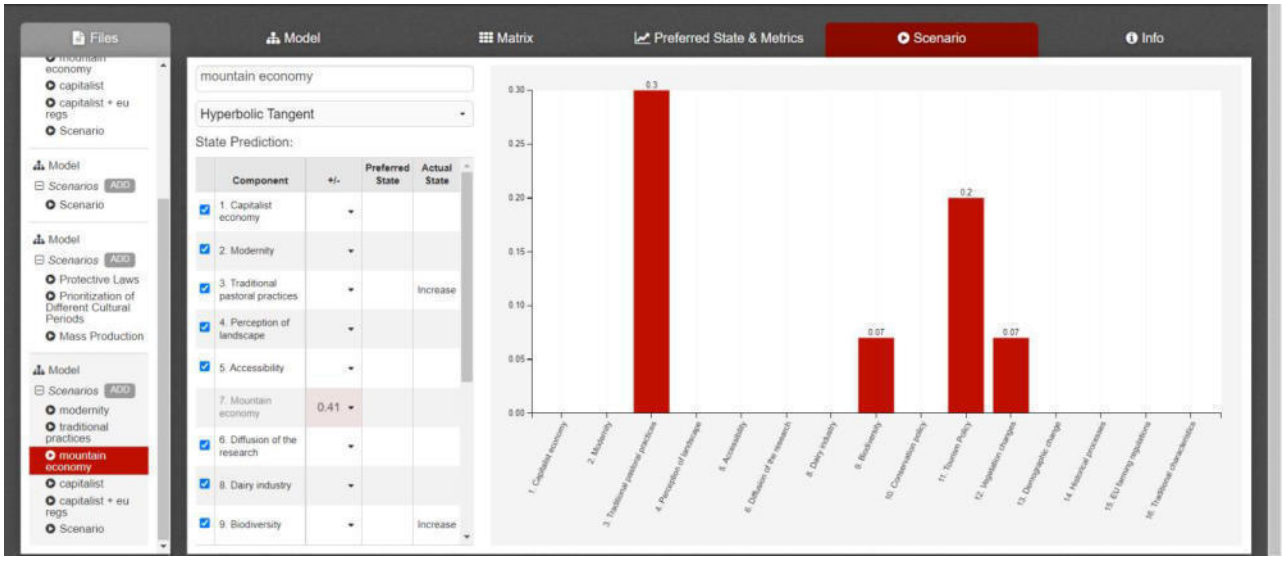
Team: University of Newcastle (Public Health, History/Archaeology, Environmental Sciences)

Case study: "Ethnoarchaeology of Western Alpine upland Landscapes (EthWAL)". This group discussed about the role that different policies and practices can have in shaping and changing the preservation of a certain mountain landscape and its perception by the people.





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2. Modernity
3. Traditional pastoral practices
Increase
4. Perception of landscape
5. Accessibility
7. Mountain economy
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6. Diffusion of the research
8. Dairy industry
9. Biodiversity
Increase
capitalist
capitalist + eu regs
Scenario
Model
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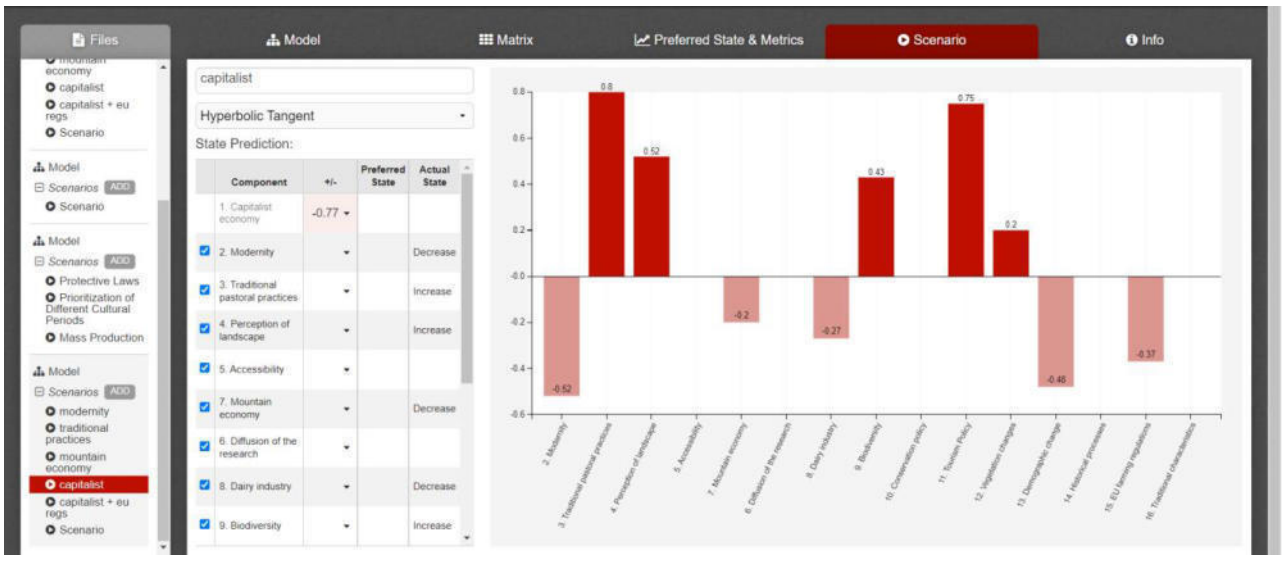
Protective Laws
Prioritization of Different Cultural Periods
Mass Production
modernity
traditional practices
mountain economy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Hyperbolic Tangent
State Prediction:
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Actual State
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2. Modernity
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3. Traditional pastoral practices
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4. Perception of landscape
5. Accessibility
7. Mountain economy
Decrease
6. Diffusion of the research
8. Dairy industry
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9. Biodiversity
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Preferred State & Metrics
Scenario
Info
capitalist + eu regs
Hyperbolic Tangent
State Prediction:
Component
+/-
Preferred State
Actual State
1. Capitalist economy
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2. Modernity
Increase
3. Traditional pastoral practices
Decrease
4. Perception of landscape
Decrease
5. Accessibility
7. Mountain economy
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6. Diffusion of the research
8. Dairy industry
Increase
9. Biodiversity
Decrease
capitalist + eu regs
Scenario
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Scenarios ADD
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Prioritization of Different Cultural Periods
Mass Production
modernity
traditional practices
mountain economy
capitalist

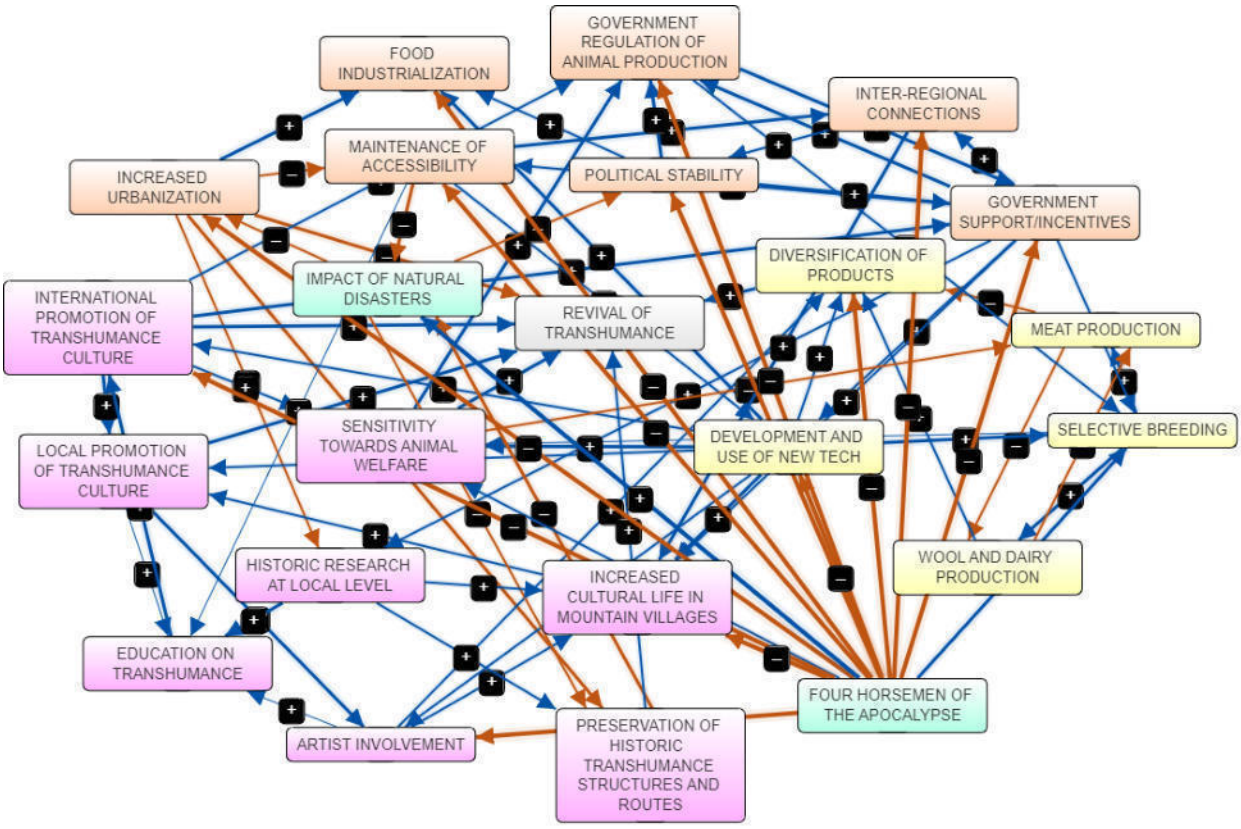
Parallel session 2 – Thursday 3/2/2022

After a recap of the topics that Pablo Vidal addressed on Monday in his lecture on transhumance in Spain, students were given the following four topic questions to choose from:

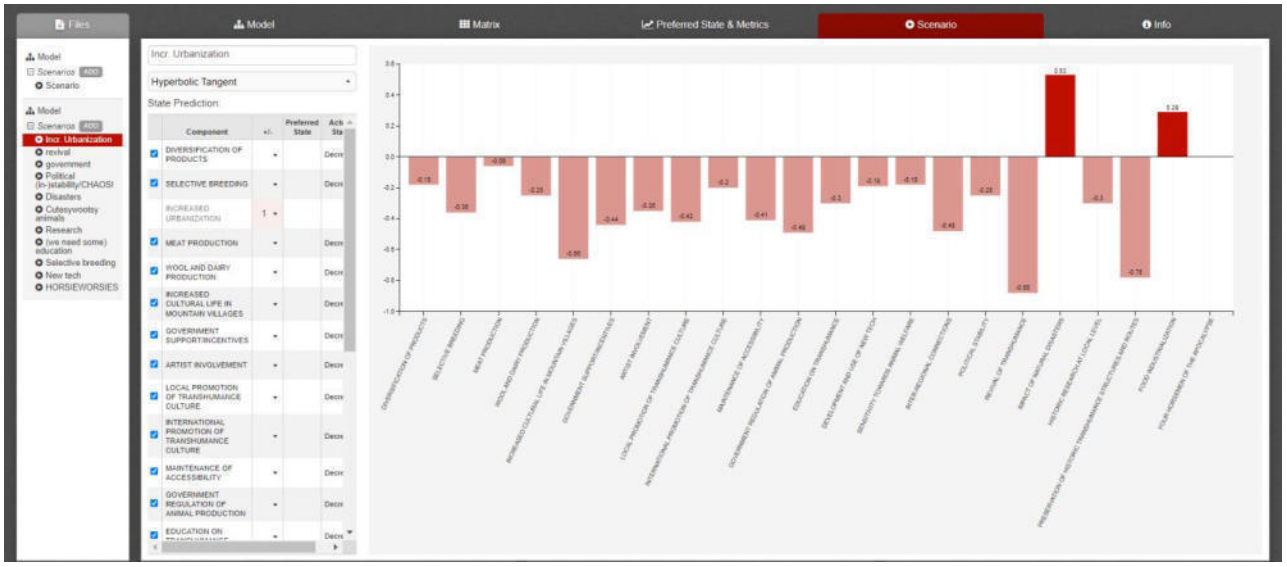
1. What factors led to the current conformation of transhumance landscape?
2. What are the factors that can preserve transhumance landscapes today?
3. What factors can contribute to a revival of the practice of transhumance?
4. What factors situate transhumance practices within regional and national social structures?

The Greek, Icelandic and Spanish teams chose the third question; the UK team chose the second one.

After all groups had presented their works, it was decided to merge the four maps into one to be presented and discussed on the next day during the last plenary session. The topic concerned the possibility of reviving transhumance in modern times.



The students created eleven scenarios: each was related to a change in the value of only one of the factors.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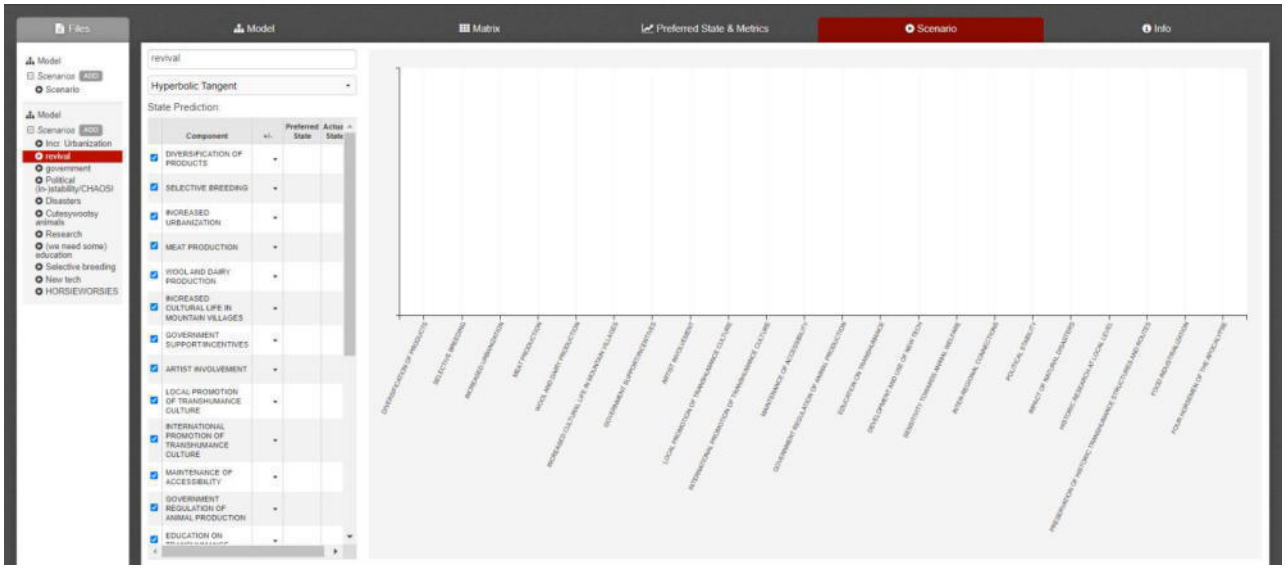
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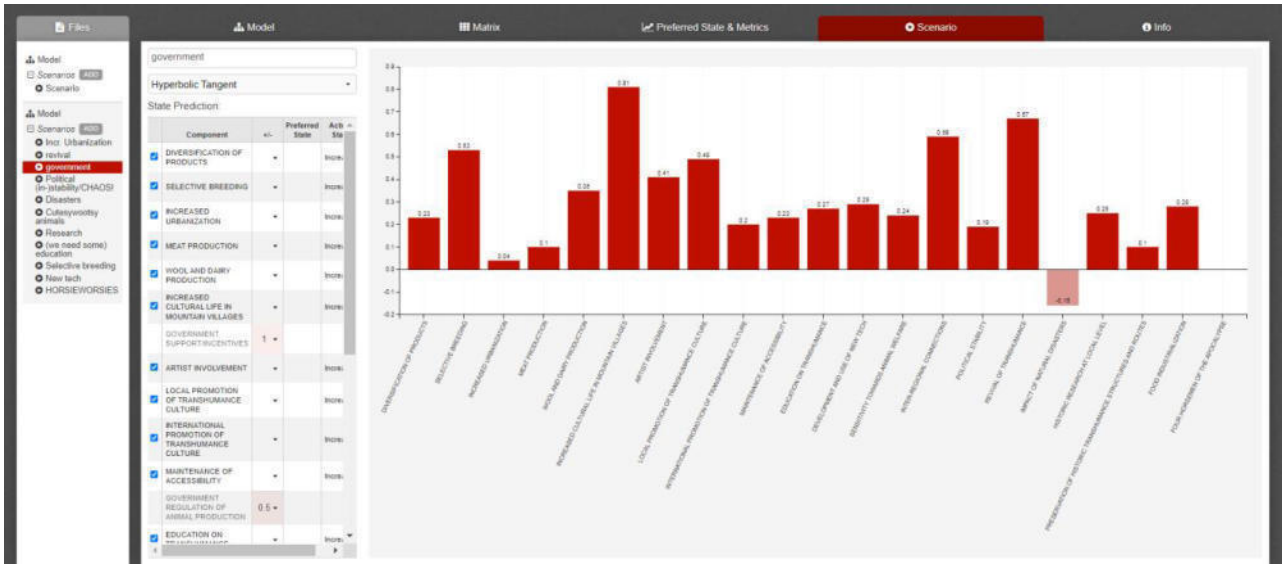
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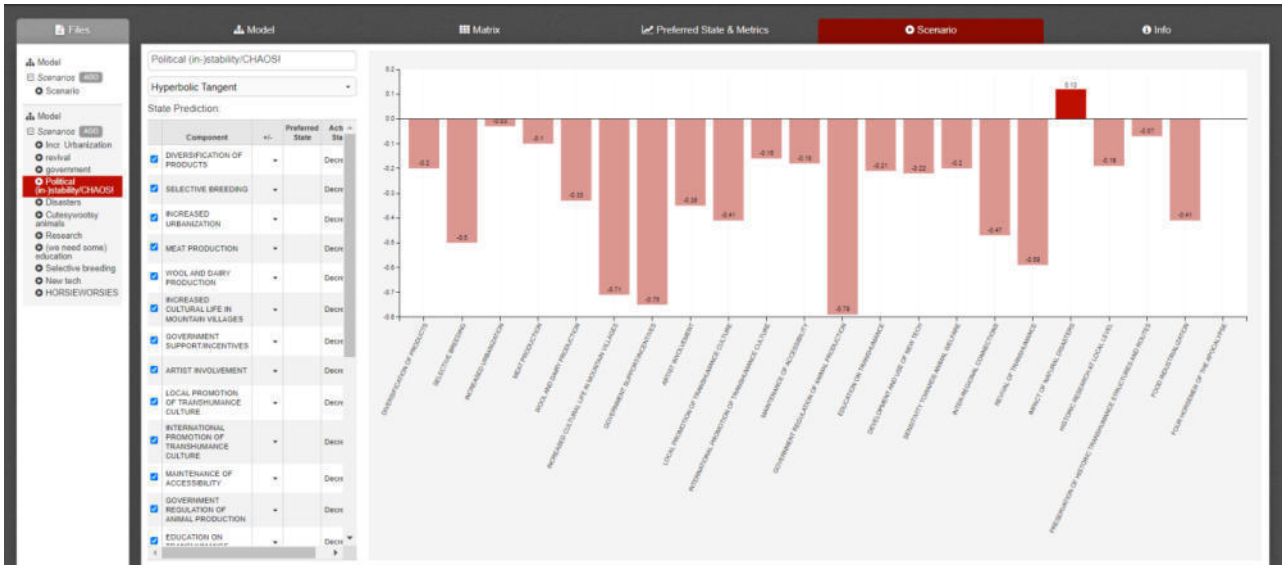
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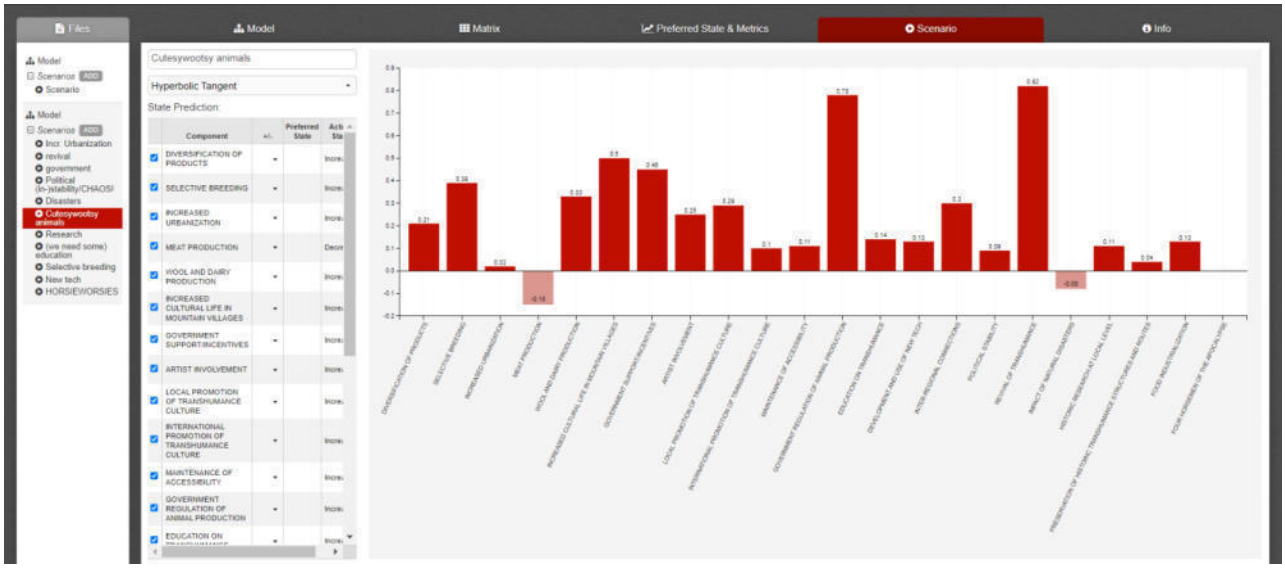
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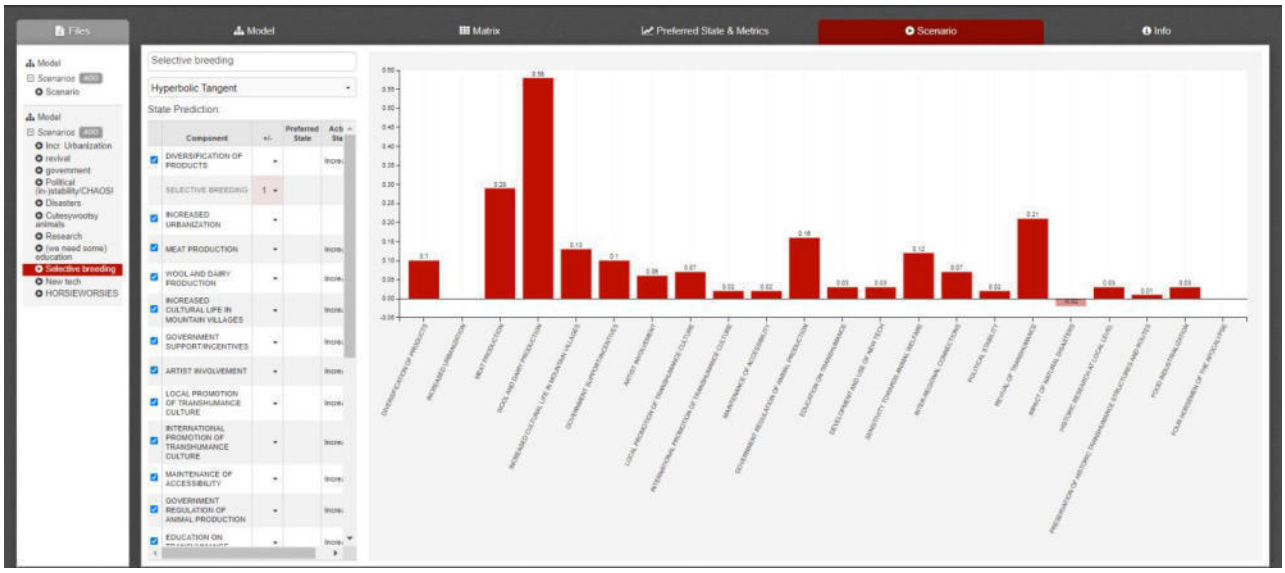
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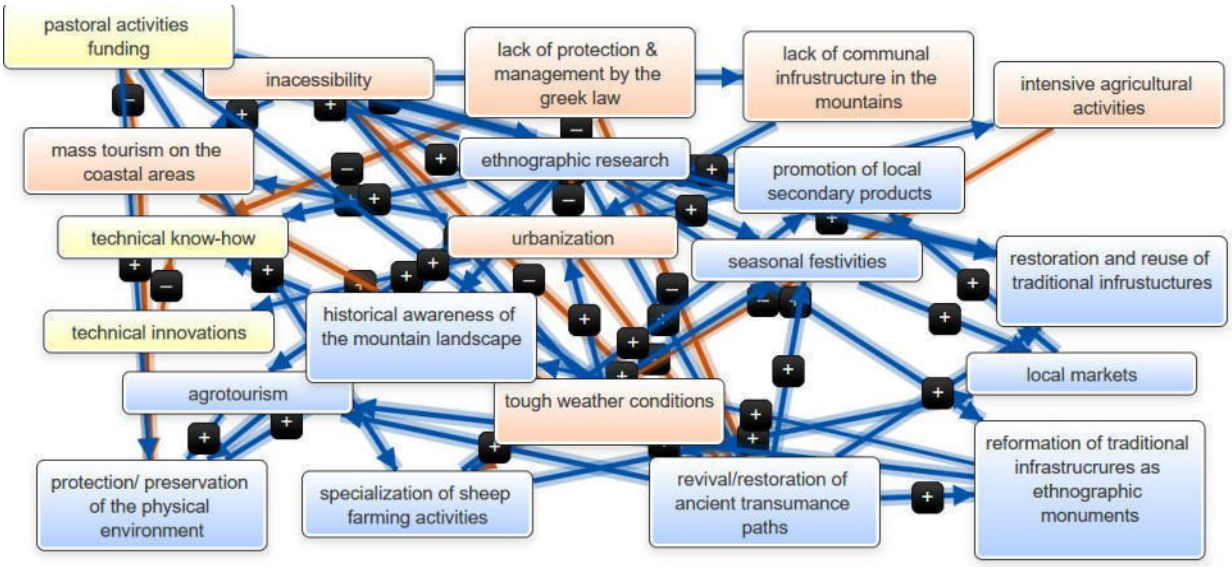
GROUP 2 – REPORT ON PARALLEL SESSIONS

DAY 1 – Tuesday 1/2/2022

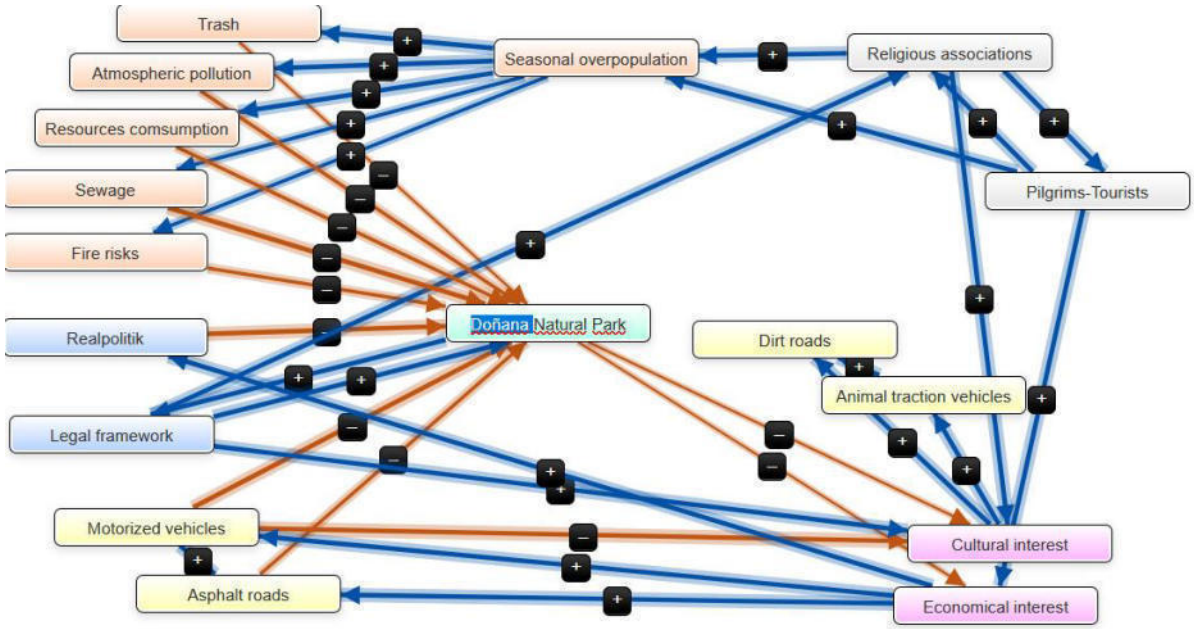
Team: National and Kapodistrian University of Athens (NKUA, GREECE)
Case Study: GR-02-1, Preservation of traditional pastoral activities in the Limnakaro Plateau, Crete, GREECE

Use of the tool to investigate connections between positive and negative factors affecting the main topic which was the protection of traditional sheep farming activities in the area of Limnakaro, on the mountains of Greece Crete.



Team: Sevilla Pablo de Olavide (UPO, SPAIN)
Case Study: Protection of the Doñana Natural Part, El Rosio, Sevilla, Spain

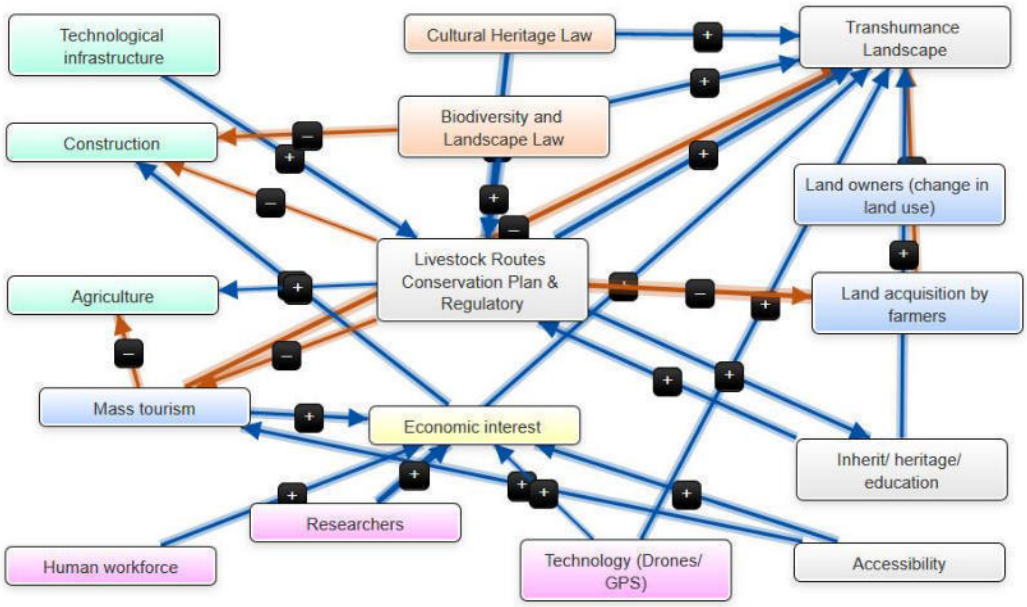
Use of the tool to investigate the negative factors that affect the small community of El Rosio and the neighbouring Doñana Natural Park, in Sevilla (Spain) during the annual Romeria pilgrimage, and the ways the local community can deal with the problems without stopping this important pilgrimage.



Team: University of Newcastle (UN, UK)

Case Study: ES-03-1, Conservation of cultural heritage associated with the Andorran livestock routes, Spain

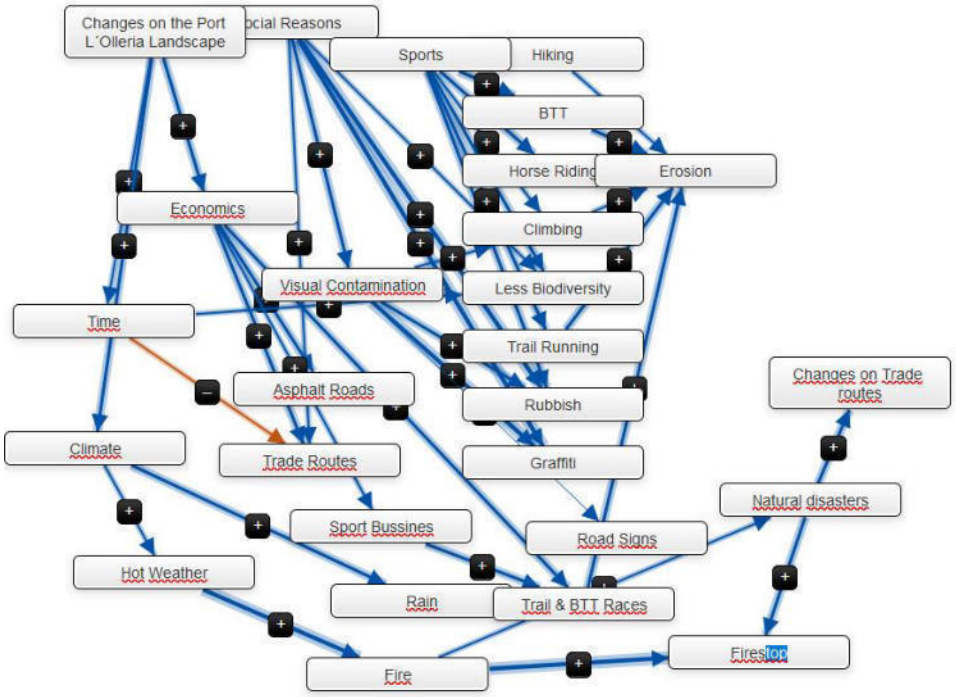
Use of the tool to investigate connections between positive and negative factors affecting the main topic which was the conservation of the cultural heritage associated with the transhumance routes in Andorra.



Team: Catholic University of Valencia (CUV, SPAIN)

Case Study: Conservation of transhumance paths in the area of Valencia

Use of the tool to investigate connections between factors that can help to preserve transhumance paths in the area of Valencia through the introduction of sport activities.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BTT
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Time
Trail Running
Asphalt Roads
Rubbish
Changes on Trade routes
Climate
Trade Routes
Graffiti
Natural disasters
Sport Bussines
Road Signs
Hot Weather
Rain
Trail & BTT Races
Firestop
Fire

DAY 2 – Thursday 3/2/2022

Mapping of a fictitious case study with the following topics

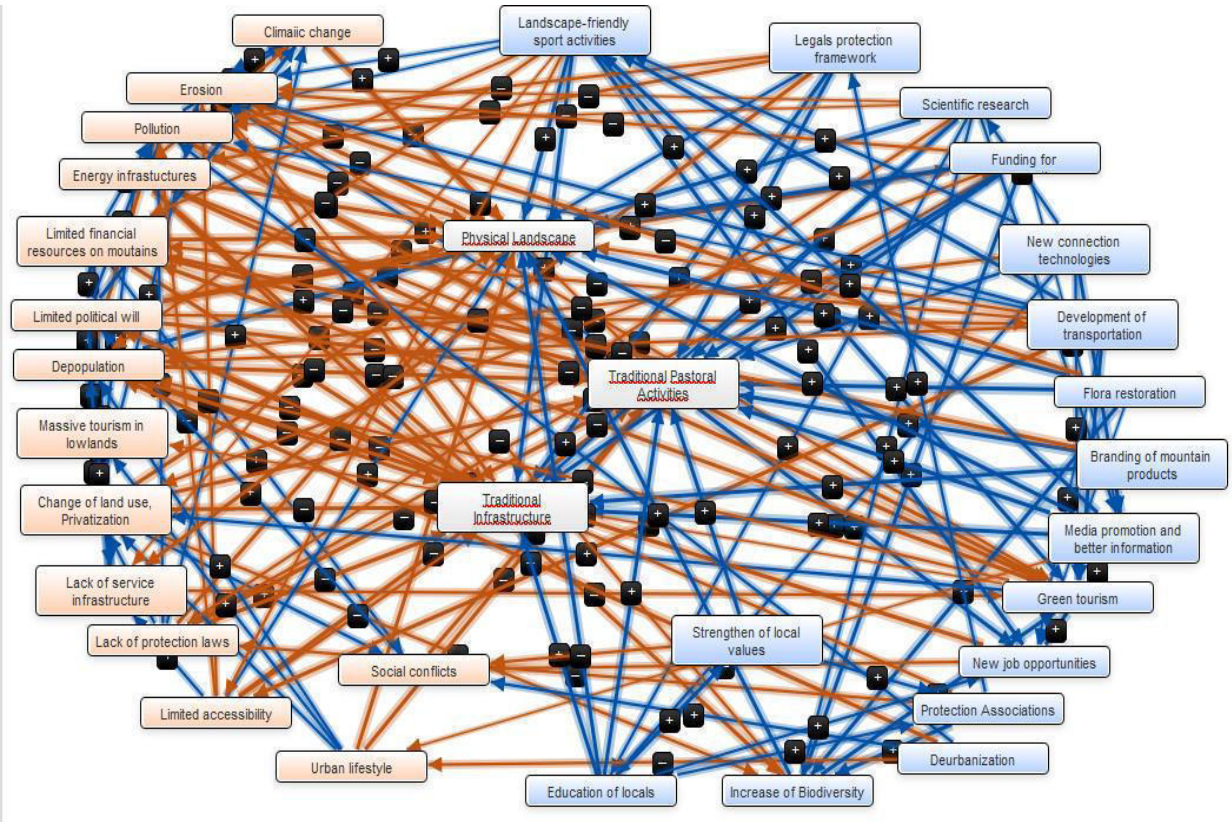
In mountain areas which factors affect

1) **The Physical Landscape**
2) **The Traditional pastoral activities**
3) **The Infrastructure associated with the traditional pastoral activities**

and what strategies or policies can be implemented for their preservation

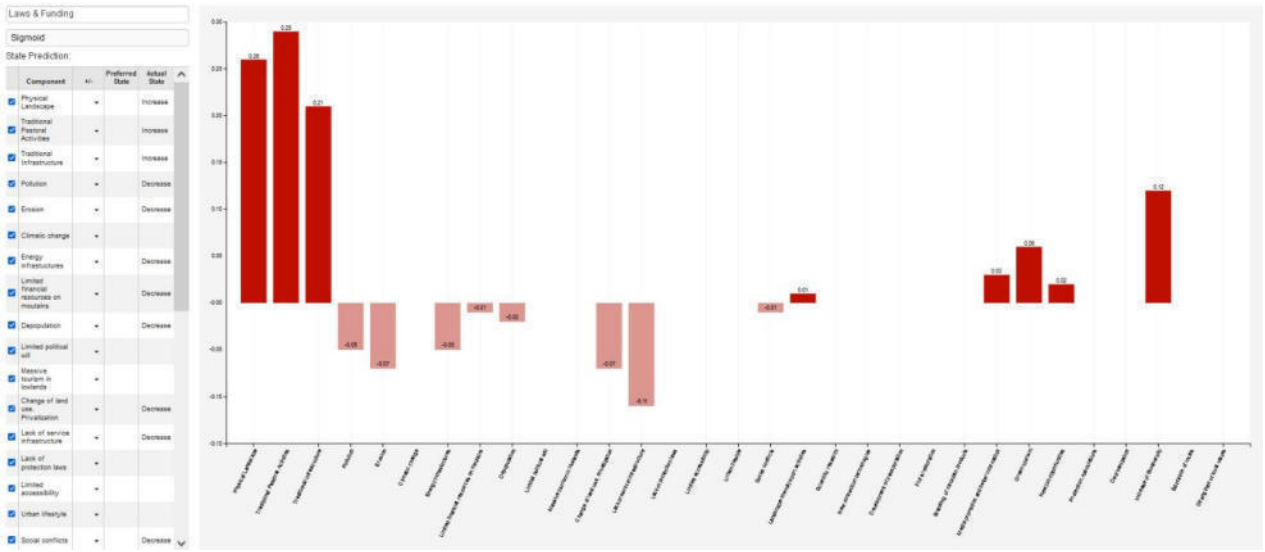
The Mental Map

The entire group (i.e. all the subgroup members) suggested 16 negative and 16 positive factors and investigated their connections with the three main issues of the model (physical landscape, traditional pastoral activities, traditional infrastructure), and between each other.
The result was a complex and sophisticated mental map, in which the factors affected both directly and directly the main three issues



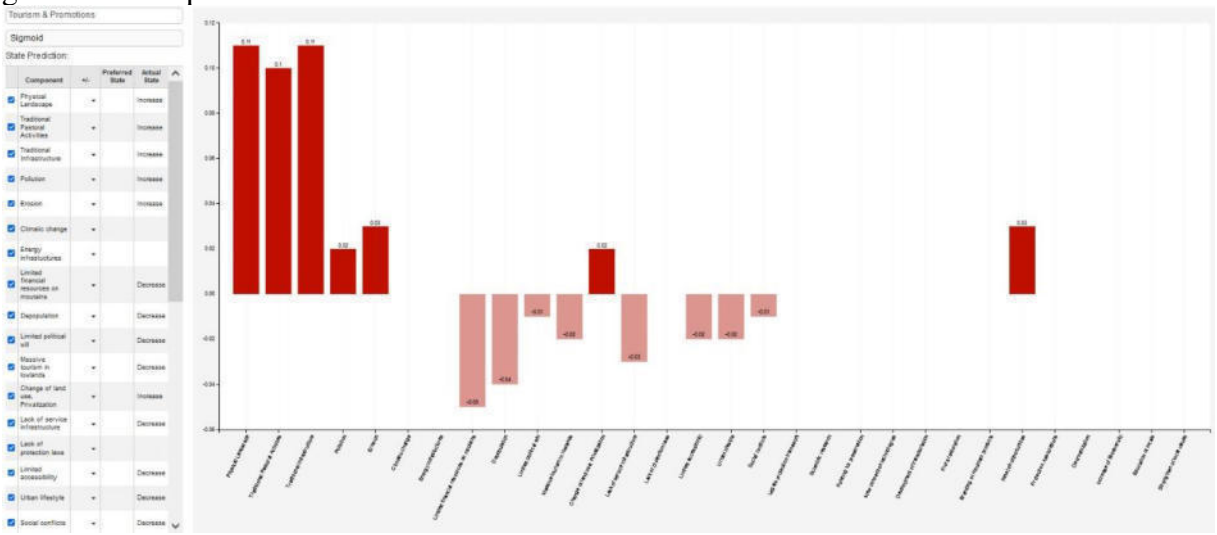
The Scenarios

The team experimented with several different scenarios
Scenario 1: Govermental policies for the preservation and protection of the three main issues
By introducing law for protection and increasing funding the government can improve the preservation of physical landscape, traditional pastoralism and traditional pastoral infrastructure by 0.2-0.3.



