

Which Accessibility for Mountain Natural Environments? The Ski-Ability Project

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Abstract. The growing desire to live experiences in naturalistic environments that are also opportunities for psycho-physical well-being has meant that the issue of accessibility is now involving environmental contexts that by their nature are often almost inaccessible due to both the morphology of the places and the meteorological-geographical conditions. It is evident that in such contexts the degree of accessibility cannot be fully satisfied by acting on the environment, it is, therefore, necessary to refer to notions such as reasonable accommodation or equivalent accessibility.

In this sense, the degree of accessibility achievable involves more organizational aspects and the provision of special aids, reducing the number and scope of interventions in the physical environment. From this point of view, the sense of limitation inherent in the definition of Universal Design (which considers the greatest number of people possible) emerges avowedly, emphasizing even more specifically the difference between accessibility and usability.

This paper aims to analyze how accessibility can be declined for places that by their nature are poorly accessible, what scope this has for the local population, and to propose an initial focus on the ongoing Ski-Ability Project research.

Keywords. Natural Mountain Environments; Ski Resorts; Cohesive and Secure Communities; Ski-Ability Project

1. Introduction

The growing desire to live experiences in naturalistic environments, mountain or otherwise, that are also opportunities for psycho-physical well-being, has meant that the issue of accessibility has come to include environmental contexts that by their very nature are often almost inaccessible, both because of the morphology of the places and because of the weather and geographical conditions.

A substantial body of evidence supports the benefits of contact with nature, including economic benefits [1]. Examining the social, physical, economic and cultural differences in the relationship between nature and health can assist in formulating targeted interventions to address disparities [2]. Such interventions aim to prevent health problems and improve lifestyles.

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Despite the aspiration to interact with natural mountain environments for recreational and therapeutic purposes, many people, particularly those with disabilities, encounter considerable obstacles to access [3]. The rugged morphology and unpredictable weather conditions of natural mountain landscapes frequently render them inaccessible, constraining participation and enjoyment opportunities. Traditional approaches to improving accessibility, linked to standards and manuals, too often focus only on physical modifications of the environment, becoming inadequate for such contexts for which hypotheses and solutions need to be formulated that consider the user and his or her peculiarities. Instead, it is essential to consider the users, their unique characteristics, and the provision of appropriate aids or facilitators to facilitate interaction with the environment. Indeed, the ICF (International Classification of Functioning) represents a comprehensive anthropological approach, describing the person in their inseparable valence of body-function-environment [4]. Such an interpretation broadens the concept of accessibility, enabling a perspective that fully analyzes the person-environment relationship concerning the activities performed.

2. Accessibility as a Person-Environment Relationship

The accessibility of spaces is in most cases referred to the built environment and takes into account that there are people who interact with the designed spaces in a different way than what is considered normal (a motor-disabled person with a wheelchair cannot use a staircase, but must use ramps with an appropriate slope, or lifts, etc.). Consequently, a variety of regulations, varying in their efficacy, govern the design of the built environment. In theory, new construction should be able to achieve a satisfactory level of accessibility for the majority of users.

However, it is well known that the regulations adopt very pragmatic and inflexible approaches, often aimed at niches of the population with standardized characteristics (the motor-disabled person in a wheelchair, the blind, the deaf), proposing specific design solutions that lead to a design for disability, thus losing sight of the issue of inclusion, as well as architectural, constructive and therefore economic redundancy, multiplying and overlapping building elements that are not integrated.

Universal Design (UD) induces the designer to formulate effective solutions starting from the complexity given by the plurality of needs and aiming to respond through a design capable of satisfying as many demands as possible. UD has a sense of limitation (it is aimed at the “greatest number of users”), both in terms of solution (any solution may pose difficulties for a specific user) and situation (the complexity of human beings cannot be reduced to immutable patterns: there will always be specific situations that require tailor-made solutions), as well as the fact that accessibility is not a product but an evolving process [5].

A further development of this theme can be seen in Inclusive Design [6], which involves users in the design process, not only to cater to as many users as possible, but also to emphasize different needs and abilities.

In such perspectives, accessibility is no longer just a requirement of the built environment to meet the needs of specific users (especially people with disabilities), but provides a broader and more inclusive response.

However, when we speak of natural contexts, the concept of accessibility must be approached in a different way, because the sphere in which we intervene cannot be considered as designable. It is therefore necessary to reinterpret the very concept of

accessibility, to understand its real limits and the possible declines that are closely linked to the relationship between person and environment. In these situations, it is therefore necessary to determine what the balance point may be between designed solutions and action on the user, who is thus transformed into an active part of the intervention. Accessibility, or rather the reduction of the handicap, is the balance between the adaptation of the person to the environment and vice versa.

