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Recovery and re-use of hut buildings for environment and Alpine land protection

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Introduction

Summer grazing in high mountain at altitudes between 700 and 1800 m a.s.l. (Tamanini, 1973), better known in Italian as "alpeggio", is a traditional practice in Alpine environments. It is advantageous to animals in terms of better metabolism, growth, health and thus productivity. However, such a practice tends to be used less and less not only because of the changes due to economic factors but also of the difficulty to find adequate sanitary and receptive shelters (Pallara and Scarascia, 1991).

Summer mountain grazing is a tradition linked to historical-cultural factors typical of the Alpine areas and populations; its preservation is one of the objectives of social, economic and territorial planning. In fact, hut breeding greatly contributes to reduce, for the months during which it is practised, the polluting load due to the manure from the animals reared in the valley. Alpine summer grazing also plays a basic role for maintaining and improving production of Alpine pasture since slurry spreading supplies organic matter to mountain pasture. The correct preservation of pasture and sward contributes to reduce surface erosion that, in turn, enhances slope stability conditions and hydrologically preserves the mountain environment.

Hut buildings, in view of their intrinsic characteristics as rural buildings of Alpine environment, are a peculiar element of the landscape and perfectly integrate natural environment and buildings; neglecting them would reduce them to a crumbling state and cause the loss of a valuable and absolutely unique historical and cultural-anthropic resource of Alpine land.

A survey was then made to check the number of existing mountain buildings, which ones are used for Alpine summer grazing, what species and how many animal heads are raised in the Alps, referring to the province of Trento - a well defined and highly representative area of the Alpine situation. Later on, based on the results acquired during the reconnaissance stage, a sub-area of the surveyed area - the Tesino upland plain in Valsugana - was considered. The typological and building characteristics of some hut buildings were studied. Also the material used and the engineering technologies adopted were analysed in order to establish criteria and methods for their recovery and re-use for production and farm holidays purposes and as historical-cultural evidence.

Hut buildings in the province of Trento

Livestock has always played a crucial role in the economy of the province of Trento (northern Italy) where, traditionally, herd was led to Alpine summer grazing and assigned

to structures - often community ones - which took care of animals in summer. These structures include buildings for night-time shelter of animals (Fig.1), houses for workers and milk processing facilities, as well as grazing areas. Early in the 20th century, in the province of Trento (Fig.2), more than 600 hut buildings were present. Because of uncomfortable working conditions for animal keepers and of difficult communications between hut buildings and villages in the valley, they drastically reduced to 450 units in 1960 and about 200 at present.

The latest available data (Speziali and Tonelli, 1995) report a number of working hut buildings equal to 226 (Fig.3), with 17690 cattle units, 10044 goats and sheep and 605 horses (Tab. 1). Related pasture covers an area of 32000 ha which represent 5% of the land area of Trento province, of 6218 km², whereas the areas globally classified as pasture (Fig.4) and then potentially falling within the activities related to hut buildings, amount to 108000 ha, equal to 17% of the province surface and to 70% of the AA (Agricultural Area) (ISTAT, 1990). The economic relevance of breeding is also evidenced by the gross marketable output (GMO) of the livestock sector which, in the Trentino-Alto Adige region, has an incidence of 30% on the whole GMO of the agricultural sector (INEA, 1994).

Tab. 1: Number of hut buildings and heads led to summer pasture in the mountains, in 1994, in the different schemes (Fig.3). Source: Speziali and Tonelli -1995.

Scheme	no. hut buildings	Cattle	Horses	Sheep and Goats
C1	23	1769	136	1670
C2	20	1560	92	1719
C3	26	2141	104	4119
C4	16	1199	36	27
C5	7	227	9	627
C6	17	1794	69	2
C7	32	2678	19	373
C8	38	2821	57	1520
C9	7	571	5	371
C10	28	2128	18	145
C11	12	792	60	
Total	226	17690	605	10044

One can infer the importance to preserve the existing activity in view of its economic, zootechnical, environmental, landscape and cultural value.

The preservation of the structures for Alpine summer grazing

The existing buildings and structures for Alpine summer grazing require a careful preservation policy hopefully conducted following two guidelines aimed at the improvement of hut buildings used for livestock and at the recovery and use of the abandoned hut buildings also for other purposes.

