EURAC
European Academy of Bolzano

PGRN
Pôle Grenobloise Risques Naturels

FOEN – Federal Office for the Environment

Handbook
for using videoconferences
in risk communication

WP6 Risk prevention and management

Interreg IV B project „AdaptAlp - Adaptation to Climate Change in the Alpine Space"

A. Zischg, C. Steurer
J.-M. Vengeon, C. Peisser
P. Greminger

30.03.2011

Handbook
for using videoconferences
in risk communication

Content

1 Introduction

Integral natural hazards risk management is a coordinated task of different stakeholders. In most situations, in which persons and goods are exposed to natural hazards, multiple options exist to reduce the risk. Risk reduction can be achieved by means of structural protection measures or by organizational measures. Sometimes, the combination of aspects from both approaches allows the reduction of risks in the most cost-efficient way. The combination of different actions for risk reduction requires a coordination of the activities of the relevant stakeholders and actors. The coordination of activities of more stakeholders requires a dialogue between all and with the beneficiaries of risk protection measures.

Therefore, one of the key tasks for the optimization of risk management practice is risk communication. Risk communication is not only necessary for coordinating the activities of a great number of action forces during a flood event, but also for risk prevention. People living in a settlement that is potentially affected by floods can prevent damages by preparing temporarily protection measures. But this will be done only if the residents are aware of the potential hazard. And the awareness of potentially endangered people can only be raised if the risks are communicated. Risk communication means also warning of flood events in advance. Early warning systems are useless if the warnings are not communicated to the group exposed to a hazard. And also in risk prevention tasks - such as the planning of flood protection measures or dikes – risk communication is indispensable. Optimal risk prevention and integrated risk management requires a huge amount of specific knowledge – knowledge that is distributed to many persons and institutions. The exchange of knowledge and information needs time, requires systematic and exercise. As in many sectors, also in natural hazards and risk management practice imperfections can be found in methodology or in implementation of tasks that are based on lacking communication.

The need for a continuous improvement of risk management practice requires also the exchange of knowledge between the responsible authorities. Experiences made in one region can be transferred to others and adapted to other framework conditions. Especially the transfer from experiences across administrative boundaries is important for steadily improving risk governance. Knowledge transfer across borders is risk communication and is part of the transnational cooperation in risk management.

Though, risk communication and knowledge exchange require time for meetings and – especially in transnational working groups - time for travelling to the meeting places. This requirement often hampers risk communication and knowledge transfer.

Within the "AdaptAlp" project, the working group of WP6 "Risk prevention and risk management" aimed at searching solutions for improving and promoting knowledge exchange and risk communication. One aim of WP6 was the improvement of risk communication over greater distances. **The aim was to test information and communication technologies (ICT) supporting the remote collaboration of different stakeholders in risk prevention.**

1.1 Approach and reading guide

The first step was to define the **target user profile** and the specific requirements. The main target group for using ICT techniques in risk communication were regional and national authorities responsible for risk management. These authorities are involved in transnational projects and in the development of common strategies. Persons from this target group often need to ask questions to other persons of the same group, to discuss some actual problems or give hints for specific topics. In some cases, persons of this target group are working on strategic levels and in decision-making processes but are not professionals in using computer-aided techniques. Furthermore, persons of this target group are often working in institutions with high requirements regarding network security aspects.

This user profile means that the tool for videoconferencing must offer at least these features:

- Simple use. Users without professional ICT skills should be able to use the tool.
- Voice transmission over internet protocol (VoIP).
- Presentation delivery. All participants should see an online document or an online presentation (ideally existing Microsoft Word or Powerpoint documents).
- Interaction between users. A discussion and a common access to online documents must be possible, e.g. all users must have the possibility to add comments or remarks to documents and to modify the text. Users should be able to ask questions. A moderator should be able to guide the interaction.
- File sharing.
- Desktop sharing. In risk management often hazard and risk maps have to be interpreted jointly. Therefore, the tool must offer the possibility to share desktop applications, e.g. local GIS-applications.
- Shared whiteboard. A whiteboard which offers the users a possibility to draw graphics for explanations is helpful to explain complex situations.
- Security issues. The tool should not be blocked by firewalls and should enable encrypted data transfer and password-protected meetings.
- Hardware requirements. The user should not have the constraint to buy specific hardware. A headset should be enough.
- Compatibility of user environments. The most used operating systems and internet browsers should be supported.

