

The SHARE project: mountain climatic observations at high altitude

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Stations at High Altitude for Research on the Environment – SHARE, is an integrated scientific and technological research project devoted to environmental monitoring and climatic studies in mountain regions. Promoted by Ev-K2-CNR Committee, SHARE activities are carried out thanks to ongoing support from CNR, the Italian Ministry of Foreign Affairs and the Ministry of Education, Universities and Research, and in collaboration with the Ministry of Economy and Finance and the Ministry of Agricultural and Forestry Policy. Thanks to support from the Italian Cooperation, funds are provided by UNEP for atmospheric monitoring activities related to their ABC Project.

SHARE allow to promote knowledge in the fields of meteo-climatic observations, atmospheric composition and dynamic processes, glaciology, hydrology and limnology, geophysics and natural risks, precise measurement of Earth surface coordinates, biodiversity and natural life. In this way the project contributes to better understand climate change on local, regional and global levels, to study the climate change impacts and adaptation strategies, with special attention to natural resources and mountain ecosystem conservation other than food security. The project assures continuous environmental monitoring in mountain sites (at times difficult to reach) carrying out high quality observations and measurements. For this reason the data collected provide useful and peerless information to several international programs, such as: GEWEX-CEOP, UNEP-ABC, WMO-GAW, WCRP- NASA-AERONET, ILTER, also providing essential support for the decision-making process of governments and international agencies.

Originally launched in the Himalaya – Karakorum region (Asia), SHARE has expanded its network in Africa (Uganda) and Europe (Italy), spreading out to South America (Bolivia) in the planning stages. Both observatories for climate monitoring and automatic weather stations (AWS) are currently included in the SHARE network. They are located at different altitudes from 2,165 m a.s.l. like Mt. Cimone to maximum height of 8,000 m a.s.l. like Mt. Everest South Col. The SHARE stations guarantee long term continuous measurements, ensuring homogeneity and completeness in the data, collected in international database (e.g. CEOP, ABC, GAW, ...). The AWS in Nepal and Pakistan are Reference Stations in the CEOP project under the WMO's World Climate Research Programme (WCRP) – Global Energy and Water cycle Experiment (GEWEX) initiative. Ev-K2-CNR recently founded a special interest group called "CEOP-High Elevation" (CEOP-HE), which is devoted to study change in hydrological and energy cycles in high elevation regions and studying the role of mountains within the climate system on a local and global scale. The Nepal Climate Observatory at Pyramid (5079 m in the Nepalese Himalayas) is part of the UNEP – Atmospheric Brown Clouds project and together Mt. Cimone CNR Station (Italian Apennines) they are part of WMO Global Atmospheric Watch Program. These observatories carried out continuous measurements of aerosol (e.g. black carbon, scattering and absorption coefficients, size distribution, chemical composition, AOD,...), trace gases (ozone, halocarbons,) and solar radiation. More recently, in the framework of SHARE, a new program devoted to study climate change impacts on HKKH's glaciers is started.

Future plans of the SHARE project include extension of the network, the addition of other key research areas including hydrology, and creation of mechanisms to favour exchange of data amongst high altitude networks. In coordination with other global research and monitoring projects, SHARE could provide a more organic and well-distributed interdisciplinary network, thus allowing governments and international agencies to better face impacts of climate change effects on energy and water budgets and elaborate appropriate adaptation strategies.

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