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# Studies and experiences of a sustainable grazing system in the mountain areas of the Dolomites

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**SUMMARY** – The studies carried out within the mapping project of the Dolomites pastures "Riquilificazione del paesaggio rurale le Malghe delle Dolomiti" [Enhancement of the rural landscape in the Malghe of the Dolomites] are presented. The maps of the pastures in the Dolomites involve the new highland pasture mapping, the possibilities for future management, technical and social-economic analysis of the malghe studied and the use of the malghe as a place to discover local flora and fauna. This document is a summary of a larger work carried out by the Local Action Group Alto Bellunese. The experience of the sheep farming Cooperative, which has tried to diversify the activities, is presented, as well as that of sheep farming which uses lowland meadows in spring and autumn and highland pastures in summer. The Cooperative is involved in the environmental upkeep of the council area (cleaning roads, upkeep of gardens, etc.) in order to be able to reach a financial balance, which is difficult to achieve in disadvantaged Alpine areas.

**Keywords:** Dolomite Alpine area, thematic maps, pastures, sustainable management, malghe, cooperatives, abandoned meadows.

**RESUME** – "Étude d'un système de pâturage durable dans les secteurs de montagnes des Dolomites". Ce travail est composé de deux parties : la première partie concerne les études menées dans le cadre du projet cartographie des pâturages dans les Dolomites (revalorisation du paysage rural dans les Malghe des Dolomites) la Malga étant une ferme d'alpage de haute altitude où les animaux passent l'été à paître et où l'on trouve des étables particulières pour les animaux. On y trouve également le matériel rudimentaire pour les vaches et un espace pour la production et la vente des produits laitiers. Les cartes des pâturages des Dolomites étudient la nouvelle cartographie des pâturages de haute altitude, les possibilités de gestion pour le futur, l'analyse technique et socio-économique de la Malga concernée par l'étude ; ils sont utilisés en tant qu'opportunité de découvrir la flore et la faune locales. Cette section résume un important travail réalisé par l'association locale Group Alto Bellunese. La deuxième partie décrit une expérience d'élevage de moutons en coopérative, ceci afin de diversifier les activités. L'élevage de moutons a besoin des prés dans la plaine, au printemps et à l'automne, et des pâturages de haute altitude en été. La coopérative s'occupe du maintien de l'environnement au sein de la commune (entretien des routes et des jardins, etc.) ceci afin d'atteindre un bon équilibre financier, équilibre toutefois difficile à trouver dans des endroits alpins assez défavorisés.

**Mots-clés :** Zone alpine de dolomite, carte thématique, pâturage, gestion assistée, malghe, coopérative, champs abandonnés.

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## The maps of pasture land use in the Dolomites

### Introduction

One of the most important topics under debate concerning the Dolomite Alpine area, a great important part of which is located in the Province of Belluno in the northern part of the Veneto Region, is the research of a method for the sustainable management of its pastures.

The research for a sustainable solution to the grazing resources exploitation was carried out in a mountain area with cattle and sheep for meat production.

One of the most interesting aspects of this territory is the presence of large areas of pasture and meadow at medium and high altitudes (around 1,500 and 2,300 metres above sea level, respectively). Traditionally, these pastures were an important source of food for the animals. The traditional method

of managing these areas has created and maintained a good balance between fauna, flora and tree vegetation and created the landscape which is still typical of the Dolomite mountains.

These areas of high altitude pasture are locally called "*malghe*": highland pastures where the animals spend the summer grazing and where there are particular buildings to stable the animals. There is also simple accommodation for cowherds and spaces for producing and selling dairy products. They may be of public property, collectively owned or, in a few cases, private.

The advantages of the highland pasture can be the following: (i) saving of food cost; (ii) the farmer has more time during summer for hay and cereal production; (iii) high number of animals which can be kept by the farmer; (iv) hygienic and sanitary advantages for the young animals.

In this way, a method of agriculture for mountain areas can be developed without putting too much production pressure on the farmer and respecting the environment. The landscape is preserved and cared for, enabling visitors to enjoy the areas.

These are the basic ideas behind the proposals of preservation, improvement or conversion of the Alpine pastures. Existing buildings that are not needed for the agricultural activity may be put into an alternative use but always respecting the environment.

Some possible strategies have been studied to re-launch the image and economic activity of the malga and, at the same time, to bring direct benefits to the owners with different objectives: (i) the improvement of the malga activity; (ii) the enhancement of the Alpine landscape; (iii) the specific use of the pasture areas including the most suitable activity for the less productive lands or areas for extensive production; (iv) the management of the grassy areas taking into account both economic and naturalistic objectives; (v) a greater protection against decline of the Alpine areas; and (vi) a realistic exploitation of the natural and environmental resources of the malghe.