Other ways of using ICT in risk communication such as in education or in communication between task forces during crisis management are not considered here. Their requirements are different from those of our target user profile.

This report is written to support the dedicated target user group in choosing the tool for their needs. Therefore, the selected tools focus on group communication systems. The report describes if and how collaboration, such as document sharing and application sharing, is possible.

1.2   Technical background

1.2.1   Difference between Audio Conferencing, Video Conferencing and Web Conferencing

Technology can offer interesting solutions to help people communicating in efficient ways even if they live in different parts of the world. Through the new technologies of audio, video and web conferencing families and business professionals can communicate real-time in different ways. Here we are describing their similarities and differences.

1.2.2   Conferencing Terminology

An audio conference, also called conference call, or audio teleconference. It is usually initiated by the host calling party that connects with two or more call recipients: they all call into a predetermined phone number and enter a security code. The host can call out to others to involve them in a conference call, or simply listen to the conversation between the other parties.

Through a video conference, on the other hand, two or more remote partners can connect and interact using a technology based on a two-way video, so that their voices are simultaneously transmitted via audio transmission and they see one another as if in a real conference. It is also possible to easily conduct other mediums like document sharing.

A web-conference is a live meeting or presentation done through a program on the Internet by partners using their own computer to connect one another. In order to access the Internet program partners usually click on a link given to them by the person who invited them at the meeting. A web conference may or may not include an audio presentation.

1.2.3   Equipment Used

The used equipment is different according to the kind of conference:

- ▲ The participants in a telephone conference use a telephone: everyone calls into the same number or the initiator of the conference calls the other parties.
- ▲ The video conference uses simultaneous video and audio transmission led to a common MCU (multipoint control unit) or video + audio bridge.
- ▲ The web conference needs a PC with Internet connection, a headset, a telephone line and a video camera. The participants connect to a single server through a program.

1.2.4 Providers

The conference call or the video conference feature is available through many communication providers. These features are regulated by the telecommunication company lending the communication lines. Moreover, a lot of free software enables the web conference feature, such as Skype, Yahoo!, Messenger and others.

2   Selected systems

The instruments and tools supporting remote conferences and communication are manifold and cover a wide range of functionalities. The working group selected some of the tools and tested them. The tools selected for the tests are described here.

2.1   Phone conferences functionalities

Features	Not native document sharing/application sharing support, only with additional systems. Only audio conferencing is suitable, Video-phony is a vanishing technology.
System requirements	For group communications a phone and for data sharing a desktop or laptop PC or a workstation and a telephone exchange service that can host phone conferences, preferably at one of the participants, or a phone bridge from a commercial service is needed for each participant.
Platform support	Every regular phone or VoIP client must be attached to a PSTN (public switched telephone network) gateway. For data/application sharing a PC or workstation with Windows, MacOS or Linux is needed.
Interoperability	With other VoIP clients there are other Systems with PABX (business telephone system) gateway for audio/phone conferencing.
User friendliness	Everyone knows how to use a phone, though dial-in instructions need to be clear when people are invited. Additional data/application sharing programs are usually easy to use. Screen sharing quality might not be good enough for some applications.
Security	None on the phone conversation, SSL (secure sockets layer) security possible (but not default) on the screen sharing applications.
Costs	Costs depend on the phone provider.

2.2   Citrix GoToMeeting 4.5

User-friendly solution with all the key functions and transparent costs; suitable for Windows and Mac.

