

SHARE - PROJECT STRUCTURE

ACTIVITY SECTOR	WORKPACKAGE	THEMATIC AREA
Scientific Research and Climate Reference Person <i>P. Bonasoni</i> <i>(CNR-ISA C)</i>	WP 1 Integrated Project for climatic, environmental and geophysical monitoring, at local, regional and global scale: Asia (Him alaya-Karakorum) Africa (Ruwenzori) Europe (Alps and Apennines) South America (Cordillera Real)	<i>WP 1.1</i> Atmosphere
		<i>WP 1.2</i> Glaciology
		<i>WP 1.3</i> Energy and water cycle
		<i>WP 1.4</i> Limnology
		<i>WP 1.5</i> Biodiversity and natural resources
		<i>WP 1.6</i> Medicine
Technological Research and Climate Reference Person <i>P. Laj</i> <i>(CNRS)</i>	WP 2 Scientific research and industry for the development of a state-of-the-art technological system in the field of environmental monitoring in mountain areas.	
Information System Reference Person <i>M.T. Melis</i> <i>(University of Cagliari)</i>	WP 3 Multidisciplinary Information System concerning scientific and technological research activities in mountain areas, to the benefit of government and inter-government scientific agencies.	
Capacity building Reference Person <i>F. Salerno</i> <i>(CNR-IRSA)</i>	WP 4 program supporting decision-making processes, at governmental level, in the environmental field; transfer of skills and technologies in order to produce and assure a sustainable development; technology transfer, business promotion and institutional offer system.	

WP1 - Scientific research and climate
Paolo Bonasoni (ISAC-CNR, Ev-K2-CNR)

SHARE SCIENTIFIC RESEARCH AND CLIMATE promotes the multidisciplinary study of the phenomena linked to global change, developing research activities in six thematic areas:

atmosphere,
glaciology,
energy and water cycle,
limnology,
biodiversity and natural resources,
medicine.

The **SHARE** network is made up of stations in Italy and around the world which monitor the environment and atmosphere. This network's stations have been running in Nepal and Italy for several years: the Pyramid Laboratory - Observatory at 5000 m a.s.l. near Mt. Everest and the ISAC - CNR "Ottavio Vittori" station on Mt. Cimone, hosted by Italian Air Force Meteorological Service.

Additional research sites have since been added in Pakistan and Uganda, and observation sites in South America are being identified.

With its stations in Europe, Asia and Africa, today SHARE contributes to international integrated scientific projects on the climate and environment, such as:

UNEP-ABC, WMO-GAW, WCRP-GEWEX-CEOP, NASA-AERONET, ILTER, EUSAAR.

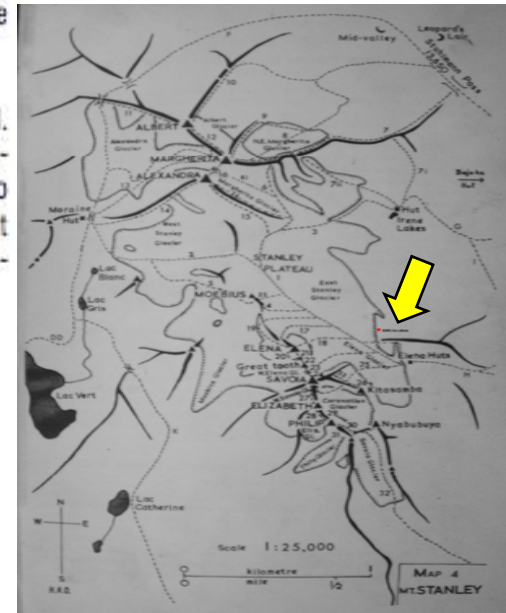


Ruwenzori weather station
Altitude 4750 m asl
Latitude N0° 22'34.55"
Longitude E 29° 52'43.24"



The station has been installed on June 18, 2006 on the occasion of the celebration of the first ascent of mt Ruwenzori by Duke of Abruzzi, on Stanley plateau (4750 m asl) the widest glacier mass of the Ruwenzori . The station, provided by Milan Lastem company, is the same model station that has been largely tested in the Ev-K2-CNR high altitude monitoring network both in Himalaya and Karakorum. The station records the 7 standard parameters of the WMO (air temperature, relative humidity, atmospheric pressure, global solar radiation, wind speed and direction, rainfall). The installation has been carried out observing the restrictive rules fixed by the Ruwenzori National Park: minimum environmental impact and adequate distance from the trekkers' route.