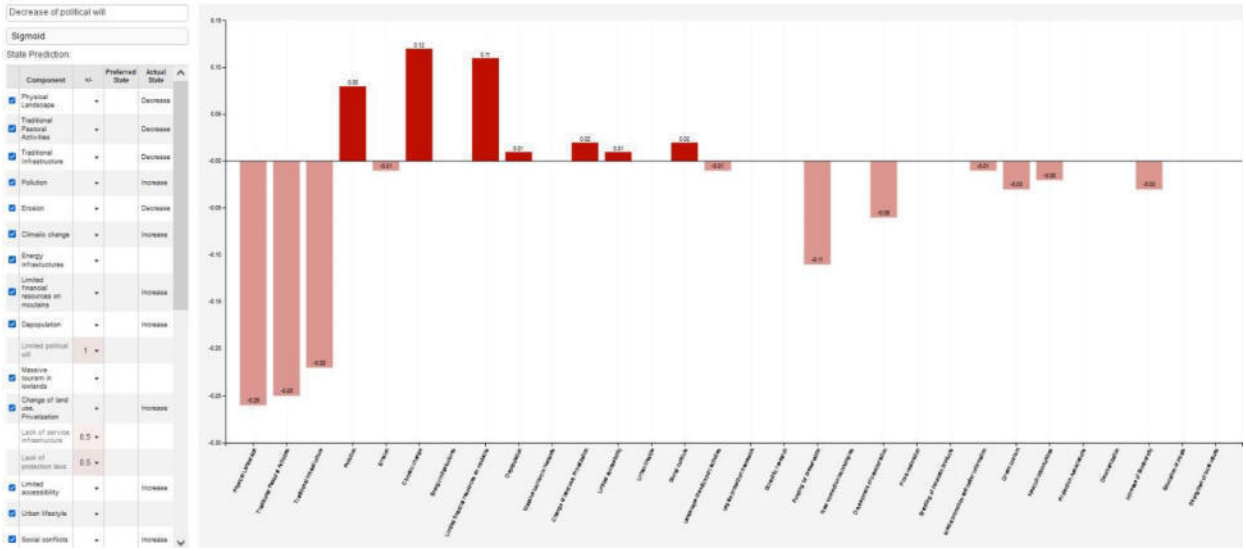
Scenario 2: Increase of tourism

The increase of tourism on the mountains, either by promoting Green Tourism or by introducing sport activities had a positive effect on the three main issues, but yet at a smaller scale than governmental policies.



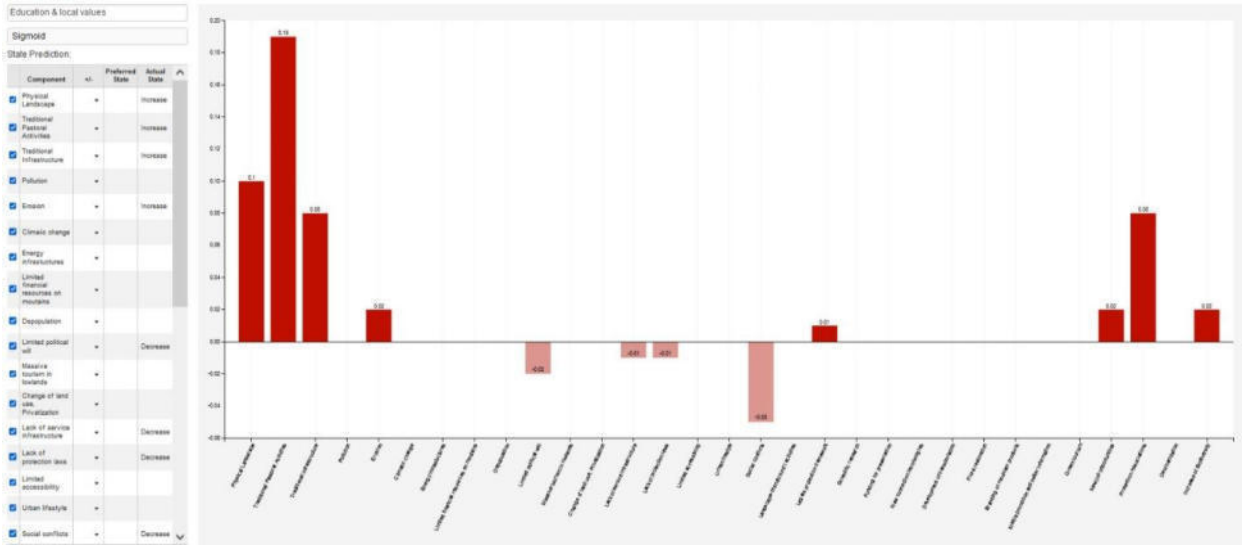
Scenario 3: The bad scenario of decreased political will

A bad scenario according which the central government has limited political will to protect the mountain physical and natural landscape (i.e. no protection laws, no funding) had serious effects and contributed to their deterioration by an average of -0.25.



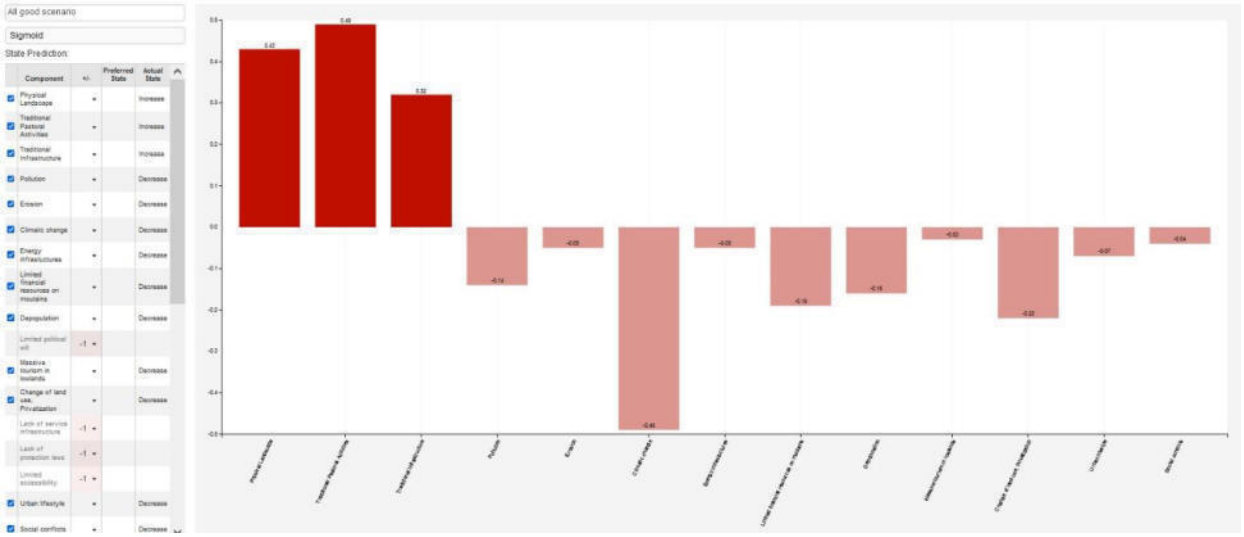
Scenario 4: Enhancement of education and strengthening of local values

In an effort to investigate the importance and gravity of abstract positive factors, such as the enhancement of the education of the locals and the strengthening of the social values of the mountain communities, we observed a small improvement of the main three issues by 0.1-0.2.



Scenario 5: The best scenario

Finally, we experimented in the best possible scenario, in which all positive factors are increased, and some of the human-related negative factors are decreased, and we observed that it was possible to improve protection and preservation of physical landscape, traditional pastoral activities and traditional pastoral infrastructure, but still not more than 0.3-.04, which means not more than 2-3 times above the aforementioned positive scenarios. This is because some of the positive factors may have also some negative indirect effects to the main issues of mental map. For example, special types of tourism, such as sports and green tourism, still have some impact in the environment, despite their landscape-friendly character.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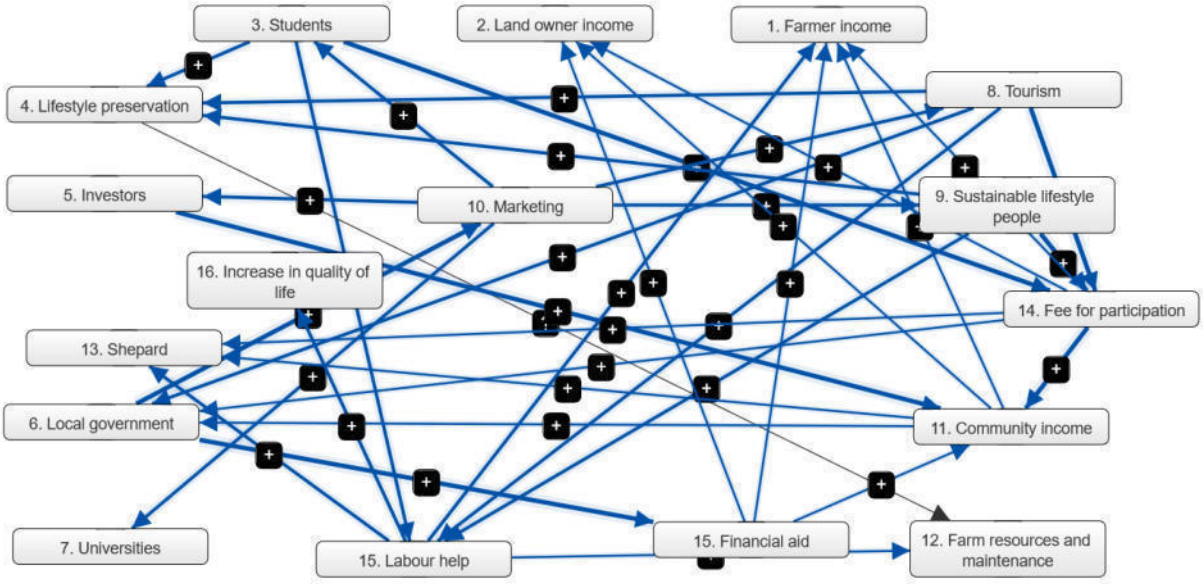
Increase
Traditional Pastoral Activities
Increase
Traditional Infrastructure
Increase
Pollution
Decrease
Erosion
Decrease
Climatic change
Decrease
Energy infrastructures
Decrease
Limited financial resources on mountains
Decrease
Depopulation
Decrease
Limited political will
-1
Massive tourism in lowlands
Decrease
Change of land use, Privatization
Decrease
Lack of service infrastructure
-1
Lack of protection laws
-1
Limited accessibility
-1
Urban lifestyle
Decrease
Social conflicts
Decrease

GROUP 3 – REPORT ON PARALLEL SESSIONS

DAY 1

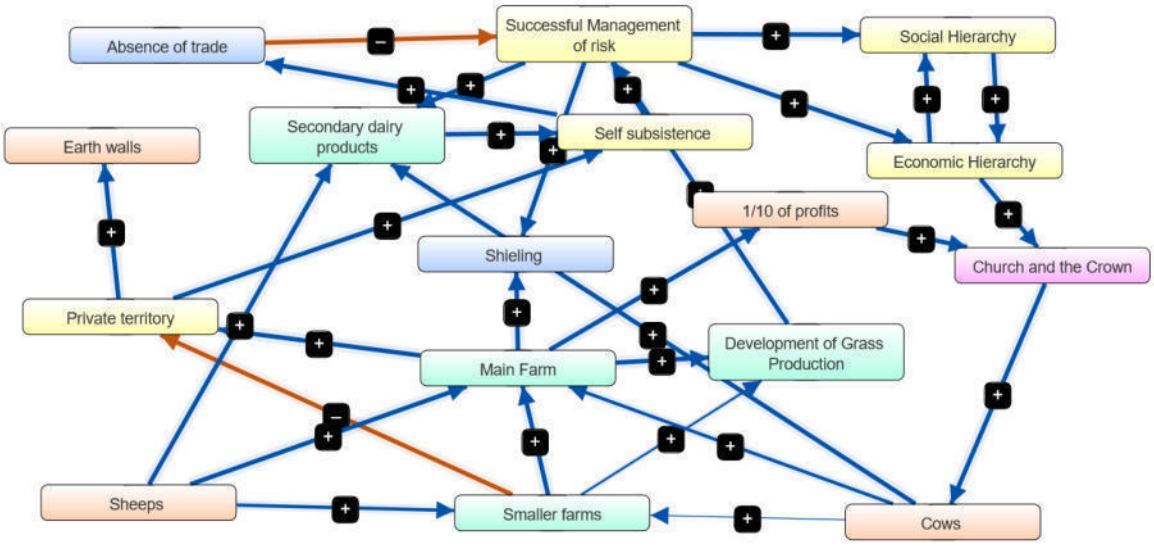
Iceland – UI/HI – ES02

Use of the tool to create an ideal scenario, with only positive connections, to preserve traditional knowledge of pastoral way of life and production model through self-funded apprentices, young volunteers, from Europe maybe anthropologists or tourists who want to learn.



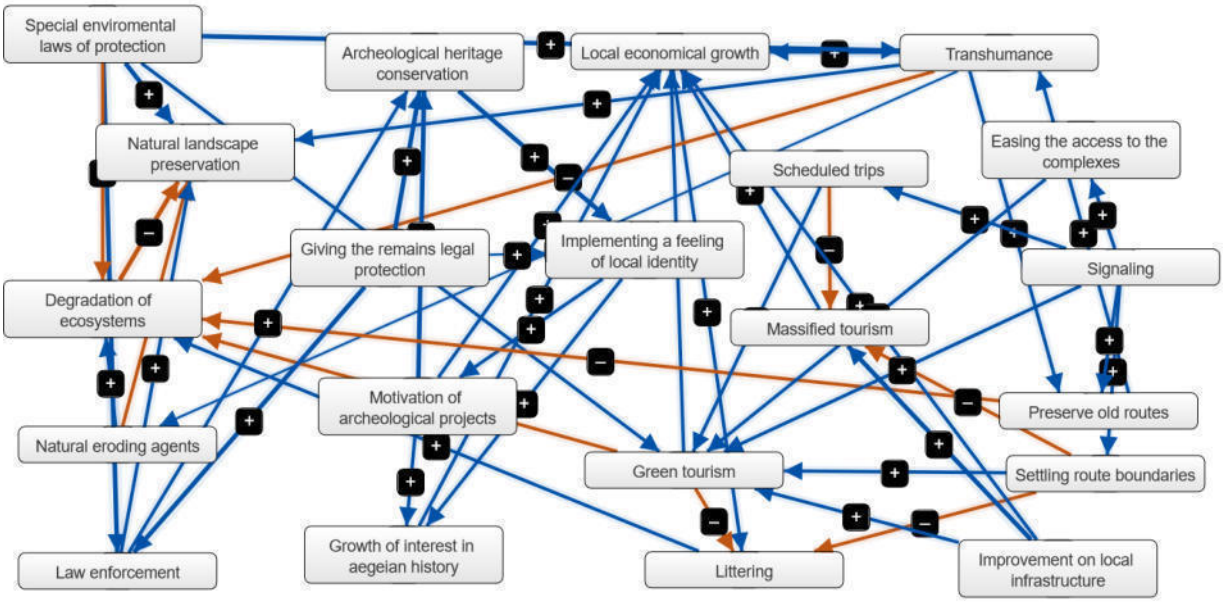
Greece – NKUA – IS01

Use of the tool to map connections between elements in order to better understand the social and economic organisation of a past (medieval) society.



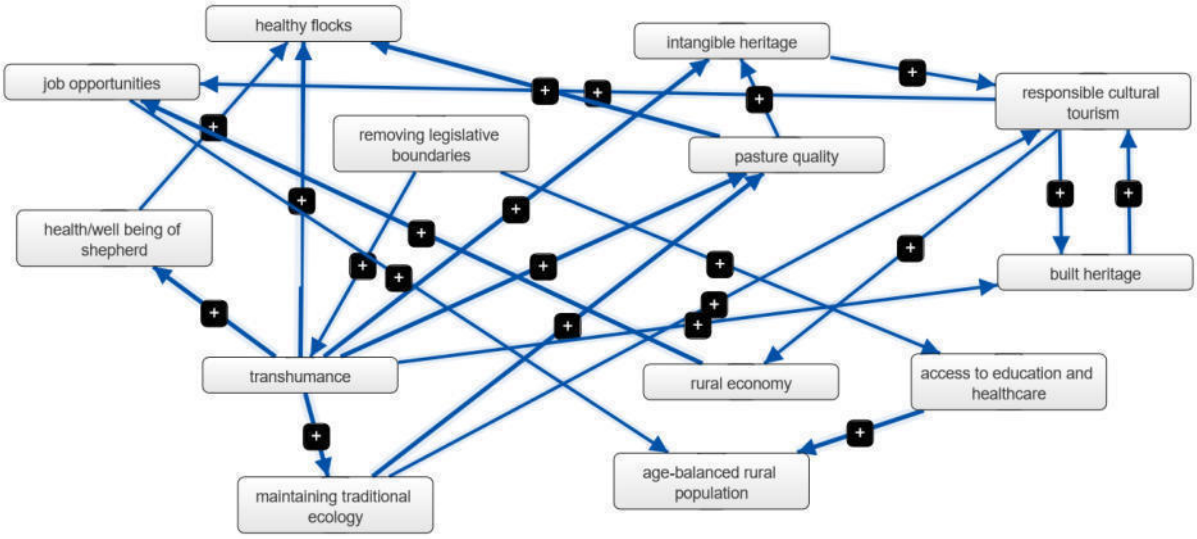
Spain – Pablo de Olavide – GR01

Use of the tool to map all factors and stakeholders in order to find the best plan to preserve the environment, the landscape and the cultural remains in it.



England – New Castle – ES01

Use of the tool to create an ideal scenario, with only positive connections, to find ways in which the young generation can have increased interest and profit in carrying on the transhumant way of production. Employment opportunities to keep people in these areas.



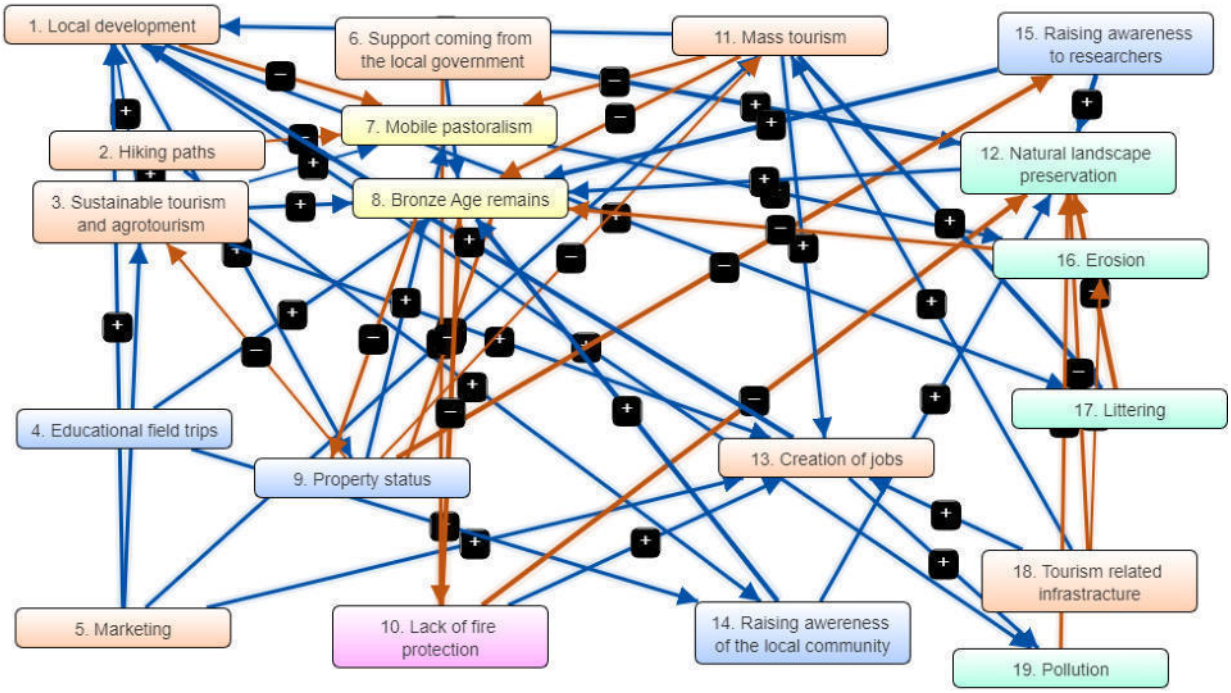
DAY 2

Mapping of case study GR01

TOPIC

Which factors are affecting the revitalization of the area and interpretation of the archaeological site?

- **How to do it without endangering the landscape and the archaeological site**
- **Take into consideration local development**
- **To what extent can we revitalise the area?**



<u>Possible Outcomes</u>

A scenario in which we increase awareness for the research community and the local stake holders plays well for the local economy, the environment and the archaeological remains as well. However, modern-day pastoralist activities seem to be confliction with the preservation and the development of archaeological sites for the public as property status issues might arise.

Experiment with more scenarios and let us know about your thoughts or results

PABLO DE OLAVIDE STUDENT COOMENTING ON THE 2ND DAY WORKSHOP & THE FCM MAPPING OF THE GR01 CASE STUDY

- Educational field trips: this factor affects in a very strong way other factors like raising awareness of the local community and of the researchers, natural landscape preservation and Bronze Age remains, so I think this can also be used as a useful tool to help both locals and foreigners to know better and to point out the value of this archaeological site.

- Support coming from the local government: this factor is also very relevant in order to achieve our objective, so maybe it would be good to combine this institutional support with educational field trips, or that institutions promote this kind of activity.

- Natural landscape preservation: this factor is very curious because its increase has a positive effect on local development, and due to that littering and pollution can increase too, which is like a paradox.

- Erosion: it happens something similar, because the increase of erosion, according to our scenario, affects positively to natural landscape preservation, but obviously this is not true in the reality. So maybe there are some connections that might be checked in order to know what is really going on with these two factors.

NEW CASTLE STUDENT COMENTING ON THE 2ND DAY WORKSHOP

Earlier today, you asked me for some notes about my thoughts on this morning's Group 3 session and how FCM was being put to work there.

In brief, I felt there was a lot of very useful open discussion among participants in the earlier part of the session but there was no active model-making going on, with the result that much of what was said was not 'captured' in any way. It was as though the participants, in their eagerness to ensure all voices were heard and none were excluded, felt they had to thoroughly discuss and finally agree every point before model-making could begin. That part of the morning felt very unproductive, and ultimately there was no record of all that activity - it felt entirely wasted effort - until the first attempts were made to start putting components into the initial model. This was a turning point...

After coffee break, much the same discussion was had among participants, but this time through active and ongoing participation in the process of model-making. It was clear that model-making is, in fact, the very medium through which all the discussion, questioning, disagreement, trying out and acceptance/rejection of alternatives, etc, must be practiced in real time. This part of the session felt very much more productive, and the model was constantly there as the living, evolving record (as well as the medium) of the work being done.

I think that for FCM to be a useful tool for diverse participants to explore and learn about a particular phenomenon or situation, the sooner those participants can start actively engaging in model-making the better - certainly, well before any 'final' choices are made - since it is this fluid evolving making process which IS the discursive learning process. It is 'thinking through (model-)making'.

Despite its inclusive intentions, I think FCM requires a single person to lead the model-making process, acting as a combined facilitator / questioner / arbiter. I'm not sure how this sits with any notion of FCM being a 'democratic' process - much depends on the personal qualities and outlook of the individual who is doing the 'leading'. I guess ultimately FCM is more about 'inclusivity' than it is about 'democracy'...

Annex 6: case studies

1. A surviving practice of transhumance in Spain – 1 (Catholic University of Valencia)
2. A surviving practice of transhumance in Spain – 2 (Catholic University of Valencia)
3. The conservation of the cultural heritage associated with the Andorran livestock routes (Pablo de Olavide University)
4. Recovery and Management Plan for livestock routes in Andalusia (Pablo de Olavide University)
5. Green Gates programme (Pablo de Olavide University))
6. Alpine Landscapes: Pastoralism and environment in Val di Sole (Newcastle University)
7. EthWAL: Ethnoarchaeology of Western Alpine Landscapes (Newcastle University)
8. Spatial frameworks of Apulian Drover Roads (U-Space srl)
9. Contribution for the revision of the "Drover Road Framework Plan" of the Municipality of Rosciano (U-Space srl)
10. Strategies of active custody for the territories of the Province of Chieti. Pilot project in the town of Arielli (U-Space srl)
11. Bronze Age occupation of Mt. Ditki in connection with animal husbandry (National and Kapodistrian University of Athens)
12. Ancient pastoral practices in the Limnakaro plateau (National and Kapodistrian University of Athens)
13. Study of shielings and earth walls in Eyjafjörður county (University of Iceland)
14. Shielings in Southern and Northern Iceland: some comparative landscape pointers (University of Iceland)

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CASE STUDY SHEET

CS code	*ES-01*	**CS Title**	*A historical transhumance still alive*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy × Study/research ☐ Project ☐ Other		
Responsible body/Promoter	Catholic University of Valencia		
Location (region, locality)	Linares de Mora (Teruel county), Spain		
Geographical area covered	*The covered displacement is about 100 km*		
Year	*It has been studied from the last 5 years*		
Summary description	*During the last 5 years we have studied the transhumance carried out by a farmer from Linares de Mora, who during the last 30 years has moved the 6 winter months from his town in the mountains of Teruel to the valleys of the province of Castellón, with milder temperatures in winter. During this period, we have interviewed the farmer on numerous occasions, both in his summer and winter pastures, as well as accompanied during his journeys, both uphill and downhill.*		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	This displacement presents an interesting legal problem, since transhumance is carried out between two autonomous communities that have different legislation in the field of livestock. Other regulations that come into conflict are health and education, meaning that the farmer moves with his whole family to another region.		
PROBLEMS AND NEEDS TARGETED			
Problems	*The main problem encountered is the generational shift. The farmer has a healthy economic situation and lives with dignity, but nobody wants to take over his economic activity when he reaches retirement age. His two daughters work in other sectors and when the farmer retires, he will lose this traditional practice, which has been declared Intangible Heritage by the Spanish Ministry of Culture*		
Needs	The problem is difficult to solve, since the work of a shepherd, although economically viable, requires a significant amount of time. The flock must go out every day of the year, from sunrise to sunset, without Sundays or holidays. The new generations prefer another type of work, with more comforts and regulated schedules.		
Quantitative data	*Non applicable*		
FOCUS, OBJECTIVES AND OUTPUTS			
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how? *(max 750 characters for each theme)***	

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Spatial planning	YES	The farmer values the summer pastures, the winter pastures, as well as keeping the transhumance route open, by going up and down it every year
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	The use of the pastures allows the maintenance and conservation of the pastoral space, avoiding the degradation of the vegetation and the invasion of thorny plants. The maintenance of the pastures attracts animal species, especially birds, as well as allowing the conservation of the aquifers
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	The winter and summer pastures used have been used for livestock farming since at least the 13th century. The transhumant route made runs along a historical path also used since the 13th century, with important monuments associated with this activity
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	The main value is precisely the livestock route used. It is especially iconic to observe the passage of cattle over a 14th century bridge, which has been mainly used for cattle passage ever since.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The transhumant route is an excellent trekking route, associated with important landscape, environmental, botanical, fauna and heritage values
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	The survival of transhumant activity is associated with the maintenance of economic activity in small mountain villages, seriously threatened by depopulation and the migration of young people to the cities
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	*The main actor in the case presented here is the farmer himself, although the owners of the mountain pastures are also involved, an individual, the town councils of the villages of Castellón that lease him the rights to pasture in their municipal districts, as well as the veterinarian who interacts in this whole process*	
Involvement procedures	*This practice is closely related to the use of pastures, so the interaction between owners and farmers is essential. In the same vein, the interaction of the farmer and his family with his neighbours, both above and below, is of great interest. Not surprisingly, the family has spent six months in the village above and six months in the village below over the last 30 years*	
Problems and challenges	*Interestingly, the main problem is the conflicts in relation to the existence of two different legislations, those of two autonomous communities, on livestock issues, but also on health and education. This divergence creates major inconveniences for transhumant livestock farmers and does not take into account that this practice has been carried out for at least the last 800 years*	

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EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	The maintenance of the transhumant activity will make it possible to preserve the open space landscapes and to keep the grazing lands and the cattle track clean of brush
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Transhumant activity itself is a manifestation of protected intangible heritage
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	The use of transhumant roads is the major element in helping to maintain and preserve the cultural heritage associated with these livestock routes
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Extensive livestock activity has a direct impact on the maintenance of the population in the rural environment and especially in mountain areas. These places currently suffer from strong problems of depopulation and lack of job opportunities for young people
IMPLEMENTATION ISSUES	
Financial resources	*This study, carried out over the years, has been financed by the UCV Vice-Rector's Office for Research and has enabled other parallel research to be carried out*
Implementation procedures	*The main difficulty has been to accompany the farmer during his periods of transhumance. The absence of a previous programming, as well as the exigency of its schedules has made complicated to be able to follow it. The weather conditions have also been, at times, a challenge*
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	

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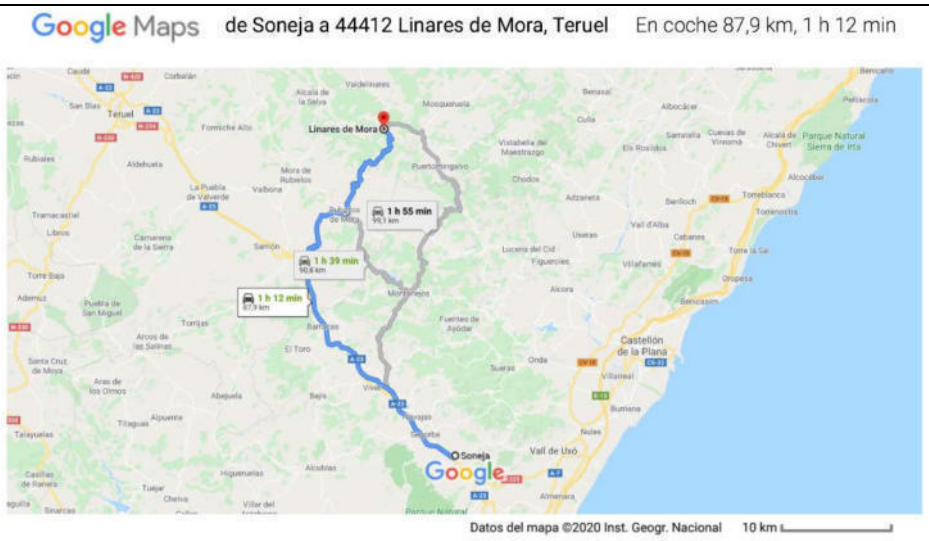

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References (including web links)	

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CASE STUDY SHEET

CS code	*ES-02*	**CS Title**	*A historical transhumance still alive*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy × Study/research ☐ Project ☐ Other		
Responsible body/Promoter	Catholic University of Valencia		
Location (region, locality)	Valdelinares (Teruel county), Spain- Ludiente (Castellón county)		
Geographical area covered	*The covered displacement is about 80 km*		
Year	*It has been studied during the last year*		
Summary description	*During the last year we have studied the transhumance carried out by a farmer from Linares de Mora, who during the last 20 years has moved the 6 winter months from his town in the mountains of Teruel to the valleys of the province of Castellón (here in two different locations so three locations per year), with milder temperatures in winter. During this period, we have interviewed the farmer on two occasions, both in his summer and winter pastures, as well as accompanied during one journey, downhiling from Valdelinares to Lucena del Cid*		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	This displacement presents an interesting legal problem, since transhumance is carried out between two autonomous communities that have different legislation in the field of livestock.		
PROBLEMS AND NEEDS TARGETED			
Problems	*The main problem encountered is the absence of marked path. He is the only person that travels on this route so every year he has problems as in some parts vegetal farmers have invaded the route and he has to change his traditional path and cross certain zones with high orographic difficulty which can be dangerous for young, old animals and the farmer himself. Moreover, he changes 3 times of location which has difficulted even more the formation of a family which is an aspect that is very valuable for him. As a farmer he has not very high technical level and has some problems in the flock that would be easy to solve with a good education. These problems affect he profitability of the business.*		
Needs	The problem is difficult to solve, since the work of a transhumant shepherd requires changing the location. The formation problem could be solved with formation programs in terms of animal handling.		
Quantitative data	*Non applicable*		
FOCUS, OBJECTIVES AND OUTPUTS			
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how? *(max 750 characters for each theme)***	
Spatial planning	YES		

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		The farmer values the summer pastures, the winter pastures, as well as keeping the transhumance route open, by going up and down it every year
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	The use of the pastures allows the maintenance and conservation of the pastoral space, avoiding the degradation of the vegetation and the invasion of thorny plants. The maintenance of the pastures attracts animal species, especially birds, as well as allowing the conservation of the aquifers
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	The winter and summer pastures used have been used for livestock farming since at least the 13th century. The transhumant route made runs along a historical path also used since the 13th century, with important monuments associated with this activity (MASÍAS DEL PEÑAGOLOSA Y SANTUARIO SAN JUAN DE PEÑAGOLOSA)
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	The main value is precisely the livestock route used. It is especially iconic to observe the passage of the sheep over a 14th century bridge, which has been mainly used for cattle passage ever since.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The transhumant route is an excellent trekking route, associated with important landscape, environmental, botanical, fauna and heritage values
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	The survival of transhumant activity is associated with the maintenance of economic activity in small mountain villages, seriously threatened by depopulation and the migration of young people to the cities
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	*The main actor in the case presented here is the farmer himself, although the owners of the mountain pastures are also involved, an individual, the town councils of the villages of Castellón that lease him the rights to pasture in their municipal districts.*	
Involvement procedures	*This practice is closely related to the use of pastures, so the interaction between owners and farmers is essential. In the same vein, the interaction of the farmer with his neighbours, both above and below, is of great interest.*	
Problems and challenges	*The major problem is the lack of formation of the farmer in animal handling. The profitability of the farm is based in the perception of direct public funds which creates a dependency. It would be very interesting to create additional funds to develop forming activities so the farmers would be more economically independent.*	
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Effects on the environment (e.g. restoration of habitats,	The maintenance of the transhumant activity will make it possible to preserve the open space landscapes and to keep the grazing lands and the cattle track clean of brush	

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increased biodiversity, climate change mitigation or adaptation…)	
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Transhumant activity itself is a manifestation of protected intangible heritage
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	The use of transhumant roads is the major element in helping to maintain and preserve the cultural heritage associated with these livestock routes
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Extensive livestock activity has a direct impact on the maintenance of the population in the rural environment and especially in mountain areas. These places currently suffer from strong problems of depopulation and lack of job opportunities for young people
IMPLEMENTATION ISSUES	
Financial resources	*This study, carried out during one year, has been financed by the faculty of veterinary and experimental sciences and with help of the local councils of the villages crossed during the path.*
Implementation procedures	*The main difficulty has been to accompany the farmer during his periods of transhumance. The absence of a previous programming, as well as the exigency of its schedules has made complicated to be able to follow it. The weather conditions have also been, at times, a challenge*
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	*Tengo fotos si necesitas*
References (including web links)	

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CASE STUDY SHEET

CS code	*ES-03*	**CS Title**	The conservation of the cultural heritage associated with the Andorran livestock routes
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research ☐ Project ☐ Other		
Responsible body/Promoter			
Location (region, locality)	Principality of Andorra		
Geographical area covered	The extension of the area covered is 468 square kilometers		
Year	2020		
Summary description	The study focuses mainly on the identification of the Andorran livestock road network and the conservation of the cultural heritage associated with these routes. From here, the aim is to identify and evaluate the factors that affect the conservation of this cultural heritage, in order to develop an early diagnosis that allows us, in turn, develop a proper maintenance plan. It will be used diffuse cognitive mapping as a tool for the identification of these factors. As a result, a prediction method will be very useful in the processes of maintenance and conservation of this cultural heritage.		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	Law 9/2003, of 12 June, of the cultural heritage of Andorra Law 7/2019, of 7 February, of environment conservation and landscape biodiversity		
PROBLEMS AND NEEDS TARGETED			
Problems	One of the problems is that the Andorran network of livestock routes has never been defined. What's more, there is no regulatory framework that regulates these routes. In the absence of a legal framework, it becomes difficult to see how the heritage associated with these livestock routes can be properly conserved and protected. Another problem is to establish which factors have a negative impact on the conservation of the heritage associated with the livestock roads and where to obtain its data.		
Needs	It would be interesting to have more technical and human resources to implement this study with guarantees.		
Quantitative data			
FOCUS, OBJECTIVES AND OUTPUTS			
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***	
Spatial planning	No		
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	No		
Protection/enhancement of tangible cultural heritage (e.g. historical paths,	Yes	The study determines the main factors that may affect the tangible cultural heritage. Making a general diagnosis about the state of conservation of this heritage and establishing priorities when we	

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archaeological sites, architecture, terraces and field systems…)		have to plan conservation and restoration interventions we will get this issue.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	Yes	The study makes an inventory of livestock roads in Andorra and their folklore associated (linguistic terms associated with transhumance in Andorra, or livestock fairs that are celebrated every year and that have their origin in transhumance).
Slow mobility (cycling routes, trekking paths, etc.)	No	
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	Yes	Tourism is an economic source that could improve the maintenance and conservation of this livestock roads and the Cultural Heritage related to them.
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	There are no public or private actors involved in this study.	
Involvement procedures		
Problems and challenges		
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)		
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	This study will help to know the level of conservation in which our intangible heritage is found. Another of the expected effects, even if indirectly, is to prove that preserving the architectural heritage or the archaeological sites associated with sheepherding we will be able to preserve the authenticity of the landscape and its scenic views . In turn, preserving the folklore associated with transhumance activity would allow preserving the cultural memory of an activity that was extremely important for Andorra in the past.	
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	One of the expected effects is that the study will allow anticipating the evolution of the heritage degradation processes. This research will also help to obtain a qualitatively measurable scale for the factors that affect the conservation of the cultural heritage associated with livestock routes. Another of the expected effects is that this cultural heritage be valued as relevant heritage of the Principality of Andorra; because knowing its history and typologies is a way of understanding the traditional economic activity of Andorra.	
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	To evaluate the economic impact of cultural tourism in the maintenance of the Cultural Heritage and its preservation.	
IMPLEMENTATION ISSUES		
Financial resources	No resources have been allocated	
Implementation procedures		
SUPPORTING INFORMATION		
Images (pictures, graphics, maps, charts, etc.)		

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References (including web links)	https://www.primerapedra.com/ https://www.iea.ad/cenma

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CASE STUDY SHEET

CS code	*ES-04*	**CS Title**	Recovery and Management Plan for Livestock Routes in Andalusia
GENERAL INFORMATION			
Type of case study	X National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research ☐ Project ☐ Other		
Responsible body/Promoter	Regional Ministry of Environment and Territorial Planning, Junta de Andalucía (Andalusian Regional Government)		
Location (region, locality)	ANDALUSIA		
Geographical area covered	Andalusia is the Autonomous Community that has the most extensive network of livestock routes, which totals 34,082 kilometres in length (Source: Statistics. Andalusia Environment Report 2013)		
Year	This plan was approved by means of the Agreement of March 27, 2001, of the Governing Council, and constitutes a basic instrument when planning the actions to be undertaken on Andalusian livestock routes. A 20-year term for the execution of the Plan was set.		
Summary description	The Plan for the Recovery and Management of Livestock Roads in Andalusia, approved by means of the Agreement of March 27, 2001, aims to provide livestock roads with a dimension of public utility that goes beyond traditional livestock use, highlighting their environmental functions: landscaping, rural development and citizen entertainment. The Regional Ministry of Environment and Territorial Planning, by virtue of the exclusive competence attributed by article 13.7 of the Statute of Autonomy to the Autonomous Community of Andalusia, addressed the regulatory development of the basic state legislation on livestock routes, through the approval of the Andalusian Livestock Regulations (Decree 155/98, of July 21). In its Third Additional Provision, the elaboration of the "Recovery and Management Plan for Livestock Routes of the Autonomous Community of Andalusia" is established. The priority aim of the Plan is to define the Andalusian Network of Livestock Routes, understanding it as the set of all the livestock routes of feasible recovery and with potential reception of any of the uses defined by the Plan: traditional use, tourist-recreational use and ecological. In addition, it establishes a program of actions necessary for the recovery and putting into use of the network, setting priority levels and collecting the budget estimate for each of the planned action and management models.		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	Regulation of livestock routes in Andalusia (Decree 155/98, of July 21). In its Third Additional Provision, the elaboration of the "Recovery and Management Plan for Livestock Routes of the Autonomous Community of Andalusia" is established.		

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	This plan was approved by means of the Agreement of March 27, 2001, of the Governing Council, and constitutes a basic instrument when planning the actions to be undertaken on Andalusian livestock routes. The Plan for the Recovery and Management of Livestock Routes in Andalusia was carried out by a multidisciplinary team made up of biologists, geographers, engineers, lawyers and historians, under the impulse and direction of the Office created for this purpose called the Office for the Livestock Road Plan, attached to the General Technical Secretariat. The Plan starts from considering livestock routes from a triple perspective: • As a backbone of the territory. Its integration into the Andalusian Regional Planning Plan is based on the active participation that livestock routes provide in the articulation of the territory. • As a fundamental element in environmental planning, this role taking shape in the establishment of ecological corridors between administratively consolidated natural areas and with management plans as set out in Directive 92/43. • In attention to the role that livestock routes must play in rural development; since they can favour the fixation of the population in degraded rural areas, due to their high potential for the development of socio-economic activities, including nature tourism, enhancing the value of cultural and historical heritage, the empowerment of artisan products, etc.
PROBLEMS AND NEEDS TARGETED	
Problems	Livestock routes make up a huge network of livestock routes in Andalusian that, beyond this largely abandoned function, represent a historical legacy of considerable value that brings us back to past customs and ways of life. It is the Autonomous Community of Andalusia, the one with the longest national length, more than 30,000 km, which represents 25% of the national total. It is 1984 when the Andalusian Government assumes exclusive powers in the area of livestock routes. In the first instance, these powers are assumed by the Andalusian Institute of Agrarian Reform (IARA) and later in 1994 by the Regional Ministry of the Environment. This last transfer coincides practically in time with the promulgation of the current Livestock Routes Law of March 23, 1995. This Law constitutes the starting point when analysing the work undertaken by the Andalusian Government in order to recover and put into use the important demand that livestock routes constitute. The reason is that it supposes a radical change with respect to the previous legislation. It is based on the affirmation that livestock routes, beyond their livestock function, constitute a historical legacy of capital interest, whose preservation must be guaranteed by the new functions and uses that current legislation assigns to them. Indeed, in the 21st century, this network plays a basic role for a modern society like ours. They constitute an essential element in the planning of the territory, they favour the diversification of the landscape -especially in urban environments- they promote biodiversity by enabling the genetic exchange of species and allow the development of free time activities compatible with respect for the conservation of the natural environment.
Needs	• The need to establish ecological corridors between natural areas already administratively consolidated and with management plans is included in Directive 92/43 (Conservation of natural habitats and wild fauna and flora). • In the proposal of Places of Community Interest (SCI), formulated by the Andalusian Government, the need to connect the different protected territories in our region is also raised, in order to achieve continuity of the great natural units.