A better use of the operating hut buildings and of the abandoned ones, potentially suitable for animal husbandry, could be possible by promoting, developing and increasing animal breeding, after specifying which farms, in view of the number and size of buildings

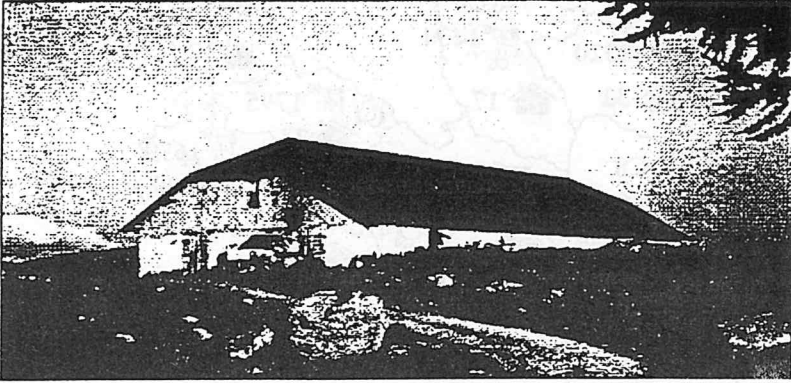


Fig.1: Monte Agaro hut building.



Fig.2: Map of Italy with the location of Trento Province.

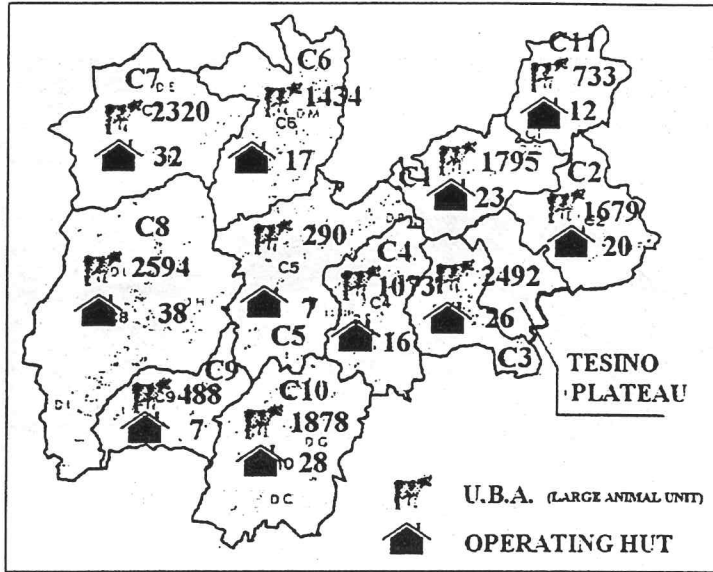


Fig.3: Breeding heads and operating huts distribution in different districts (C1..C11) of Trento Province.

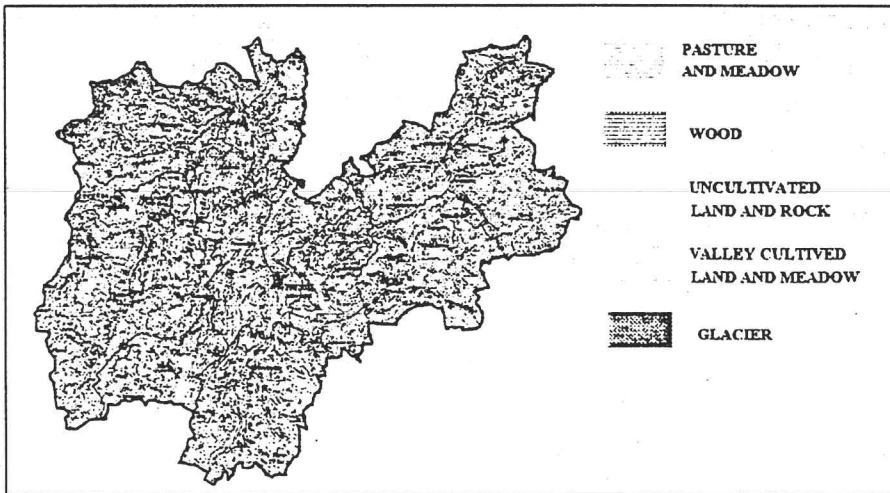


Fig.4: Land use map of Trento Province.

and land as well as the accessories, can allow an activity consistent with the economic and lodging needs (Failla, 1994; Fichera, 1994).

For the abandoned hut buildings and the ones for which the use for livestock is not profitable, recovery and re-use are envisaged for purposes other than the original ones, provided the activities promoted be included in a balanced and harmonious way in the Alpine environment, in order not to lose the rich resource of existing buildings.

A better use of operating hut buildings

Considering its multiple values and positive aspects, it is thought to preserve and increase Alpine summer grazing breeding activity by identifying the operating hut buildings and defining the required development and improvement plans of engineering and construction structures for livestock.