Being aware of all this, working in natural contexts, which by their very nature are not accessible, and in most cases will never be accessible, if not by distorting them and thus depriving them of their peculiarities that make them attractive, becomes a complex operation that requires compromises. The UN Convention on the Rights of Persons with Disabilities itself proposes the instrument of reasonable accommodation [7] which, from the point of view of inclusion and equal opportunities, allows for different ways of accommodating users with disabilities. This last consideration concerns both the issue of accessibility of places, which is what we are dealing with here, and the possibility of providing the user with tools that enable him/her to compensate for his/her difficulties.

In the field of planning, the issue of the accessibility of the natural environment raises many considerations similar to the debate on the accessibility of cultural heritage, where the protection of the property must be balanced against its accessibility. It is well known that, even in this field, compromises have to be made in order to reconcile the two values. In this sense, the legislation of the Veneto Region in Italy introduces the notion of “equivalent accessibility” [8], defined as a requirement to be achieved through solutions or management methods of the asset or area that improve its degree of accessibility and usability, so that a person with a disability can (a) move around, even if with the help of an escort or, in the case of large areas, equipped with “light” means; (b) reach only some significant parts of the property or area and, for the remaining parts, have at their disposal appropriate information aids enabling them to know and understand them; (c) have at their disposal appropriate tactile and visual material, audio guides, etc. (facilitators).

Examples of such approaches for mountain and non-mountain nature areas include the use of the jolette, a litter pushed by two drivers, which is used to transport a person with reduced mobility along mountain paths, allowing the user to experience places that are otherwise inaccessible. Similarly, in the case of Vatnsdalur and Ting in northern Iceland, the Vatnsdæla Sagauna landscape, a vast area that also contains important archaeological ruins, the issue of accessibility and usability has been addressed by identifying viewpoints that can be reached by driveways and by using horses equipped with a special saddle to carry some people with motor disabilities to the area of the ruins or along appropriate guided routes [9].

Interventions in mountain and non-mountain naturalistic contexts require careful consideration to ensure that the following are satisfied: reachability, which expresses the possibility that any person can reach the desired place, even in different ways; accessibility, which objectively describes the characteristics of an environment so that it can be enjoyed; and usability, which reads the person-environment relationship subjectively [10], regarding the user's own conditions. For example, a hut or chalet located on a ski slope may be accessible (entrance without steps, counters at the right height, equipped toilets, etc.) but not usable by a disabled person arriving on a monoski. Accessibility therefore depends on how it is used by the user and, to return to the example, it becomes usable when there is a courtesy wheelchair that allows the disabled user to access and actually use the facility. From this point of view, accessibility and usability,

objective and subjective data [10], must complement each other so that the user can experience the environment as fully and independently as possible.

The difficulties in defining the accessibility of natural mountain areas do not only concern the possibility of carrying out recreational-tourist activities, but also have important implications for local communities. In fact, these activities are flanked by all the usual activities of daily life (accommodation, mobility, shopping, etc.) that should also be accessible, raising similar issues to those mentioned above, since they are often located in small and isolated localities where the geographical-natural conformation shapes the fabric of socio-economic activities, cultural traditions and aspirations for a sustainable future.

Existing actions are mainly based on the development of tourism, but a more careful reading of the phenomenon shows how everything that raises the level of accessibility benefits first and foremost the local population, giving rise to more cohesive and secure communities, facilitating connections with the larger centres close to them, and warding off the endemic processes of abandonment and depopulation, thus satisfying the 11th UN Sustainable Development Goal, Agenda 2030.

3. The Sky-Ability Project

When considering sporting activity, whether competitive or not, for people with disabilities, we always mean adapted physical activity, i.e. the fact that the person must be equipped with aids and assistive devices to enable them to practice their chosen sport. In the case of skiing, these aids differ according to the type of disability: for motor disabilities, the main equipment used includes skis with stabilizers, sit-skis and mono-skis that can be used independently, or with the help of an instructor who guides them. For sensory (mainly visual impairments) and cognitive disabilities, the accompaniment of a guide is required.

As mentioned above, it is therefore necessary to adapt the person in order to be able to practice sports and leisure activities on the snow. The actions to be carried out on the environment do not therefore relate specifically to the adaptation of the ski slopes, but must include all the services surrounding the skiing activity, thus becoming an essential element for the accessibility and usability of the sites.