Mt Ruwenzori is characterized by a wide rain forest at an altitude between the 2500 and 3500 m asl. Such condition contributes to a temperate microclimate defending the glacier mass form the aggression of the deep equatorial solar radiation. There are two rainy periods (Spring and Autumn) and two dry Seasons (winter and summer), and the mount is often surrounded by a thick blanket of clouds, but a minimum temperature below zero at an altitude of 3300 n asl and a frequent snowfall at an altitude of 4300 m asl have also been recorded.



MOU with the Uganda Meteorological Department (UMD) for high altitude weather stations network management signed on 2009

WP - 2 Technological research and climate *Paolo Laj (LGGR Grenoble, CNRS)*



SHARE includes:

a component of technological innovation regarding the instrumentation for climate monitoring in remote high altitude areas, also in close collaboration with the private sector,

other than the set-up of high mountain research station for the climate observations and climate change studies.

A sophisticated technological system called **Nano-SHARE** has been created to overcome the difficulties often experienced in installing high altitude stations: e.g. extreme conditions, transport, technical aspects, power supply problems and data transmission .



In early 2009, Ev-K2-CNR installed the first prototype of **Nano-SHARE** in collaboration with CNR and CNRS in a test campaign along the Himalayan Khumbu Valley (April 20 - May 5) and at the Nepal Climate Observatory – Pyramid, 5,079 m a.s.l. Following these tests, **Nano-SHARE** will be improved for installation in 2010 at 8,000 m on Mt. Everest's South Col, home to the world's highest weather station since 2008.



SHARE TECHNOLOGICAL RESEARCH AND CLIMATE OBJECTIVES

1- to improve scientific knowledge of atmospheric composition changes (sources, transport, etc..) in remote areas (i.e. high altitude environments)

2- to adapt state-of-the-art monitoring technologies to extreme weather conditions (high altitude environments) : NCO-P

3- to develop a cost-effective automatic station for monitoring aerosol and gas phase species : SHARE-Box