The present animal husbandry technique is still based on long stand (Fig.5) in the stable or, more rarely, on litter; these solutions seem to be both obsolete because of cleaning constraints and working conditions requirements in a modern animal husbandry system. The adoption of cubicle houses with removal systems of manure through a scraper or slotted floor, would allow to save more labour and to have an improved cleaning of shelters and of animal heads. One should also envisage modern feeding systems as well as storage, maturation and subsequent spreading of manure on the sward.

Also milking systems should be adapted to more performing animal breeding concepts; milking should no longer be done in the stall but in appropriate milking parlours connected with the plants for milk storage and refrigeration, the size of which should take into account the collecting time by the dairy factories. Such a choice is consistent with the planning orientations (Tonelli, 1994) which foster milk processing in the valley and require an adequate supply of energy as well as the need to improve an environmentally sound road system in the mountains.

The hut buildings used for animal breeding thus require new adaptation criteria. For promiscuity reasons, buildings for livestock should be separated from the lodgings of the working personnel. Recovery should respect the present requirements in terms of lodging and sanitary needs with the purpose of improving and enhance the working conditions in the mountains.

Also for pasture, there is a need for establishment and maintenance works as fencing, stone removal and fertigation plants. Such actions would not only be beneficial to pasture productivity, but would also safeguard Alpine land against hydrological imbalance (Fig.6) and surface erosion.

Recovery and re-use of abandoned hut buildings

Recovery and re-use should respect the cultural and environmental scenario.

For those hut buildings whose position on the land, in terms of altitude and distance from the dairy factories, accessible road system available, energy and/or water supply conditions, state of abandonment of pasture, do not allow a use for animal husbandry, restoration and recovery are still desirable for other production activities like tourism (Fossa, 1991), farm holidays, horse riding, horse breeding.

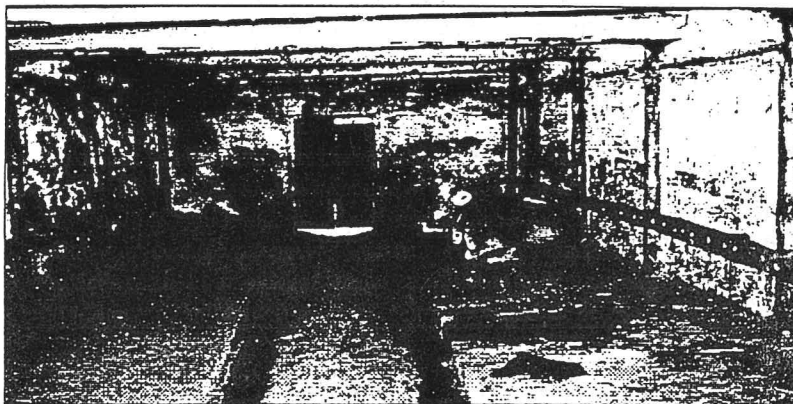


Fig.5: Internal view of stable with long stands; Sorgazza hut building.

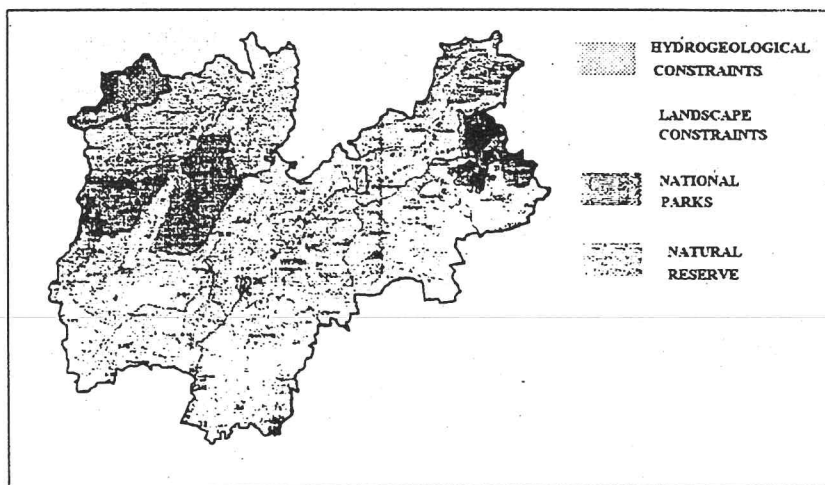


Fig.6: Hydrogeological constraints and naturalistic resources map of Trento Province.