## Methodology and objectives

Within the Leader II Programme, the Local Action Group (LAG) No.1 Alto Bellunese carried out a project called "Environmental Maps of the Dolomites Malghe", co-financed by the European Union (European Funds for Regional Development). The study considered 84 malghe of the Province of Belluno, covering an area of 9106 hectares. The average area of each malga studied was about 108 ha. The research was carried out in two directions: one general, covering the whole territory and a more detailed one, in a certain number of malghe chosen as typical of the different areas.

The exact limits of the malghe, with the indications of the various area types based on the culture quality, were drawn up 40 years ago. In the Dolomite areas there were no up-to-date maps and this caused problems for calculating the number of animals that could be kept on any specific area. It is no longer possible to estimate the right number of animals or to carry out the European agro-environmental regulations without knowing the exact quantity of available feeding lands.

It can be seen that really the areas used for pasture are more extensive because a lot of highland meadows became areas for grazing animals; on the other hand, there is the danger of overgrazing. However, the grazing activity is now more widely spread even on the lowland meadows where the grass was cut by the numerous farmers operating there. Presumably this tendency will increase, especially in areas where it is easier to bring young animals from a neighbouring province with a high number of animals.

The relief maps were drawn up with surveys on site and using special software able to link the cadastral information with the cartography studies taken from the air. The cartography allows for a simulation of a perspective vision and of maps with differing scales that show for all 84 malghe: (i) a map of the properties; (ii) present pasture use; (iii) functional attitude of the grazing area; and (iv) possibilities for future management.

In recent years, the use of Territorial Information Systems has made it possible to achieve results in the field of silvopastoral planning that would have been very difficult with the few available cartographic tools for traditional planning. The area taken into consideration was so vast (9106 ha)

and the malghe so small (84 ha) that it would have not been possible to use a traditional cartographic method. A digital method of cartography was chosen using GIS software (Geographic Information Systems). The cartographic base used was the Regional Technical Maps at a scale of 1:10,000 and 1:5000.

The work considered the land use, in particular the pasture use, and was based on photo-interpretation, research from existing maps and, in some cases, visits to the places. The creation of a digital model showed three aspects of the land: altitude, slope and exposure. The morphological analysis of each malga is based on the above factors. Three dimensional perspective views were added to give an idea on the local impression to an observer. The property map comes from the study of council forest plans and, sometimes, from cadastral maps. The maps, concerning the pasture suitability and possibilities for the future, derived from considerations of the way the land lies the vegetation and the animals that will graze in the malga. The characteristics of the malghe are also represented in graphs.

## Technical and social economic analyses of the Malghe studied

The starting point for an accurate analysis of the economic malga viability is a consideration of the type of suitable organisation for each individual situation. A proposal can then be made taking into consideration the most appropriate land uses and organization for that specific environment. In the planning and running of the pastures, both economic and environmental issues must be taken into consideration. An estimation of the flora and the type of animals to be kept (sheep, cattle, etc.) is necessary.

An accurate analysis of the pasture is the essence of a correct planning of the grazing type to be carried out. It must be based on the natural conditions, the existing botanical composition and the ecological value. A grazing plan should also be based on the type of grazing animals to be considered. An available pasture type plan has been prepared for each malga, the land being divided as follows: (i) area particularly suitable for grazing dairy animals; (ii) area suitable for grazing young cattle; (iii) area suitable for grazing only sheep and goats; and (iv) area not suitable for grazing.

## Use of the malga as a place to discover local flora and fauna

The malga territory is an ecosystem with very many botanical species where domestic animals can be found together with wild animals. In this context it is possible to farm without damaging the ecosystem. Even micro-environments like alpine pools, which may not be particularly rare, become important for the high number of biological species that they contain. The development of these environmental aspects with didactic panels and leaflets describing excursions can be integrated with agricultural activity. In the present study, didactic panels have been used because they are flexible and easily to be organised. They do not take up much space and they can be easily moved if necessary. In this project, didactic panels have been placed in 10 malghe.

All the material produced was made up of:

(i) A general panel that shows malga life with the aid of 10 cartoon drawings and written explanations (translated into English).

(ii) Specific panels for each malga, including the pasture use map, the perspective view, the malga characteristics and the description of the grazing area, together with photos.

(iii) General leaflets that illustrate where the malghe are, and the importance of the malghe in the "Alto Bellunese" area.

(iv) Specific leaflets that illustrate the vegetation, cartography and technical characteristics. They give notes concerning interest of pasture and environmental characteristics; they were illustrated by photos, plans of grazing land use, perspective views showing the malga location and the access to it.

(v) A CD-Rom giving information about Alpine pastures in the higher part of the Belluno province.

