80 Awareness Rising For Natural Hazards And The Alpine Environment Through Interactive Nature Trails

BACKGROUND

The Swiss Federal Institute for Snow and Avalanche Research (SLF) primarily conducts research activities in the fields of snow, natural hazards and the alpine environment. All the fields of activity share the central theme of integral risk management. The aim of the institute's work is to develop economically and ecologically viable concepts of protection against natural hazards and to investigate possibilities for the sustainable development of mountain regions. Knowledge transfer within science as well as to the broad public is one of the general duties of SLF. In the International Year of Mountains 2002, that intended to increase global awareness of the importance of mountains, SLF took part in international endeavours and made special efforts to share its research topics with the public with a new approach: Two interactive nature trails were designed, installed in the mountains around Davos, Switzerland, and were both run for 2 seasons. One trail was for winter use and the other for summer use.

OBJECTIVES

Avalanche warning in Switzerland – as in the The main objectives were to educate people about the particularities of mountain regions, especially related to natural hazards and sustainable development and to show the associated role of research. On the one hand we aimed at providing a better understanding of natural phenomena such as avalanches (and including as well protection measures), because these phenomena play an important role in mountain people's lives, but may not be readily understood. On the other hand we aimed at promoting people's understanding of the sensitivity and vulnerability of mountain regions, so that this would eventually effect on their behaviour. Generally we intended to increase public awareness about these topics.

ACTIVITIES

The winter trail, named "Winter Experience trail", was installed along a main winter walking trail in the center of Davos. The summer trail, the "Mountain Experience trail", was installed along a more difficult hiking trail. The trails each consisted of 8 to 9 stations. The trail stations were always directly related to something people could see along the trail. Amongst other things the summer trail crossed through one of the most famous study sites for SLF's research on afforestation in an avalanche release zone. The core of the concept was to always offer information combined with activities such as short experiments, observations and measurements. The purpose was to let people discover the fascinating aspects of the natural phenomena in the surroundings and to encourage the individual's perception of natural hazards through the active reflection on research questions, the participation in activities, and through activating all senses.
Once the trails were installed, several advertising activities were started, guided tours and school programs were offered and a permanent competition was run on the summer trail combined with a feedback possibility. The feedbacks were evaluated to find out, if and how well the public was captured with our approach.

ACHIEVEMENTS

Based on the number of brochures that were picked up, it is estimated that about 30 000 people visited the winter trail and about 5 000 people visited the summer trail. The 250 feedback postcards that we received had comments on the people's trail experience. Among other things the visitors pointed out that "they can't imagine a better way for an exciting and informative walk" and that they appreciated very much the well-prepared information. In the third year, the local tourism

center and the cable car organization accepted the responsibility for the trails, so that the trails will remain existing even without any further support of the institute. It was resumed that:

- Many people could be attracted by the interactive nature trails
- The trails appealed to the people with the methodical-didactic concept of information combined with activities and fun.
- Interactive nature trails are an adequate method to raise people's awareness of sustainable development and natural hazards and to transfer research knowledge.
- The interactive nature trails were a contribution to the touristic offers in terms of gentle tourism
- The trail project strengthened the relationship and cooperation with local organisations.

LESSONS

Following three points are considered as the most important aspects of the nature trail project:

- It is easy to quicken interest in aspects of nature and mountains when people (children as well as adults) are addressed on an adequate level, and when activities are offered in combination with the information. This is particularly important, if a sustainable learning process is intended.
- For the sustainability of a nature trail project it is vital to involve local organisations in the design and set-up processes. It is important that they support the general concept and are prepared to take the responsibility when the initial resources are spent.
- The challenge for an interesting trail on natural hazards is to find a good connection between the visible objects outside and the complex information about the phenomena themselves at a level that is pleasant for the visitors.

FUTURE

It is conceivable to develop an interactive nature trail in a virtual environment and to make it available on the internet, if the local connections and adequate natural settings are not given.

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81 Education Systems For Avalanche Experts In Switzerland

BACKGROUND

Since the 1930ies, the Swiss Federal Institute for Snow and Avalanche Research SLF in Davos, Switzerland, has pioneered the development of avalanche forecast and warning systems. The institute is responsible for the development and for the operation of the Swiss national avalanche warning system.