There is indeed an increasing diversification of the tourism supply especially in summer rather than in winter where mostly skiing is practised. The use of hut buildings for farm holidays purposes fits well to the purpose of recovery of such buildings, provided restoration is made based on criteria of a better accommodation comfort, thus obtaining an increased promotion and consumption of local food products.

Alternative energy sources, as the wind or sun energy, can usefully contribute to restoration and especially to the management of those hut buildings which do not present favourable conditions in that they are isolated or of such a size not to be adequate or hardly accessible or not supplied with electricity. It could be economically viable to re-use such hut buildings for excursion tourism that could possibly be made on horseback.

The increasing widespread of such a practice and the development of summer horse breeding at high altitude make it possible to envisage the reconversion of some hut buildings from cattle to horse breeding.

Recovery and restoration works

For the recovery and restoration of mountain buildings, the technology and the materials traditionally used for this type of building have to be maintained (Cacciaguerra, 1994; Fichera, 1994; Guercini, 1994).

In the buildings used for livestock, the basement is generally made of a wall of natural stone available in situ (Fig.7), laid with decorative cement mortar.

No hollow space is foreseen and the wall, although being medium height buildings, is rather thick for sake of insulation and resistance to external loads, especially wind and snow which are particularly strong and heavy in such areas. Covering by pitched roof is supported by wood trusses and a frame of beams and small beams; structural wood is generally of larch or fir both available in situ. The finishing layer is discontinuous and consists of rock slabs or wood. The latter, the "scandole" (wooden roofing-tiles) (Fig.8) are nailed and are largely used for hut buildings in the province of Trento and, although requiring maintenance, they still seem to be a sound construction solution which assures the safeguard of the traditional technologies as well as landscape and environmental compatibility (Laner et al., 1990; Pallara and Scarascia, 1991).

It is also of importance to respect the indoor environmental parameters to be performed through a control of the natural ventilation system through windows. Looking at their constituent elements, the buildings for the accommodation of animal keepers stand out because of their more compact shape, the presence of one or two floors, the size of windows and doors and the planimetric position along the access road to the farm. The materials and the construction technologies are basically the same as the ones of animal shelters, but the poor lodging quality standard is one of the causes for estrangement from this kind of activity. It is therefore required to adapt the residential standards through internal restoration particularly of sanitary facilities. Nevertheless, it is appropriate to refer to traditional solutions like wooden lining of internal walls of the rooms more frequently used in order to make them more comfortable (Cacciaguerra, 1994).

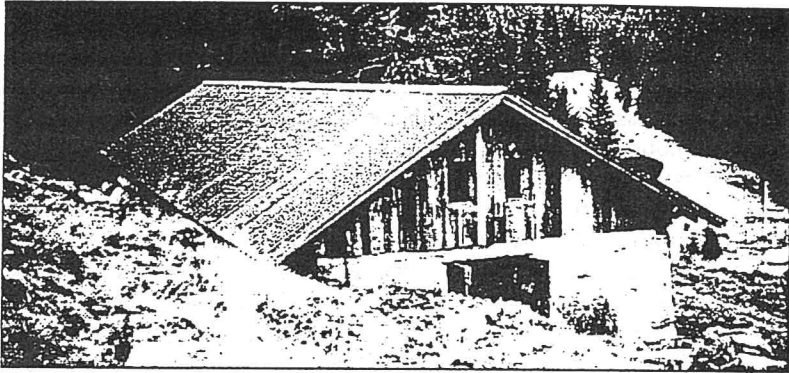


Fig.7: Sorgazza hut building.

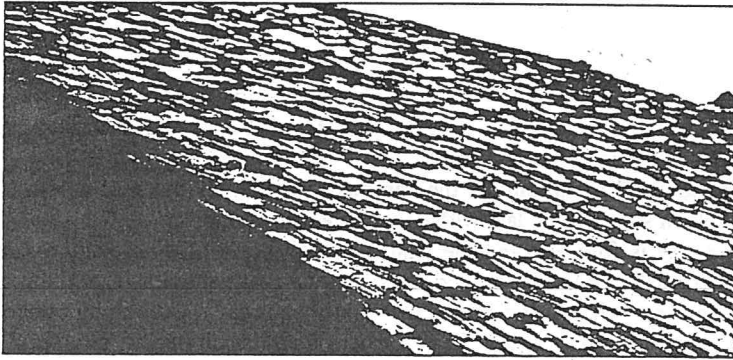


Fig.8: Detail of covering with wooden roofing tiles; Copola di Sotto hut building.