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	• Andalusia is the region that has the most extensive network of livestock routes at the national level, which is why the network of ecological corridors in our Community has an adequate territorial base in the already existing Network of Cattle Routes.
Quantitative data	For the Recovery and Management Plan of the Livestock Roads of Andalusia, an execution period of the Plan was set for 20 years. The programming of actions was established in three phases according to the levels of importance defined for the Livestock Roads Network previously carried out based on the proposed methodology. In this way, Priority 1 Network was scheduled to be carried out in the period 2001-2010, priority 2 in the period 2011-2015 and priority 3 in the period 2016-2020. The kilometres that had to be delimited were 10,103 in 2010, to which 8,092 would have to be added in 2015 and 7,005 in 2020 (which makes a total of approximately 25,000 km). It was proposed to undertake the processes of recovery and putting into use of the routes in an integral way, so that all the roads that were being delimited were immediately adapted for the actions proposed in them. With this, it was intended that the use of the routes for the proposed uses, in the shortest period of time, would help to guarantee their respect, since the users themselves are the first interested in reporting any type of intrusion or impairment of the functionalities created or promoted by the Administration. Situation updated at 2018 (for more info on the typology of action please see footnote[1]: • 2,153 files for demarcation were opened and 76% of those files have actually a final judgment rendered by a competent body (=1,669 delimited livestock routes). • 9,045 km of demarcated livestock tracks. • 96.58% of Priority 1. • 37.5% of the Andalusian Network. Demarcation Action. Priority 1 - Total Expected 9,857.00 - Total Executed 9,045.00 - Firm boundaries 6,620.00

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme?** **(YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***

[1] The Plan for the Management and Recovery of Andalusian livestock routes defines the implementation of a series of administrative actions to achieve the Plan's own objectives. These include a process of classification, demarcation and marking of livestock routes in the Andalusian Autonomous Community since 1995.

Classification

The classification is an administrative act of a declarative nature, through which the existence of a livestock route, its name, the width of the layout and other general physical characteristics of the road are determined.

To guarantee legal support in the restoration and maintenance of the Network, it is necessary that all its routes are classified.

Demarcation

Through the demarcation the limits of the cattle routes are defined, including the troughs, resting places, sheepfolds and other places associated with livestock traffic, according to the approved classification.

This procedure is essential for the actual recovery of the livestock routes, and as a consequence, to define the practicable width to carry out the restoration of the livestock routes according to their subsequent use.

Edging

Once the boundary is approved, the boundaries of the livestock route are physically determined by marking and are permanently marked on the ground. Thus, the marking shows the limits and width of the livestock route through permanent landmarks (cairn).

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Spatial planning	YES	The integration of livestock routes in the Territorial Planning Plan is based on the active participation it provides in the articulation of Andalusia, and specifically: • For making possible the connection of the urban system with the natural resources of the environment. • For contributing to the increase in the quality of life and social well-being: - Serve as a containment of the occupation of rural, natural or special patrimonial interest spaces. - Be an element that favours sustainable economic development. - Promote the diversification of the landscape. - Harmonise urban and rural activities in the territorial area. - Influence city planning, as a complementary element for the incorporation of environmental considerations.
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	It favours the conservation of the transhumant practice and the extensive livestock system that maintains and conserves different habitats such as the meadows, steppe areas and high mountain grasslands.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	Livestock roads favour: - the enhancement of the value of Cultural and Historical Heritage, promoting craft products, etc - Serve as a containment of the occupation of rural, natural or special patrimonial interest spaces
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	
Slow mobility (cycling routes, trekking paths, etc.)	YES	Livestock roads make possible the connection of the urban system with the natural resources of the environment.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	Livestock routes are an axis for rural development, by favouring the population's fixation in degraded rural areas due to their high potential for the development of socioeconomic activities, including nature tourism, enhancing the value of Cultural and Historical Heritage, promoting craft products, etc.
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	The Recovery and Management Plan for Livestock Routes of Andalusia was carried out by a multidisciplinary team made up of biologists, geographers, engineers, lawyers and historians, under the impulse and direction of the Office created for this purpose called the Office for the Livestock Roads Plan, attached to the General Technical Secretariat.	
Involvement procedures	*No information available*	
Problems and challenges	The Plan for the Recovery of Public Routes in 2001 provided for the recovery of 17,398 kilometres of livestock routes in Andalusia in 2015. Although the Plan began to be	

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	implemented with force in the first years, by September 2016 only 10,103 km had been delimited. In other words, practically what should have been defined for 2010. In this context, it is important to keep in mind that the total number of kilometres classified is 33,777. The kilometres that had to be delimited were 10,103 in 2010, to which 8,092 would have to be added in 2015 and 7,005 in 2020 (which makes a total of approximately 25,000 km). Of course, the demarcation is a previous step to what is really the ultimate inalienable objective, which is the recovery of the good ex officio and its proper maintenance and conservation. The data provided by the Regional Ministry of Environment verify non-compliance with the Plan since 2013 in the provinces of Córdoba, Huelva and Jaén; and generalised in the eight provinces as of 2014 (0.24 kilometres in Granada and 3.2 km in Seville were delimited, in the rest of the provinces there were no registered demarcation action). In 2015, 2016 and 2017 there is no news of any demarcation.
EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	The Regional Ministry of Environment and Territorial Planning has already demarcated in Andalusia a total of 8,959 kilometers of livestock routes within the Plan developed by the Board to recover these traditional roads - 89% of those classified as level 1 priority. Part of these resources have been destined to the maintenance of the Green Corridors (Puertas Verdes/Green Gates), implemented in all Andalusian municipalities with more than 50,000 inhabitants (and 20.000 inhabitants later on), within the framework of the Green Gates Program, which has allowed the creation of Free Space Systems in the agglomerations of Andalusia. These green infrastructures, after several years of implementation, required maintenance tasks in order to guarantee the safety of the significant number of users who use these natural itineraries on a daily basis, both for daily transport and for the practice of sports and leisure activities.
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Livestock Routes Law of March 23, 1995, and the Plan for the Recovery of Public Routes supposed a radical change with respect to the previous legislation. It is based on the affirmation that livestock routes, beyond their livestock function, constitute a historical legacy of capital interest, whose preservation must be guaranteed by the new functions and uses that current legislation assigns to them.
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	As a consequence of the generation of extraordinary credits from the EAFRD Funds (closing of the 2007-2014 framework), the Regional Ministry of the Environment and Spatial Planning addressed actions aimed at the recovery of livestock routes, located in municipalities classified as "disadvantaged" by the Andalusian Sustainable Rural Development Plan, with the aim of providing them with an adequate and necessary green infrastructure for agricultural communications, which contributed to the economic revitalisation of these most depressed areas of Andalusia.
IMPLEMENTATION ISSUES	

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Financial resources	The programming of actions was established in three phases according to the levels of importance defined for the Network. In this way, Priority 1 Network was scheduled to be carried out in the period 2001-2010, priority 2 in the period 2011 -2015 and priority 3 in the 2016-2020 period. Total foreseen budget: - TOTAL 1st Phase 17,294,259,515 pts (103,940,506.07 euro) - TOTAL 2nd 8,749,696,015 pts (52,586,688.14 euro) - TOTAL 3rd 5,988,841,970 pts (35,993,635.03 euro)
Implementation procedures	As a previous step to the development of the works, the proposed uses were defined and characterised as: • Traditional use: livestock transit and access to agricultural farms · Tourist-recreational use: related to "rural tourism" • Ecological use: link of protected spaces, generators of biodiversity and corridors of fauna and flora. Actions: • Common actions: actions independent of the type of use assigned. It is about the classification, delimitation, marking and recovery of the livestock routes that make up each route, as administrative actions, and the signaling, cleaning and regeneration, landscape, as generic actions. • Specific actions: concrete actions for each intended use. - In the cattle routes, it is worth mentioning the isolation of the livestock route, in the event that the margin of the livestock route coincides with canals, roads or other infrastructures, in order to avoid accidents; the restoration of livestock infrastructures, such as: drinking troughs, resting places, sheepfolds, etc .; the incorporation of punctual elements of passage that facilitate the transit of cattle; plantations looking for shady areas, etc. - In tourist-recreational routes, the adaptation of the road is necessary to facilitate leisure activities such as hiking on foot, by bicycle or on horseback; the installation of light equipment for public use (bicycle parking, bike lanes and rest areas for the latter); plantations in order to achieve a landscaping improvement and make more attractive the use of livestock routes as walking routes, especially in urban settings. - In ecological routes, highlight the vegetable restoration, given the function to which they are called to play. The following works were subsequently carried out: • Elaboration of the work methodology: includes the selection, evaluation and weighing of the variables of interest for the defined uses, as well as the establishment of the procedure to be followed for data collection in the field. • Inventory: data collection on the defined variables. This work is carried out in parallel with the elaboration of the methodology. • Analysis of the information and allocation of uses: study of the potential of livestock routes to accommodate each of the proposed uses, and definition of priority routes for action. • Data capture in the field: in order of priority, the necessary data is collected for the recovery, restoration and application of the assigned uses on the roads. • Definition of the action and maintenance program: definition of the types of action to be carried out based on the combination of the proposed use and the current state of the roads.

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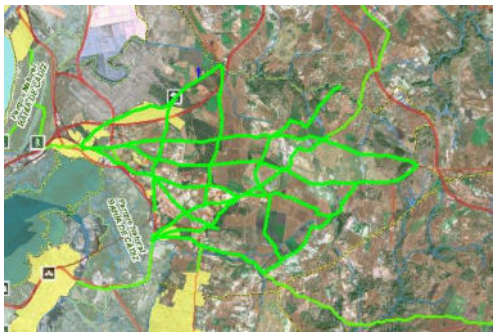
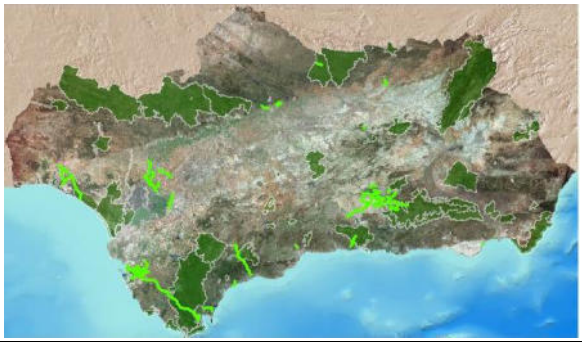
	• In addition, the necessary maintenance is analysed and the proposed measures are economically evaluated. These works were carried out on the classified livestock routes and those that were in the classification process.
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	     
References (including web links)	Fondo documental de vías pecuarias de Andalucía (Documentary collection of livestock routes in Andalusia) Inventario de vías pecuarias en Andalucía (Inventory of livestock routes in Andalusia) Mapa de vías pecuarias en Andalucía (Map of livestock routes in Andalusia)

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CASE STUDY SHEET

CS code	*ES-05*	**CS Title**	GREEN GATES PROGRAMME
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research X Project ☐ Other		
Responsible body/Promoter	Regional Ministry of Environment and Territorial Planning, Junta de Andalucía (Andalusian Regional Government)		
Location (region, locality)	ANDALUSIA		
Geographical area covered	This programme covers all citizens of the most densely populated Andalusian urban areas and the neighbouring municipalities, points of cultural interest, university campuses, peri-urban and metropolitan parks, among others, that pass through the green corridors. Period 1 (municipalities with more than 50,000 inhabitants) 2004-2017: 30 green Gates for 27 Andalusian municipalities with more than 50,000 inhabitants. Recovery of 765 kilometres that will benefit a total of 3.7 million inhabitants.		
Year	Period 1 (municipalities with more than 50,000 inhabitants) 2004-2017 Period II (municipalities with more than 20,000 inhabitants) 2017-2020		
Summary description	The "Green Gates Program", drawn up by the Regional Ministry of the Environment and Land Management of the Andalusian Government, is integrated into the Plan for the Management and Recovery of Livestock Routes in Andalusia and consists of the design of a network of green corridors in Andalusian urban centres with more than 20,000 / 50,000 inhabitants, generating a new countryside-city relationship through quality green infrastructures that contribute to the creation of a true Metropolitan Green Space System. Livestock routes, due to their configuration and network structure, constitute a useful resource for a sustainable organisation of the territory, offering great possibilities for the articulation and integration of points of territorial interest. In short, livestock routes, which many could consider declining, represent not only an important part of Andalusian heritage, but are also basic to contribute, through compatible and complementary uses, to the fulfilment of social needs currently in demand in our Autonomous Community.		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	The "Green Gates Program", drawn up by the Regional Ministry of the Environment and Land Management of the Andalusian Government, is integrated into the Plan for the Management and Recovery of Livestock Routes in Andalusia. The Andalusian Territory Planning Plan (POTA) considers livestock routes as a linear system called to fulfil important functions within the framework of the objectives of the Regional Protection System, which considers the protection of cultural and natural		

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	resources as a strategic action of regional interest, one of the essential characteristics being to integrate the protection elements with each other until generating coherent and interconnected networks. All the actions included in the green Gates program are part of the master plan of the European Green Network for the Mediterranean (Rever Med), hence its character exceeds the regional one, acquiring transnational scale.
PROBLEMS AND NEEDS TARGETED	
Problems	The main weakness facing this programme is related to the structuring and connection of the territory, so that through the Green Gates Programme, access gates to the countryside are opened in cities to decongest urban areas, promote sustainable mobility, increase income from ecotourism in rural areas, and open natural corridors for Andalusian fauna and flora. And in turn, contribute to sustainable and integrated socio-economic development at the local or regional level, as well as sustainable rural development and job creation.
Needs	• To promote non-motorised mobility. • To contribute to the creation of true free space systems in cities. • To participate in the rehabilitation and landscape improvement of urban and peri-urban environments currently deteriorated or trivialized. • To stop urban development expansion and avoid conurbation.
Quantitative data	Period 1 (municipalities with more than 50,000 inhabitants) 2004-2017: - 30 green Gates for 27 Andalusian municipalities with more than 50,000 inhabitants - Recovery of 765 kilometres that benefit a total of 3.7 million inhabitants

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme?** **(YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	YES	The Green Gates Program is fully integrated into regional policy through synergies with the Plan for the Management and Recovery of Livestock Routes in Andalusia, through which it will invest in the rehabilitation, improvement and conditioning of livestock roads, the public heritage of the Autonomous Community, to favour the contact of citizens with nature and the management of the environmental environment, effectively contributing to sustainable development, to the improvement of the landscape and enhancement of the natural and cultural heritage of our territory. Likewise, with the General Plan for Sustainable Tourism of Andalusia Horizon 2020, with which it is intended, among other aspects, to implement a sustainable, viable, equitable and competitive tourism development model that makes optimal use of available resources,

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		respectful of local values and spaces where tourism develops and that guarantees territorial cohesion.
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	This set of Green Corridors supposes an important network of Green Infrastructures that articulates the most densely populated urban areas with the closest natural environment. With them the infrastructures linked to the protection and sustainable use of natural heritage are increased and improved, the sustainable use and knowledge of natural heritage by citizens is increased, as well as the protection of natural spaces and the biodiversity of the territory.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	Set of Green Corridors and Green Gates that articulate the most densely populated urban areas with their natural surroundings, with points of cultural interest and with other relevant spaces such as university campuses, peri-urban parks, metropolitan parks, etc.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	
Slow mobility (cycling routes, trekking paths, etc.)	YES	These are infrastructures reserved for non-motorised movements, which allow access from the cities to their immediate natural environment on foot, by bicycle or even on horseback, providing an alternative form of mobility to motorized transport, even for daily movements.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	The Green Gates program allows connecting the Andalusian urban centres of more than 50,000 inhabitants with their immediate surroundings, through non-motorised routes intended for the use of citizens. This project aims to increase the percentage of tourists who carry out activities related to nature observation during their visit, reaching a value of 38.9% in 2023, compared to 33.9% of the reference value in 2013.

INVOLVEMENT OF STAKEHOLDERS	
Actors involved	*No information available*
Involvement procedures	*No information available*
Problems and challenges	*N/A*

EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	Establishment of an important network of Green Infrastructures that creates a system of free spaces in the cities included in the scope of action. This "Green Gates Program" presents results to establish a new relationship between the city, increase the quality of

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	life of citizens, promote the practice of non-motorised sports activities, improve the landscape in urban and port environments, and reduce emissions of CO2.
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	This programme impacts all citizens of the most densely populated urban areas and the neighbouring municipalities, points of cultural interest, university campuses, peri-urban and metropolitan parks, among others, that pass through the green corridors.
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Tourist seasonality is broken and coverage with tourists increases throughout the year, thus increasing the income derived from ecotourism in rural areas. The routes also unite agricultural and livestock itineraries, helping to structure and connect the territory, generating direct and indirect wages in the area's population.
IMPLEMENTATION ISSUES	
Financial resources	19 million euros in the Green Gates program for municipalities with more than 50,000 inhabitants during the 2007-2017 period (an investment of € 71.5 M was planned and its completion is scheduled for the end of 2008). 7 million euros for the design, adaptation and improvement of a network of green corridors in these urban centres, for municipalities with more than 20,000 inhabitants. Financed through Feder funds during the period 2017-2020.
Implementation procedures	1. Land reclamation 2. Landscape restoration 3. Construction of bike lanes 4. Road conditioning 5. Cleaning 6. Signaling
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	
References (including web links)	Estado de los trabajos en Puertas Verdes (State of the Art on The Green Gates Programme) Portal del Programa Puertas Verdes (The Green Gates Programme Portal)

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CASE STUDY SHEET

CS code	*UK-01*	**CS Title**	**Alpine Landscapes: Pastoralism and Environment in Val di Sole (ALPES)**
GENERAL INFORMATION			
Type of case study		☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research X Project ☐ Other	
Responsible body/Promoter		University of Trento (Italy), Newcastle University (UK)	
Location (region, locality)		Val di Sole, Trentino, Italy	
Geographical area covered		The main study area corresponds to an upland sector of approximately 2500 hectares	
Year		2010 - ongoing	
Summary description		The ALPES project uses the methods of landscape and environmental archaeology to study human-environment interaction in an upland sector of the Italian Alps. The study area corresponds to a high-mountain environment (1900-2700 m asl) in the Municipality of Mezzana (Val di Sole, Autonomous Province of Trento). The project, started in 2010, has focused on two upland valleys: Val Molinac and Val Poré. Here the research group, coordinated by Dr Francesco Carrer (Newcastle University) and Prof Diego E. Angelucci (University of Trento), has carried out archaeological surveys, to identify archaeological evidence of human presence. More than 100 dry-stone structures have been identified, and divided into 3 categories: rock-shelters, fairly ephemeral and used by shepherds or hunters as temporary refuge; isolated huts, small dwelling structures, primarily associated with hay-making; enclosures, large animal corrals, often associated with a small dwelling structure. The enclosures turned out to be the most interesting features. Following archaeological excavation, a large and compound enclosure has been dated to the late-medieval period, although evidence of early-medieval and even late-prehistoric occupation of the area has also been recorded. A smaller and less preserved enclosure has recently provided evidence of a very early occupation (1800-1600 BC), although the functional and chronological correlation between this prehistoric context and the enclosure needs to be further assessed.	
Link with laws/regulations and with other policies/ plans/strategies *(if any)*		There is no regulatory and policy framework for this case study. The objectives are primarily related to archaeological and palaeoecological research, and the promotion of local small-scale tourism through dissemination events and open days.	
PROBLEMS AND NEEDS TARGETED			
Problems		The general perception of high altitudes is of pristine natural landscapes, weakly affected by the impact of human agency. But this perception is inaccurate. Indeed, the impact of farming and other land-management strategies is more evident in other “less marginal” contexts. But this does not mean that anthropogenic influence was less significant in these high mountain landscapes. Pastoral activities have exploited mountain resources for thousands of years, and by doing that they have transformed these resources. The treeline has been artificially lowered, and constantly managed for millennia. Plant composition and soil development have been influenced by livestock manure. And animal grazing and mobility have often triggered soil erosion. Therefore, to understand and protect high mountain landscapes today, we need to understand the complex history of human interaction with alpine/subalpine ecosystems.	
Needs		A more accurate knowledge of human occupation of the uplands is necessary. This requires archaeological surveys, to record any the possible evidence of past human presence at high altitude. Another important proxy comes from the study of soil. By studying soil dynamics, and correlating them with archaeological evidence, we can understand whether the waxing	

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	and waning of human occupation had a consequence on the development or erosion of soil. In order to have a detailed perception of these phenomena, archaeological investigation and soil analysis must move from the landscape to the site scale. Representative sites need to be stratigraphically investigated, in order to understand how their development correlated with the local environmental change and the aforementioned soil dynamics. Informatics (in particular the use of GIS) provides a significant support, as all the relevant information can be stored and analysed within a single digital platform.
Quantitative data	Quantitative data are not available yet, but one of the purposes of the project is to provide a quantification of landscape change over time.

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	NO	
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	By studying past human-environment interaction we will be able to assess how pastoral strategies have transformed the upland landscapes during the Holocene. This will provide the ideal baseline to discuss with decision makers how the knowledge of the past can inform future policies. In particular, whether current land-use and land-management strategies seem ecologically sustainable compared to archaeologically inferred strategies.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	Most of the investigated structures in the area (rock-shelters, huts, enclosures) are still visible, and represent key features in the local landscape. One of the purposes of this project is to promote the upland landscape of Val di Sole for their cultural and historical value, beyond their obvious ecological importance. We aim to promote the archaeological heritage of the study area by suggesting a series of touristic itineraries, for hikers and local amateurs.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	The basecamp of the project is the small hamlet of Ortisé, at 1500 m asl, close to the upland pastures of the study area. Most of the villagers used to be farmers, and some of them are still practicing farming activities. By interacting with the local communities, discussing the results of our research and trying to understand their seasonal farming practices, we would like to protect and promote their traditional ecological knowledge, and to strengthen their connection with their history and landscape, which feed their strong local identity.
Slow mobility (cycling routes, trekking paths, etc.)	YES	By promoting touristic itineraries, this project might foster the development of new trekking paths and hiking routes. Mountain hiking is increasingly popular on this side of Val di Sole (less suitable for ski resorts), and it is likely that this initiative will contribute to accelerate the interest of specific groups of hikers for this area.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	By promoting touristic itineraries, cultural landscapes and the preservation of traditional knowledge, this project will be beneficial for the economy of the small hamlet of Ortisé. New initiatives, organised by the village to promote the upland archaeological landscapes among new visitors, seem to confirm that this is considered by the local entrepreneurs as an initiative worth investing on.

INVOLVEMENT OF STAKEHOLDERS	
Actors involved	During the whole project there was a strong collaboration with local communities in the hamlets of Ortisé and Menas, and with the Council of Mezzana, who provide in-kind support

	to the project. Villagers, instead, not only provided useful information and support for the project, but contributed to informing the early stages of the survey and complementing the analysis of the historic landscape.
Involvement procedures	Stakeholders were engaged during informal meeting in public spaces (the local pub) or during their work in the field or in the forest. Ethnographic information about traditional ecological knowledge was collected during individual meetings in the houses of some relevant stakeholders or during fieldwork. No formal focus groups or feedback meetings have been organised, although this is a plan for future research campaigns more focused on the community involvement.
Problems and challenges	No specific problems or difficulties were experienced during the collection of ethnographic information and other types of engagement of members of local communities.
EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	Promotion of farming and non-farming activities that guarantee a sustainable management of the area, based on the identification of past sustainable and unsustainable strategies. Identification of the areas more affected by intensive pastoral exploitation, and the consequences of long-term grazing on vegetation cover and soil
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Preservation of traditional ecological knowledge, particularly that connected with the exploitation of high-altitude environments. Promotion of upland landscape, as critical asset for local communities, from their identity as much as their economy
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	Promotion of the archaeological sites (dry stone structures) identified at high altitude in the study area Monitoring the degradation of abandoned pre-modern structures. Producing a visual record of these structure (3D photogrammetry) before they collapse.
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Promotion of cultural tourism in this area of Val di Sole
IMPLEMENTATION ISSUES	
Financial resources	The ALPES project is carried out with internal funding of the University of Trento and Newcastle University, complemented by a small contribution of the Italian Alpine Club (CAI). In 2015, the team got awarded a substantial LEADER project grant by the Local Action Group (GAL) of Val di Sole. This grant was used to fund the fieldwork project, archive research, and to publish two volumes: a scientific edited volume, with the results of the first 5 years of the project, and a booklet for public dissemination.
Implementation procedures	Not applicable
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	*All the following pictures and maps are reproduced from the volume Angelucci & Carrer 2015 (see publications below)*

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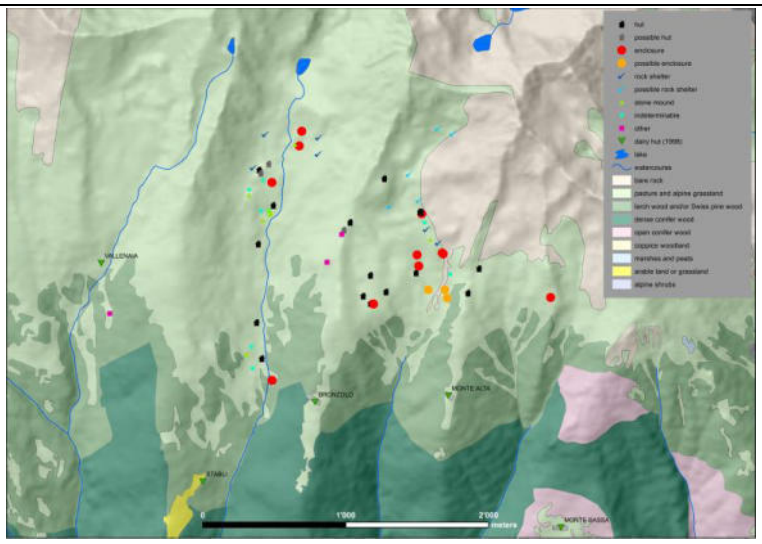

Fig. 1: Map of the study area


Fig. 2: Val Molinac, from south (Photo D.E. Angelucci)

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Fig. 3: An example of historic hut, abandoned towards the end of the 20th century (Photo M. Rapanà)

Fig. 4: A rock-shelter in Val Molinac (Photo M. Rapanà)

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Fig. 5: Archaeological excavation within the medieval livestock enclosure.

Fig. 6: Archaeological excavation of a possibly early-medieval hut (Photo F. Cavulli)

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Dissertations

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	• "Studio di reperti archeologici provenienti da alcune strutture pastorali d'alta quota in Val di Sole, TN (progetto ALPES)", di Federica Dell'Amore, tesi di laurea magistrale in Conservazione e Gestione dei Beni Culturali (rel. D.E. Angelucci, correl. Elisa Possenti), A.A. 2014/15. • "Indagine archeologica sulle strutture in pietra a secco della Val Molinac e della Val Porè (Val di Sole, TN - Progetto ALPES)", di Giovanni Barozzi, tesi di laurea magistrale in Conservazione e Gestione dei Beni Culturali (rel. D.E. Angelucci, correl. F. Cavulli e F. Carrer), A.A. 2015/16. • "Studio dendrocronologico di campioni di legno provenienti da alcune strutture pastorali d'alta quota in Val di Sole – Trento (Progetto ALPES)", di Maria Chiara Chistè (rel. D.E. Angelucci, correl.i Fabio Cavulli e Mauro Bernabei, CNR-IVALSA), A.A. 2017/18. • "L'industria litica del sito MZ051S (Val Poré, TN): materie prime, tipologia e tecnologia", di Anna Ferrazzi (rel. D.E. Angelucci, correl. Stefano Grimaldi), A.A. 2017/18. • "Archeopedologia della Val Poré (Mezzana, TN – progetto ALPES): primi contributi", di Laura Vezzoni (rel. D.E. Angelucci, correl. Fabio Cavulli), A.A. 2016/17. • "Modellazione tridimensionale applicata all'analisi archeologica: il caso di studio dei "bait" in Val di Sole", di Marco Padovan, prova finale triennale in Beni Culturali (rel. D.E. Angelucci, esperto M. Rapanà), A.A. 2014/15. • "Elaborazione in ambiente GIS dei dati di scavo del sito MZ005S (Val Poré, Mezzana, TN)", di Simone Ravanelli, prova finale triennale in Beni Culturali (rel. D.E. Angelucci, esperto F. Cavulli), A.A. 2012/13. • "I carboni nei suoli d'alta quota come indicatori dell'impatto antropico nel passato: il caso della Val di Sole (TN)", di Federica Dell'Amore, prova finale triennale in Beni Culturali (rel. D.E. Angelucci), A.A. 2012/13. • "Studio esemplificativo di una struttura pastorale d'alta quota: il sito MZ005S (Val del Porè, Mezzana, TN)", di Denis Pisoni, tesi di laurea in Scienze dei Beni Culturali (rel. D.E. Angelucci, correl. A. Pedrotti e F. Cavulli), A.A. 2010/11. • "L'utilizzo delle alte quote a scopo pastorale. Primi dati archeologici dai pascoli di Ortisé e Menàs (Val di Sole, TN)", di Giulia Foradori, tesi di laurea in Scienze dei Beni Culturali (rel. D.E. Angelucci, correl. A. Pedrotti e F. Carrer), A.A. 2009/10.

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CASE STUDY SHEET

CS code	*UK-02*	**CS Title**	**Ethnoarchaeology of Western Alpine upland Landscapes (EthWAL)**
GENERAL INFORMATION			
Type of case study			☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research X Project ☐ Other
Responsible body/Promoter			University of York (UK), Newcastle University (UK)
Location (region, locality)			Monregalese, Province of Cuneo, Piedmont, Italy; Parc National des Ecrins, PACA, France
Geographical area covered			The study area corresponds to an upland sector of approximately 3000 hectares
Year			2013 – 2015
Summary description			The EthWAL project aims at understanding how changes in pastoral practices contributed to changing the character of mountain landscapes during the last three centuries. This will enable us to understand how modernity and capitalistic economy have radically transformed not only pastoral practices that we still regard as traditional, but also landscapes that we still largely perceive as marginal and pristine. The outcomes of this project will also provide an interesting ethnoarchaeological analogue for interpreting the material evidence of pastoral practices and their relationship with mountain ecosystems. The EthWAL project compares two study areas. One is the Val Maudagna (Italy), an economically marginal sector of the Maritime Alps where small-scale pastoralism has been characterised by the same strategies till the end of the 1990s, producing and maintaining a very specific and unique upland landscape. The second is the Vallée de Freissinieres (France), which has seen a really early phase of intensification of pastoral activities, followed by an abrupt collapse between the late 19th and the 20th century. These two areas share ecological and geological similarities, but different histories of land managements have created two very different landscapes. The project integrates methods of landscape archaeology, spatial analysis, ethnoarchaeology and historical ecology, to produce a comparative narrative and enable generalisations, to be used for the development of policy advice and the promotion of local historic landscapes.
Link with laws/regulations and with other policies/ plans/strategies *(if any)*			Maudagna: there's no regulatory plan in place. The veterinary office of Mondovi (Cuneo) looks after the exploitation of the area by cattle-herders and shepherds. Freissinieres: the Parc des Ecrins (which this study area is part of) has a conservation policy which includes the exclusion of motorised vehicles from the protected areas (there are no proper roads that reach the upland sector, and all the monitoring is done by foot, with the support of donkeys and a helicopter). Some areas of the park are subjected to "wilderness" regulations, which prevent any human activity. In other parts (including Freissinieres), transhumant pastoralism is still allowed, and constantly monitored. No open fires and no camping are permitted within the area of the park. Tourism is regulated, to protect wildlife and plant biodiversity.
PROBLEMS AND NEEDS TARGETED			
Problems			The last five or six decades have triggered profound transformations to pastoral practices. Vallée of Freissinieres experienced a rapid depopulation in the 1960s, followed by the inclusion of their "natural" upland landscapes into the Parc des Ecrins in the 1970s. At the end of the 1990s, new health and safety regulation for dairy productions, led to profound transformations of the small-scale dairy industry in Val Maudagna. The general perception was that the socio-economical phenomena of the 20th century were unprecedented, and caused the loss of a precious "traditional" world, immutable for hundreds or thousands of

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	years. To prevent this loss, pre-industrial practices were rediscovered and promoted. But there was a significant flaw in this requalification of tradition and traditional landscapes: the assumption of their immutability. Pastoral practices and their landscapes were perceived as a linear process of adaptation to a hostile environment, rather than the result of historical dynamics, inherently discontinuous.
Needs	In order to debunk the myth of an immobile past, historical and archaeological research is necessary. A thorough analysis of the correlations between macro-economic processes or major socio-political upheaval and transformations in the subsistence of the agro-pastoral groups of the Western Alps, might show whether mountain communities were immune to the transformations occurred during the transition to modernity. The study of mountain landscape using a landscape archaeology approach (recording abandoned and active landscape features and identifying spatio-temporal patterns) enables upland transformations to be correlated with the same historical processes. Historical ecology can be used to assess the impact of these changes on vegetation. This multi-proxy evaluation highlights that mountain economies and landscapes have transformed over time, and not exclusively in the last decades. Besides, the methods and inferences produced by this approach can provide useful insights for understanding similar processes happened in other historical periods, for which we have got less detailed historical (and archaeological) records.
Quantitative data	This research was mostly qualitative. However, some quantitative data have been produced for the analysis of a pastoral hut in Maudagna. Here the distribution of objects on the floor has been analysed with sophisticated tools of spatial statistics, providing an important methodological and theoretical reference for understanding the use of domestic space in mountain environments and unravelling depositional and post-depositional formation processes in seasonal contexts.

FOCUS, OBJECTIVES AND OUTPUTS

Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	NO	
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	The use of cartographic regression and interviews, integrated with palaeobotanical data, to investigate transformations in land-use and land-cover in the last 3 centuries, provide important information on ecological dynamics that can be used for informing future environmental plans. Collaborations with local policy makers (councils and park) during the project facilitates the dissemination of data and recommendations among relevant decision makers.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	The methodological core of this project is the use of landscape archaeology methods to record and analyse the transformation of settlement patterns at high altitude, during the last three centuries. By mapping seasonal structures in the two study areas, and by assessing their complex history of use and abandonment, this project will provide important information for the protection and promotion of rural heritage.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	By recording traditional pastoral practices in the two study areas, through interviews and participant observation, this project will promote the conservation of activities and strategies threatened by depopulation, demographic change and economic processes. The investigation of the historical roots of some of these practices will contribute to reviving the interest of local stakeholders and attracting the attention of other relevant subjects (including tourists and decision makers)
Slow mobility (cycling routes, trekking paths, etc.)	YES	Slow mobility in the Parc des Ecrins area is already promoted by the park, and will only be complemented by the initiatives of this project.

		In Maudagna, instead, new itineraries for tourists and community members interested in pastoralism and cultural landscapes can be promoted. These itineraries can take advantage of the existing network of hiking paths in the area, which is well maintained although not significantly exploited for touristic purposes. This research will provide the historical and archaeological background for the development of hiking routes connected to local heritage.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	The promotion of cultural hiking in Maudagna will boost summer tourism in an area where winter tourism is heavily threatened by climate change. This, in turn, will be extremely beneficial for local touristic infrastructures and activities. The study of historic dairy farming (se called "gias" system) in the area might also have a positive influence on local agro-pastoral industry.
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	For Maudagna we involved different actors from local communities (including retired and active shepherds and cattle herders) as well as civil servants (like the head of the veterinary office of Mondovi) and policy makers (mayor of local villages and city council of Mondovi) For Freissinieres, we involved the authorities of the Parc des Ecrins, who helped us engaging local farmers and herders, retired and still active.	
Involvement procedures	For Maudagna, local actors were involved individually and informally, and helped shaping the research since the beginning, by providing critical advice and information. Public outreach events were also organised in collaboration with these stakeholders, and provided important feedback on the results and new keys of interpretation. For Freissinieres the involvement of local actors was primarily through park's rangers and other authorities. Informal engagement was also established with villagers. Interviews carried out at the end of the fieldwork, contributed to a more solid interpretation of archaeological and historical data.	
Problems and challenges	There was no particular problem during the stakeholder engagement in Maudagna. On the other hand, involvement of local actors in Freissinieres was quite problematic for two reasons. The first is the demographics: a rapid depopulation affected the area towards the end of the 20th century, and most of the members of the local communities are new immigrants, and have no connections with the local landscape and traditional activities. The second is the language. Although the PIs of the project (Carrer and Walsh) speak French, the local dialect forced them to recruit a translator. This enabled them to acquire relevant information but prevented them to develop a connection with local stakeholders.	
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	Maudagna: • Identification of the effect of the recent collapse of dairy farming on biodiversity in the most and least intensively exploited areas • Assessment of the ecological advantages of protecting the historical pastoral system (so called "gias" system) • Prediction of the effect of the total collapse of the "gias" system Freissinieres: • Long-term assessment of the negative environmental impact of intensive pastoral strategies on upland pastures as much as lowland meadows • Long-term assessment of the negative environmental impact of un-manged re-wilding of mid and high altitudes • The possible advantages of high-altitude hay-making and small-scale pastoralism for biodiversity and soil protection	
Effects on immaterial, cultural assets (e.g. cultural	Maudagna:	

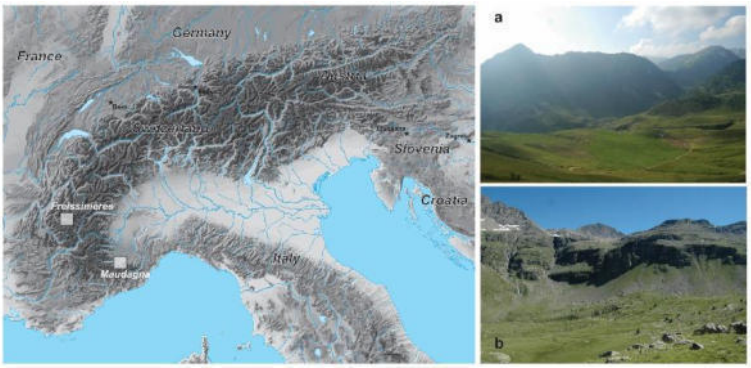
landscape, scenic views, folklore…)	• Evidence of the historical roots and cultural relevance of traditional pastoralism ("gias" system) • Promotion of the value of historic character of upland landscapes for tourism and for the protection of local identity Freissinieres: • Rethinking the economic, social and cultural role of transhumance for local communities, and how this can rebuild local identity, perturbated by depopulation and cult of upland wilderness
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	Maudagna: • Abandoned dry stone huts in the uplands are now protected by the local councils, as part of the rural heritage of the area • Some huts have recently been renovated, rather than been put down and replaced by more modern dwelling structures Freissinieres: • The record of abandoned structures produced in this project provides a valuable database for monitoring the degradation of these structures and planning possible renovation works • Some of the recorded structures are ephemerally used by hikers (since tent camping in the area is forbidden). The new record and GIS mapping provide a useful tool for hikers who are planning long excursions and require a shelter.
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Maudagna: • A leaflet with a short explanation of the history of one of the investigated huts, complemented by an itinerary to get from the nearest hostel (*rifugio*) to the hut, was printed in 1000 copies and distributed to the local council, shops and the hostel itself. This initiative was aimed at stimulating cultural tourism in the area.
IMPLEMENTATION ISSUES	
Financial resources	The project was funded by the EU Marie Curie Actions scheme. This scheme provided a salary for the researcher (Carrer) and approximately 30,000€ to carry out the research and produce outputs.
Implementation procedures	Not applicable
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	 Fig. 1: The two study areas: Maudagna (a) and Freissinieres (b). (from Carrer et al. 2020 *Hum. Ecology*)

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Fig. 2: an example of abandoned dry-stone hut in Freissinieres. (credits F. Carrer)

Fig. 3: An abandoned rock-shelter in Freissinieres. (credits F. Carrer)

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Fig. 4: The only structure still in use in Freissinieres: the hut currently occupied by the transhumant shepherd. (credits F. Carrer)

Fig. 5: A recently abandoned pastoral hut in Maudagna. (credits F. Carrer)

Fig. 6: A pastoral hut in Maudagna, possibly abandoned in the first half of the 20th century. (credits G. Dulbecco)

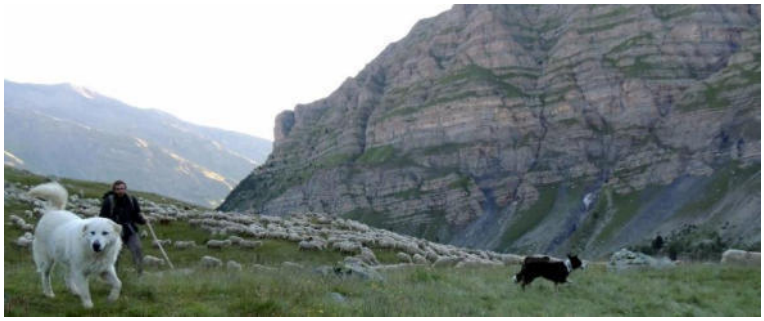

Fig. 7: The transhumant shepherd in Freissinieres. (credits K. Walsh)

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Fig. 8: One of the public outreach events held in Val Maudagna. (credits G. Dulbecco)

