NUMBER 4   JUNE 2021

Welcom@ to the fourth newsletter of the LIFE PASTORALP Project!

This newsletter aims to update all interested people about the progress of the LIFEPASTORALP project, describing the activities carried out and the results obtained to mitigate the impacts of climate change on alpine grassland ecosystems.


Adaptation strategies for alpine pastures

Within the framework of action C.6 (Identification of adaptation strategies), medium (technical) and long-term (political) **adaptation strategies are currently being defined**.

These strategies, through the identification of management methods, can be applied in Alpine pastoral contexts **to address and cope with climate change** and extreme climate events (e.g. droughts). Therefore, based on **tests and trials of application in the areas of interest**, strategies were chosen by assessing both the effects on farmers and breeders (production, ability to preserve livestock from the effects of extreme events, etc.) and on the ecosystem (biodiversity and pastoral diagnostics). Furthermore, **political strategies** have been selected at different levels (EU, State, Region) **allowing the promotion and exploitation of the developed methods**. All identified strategies will be described in detail in a specific report and then **exploited to develop the climate change action plan** in alpine pastoral contexts (**Action C.8**).

Modelling future to act now, first results of modelling activities on future climate scenarios
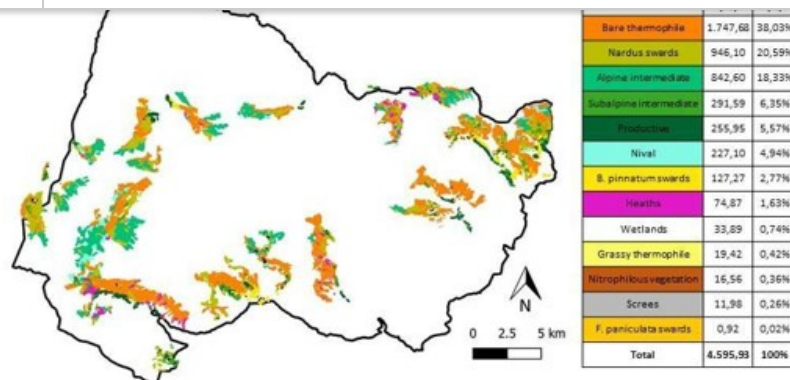
By combining in situ climatic and agronomic observations, climate impact modelling and socio-economic analyses, the project provided **new data for sustainable management of mountain pastures**. Based on **long meteorological datasets**, **models** (DayCent, PaSim and Random Forest) were able to **reproduce the distribution and growth of pastures and predict their evolution** under future climate scenarios (Figure 1). These results enabled discussion with local stakeholders to highlight the most relevant issues for alternative management of mountain pastures and implementation of **concrete socio-economic adaptation measures**. Simulation results suggest that **temperatures are likely to increase** in both parks, especially in summer, with an associated increased **risk of droughts**. In addition, the growing season of vegetation is expected to lengthen by about two months in the near future, together with an earlier peak in biomass forage production. Finally, a **reduction in snow cover** is predicted. Therefore, decision-makers, park staff and representatives of the farming community are involved in suggesting adaptation strategies and evaluating them on the basis of model results.
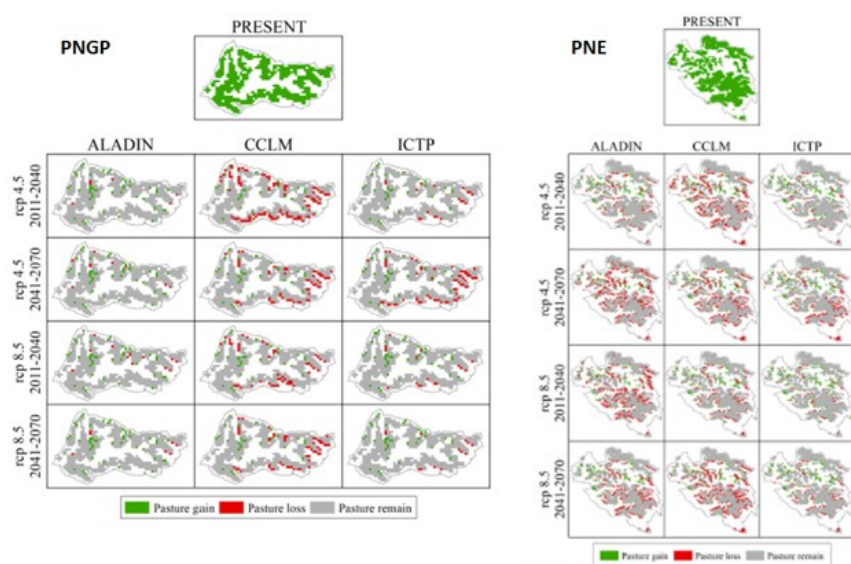

Figure 1: Map of pasture distribution in the study areas. Top of the figure shows the current situation, bottom the changes (losses in red, gains in green and no change in grey) in the near (2011-2040) and far future (2041- 2070). 4.5 and 8.5 RCP scenarios are represented according to the three RCMs compared to the present one, as simulated by RF.