The NCO-P atmospheric station, Nepal

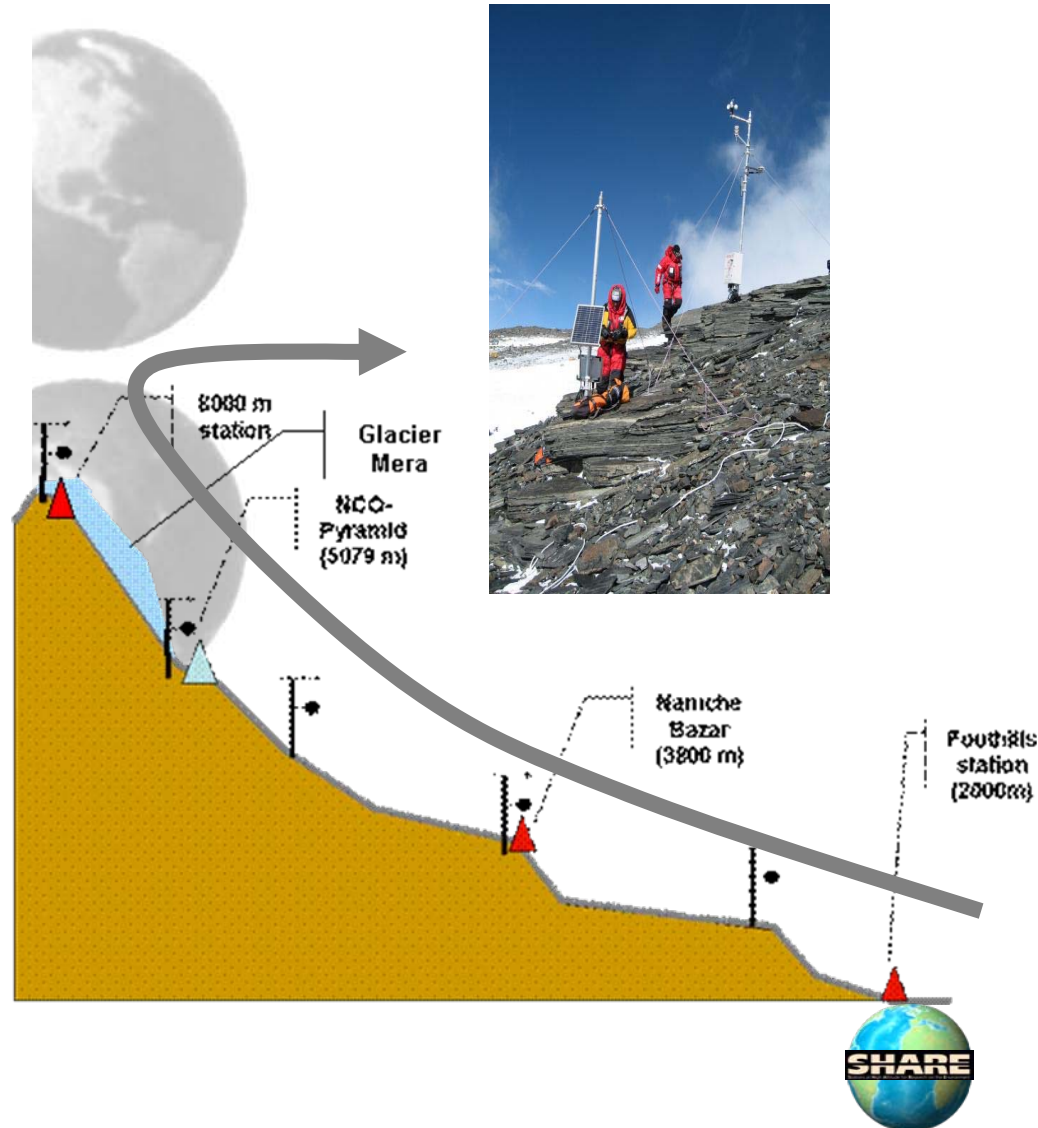
SHARE TECHNOLOGICAL RESEARCH AND CLIMATE CHALLENGE

Scientific Rationale :

Substantial contribution of polluted boundary layer air at NCO-P due to upslope valley winds.

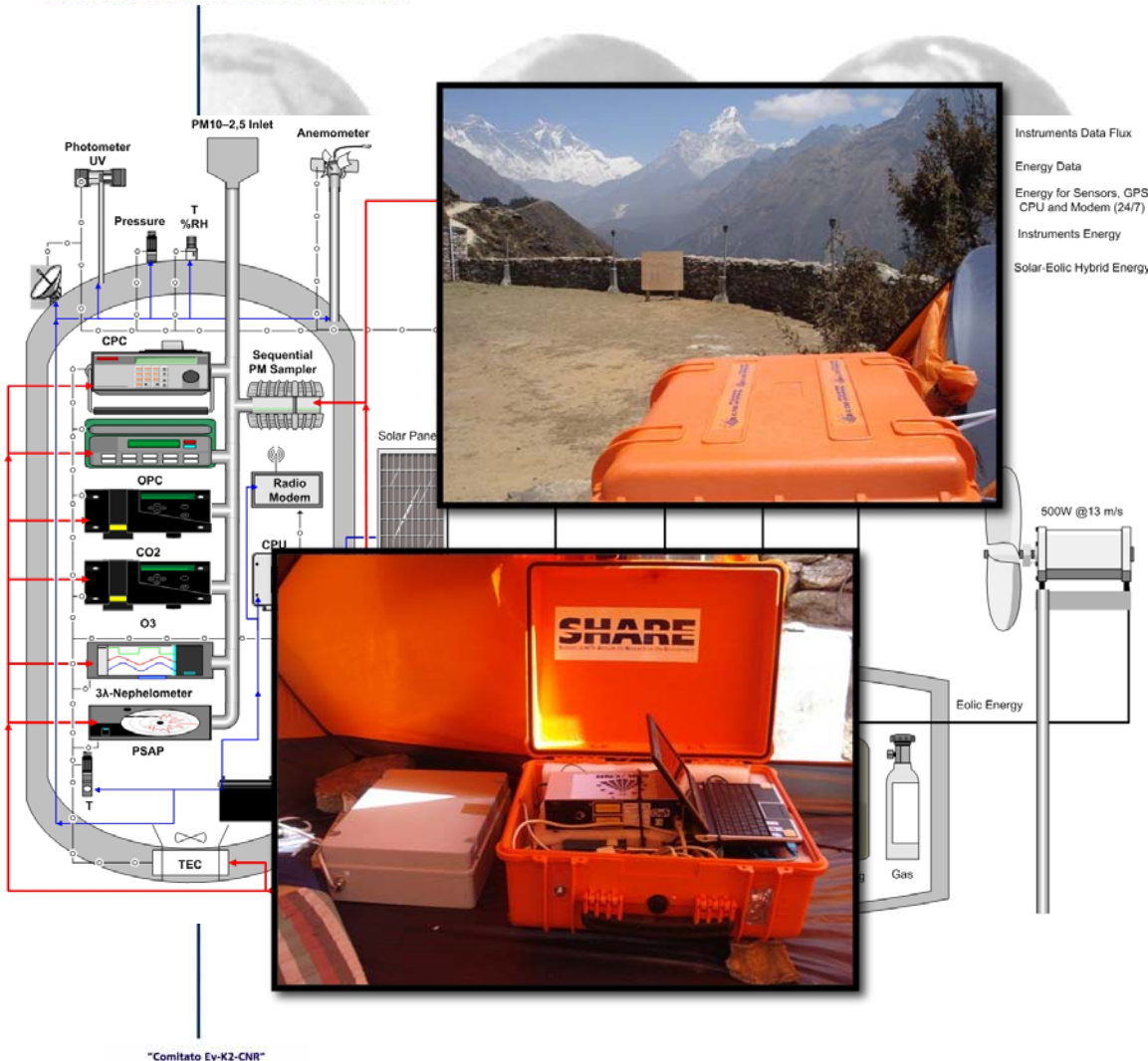
Question 1: is pollution detectable higher up in the glacierized area (impact on glacier melting) ?