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CASE STUDY SHEET

CS code	*IT-01*	**CS Title**	**Quadro di Assetto dei Tratturi di Puglia (Spatial Framework of Apulian Drover Roads)**
GENERAL INFORMATION			
Type of case study	X National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy ☐ Study/research ☐ Project ☐ Other		
Responsible body/Promoter	Apulia Region – State property and regional assets Section		
Location (region, locality)	Apulia		
Geographical area covered	The case study covers around 6,000 hectares of drover roads of regional property.		
Year	2019		
Summary description	The Spatial Framework of Apulian Drover Roads is a regional-level instrument that identifies, classifies and defines the boundaries of the regional drover roads network, underpinning the definition of the protection and enhancement actions to undertake to achieve a sustainable development and a mindful use of the regional territory. The Framework identifies 3 categories of drover roads: A) those (n. 64) whose original assets are well preserved or can be restored, to be preserved and enhanced due to their historical, archaeological and tourist value; B) those (n. 13) suitable to fulfil public needs, to be transferred free of charge to Local Authorities; C) those (n. 1) having undergone permanent alterations (including development) and thus irreparably compromised, to be alienated to interested private subjects. The definition of the Framework underwent 3 main phases: 1) Localization and definition of the boundaries of the historic drover roads network and construction of a GIS knowledge base: • Analysis and overlaying of historic maps for identifying and geo-referencing the main elements characterizing the drover roads system • Analysis of interconnections between the network and spatial planning instruments in force; • Survey and study of archaeological, landscape, architectural, anthropological and agronomical elements/aspects linked to transhumance; 2) Quantitative and qualitative analysis 3) Final classification of drover roads The Framework does not go into depth in the analysis of single drover roads, this being the objective of future Local Enhancement Plans defined by the involved Local Authorities.		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	The Framework – approved by the Apulia Regional Government with Decision n. 256/2019 – is the first step of a wider planning process regulated by Regional Law n. 4/2014. This Law (art. 3) classifiesdrover roads as "a monument of the economic and social history of the Apulian territory involved in seasonal migration of cattle, and an archaeological evidence of settlements dating back to various ages" and transfers their administrative functions to the Regional authority. The planning process foresees, after the Framework, other 2 steps: the preparation of an Enhancement Document by the Region, and the elaboration and implementation of Local Enhancement Plans by the involved Local Authorities. This planning process is preparatory to the establishment of the "Apulian Drover roads Park" that will include those parts of the network that mostly deserve protection and enhancement. The Framework used as a reference a series of plans and studies already implemented (such as the Network of Soft Mobility, ISPRA's Nature Map, and the Regional Landscape Plan), sharing their objectives in terms of protection, enhancement, rehabilitation and restoration of Apulian		

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	landscapes. It also updates the knowledge framework of the Regional Landscape Plan and takes into account the "Drover road municipal plans" already in force (according to Regional Law n. 29/2003), updating them when necessary.
PROBLEMS AND NEEDS TARGETED	
Problems	In Apulia region, since the XIX century, the diffusion of intensive, highly specialized cultivation (especially cereals, grapevines and olives), the increase of population in plains, the growing urbanization and building of infrastructure has threatened the integrity of drover roads, compromising their visibility and agro-ecological value. Historic architectural elements linked to transhumance are often, nowadays, isolated and dilapidated, while paths once highly structured and visible are now hardly recognizable and indistinctively incorporated in the modern infrastructure system (road networks, etc.), especially in urban areas.
Needs	• Accurate mapping and analysis of the historic drover roads network, to provide a coordinated and evidence-based reference framework for local enhancement actions • Restoration of the continuity of the drover roads network and of their ecological and landscape values as "green infrastructures" connecting natural and agro-environmental areas, and aggregating geographically and economically disadvantaged areas • Restoration and reconnection of historic elements (both architectural and archaeological) along drover roads
Quantitative data	*Not available*

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	YES	In order to assess the feasibility of the enhancement of the drover roads network, the Framework was overlaid with the planning instruments in force: the Nature Map (by ISPRA, the National Institute for the protection of nature), the regional Landscape Plan, the project of the Regional Ecological Network, the municipal drover roads plans (where existing). Moreover, the strategic enhancement orientations contained in planning instruments were included among the criteria considered for the qualitative analysis of the drover roads network.
Protection of landscape/environment (e.g. biodiversity, water, geomorphology, soil, scenic views, historic landscapes, etc.)	YES	When elaborating the Framework, the agro-ecological features of the drover roads network were considered, in order to identify those areas whose environmental value can justify protection, rehabilitation and enhancement actions (aimed i.e. to reconnect natural and agricultural areas within an Ecological Network). An agro-biotope map was prepared, paying special attention to permanent pastures, grasslands, garrigues and scrubs, as well as to areas where traditional farming practices are prevalent ("complex heterogeneous agricultural mosaic") and protected natural areas. The hydro-geomorphological structure was investigated as well, highlighting the link between the morphological features of the Apulian region and the development of the transhumance-related economy.
Protection/enhancement of tangible cultural heritage (e.g. archaeological sites, historical routes, architecture…)	YES	When elaborating the Framework, an assessment and survey of the historic heritage linked to the drover roads network was performed, by overlaying historic maps. The study regarded both perceptive values (panoramic viewpoints, scenic routes, visual cones) and the structure of settlements and cultural sites linked to transhumance practices.
Protection/enhancement of intangible cultural heritage (e.g. folklore, food, music…)	YES	The anthropological structure was included among the criteria considered for the qualitative analysis of the drover roads network, considering the network itself as an expression of local collective identity embedding shared values, practices and rituals. The analytic

		model took into consideration the incidence of qualitative factors linked to the pastoral world, such as the presence of places of worship, the transmission of founding myths, the presence of material culture objects collected in ethnographic museums, of traditional food heritage, as well as the persistence of economic/productive activities showing at least an ideal continuity with pastoral traditions.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The Framework took into account the prescriptions of the Regional Landscape Plan regarding the infrastructures for soft mobility, by overlaying them with both the drover roads network and the Natura 2000 network.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	The preparation of the Framework included a mapping of the livestock and dairy businesses linked to transhumance practices in the region.
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	• Apulia Region: approves regional-level planning instruments regarding drover roads (Spatial Framework and Enhancement Document); manages the state property included in the drover roads network • Scientific Committee (composed by Polytechnic university of Bari, University of Foggia, Province of Foggia, Superintendence authorities for the Archival, Architectural, Archaeological and Landscape Heritage): provided regional officers with methodological and technical-scientific indications, ensured coordination and monitoring of the operational activities aimed at the preparation of the Spatial framework. • InnovaPuglia (in-house company of Apulia Region working in the field of digital innovation): provided technical support to regional officers in charge of the preparation of the Spatial framework • Local authorities (Municipalities and their associations): took part in the process of classification of the droves network by preparing observations and/or integrative proposals to the draft Spatial framework; approve the Local enhancement plans for specific parts of the network; control the integrity and conservation of regional droves; check for violations and collect sanctions • Other subjects working in the field of the protection and promotion of the environmental, cultural and ethno-anthropological heritage of the areas to be enhanced: prepared observations and/or integrative proposals to the draft Spatial framework	
Involvement procedures	The preparation of the document was carried out by the regional offices, supported by the Scientific Committee appointed by the Region and by InnovaPuglia. The preparation procedure embedded (according to Regional Law n. 4/2013) a specific phase for the acquisition of observations and proposals by involved Municipalities and other interested subjects, within 60 days after the publication of the draft Framework on official channels. After the approval of the final version of the document by the Regional Authority, the Municipalities have the role to implement it by drafting, approving and executing Local Enhancement Plans for single sections of the drover roads network, in line with the contents of the Framework.	
Problems and challenges	*Information not available*	
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Environmental/landscape (e.g. restoration of habitats, effective protection of historic landscapes…)	• Restoration of habitats linked to pastoral activities, such as grasslands • Protection of traditional agro-ecosystems and rural landscapes • Reconnection between natural and agricultural areas, according to a distributed ecological network model	
Cultural (e.g. restoration of	• Preservation and restoration of architectural elements such as posts, taverns, chapels,	

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historic artefacts, promotion of folkloric assets…)	bridges, towers, castles, fountains, mills, etc. • Promotion of ethnographic museums in involved Municipalities • Strengthening of local communities' identity and ownership
Social/economic (e.g. new jobs, new enterprises…)	• Promotion of rural products linked to sheep breeding and of the related gastronomy, and consequently of small-sized companies working in milk and wool processing, restaurants, etc. • Propulsion of rural proximity tourism (also linked to cycling mobility)
IMPLEMENTATION ISSUES	
Financial resources	The Framework does not provide information on funding; however, it does not include concrete actions to be implemented for the enhancement of the drover roads network either. The quantification of the resources needed for the implementation of such actions must be included in the Local Enhancement Plans that will be drafted by Local Authorities as local-level tools to actually implement the Framework.
Implementation procedures	The planning process regarding the drover roads network is structured in 3 phases: 1) The Region defines the Spatial Framework (the present case study), defining boundaries, classification and zoning of drover roads 2) The Region issues a Regional Enhancement Document, defining objectives, guidelines, criteria and procedures for the preparation of Local Enhancement Plans. 3) Municipalities (single or associated) prepare Local Enhancement Plans containing: a) Identification of areas for infrastructure or equipment for collective use, to improve the fruition of the Regional Drover Roads Park b) Survey of artefacts representing evidences of transhumance phenomena c) Actions to restore and enhance the elements listed at points a) and b), as well as the modalities and forms of their use and management for social purposes d) Indication of the activities that are compatible with the Park's conservation and enhancement objectives, as well as the ways to promote them e) Education actions aimed at raising awareness on environmental protection issues, as well as on the need to preserve typical transhumance elements f) Quantification of resources needed for implementing the above-mentioned actions.
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	*Not available*
References (including web links)	Regione Puglia, "Quadro di assetto dei tratturi di Puglia – Una risorsa per il futuro: verso la valorizzazione della rete tratturale attraverso la progettazione condivisa", 2019 Deliberazione della Giunta Regionale 15 febbraio 2019, n. 256 "Legge Regionale n. 4/2013, Testo Unico delle disposizioni in materia di demanio armentizio, artt. 6 e 7. - Approvazione del Quadro di Assetto dei Tratturi", Bollettino Ufficiale della Regione Puglia - n. 31 suppl. 19-3-2019 http://sit.puglia.it/portal/portale_pianificazione_regionale/assetto_tratturi http://webapps.sit.puglia.it/freewebapps/QuadroAssettoTratturiApprovato/index.html

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ERASMUS+ PECUS

CASE STUDY SHEET

CS code	*IT-02*	**CS Title**	*Degree thesis by Simona Di Crescenzo: Contribution for the revision of the "Drover Road Framework Plan" of the Municipality of Rosciano ("Tratturo Bene comune territoriale. Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano (PE)")*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy X Local level policy/plan/strategy X Study/research X Project ☐ Other		
Responsible body/Promoter	Università degli Studi G. D'Annunzio – Chieti-Pescara		
Location (region, locality)	Rosciano (PE), Abruzzo, Italy		
Geographical area covered	14.36 sq. km, distributed among seven municipalities: Cepagatti, Rosciano, Nocciano, Cugnoli, Alanno, Pietranico, Corvara		
Year	*2016-2017*		
Summary description	The project is focused on the foothills and mountains of the province of Pescara (Abruzzo, Central Italy). This territorial district is shared among seven municipalities crossed by the L'Aquila-Foggia sheep-track: Rosciano, Cepagatti, Nocciano, Cugnoli, Alanno, Pietranico, Corvara. Along the network of sheep-tracks and minor paths that crosses these municipalities we find important landscape, historical and archaeological values related to the transhumance culture. In 2011 an agreement – promoted by the Municipality of Rosciano and the local Superintendence – was signed by the 7 mentioned villages, to favour the cultural and tourist enhancement of the Tratturo Magno and of the minor sheep-tracks. It is possible to consider the sheep tracks as "Territorial Common Goods", object of interest of the local communities because they are linked to the exercise of common rights. We can define them as places and spaces, interested by possible community practices, resource and opportunity of intervention for the territorial regeneration of marginal inland territories, through the reconnection of these environments with the highly developed coastal regions. The defined methodology is based on the idea of the territory as a "stratification of elements linked to its nature and use". These elements have two distinct "souls": they are defined either as physical and material – tangible – or as intangible elements, belonging to the sphere of history and memory of places. These elements, in different ways, determine the identity of a territory. The objective of the project is the definition of shared strategies of sustainable development that could represent pilot interventions within a wider national strategy dedicated to marginal mountainous areas, even using multimedia tools, instruments and applications. The methodology is organized into 5 phases: 1) Soil study on cadastral basis; study of soils on the basis of the Regional Technical Map; 2) Study of Historical Sources, archaeological data, "Reintegre" (1651,1712,1810); 3) Transcription from open data source: Landscape Plan currently in force ("Piano Paesistico", 2004) and "Carta dei Luoghi e dei Paesaggi" (CLeP) of the new Landscape Plan under development ("Piano Paesaggistico", 2009) 4) field surveying, use of digital techniques (Locus Map, Google Earth, etc.)		
Link with laws/regulations and	The sheep-tracks in Abruzzo are protected by specific laws: 1) D.M. 23 marzo 1980;		

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with other policies/ plans/strategies *(if any)*	2) D.M. 22 dicembre 1983, *"Linee guida in materia di tutela e utilizzo dei tratturi d'Abruzzo, sottoposti a tutela con D.M. 22 dicembre 1983";* 3) Artt. 21-22 D. Lgs. 42/2004; Drover Road Framework Plans (Piani Quadro Tratturi, PQT) – Some municipalities whose territories are crossed by sheep-tracks have defined the "Piani Quadro Tratturi" in collaboration with the local Superintendences. PQTs are very important tools in the field of territorial planning, aimed, on the one hand, at protecting the rights of those citizens interested in the sheep-tracks and, on the other hand, at preserving the historical nature of the sheep-tracks. The plans provide rules that allow the use of the sheep-tracks areas, giving clear technical indications. PQT can therefore represent an economic impulse for specific economic activities. The main objectives are: a) the conservation and improvement of the visibility and legibility of the routes; b) the possibility to allow a reuse compatible with the landscape and the historical-archaeological heritage. Based on PQT provisions, enhancement interventions are allowed; itineraries and stations of historical, archaeological and naturalistic interest; interventions that do not involve soil alteration (authorized by the local Superintendence). PQT – Rosciano: approved by the "Soprintendenza per i Beni archeologici dell'Abruzzo" – Chieti, note n. 2897 5.6.1999. Internal Areas – The National Strategy for Internal Areas is defined by the Partnership Agreement with Italy 2014-2020 ("Accordo di Partenariato con l'Italia 2014-2020"), a document prepared by Italy and approved by the European Commission that defines strategies, methods and priorities for spending resources co-financed by the European Structural and Investment Funds (EIF Funds) for the 2014-2020 programming cycle. "Internal areas" are identified by the Agreement as those territories significantly distant from the "nodes" offering essential services (education, health and mobility), based on an accessibility indicator calculated in terms of minutes of travel from the nearest node (service offering centre). The internal areas are subdivided into intermediate areas, peripheral areas and ultra-peripheral areas, representing about 53% of Italian municipalities (4,261) and 23% of the Italian population according to the latest census, equal to over 13.5 million inhabitants, and more than 60% of the national territory. https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/19850/UT/systemPrint
PROBLEMS AND NEEDS TARGETED	
Problems	It is not possible to get access to the local regulations (PQT) via web. The majority of the problems are related with the preservation of the sheep-tracks, not in use at least since the first half of the XX Century. The L'Aquila-Foggia sheep-track (*Tratturo Magno*), which crosses several villages and small towns along its route – among which the seven chosen municipalities – is strongly affected by the modern anthropic impact. Several sectors of this sheep-track are lost, covered by modern roads, buildings and infrastructures. It is therefore often difficult to map and even to recognize its borders and its path, making the definition of protection strategies very complex.
Needs	It would be necessary to create a multimedia platform (e.g. in an open source GIS environment), able to correlate in real time geographical, cartographic, historical, archaeological, environmental and ethnographic data, with the aim of returning the path on geo-referenced cartography, associating it to multiple interpretative layers. Such a tool should network different public (State Archives, Superintendences, Museums, Regions, Provinces, Municipalities, Universities) and private (non-profit foundations, archives, cultural associations, etc.) databases. It would also be appropriate to raise the awareness of the local population through the definition of specific cognitive programmes, aimed at spreading knowledge of the pastoral culture, of the sheep-tracks' network, described as a possible economic and social resource. Knowledge, combined with a greater awareness and the possibility of using easily accessible multimedia tools, could contribute to the development of marginal internal areas, such as the territory considered within the project.
Quantitative data	e.g. agricultural surface per inhabitant:

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	Rosciano: < 1 ha Cepagatti: < 1 ha Nocciano: < 1 ha Cugnoli: < 1 ha Alanno: < 1 ha Pietranico: between 1 and < 2 ha Corvara: between 2 and < 3 ha e.g. population density per sq.km: Rosciano: > 30 and < = 50 Cepagatti: > 200 Nocciano: > 100 and < = 200 Cugnoli: > 50 and < = 100 Alanno: > 100 and < = 200 Pietranico: > 30 and < = 50 Corvara: < = 30 e.g. people over 65: Rosciano: > 35 and < = 40 % Cepagatti: < = 25 % Nocciano: < = 25 % Cugnoli: < = 25 % Alanno: < = 25 % Pietranico: > 30 and < = 35 % Corvara: > 35 and < = 40 %

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	YES	The project is focused on spatial planning, with a new definition of a PQT (Piano Quadro Tratturi) shared among Rosciano and the other Municipalities, which will improve the local spatial plans ("Piani Regolatori Generali", PRG). On a broader, regional level, this work will contribute to the updating of the Guidelines/Rules on the protection and direction of the sheep-track network in Abruzzo by the Ministry of Cultural Assets, and to the development of the Regional Plan for Sustainable Mobility ("Piano Regionale per la Mobilità Sostenibile"), directly involving associations, citizens and local stakeholders.
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	Along the sheep-tracks network we find different environments and bio-ecological systems. The soils of the foothills crossed by the *Tratturo Magno* are purely agricultural (vineyards, olive groves) while the mountain part is characterized by sporadic pastures and arable land that alternate with large areas of woodland. They have a high naturalistic value.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	We can define sheep-tracks – and the *Tratturo Magno* is the most relevant among the four Italian "Tratturi Regi"– as territorial, diffused, areas where historical and archaeological values linked to the transhumance civilization are often concentrated. The landscape is marked along these paths by architectural presences defined as "architectures of transhumance" (churches, fountains, crossroads, towers). Several relevant archaeological sites are scattered along these ancient routes, defining a broad time span, framed between Prehistory and the Modern age. GIS analysis would be of great importance in mapping

		natural, archaeological, historical and ethnographic elements related to the sheep-tracks, favouring valorisation projects and improving scientific researches.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	The seven municipalities involved in the project are nearby or they are crossed by the most important among the so called "Tratturi Regi": the *Tratturo Magno*. All villages share common uses, folklore, food and music tradition. We also have to underline that Transhumance became part of the UNESCO Intangible Cultural Heritage on December 11, 2019. The term transhumance generally indicates the seasonal movement of flocks, in Central-southern Italy mainly conducted, until the middle of the twentieth century, between the Apennine pastures and the Apulian Tavoliere. In the past centuries the pastoral culture has favored the development of socio-economic relations, the diffusion of knowledge and traditions. Today this reality barely survives and the local Administrations struggle to administer a patrimony of material and immaterial goods that could represent, in concrete terms, a resource and a formidable instrument of regeneration for the internal areas.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The project improves the opportunity of planning and valorising the sheep-tracks' network, creating naturalistic paths, cycling routes, bridleways and eco-archaeological trekking paths.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	This is the principle goal: to improve the economic development of this marginal, rural district, through eco-cultural and slow tourism, wine and food tours, bio-agriculture and livestock breeding, even creating a local land-mark.

INVOLVEMENT OF STAKEHOLDERS	
Actors involved	University of Chieti-Pescara "Gabriele D'Annunzio"; Municipalities of Rosciano, Alanno, Cepagatti, Nocciano, Cugnoli, Pietranico and Corvara; Regione Abruzzo.
Involvement procedures	- Development and revision of a new "Piano Quadro Tratturi"; - Contribution to the updating and operational experimentation of the Guidelines /Rules on the protection and direction of the sheep-tracks' network in Abruzzo (MIBACT, Segretariato Regionale per i Beni e le Attività culturali e per il Turismo per l'Abruzzo); - Contribution to the formation and development of the "Piano Regionale per la Mobilità Sostenibile", also through forms of participation and direct involvement of associations, citizens and local stakeholders; - Creation of a strategic agenda in which to define short, medium and long term actions for the active custody of the common assets linked to the sheep-tracks' system in Abruzzo.
Problems and challenges	lengthy bureaucratic procedures and long technical-scientific analysis to achieve the goals; long difficult connections between the University and the Municipalities; luck of funds.

EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	- Ecological protection of the territorial areas along the route and, when possible, restoration of the original situation; - Maintenance of the non-anthropized landscape; - Conservation of protected or rare animal and plant species; - Protection of fragile, mountainous areas.
Effects on immaterial, cultural assets (e.g.	- Protection of the so called "collective memory" through the definition of projects aimed at collecting and recording the testimonies of "memory bearers";

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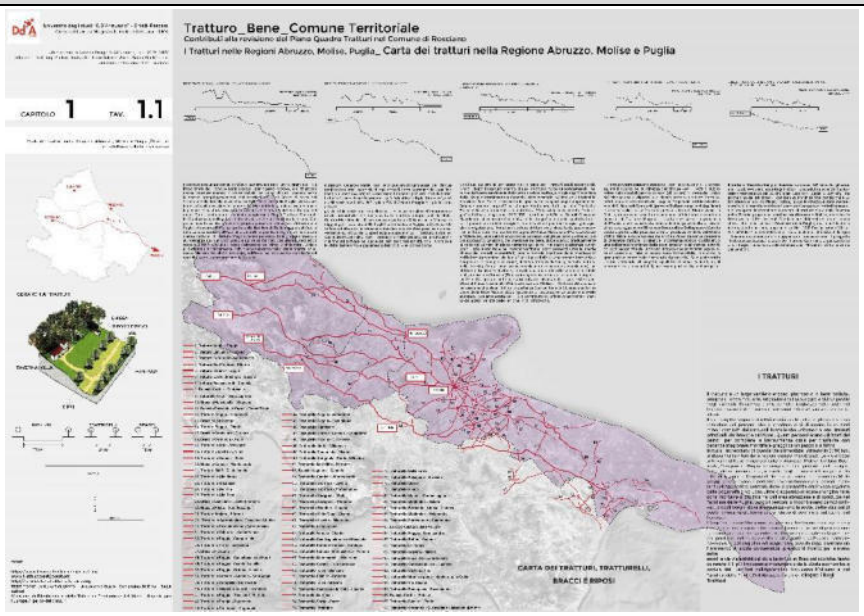
cultural landscape, scenic views, folklore…)	- Filing – through web-tools suggested by the Ministry of Cultural Assets – of elements relevant to the intangible cultural heritage; - Creation of archives and museums, aimed at preserving and spreading the knowledge of local traditions; - Definition of specific projects focused on extending, at national and international level, the knowledge of the ethnographic and cultural heritage of the territory.
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	- Mapping of historical-archaeological and architectural elements located along the paths (farms, churches, rural and/or pastoral structures); - Mapping and surveying of traditional cultivation systems; - Knowledge, protection and valorisation of some of the historical-archaeological, architectural and rural contexts highlighted; - Public fruition.
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	- Raising the awareness of local people to consider the sheep-tracks as a common good; - Collaboration with schools and associations in the area (participation in regional and European calls for proposals); - Involvement of territorial activities (economic aspect of the sheep-tracks); - Participatory planning.
IMPLEMENTATION ISSUES	
Financial resources	None.
Implementation procedures	N.a.
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)* ***PLEASE SEE ANNEX FOR LARGER IMAGES***	

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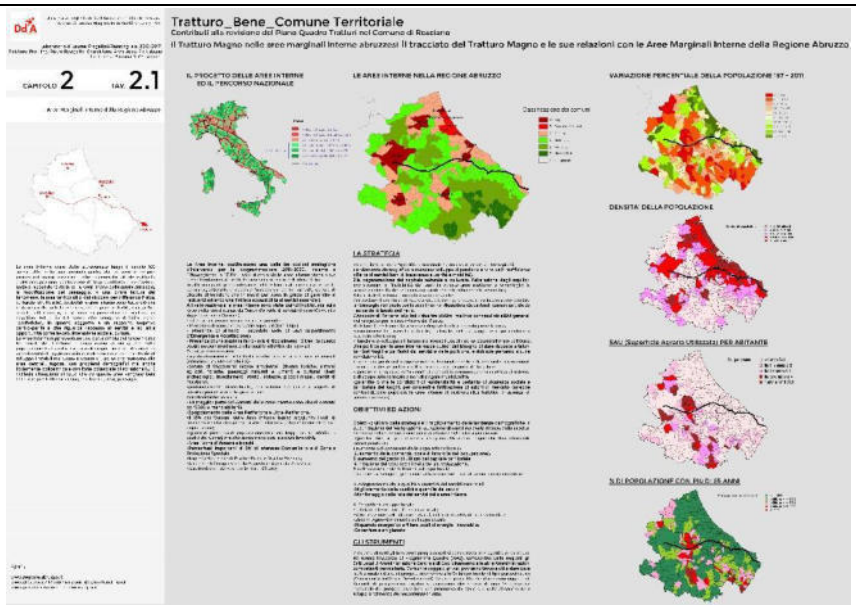

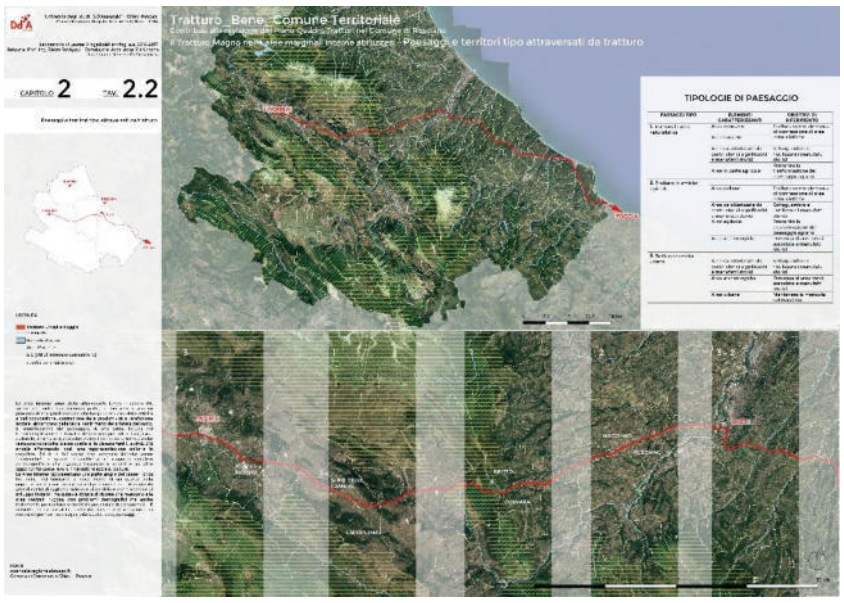

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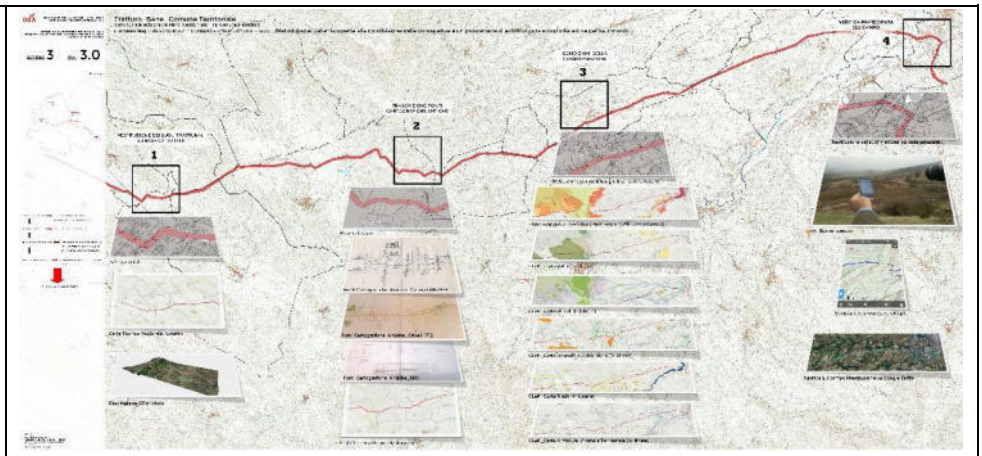

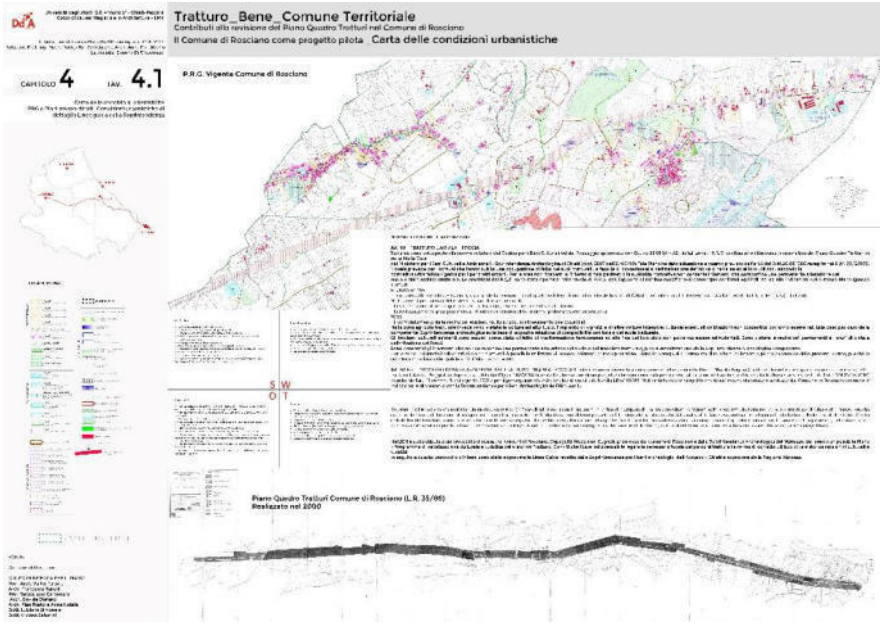

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	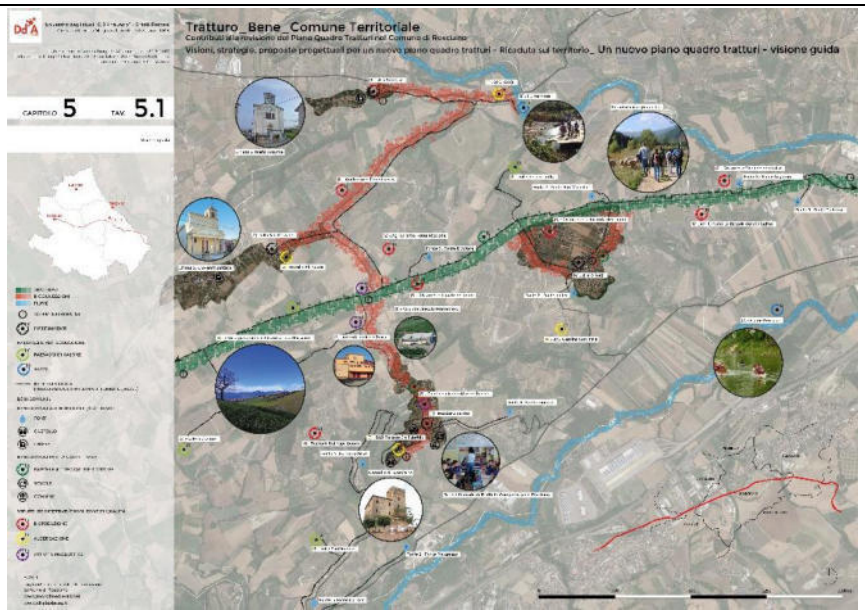 (Di Crescenzo 2016-2017, T 1.1, 2.1, 2.2, 3.0, 4.1, 5.1)
References (including web links)	A. Busca, B. Di Rico, V. Fabietti 2007, *Una via per l'Europa: il parco dei tratturi* (in collaboration with University of Chieti-Pescara "G. D'Annunzio" and Ministero dell'Ambiente e della Tutela del Territorio), S. Salvo – CH, Dierre Edizioni; A. Busca, B. Di Rico 2000, *Territorio, Tratturo, Sviluppo*, Pescara, Sala Edizioni; Camera di Commercio Chieti – Pescara, Piano Paesaggistico Regione Abruzzo; S. Di Crescenzo 2016-2017, *Tratturo Bene comune territoriale. Contributi alla revisione del piano quadro tratturi nel Comune di Rosciano a sostegno delle aree marginali interne abruzzesi*, dissertation, University of Chieti-Pescara "G. D'Annunzio" – Dip. of Architecture, "Laboratorio di Laurea Progetto & Planning", thesis Supervisor Prof. Piero Rovigatti, thesis co-rapporteur Arch. Anna Pia Urbano; P. Imperiale (a cura di) 2008, P*rima guida al Tratturo Magno. Verso un futuro da scoprire camminando*; L. Ermini Pani (a cura di) 2015, *Abruzzo sul Tratturo Magno*, Roma, Edizioni Exorma. G. Vannucci 2017-2018, *Tratturo Bene comune territoriale. Strategie di cura e custodia attiva per i territori della provincia di Chieti. Progetto Pilota : Comune di Arielli*, dissertation, University of Chieti-Pescara "G. D'Annunzio" – Dip. of Architecture, "Laboratorio di Laurea Progetto & Planning", thesis Supervisor Prof. Piero Rovigatti. www.regione.abruzzo.it www.dps.gov.it/it/pubblicazioni_dps/materiali_uval www.programmazioneeconomica.gov.it opendata.regione.abruzzo.it https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/19850/UT/systemPrint https://www.locusmap.eu/ http://www.leviedeitratturi.com/regio-tratturo-laquila-foggia-dalla-montagna-al-mare/ https://www.sabap-abruzzo.beniculturali.it/

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Università degli studi "G.D'Annunzio" - Chieti-Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di Laurea Progetto&Planning a.a. 2016-2017
Relatore: Prof. Ing. Pietro Rovigatti Correlatore: Arch. Anna Pia Urbano
Laureanda: Simona Di Crescenzo

Tratturo_Bene_Comune Territoriale

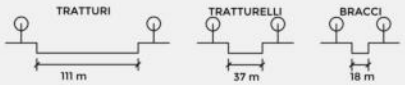
Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

I Tratturi nelle Regioni Abruzzo, Molise, Puglia_ Carta dei tratturi nella Regione Abruzzo, Molise e Puglia

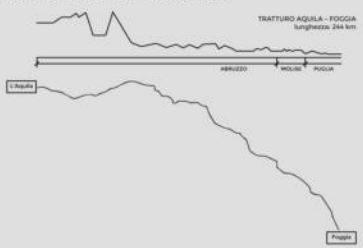
CAPITOLO 1 **TAV. 1.1**

Carta dei tratturi nella Regione Abruzzo, Molise e Puglia /Storia e architettura della transumanza

GERARCHIA TRATTURI



REGIO TRATTURO L'AQUILA-FOGGIA - DALLA MONTAGNA AL MARE

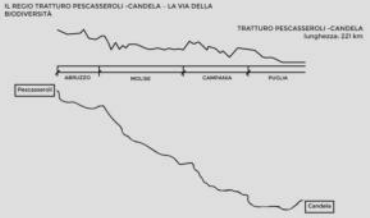


Il Tratturo **L'Aquila-Foggia**, con i suoi **244 km**, era il più lungo, grande e il più importante dei cinque Regi Tratturi: per questo motivo, era chiamato anche "**Tratturo Magno**". Si tratta del più "adriatico" di tutti, convogliando le enormi greggi provenienti dai massicci del Gran Sasso, di parte del Sirente e della Majella ai vasti pascoli del Tavoliere delle Puglie, dopo aver lambito in più occasioni le sponde del Mar Adriatico, unico caso nel quale le pecore e i pastori arrivavano a toccare anche materialmente l'acqua del mare. Da esso si diparte e poi si ricongiunge il Regio Tratturo Centurelle-Montesecco, collegato a metà strada anche dal Tratturo Lanciano-Cupello.Il suo tracciato, in vero e proprio percorso storico tra l'Abruzzo e la Puglia attraverso il Molise, parte dalla **Basilica di Collemaggio** dell'Aquila ed è caratterizzato nell'Aquilano da tratti alquanto integri e da numerose chiese tratturali. Il Tratturo Magno veniva percorso dalle greggi al pascolo sul versante sud del Gran Sasso e sul versante nord del Sirente, seguendo sotto la città di L'Aquila il corso dell'Aterno per circa 10 chilometri. L'inizio può essere simbolicamente individuato nel Parco della Transumanza, adiacente alla Basilica di Collemaggio, edificata nel XIII secolo proprio con il contributo della corporazione dei Lanaioli.

REGIO TRATTURO CELANO-FOGGIA - IL CAMMINO DELLA CIVILTÀ

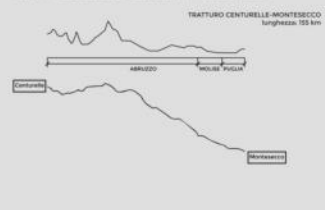
Il tratturo **Celano-Foggia**, con i suoi **208 km** di lunghezza, tra i cinque Regi Tratturi era il terzo più lungo, dopo il Tratturo Magno da L'Aquila a Foggia (lungo 244 km) e il Pescasseroli-Candela (221 km). Se i due tratturi citati sono, rispettivamente, il più "adriatico" e il più "tirrenico", cioè quelli posizionati più a NE e più a SW, il **Celano-Foggia** è il più interno di tutti:
grazie a tale posizione, è quello che si inserisce meglio nell'**enorme rete di vie armentizie** che innervava tutti i centri più importanti dell'Italia Centro-Meridionale. Il suo tracciato parte da Celano, nella Marsica, e raggiunge il Tavoliere delle Puglie terminando a Foggia, attraversando vallate ed altopiani in direzione Sud-Est e tenendosi quasi sempre sul versante adriatico dello spartiacque appenninico. Il tratturo entra nel cuore dell'Appennino, con il passaggio nell'altopiano delle Cinquemiglia fino ad arrivare nel cuore del territorio dei sanniti, con il transito e la visita del tempio e parlamento italico di Pietrabbondante.

IL REGIO TRATTURO PESCASSEROLI -CANDELA - LA VIA DELLA BIODIVERSITÀ



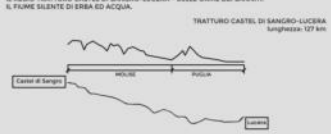
Con i suoi **221 km** di lunghezza, tra i cinque Regi Tratturi era il secondo più lungo, dopo il Tratturo Magno. Il suo tracciato parte da **Pescasseroli**, nel cuore del **Parco Nazionale d'Abruzzo Lazio e Molise**, e raggiunge il **Tavoliere delle Puglie terminando a Candela**, attraversando vallate ed altopiani in direzione Sud-Est e ricalcando in gran parte lo spartiacque appenninico. Originariamente largo 60 passi napoletani come tutti gli altri Tratturi e Bracci della rete armentizia, fu ristretto a 30 passi dalla cosiddetta "reintegra" effettuata negli anni 1810-1812 su ordine del Re di Napoli Giuseppe Napoleone, che comportò in realtà la "disintegra" di metà del suolo tratturale. Il percorso attraversa regioni molto diverse per morfologia, geologia, clima, vegetazione, flora, fauna ed uso del territorio. Si parte da quote superiori ai 1000 metri, tra le alte montagne del Parco Nazionale d'Abruzzo, Lazio e Molise, segnate dalla bianca roccia calcarea, dal glacialismo quaternario e dal successivo carsismo, tra maestose faggete, discendendo gradualmente la Valle del Sangro, in pieno versante adriatico. Nel Parco Nazionale d'Abruzzo, Lazio e Molise e nei boschi confinanti sono presenti tutte le specie chiave dei grandi mammiferi, vere e proprie bandiere della biodiversità dell'intero Appennino: dai lupi (Canis lupus italicus) che stanno tornando a ripopolare le zone più selvagge, al cervo (Cervus elaphus), incontrastato re della foresta, fino all'orso bruno marsicano (Ursus arctos marsicanus), ad altissimo rischio d'estinzione, con solo una quarantina di esemplari in totale e al camoscio d'Abruzzo (Rupicapra pyrenaica ornata), la cui unica popolazione relitta qui presente ha consentito di salvarlo dalla sicura estinzione. Oltre al Parco Nazionale d'Abruzzo, Lazio e Molise, il Tratturo attraversa o lambisce anche alcuni Siti di Importanza Comunitaria (SIC), aree che fanno parte della Rete Natura 2000, godendo di protezione particolare a livello europeo, in quanto scelte per il loro contributo significativo al mantenimento della biodiversità della regione in cui si trovano.