Synergy of satellite and field data: online the map of the Gran Paradiso Park's pastures

Field surveys and analyses from orthophotos enabled the production of a **map of alpine pastures for the entire Gran Paradiso National Park**. This valuable database relates to over 4500 ha will be available on the PASTORALP platform. These models **allowed the area of the PNGP to be classified according to three   levels** of complexity: (i) definition of the presence/absence of pastures, (ii) classification of pastures according to productivity and (iii) classification into 13 pastoral categories (Figure 2). The sensitivity analysis of the models showed a high predictive capacity combined with consistency and robustness of the final product. Therefore, **the combined use of remotely sensed data with** detailed **field observations** showed excellent performance in mapping alpine pastures (Figure 3). In addition, the deliverable concerning action C.2 (mapping of Alpine pastures) has been produced.

Bare thermophile	1.747,68	38,03%
Nardus swards	946,10	20,59%
Alpine intermediate	842,60	18,33%
Subalpine intermediate	291,59	6,35%
Productive	255,95	5,57%
Nival	227,10	4,94%
B. pinnatum swards	127,27	2,77%
Heaths	74,87	1,63%
Wetlands	33,89	0,74%
Grassy thermophile	19,42	0,42%
Nitrophilous vegetation	16,56	0,36%
Screes	11,98	0,26%
F. paniculata swards	0,92	0,02%
Total	4.595,93	100%

Figure 2: Map of pastoral categories in Gran Paradiso National Park: the 13 pastoral types shown in the table are represented, with their respective net grazing area (classification harmonised between PNGP and PNE within the project).
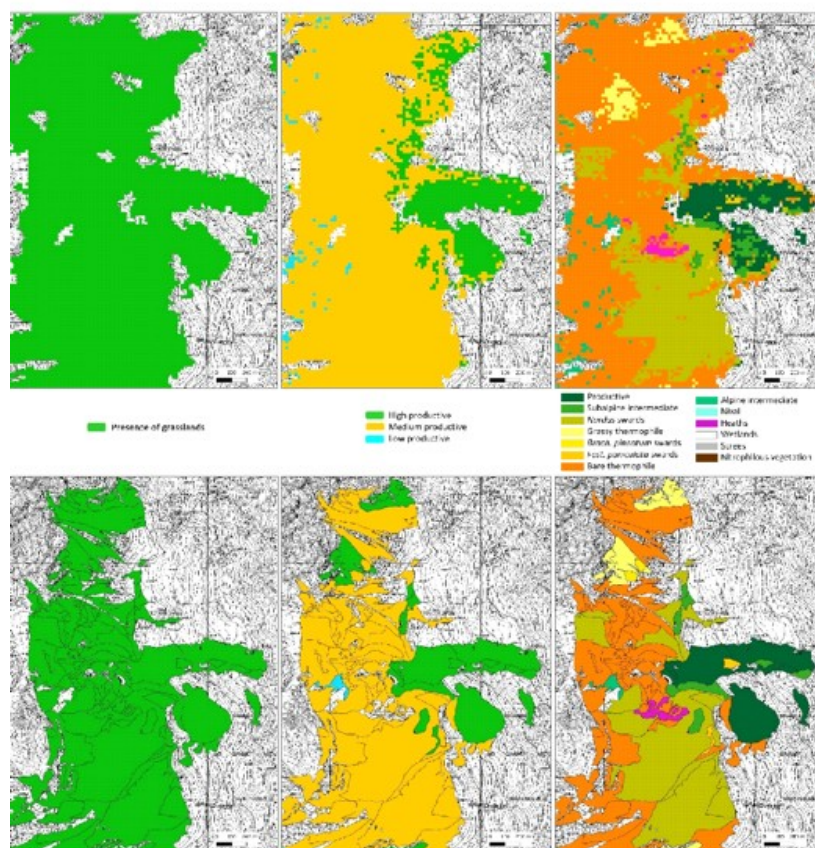

Figure 3: Prediction maps (top) and pastoral maps produced following field surveys (bottom) on the pastoral district of Djovan-Orvieilles in the PNGP (AO). Graphical representation of the three levels of classification of the predictive maps: i) presence/absence of grasslands; ii) 3 productivity classes (centre); iii) 13 grazing categories (right)

The PASTORALP project is included in the GELSO database of good practices for environmental sustainability published by ISPRA

The Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) on behalf of the Ministero dell'Ambiente e della Tutela del Territorio e del Mare (MATTM) invited the PASTORALP project to integrate a **summary of the adaptation strategies that emerged during the project into the** Italian platform on adaptation to climate change. The PASTORALP contribution will be to provide information, data and operational tools to **involve citizens and stakeholders**. In addition, this free data will enable **decision-making planning** by administrators and scientific research.