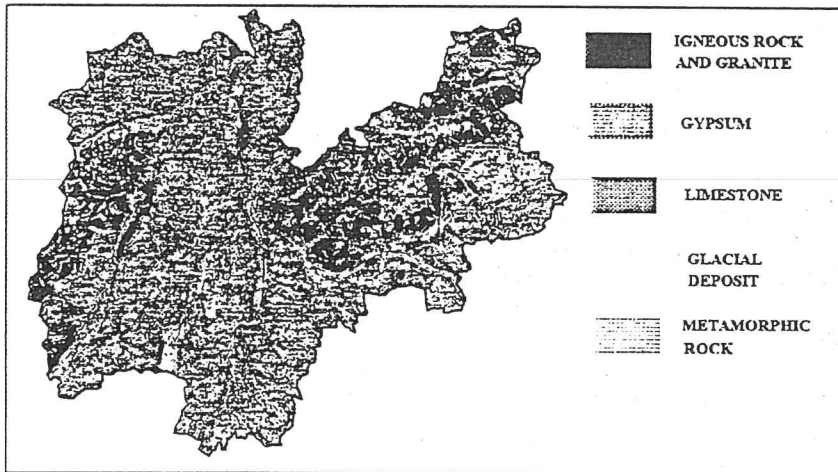


Fig.9: Geological map of Trento Province.

Examples of hut buildings in Valsugana

In order to detail the proposed solutions, a survey was made on some buildings for Alpine summer grazing existing in a sample area of the province of Trento: Tesino upland plain in Valsugana (Fig.3). The surveyed land is located east of Trento and stretches over about 224 km² with a population of about 3200 inhabitants and a density of 14 inhabitants per km² (ISTAT, 1991).

Geologically, the area is characterised in the west by magmatic intrusive rocks like granites and granodiorite which constitute, for instance, the relief of "Cima d'Asta" (2847 m a.s.l.), and by schistose-textured metamorphic rocks, like phyllites and gneiss; whereas in the eastern portion the soil consists of stratified limestone and marl and calcareous formations (Fig.9). Therefore, raw material is fully available for making the required structural elements and the curtain wall in carved stone or simply rough-hewed stone.

Vegetation is a typical Alpine one with larch and fir or beech wood, depending on the height of the site, which could directly provide the wood required for making the truss and covering.

Tesino upland plain was chosen in that production activities of both the primary and secondary sector still coexist with some tourism development. The coexistence of cow, sheep and horse breeding with the number of hut buildings scattered on the land, make the surveyed area geographically significant. It is therefore necessary to go deeper in the knowledge of construction elements of the past in order to respect the project approach resulting from the architecture-environment combination and to reduce the dualism between man-affected environment and natural environment. The survey concerned six hut buildings, four of which for cattle breeding, one for horse breeding and one abandoned. The last one, Copola di Sotto (Fig.8) hut building at about 1800 m a.s.l., belongs to the municipality of Pieve Tesino and was subject to static restoration because of the bad conditions both of the walls and of the wooden roofing-tile. The action was taken for preservative purposes in order to use the work as a hut for excursionists.

The hut buildings still operating for dry and lactating cows are situated in the municipality of Pieve Tesino, Sorgazza hut at 1450 m a.s.l. (Fig.7), with 60 heads; in Castello Tesino municipality, Coazzo hut at 1650 m a.s.l., with about 60 heads and Monte Agaro hut (Fig.1) at 1700 m a.s.l. with about 100 heads; in Cinte Tesino area, Arpago hut at 1660 m a.s.l. with 150 heads. Some of them belong to private owners, others to municipalities that assign management to private persons.

Marande hut building, 1600 m a.s.l., is used for horse breeding and has about 100 horses belonging to private citizens.

In the hut for cattle breeding, the building serves as night-time shelter where two milking operations per day are performed for lactating cows. The structures equipped with a cheese processing plant process milk on the spot, otherwise it is sent to dairy factories in the valley. The house for the animal keepers is generally made in the south part of the stable at the first floor (Fig.7), or in a building separate from the stable.

Conclusions

The social and economic changes of the last decades have caused an increasing abandonment of the traditional animal husbandry in the Alps, with unfavourable effects on hut buildings as valuable building and land resources.

Hut buildings are the product of a well defined social, economic, cultural, climatic and territorial context and their construction fulfils different performance requirements: functionality, layout of rooms premises and technological performances.

The environment, landscape and cultural preservation of this type of settlements calls for the need to plan the recovery of hut buildings, either presently operational or abandoned. For a functional and economic use to be possible, such recovery should foresee modernisation of structures and equipments and any change, if required, of the type of use, for instance for tourism or farm holidays.

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