REGIO TRATTURO CENTURELLE-MONTESECCO - LA VIA DELLO ZAFFERANO

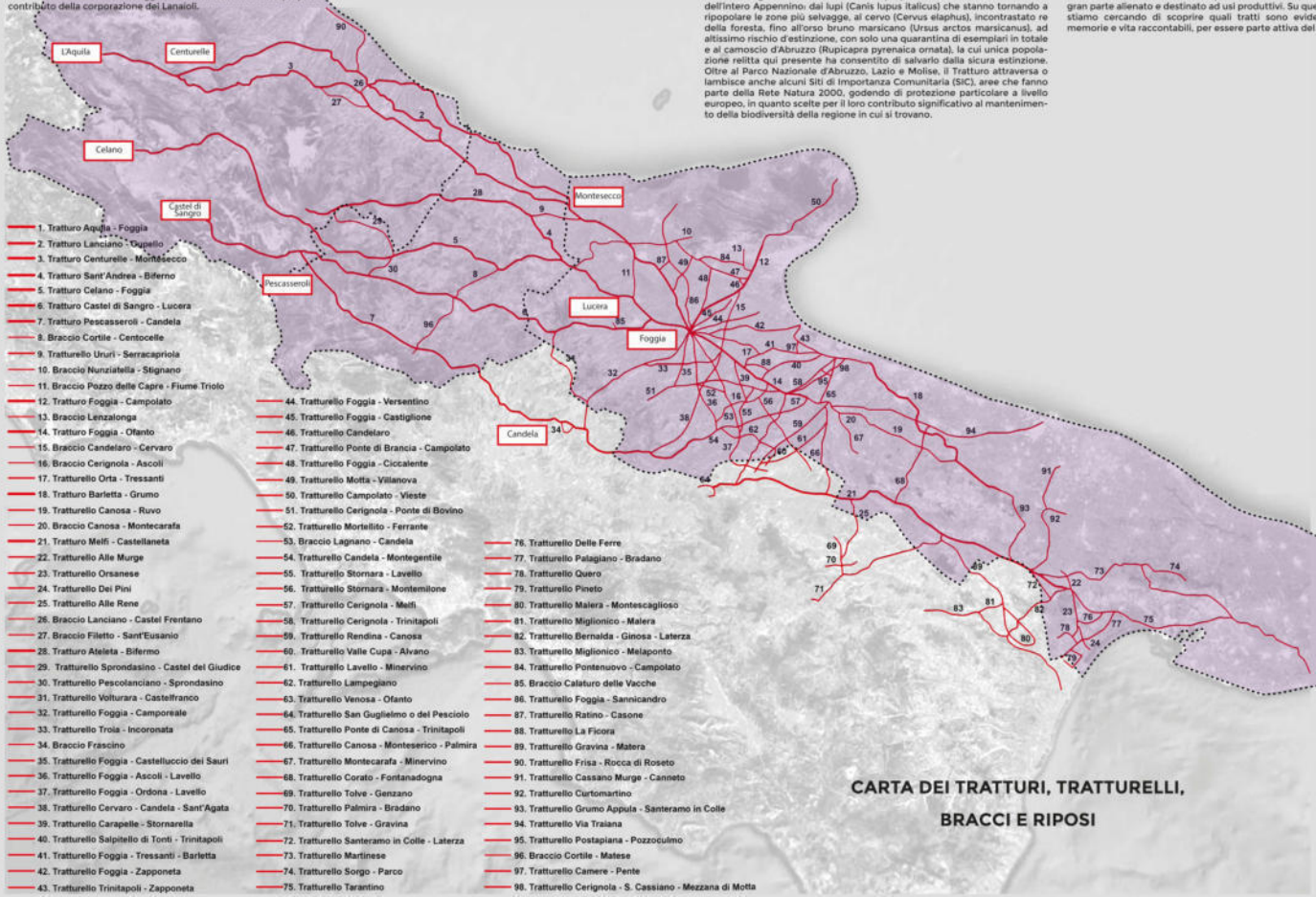


Il **Tratturo Centurelle-Montesecco**, con i suoi **155 km** di lunghezza, era il quarto per lunghezza dei cinque Regi Tratturi, subito prima del Castel di Sangro-Lucera (di 127 km). Si tratta dell'unico dei cinque che si diparte e si ricongiunge su un altro Tratturo: infatti parte direttamente dal L'Aquila-Foggia dalla **Chiesa tratturale di S. Maria di Centurelli (presso Civitaretenga, nell'Aquilano)** e termina sullo stesso Tratturo presso l'altura di **Montesecco**, in Molise, dopo aver seguito un percorso più interno e montano rispetto al Tratturo Magno. Il tratto che corre in provincia dell'Aquila è ben conservato e ricco di emergenze culturali, storiche e paesaggistiche: (**12 km da Centurelle a Collepietro**). Questo tratturo parte dalla preziosa area di produzione dello **zafferano DOP di Navelli**, dove è presente anche un'insolita concentrazione di chiesette tratturali di grande importanza storica, costituendo una solida testimonianza delle eccellenze agro-alimentari e storico-architettoniche dell'Abruzzo. Il tratto che attraversa le province di Pescara e Chieti è invece poco riconoscibile, in quanto in gran parte alienato e destinato ad usi produttivi. Su questo tratto stiamo cercando di scoprire quali tratti sono evidenti, quali memorie e vita raccontabili, per essere parte attiva del progetto.

IL REGIO TRATTURO CASTEL DI SANGRO-LUCERA - SULLE ORME DEI SANNITI. IL FIUME SILENTE DI ERBA ED ACQUA.



Il **tratturo Castel di Sangro –Lucera**, con i suoi **127 km** di lunghezza, era il più breve dei cinque Regi Tratturi, preceduto anche dal Centurelle – Montesecco (di 155 km) e dal Celano - Foggia (di 207 km), ma anche uno dei più integri, con ben 28 km in buone condizioni e 53 km sistemati e ri-confinati. Inoltre, la sua larghezza è stata mantenuta in 111,1 metri e molti tratti sono stati oggetto di ottimi interventi di recupero, in tempi molto recenti. Il tratturo parte dalla **Taverna della Zittola**, proprio sul **confine tra Abruzzo e Molise**, dove lascia l'Abruzzo, e il Pescasseroli-Candela per dirigersi nella stessa sua stessa direzione, verso il **Tavoliere delle Puglie**, ma tenendosi più internamente nell'area appenninica. Nel 2012 l'associazione "AttraversoilMolise" ha condotto uno studio analitico sul Castel di Sangro – Lucera, riesplorando e rimappando il tracciato, con il progetto "Tratturocoast2coast" e creando il primo Cammino organizzato su di un Regio Tratturo, con denominazione: "Il Cammino Sulle Orme dei Sanniti".



1. Tratturo Aquila - Foggia
2. Tratturo Lanciano - Cupello
3. Tratturo Centurelle - Montesecco
4. Tratturo Sant'Andrea - Biferno
5. Tratturo Celano - Foggia
6. Tratturo Castel di Sangro - Lucera
7. Tratturo Pescasseroli - Candela
8. Braccio Cortile - Centocelle
9. Tratturello Ururi - Serracapriola
10. Braccio Nunziatella - Stignano
11. Braccio Pozzo delle Capre - Fiume Triolo
12. Tratturo Foggia - Campolato
13. Braccio Lenzalonga
14. Tratturo Foggia - Ofanto
15. Braccio Candelaro - Cervaro
16. Braccio Cerignola - Ascoli
17. Tratturello Orta - Tressanti
18. Tratturo Barletta - Grumo
19. Tratturello Canosa - Ruvo
20. Braccio Canosa - Montecarafa
21. Tratturo Melfi - Castellaneta
22. Tratturello Alle Murge
23. Tratturello Orsanese
24. Tratturello Dei Pini
25. Tratturello Alle Rene
26. Braccio Lanciano - Castel Frentano
27. Braccio Filetto - Sant'Eusanio
28. Tratturo Ateleta - Biferno
29. Tratturello Sprondasino - Castel del Giudice
30. Tratturello Pescolanciano - Sprondasino
31. Tratturello Volturara - Castelfranco
32. Tratturello Foggia - Camporeale
33. Tratturello Troia - Incoronata
34. Braccio Frascino
35. Tratturello Foggia - Castelluccio dei Sauri
36. Tratturello Foggia - Ascoli - Lavello
37. Tratturello Foggia - Ordona - Lavello
38. Tratturello Cervaro - Candela - Sant'Agata
39. Tratturello Carapelle - Stornarella
40. Tratturello Salpitello di Tonti - Trinitapoli
41. Tratturello Foggia - Tressanti - Barletta
42. Tratturello Foggia - Zapponeta
43. Tratturello Trinitapoli - Zapponeta
44. Tratturello Foggia - Versentino
45. Tratturello Foggia - Castiglione
46. Tratturello Candelaro
47. Tratturello Ponte di Brancia - Campolato
48. Tratturello Foggia - Ciccalente
49. Tratturello Motta - Villanova
50. Tratturello Campolato - Vieste
51. Tratturello Cerignola - Ponte di Bovino
52. Tratturello Mortellito - Ferrante
53. Braccio Lagnano - Candela
54. Tratturello Candela - Montegentile
55. Tratturello Stornara - Lavello
56. Tratturello Stornara - Montemilone
57. Tratturello Cerignola - Melfi
58. Tratturello Cerignola - Trinitapoli
59. Tratturello Rendina - Canosa
60. Tratturello Valle Cupa - Alvano
61. Tratturello Lavello - Minervino
62. Tratturello Lampegiano
63. Tratturello Venosa - Ofanto
64. Tratturello San Guglielmo o del Pesciolo
65. Tratturello Ponte di Canosa - Trinitapoli
66. Tratturello Canosa - Monteserico - Palmira
67. Tratturello Montecarafa - Minervino
68. Tratturello Corato - Fontanadogna
69. Tratturello Tolve - Genzano
70. Tratturello Palmira - Bradano
71. Tratturello Tolve - Gravina
72. Tratturello Santeramo in Colle - Laterza
73. Tratturello Martinese
74. Tratturello Sorgo - Parco
75. Tratturello Tarantino
76. Tratturello Delle Ferre
77. Tratturello Palagiano - Bradano
78. Tratturello Quero
79. Tratturello Pineto
80. Tratturello Maiera - Montescaglioso
81. Tratturello Miglionico - Matera
82. Tratturello Bernalda - Ginosa - Laterza
83. Tratturello Miglionico - Melaponto
84. Tratturello Pontenuovo - Campolato
85. Braccio Calaturo delle Vacche
86. Tratturello Foggia - Sannicandro
87. Tratturello Ratino - Casone
88. Tratturello La Ficora
89. Tratturello Gravina - Matera
90. Tratturello Frisa - Rocca di Roseto
91. Tratturello Cassano Murge - Canneto
92. Tratturello Curtomartino
93. Tratturello Grumo Appula - Santeramo in Colle
94. Tratturello Via Traiana
95. Tratturello Postapiana - Pozzoculmo
96. Braccio Cortile - Matese
97. Tratturello Camere - Pente
98. Tratturello Cerignola - S. Cassiano - Mezzana di Motta

CARTA DEI TRATTURI, TRATTURELLI, BRACCI E RIPOSI

I TRATTURI

Il tratturo è un largo sentiero erboso, pietroso o in terra battuta, sempre a fondo naturale, originatosi dal passaggio e dal calpestio degli armenti. Di norma la misura della larghezza della sede del tracciato viario è di 111 metri corrispondenti a sessanta passi napoletani.
Il suo tragitto segna la direttrice principale del complesso sistema reticolare dei percorsi che si snodano e si diramano in sentieri minori costituiti dai tratturelli bretelle che univano tra loro i tratturi principali, dai bracci e dai riposi. Questi percorsi erano utilizzati dai pastori per compiere la transumanza ossia per trasferire con cadenza stagionale mandrie e greggi da un pascolo all'altro.
In Italia l'intrecciarsi di queste vie armentizie, stimato in 3.100 km, si rileva nei territori delle regioni centro-meridionali. Le vie erbose si trovano diffuse principalmente in Abruzzo, Molise, Umbria, Basilicata, Campania e Puglia. Le loro piste erano percorse nelle stagioni fredde in direzione sud, verso la Puglia, dove esisteva, presso la città di Foggia la Dogana delle Pecore, mentre nei mesi caldi le greggi percorrevano il percorso inverso tornando ai pascoli montani dell'Appennino centrale dove la pastorizia era invece regolata dalla Doganella d'Abruzzo L'intero apparato stradale si origina nelle zone montane e più interne dell'area abruzzese e si conclude nel Tavoliere delle Puglie. Lungo i percorsi si incontravano campi coltivati, piccoli borghi dove si organizzavano le soste, dette stazioni di posta, chiese rurali, icone sacre, pietre di confine o indicatrici del tracciato.
I Regi Tratturi costituiscono una preziosa testimonianza di percorsi formatisi in epoca protostorica in relazione a forme di produzione economica e di conseguente assetto sociale basate sulla pastorizia, perdurati nel tempo e rilanciati a partire dall'epoca normanno-sveva, e poi angioina ed aragonese, così da rappresentare un frammento di storia conservatosi pressoché intatto per almeno sette
secoli e via via arricchitosi do ulteriori stratificazioni storiche, tanto da renderli il più imponente monumento della storia economica e sociale dei territori dell'Appennino Abruzzese-Molisano e del Tavoliereedelle Puglie.Dall'Abruzzo partono i **cinque i Regi Tratturi**

FONTI

http://www.leviedeitratturi.com/i-tratturi/
www.tratturocoast2coast.org
http://osservatoriotratturi.altervista.org
TERRITORIO tratturo SVILUPPO - Alessandro Busca, Beniamino Di Rico - SALA editori
Ministero dell'Ambiente e della Tutela delTerritorio e del Mare - Una via per l'Europa: il parco dei tratturi

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Tratturo_Bene_Comune Territoriale

Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

Il Tratturo Magno nelle aree marginali interne abruzzesi_Il tracciato del Tratturo Magno e le sue relazioni con le Aree Marginali Interne della Regione Abruzzo

CAPITOLO **2** TAV. **2.1**

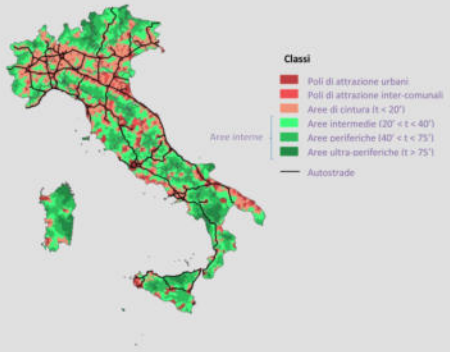
Aree Marginali Interne della Regione Abruzzo

Le aree interne sono state attraversate lungo il secolo XX, soprattutto nella sua seconda parte, da un vero e proprio processo di marginalizzazione che ha generato calo delle attività e dell'occupazione, contrazione della produttività e rarefazione sociale, abbandono della terra, venir meno della tutela del suolo, la modificazione del paesaggio. A una prima lettura del fenomeno, le aree territoriali si definiscono per differenza (fisica, culturale, strutturale), cosicché le aree interne sono tutto ciò che resta una volta tolte le aree costiere, le pianure fertili, le città. Si è andata affermando, così, una rappresentazione unitaria in negativo. Ed è in tal senso che vengono definite come "periferiche", in quanto soggette a un rapporto negativo centro-periferia che riguarda l'accesso ai servizi e ad altre opportunità come lavoro, interazione sociale, cultura.
Le Aree Interne rappresentano una parte ampia del paese – circa tre quinti del territorio e poco meno di un quarto della popolazione – assai diversificata al proprio interno, distante da grandi centri di agglomerazione e di servizio e con traiettorie di sviluppo instabili ma tuttavia dotata di risorse che mancano alle aree centrali, rugosa, con problemi demografici ma anche fortemente policentrica e con forte potenziale di attrazione [...] E richiede attenzione al fatto che da queste aree vengono beni necessari per tutti noi: acqua, aria buona, cibo, paesaggi.

FONTI:

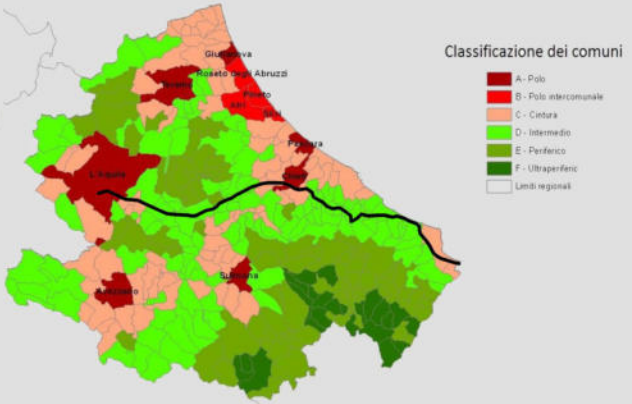
www.regione.abruzzo.it
www.dps.gov.it/it/pubblicazioni_dps/materiali_uval
www.programmazioneeconomica.gov.it

IL PROGETTO DELLE AREE INTERNE ED IL PERCORSO NAZIONALE



Le Aree Interne, costituiscono una delle tre opzioni strategiche d'intervento per la programmazione 2014-2020, insieme a "Mezzogiorno" e "Città " ed il rilancio delle aree interne viene visto come fondamentale e strategico per il rilancio dell'intera Italia.
Infatti, una parte preponderante del territorio italiano è caratterizzata da un'organizzazione spaziale fondata su "centri minori", spesso di piccole dimensioni, che in molti casi sono in grado di garantire ai residenti soltanto una limitata accessibilità ai servizi essenziali.
A livello nazionale le aree interne sono state quindi individuate sulla base della loro distanza da Centri d'offerta di servizi di base (Comuni o Aggregazioni di Comuni);
L'offerta dei servizi considerata comprende:
• Presenza di scuole secondarie superiori (tutti i tipi);
• Presenza di almeno 1 ospedale sede di DEA (Dipartimento d'Emergenza e Accettazione);
• Presenza di una stazione ferroviaria di tipo almeno «Silver» (a questo stadio nessun riferimento alla qualità effettiva dei servizi).
Si tratta quindi di aree:
•significativamente distanti dai centri di offerta di servizi essenziali (istruzione, salute e mobilità);
•dotate di importanti risorse ambientali (risorse idriche, sistemi agricoli, foreste, paesaggi naturali e umani) e culturali (beni archeologici, insediamenti storici, abbazie, piccoli musei, centri di mestiere);
•profondamente diversificate, per sistemi naturali e a seguito di secolari processi di antropizzazione.
Caratteristiche comuni:
• La maggior parte dei Comuni delle Aree Interne sono piccoli comuni con5000 o meno abitanti;
•Spopolamento delle Aree Periferiche e Ultra-Periferiche;
•Il 15% dei Comuni delle Aree Interne hanno raggiunto livelli di invecchiamento considerati «senza ritorno» salvo iniezioni di nuova popolazione;
•Quote di presenza di popolazione straniera leggermente inferiori a quelle dei Centri, ma che aumentano con la stessa intensità;
•Aree ricche di foreste e boschi;
•Percentuali importanti di Siti di Interesse Comunitario e di Zone a Protezione Speciale;
•Importanti sacche di Rischio Frane e Rischio Sismico;
•Andamenti Complessi della Superficie Agricola Utilizzata;
•Caratterizzate da Economie Diversificate;

LE AREE INTERNE NELLA REGIONE ABRUZZO



LA STRATEGIA

Le aree interne sono "questione nazionale" e non solo locale per tre ragioni:
1.andamento demografico e mancato sviluppo dipendono anche dall'insufficiente offerta di servizi/beni di base (scuola, sanità e mobilità);
2.la degenerazione del capitale naturale e culturale, l'alterazione degli equilibri eco-sistemici e l'instabilità dei suoli in queste aree mettono a repentaglio la sicurezza dei cittadini e generano cambiamenti difficilmente reversibili;
3.il capitale territoriale non utilizzato è ingente.
Per avviare l'inversione di questa situazione e promuovere sviluppo viene lanciata la "Strategia nazionale per le aree interne" finanziata sia da fondi comunitari, sia da risorse del bilancio ordinario.
L'Accordo di Partenariato individua tre distinti ma interconnessi obiettivi generali del progetto per le aree interne del Paese:
•tutelare il territorio e la sicurezza degli abitanti affidandogliene la cura;
•promuovere la diversità naturale, culturale, del paesaggio e il policentrismo aprendo all'esterno;
•rilanciare lo sviluppo e il lavoro attraverso l'uso di risorse potenziali male utilizzate.
Una politica per le aree interne nasce quindi dal bisogno di dare risposte a taluni territori fragili e periferici dai servizi e dalle politiche, e richiede pertanto alcune condizionalità:
•essere una politica di cooperazione istituzionale con le politiche ordinarie nazionali e regionali stesse sui temi dell'istruzione, dei trasporti, della salute;
•operare in un quadro di "unione" di comuni, io comunque in una ottica di sistema e di cooperazione locale e non di singola municipalità;
•garantire prima le condizioni di residenzialità e pertanto di sicurezza sociale e territoriale dei luoghi, per consentire l'attivazione di azioni di mercato (sarebbe contraddittorio popolare le aree interne di residenzialità turistica in assenza di servizi essenziali).

OBIETTIVI ED AZIONI

Obiettivo ultimo della strategia è il miglioramento delle tendenze demografiche in atto: riduzione dell'emigrazione, attrazione di nuovi residenti, ripresa delle nascite, modifica della composizione per età a favore delle classi più giovani.
Questo obiettivo può essere conseguito attraverso cinque obiettivi-intermedi, interdipendenti:
1.aumento del benessere della popolazione locale;
2. aumento della domanda locale di lavoro (e dell'occupazione);
3. aumento del grado di utilizzo del capitale territoriale;
4. riduzione dei costi sociali della de-antropizzazione;
5. rafforzamento dei fattori di sviluppo locale.
Tali obiettivi vengono perseguiti attraverso due classi di azioni, complementari:

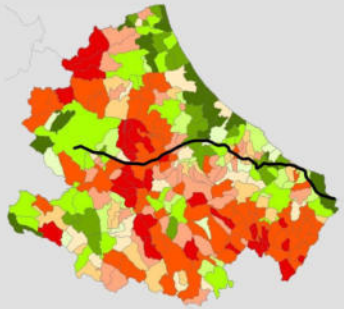
I. Adeguamento della qualità e quantità dei servizi essenziali
•Miglioramento della qualità e quantità dei servizi
•Monitoraggio della rete dei servizi delle aree interne

II. Progetti di sviluppo locale
•Tutela del Territorio e Comunità Locali;
•Valorizzazione delle risorse naturali, culturali e del turismo sostenibile;
•Sistemi Agro-Alimentari e Sviluppo Locale;
•Risparmio energetico e filiere locali di energia rinnovabile;
•Saper fare e artigianato

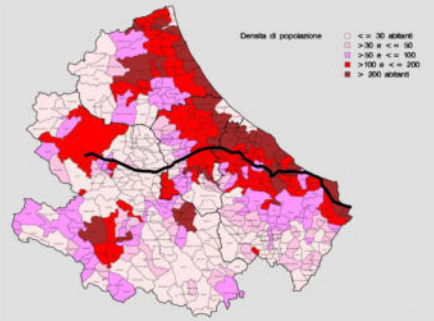
GLI STRUMENTI

L'insieme di tutti gli interventi programmati si concretizza in Progetti d'Area attuati attraverso l'Accordo di Programma Quadro (APQ), sottoscritto dalle Regioni, gli Enti Locali, l'Amministrazione Centrale di Coordinamento e le altre Amministrazioni competenti per materia. Comuni e soggetti privati potranno trovare utile dare base istituzionale ad alcuni progetti ricorrendo allo Sviluppo locale di tipo partecipativo (Community-led Local Development). Le aree-progetto che divengono oggetto di Accordi di programma quadro si avvalgono dei servizi di una "Federazione nazionale dei progetti aree interne", promossa dal Centro e volta al confronto e all'apprendimento dell'esperienze in atto.

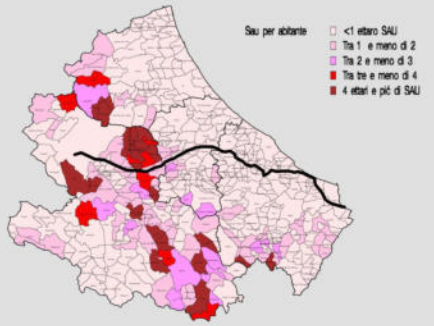
VARIAZIONE PERCENTUALE DELLA POPOLAZIONE 197 - 2011



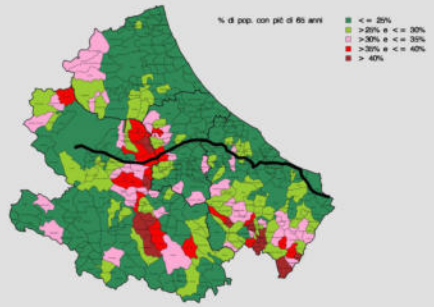
DENSITA' DELLA POPOLAZIONE



SAU (Superficie Agraria Utilizzata) PER ABITANTE



% DI POPOLAZIONE CON Più DI 65 ANNI



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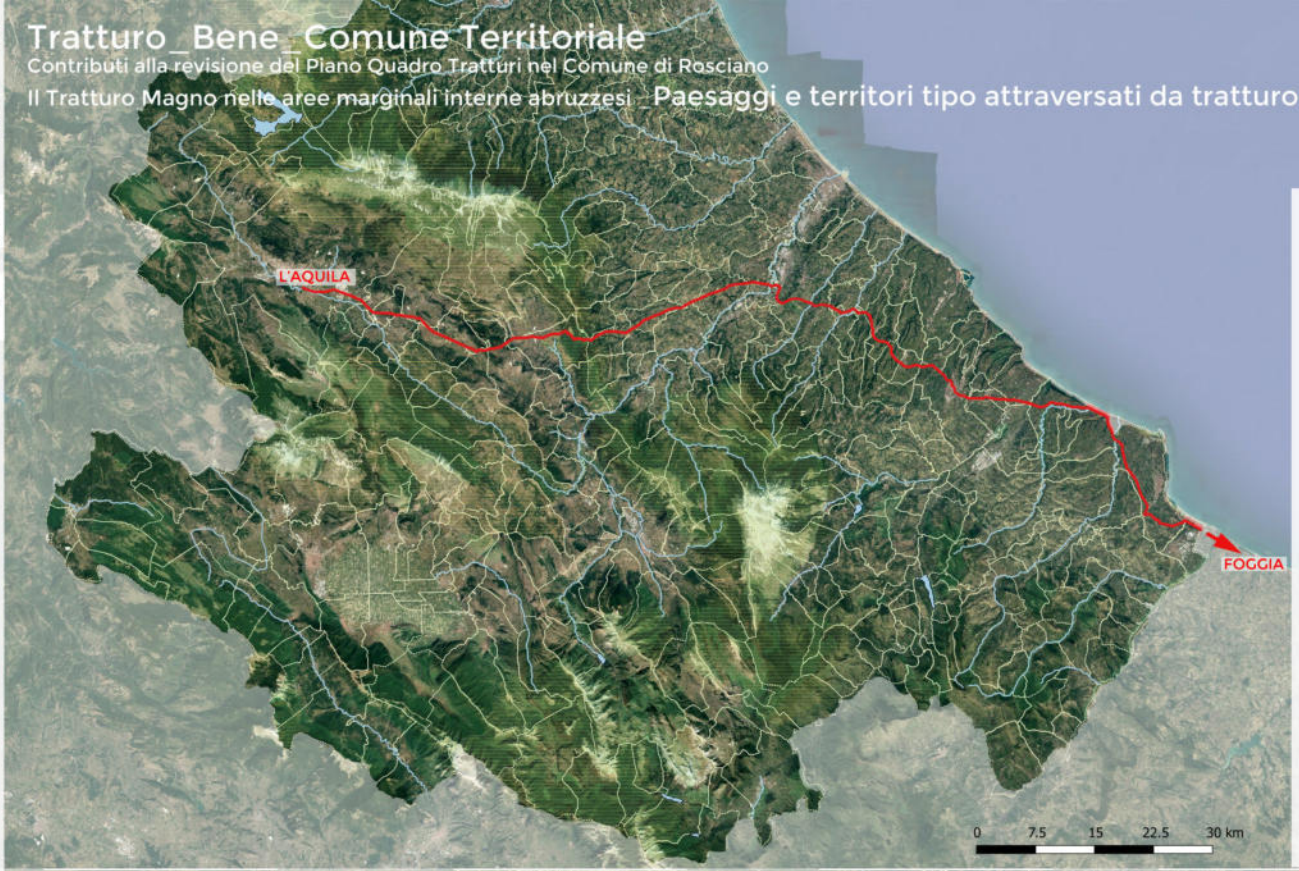
Tratturo_Bene_Comune Territoriale

Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

Il Tratturo Magno nelle aree marginali interne abruzzesi - Paesaggi e territori tipo attraversati da tratturo

CAPITOLO 2 TAV. 2.2

Paesaggi e territori tipo attraversati da tratturo



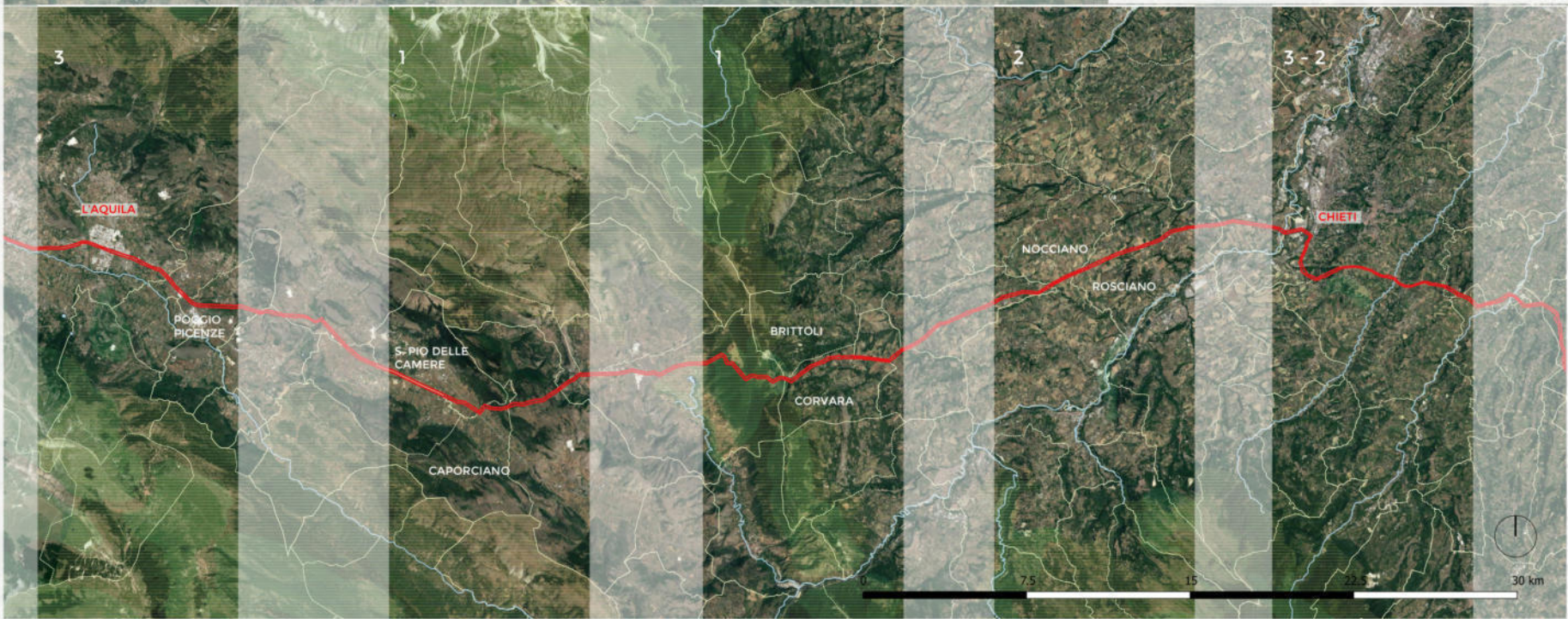
TIPOLOGIE DI PAESAGGIO

PAESAGGI TIPO	ELEMENTI CARATTERIZZANTI	OBIETTIVI DI RIFERIMENTO
1. Tratturo in area naturalistica	Aree montane	Tratturo come elemento di connessione di aree naturalistiche
	Aree boscate	
	Aree caratterizzate da centri storici significativi e manufatti storici	Salvaguardare e riutilizzare i manufatti storici
	Aree in parte agricole	Prevenire la trasformazione del paesaggio agrario
2. Tratturo in ambito agricolo		
	Aree collinari	Tratturo come elemento di connessione di aree naturalistiche
	Aree caratterizzate da centri storici significativi e manufatti storici	Salvaguardare e riutilizzare i manufatti storici
	Aree agricole	Prevenire la trasformazione del paesaggio agrario
	Aree archeologiche	Presenza di aree verdi associate a manufatti storici
3. Tratturo in ambito urbano		
	Aree caratterizzate da centri storici significativi e manufatti storici	Salvaguardare e riutilizzare i manufatti storici
	Aree archeologiche	Presenza di aree verdi associate a manufatti storici
	Aree urbane	Mantenere la memoria del tracciato

LEGENDA

- Tratturo L'Aquila-Foggia
- Idrografia
- Specchi d'acqua
- Aree Protette
- SIC (siti di interesse comunitario)
- Confini amministrativi

Le aree interne sono state attraversate lungo il secolo XX, soprattutto nella sua seconda parte, da un vero e proprio processo di marginalizzazione che ha generato calo delle attività e dell'occupazione, contrazione della produttività e rarefazione sociale, abbandono della terra, venir meno della tutela del suolo, la modificazione del paesaggio. A una prima lettura del fenomeno, le aree territoriali si definiscono per differenza (fisica, culturale, strutturale), cosicché le aree interne sono tutto ciò che resta una volta tolte le aree costiere, le pianure fertili, le città. Si è andata affermando, così, una rappresentazione unitaria in negativo. Ed è in tal senso che vengono definite come "periferiche", in quanto soggette a un rapporto negativo centro-periferia che riguarda l'accesso ai servizi e ad altre opportunità come lavoro, interazione sociale, cultura.
Le Aree Interne rappresentano una parte ampia del paese – circa tre quinti del territorio e poco meno di un quarto della popolazione – assai diversificata al proprio interno, distante da grandi centri di agglomerazione e di servizio e con traiettorie di sviluppo instabili ma tuttavia dotata di risorse che mancano alle aree centrali, rugosa, con problemi demografici ma anche fortemente policentrica e con forte potenziale di attrazione [...] E richiede attenzione al fatto che da queste aree vengono beni necessari per tutti noi: acqua, aria buona, cibo, paesaggi.



FONTI
opendata.regione.abruzzo.it
Camera di Commercio Chieti - Pescara

Università degli studi "G.D'Annunzio" - Chieti-Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di Laurea Progettista&Planning a.a. 2016-2017
Relatore: Prof. Ing. Pietro Rossigalli - Correlatore: Arch. Anna Pia Urbano
Laureanda: Simona Di Crescenzo

CAPITOLO 3 TAV. 3.0

Metodologia

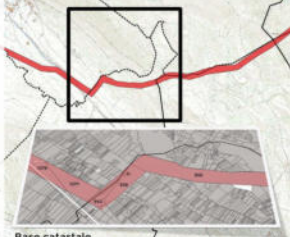
Tratturo_Bene_Comune Territoriale

Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

Il Tratturo Magno da Santa Maria in Centurelli alla foce del fiume Pescara _Metodologia: Dalla riscoperta alla condivisione delle conoscenze a un programma di azioni di cura e custodia attiva del patrimonio

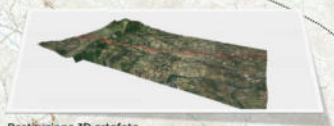
RESTITUZIONE DEI SUOLI TRATTURALI SU BASE CATASTALE

1



Base catastale

Carta Tecnica Regionale Abruzzo



Restituzione 3D ortofoto

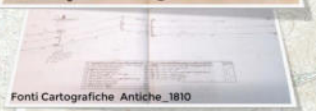
TRASCRIZIONE FONTI CARTOGRAFICHE ANTICHE

2

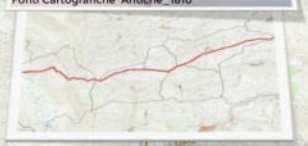
Base catastale

Fonti Cartografiche Antiche_Capecelatro 1651

Fonti Cartografiche Antiche_Crivelli 1712



Fonti Cartografiche Antiche_1810



Carta Tecnica Regionale Abruzzo

CONDIZIONI DELLA TRASFORMAZIONE

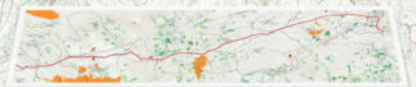
3

Restituzione dei suoli tratturali su base catastale

Piano Regionale Paesistico (PRP) Regione Abruzzo (Vigente)

CLeP_Carta Valori (in itinere)

CLeP_Carta Vincoli (in itinere)



CLeP_Carta Degrado e Abbandono (in itinere)

CLeP_Carta Rischi (in itinere)

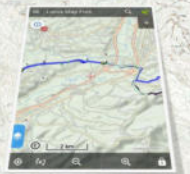
CLeP_Carta Armatura Urbana e Territoriale (in itinere)

VERIFICA PARTECIPATA SUL CAMPO

4

Restituzione dei suoli tratturali su base catastale

Verifica sul campo



Verifica sul campo (Locus Map)

Verifica sul campo (Restituzione su Google Earth)

FONTI:
Geoportale regione abruzzo.it
Camera di Commercio Chieti - Pescara
Piano Paesaggistico Regione Abruzzo
Locus Map
www.agenziaentrate.gov.it

Università degli studi "G.D'Annunzio" - Chieti-Pescara
Corso di Laurea Magistrale in Architettura - LM4

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Laureanda: Simona Di Crescenzo

Tratturo_Bene_Comune Territoriale

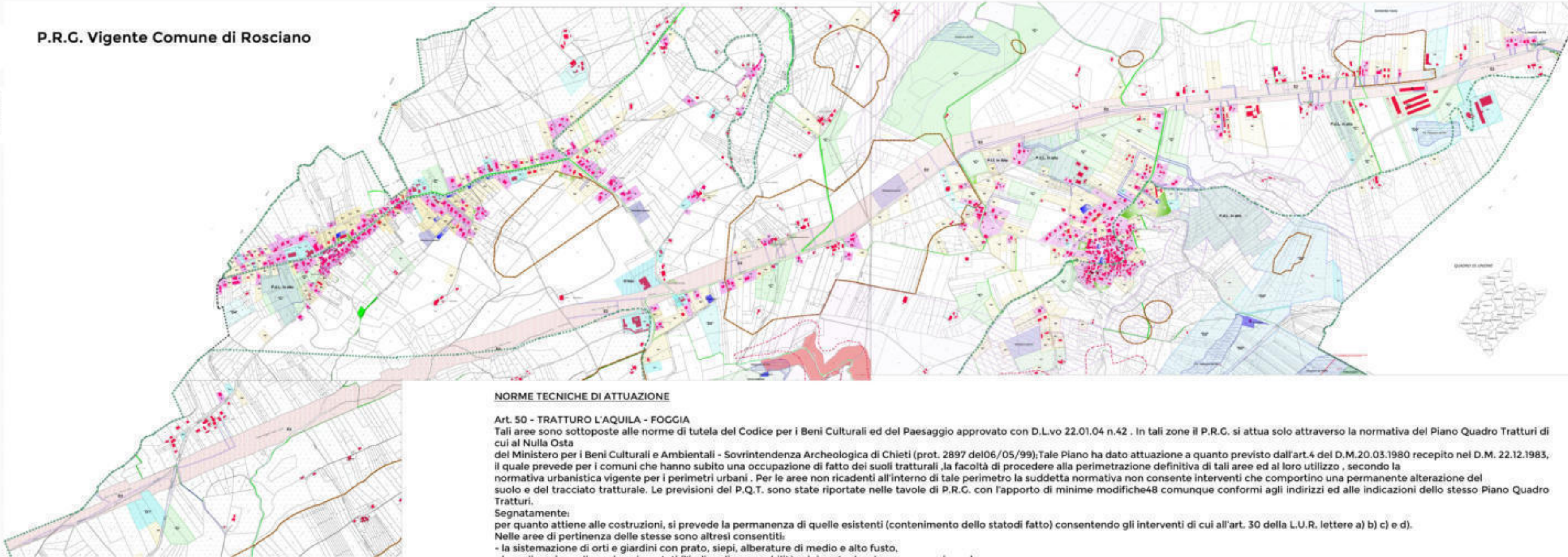
Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

Il Comune di Rosciano come progetto pilota _Carta delle condizioni urbanistiche

CAPITOLO **4** TAV. **4.1**

Carta delle condizioni urbanistiche
PRG e Piani sovraordinati_Condizioni urbanistiche di dettaglio Linee guida della Soprintendenza

P.R.G. Vigente Comune di Rosciano



LEGENDA PRG

VINCOLO IDROGEOLOGICO

Punti di forza

- Qualità ambientale (aria, microclima, ecc.)
- Presenza di prodotti agroalimentari tipici di qualità;
- Presenza di elementi culturali (architettonici, fonti, masserie);
- Relativa conservazione di naturalità e paesaggi rurali (aree rurali e tratturali);
- Popolazione in aumento;
- Vicinanza ai comuni di Chieti e Cepagatti;
- Vasta Pianura agricola legata alla produzione agro-alimentare;
- Emergenze aziende vitivinicole di media ed elevata rilevanza (Marramiero, Rosan);
- Presenza di Beni architettonici e culturali;
- Presenza del Tratturo L'aquila – Foggia;
- Presenza di elementi paesaggistici e naturalistici di pregio (Colle mezzano, Colle Sant'Angelo, Colle della Guardia, il percorso delle fonti).

Punti di debolezza

- Stato di degrado e insufficienza di alcune infrastrutture viarie;
- Scarsa dotazione di strutture agrituristiche e di incentivo alla diffusione dei prodotti agro-alimentari e vitivinicole;
- Patrimonio edilizio rurale prevalentemente vetusto, non manutenuto e non adeguato alle mutate esigenze di produzione;
- Debolezza nell'organizzazione dell'offerta dei prodotti tipici e di ricettività turistica;
- Assenza di spazi e attrezzature pubbliche
- Scarsa dotazione di attività commerciali

S W
O T

Opportunità

- Potenziamento dei collegamenti e delle infrastrutture, in particolare quelli verso il centro urbano di Rosciano e quelli verso Cepagatti e Chieti;
- Valorizzazione dei colli di valore paesistico: Colle Mezzano, Colle della Guardia, Colle Sant'angelo;
- Valorizzazione dell'area del parco archeologico;
- Valorizzazione prodotti agro-alimentari e del paesaggio rurale attraverso incentivi alle attività agrituristiche;
- Rafforzamento della rete di aziende agricole e vitivinicole locali;
- Incentivare il turismo in senso culturale, naturale, escursionistico e culinario;
- Potenziamento e valorizzazione del tracciato del tratturo, attraverso la connessione alle aziende vitivinicole limitrofe e la rifunzionalizzazione con attrezzature e servizi affini;
- potenziare il settore agricolo;
- Potenziamento e valorizzazione del tracciato del tratturo, connettendolo alle aziende vitivinicole limitrofe;
- Localizzazione del nuovo interporto Chieti-Pescara nel comune di Manoppello, vicino al confine con Rosciano;

Minacce

- Abbandono di suoli agricoli e loro trasformazione
- Espansione dell'edificato a macchia di leopardo ed occupazione dei suoli agricoli prossimi ai centri abitati;
- Progressivo spopolamento del centro
- Perdita di monumenti della civiltà contadina, case coloniche, cantine, silos, torri
- Rischi ambientali (sismico, idraulico, geomorfologico, da incendio);
- Marginalizzazione dell'agricoltura e dell'artigianato;
- Fenomeni geologici di rilevanza: i calanchi;
- Assenza di attrezzature pubbliche per gran parte della città;
- Dispersione e difficoltà di sviluppo del settore industriale.