Features	Desktop Sharing**,** Application sharing, Annotation and drawing tools, Chat, Instant Messaging, Meeting recording, Outlook integration Audio conferencing, no video conferencing
System requirements	Minimum of Pentium® class 1GHz CPU with 512 MB of RAM (2 GB of RAM for Windows Vista) Internet Connection Required: Cable modem, DSL, or better recommended
Platform support	Windows: Windows® 7, Vista, XP or 2003 Server (Linux is not supported) Mac: Mac OS® X 10.4 (Tiger®), OS X 10.5 (Leopard®), OS X 10.6 (Snow Leopard®) ,other platforms: iPad
Interoperability	Proprietary system, integrable with PSTN and SIP PABX
User friendliness	Quick and easy to install, Planning is simple and intuitive, Intuitive user interface
Security	Medium security: Meeting only accessible by means of an additional password (meeting ID + meeting password), accounts are deactivated after three failed attempts to enter the correct meeting password, 128-bit AES/ Blowfish encryption, Security certification from CyberTrust
Costs	**Flat monthly subscription** USD 49 per month **Annual subscription (pre-paid)**: USD 468 per year Single license for unlimited meetings with up to 15 participants. Integrated VoIP and telephone conferencing service (with local telephone number - incurring additional costs)

2.3   Cisco WebEx Meeting Center 8.5

Complex solution with a comprehensive set of features, which runs on the most common operating system platforms.

Features	Desktop Sharing, Virtual room, Application sharing**,** Annotation and drawing tools, Whiteboard, Chat, Instant Messaging, File transfer via virtual storage room, Webcam, Surveys / polls, Meeting recording Outlook integration Audio conferencing, Video conferencing
System requirements	Intel or AMD processor (1GHz or faster), at least 512 MB RAM (at least 2 GB RAM for Vista) Internet Connection Required: Cable modem, DSL, or better recommended
Platform support	Windows 2000, XP, 2003, 32-bit Vista, 64-bit Vista, Mac OS X 10.4+**, Linux** Ubuntu 9.04, Red Hat 5, Open SuSE 11.1, Fedora 11, Solaris 10, HP-UX 11.11, AIX 5.3, iPhone

Interoperability	Proprietary system, integrable with PSTN
User friendliness	Quick and easy to install, planning is simple and intuitive. Complex due to the wide-ranging options
Security	High security: Meeting only accessible to invited participants (email + meeting ID + password), 256-bit AES encryption, Security certification from Web Trust and SAS70
Costs	Monthly subscription: USD 69 per month (UK: GBP 38 per month; Europe: 53 EUR per month) Annual subscription (prepaid): USD 708 per year (UK: 396 per year; Europe: 552 EUR per year) Pay-per-use: USD 0.33 per minute and participant (UK: GBP 0.19 per minute and participant; Europe: 0.29 per minute and participant) Single license for unlimited meetings with up to 25 participants Integrated VoIP and telephone conferencing service

2.4 Skype 5.0

Skype was founded in 2003. It is based in Luxembourg, with offices in Europe, the US and Asia. It is owned by an investor group led by Silver Lake and which includes eBay Inc, Joltid Limited and Skype founders Niklas Zennström and Janus Friis, the Canada Pension Plan Investment Board and Andreessen Horowitz.

With its users making 6.4 billion minutes of calls to landlines and mobiles in the first half of 2010, Skype is a leading global Internet communications company. Skype-to-Skype voice and video calls are completely free.

Features	Desktop sharing, Instant messaging, document transfer Audio Conferencing, video conferencing (max. 5 users in beta, to be charged)
System requirements	Processor: At least 1GHz , G4, G5 or Intel processor, 800 MHz or faster At least 512 MB Internet Connection Required: Cable modem, DSL, or better recommended
Platform support	Windows 2000, XP, Vista, 7(32-bit and 64-bit versions supported), Mac OS X 10.3.9, 10.4, 10.5 , 10.6 (32-bit and 64-bit versions supported), Linux Ubuntu 8.10+ 32+ 64-bit, Debian Lenny, Fedora 10+, OpenSUSE 11+, Dynamic Static
Interoperability	Proprietary system, integrable with PSTN and SIP PABX (beta)
User friendliness	Quick and easy to install, planning is simple and intuitive, works over various firewall systems
Security	Medium security, 256 bit AES encryption, protocol unknown
Costs	Free for Skype inter-Skype calls, PSTN Phone Calls from: 0,026€/min to 0,34€/min

2.5   Microsoft Lync

Microsoft Office Live Meeting 2007 is a conferencing solution that boasts many features, ideal for various usage meeting scenarios. Web conferences can be easily planned and started in Outlook and the partners can present documents (uploaded in advance) online. The usage is intuitive, even though many functionalities and usage scenarios are offered.