On the average, 24 people per winter die in avalanches in the Swiss Alps. The overwhelming majority of fatalities occurs in the tourist sector (backcountry skiers, snowboarders). No fatalities have occurred on roads and in settlements during the last 5 winters.

OBJECTIVE

Avalanche warning in Switzerland - as in the other Alpine countries - has two main objectives:

■ The public safety in settlements and on traffic lines

■ The safety in the tourist sector (ski resorts, backcountry skiing, mountaineering)

Although a tourist warning system might seem a matter of the private sector it has been defined as a public service in Switzerland, given the great economic significance of the tourism in the Alpine regions

The avalanche warning for both sectors relies on the following cornerstones:

i. A dense observer and automatic measurement network throughout the alpine space

ii. Continuous progress in process research for further temporal and spatial refinement of the forecast process

iii An efficient communication and information system

iv. A good education and training of the end users of the warning information and the observers (see point i).

The success of avalanche warning relies on the parallel and synergetic development of these four components. The experiences in the catastrophic avalanche winter 1998/99 (34 fatalities) have lead to steps for further improvement in all of the four domains Together they form the so-called Inter-Cantonal Early Warning and Crisis Information System IFKIS.

ACTIVITIES

The education program for the tourist and the public safety sector are characterized by a major difference with respect to the number and the training level of the end users.

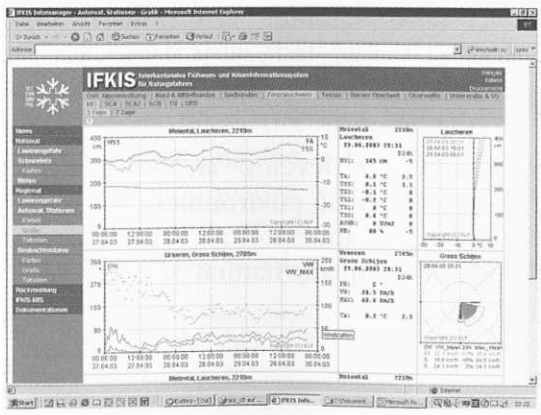
■ Tourist sector:

The spectrum of end users of the avalanche information reaches from occasional skiers without avalanche expert knowledge up to professional mountain guides Due to the large number of addressees, these groups can not be directly approached by the Institute for Snow and Avalanche Research. The education programs therefore follows three lines:

- Distribution of daily information (national and avalanche bulletins and special maps) via all publicly used information channels internet, phone/SMS/WAP, radio, fax, TV (the latter mostly in critical situations), special information in ski resorts, etc
- Brochures
- A close collaboration with professional unions and experts, such as mountain guide associations, safety experts in ski resorts, etc.

■ Public safety sector:

In the spirit of an integral risk management, public safety is ensured by a variety of measures, ranging from technical (avalanche defense structures), biological (protection forests), to organizational measures. The responsibility for the latter type of measures is in the hands of specially trained safety services Besides the public information for the public tourist sector, these organizations have access to a non-public information platform, providing a variety of expert information, such detailed station and observer data, model results, and particularly early warnings



In contrast to the tourist sector, the responsibilities for the public safety are educated and trained directly in annual courses organized and carried out by the Institute for Snow and Avalanche Research. The courses cover, among others, the following issues: meteorological and avalanche process, observation, communication systems, legal aspects, and media relations. The courses are held annually in German and French

ACHIEVEMENTS

The education system, on the tourist as well as on the public safety side, is a strong basis for the success of the avalanche warning system. Besides a generally increased knowledge, certain standardization in the management of avalanche situation could be reached.

LESSONS

A warning system is only as good as its users. Permanent feedback on the usability of the information and proposals for further improvements from the user side is a crucial input for the further development of the warning system.

FUTURE

One of the main future objectives is the extension of the experience gained in avalanche warning to the development of warning and information systems for other natural hazards, such as hydrological hazards in the mountains, which due to their generally short forecast times, still pose a considerable challenge to crisis management.

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