Moreover, in these contexts, the latter is strongly conditioned by weather conditions: snow, ice and low temperatures, if not properly managed, become obstacles that render inaccessible environments that would otherwise be accessible (think, for example, of a flat route with and without snow or ice).

The proposed case study is the Ski-Ability Project, financed by the Arge Alp Community and promoted by the Lombardy Region. The Arge Alp Community involves ten Provinces, Regions, Länder and Cantons from Austria, Germany, Italy and Switzerland with the aim of “addressing, through cross-border cooperation, common problems and goals, particularly in the ecological, cultural, social and economic fields, as well as promoting mutual understanding of the peoples of the Alpine arc and strengthening the sense of common responsibility for the living space of the Alps” [11], is grafted onto the above-mentioned theme. The main aim of the Ski-Ability Project is to study the receptive capacity and accessibility in the ski resorts of the Arge Alp area, as a reference area for the entire Alpine arc, and to identify which good practices can guarantee the highest degree of accessibility of the resorts and the practice of skiing for people with disabilities, as well as the receptive capacity of all the service providers for

skiers. Based on this research, a useful model for measuring the accessibility, for different forms of disability, in ski resorts will be identified.

The research will be completed by December 2025, to develop guidelines to improve ski resort accessibility. These guidelines could be approved by the EU. Seven ski resorts from the Arge Alp Community agreed to participate in the research as benchmark locations (three Italian, two German, one Austrian, and one Swiss). Each place was picked by its respective Region.

The first survey carried out for the Ski-Ability project consisted of a questionnaire sent to the contact persons identified by the various ski resorts participating in the project. The first part of the questionnaire focused on the accessibility of the ski slopes and related services, while the second part looked at the accessibility of the resort as a whole (accommodation, restaurants, transport, personal care services, etc.), i.e. the accessibility and usability of the areas and services used by all users, including disabled users, when they are not on the slopes.

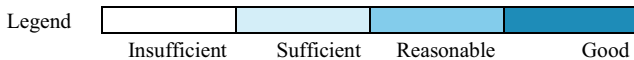
The methodology used, in this first cognitive phase, involved the application of qualitative research as part of a more specific study carried out with the participating districts, with the aim of verifying the state of affairs and possible developments of adaptive winter sports and community-based mountain organizations. This research method, based on the constructivist paradigm [12], provides a better understanding of the social realities of individuals, cultures, solutions adopted and lived experiences [13]. It is then accompanied by the study of specific objective parameters, such as the survey of the actual services offered in terms of reception, management and physical accessibility.

The first results of the survey launched (Table 1) are the answers to a series of self-assessment questions, through which the districts expressed their opinion on the *status quo* regarding the degree of accessibility offered by the facilities surveyed, both from the point of view of the services offered and from the point of view of the management. These responses provide important data for assessing not only the actual status quo of the study areas, but also the degree of understanding and sharing of the issue. The interpretation of the questions and the language used for the answers is a characteristic and culturally specific element: some areas have been dealing with the issue of accessibility for some time, also thanks to the collaboration of local administrations and associations, while others are taking their first steps, leaving the "answer" mainly to the regulatory system.

The answers obtained show, first of all, that in many cases there is no ecosystem approach to the accessibility and usability of the entire ski area; on the contrary, the management is characterized by a fragmentation of public and private bodies that act independently of each other. Another point to be considered, where it exists, is the communication of a tourist nature that is provided with regard to the accessibility and usability of the areas studied, which refers more to the summer season, confirming that winter weather conditions constitute an additional obstacle to be overcome.

Table 1. Self-assessment questionnaire on the degree of accessibility of the ski resorts involved in the project.