Features	Desktop sharing; application sharing, document transfer, Instant messaging Audio conferencing, Video conferencing
System requirements	Internet Connection Required: Cable modem, DSL, or better recommended
Platform support	Runs on Windows and Mac, Smartphone/ tablet: iPhone, Android, iPad
Interoperability	Proprietary system, integrable with PSTN and SIP PABX
User friendliness	Easy to use, quick and simple installation of the Live Meeting client and the Outlook-Add-on. Users must register at Microsoft Online Services, which is a bit tedious, the Outlook integration makes the invitation process efficient and starting a meeting effortless
Security	very high
Costs	(1) "Standard": up to 250 participants per meeting: US$ 4.50 per month (minimum of 5 licenses) (2) "Professional": up to 1.250 participants per meeting: US$ 16.00 per month (minimum of 5 licenses)

2.6   Adobe Acrobat Connect Pro

Adobe Acrobat Connect Pro Meeting is very well structured, but the wide range of offered features and functionalities makes the usage quite complex, although their handling is intuitive.

The user can plan, create and set up an online meeting in a comfortable way, uploading images and data. The meeting itself is easily managed thanks to the numerous features offered. The access to the meeting must be approved by the host.

Adobe Acrobat Connect Pro Meeting is a well constructed meeting tool for web conferences planned in advance.

Features	Document sharing/application sharing support, chat, whiteboard, Breakout rooms Audio Conferencing, Video conferencing
System requirements	1.4GHz Intel® Pentium® 4 or faster processor (or equivalent) for Microsoft® Windows® XP or Windows 7; 2GHz Intel Pentium 4 or faster processor (or equivalent) for Windows Vista® , 512MB of RAM (1GB recommended) for Windows XP or Windows 7; 1GB of RAM (2GB recommended) for Windows Vista Internet Connection Required: Cable modem, DSL, or better recom-

	mended
Platform support	Windows XP Home or Professional with Service Pack 2; Windows Vista Home Premium, Business, Ultimate, or Enterprise; or Windows 7 Home Premium, Professional, or Ultimate (32-bit edition, or 64-bit edition with 32-bit browser), Mac OS X v10.4–10.6 (Intel); Mac OS X v10.4 (PowerPC) , Solaris, Apple iPhone, Android™ devices: Android 2.2
Interoperability	Proprietary system
User friendliness	Large number of functionalities with intuitive usage. Desktop sharing and virtual room. The complexity and sheer number of functionalities bring down the score slightly, easy SW installation.
Security	High
Costs	Flat rate: US$ 55 per month, respectively US$ 45 for a yearly subscription for meetings with up to 100 participants Pay-Per-Use: 32 US cent per minute and user