NORME TECNICHE DI ATTUAZIONE

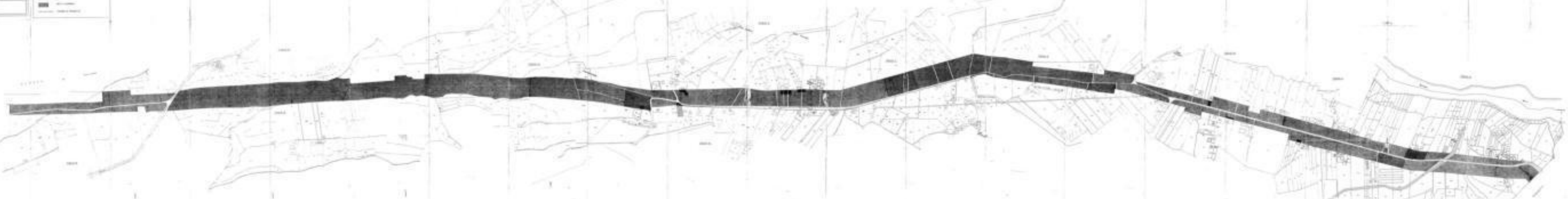
Art. 50 - TRATTURO L'AQUILA - FOGGIA
Tali aree sono sottoposte alle norme di tutela del Codice per i Beni Culturali ed del Paesaggio approvato con D.L.vo 22.01.04 n.42 . In tali zone il P.R.G. si attua solo attraverso la normativa del Piano Quadro Tratturi di cui al Nulla Osta del Ministero per i Beni Culturali e Ambientali - Sovrintendenza Archeologica di Chieti (prot. 2897 del06/05/99);Tale Piano ha dato attuazione a quanto previsto dall'art.4 del D.M.20.03.1980 recepito nel D.M. 22.12.1983, il quale prevede per i comuni che hanno subito una occupazione di fatto dei suoli tratturali ,la facoltà di procedere alla perimetrazione definitiva di tali aree ed al loro utilizzo , secondo la normativa urbanistica vigente per i perimetri urbani . Per le aree non ricadenti all'interno di tale perimetro la suddetta normativa non consente interventi che comportino una permanente alterazione del suolo e del tracciato tratturale. Le previsioni del P.Q.T. sono state riportate nelle tavole di P.R.G. con l'apporto di minime modifiche48 comunque conformi agli indirizzi ed alle indicazioni dello stesso Piano Quadro Tratturi.
Segnatamente:
per quanto attiene alle costruzioni, si prevede la permanenza di quelle esistenti (contenimento dello statodi fatto) consentendo gli interventi di cui all'art. 30 della L.U.R. lettere a) b) c) e d).
Nelle aree di pertinenza delle stesse sono altresì consentiti:
- la sistemazione di orti e giardini con prato, siepi, alberature di medio e alto fusto,
- la realizzazione di spazi pavimentati (l'indice di permeabilità minimo Ip dovrà essere superiore al 70%),
- il completamento delle recinzioni esistenti (sulla strada, in allineamento ove possibile).
Nella zona agricola tratturale invece sono vietate le colture ad alto fusto, l'impianto di vigneti, e di altre colture intensive; tuttavia eventuali coltivazioni non consentite potranno essere valutate caso per caso dalla competente Soprintendenza archeologica sulla base di apposita relazione di compatibilità con tutela del suola tratturale.
Gli impianti culturali esistenti sono assunti come stato di fatto di trasformazione temporanea ad alla fine del loro ciclo non potranno essere reimpiantati. Sono vietate le recinzioni permanenti e i muri di cinta a delimitazione dei fondi.
Sono consentiti gli interventi che non comportino una permanente alterazione del suolo e del tracciato tratturale, previa autorizzazione della Soprintendenza Archeologica competente.
Per le zone residenziali adiacenti alle aree tratturali è possibile utilizzare gli accessi esistenti come riportati nel Piano in deroga alla norma stabilita all'art. 24 lettera c primo capoverso delle presenti norme, purchè la cubatura massima sviluppabile sia inferiore a mc. 3000

Art. 50 bis – PROGETTO DI VALORIZZAZIONE DEL TRATTURO L'AQUILA- FOGGIA Si intende promuovere la valorizzazione dello storico tratturo L'Aquila-Foggia (evidenziato nelle cartografie di piano come zona E2 - tratturo L'Aquila-Foggia) sottoposto a tutela dal Dlgs n° 42/2004 tramite l'elaborazione di un progetto che non comporti permanenti alterazioni del suolo e del tracciato tratturale ai sensi dell'art. 2 del DM 20.03.2000 nonché dell'art. 13 comma 5 del vigente PQT e per il perseguimento delle finalità di cui all'art. 8 della LR n° 35/86. Nell'ambito di tale progetto che dovrà essere elaborato e adottato dal Comune di Rosciano secondo le indicazioni e di concerto con la Soprintendenza per i Beni Archeologici dell'Abruzzo [...]

Il Comune di Rosciano sta realizzando un Nuovo P.R.G. (in fase di adozione) con il supporto tecnico del gruppo di lavoro coordinato dal prof. Valter Fabietti, iniziato nel 2014. Lo studio preliminare del nuovo PRG ha come obiettivo la definizione di un quadro conoscitivo completo e l'individuazione di temi progettuali. Il primo deriva da un lato dall'analisi dei piani sovraordinati e dei vincoli e dall'altro dalla lettura dello stato di fatto e di diritto del territorio come si è venuto a costituire in seguito alla gestione ed attuazione del vigente Prg. L'ascolto e la partecipazione accompagnano il quadro conoscitivo. Le analisi del prg vigente, delle mancanze, necessità ed eventuali punti di forza, descrivendo ed interpretando il territorio fanno emergere i valori ambientali, storici, culturali ed economici condivisi da valorizzare attraverso azioni progettuali.

Nel 2011 è stato stipulato un protocollo d'intesa tra i comuni di Rosciano, Cepagatti, Nocciano, Cugnoli, promosso dal comune di Rosciano e dalla Soprintendenza Archeologica dell'Abruzzo, definendo un possibile Piano – Programma di valorizzazione culturale e turistica dello storico Tratturo. Conviti che fosse indispensabile legare la necessaria tutela dei percorsi tratturali a forme di corretto utilizzo di tale storica rete a fini culturali e turistici.
In seguito a questo protocollo d'intesa, sono state approvate le Linee Guida redatte dalla Soprintendenza per i beni archeologici dell'Abruzzo – Chieti e approvate dalla Regione Abruzzo.

Piano Quadro Tratturi Comune di Rosciano (L.R. 35/86)
Realizzato nel 2000



FONTI:

Comune di Rosciano

GRUPO DI RICERCA PER IL PIANO
Prof. Arch. Valter Fabietti
Arch. Francesca Ranalli
Prof. Sebastiano Carbonara
Arch. Davide Stefano
Arch. Pianificatore Anna Natale
Dott. Luisiana Simone e
Dott. Viviana Sabatini

Università degli studi "G.D'Annunzio" - Chieti-Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di Laurea Progetto&Planning a.a. 2016-2017
Relatore: Prof. Ing. Pietro Rovigatti Correlatore: Arch. Anna Pia Urbano
Laureanda: Simona Di Crescenzo

Tratturo_Bene_Comune Territoriale

Contributi alla revisione del Piano Quadro Tratturi nel Comune di Rosciano

Visioni, strategie, proposte progettuali per un nuovo piano quadro tratturi - Ricaduta sul territorio_ Un nuovo piano quadro tratturi - visione guida

CAPITOLO 5 TAV. 5.1

Visione guida

TRATTURO
RICONNESSIONI
FIUME

TOTEM INFORMATIVI

INSEDIAMENTI

PAESAGGI E RETI ECOLOGICHE

PAESAGGI DI VALORE

FIUMI

RETE ECOLOGICA
(PERCORSI CICLO-PEDONALI, TURISTICI, ECC...)

BENI COMUNI :

BENI COMUNI ARCHITETTONICI/CULTURALI

FONTI

CASTELLO

CHIESE

BENI COMUNI PER LA COLLETTIVITÀ

PARCHI E ATTREZZATURE SPORTIVE

SCUOLE

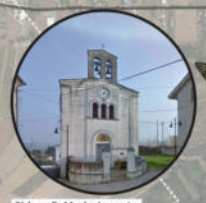
COMUNE

STRUTTURE RICETTIVE/PRODUZONE DI QUALITÀ

RISTORAZIONE

ALBERGAZIONE

ATTIVITÀ PRODUTTIVE


Chiesa S. Maria Assunta

[3] : villa Badessa

[1] : B&B OASI

[1] : Fiume Nora

Percorso ciclo-pedonale

[1] : colle della guardia

[1] : Agriturismo Fior di pesco

Fonte 7 : Fonte San Michele

[7] : Ristorante Giardino degli ulivi

Fonte 8 : Fonte Segatore

Fonte 9 : Fonte Tratturo

[6] : Agriturismo La fattoria del contadino

[5] : Ristorante La locanda dei sapori


Chiesa S. Giovanni Battista

[2] : villa San Giovanni

[2] : Hotel Pink house

[2] : Agriturismo Fonte Riccione

Fonte 3 : Fonte Riccione

[4] : villa Oliveti

[3] : Ristorante Il poeta del mare

Fonte 6 : Fonte antica

[1] : Azienda vinicola Marramiero

[4] : Vista panoramica del comune di Rosciano

[2] : Azienda vinicola Roxan

[4] : B&B Cascina Cardinale

[2] : Fiume Pescara

[3] : Frantoio oleario Alfredo Ranieri

[1] : Rosciano centro

Fonte 5 : Fonte murata

[2] : colle mezzano

[4] : Trattoria Dal papa buono

[3] : B&B Palazzo De Fabritiis

Fonte 4 : Fonte vall'isce

Castello di Rosciano


Scuola Primaria dell'Istituto Comprensivo di Rosciano

[3] : colle Sant'Angelo

Fonte 2 : Fonte Matarazzo

Fonte 1 : Fonte zio Tom

0 750 1500 2250 3000 m

FONTI
digilander.libero.it/albatrosrosciano
comune di Rosciano
www.mondimedievali.net
www.villabadessa.it

PECUS | EUROPEAN LANDSCAPES OF TRANSHUMANCE

ERASMUS+ PECUS

CASE STUDY SHEET

CS code	*IT-03*	**CS Title**	*Degree thesis by Gioia Vannucci: Strategies of active custody for the territories of the Province of Chieti. Pilot project in the town of Arielli ("Tratturo Bene comune territoriale. Strategie di cura e custodia attiva per i territori della Provincia di Chieti. Progetto pilota Comune di Arielli (CH)")*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy X Local level policy/plan/strategy X Study/research X Project ☐ Other		
Responsible body/Promoter	Università degli Studi G. D'Annunzio – Chieti-Pescara		
Location (region, locality)	Arielli (CH), Abruzzo, Italy		
Geographical area covered	2,588.35 sq. km (Province of Chieti) More specifically: Municipality of Arielli, 11.72 sq. km		
Year	*2017-2018*		
Summary description	The project concerns the L'Aquila-Foggia sheep-track (*Tratturo Magno*) in the Province of Chieti. In a first phase, the analysis focused on the study of the sheep-tracks' soils on a cadastral basis; in a second moment the study proceeded with the "Reintegre" (procedures for mapping the public sheep tracks and transferring part of their plots to private citizens – 1651, 1712, 1810) and with the subsequent transformations. Finally, after the field survey, all the information collected was reported, creating a table with photos, a SWAT analysis and a strategic agenda aimed at defining a Strategic Plan. The Municipality of Arielli was then identified as a pilot project: the research analysed the current urban planning conditions and the system of the sheep-tracks' concessions. Finally, a Project Masterplan was elaborated. Along the Tratturo Magno we find important landscape, historical and archaeological values related to the transhumance culture. It is possible to consider the sheep track as "Territorial Common Goods", a resource and opportunity for the territorial regeneration of marginal inland territories. The defined methodology, experimented also in the case of Rosciano (DI CRESCENZO 2016-2017), is based on the idea of the territory as a stratification of elements linked to its nature and use. The objective of the project is the definition of shared strategies of sustainable development that could represent pilot interventions within a wider national strategy dedicated to marginal mountainous areas, even using multimedia tools, instruments and applications. The methodology was organized into 5 phases: 1) Soil study on cadastral basis; study of soils on the basis of the Regional Technical Map; 2) Study of Historical Sources, archaeological data, "Reintegre" (1651,1712,1810); 3) Transcription from open data source: Landscape Plan currently in force ("Piano Paesistico", 2004) and "Carta dei Luoghi e dei Paesaggi" (CLeP) of the new Landscape Plan under development ("Piano Paesaggistico", 2009) 4) field surveying, use of digital techniques (Locus Map, Google Earth, etc.)		
Link with laws/regulations and with other policies/ plans/strategies	The sheep-tracks in Abruzzo are protected by specific laws: 1) D.M. 23 marzo 1980; 2) D.M. 22 dicembre 1983, *"Linee guida in materia di tutela e utilizzo dei tratturi d'Abruzzo, sottoposti a tutela con D.M. 22 dicembre 1983";* 3) Artt. 21-22 D. Lgs. 42/2004;		

Co-funded by the Erasmus+ Programme of the European Union

	Drover Road Framework Plans (Piani Quadro Tratturi, PQT) – Some Municipalities whose territories are crossed by sheep-tracks have defined the "Piani Quadro Tratturi" in collaboration with the local Superintendences. PQT are very important tools in the field of territorial planning, aimed, on the one hand, at protecting the rights of those citizens interested in the sheep-tracks and, on the other hand, at preserving the historical nature of the sheep-tracks. The plans provide rules that allow the use of the sheep-tracks areas, giving clear technical indications. PQT can therefore represent an economic impulse for specific economic activities. The main objectives are: a) the conservation and improvement of the visibility and legibility of the routes; b) the possibility to allow a reuse compatible with the landscape and the historical-archaeological heritage. Based on PQT provisions, enhancement interventions are allowed; itineraries and stations of historical, archaeological and naturalistic interest; interventions that do not involve soil alteration (authorized by the local Superintendence). PQT – Arielli: approved by the Municipality of Arielli on 8.30.1985 and by "Soprintendenza per i Beni archeologici dell'Abruzzo" – Chieti, on 10.25.1985. Internal Areas - The National Strategy for Internal Areas is defined by the Partnership Agreement with Italy 2014-2020 ("Accordo di Partenariato con l'Italia 2014-2020"), a document prepared by Italy and approved by the European Commission that defines strategies, methods and priorities for spending resources co-financed by the European Structural and Investment Funds (EIF Funds) for the 2014-2020 programming cycle. "Internal areas" are identifies by the Agreement as identifies those territories significantly distant from the "nodes" offering essential services (education, health and mobility), on the basis of an accessibility indicator calculated in terms of minutes of travel from the nearest node (service offering centre). The internal areas are subdivided into intermediate areas, peripheral areas and ultra-peripheral areas, representing about 53% of Italian municipalities (4,261) and 23% of the Italian population according to the latest census, equal to over 13.5 million inhabitants, and more than 60% of the national territory. https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/19850/UT/systemPrint
PROBLEMS AND NEEDS TARGETED	
Problems	It is not possible to get access to the local regulations (PQT) via web. The majority of the problems are related with the preservation of the sheep-tracks, not in use at least since the first half of the XX Century. The L'Aquila-Foggia sheep-track (*Tratturo Magno*), which crosses several villages and small towns along its route – among which the seven chosen municipalities – is strongly affected by the modern anthropic impact. Several sectors of this sheep-track are lost, covered by modern roads, buildings and infrastructures. It is therefore often difficult to map and even to recognize its borders and its path, making the definition of protection strategies very complex.
Needs	It would be necessary to create a multimedia platform (e.g. in an open source GIS environment), able to correlate in real time geographical, cartographic, historical, archaeological, environmental and ethnographic data, with the aim of returning the path on geo-referenced cartography, associating it to multiple interpretative layers. Such a tool should network different public (State Archives, Superintendences, Museums, Regions, Provinces, Municipalities, Universities) and private (non-profit foundations, archives, cultural associations, etc.) databases. It would also be appropriate to raise the awareness of the local population through the definition of specific cognitive programmes, aimed at spreading knowledge of the pastoral culture, of the sheep-tracks' network, described as a possible economic and social resource. Knowledge, combined with a greater awareness and the possibility of using easily accessible multimedia tools, could contribute to the development of marginal internal areas, such as the territory considered within the project.
Quantitative data	*See Figure #2.3*
FOCUS, OBJECTIVES AND OUTPUTS	

Themes	**Does the case study address this theme?**	**If yes, how?**

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	(YES/NO)	
Spatial planning	YES	The analysis conducted during the project offered the opportunity to define a Project Masterplan, specifically dedicated to the Municipality of Arielli, useful to improve the local "Piano Quadro Tratturi" (PQT) and the municipal spatial plan ("Piano Regolatore Comunale", PRG).
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	YES	Along the sheep-tracks network we find different environments and bio-ecological systems. The soils of the foothills crossed by the *Tratturo Magno* are purely agricultural (vineyards, olive groves) while the mountain part is characterized by sporadic pastures and arable land that alternate with large areas of woodland. They have a high naturalistic value. More in general, the province of Chieti has a predominantly hilly and mountainous territory, with a very varied orography. The territory is characterized by a succession of parallel valleys, in most of which watercourses of varying flow. In the northernmost part the landscape is more rugged and uninhabited, in the southern part it is sweeter and richer with small scattered settlements. Many areas of the surface have wooded areas, protected by nature reserves. In the southern part there are large areas covered with fir trees, while near the coast there is still a holm oak forest. Near the Majella, a territory included in the National Park of the same name, the flora is rich in many valuable plants, such as Lobel's maple, birch, "black pine of Fara San Martino" and beech, thanks to the wild, uncontaminated environment.
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	We can define sheep-tracks – and the *Tratturo Magno* is the most relevant among the four Italian "Tratturi Regi" – as territorial, diffused areas where historical and archaeological values linked to the transhumance civilization are often concentrated. The landscape is marked along these paths by architectural presences defined as "architectures of transhumance" (churches, fountains, crossroads, towers). Several relevant archaeological sites are scattered along these ancient routes, defining a broad time span, framed between Prehistory and the Modern age. GIS analysis would be of great importance in mapping natural, archaeological, historical and ethnographic elements related to the sheep-tracks, favouring valorisation projects and improving scientific researches.
Protection/enhancement of intangible cultural heritage (e.g. historical route networks, scenic views, folklore, food, music…)	YES	The Province of Chieti, crossed by the *Tratturo Magno*, shows a rich folklore, largely still linked to the pastoral culture and the ancient practice of transhumance. Ideas, customs, uses and traditions - still alive among the local communities - spread along the sheep-tracks. Transhumance (the seasonal movement of flocks, in Central-southern Italy, mainly conducted, until the middle of the XX century, between the Apennine pastures and the Apulian Tavoliere) became part of the UNESCO Intangible Cultural Heritage on December 11, 2019. Unfortunately, we have to underline that the local Administrations struggle to administer a patrimony of material and immaterial goods that could represent, in concrete terms, a resource and a formidable instrument of regeneration for the internal areas.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The project improves the opportunity of planning and valorising the sheep-tracks' network, creating naturalistic paths, cycling routes, bridleways and eco-archaeological trekking paths.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	This is the principle goal: to improve the economic development of the Province of Chieti through eco-cultural and slow tourism, wine and food tours, bio-agriculture and livestock breeding, even creating a local landmark.

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INVOLVEMENT OF STAKEHOLDERS	
Actors involved	University of Chieti-Pescara "Gabriele D'Annunzio"; Province of Chieti; Municipality of Arielli; Regione Abruzzo.
Involvement procedures	- Development and revision of a new "Piano Quadro Tratturi" (PQT); - Contribution to the updating and operational experimentation of the Guidelines/Rules on the protection and direction of the sheep-track network in Abruzzo (Ministry of Cultural Assets); - Contribution to the development of the Regional Plan for Sustainable Mobility ("Piano Regionale per la Mobilità Sostenibile"), also through forms of participation and direct involvement of associations, citizens and local stakeholders; - Creation of an agenda to define short, medium and long terms strategies for an active custody of the common assets linked to the sheep-track system in Abruzzo.
Problems and challenges	Lengthy bureaucratic procedures and long technical-scientific analysis to achieve the goals; long difficult connections between the University and the Public Administration; lack of funds.
EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description**
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	The sheep-track is imagined as a large ecological corridor that preserves biodiversity. In order to restore its continuity, rows of trees and the original boundary stones will be re-placed on the edges and, where crops have invaded the sheep-track soil, deforestation is planned. There are two types of soil: 1) cultivated land: interventions are planned for the creation of picnic areas, bridleways, paths, wooden kiosks to sale local products, facilities to conduct educational activities. 2) built land: the interventions foresee the creation of historical-cultural and religious routes, recovery of ruins for the creation of new points of attraction and the insertion of new activities. Other effects: - Ecological protection of the territorial areas along the route and, when possible, restoration of the original situation; - Maintenance of the non-anthropized landscape; - Conservation of protected or rare animal and plant species; - Protection of fragile, mountainous areas.
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	- Protection of the so called "collective memory" through the definition of projects aimed at collecting and recording the testimonies of "memory bearers"; - Filing – through web-tools suggested by the Ministry of Cultural Assets – of elements relevant to the intangible cultural heritage; - Creation of archives and museums, aimed at preserving and spreading the knowledge of local traditions; - Definition of specific projects focused on extending, at national and international level, the knowledge of the ethnographic and cultural heritage of the territory.
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	- Mapping of historical-archaeological and architectural elements located along the paths (farms, churches, rural and/or pastoral structures); - Mapping and surveying of traditional cultivation systems; - Knowledge, protection and valorisation of some of the historical-archaeological, architectural and rural contexts highlighted; - Public fruition.
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	- Raising the awareness of local people to consider the sheep-tracks as a common good; - Collaboration with schools and associations in the area (participation in regional and European calls for proposals); - Involvement of territorial activities (economic aspect of the sheep-tracks); - Participatory planning.
IMPLEMENTATION ISSUES	
Financial resources	None.

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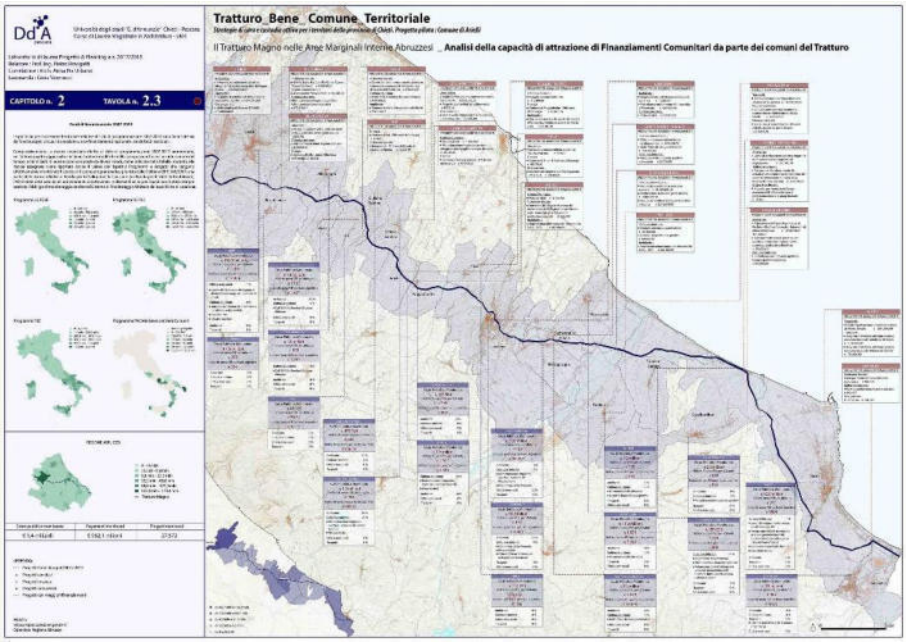
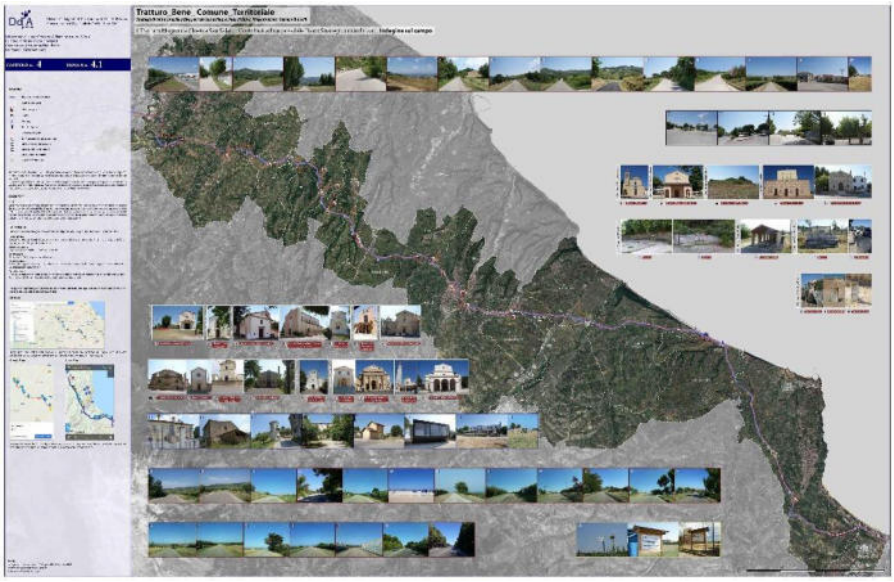
Implementation procedures	N.a.
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.) ***PLEASE SEE ANNEX FOR LARGER IMAGES***	 

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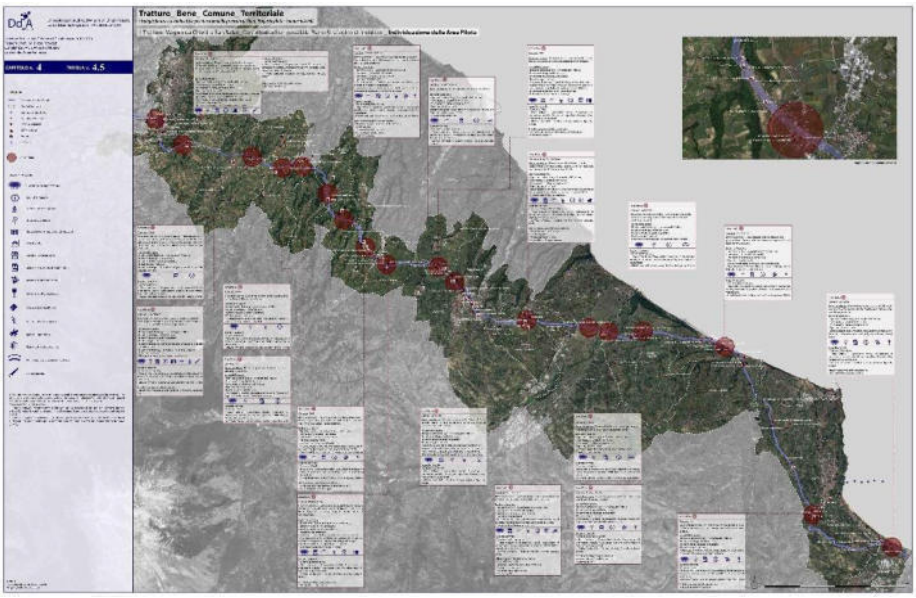

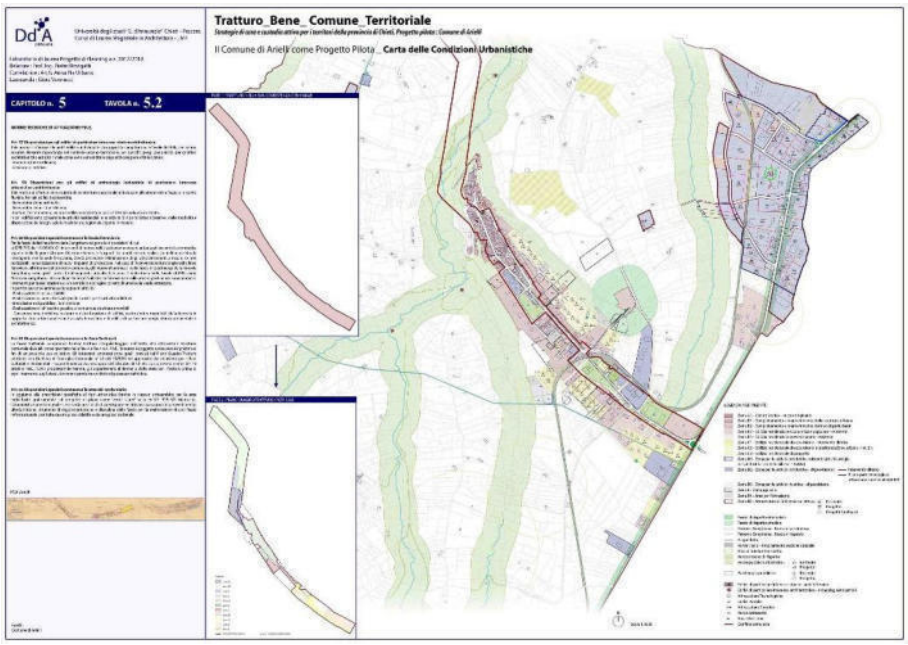

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	 (VANNUCCI 2017-2018, T 2.3, 4.1, 4.5, 5.2, 5.5)
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Tratturo_Bene_Comune_Territoriale

Strategie di cura e custodia attiva per i territori della provincia di Chieti. Progetto pilota : Comune di Arielli

Il Tratturo Magno nelle Aree Marginali Interne Abruzzesi _ **Analisi della capacità di attrazione di Finanziamenti Comunitari da parte dei comuni del Tratturo**

Università degli studi "G. d'Annunzio" Chieti - Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di laurea Progetto & Planning a.a. 2017/2018
Relatore : Prof. Ing. Pietro Rovigatti
Correlatrice : Arch. Anna Pia Urbano
Laureanda : Gioia Vannucci

CAPITOLO n. 2 **TAVOLA n. 2.3**

Fonti di finanziamento 2007-2013

Le politiche per la coesione territoriale relative al ciclo di programmazione 2007-2013 sono finanziate sia da fondi europei, ai quali è associato un co-finanziamento nazionale, sia da fondi nazionali.

Complessivamente, le risorse finanziarie riferite al ciclo di programmazione 2007-2013 ammontano, nell'ultimo quadro aggiornato che tiene conto di modifiche nelle assegnazioni finanziarie intervenute nel tempo, a 89 miliardi di euro e sono composte da diversi Fondi, come indicato nella tabella. Accanto alle risorse assegnate viene riportato anche il valore dei rispettivi Programmi e progetti che vengono effettivamente monitorati. Rispetto al disegno programmatico previsto dalla Delibera CIPE 166/2007, una parte delle risorse relative al Fondo per lo Sviluppo e la Coesione (ex Fondo per le Aree Sottoutilizzate, FAS) è stata destinata ad alcuni strumenti di intervento e diverse finalità per i quali non è stato sempre previsto l'obbligo di monitoraggio anche nel Sistema di Monitoraggio Unitario delle politiche di coesione.

Programmi UE FESR

Programmi UE FSE

Programmi FSC

Programma PAC Ministero dei Beni Culturali

REGIONE ABRUZZO

Costo pubblico monitorato	Pagamenti monitorati	Progetti monitorati
€ 1,4 miliardi	€ 962,1 milioni	27.572

LEGENDA:

- Progetti Fondi Europei 2007 / 2013
- Progetti conclusi
- Progetti in corso
- Progetti non avviati
- Progetti con maggiori Finanziamenti

FONTI :
https://opencoesione.gov.it/it/
Opendata Regione Abruzzo

CHIETI
PROGETTI CON MAGGIORI FINANZIAMENTI
Ambiente :
- Intervento di riduzione del rischio idraulico nel bacino idrografico del fiume Aterno - € 54.800.000,00

Trasporti :
- Acquisto di autobus ad alimentazione non convenzionale - € 7.546.575,00

Occupazione :
- Sede Municipale Palazzo D'Achille € 3.400.000,00

BUCCHIANICO
PROGETTI CON MAGGIORI FINANZIAMENTI
Inclusione Sociale :
- Istituto figlie di S. Camillo-Roma -Opera "Casa di Sollievo" - € 543.340,00

Ricerca e Innovazione :
- Associazione Nuovi Lavori - € 291.840,02

Cultura e turismo :
- Ristrutturazione impianto sportivo - Adeguamento campo da calcio € 273.678,61

VILLAMAGNA
PROGETTI CON MAGGIORI FINANZIAMENTI
Istruzione :
- Messa in sicurezza adeguamento strutt. edificio scolastico in Via Fonte Grande € 806.762

Cultura e turismo :
- Dall' EXPO ai Territori Regione Abruzzo € 430.000,00

Energia :
- Comune di Villamagna - Efficienza dell'energia € 50.000

VACRI
PROGETTI CON MAGGIORI FINANZIAMENTI
Inclusione Sociale :
- Lavori di straordinaria manutenzione per la messa in sicurezza dal rischio sismico della sede del Municipio - € 729.041,95

Cultura e turismo :
- Dall' EXPO ai Territori Regione Abruzzo € 430.000,00

Ambiente :
- Comune di Vacri - Prevenzione dei Rischi € 397.924,47

ARI
PROGETTI CON MAGGIORI FINANZIAMENTI
Energia :
- Comune di Ari - Efficienza dell'energia € 48.445

Inclusione Sociale :
- Intraprendo - Officina del Gusto di Cicchitti Mimmo € 12.579,49

GIULIANO TEATINO
PROGETTI CON MAGGIORI FINANZIAMENTI
Ambiente :
- Implementazione impianto telecontrollo S.A.S.I. S.P.A. € 282.300,39
- Acquisto contenitori per differenziata € 8.574,16

Occupazione :
- Incentivi alle imprese per l'Occupazione - Individua S.R.L. € 2.500,00

CANOSA SANNITA
PROGETTI CON MAGGIORI FINANZIAMENTI
Cultura e turismo :
- Pista ciclabile € 1.155.763
- Ristrutturazione impianto sportivo - Adeguamento spogliatoi campo da calcio € 48.470,83

Energia :
- Comune di Canosa Sannita - Efficienza dell'energia € 47.043,42

POGGIOFIORITO
PROGETTI CON MAGGIORI FINANZIAMENTI
Infanzia e Anziani :
- Completamento Asilo nido € 117.299,60

Energia :
- Comune di Poggiofiorito - Efficienza dell'energia € 48.073,18

Ambiente :
- Gestione associata dei servizi di raccolta differenziata. Rendicontazione dei servizi attivi € 20.301,20

FRISA
PROGETTI CON MAGGIORI FINANZIAMENTI
Istruzione :
- Messa in sicurezza edificio scolastico "Scuola Materna" € 349,72

Energia :
- Comune di Frisa - Efficienza dell'energia € 48.470,50

Occupazione :
- Incentivi alle imprese per l'Occupazione - INDIS S.R.L. € 30.000,00

ARIELLI
PROGETTI CON MAGGIORI FINANZIAMENTI
Cultura e turismo :
- Pista ciclabile € 1.155.763

Inclusione Sociale :
- Interventi di messa in sicurezza dal rischio sismico delle strutture ove hanno sede i municipi ed altre funzioni pubbliche comunali € 565.000

Ambiente :
- Implementazione impianto telecontrollo S.A.S.I. S.P.A. € 282.300,39

LANCIANO
PROGETTI CON MAGGIORI FINANZIAMENTI
Ambiente :
- Ampliamento piattaforma ecologica di Cerratina € 1.532.251
- Piattaforma smaltimento rifiuti raccolta differenziata € 902.926,26

Cultura e turismo :
- Pista ciclabile € 787.418,55

SANTA MARIA IMBARO
PROGETTI CON MAGGIORI FINANZIAMENTI
Ricerca e Innovazione :
- Ditta innovazione automotive e metalmeccanica € 811.430,76
- DMC "Terre del Sangro Aventino" € 500.000,00

Cultura e turismo :
- Adeguamento impianto sportivo polivalente € 50.700,00

MOZZAGROGNA
PROGETTI CON MAGGIORI FINANZIAMENTI
Ricerca e Innovazione :
- Acquisizione e Sistemazione aree scoperte € 13.468.628,10
- Realizzazione laboratori per la ricerca € 9.888.372,17
- Acquisizione attrezzature per laboratori di ricerca € 3.243.691,00

PAGLIETA
PROGETTI CON MAGGIORI FINANZIAMENTI
Cultura e turismo :
- Completamento sala polivalente € 300.000,00
- Lavori di impiantistica sportiva € 236.067,42

Ambiente :
- Implementazione impianto telecontrollo S.A.S.I. S.P.A. € 282.300,39

FOSSACESIA
PROGETTI CON MAGGIORI FINANZIAMENTI
Trasporti :
- Ammodernamento e riqualificazione stazione di Fossacesia € 4.659.913,00

Inclusione Sociale :
- Consolidamento e miglioramento sismico sito nel fabbricatoio in Via Natale € 452.207,76

Infanzia e Anziani :
- Sostenere gli ambiti territoriali sociali nell'attuazione dei piani di zona € 317.045,28

TORINO DI SANGRO
PROGETTI CON MAGGIORI FINANZIAMENTI
Ambiente :
- Lavori di realizzazione collettori fognari e dismissione vecchio impianto di depurazione € 285.308,78

Cultura e turismo :
- Recupero e rifunzionamento dei detrattori ambientali e potenziamento dei servizi di promozione turistica della Riserva Naturale Lecceta € 212.078,49

Città e Aree Rurali :
- Progetto per l'inserimo in forma associata dell'ufficio unico per la programmazione e la progettazione € 97.098

CASALBORDINO
PROGETTI CON MAGGIORI FINANZIAMENTI
Ambiente :
- Attuazione del Piano Organico per il Rischio delle Aree Vulnerabili - Interventi di difesa della Costa € 1.144.158,30

Istruzione :
- Accorpamento scuola materna con scuola primaria con miglioramento sicurezza strutturale dell'edificio € 921.529,15

Cultura e turismo :
- Ristrutturazione impianto sportivo - Campo sportivo comunale € 300.000,00

VASTO
PROGETTI CON MAGGIORI FINANZIAMENTI
Trasporti :
- Lavori di potenziamento ed escavazione del Porto di Vasto € 1.870.000,00

Istruzione :
- Acquisto di Autobus ad alimentazione non convenzionale. Autobinee Di Fonzo € 1.370.000,00
- Acquisto di Autobus ad alimentazione non convenzionale. Autoservizi Cerella € 750.000,00

SAN SALVO
PROGETTI CON MAGGIORI FINANZIAMENTI
Inclusione Sociale :
- Adeguamento sismico della sede municipale € 980.175

Cultura e turismo :
- Palestra pattinodromo polo scolastico € 663.447

Occupazione :
- Trans Care € 594.511

CHIETI
Costo Pubblico Monitorato
€ 106.8 milioni
Indice di spesa FSE per abitante
€ 2.103
Indice di spesa FSE per ha di superficie
€ 17.928

Città e aree rurali	1 %
Cultura e turismo	0 %
Ambiente	0 %
Trasporti	0 %

- Lavoro di rifacimento della pista di atletica Stadio Angelini - Comune di Chieti
- TuttoAbruzzo - Portale di informazioni turistiche - web e mobile
- App Abruzzo
- Rifugio Paradiso

BUCCHIANICO
Costo Pubblico Monitorato
€ 1.5 milioni
Indice di spesa FSE per abitante
€ 292
Indice di spesa FSE per ha di superficie
€ 394

Ambiente	6 %
Cultura e turismo	3 %
Città e aree rurali	0 %
Trasporti	0 %

VILLAMAGNA
Costo Pubblico Monitorato
€ 1.6 milioni
Indice di spesa FSE per abitante
€ 693
Indice di spesa FSE per ha di superficie
€ 1.257

Cultura e turismo	4 %
Ambiente	0 %
Città e aree rurali	0 %
Trasporti	0 %

- Dall' EXPO ai Territori Regione Abruzzo

VACRI
Costo Pubblico Monitorato
€ 1.8 milioni
Indice di spesa FSE per abitante
€ 1.103
Indice di spesa FSE per ha di superficie
€ 1.467

Ambiente	16 %
Cultura e turismo	5 %
Città e aree rurali	0 %
Trasporti	0 %

- Dall' EXPO ai Territori Regione Abruzzo

ARI
Costo Pubblico Monitorato
€ 65.125
Indice di spesa FSE per abitante
€ 56.72
Indice di spesa FSE per ha di superficie
€ 57.17

Ambiente	0 %
Cultura e turismo	0 %
Città e aree rurali	0 %
Trasporti	0 %

GIULIANO TEATINO
Costo Pubblico Monitorato
€ 837.126
Indice di spesa FSE per abitante
€ 686
Indice di spesa FSE per ha di superficie
€ 846.43

Ambiente	27 %
Cultura e turismo	4 %
Città e aree rurali	0 %
Trasporti	0 %

CANOSA SANNITA
Costo Pubblico Monitorato
€ 1.3 milioni
Indice di spesa FSE per abitante
€ 966
Indice di spesa FSE per ha di superficie
€ 934.57

Ambiente	30 %
Cultura e turismo	20 %
Città e aree rurali	0 %
Trasporti	0 %

- Ristrutturazione impianto sportivo - Comune di Canosa Sannita
- Pista ciclabile

POGGIOFIORITO
Costo Pubblico Monitorato
€ 205.884
Indice di spesa FSE per abitante
€ 239
Indice di spesa FSE per ha di superficie
€ 207

Ambiente	25%
Cultura e turismo	0 %
Città e aree rurali	0 %
Trasporti	0 %

ARIELLI
Costo Pubblico Monitorato
€ 2.9 milioni
Indice di spesa FSE per abitante
€ 2.541
Indice di spesa FSE per ha di superficie
€ 2.546

Cultura e turismo	14 %
Ambiente	10 %
Città e aree rurali	0 %
Trasporti	0 %

- Ristrutturazione impianto sportivo - Comune di Arielli
- Pista ciclabile

MOZZAGROGNA
Costo Pubblico Monitorato
€ 31.8 milioni
Indice di spesa FSE per abitante
€ 13.014
Indice di spesa FSE per ha di superficie
€ 22.553

Ambiente	8 %
Cultura e turismo	5 %
Città e aree rurali	0 %
Trasporti	0 %

- Ristrutturazione impianto sportivo - Comune di Mozzagrogna
- Il Cammino della Memoria

LANCIANO
Costo Pubblico Monitorato
€ 15.8 milioni
Indice di spesa FSE per abitante
€ 457
Indice di spesa FSE per ha di superficie
€ 2.360

Ambiente	22 %
Cultura e turismo	9 %
Città e aree rurali	0 %
Trasporti	2 %

- Il Cammino della Memoria
- Pista ciclabile
- Cultu e Cultura "Il Cammino dell'apostolo Tommaso"

FRISA
Costo Pubblico Monitorato
€ 214.274
Indice di spesa FSE per abitante
€ 4.123
Indice di spesa FSE per ha di superficie
€ 186

Ambiente	6 %
Cultura e turismo	0 %
Città e aree rurali	0 %
Trasporti	0 %

PAGLIETA
Costo Pubblico Monitorato
€ 1.2 milioni
Indice di spesa FSE per abitante
€ 278
Indice di spesa FSE per ha di superficie
€ 355

Ambiente	9 %
Cultura e turismo	6 %
Città e aree rurali	0 %
Trasporti	0 %

- Il Cammino della Memoria
- Lavori di impiantistica sportiva

FOSSACESIA
Costo Pubblico Monitorato
€ 11.8 milioni
Indice di spesa FSE per abitante
€ 1.856
Indice di spesa FSE per ha di superficie
€ 3.915

Ambiente	10 %
Cultura e turismo	5 %
Trasporti	2 %
Città e aree rurali	0 %

- Il Cammino della Memoria

SANTA MARIA IMBARO
Costo Pubblico Monitorato
€ 6.2 milioni
Indice di spesa FSE per abitante
€ 3.079
Indice di spesa FSE per ha di superficie
€ 10.858

Ambiente	12 %
Cultura e turismo	8 %
Città e aree rurali	0 %
Trasporti	0 %

- DMC "Terre del Sangro Aventino"

CASALBORDINO
Costo Pubblico Monitorato
€ 3.8 milioni
Indice di spesa FSE per abitante
€ 624
Indice di spesa FSE per ha di superficie
€ 826

Ambiente	8 %
Cultura e turismo	2 %
Trasporti	0 %
Città e aree rurali	0 %

- Ristrutturazione impianto sportivo

TORINO DI SANGRO
Costo Pubblico Monitorato
€ 989.253
Indice di spesa FSE per abitante
€ 324
Indice di spesa FSE per ha di superficie
€ 308

Cultura e turismo	11 %
Ambiente	7 %
Trasporti	0 %
Città e aree rurali	0 %

- Il Cammino della Memoria
- Ristrutturazione impianto sportivo
- Potenziamento del sistema dei servizi di promozione della fruizione turistica della riserva naturale lecceta

VASTO
Costo Pubblico Monitorato
€ 12.9 milioni
Indice di spesa FSE per abitante
€ 311
Indice di spesa FSE per ha di superficie
€ 1808

Cultura e turismo	1 %
Ambiente	0 %
Trasporti	0 %
Città e aree rurali	0 %

- Lavori di adeguamento campo di calcio comunale
- Potenziamento del sistema dei servizi di promozione della fruizione turistica della riserva naturale Punta Aderci
- Consorzio Vivere Vasto Marina
- Vasto Bike Hostel

SAN SALVO
Costo Pubblico Monitorato
€ 9.8 milioni
Indice di spesa FSE per abitante
€ 485
Indice di spesa FSE per ha di superficie
€ 4.975

Ambiente	0 %
Cultura e turismo	0 %
Trasporti	0 %
Città e aree rurali	0 %

- Bike to Coast Itinerario del Comune di San Salvo

da 66.7 mln a 156.0 mln
da 31.5 mln a 66.7 mln
da 8.3 mln a 31.5 mln
da 55.569 a 8.3 mln
da 0 a 55.569

0 5 Km

Tratturo_Bene_ Comune_Territoriale

Strategie di cura e custodia attiva per i territori della provincia di Chieti. Progetto pilota : Comune di Arielli

Il Tratturo Magno da Chieti a San Salvo _ Contributi ad un possibile Piano Strategico di indirizzo_ **Indagine sul campo**

Università degli studi "G. d'Annunzio" Chieti - Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di laurea Progetto & Planning a.a. 2017/2018
Relatore : Prof. Ing. Pietro Rovigatti
Correlatrice : Arch. Anna Pia Urbano
Laureanda : Gioia Vannucci

CAPITOLO n. 4 **TAVOLA n. 4.1**

LEGENDA

- Tratturo L'Aquila - Foggia
- Confini Comunali
- Edifici religiosi
- Ruderi
- Fontane
- Termini tapolari
- Percorso eseguito
- Territori attraversati dal tratturo
- Edifici presenti sul tratturo
- Spazi pubblici sul tratturo
- Edifici legati al tratturo
- Segnoletica tratturo

Dal rilievo effettuato il tratturo risulta percorribile in quasi tutta la sua estensione con un mezzo di trasporto. In molti comuni il tracciato viario si sovrappone a quello tratturale e i terreni limitrofi sono per lo più coltivati.
Il sopralluogo, diviso in due giornate, è stato eseguito con l'ausilio di mappe con percorsi realizzati da Google Earth ed importati in My Maps e con l'utilizzo dell'App. Locus Map con cui è stato possibile registrare il tracciato e realizzare photo point per una corretta restituzione delle foto.