The point of view of farmers on climate change

During the 2019 and 2020 summer seasons, **43 alpine pasture farmers in the Gran Paradiso National Park were interviewed** to discuss the main issues related to climate change and its impacts, and the evolution of the socio-economic context (Figure 4). Interviews suggest that **climate change is not the most pressing issue for farmers** right now, although in recent years they have already faced extreme weather conditions or frequent long periods of drought. The current problems reported by farmers are mainly threefold: i) damage caused by wildlife (e.g. wild boar and wolf); ii) poor infrastructure and lack of roads; iii) bureaucracy. However, **many consequences of climate change have been identified** on both animals (health problems, reduced milk production, lower fertility) and pastures (changes in floristic composition, lower productivity). **Potential methods adopted by farmers** to limit the negative impacts of climate change on alpine pasture farming **were also recorded**.

These will be discussed and analysed to identify adaptation strategies that can be implemented in local contexts.
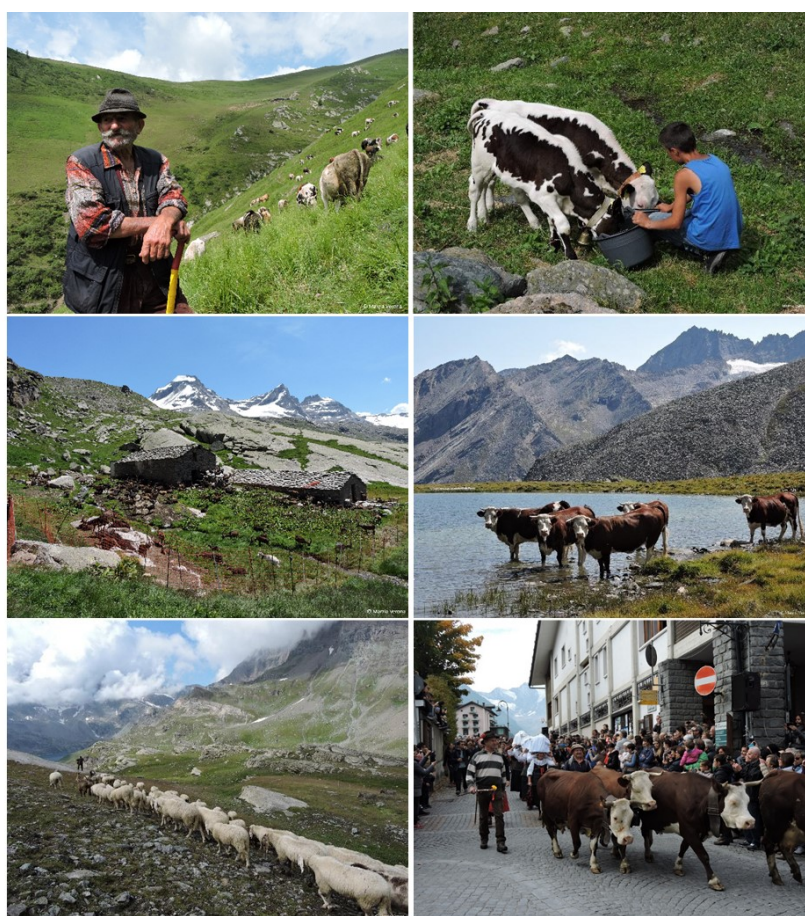
Figure 4: Views of landscapes and mountain pastures in the PNGP. From top to bottom: 1) Morning opening of the fence (Piedmont) 2) Watering point in a high altitude alpine pasture (Aosta Valley); 3) Elderly shepherd with grazing cattle (Piedmont); 4) In the alpine pasture all family members collaborate in the many daily activities, even the youngest; 5) Fence for keeping the cattle at night (Valle d'Aosta); 6) Cattle grazing near a high-altitude lake, a precious source of water for the animals (Valle d'Aosta); 7) Flock of sheep grazing (Piedmont); 8) The "Devétéya", a festival celebrating the descent of the herds from the mountain pastures, in Cogne (AO).