3   Experiences of the AdaptAlp working group

The working group of WP6 tested the selected tools. The tool tested most intensively was Adobe Connect. Some of the workshops of the working group have been held by using Adobe Connect. The Federal Ministry of the Environment of Switzerland had a licence of Adobe Connect and offered the use of it within the AdaptAlp project. This tool fulfilled all of the requirements of the target group as described above. Adobe Connect offers the presentation of documents and adding remarks to them. It offers video telephony and the sharing of desktop applications.
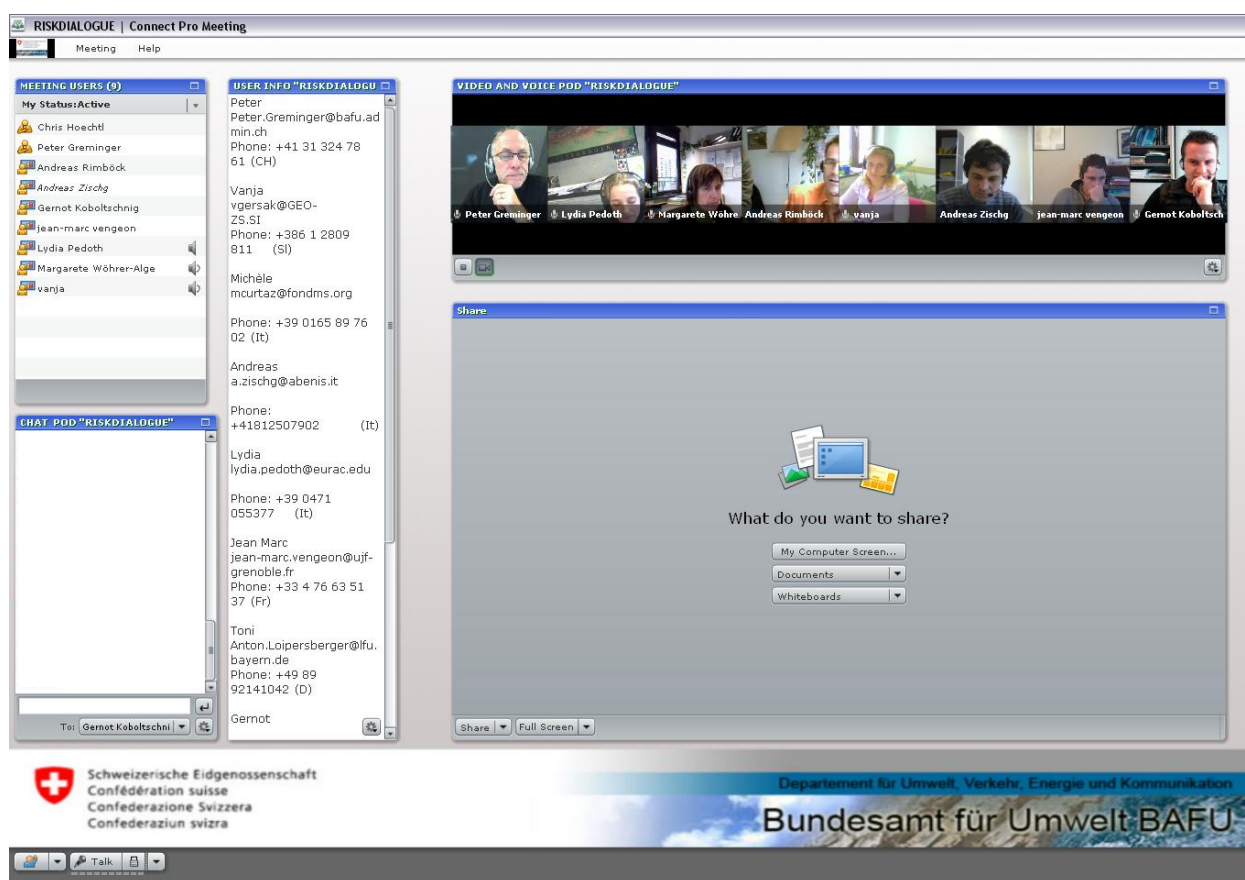

Figure 1: Screenshot of the main page of Adobe Connect.

In general, the working group made positive experiences in using Adobe Connect. At the beginning, some persons had difficulties with the installation of the headsets and the video camera. In one case, the partner had to use another browser, because there was no correct plug-in available for the pre-ferred browser. Some partners had difficulties with the connection. Due to a labile internet connec-tion, the partner kicked out sometimes. If this problem rose because of a small bandwidth or because of a problem with the firewall is not known.