Having decided to create new initiatives for running the malghe, rather than just relying on the traditional selling of butter, cheese and ricotta, different methods of information were considered. It was decided to use didactic panels, publications-leaflets and CD-Rom at two levels. The first level included aspects which concern the whole malghe. Simple drawings were chosen as a realistic and pleasant way of communicating with visitors. The second level, technically more complex, was directed to a more specialised public.

The information is intended not only for tourists but also for landowners, administrators and managers.

## Conclusions

The project has been innovative because it has taken into consideration the agro-economic, ecological and socio-economic aspects of the malga reality, in a general context trying to reach the best form of management.

It has been found that it is better to use the pasture taking into account the local characteristics rather than using an extensive grazing system (with few animals) that could lead to a reduction in the quality of the forage species and a decline in the typical landscape.

However, it is important to remember that grazing takes place in the pastures where the delicate balance is reached with the interaction between animals, pasture and the people who run the malga; factors which must remain tightly linked in harmony. In the most extreme situations, the most marginal areas with low productivity could be maintained and used to make a contribution to the ecosystem biodiversity without the need for specific interventions.

The most important message that we wish to communicate is that in the management of these Alpine pastures economic objectives and environmental values must co-exist and that it is possible to use farming techniques without damaging the ecosystems.

## **The experience of the sheep cooperative in running mountain pastures and meadows**

A small Cooperative of meat sheep was founded in 1993 whose main objective was environment maintenance. The Cooperative was made up of inhabitants of the council area of Domegge, coordinated by the mayor who also became a member. Its primary objective was to restore the meadows and pasture of one of the "malghe" we have studied, which had been abandoned for years.

In the most marginal areas of the Dolomite mountains the end of vital agricultural activities has resulted in the fields and pastures being neglected to a point which has almost become an emergency. This problem has promoted changes in the landscape, field flora and pasture areas but there were also health problems related to the proliferation of insects, in particular ticks which carry dangerous viruses for human beings.

Most of the population of this area work in the glass industry and it was very difficult to encourage new agricultural activities. For this reason all the inhabitants owning meadows and the local administration which owned the high altitude pasture areas came together to form a sheep breeding cooperative with the aim of saving the area from neglect. At the beginning of the project each member of the cooperative bought a certain number of sheep corresponding to the value of their participation quota.

Agricultural activities were undertaken and organized as follows:

(i) Spring period: grazing took place in the meadows on the valley floor, around the villages, using an alternate grazing system.

(ii) Summer period: flocks were transferred to the malga Doana while at the valley floor the grass of the pasture area was cut to produce hay for the winter.

(iii) Autumn period: the flocks returned to the valley floor, grazing once again on the areas already grazed and cut.

(iv) Winter period: animals were kept and fed indoors in the previously existing and modified buildings.

The Cooperative was run in the following manner:

(i) The main activity was based on the breeding of about 200-250 meat sheep.

(ii) The secondary activity was based on the environment, council area roads and public gardens maintenance; environment improvement, such as the improvement and recultivation of abandoned fields belonging to the council or to the Comunità Montane (Mountain Communities).

(iii) Employment of 2 full-time workers to undertake agricultural activities and of 3-4 seasonal workers to carry out the other activities.

(iv) Direct selling of lambs to members or local restaurants to try to maximise profits.

## The results

It has been possible to create agricultural activities perfectly integrated and compatible with a mountain area of pastures. In particular, the traditional valley floor areas of meadows have been saved from neglect and the period of pasture has ensured sufficient amount of nutritive elements and organic substances to maintain a balance between input and output of the agricultural lands. A new rural landscape has been obtained with meadows of a rich green colour and with a variety of vegetation greatly appreciated by the local population.

The production of dairy lambs has been introduced using an extensive breeding technique with locally-produced food and which allows the consumer to enjoy a traditional product.

The problem of land division into small areas that hindered valid agricultural activities has been resolved. The initial diffidence of land owners to allow the cooperative to use their lands was soon overcome when the results of the project were seen.

A new concept of mountain agricultural activity, based on diversification, has been created. This system permits the economic viability of the activity and also the upkeep of the mountain territory.

## Conclusions

In the most marginal areas of the Dolomite mountains where the problem of neglected meadows or pastures has almost become an emergency, this experience gives a new dimension to an activity that was traditionally only agricultural. In the future, a farming enterprise in the mountains will have to diversify its activities in order to economically survive and the cooperative has tried to use the European funds to improve a neglected area (environmental maintenance of the pastures, subsidies for disadvantaged areas) and also to find other activities. The Cooperative is involved in the environmental upkeep of the council (cleaning roads, upkeep of gardens, etc.) in order to reach a financial balance, which is important for the Cooperative itself. We can say that the experience, which is still in progress, is certainly a first step and a first method to solve the problem of meadows and pastures neglect in marginal areas, seeking a form of collective organisation that can involve the inhabitants of a particular area and can create employment as well as offering services to the community.

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