LOCUS MAP

Cos'è :
Locus Map è un'applicazione che permette di registrare una traccia, quindi registra e memorizza il percorso che fai, dando poi la possibilità di giustarlo nuovamente per tale circuito ed offrendo tutta una serie di dati utili, distanza, velocità media, dislivelli, tempi, etc.. Tali percorsi una volta memorizzati possono essere inviati o meno sulla mappa. Una caratteristica interessante è la possibilità di impostare durante il proprio percorso dei punti di interesse, corredati da foto e descrizioni. (photopoint)

LATO PRATICO

Prima di procedere bisogna scaricare sullo smartphone dal Google Play Store l'App. Locus map free

Prima passo :
Creare da Google Earth il percorso che si vuole effettuare salvandolo in formato KML o KMZ e aggiungendo tutti i punti di interesse

Secondo passo :
Importare i formati KML o KMZ su Locus Map

Terzo passo :
Accendere il GPS del proprio telefonino

Quarto passo :
Avviare la registrazione del tracciato di cui poi saranno disponibili : tempi di percorrenza, dislivello, velocità media, distanza etc.

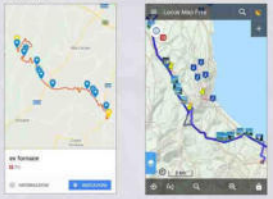
Quinto passo :
Una volta terminato il sopralluogo è possibile esportare le tracce in formato KML ed aprirle con Google Earth o con QGIS per messa in Savola e confronto con altre analisi

Per questo sopralluogo in particolare sono state utilizzate due applicazioni contemporaneamente : Locus Map e Google Maps (con My Maps)

My Maps

Su My Maps sono stati caricati i tracciati e i punti di interesse KMZ realizzati da Google Earth. Una volta salvato il percorso, questo è stato aperto con Google Maps per attivare il Navigatore.

Google Maps **Locus Map**



Contemporaneamente Locus Maps stava registrando il percorso eseguito e i vari photopoint che permettono di restituire la posizione esatta in cui sono state scattate le foto.

FONTI :
Fotografie : Gioia Vannucci , 25 Luglio 201 - 1 Agosto 2018
http://opendata.regione.abruzzo.it/
Geoportale Regione Abruzzo

Dd'A pescara

Università degli studi "G. d'Annunzio" Chieti - Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di laurea Progetto & Planning a.a. 2017/2018
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Laureanda : Gioia Vannucci

CAPITOLO n. 4 **TAVOLA n. 4.5**

Tratturo_ Bene_ Comune_ Territoriale

Strategie di cura e custodia attiva per i territori della provicnia di Chieti. Progetto pilota : Comune di Arielli

Il Tratturo Magno da Chieti a San Salvo_Contributi ad un possibile Piano Strategico di indirizzo _ **Individuazione delle Aree Pilota**

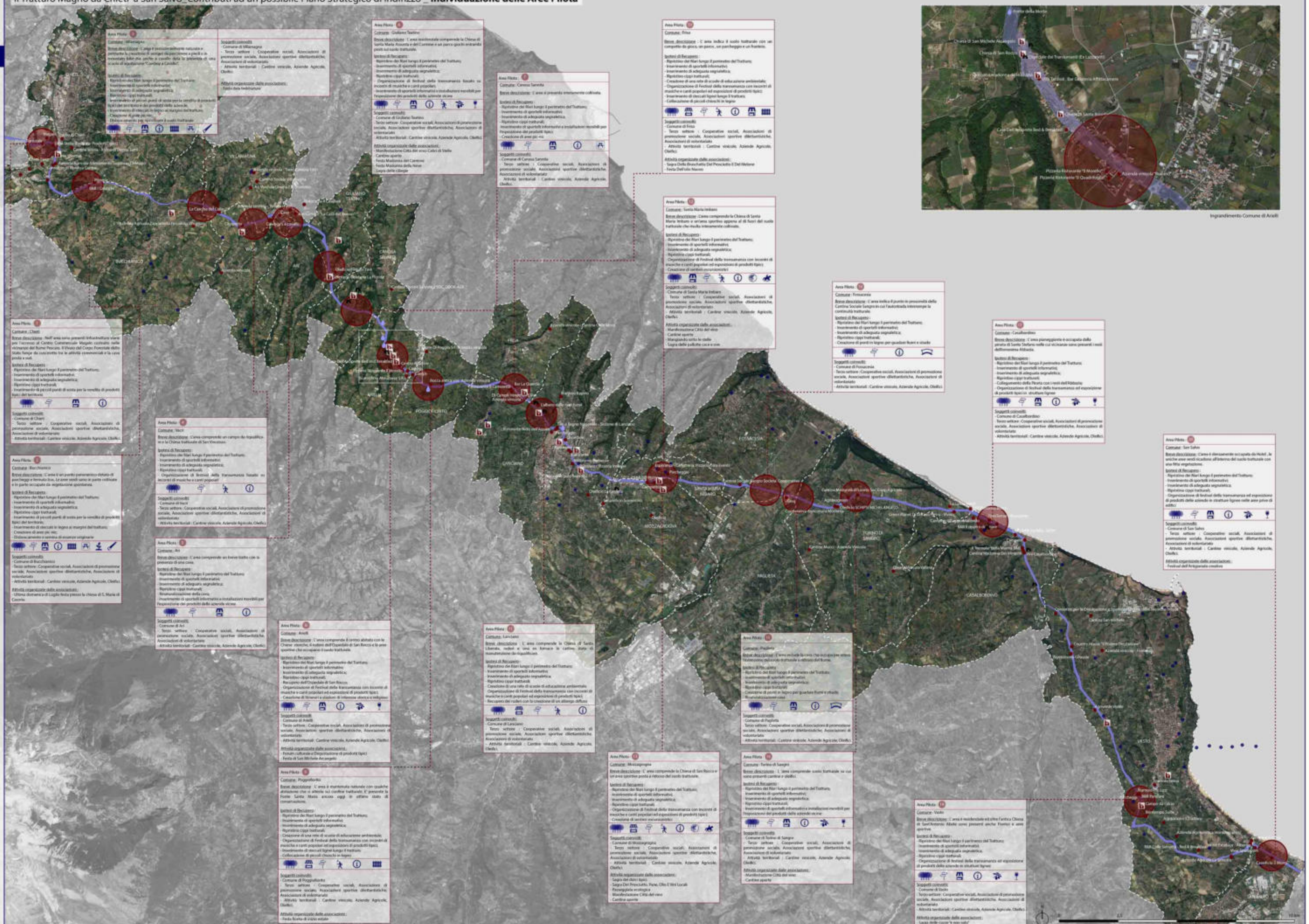
LEGENDA

- Tratturo L'Aquila - Foggia
- Confini Comunali
- Interesse Archeologico
- Beni storici Vincolati
- Attività principali
- Edifici religiosi
- Ruderi
- Fontane
- Aree Pilota

Interventi Proposti

- Filari lungo i margini trattuali
- Sportelli informatici
- Semina essenze originarie
- Segnaletica culturale
- Steccati in legno lungo i margini trattuali
- Aree pic - nic
- Piccole strutture in legno
- Strutture per vendita di prodotti tipici
- Mostra e vendita Olio locale
- Mostra e vendita Vino locale
- Aree sportive riqualificate
- Festival della transumanza
- Ippovie - Ippoterapia
- Piste ciclabili - Mountain bike
- Ponti lignei per guadare fiumi e strade
- Disboscamento

Il Tratturo viene concepito come un grande corridoio ecologico che conserva la biodiversità . Per ripristinare la continuità della via erbosa, ai margini vengono ripristinati filari alberati, i cippi tratturali di confine e laddove la coltivazione ha invaso il suolo,è previsto un disboscamento.
Sono presenti due tipi di suolo :
1) Terreno coltivato - vengono previsti interventi per la creazione di aree pic- nic , percorsi, ippovie, chioschi lignei per la vendita dei prodotti locali, strutture lignee per scuole di educazione ambientale e così via.
2) Terreno occupato da costruzioni - gli interventi prevedono la creazione di itinerari storico- culturali e religiosi, recuper di ruderi per la creazione di nuovi punti di attrazione e l'inserimento di nuove attività.



FONTI :
http://opendata.regione.abruzzo.it/
Geoportale Regione Abruzzo

Tratturo_Bene_ Comune_Territoriale

Strategie di cura e custodia attiva per i territori della provincia di Chieti. Progetto pilota : Comune di Arielli

Il Comune di Arielli come Progetto Pilota _ **Carta delle Condizioni Urbanistiche**

Università degli studi "G. d'Annunzio" Chieti - Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di laurea Progetto & Planning a.a. 2017/2018
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Laureanda : Gioia Vannucci

CAPITOLO n. 5 **TAVOLA n. 5.2**

NORME TECNICHE DI ATTUAZIONE P.R.E.

Art. 57 Disposizioni per gli edifici di particolare interesse storicoarchitettonico
Tale norma si riferisce alle unità edilizie, individuate con apposita campitura sulle tavole del PRE, che hanno assunto rilevante importanza nel contesto urbano territoriale, per specifici pregi, per unicità, per caratteri architettonici o artistici. In tale zona sono consentite le seguenti categorie di intervento:
- manutenzione ordinaria;
- restauro scientifico.

Art. 58 Disposizioni per gli edifici di archeologia industriale di particolare interesse urbanistico-architettonico
Tale norma si riferisce ai manufatti di architettura industriale individuate all'interno della fascia di rispetto fluviale. Per tali edifici è consentita:
- la manutenzione ordinaria;
- la manutenzione straordinaria;
- tantum l'incremento di volume edilizio una tantum pari al 10% del volume esistente .

In tali edifici sono consentite le attività residenziali e le attività di tipo turistico ricreativo, nelle modalità e disposizione della legislazione nazionale e regionale vigente in materia.

Art. 60 Disposizioni speciali connesse alla fascia ferroviaria
Per la fascia della linea ferroviaria Sangritana valgono le disposizioni di cui
al DPR 753 del 11/07/80. Gli interventi di natura edilizia dovranno essere autorizzati secondo la normativa vigente della Regione Abruzzo Direzione Generale Trasporti. Le modifiche e/o realizzazioni di nuove strade interagentii con la sede ferroviaria, dovrà prevedere l'eliminazione degli attraversamenti a raso e, se non realizzabili, la realizzazione di nuovi impianti di protezione. Nel caso di riconversione funzionale della linea ferroviaria all'interno del territorio comunale, gli interventi ammessi nella fascia di pertinenza della ferrovia Sangritana, sono quelli previsti dal seguente articolo. Tale zona è individuata sulle tavole di PRE come "Ferrovia Sangritana – fascia di pertinenza". Sulla fascia ferroviaria e sulle aree di pertinenza sono ammessi interventi per la realizzazione di un corridoio ecologico, ovvero di una fascia verde attrezzata.
In particolare sono ammesse le seguenti attività:
- Realizzazione di pista ciclabile
- Realizzazione di aree attrezzate per lo sport e per le attività collettive
- Installazione di pubblica illuminazione
- Realizzazione di chioschi e gazebo, e comunque strutture amovibili
- Conservazione, ripristino, restauro e ristrutturazione di edifici, costruzioni e manufatti della ferrovia in rapporto storico-funzionale con tracciato ferroviario e di edifici di particolare pregio storico-ambientale e architettonico.

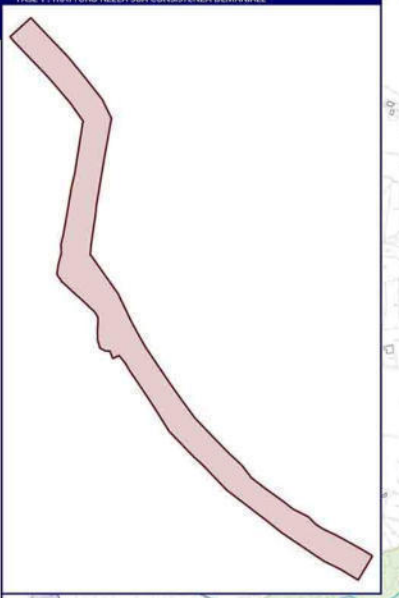
Art. 61 Disposizioni speciali connesse alle Zone Tratturali
La fascia tratturale comprende l'antico tratturo «L'aquila-Foggia» nel tratto che attraversa il territorio comunale di Arielli come riportato nella Tav. 4 e Tav 4 a di PR.E.. Tale area è soggetta a recupero e ripristino ai fini di un possibile uso collettivo. Gli interventi ammessi sono quelli previsti dal Piano Quadro Tratturo adottato con Delibera di Consiglio Comunale n° 42 del 30/8/85 ed approvato dal ministero per i Beni Culturali e Ambientali - Soprintendenza Archeologica dell'Abruzzo di Chieti, con provvedimento del 10 ottobre 1985. Tutti i proprietari dei terreni, già appartenenti al demanio dello stato per i Tratturi, prima di ogni intervento sugli stessi, dovranno produrre un titolo di possesso definitivo.

Art. 66 Disposizioni speciali connesse alle aree del verde viario
In aggiunta alle prescrizioni specifiche di tipo urbanistico fornite in ciascun sottoambito, per le aree individuate graficamente sul progetto di piano come "verde viario" sulla ex S.S. 538 S.P. Marrucina, l'Amministrazione Comunale si riserva la possibilità di predisporre ed attivare, con apposito provvedimento, ulteriori idonei strumenti di regolamentazione e disciplina della fascia per la realizzazione di una fascia infrastrutturale costituita da una pista ciclabile e da una pista pedonale.

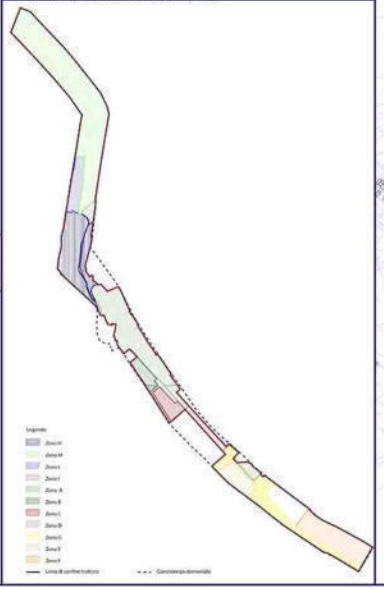
PQT Arielli

Fonti :
Comune di Arielli

FASE 1 : TRATTURO NELLA SUA CONSISTENZA DEMANIALE



FASE 2 : PIANO QUADRO TRATTURO (PQT) 1985



LEGENDA P.R.E. VIGENTE :

- Zona A1 - Centro storico - nucleo originario
- Zona B1 - Completamento e mantenimento della struttura urbana
- Zona B2 - Completamento e mantenimento dei nuclei periurbani
- Zona B3 - Edilizia residenziale economica e popolare - esistente
- Zona B4 - Edilizia residenziale sovvenzionata - esistente
- Zona C1 - Edilizia residenziale di espansione - intervento diretto
- Zona C2 - Edilizia residenziale di espansione e trasformazione urbana - Int. dir.
- Zona C3 - Edilizia residenziale di progetto
- Zona D1 - Zona per le attività produttive esistenti (attività artigianali, industriali, comerciali e di servizio)
- Zona D2 - Zona per le attività produttive - di previsione : Intervento diretto; Piano particolareggiato attuazione immediata (AI-PP)
- Zona D3 - Zona per le attività ricettive - di previsione
- Zona E - Zona agricola
- Zona FA - Area per l'istruzione
- Zona FB - Attrezzature di interesse collettivo : (C) Esistente; (C) Progetto; Progetti Strategici
- Fascia di rispetto cimiteriale
- Fascia di rispetto stradale
- Ferrovia Sangritana - Fascia di pertinenza
- Ferrovia Sangritana - Fascia di rispetto
- Acquedotto
- Verde viario - Ampliamento sezione stradale
- Area di tutela e/o rispetto
- Verde urbano di rispetto
- Verde pubblico attrezzato : (V/P) Esistente; (V/P) Progetto
- Parcheggio pubblico : (P) Esistente; (P) Progetto
- Edifici di particolare interesse storico - architettonico
- Edifici di particolare interesse architettonico - archeologia industriali
- Attrezzature Tecnologiche
- EP Edifici Pubblici
- VPS Attrezzature Sportive
- VA Verde Attrezzato
- IS Area Istruzione
- Confine comunale

Tratturo_Bene_ Comune_Territoriale

Strategie di cura e custodia attiva per i territori della provincia di Chieti. Progetto pilota : Comune di Arielli

Il Comune di Arielli come Progetto Pilota_ **Concept e Masterplan di progetto**

Università degli studi "G. d'Annunzio" Chieti - Pescara
Corso di Laurea Magistrale in Architettura - LM4

Laboratorio di laurea Progetto & Planning a.a. 2017/2018
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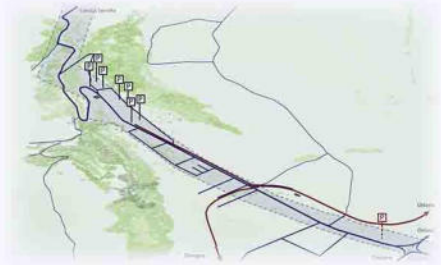
Laureanda : Gioia Vannucci

CAPITOLO n. 5 **TAVOLA n. 5.5**

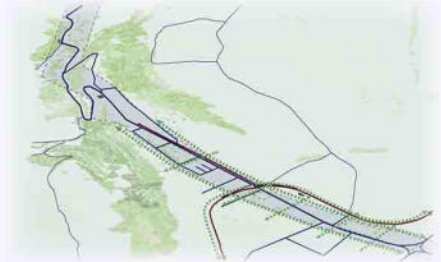
Concept

Sistema infrastrutturale e mobilità lenta



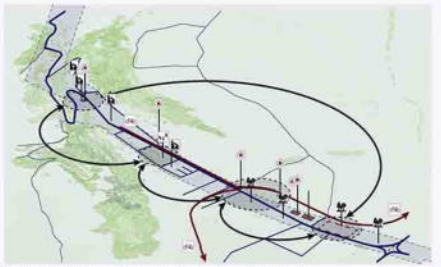
Parcheggi esistenti — Viabilità secondaria — Parcheggi di progetto
Viabilità principale — Percorso ciclo-pedonale di progetto

Rafforzamento sistema del verde per la leggibilità del suolo tratturale



Viabilità principale — Potenziamento del verde
Viabilità secondaria — Percorso ciclo-pedonale di progetto

Poli attrattori



Edifici religiosi storici — Rigenerazione edifici dismessi — Parchi urbani
Parco pubblico — Percorso ciclabile di progetto

Obiettivo 1: Tratturo

- Leggibilità e visibilità del suolo tratturale
- Continuità del tracciato mediante ripristino confini
- Fruibilità lenta

Obiettivo 2: Reti verdi, spazi di aggregazione e di servizio

- Potenziamento percorsi pedonali e inserimento rete ciclabile
- Rafforzamento del sistema del verde
- Abbattimento barriere
- Recupero edifici dismessi e in decadenza
- Riqualificazione rete ferroviaria dismessa
- Riqualificazione Parco Quattro Stagioni
- Creazione di parcheggi verdi
- Bike sharing
- Ristorazione
- Museo

ABACO DELLA VEGETAZIONE

Specie erbacee

Specie arbustive

Specie arboree

ABACO DEI MATERIALI

Pavimentazione : Graniglia stabilizzante per ghiaia

Parcheggi : Graniglia erbosa

Pista ciclabile : Terra stabilizzata

Fioriere in legno per erbe aromatiche

Ghiaia, lapillo, pacciamatura rimedio contro le piante infestanti

Panchine in pietra

Moduli lignei in pallet per ospitare funzioni

Lampioni -Favola Urbana- per la definizione dello spessore tratturale

Segnaletica

Cippi tratturali in Travertino

L'Ospedale dei Transumanti torna ad avere una funzione pubblica come centro ambulatoriale e punto di ristoro

Schemi funzionali

Funzioni :
1. Biblioteca
2. Magazzino ristorazione piano terra
3. Servizi igienici
4. Ristorazione
5. Servizi igienici
6. Sportello informativo
7. Servizi igienici
8. Sala d'attesa
9 - 10 - 11 - 12. Ambulatori medici
13. Spogliatoio
14. WC di servizio
15. Servizi igienici
16 - 17 - 18. Stanze per brevi ricoveri/ospitalità

Piano seminterrato	Superficie (mq)	Sup. Totale (mq)
Biblioteca	100	183
Magazzino	63	
Servizi igienici	20	

Piano terra	Superficie (mq)	Sup. Totale (mq)
Cucina	33	101
Ristorante	86	
Ingresso e di smegno	39	
Box informazioni	35	
Servizi igienici	20	

Piano primo	Superficie (mq)	Sup. Totale (mq)
Servizi igienici	11	169
Sala di attesa	38	
Ambulatorio 1	24	
Ambulatorio 2	28	
Ambulatorio 3	32	
Ambulatorio 4	32	
Disimpegno, vano scala	40	
Spogliatoio	16	
WC di servizio	10	

Piano secondo	Superficie (mq)	Sup. Totale (mq)
Servizi igienici	16	108
Stanza 1	17	
Stanza 2	18	
Stanza 3	22	
Disimpegno, vano scala	35	

PECUS | EUROPEAN LANDSCAPES OF TRANSHUMANCE

ERASMUS+ PECUS

CASE STUDY SHEET

CS code	*GR-01*	**CS Title**	*SOUTHEASTERN SLOPS OF MT. DIKTI (GAIDOUROPHAS AND LAVRAKIA)*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy X Study/research X Project ☐ Other		
Responsible body/Promoter	NKUA / Yiannis Papadatos, Tina Kalantzopoulou		
Location (region, locality)	Southeast slopes of Mt. Dikti, Ierapetra, Crete, Greece		
Geographical area covered	18 km^2(1800 hectares) The area is bordered by the Kokkies range to the north, and the modern villages of Kalamafka to the east, Anatoli to the south and Malles to the west. Altitudes range from 800 to 1200 m amsl.		
Year	*2012-ongoing*		
Summary description	This case study includes a multitude of Bronze Age sites on the Southeast slopes of Mt. Dikti, east Crete. The study focuses on the economic aspects of these occupations and their role for the exploitation of the mountain resources. Special emphasis is given on the importance of the mountains for the economy of the Minoan palaces in the Neopalatial period (c. 1700-1450 BCE), during which there is a conscious effort of the palatial elites to control mountain production. The area is focus of a long-term archaeological project of the NKUA since 2012, which comprises two major field-works. 1) The excavation of a large, monumental Neopalatial building at the site of Gaidourophas, which functioned as a palatial administrative centre, serving the control, storage and distribution of the mountain products to the urban centres of the lowlands 2) The extensive survey of the surrounding hinterland identified a series of contemporary rural houses, in several sites, such as Lavrakia. The lack of flat, arable areas and the presence of long precinct walls in the surroundings of these buildings, which created large open spaces such as pens, are interpreted as evidence for a pastoral economy. Despite the lack of written sources, the archaeological evidence shows interesting changes through time from seasonal to permanent habitation and backwards, as well as shifting patterns of transhumance. Furthermore, this case study shows the importance of animal husbandry not only for the small mountain communities, but also for the large urban centres of the lowlands and the palatial economy in general. Spatial analysis included accurate mapping of the prehistoric rural buildings in relation to 1) mountain paths, modern transhumance routes, as well as springs, streambeds and arable land. 2) the monumental administrative building at Gaidourphas This spatial analysis allows (a) inferences about the criteria on which prehistoric populations chose to build their establishments at these specific locations (b) a better understanding of the way pastoral life and economy affected the settlement patterns we observe during prehistory		

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Link with laws/regulations and with other policies/ plans/strategies*(if any)*	The excavation of the Gaidourophas building and the surface survey of the surrounding areas have been carried out under the auspices of the NKUA and with official permit by the Hellenic Ministry of Culture and Sports. The Gaidourophas building has been declared Monument of Cultural Heritage, and is protected by the Greek Law. The full documentation of the newly identified buildings as part of the project, will eventually lead to their declaration as protected Monuments of Cultural Heritage. Also, almost the entire area of the case study is protected as public forest or as area for re-forestation.
PROBLEMS AND NEEDS TARGETED	
Problems	Due to the lack of written sources, the main problem is to associate archaeological evidence and material culture with abstract notions, such as economic strategies, social structure, political organization, ideology or the perception of the mountains by civilizations of the past. This is always a challenge for prehistoric archaeologists, and, consequently, one of the main aims of this case study is to demonstrate what type of archaeological evidence can be used in order to infer about pastoral economy, mountain exploitation and transhumance. An additional problem is related to the fact that mountains have been neglected and scientifically marginalized by archaeologists of Minoan Crete, who tend to focus their research in the archaeologically rich palatial centres of the lowlands.
Needs	In order to overcome the problems of interpretation and reconstruct the economy and life of prehistoric pastoral mountain communities on the basis of mute archaeological evidence, it is necessary to: 1) Record and study anthropological and ethnographic cases of pastoral communities of today and the recent past 2) Record and study written sources from later historical periods referring to pastoral life and strategies of transhumance 3) Study the existing bibliography on the importance of mountain resources and animal husbandry products for the subsistence and prosperity of prehistoric (Minoan) urban and palatial centres of the lowlands With the help of the above we will try to (a) overcome the problems of interpretation of the available archaeological evidence (b) associate the existing archaeological evidence with specific economic strategies (c) understand the ways prehistoric communities coped with the demanding conditions of life on the mountains (d) associate shifts in the exploitation of mountains with specific economic, social and political changes in the lowlands
Quantitative data	Not available

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	NO	
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	NO	

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Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	Of the prehistoric buildings under study, only one (Gaidourophas) has been declared as protected Monument of Cultural Heritage. The full documentation of the newly identified buildings as part of the project, will eventually lead to their declaration as protected monuments.
Protection/enhancement of intangible cultural heritage (e.g.historical route networks, scenic views, folklore, food, music…)	NO	
Slow mobility (cycling routes, trekking paths, etc.)	YES	All these buildings are conveniently located along or very close to the European long-distance path E4. This offers the opportunity to create a marked (pre)historical trekking route passing by the sites. Signs with maps and information could attract attention to the buildings, which could act as hot-spots along this important European path.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)	YES	Crete has a long tradition of archaeology-related tourism, due to the important archaeological sites in the lowlands, e.g. the world famous Minoan palaces at Knossos, Phaistos, Malia and Zakros. However, mountains never attracted this kind of tourism, due to the lack of archaeological sites. The declaration of the newly found buildings as protected monuments, and the preservation and enhancement of the archaeological sites will contribute to the economic development of this mountain area, by attracting knowledgeable tourists from the nearby lowlands.
INVOLVEMENTOF STAKEHOLDERS		
Actors involved	1) NKUA: is the main academic promoter of the antiquities in the area.It has had and will continue to have several research campaigns, which include excavation, surface survey, mapping, documentation and study of pottery and other movable finds. These campaigns are carried out by large interdisciplinary groups, consisting of members of stuff, postdoctoral researchers, and BA, MA and PhD students, as well as scientists from different disciplines such as archaeologists, geologists, conservators, geologists, archaeobotanists, archaeozoologists, etc. Also, NKUA has initiated and undertakes a special project of Public Archaeology which every year includes interviews, guided tours and other forms of public outreach, aiming at engaging the local communities in the protection of the cultural heritage of the mountains. 2) Ephorate of Antiquities of Lasithi: is the local department of antiquities of the Hellenic Ministry of Culture. It is responsible for the protection, preservation and enhancement of all the archaeological sites in the area and it is the main local stakeholder concerning the protection of cultural heritage. It provides the necessary permits for scientific research and supervises all the work related to the antiquities of the area. 3) Local Authorities, i.e. the Municipality of Ierapetra and the Cultural Associations of the surrounding villages (Malles, Kalamafka and Anatoli): host and support the archaeological teams, and provide valuable information about the area. These communities use the same mountain area for subsistence, following practices such as animal husbandry, cultivation of vine and fruit bearing trees, hunting and foraging. These practices are very much alike those of the prehistoric populations as manifested by the rural houses documented by this study. The mobilization and engagement of these communities in the monitoring, protection, and enhancement of this archaeological landscape through educational and participatory activities is important for the preservation of the monuments and their surrounding landscape.	

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Involvement procedures	NKUA has already applied to the Hellenic Ministry of Culture for archaeological work in the area of the case study, and the local Department of Antiquities (Ephorate of Antiquities of Lasithi) has provided the necessary permits. The Local Municipality and the Local Culture Associations are contacted in order to host the archaeological team and provide support and access to the remote mountain areas where the Minoan buildings exist.
Problems and challenges	Not available
EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)	Protection of the pristine landscape which surrounds the prehistoric buildings and constructions
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Re-establishing the connection between the built and the natural environment and preserving the cultural landscape of the prehistoric period, which includes both man-made and natural features
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	Discover, preserve and protect important prehistoric buildings, which are dated to 1700-1500 BCE and are still visible on the surface today Discover and conserve a large number of prehistoric artefacts found in excavations and surface surveys in the area. These artefacts are related and can contribute to a better understanding of economy, society and everyday life on the mountains during prehistory
Effects on social and economic aspects (e.g. new jobs, new enterprises…)	Propulsion of mountain tourism, and creation of new jobs in the local communities
IMPLEMENTATION ISSUES	
Financial resources	The archaeological excavations on the mountains are funded by NKUA, the Institute for Aegean Prehistory (INSTAP), Psycha Foundation, and the surface survey by NKUA and the Greek State Scholarships Foundation (IKY).
Implementation procedures	All the procedures have already been implemented
SUPPORTING INFORMATION	

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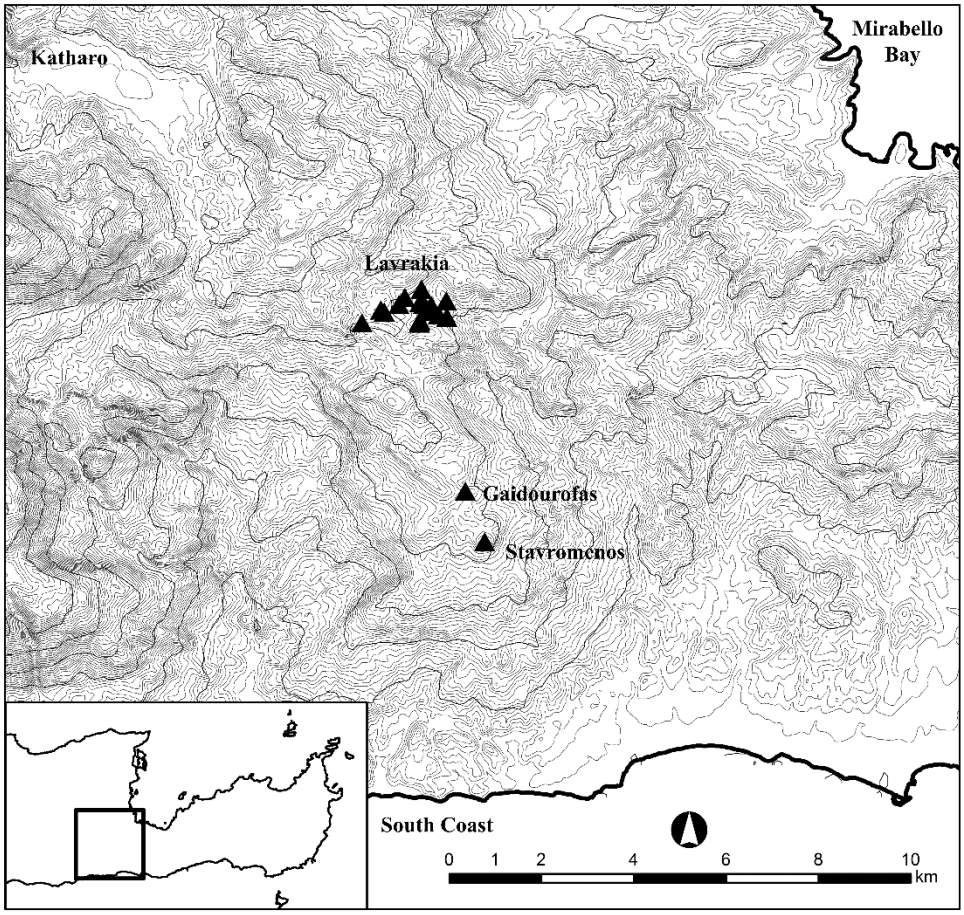
Images (pictures, graphics, maps, charts, etc.)	

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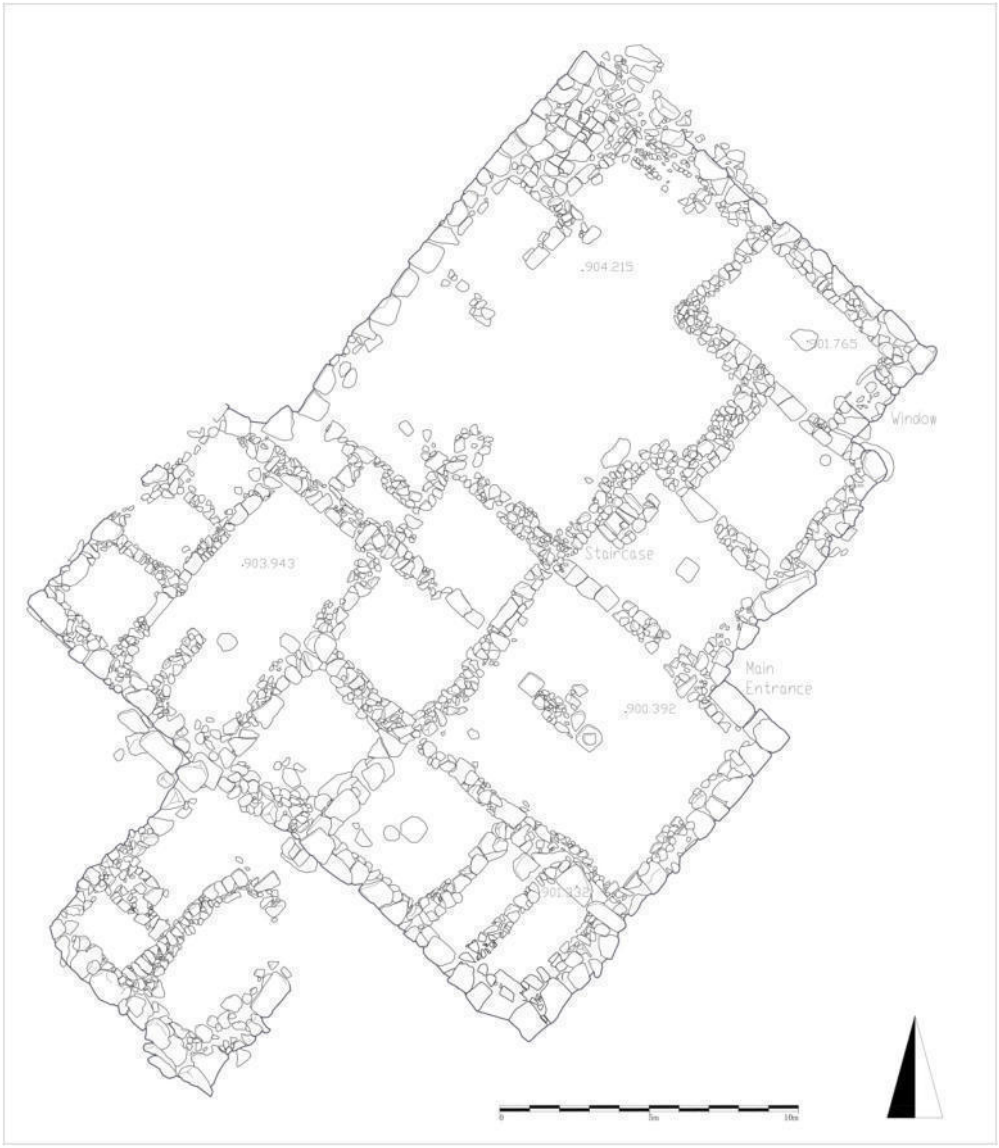

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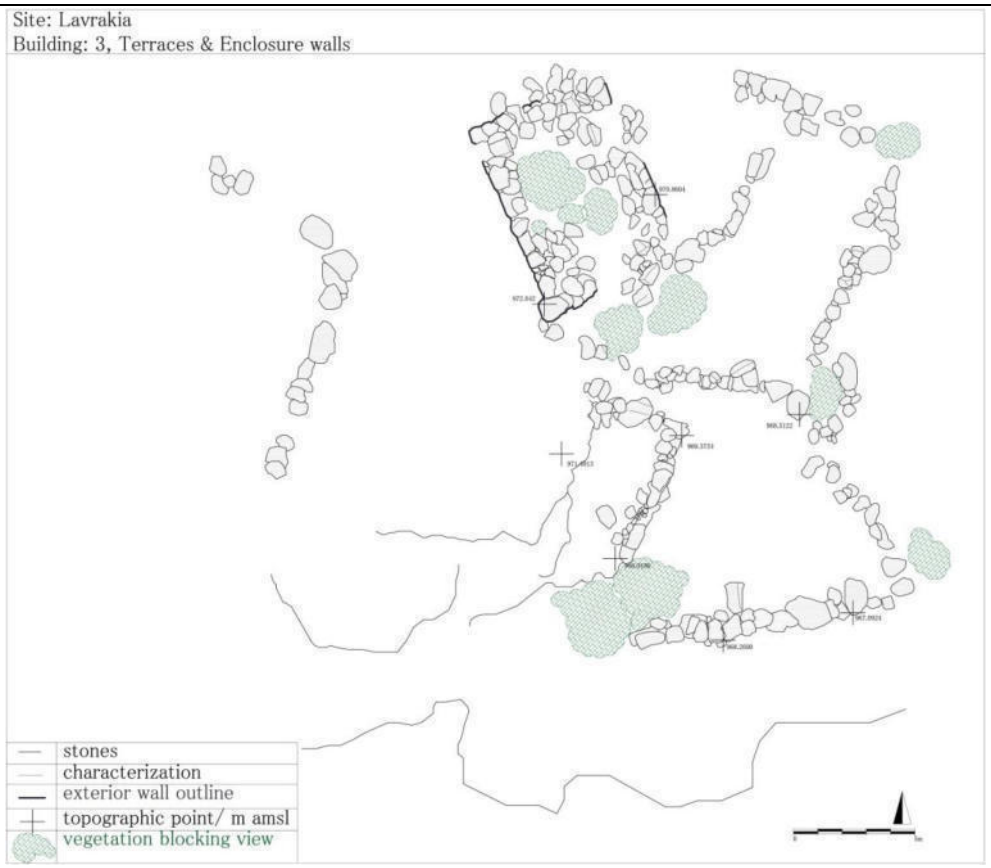

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CASE STUDY SHEET

CS code	*GR-02*	**CS Title**	*LIMNAKARO MITATO*
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy X Study/research ☐Project X Other (Article in a Scientific Magazine)		
Responsible body/Promoter	Harriet Blitzer, NKUA		
Location (region, locality)	Mt. Dikti, Limnakaro upland valley, Lasithi, Crete, Greece		
Geographical area covered	Limnakaro plateau is a karstic depression covering an area of c. 90 hectares. It is located at an altitude of 1120 m amsl. It lies right south of the Lasithi plateau (the largest upland valley in Crete at 850 m amsl) and right under the highest peak of the Dikti Mt., Spathi (2148 m amsl).		
Year	1990		
Summary description	In 1990 Dr. Harriet Blitzer, professor of Art History at the State University of New York, published a paper about the pastoral families of Ag. Georgios, their productive practices in the Limnakaro plateau and the core structure of these economic strategies, the so-called 'mitato', a complex building of seasonal use. The paper was based on evidence collected on site at the time and was meant to be used as an ethnographic parallel for ancient pastoral activity. In the article, after a brief description of the locality and topography, there is a description of the 'mitato', the main building used by the shepherds that includes the dwelling area, a corral and specialized working spaces for milking, shearing, cheese production etc. The article deals also with the seasonality of activities of these shepherding families, with the practice of transhumance, and with the end products that the shepherds marketed, such as wool, hides and dairy products. An extended part is devoted to the cheese making practices as well as milking. The study discussed here, apart from being important for ethnography and the documentation of traditional practices, is highly valuable for archaeology as well. The practices presented are a group of activities that live minimum to no archaeologically detectable traces. However, it is quite certain that such activities took place as indicated by indirect evidence. Thus the documentation and detailed description of recent parallels can be revealing for archaeologist and they usually contain hints directing our attention and making us understand what we need to look for.		
Link with laws/regulations and with other policies/ plans/strategies*(if any)*	Despite their deep history and their importance as tangible evidence for long lasting traditions of pastoralism and transhumance, the 'mitata' of Dikti have not been declared as monuments of Cultural Heritage and are not protected by the Greek Law. Thus, they have been left to decay and oblivion. This is rather surprising, because “Transhumant Livestock Farming” has been included to the National Inventory of Intangible Cultural Heritage of Greece since 2017.		
PROBLEMS AND NEEDS TARGETED			
Problems	The main problem is that the economic strategies and productive activities described in the article have become so rare to the point of extinction. Very few people still follow these activities, they are usually very old and they only continue to perform certain tasks and not the whole process. Therefore, the transhumant way of life and economic model disappears rather rapidly in Crete and will soon become subject of archaeology instead of ethnography. Furthermore, the article discusses transhumance, but not with much detail, and certain aspects of this phenomenon remain elusive, such as the demographic composition of the transhumant groups, the distance covered with the flocks or different strategies of husbandry in the summer and the winter pasture lands.		