The main challenge was faced by the moderator of the working group, because in case of video con-ferences his/her role has a higher importance than during workshops. The moderator must be well prepared and must know the use of the tool very well. In case of technical difficulties, he/she has to give advice to the users. Discussions must be structured and organized. Discussions in video confer-

ences work well if all participants know each other and the team has a proper discussion culture. This means that video conferences cannot replace real meetings totally, but are suited to improve the already existing collaboration.
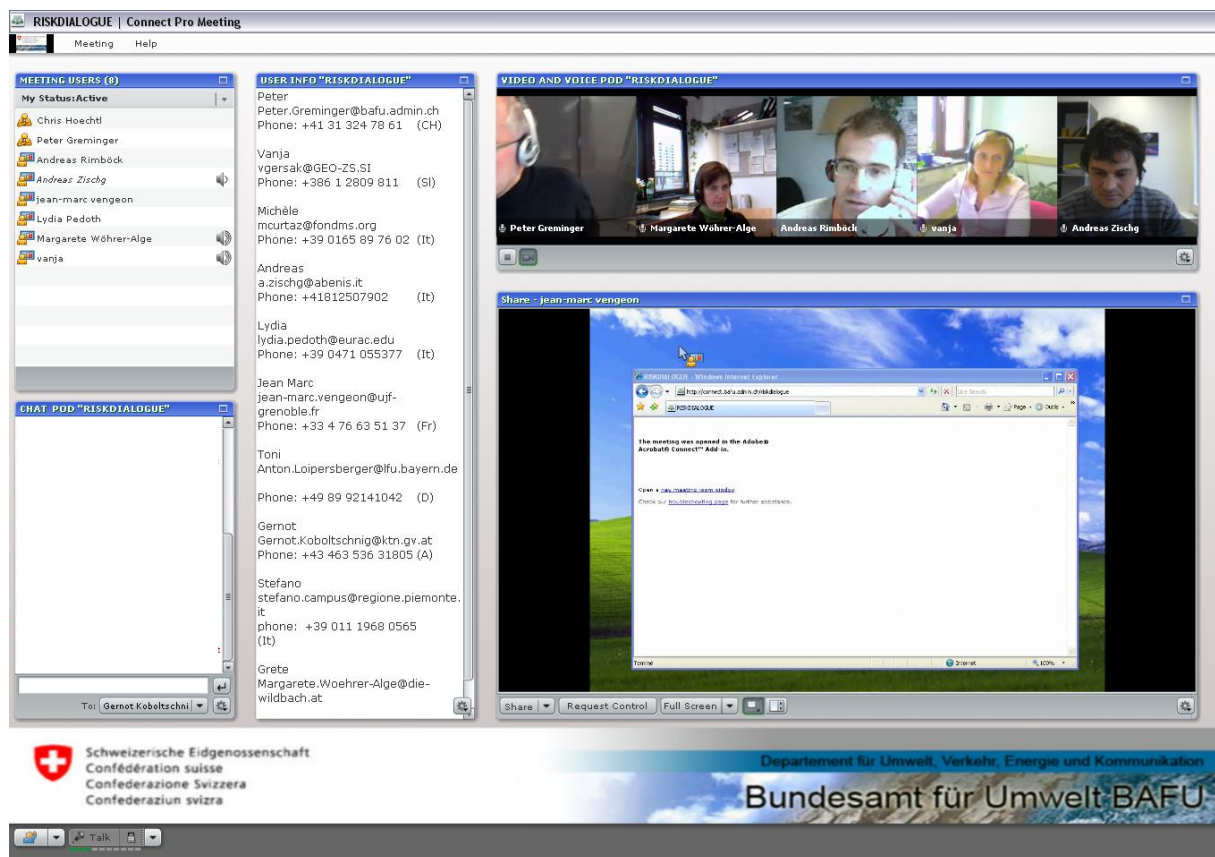