Ongoing contribution of PASTORALP to the discussion tables for climate change strategies

The **results of the PASTORALP project** were implemented and are currently **included in several institutional working tables of the Autonomous Region of Valle d'Aosta**. Results of PASTORALP activities have therefore **influenced the adaptation plans for the sector "Agriculture and livestock"** contained in the Regional Strategy for Adaptation to Climate Change of Valle d'Aosta. Specific adaptation strategies developed as part of the

mapping and classification of pastures raised high interest in the framework of the Tables on the Eco schemes of the Alpine regions, foreseen by the regulation on the National Strategic Plans 2023-2027 in the framework of the EAGF and of the following National Strategic Plans of the rural development measures. The mapping of the pastoral areas developed in PASTORALP can be proposed as a cognitive tool useful for the implementation and verification of the Ecoschema (a tool born from the **collaboration between the Autonomous Region of Valle d'Aosta and Piedmont Region**).

PASTORALP attends the 5th Conference of EURAF (2021) - European Agroforestry Federation

A poster was presented at the **5th conference** promoted by the **EURAF association (European Agroforestry Federation)** within the NEWTON Operational Group (PSR of the Tuscany Region 2014-2020). The meeting, dedicated to the theme of **Agroforestry in Tuscany** allowed **presenting and disseminating the results** obtained during the PASTORALP project.

The PASTORALP project in the booklet of good practices by OREKA MENDIAN

As a result of the networking activities carried out with EUROMONTANA (European Association of Mountain Areas), we were contacted by the LIFE OREKA MENDIAN project. The project has recently published a booklet **of best practices that includes 31 good examples of sustainable management of the mountain pasture ecosystem**, collected in 18 European countries. We are very proud that **PASTORALP has been included among these virtuous examples**. These best practices will inspire farmers, and other local stakeholders to increase the biodiversity of mountain ecosystems, address the impacts of climate change and improve the marketing of their products.

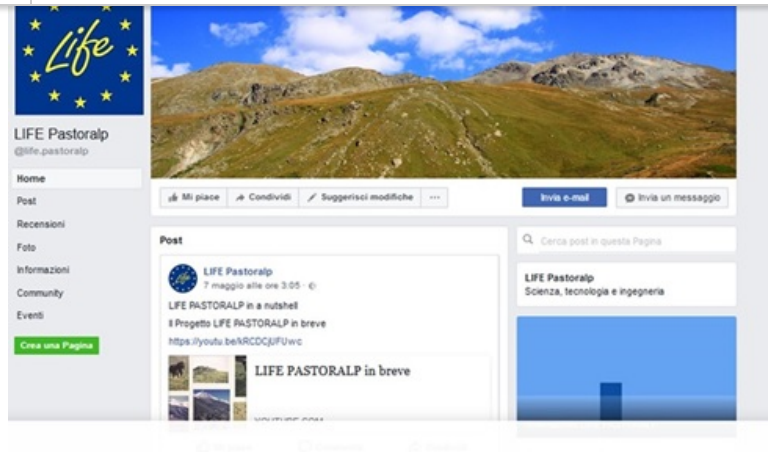## FOR FURTHER INFORMATION

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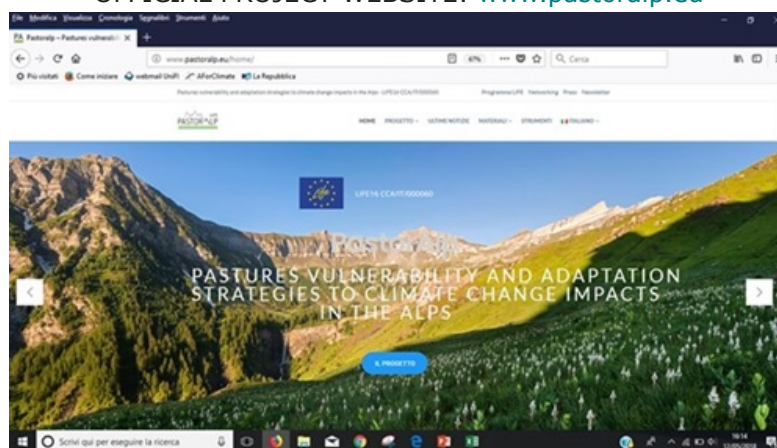
LIFE Ref. No: LIFE16 CCA/IT/000060
Implementation area: Parc national des Écrins - FR and Parco Nazionale Gran Paradiso - IT
Duration: 54 months (01/10/2017 - 30/03/2022)
Budget: 2,314,400 €

PASTORALP eNewsletter
Contacts: camilla.dibari@unifi.it
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