



World Conference on Disaster Reduction

18-22 January 2005, Kobe, Hyogo, Japan

ECHO/ISDR good practices for resilient communities

Goma Volcano Risk Reduction

INTRODUCTION /BACKGROUND

The volcano Nyiragongo is an important strato-volcano towering at 3.470m. It has been very well known for the permanent activity of lava lake in the main crater. This lava lake emptied during a lateral eruption in 1977 and was later feeded in 1982 and 1994 : it raised then its level into the crater.

Another eruption occurred in January 2002, once again emptying the crater. Activity reappeared some months later and today an important lava lake is growing up into the central crater.

The January 2002 eruption of volcano Nyiragongo has deeply impacted the city of Goma : 18 % of its surface has been destroyed, forcing the evacuation of some 300.000 persons and actually leaving 120.000 people homeless. About 110 persons died as an immediate consequence of the eruption and approx. 80 % of the local economy has been destroyed. In November 2002 renewal of activity occurred in the Nyiragongo crater with the reappearance of an active lava lake. Since then the level of activity is regularly growing, putting at risk an estimated population of some 460.000 persons.

The permanency of the volcanic activity has also a very deep impact on the environment. A huge volcanic gas plume is constantly emitted by the crater with Sulfur dioxide quantities ranging from 12.000 to 50.000 metric tons per day, this represents approx. 50% of the total volcanic SO₂ emitted by all volcanoes around the world. As a consequence, acid rains are burning forests and crops and very high concentrations of Fluoride are polluting drinking water.

This constant volcanic activity could last for years or decades, exposing the population to direct volcanic risks with a possible new eruption or impacting the same population with indirect risks like damages to crops, pollution of air and water.

MAJOR ACHIEVEMENTS

During the World Conference on Disaster Reduction, we will have to present 2 posters with the main achievements of the UN interagency programme (BCPR-UNDP, ISDR, OCHA) for development of disaster reduction capacities within the Goma area/North-Kivu, DRC and its vicinities.

- For the first time since 1996, the Goma Volcano Observatory and its staff is maintained alive and full time working.
- Since the last eruption in January 2002, volcano Nyiragongo is permanently under surveillance.
- Monitoring networks have been deployed or strengthened : 7 seismic stations with digital seismometers radio-connected in real time to GVO ; ground deformation surveillance network ; thermal anomalies surveillance network ;

- geochemical survey network and regular field works (twice per month) on Nyiragongo crater for lava lake activity observations.
- 6 members of the congolese GVO staff have followed formation or specialization sessions in foreign institutions (Hawaii, Italy)
 - 12 experts from different countries (France, Italy, USA, England, Denmark) have made stays in GVO and developed new techniques with the local staff.
 - A meeting of national and international experts having worked on Nyiragongo has been held for establishing the present level of knowledge on volcano Nyiragongo and determining new paths in volcano surveillance. An important result is the building of a Technical and Scientific Advisory Committee giving recommendations to the UN Interagency Programme and to GVO.
 - A preliminary volcanic hazard map has been prepared with simulations of all potential lava flows in the area.
 - Early warning system has been initiated.
 - A dedicated video program has been realized on volcanic hazards around the Virunga volcanoes : it is now the most efficient communication tool.
 - Public education sessions on volcanoes and related risks have been organized by a team of 15 animators. They have been working within the city of Goma and surroundings and in 2 years a total of 260.000 beneficiaries have been following these sessions.
 - A seminary gathering all professors and teachers in geography or natural sciences has been organized for a reajustement of knowledge and pedagogy in earth sciences. It has been decided to collect all material used during the seminary and to edit a book destined to the teachers as well as all students from secondary schools. Same project is under study for primary schools. These books could be used for a total of 25.000 children every year.
 - 90.000 leaflets in French and Swahili have been printed and distributed
 - 55 panels explaining the alert system and showing the present alert level have been set up in several public places and schools
 - Weekly regular messages are broadcasted by the two existing local radio networks, some messages being relayed by the national network

LESSONS LEARNED AND CHALLENGES

The main lesson is that volcano emergencies are “non-ending emergencies” : the active volcano is developing its own pattern, with many changes in the type or in the level of activity. But this activity is always lasting, putting people at risk for many years or decades, even centuries... The only response is permanent surveillance and vigilance, accompanied by permanent community awareness. In this frame, education and communications have to be constant also.

Another important lesson is that communication is much more effective if specific tools are build for specific problem or population group. In the past we did use general information tools about volcanoes and volcanic risks. The dedicated video program on Virunga has dramatically changed this approach and shown more efficiency when speaking about the local volcanoes only and using specific approach (by ex. 3D models instead of maps that are not understood by local population).

The main challenge is developing such a program in an area of conflict : population and authorities are facing many different dangers and their interest is changing according to other local problems.

Another challenge is to maintain field developed networks with many equipment and to pursue field work in an area with a high insecurity level : attacks and looting are main problems.