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Needs	To face the above problems it is necessary to interview people who still leave on the Mt. Dikti villages, particularly shepherds, and to investigate other ethnographic sources and testimonies from the pre-mechanised/ pre-modern era on the island of Crete. It is likely that the older inhabitants remember the seasonal routes covered by the shepherds with the animals even if no one follows them anymore or if the animals are transferred with trucks. It is important to try and preserve this information before that knowledge is lost together with last people capable of testifying about it. With the information gained from these interviews we will: 1) Carry out an accurate mapping of the recent drover roads 2) Follow the drover roads and try to identify archaeological sites, structures and any kind of tangible evidence, which may indicate a diachronic use of these roads in the recent and remote past 3) Inform the Local Authorities and discuss about the possibility of preserving and restoring such structures, as valuable resources and tangible evidence of a disappearing element of Intangible Culture Heritage.
Quantitative data	*Number of villages on Crete at altitudes between 800 m and 1199 m amsl = 31* *Number of people in these according to the 1991 census = 4617, 2001 census = 3,366* *Current number of shepherding families = ?*

FOCUS, OBJECTIVES AND OUTPUTS

Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	NO	
Protection of environment (e.g. biodiversity, water, geomorphology, soil, climate…)	NO	
Protection/enhancement of tangible cultural heritage (e.g. historical paths, archaeological sites, architecture, terraces and field systems…)	YES	Although "Transhumant Livestock Farming" has been included to the National Inventory of Intangible Cultural Heritage of Greece since 2017, this does not include the protection of structures and other tangible evidence of transhumance. Starting with Blitzer's article, which will be followed by a systematic survey, mapping and documentation of mountain 'mitata' and other structures we hope to increase public awareness and motivate the local inhabitants to protect, preserve and, if possible, restore them.
Protection/enhancement of intangible cultural heritage (e.g.historical route networks, scenic views, folklore, food, music…)	YES	Interviews with locals almost 30 years after Blitzer's article, combined with the survey of the area and the documentation of other structures related to pastoralism will help to increase the local interest for the disappearing practice of transhumance. This will contribute to the protection and enhancement of this element of Intangible Cultural Heritage.
Slow mobility (cycling routes, trekking paths, etc.)	YES	The well-known and signed E4 European trekking path is passing right from the middle of the Limnakaro plateau. Therefore, the area is suitable for trekking, and is already included in all major guides about trekking in Greece and Europe.
Economic development of mountain & rural	YES	An effort to re-instigate transhumant pastoral practices might be hopeless in a constantly shifting towards intensification of production economic system. However, the material remains of this practices are worthy of preservation as a 'museum' of

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areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)		the recent past. The option of reviving traditional pastoral practices on a small, touristic scale is always open, as long as the know-how is not lost, and might be economically sensible if combined with agro-touristic ventures, that are quite attractive to an alternative audience.
INVOLVEMENTOF STAKEHOLDERS		
Actors involved	1) NKUA:a team from the NKUA will visit the Limnakaro area, record the situation almost 30 years after Blitzer's article, and survey the area for more structures and any kind of evidence for human pastoral activity in the recent and remote past. Additionally, the team will take interviews from local inhabitants and compare the present picture with the picture describer by Blitzer 30 years ago, 2) The shepherds and the inhabitants of the surrounding villages (Avrakontes and Agios Georgios): will host the NKUA team, and will provide valuable information about the area. These communities exploit this mountain area with practices related to animal husbandry. The mobilization and engagement of these communities in the monitoring, protection, and restoration of structures related to pastoralism in the recent past is important for the preservation of these structures and their surrounding landscape.	
Involvement procedures	Blitzer's article includes many information provided by the owners of the 'mitata' in Limnakaro. However, this information is 30 years old, and it would be interesting to contact once more the families of Ag. Georgios and monitor the situation 30 years later.	
Problems and challenges	*Over time, the old 'mitata' fell out of use and they have started to decay.* *Younger generations do not travel seasonally with their herds towards the upland valley of Limnakaro and they are not interested in such a practice anymore.* *Producing activities and transhumant routes of the past may have been forgotten*	
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Effects on the environment (e.g. restoration of habitats, increased biodiversity, climate change mitigation or adaptation…)		
Effects on immaterial, cultural assets (e.g. cultural landscape, scenic views, folklore…)	Preservation of traditional economic practices of the mountain communities is important both for their own history and survival in a rapidly changing economic system and for ethnographic purposes. The use of parallels from pre-industrial economic systems of the recent past in order to understand human activity of the remote past is of paramount importance and their value increases as they are less and less frequently observed.	
Effects on material, cultural assets (e.g. restoration of historic artefacts or buildings, restoration of traditional terraces or cultivation systems…)	It is a happy coincidence that the intangible practices of traditional pastoralism and transhumance are accompanied by material remains, such as the multifunctional 'mitata' buildings in the Limnakaro upland valley. Preserving the knowledge about the practices taking place in these buildings if not trying to re-instigate parts of these practices is important for the preservation of the architectural remains themselves and for the preservation of their landscape.	
Effects on social and economic	Agro-touristic opportunities are very likely to emerge through an open dialog between the local population and the academic community. Acts for the preservation and enhancement of cultural heritage	

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aspects (e.g. new jobs, new enterprises…)	and tradition might lead to economic development in an already highly touristic island, in which, however, all touristic activity concentrates only on the coastal zone, far from the mountain communities. This could be an opportunity for the mountainous hinterland of Crete to bring forward its unique and neglected characteristics.
IMPLEMENTATION ISSUES	
Financial resources	The relevant work is funded by NKUA and the Institute for Aegean Prehistory (INSTAP).
Implementation procedures	The monitoring of the status of pastoral structures on the Limnakaro plateau is the first action related to this case study. This will include recording, documenting, surveying and mapping the area. Spatial analyses includes accurate mapping of the recent mountain paths and transhumance routes. Then, these routes will be surveyed for structures and evidence of human activity and presence in the past. These will be mapped in relation to transhumance routes, and natural features such as springs, streambeds and arable land. This will show the diachronic use of these routes transhumance and human and animal movement. Secondly, a dialog is to be opened between the (ex?)shepherding families and the academic community concerning life on the mountains and pastoral economy.
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	

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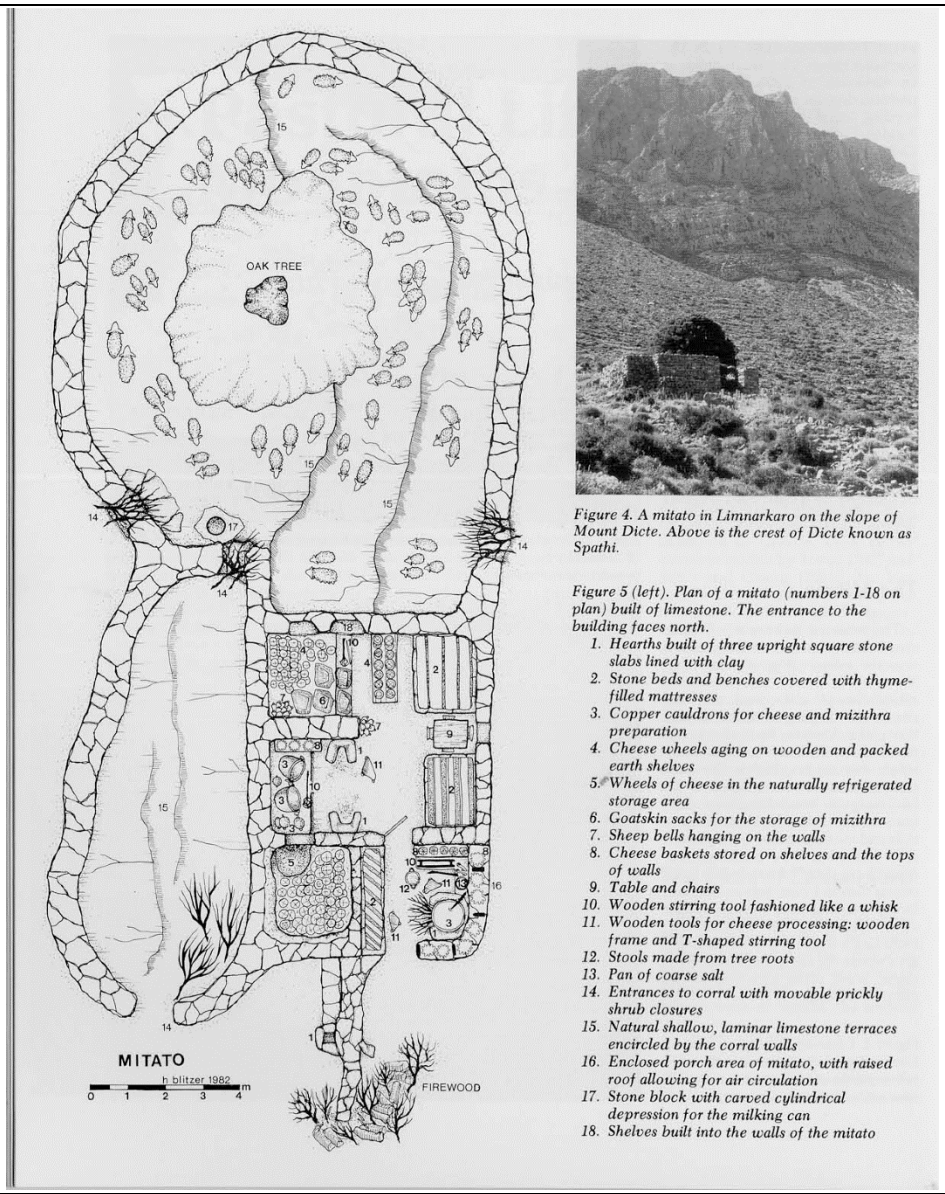

Figure 4. A mitato in Limnarkaro on the slope of Mount Dicte. Above is the crest of Dicte known as Spathi.

Figure 5 (left). Plan of a mitato (numbers 1-18 on plan) built of limestone. The entrance to the building faces north.

1. *Hearths built of three upright square stone slabs lined with clay*
2. *Stone beds and benches covered with thyme-filled mattresses*
3. *Copper cauldrons for cheese and mizithra preparation*
4. *Cheese wheels aging on wooden and packed earth shelves*
5. *Wheels of cheese in the naturally refrigerated storage area*
6. *Goatskin sacks for the storage of mizithra*
7. *Sheep bells hanging on the walls*
8. *Cheese baskets stored on shelves and the tops of walls*
9. *Table and chairs*
10. *Wooden stirring tool fashioned like a whisk*
11. *Wooden tools for cheese processing: wooden frame and T-shaped stirring tool*
12. *Stools made from tree roots*
13. *Pan of coarse salt*
14. *Entrances to corral with movable prickly shrub closures*
15. *Natural shallow, laminar limestone terraces encircled by the corral walls*
16. *Enclosed porch area of mitato, with raised roof allowing for air circulation*
17. *Stone block with carved cylindrical depression for the milking can*
18. *Shelves built into the walls of the mitato*

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CASE STUDY SHEET

CS code	*IS-01*	**CS Title**	Eyjafjörður
GENERAL INFORMATION			
Type of case study	☐ National or regional level policy/plan/strategy ☐ Local level policy/plan/strategy x Study/research ☐ Project ☐ Other		
Responsible body/Promoter	Háskóli Íslands		
Location (region, locality)	Eyjafjörður, North Iceland		
Geographical area covered	4000 km^2, the coast plain, valleys and mountains of central Eyjafjörður.		
Year	2000, 2001, 2002, 2003, 2008, 2016, 2018, 2019		
Summary description	The valleys of Svarfaðardalur and Hörgárdalur in Eyjafjörður county in Iceland contain a wealth of archaeological remains. The valleys are located in mountains that rise up to 1400 meters above sea level. They differ in that the more northerly valley (Svarfaðardalur) has more vegetation in the mountain slopes, the slopes also being less steep and much more covered in snow during winter. Each valley has about fifty to hundred 20th century farms, but in the middle ages there probably were about 400 farms in the whole area. Ruins of a large number of medieval farms dot the landscape. Remains of huge earth wall systems are visible above ground, with more than 75 km. visible, especially in the northern part of the area. Also remains of a large number of shielings have been registered, but none excavated. The number and location of shielings might largely fit with the number and location of full farms in this area. A study of this medieval agricultural system would mobilize agricultural registration, evidence from environmental history, satellite information on vegetation, map making and written sources, especially the so-called Búalög (Farmer´s Law, medieval regulation of farming), to analyse the system. Mapping of the system on this basis would lead to a hypothesis about the extent and organisation of transhumance in these northern valleys of Svarfaðardalur and Hörgárdalur and the role of shielings in the system as a whole.		
Link with laws/regulations and with other policies/ plans/strategies *(if any)*	This case study is research based. The results of the research would have important ramifications for the interpretation and understanding of the medieval Icelandic agricultural system, for example regarding its origins in the Norwegian agricultural system. The ubiquity of shielings in the middle ages in this area is very different from their relative paucity in the early modern period. A better understanding of the development of land use and the role of shielings in this area during the whole period 870–1800, possibly with contrasting examples from the 14th century and the early 18th century, would give an invaluable insight into the development of land use. This would deepen the understanding of the logic of land use in Iceland in this period which has ramifications for policy aims and regulation of land use and the understanding of the interaction of nature and society before modernity.		
PROBLEMS AND NEEDS TARGETED			
Problems	The problems encountered and targeted here include a lack of knowledge about shieling management and its place in the production system. The University of Oslo published in 1979 a		

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	study of the Icelandic shieling system which is only available in German, but it is still the best study of the Icelandic system available. There has been considerable research and survey of shielings which in the last 20 years or so has completely transformed our view of the role of shielings in the Icelandic system, even from the findings of the above mentioned study. So a re-evaluation and reexamination of the problem as a whole is very necessary. A shieling system based on the old shieling system in Norway which was the parent of the Icelandic system still exists. It is very carefully described and researched and that research is probably pertinent in this connection.
Needs	The needs identified especially pertain to the research on transhumance in Iceland. There is a need of a research project aimed at clarifying the problems brought forward in the archaeological surveys and research already available.
Quantitative data	The area in question probably had around 350 operating farms in 1200–1400. Of these, about 200 where „main farms" (obliged to pay tithe to the church). Their number was registered in the *máldagar*, a kind of charters for the parish churches. There were also smaller farms, not obliged to pay tithe directly, but only as part of the main farm. The farms were spread across the landscape, sometimes with clusters of smaller farms around them. The number of shielings in Svarfaðardalur was around 50. There was one shieling per main farm in most of the valley. The number of shielings in Hörgárdalur was around 40, also with most farms having a shieling. The number of animals at each farm was around 5-10 cows and 20-40 sheep. The access to vegetation area for each farm was on average about 50 hectares in the period 1200–1400. The volume of grass harvest from each hectare was about 1-6 tons, depending on kind of grassland. It was 3 tons from fertilized hayfield per hectare, up to 6 tons from wetlands, and around 1-2 tons from unfertilized outfield.

FOCUS, OBJECTIVES AND OUTPUTS

Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	yes	The value of the existing remains of the medieval agricultural systems as a part of the cultural heritage of the area should be taken into consideration during spatial planning of the area.
Protection of landscape/environment (e.g. biodiversity, water, geomorphology, soil, scenic views, historic landscapes, etc.)	yes	The medieval agricultural system should be carefully protected, as it is potentially a very valuable resource for reconstruction of past land use and society.
Protection/enhancement of tangible cultural heritage (e.g. archaeological sites, historical routes, architecture…)		The earth walls and ruins of the old farm buildings and shielings should be protected. They are, formally, but in practice this is overlooked, even by official institutions and there are examples of destruction of such remains.
Protection/enhancement of intangible cultural heritage (e.g. folklore, food, music…)		There are possibilities involved in restoring and reinventing the old culture of transhumance in relation to food culture. For example, the Icelandic skyr has gained foothold in most countries in the Atlantic world and beyond in the last two decades. Skyr was originally produced at the shielings.
Slow mobility (cycling routes, trekking paths, etc.)		Cycling routes and trekking paths could be organised around the visible remains of the system.
Economic development of mountain & rural areas (e.g. tourism, agro-food production, agriculture, livestock breeding…)		Especially if the course of present-day agriculture is diverted from the ecologically destructive monoculture and agrobusiness focus, shieling practice and transhumance might become an option for the development of agriculture.

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INVOLVEMENT OF STAKEHOLDERS	
Actors involved	1.The National Museum of Iceland is a centre for the preservation of and research on artifacts and culture regarding Icelandic society. 2. The Cultural Heritage Agency of Iceland is the guardian of all cultural heritage in Iceland, issuing permits for and supporting research on this heritage. 3. The Institute of Archaeology, Iceland is a private research company that has surveyed and done research on archaeology and the cultural heritage in the region. 4. RANNÍS – The Icelandic Centre for Research. Provides funding for research in all areas of science and scholarship. 5. The University of Iceland. Organises research and education on archaeology, the history of Iceland and the biology and nature of Iceland. 6. The Agricultural University of Iceland. Research and education on agricultural history. 7. The Municipal Museum of Dalvík. Representing the local authorities on 8. The Historical Society of Svarfaðardalur. 9. Akureyri Museum.
Involvement procedures	Research on the shieling system has been carried out in two steps, and a third step is needed. 1. Surveying and documenting the extent of shieling remains in the Icelandic cultural landscape. This step was carried out in 2000 to 2008 by the The Institute of Archaeology, working on behalf of the municipal authorities and on the basis of national legislation. 2. Research on this system of transhumance and its place in the medieval agricultural economy was carried out at the National Museum of Iceland during 2015–1017. Further research has been carried out with archaeological research in Eyjafjörður during 2018–2019 by the Institute of Archaeology and the University of Iceland, Faculty of Humanities. 3. A third step is necessary, archaeological research on shieling remains, determing the dates of shieling remains and the longetivity or duration of the medieval transhumance operation in the area. At present, work on this system is carried out with the support of a hypothesis supported by research presently available.
Problems and challenges	
EXPECTED OR ACHIEVED EFFECTS	
Type of effect	**Description** ***(max 750 characters for each type)***
Environmental/landscape (e.g. restoration of habitats, effective protection of historic landscapes…)	The project effected the discovery of a massive transhumance system, involving the whole community in the middle ages.
Cultural (e.g. restoration of historic artefacts, promotion of folkloric assets…)	The discovery of a system of transhumance chanced the interpretation of the agricultural system of Iceland vis-à-vis the origin system. It proved to be much closer in kind to the origin system than suspected, because of the ubiquity of the transhumance. This probably only changed after 1400, leading to divergence of the Icelandic system from the origin system in Scandinavia.
Social/economic (e.g. new jobs, new enterprises…)	
IMPLEMENTATION ISSUES	
Financial resources	1. The surveying of local archaeology was funded by the municipality according to national law which came into effect 1993 and revised in 2012. 2. Research into the survey was carried out at the Dr. Kristján Eldjárn fellowship at the University of Iceland 2015–2017. This fellowship is funded by the Icelandic ministry for culture. Also relevant archaeological research in the area has been funded by the Cultural Heritage Agency of Iceland, RANNÍS and NSF. 3. Funding has been sought from Icelandic and Norwegian authorities for further integrated archaeological, historical and palaeoecological work in the area. Transhumance is not specifically targeted in this proposed project, called Two Valleys, but transhumance research is on the agenda

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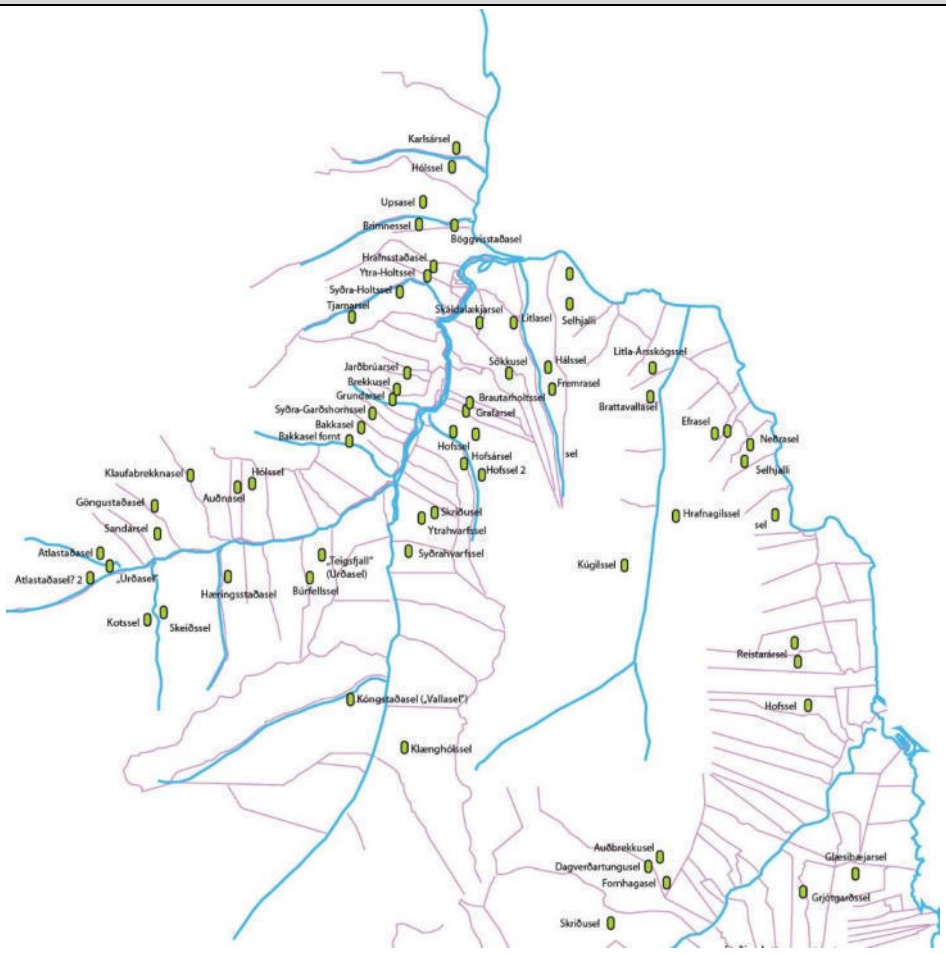
	in the planning of further research. The Two Valley project has hitherto been able to secure limited funding from research but more is needed.
Implementation procedures	
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	 *Shieling ruins in the north part of the area (Svarfaðardalur)*

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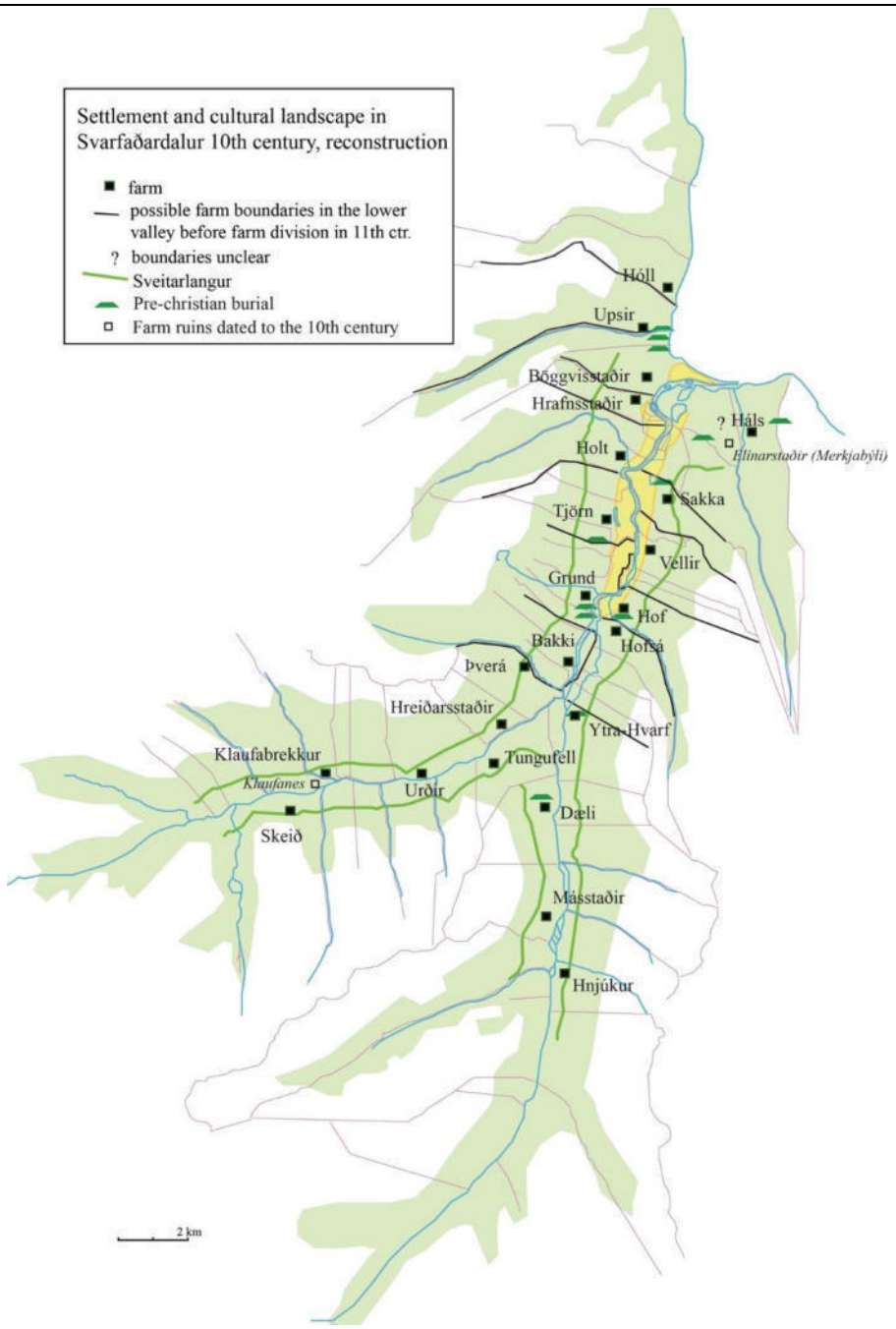

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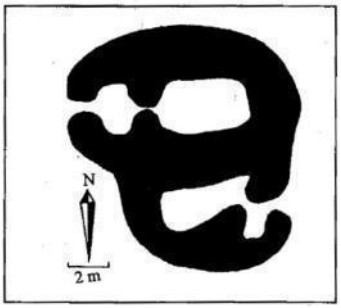
Shieling ruins in Svarfaðardalur Brekkusel 11 August 2015

Ey-121:015 *Sel* seltóft 65°55.347N
18°55.102V

"... ofar [en Stekkur 012, á nafnlausu halli] eru tóftarústir, sem heita Sel og stór steinn, sem heitir Selsteinn." segir í örnefnalýsingu. Selið er óvenjulega nærri bæ og ekki nema 30 m ofan við stekkinn 012. Við Selið er Selsteinninn sem tekur af allan vafa um að hér sé um réttan staða að ræða. Tóftin er á röku svæði neðst í fjallshlíðinni. Hún er mjög gróin og nokkuð fornleg. Hún er tvískipt og er 9 X 5 m að stærð. Við hlið tóftarinnar er dældótt svæði sem er 5 X 3 m að stærð og hægt er að greina 2 afgerandi dældir. Eru þetta líklega einnig leifar tófta.

Hættumat: engin hætta
Heimildir: Ö-Svarf, 335



Description of Brekkusel ruins in arch. Survey

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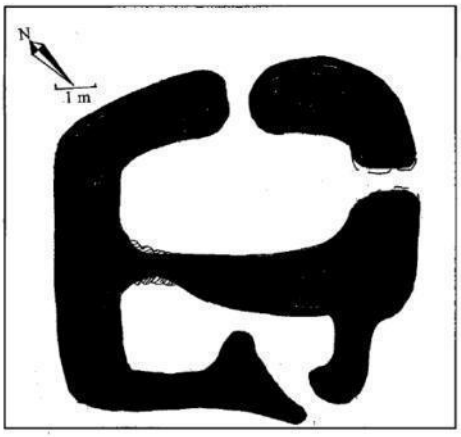
Shieling ruins in Svarfaðardalur Bakkasel 13 August 2015



"... spöl framan við Hólabrún er foss í ánni, Efrifoss, og þar í gilbarminum eru seltóftir fornar sem ég hef ekki heyrt nafn á." segir í örnefnalýsingu Gests Vilhjálmssonar. Tóftin er ofan við gilbarminn, um 30 m norðan við brúnina ofan við Efrifoss og um 20 m austan við gilbrún Bekkjalækjar. Lítill valllendisblettur á lyng- og flagmóasvæði. Sunnan við er djúpt árgil en norðan við er melhólaröð með lyngmóum á milli. Ofan við hólana meðfram og norðan við Bekkjalæk er graslendi. Tvískipt tóft, 1,5 m djúp með stæðilegum veggjum. Grjót sést í hleðslum.

Hættumat: engin hætta

Heimildir: Nokkrar leiðréttingar og viðbætur við örnefnaskrá Bakka og Bakkagerðis eftir Gest Vilhjálmsson 1.7.1967

Description of Bakkasel ruins in arch. survey

References (including web links)

Archaeological Survey of Eyjafjörður, ten vols. (2000–2008), The Institute of Archaeology, Iceland.
Egon Hitzler (1979), "Sel", Untersuchungen zur Gesichte des isländischen Sennwesens seit der Landnahmezeit. Oslo, Universitetsforlaget.
Árni Daníel Júlíusson (2016), *Miðaldir í skuggsjá Svarfaðardals.* Reykjavík, Þjóðminjasafn.
Árni Daníel Júlíusson (2019) *A Tale of Two Valleys in Medieval Iceland. Settlement, land use and landownership.* Research Report. Reykjavík, The National Museum of Iceland.
https://www.researchgate.net/publication/340862874_A_Tale_of_Two_Valleys
Accessible map of vegetation types in Iceland
http://lbhi.maps.arcgis.com/apps/webappviewer/index.html?id=227b358de2ec4738b9d51c8e86457c0d
Accessible map of farm boundaries in Iceland
https://www.map.is/base/

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CASE STUDY SHEET

CS code	*IS-02*	**CS Title**	*Shielings in South- and North-Iceland, AD850–: Some Comparative Landscape Pointers*
GENERAL INFORMATION			
Type of case study		□ National or regional level policy/plan/strategy □ Local level policy/plan/strategy x Study/research □ Project □ Other	
Responsible body/Promoter		Háskóli Íslands	
Location (region, locality)		South-Iceland: Blikdalur, Grímsneshreppur, and Hrunamannahreppur	
Geographical area covered		The proposed research area is composed of three areas in South Iceland, ie Blikdalur (a grassy valley) c 6 x 2,5 km in size; Grímsneshreppur (flatland), c 20 x 20 km in size and Hrunamannahreppur ('flatlandish') c 25 x 10 km in size.	
Year		1998 and onwards	
Summary description		Since the beginning of the systematic archaeological surveys in South-Iceland 'flatlands' in the 2000s, rich information on shielings has been gathered, demonstrating that there is no shortage of information regarding their layout and location. Overall, c 41 shielings have been identified so far in case study area (Blikdalur, Grímsneshr and Hrunamannahr). Still, there remains a burning issue to understand the character of the sheilings as well as examining the differences and similarities in structure, and location between sheilings in South- and North-Iceland. Much is thus to be learned about the character of the sheilings in the southern region, and by combing archaeological and historical studies it opens up a research of considerable potential to compare and contrast sheilings in North and South-Iceland. The study would make use of existing walkover surveys and sheiling research in North-Iceland (see case IS-01) coring to obtain crucial information of dating as well as geoarchaeological methods. Crucial part will be to use map making through GIS (predictive modelling and spatial analysis). Such a holistic study of the sheilings in South-Iceland would help built a hypothesis of the role of the transhumance in the southern areas. It would also enhance our understanding of sheilings in the south 'flatlands' and identify potential gaps in knowledge regarding the nature of sheilings in North- and South-Iceland.	
Link with laws/regulations and with other policies/ plans/strategies *(if any)*		This case study is research based but is connected to the cultural heritage law in Iceland no 80/2012 of classifying and researching sheilings. The project's result would greatly assist us in learning about the preservation and the nature of sheilings in South-Iceland. Such knowledge is of great importance for the planning authorities as well as the local cultural heritage offices so they can attempt to safeguard the heritage, either by protecting them or to ensure that their importance is stored in some other way – such as through journal articles, GIS-database etc.	

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PROBLEMS AND NEEDS TARGETED	
Problems	Whilst there has been considerable attention given to transhumance in Iceland recently, such as in archaeology and history, our knowledge of sheilings in South-Iceland is still pitifully inadequate and has not increased greatly from the otherwise great study by E. Hitzler. Studies of transhumance in Iceland have therefore been more concerned about the research potential of sheilings in South-Iceland rather than the reality of the archaeology and the history of the sheilings. This study opens up a long-needed interrogation of sheilings in South-Iceland, it will identify gaps in the literature, and more importantly: It will explore the difference and similarities between sheilings in South- and North-Iceland.
Needs	The needs identified especially pertain to the research on transhumance in Iceland. There is a need of a research project aimed at clarifying the problems brought forward in the archaeological walkover surveys, historical research, and other research already available.
Quantitative data	All statistic, such as size, land usage, farm value etc, is either found in *Jarðabók Árna Magnússonar and Páls Vídalíns* from 1703 or Ísleif, the database of the Institute of Archaeology, Iceland. Due to their monumental size, figures will not be presents here - but those crucial numbers can easily be accessed when needed.

FOCUS, OBJECTIVES AND OUTPUTS		
Themes	**Does the case study address this theme? (YES/NO)**	**If yes, how?** ***(max 750 characters for each theme)***
Spatial planning	yes	The value of the existing remains of the medieval and post-medieval agricultural systems as a part of the cultural heritage of the area should be taken into consideration during spatial planning of the area.
Protection of landscape/environment (e.g. biodiversity, water, geomorphology, soil, scenic views, historic landscapes, etc.)	yes	Sheilings in South-Iceland should, in most cases, be protected, as it is potentially a very valuable resource for reconstruction of past land use and the formation of local communities.
Protection/enhancement of tangible cultural heritage (e.g. archaeological sites, historical routes, architecture…)	yes	Same as above. Indeed, they are, formally, but in practice this is overlooked, even by official institutions.
Protection/enhancement of intangible cultural heritage (e.g. folklore, food, music…)	yes	There are possibilities involved in restoring and reinventing the old culture of transhumance in relation to food culture. For example, the Icelandic skyr has gained foothold in most countries in the Atlantic world and beyond in the last two decades. Skyr was originally produced at the shielings.
Slow mobility (cycling routes, trekking paths, etc.)	yes	Cycling routes and trekking paths could be organised around the visible remains, especially at Blikdalur, which is situated less than a half hour driving distance from the city of Reykjavík. The sheiling system form a crucial part of Icelandic agricultural history. Still it is often overlooked, making pathways and other routes an ideal way to presents knowledge about this important heritage to local communities via information boards.
Economic development of mountain & rural areas (e.g. tourism,	yes	This study hopefully creates new knowledge that can be used by the tourist industry, such as through apps or information boards near cycling routes as mentioned above. In more general terms, the study will create incentives for

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agro-food production, agriculture, livestock breeding…)		local communities to safeguard their heritage and present it to tourists.
INVOLVEMENT OF STAKEHOLDERS		
Actors involved	1. The National Museum of Iceland is the centre for the preservation of and research on artefacts. 2. The Cultural Heritage Agency of Iceland are the official body of the intangible and tangible cultural heritage in Iceland, as well as issuing permits for and supporting research Icelandic heritage. 3. The Institute of Archaeology, Iceland is a private research company (non-profit), specialising in walkover survey in Iceland and excavations, and has surveyed and researched cultural heritage in all of Iceland – including South of Iceland. 4. The University of Iceland. Provides research and education on archaeology, and the history of Iceland.	
Involvement procedures	Research on the shieling system has been carried out in following steps: 1. Surveying and documenting the extent of shieling remains in the Icelandic cultural landscape. This step has been undertaken by the Institute of Archaeology, working on behalf of local government authorities. The work is still ongoing in Hrunamannahreppur. 2. Research on this system of transhumance and its place in the medieval agricultural economy in North-Iceland was carried out at the National Museum of Iceland during 2015–1017. Further research has been carried out with archaeological research in Eyjafjörður during 2018–2019 by the Institute of Archaeology and the University of Iceland, Faculty of Humanities. 3. A third step is necessary, archaeological research on shieling remains, determining the dates of shieling remains and the longevity or duration of the transhumance operation in the area. At present, work on this system is carried out with the support of a hypothesis supported by research presently available.	
Problems and challenges	*If relevant, please explain the problems (either potential or actually encountered) affecting the involvement of the above-mentioned actors in the elaboration and/or implementation of the case study (max 3,000 characters)*	
EXPECTED OR ACHIEVED EFFECTS		
Type of effect	**Description** ***(max 750 characters for each type)***	
Environmental/landscape (e.g. restoration of habitats, effective protection of historic landscapes…)	The project is expected to shed light on a massive transhumance system in South-Iceland 'flatlands' and challenging our 'romantic' view that shielings are primarily situated in mountainous regions.	
Cultural (e.g. restoration of historic artefacts, promotion of folkloric assets…)	The discovery of a system of transhumance is expected to alter the interpretation of the agricultural system in South-Iceland. It will present us, to a certain degree, a different view of the sheilings system than the system in the north. It is therefore expected to challenge the 'uniformity' attitude of the sheiling system in Iceland.	
Social/economic (e.g. new jobs, new enterprises…)		
IMPLEMENTATION ISSUES		
Financial resources	1. The surveying of the archaeology was funded by the various local governments according to national law which came into effect 1993 and revised in 2012. 2. Research into the survey in North-Iceland was carried out at the Dr Kristján Eldjárn fellowship at the University of Iceland 2015–2017. This fellowship is funded by the Icelandic ministry for culture. Further, relevant archaeological research in the area has been funded by the Cultural Heritage Agency of Iceland, RANNÍS and NSF.	

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	3. Funding is currently being sought from various research grants, such as Icelandic one (Fornminjasjóður) and British (Post-Medieval Archaeological Research). Deadlines are either in September 2020 or January 2021. The grants applications are centred on coring and excavations at sheilings to determine their date, and possible geoarchaeological methods to finds new sheiling sites based on the findings from the Predictive Modelling results.
Implementation procedures	
SUPPORTING INFORMATION	
Images (pictures, graphics, maps, charts, etc.)	
References (including web links)	Archaeological walkover survey at Grímsneshreppur, Hrunamannahreppur (1998–), The Institute of Archaeology, Iceland. – see fornleif.is and https://www.researchgate.net/publication/338886314_Adalskraning_fornminja_i_Hrunamannahreppi Archaeological walkover survey at Blikdalur (2011), Minjasafn Reykjavíkur (Now, Borgarsögusafn Reykjarvíkur). Egon Hitzler (1979), "Sel", Untersuchungen zur Gesichte des isländischen Sennwesens seit der Landnahmezeit. Oslo, Universitetsforlaget. Árni Daníel Júlíusson (2016), *Miðaldir í skuggsjá Svarfaðardals*. Reykjavík, Þjóðminjasafn. Árni Daníel Júlíusson (2019) *A Tale of Two Valleys in Medieval Iceland. Settlement, land use and landownership*. Research Report. Reykjavík, The National Museum of Iceland. https://www.researchgate.net/publication/340862874_A_Tale_of_Two_Valleys Accessible map of vegetation types in Iceland http://lbhi.maps.arcgis.com/apps/webappviewer/index.html?id=227b358de2ec4738b9d51c8e86457c0d Accessible map of farm boundaries in Iceland https://www.map.is/base/

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