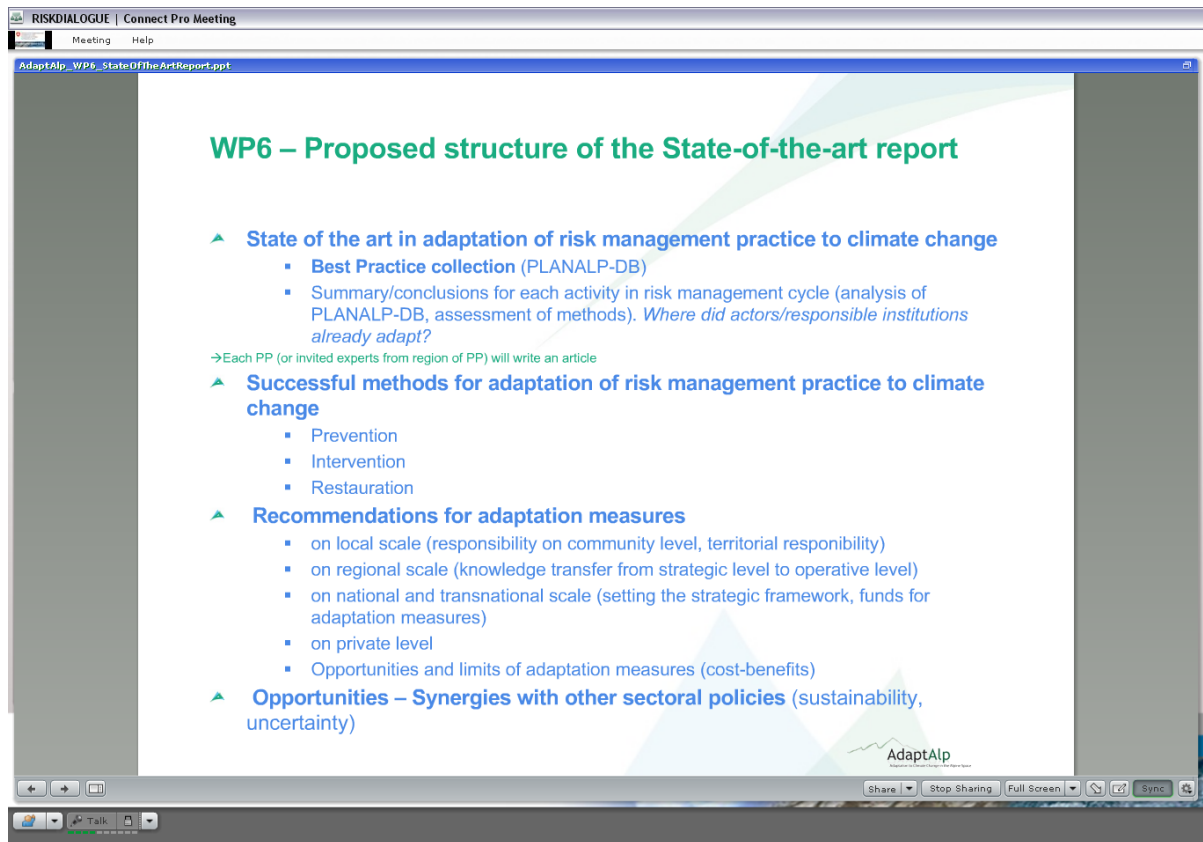**Figure 2: Example of sharing a desktop application.**

Figure 3: Example of a presentation of a document.

4   Deciding which system to use

The ideal system should integrate all the specifications from the various systems described before, with the high reliability of a classical Telephony System, a high security regarding interception with a well-known end user controllable Encryption methodology, at no cost.

Since no system actually available on the market is fulfilling these ideal requirements, the user has to choose the most appropriate system, according to the application field that he/she is working on.

Comparing the various systems is a real complex task; we focused mainly on web conferencing systems because they are the most appropriated systems available at the moment and offer also digital information sharing applications. The traditional Telephony System (PSTN) is to be considered in every case, it is the simplest solution, can be used by everyone, but has the limitation that it does not allow to share information like images, videos or other digital documents or software applications.