		SKI RESORT 1	SKI RESORT 2	SKI RESORT 3	SKI RESORT 4	SKI RESORT 5	SKI RESORT 6	SKI RESORT 7
1	Are there disabled parking spaces near the ski lifts?	Good	Good	Good	Good	Good	Good	Good
	a How far are they from the ski lift/ticket office?	Good	Good	Good	Good	Good	Good	Good
	b How many are there?	Sufficient	Sufficient	Sufficient	Good	Sufficient	Good	Good
	c Are they kept snow-blown?	Good	Good	Good	Good	Sufficient	Good	Good
	d How often are they snow-blown?	Good	Good	Good	Good	Sufficient	Good	Good
	e Is it equipped with a cover?	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Good	Sufficient
	f Is there an accessible route?	Good	Good	Good	Good	Good	Good	Sufficient
	g Is the route feasible with a wheelchair? With skis? Is it equipped with signage for the blind?	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient
2	Is there a shuttle service accessible from car parks or accommodation facilities?	Good	Good	Good	Good	Sufficient	Good	Good
	a At what distance from the ski lift/ticket office/accommodation facility?	Good	Good	Good	Good	Sufficient	Good	Good
	b How many are there?	Sufficient	Good	Good	Good	Sufficient	Good	Good
	c What is the frequency?	Good	Good	Good	Good	Sufficient	Good	Good
d Describe the type of service	Sufficient	Good	Good	Good	Sufficient	Good	Good	
3	How many ski lifts are there? What kind?	Sufficient	Good	Sufficient	Good	Sufficient	Good	Sufficient
	Are there turnstiles?	Good	Good	Good	Good	Good	Good	Good
	Are there dedicated lanes for disabled persons?	Good	Good	Good	Good	Good	Good	Good
	Is there an assistance service?	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Good	Sufficient
4	Are there specialised instructors?	Sufficient	Good	Good	Good	Sufficient	Good	Sufficient
5	Refreshment/Refuges	Good	Good	Good	Good	Good	Good	Good
	a How many are there for each lift and each ski slope?	Sufficient	Sufficient	Sufficient	Sufficient	Sufficient	Good	Sufficient
	b Are they accessible? To what level? What initiatives have been implemented or are in the process of being implemented?	Sufficient	Good	Good	Sufficient	Good	Good	Sufficient
	c Are there accessible toilets? How many for each ski slope?	Sufficient	Good	Good	Sufficient	Sufficient	Good	Good
	d What kind of support is provided to the disabled persons?	Sufficient	Good	Good	Sufficient	Sufficient	Good	Sufficient
e Are there sledges or other means of support?	Sufficient	Good	Good	Sufficient	Sufficient	Good	Sufficient	



3.1. Research Questions

Based on these premises, the research takes its first steps by addressing some fundamental questions:

- How do the specific geographical and meteorological challenges of wilderness environments influence the implementation of UD principles and the achievement of equivalent accessibility within ski resorts?
- What are the most effective strategies for promoting inclusive sports initiatives in natural environments?
- What are the main barriers and facilitators to the adoption and implementation of UD strategies, inclusive sport and design in natural environments, and how can these challenges be addressed to promote equivalent accessibility for people of all abilities?
- How do the socio-economic and cultural contexts of specific settings influence the effectiveness of accessibility initiatives, and how can these contextual factors be used to improve the inclusivity and usability of ski resorts and the communities that visit them?
- What examples can be studied and adopted? Are there sustainable solutions in a broader sense?

These research questions aim to provide a comprehensive understanding of the complexities that characterize accessibility in natural environments and to identify feasible strategies to promote equivalent accessibility and inclusivity in diverse landscapes.

By achieving these research objectives, this study aims to contribute to the advancement of knowledge and understanding in the field of accessibility in natural environments and to provide practical insights and recommendations for policy makers, planners, designers and stakeholders involved in the planning, development and management of recreational spaces and facilities.

4. Conclusions

The accessibility and usability of natural mountain environments can be achieved by acting mainly on the adaptation of the person to the environment through the provision of specific aids and in the awareness that the degree of accessibility may vary from case to case in relation to the person-environment relationship that can be defined. This must be accompanied by actions that see accessibility declined above all at an organizational level to support the usability of spaces and services that, designed for skiers with disabilities, can also become an advantage for the communities that live in the ski areas.

The first results of the Ski-Ability project show a strong inhomogeneity between the different ski resorts studied. This inhomogeneity is not only related to the fact that some resorts have been working on the issue for a long time, while others have only recently started, but also to the specific context and to the way accessibility and usability are understood.

In this sense, the project will need to jointly define the concepts of accessibility and usability of ski resorts and then identify approaches to improve accessibility in adaptive

snowsports for people with disabilities, including the availability and proper use of specialized adaptive equipment tailored to the specific needs of participants with disabilities to improve the overall experience; the creation of community partnerships (local resorts, ski shops and community members); the use of event marketing strategies, social media presence with detailed and objective information; the identification of opportunities to secure grants or earmarked funds for the purchase of new equipment; and the training and support of staff, volunteers and instructors [14, 15].

In all of this, it should not be forgotten that the involvement of local communities, understood in a broad sense and thus including inhabitants, political-associative realities and recreational activities in the planning and design of environments will strengthen the sense of belonging and cohesion. Indeed, collaborative efforts in landscape planning and management can help create inclusive and health-promoting spaces as well as create new opportunities for socio-economic sustainability in mountain areas.

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