Question 2: is orographic lifting of polluted air masses an efficient transport mechanism into the free tropospheric (impact on climate)



SHARE TECHNOLOGICAL RESEARCH AND CLMATE CHALLENGE

SHARE
Stations at High Altitude for Research on the Environment



SHARE-Box to be installed in May 2010 at South col near the meateorological station

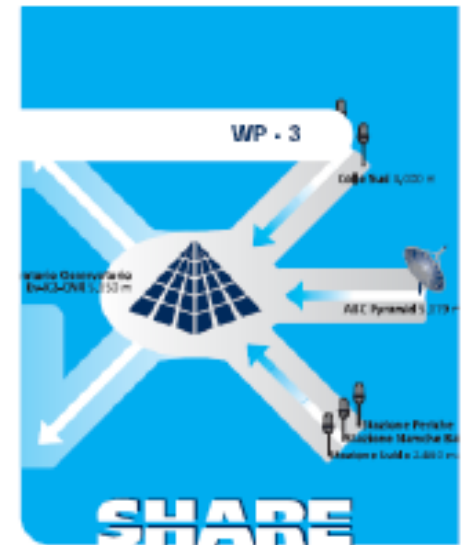
- Measurement of O₃, CO₂, Particle number and size
- Power consumption < 50 W
- Integrated power production unit
- Remote control and NRT
- Preliminary tests for low pressure and temperature already performed
- Prototype tested during the 2009 spring campaign



WP - 3 SHARE Information system Maria Teresa "Titi" Melis (Cagliari University)



An integrated GIS database for environmental data management in the high mountains regions will be created.



Two principal and integrated actions are planned:

- a shared database for the collection, management and access to spatial and non spatial data;
- a dedicated thematic portal for the access to distributed databases and directly to remote high altitude stations.

Electronic information systems and databases that are accessible to governments and scientific research institutes facilitate the dissemination of knowledge, helping improve understanding of climate change phenomena and mitigation of the effects.



SHARE INFORMATION SYSTEM

SHARE
Stations at High Altitude for Research on the Environment

SHARE
Stations at High Altitude for Research on the Environment



International Conference
"Mountains: energy, water and food for life."
The SHARE project:

The key criteria for an open portal is that it be fully interoperable with all the other spatial resources on the Web that are equipped with interfaces, encodings etc.

The SHARE Information System is an open portal of environmental data managed by the University of Turin.

University of Turin

DOCUMENT MANAGEMENT COMPONENT

DATA MAINTENANCE COMPONENT

DISTRIBUTION DATABASE

Partners and correlated networks



United Nations Environment Programme



GIIDA



National Research Council of Italy (CNR)
Department of Earth and Environment (DTA)



univaq.it

- Project Atmospheric Brown Clouds (ABC) - UNEP.
- AEROSOL ROBOTIC NETWORK (AERONET) - NASA
- Coordinated Enhanced Observing Period (CEOP) - WMO
- Global Atmosphere Watch (GAW) - WMO
- Global Land Ice Measurement from Space (GLIMS) - NASA
- Global Seismographic Network (GSN)
- International GNSS (Global Navigation Satellite Systems) Service (IGS)
- International Long-term Ecological Research Network (ILTER)



Ev-K2-CNR



World Meteorological Organization
Working together in weather, climate and water



GCOS

Global Climate Observing System
Ensuring the Availability of Essential Observations for 4 Climate



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