Another important key-factor is the security and the user friendliness. Here we enter in a highly discussed issue about using Skype. Skype has a big advantage: it works and is simple to use! It overcomes most network problems, related to firewalls and operating systems, but… what's about the security? At this time Skype is using a proprietary protocol for data transfer, which means that the user cannot control e.g. if the data is intercepted by "a man in middle" and this for some applications can be a critical issue. It must also be said that not publishing the used protocol could also be a security improvement, because this limits external interceptions or attacks.

Some of the systems like Adobe Connect or Lync can be used in a rent-form or implemented in-house. The advantage of using a service from an external provider is that there is no need to take care of a complex IT-System that is also really time-consuming and cost intensive; the big advantage of an in-house solution is the security and the integration with other systems that can be fulfilled much more easily than with an external provider.

We tested the systems mentioned above and Adobe Connect results as the most useful system for our target group and the addressed application. We worked on a service provided by Adobe and experienced a well-balanced system that fulfilled our necessities. The Video-Communication in our test group (4-10 persons) worked very well. We experienced some delay regarding the transmission, but this depends on the available bandwidth of the Internet connections between partners and the other traffic travelling on data-highways. The document-sharing and the whiteboard also performed in a useful way that was intuitive and easy to use. The choice to use an external provider based system is future oriented and allows the user to be independent from future feature upgrade or modifications and if the system is not used daily with a large amount of participants, it is surely the most cost efficient solution.

5   Conclusion

The project partners EURAC, BAFU and PGRN created a list of different ICT tools for remote collaboration and tested the selected tools. One of the most exciting tools tested by BAFU, EURAC, PGRN and the other project partners involved in WP6 was the software Adobe Connect Pro. This tool enables an unlimited number of participants to share their desktops, a whiteboard, a digital flip chart or a document. The participants can communicate with each other through a webcam and a headphone. The user interface of this tool allows to jointly editing a document or a presentation. Moreover, the meeting's moderator can prepare quickly buttons for clicking the pre-chosen answers in voting procedures.

Up to now, the first tests have been successful. The experiences made and the feasibility of video conferences for risk communication were evaluated and summarized. Problems have been encountered with small bandwidths of some project partners. But, the future development of the information and communication infrastructure will overcome this problem. Discussions in video conferences work well if all participants know each other and the team has a proper discussion culture. This means that video conferences cannot replace real meetings totally, but are suited to improve an already existing collaboration. One benefit arises in any case: if these ICT instruments can help only to invest half of the time and costs (and the related CO_2) in efficient work instead of travelling around for WP meetings, risk management could be optimized at any rate. One of the main results of the work package 6 "Risk prevention and management" was the need for intensifying the coordination of the stakeholders in risk management. Video conferencing tools could provide support in the efforts of improving coordination and communication in risk management.

6 References

http://www.webconferencing-test.com/en/webconference_home.html

http://www.terena.org/publications/files/videoconf-reccomendations-dec2005.pdf

http://en.wikipedia.org/wiki/Comparison_of_web_conferencing_software

http://www.gotomeeting.com/fec/online_collaboration

http://static.webex.com/fileadmin/webex09/files_en_us/pdf/data_sheets/mc_ds.pdf

http://www.skype.com/intl/en/features/

http://go.microsoft.com/?linkid=9742888

http://www.adobe.com/products/adobeconnect/features.html

7   Abbreviations

AES Advanced Encryption Standard

PABX private automatic branch exchange / business telephone system

CPU central processing unit: portion of a computer system that carries out the instructions of a computer program, and the primary element carrying out the computer's functions

DSL Digital Subscriber Line: family of technologies that provides digital data transmission over the wires of a local telephone network (i.e. ADSL)

ID Identity

IP Internet Protocol: principal communications protocol used in the Internet

PSTN public switched telephone network

RAM Random-access memory: computer data storage

SIP Session Initiation Protocol: signalling protocol, widely used for controlling multimedia communication sessions such as voice and video calls over Internet Protocol (IP)

VoIP Voice over Internet Protocol: family of methodologies, communication protocols, and transmission technologies for delivery of voice communications and multimedia sessions over Internet Protocol (IP) networks, such as the Internet.