



United Nations
Educational, Scientific and
Cultural Organization
1945-2015



International
Hydrological
Programme



Flanders
State of the Art

The Impact of Glacier Retreat in the Andes: International Multidisciplinary Network for Adaptation Strategies

Agenda 2015-2016

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UNESCO



Agenda 2015-2016: Background

- Project initiation in 2012 in Lima
- Proposed activities by the regional inception meeting, with three main focusses:
 - ✓ Climate impact assessment: snow, glacier, and water resources
 - ✓ Vulnerability assessment
in the Andean Region
 - ✓ Policy assessment in the
Andean Region





Agenda 2015-2016: Background

Expected Results of the project



Social and Institutional

Human and institutional capacities strengthened to cope with climate change impacts in the Andean region



Scientific development

- *Trends and variability of climatic parameters developed;*
- *downscaled climate scenarios distributed;*
- *time series of climate scenarios for selected points water basins*
- *water availability and demand for current and future period scenarios of water stress at various time scales;*



Synthesis Studies and Political framework

Identification of land use changes and socio-economic conditions as a result of climate change; identification of most vulnerable communities and groups across the study area; analysis of policy and framework conditions to support mountain communities adaptation; ...



Agenda 2015-2016: Proposed Activities

1. Climate impact assessment: snow, glacier, and water resources
 - a. Background paper on snow and glaciers in the Southern Andes
 - b. Mountainous Watershed Case study
 - c. Training course on mountain hydrology and ecosystem services
 - d. Strengthening of ongoing mass balance research
2. Vulnerability assessment in the Andean Region
3. Policy assessment in the Andean Region
4. Crosscutting
 - a. Website of the Working Group on Snow and Ice
 - b. Education and capacity building





Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

a. **Background paper on snow and glaciers in the Southern Andes**

by Dr. Gino Cassasa of the Universidad de Magallanes on 'Vulnerability and threats to snow and glaciers in the Southern Andes'

- Observations during the 20th century, mentioning observed climate change and glacier retreat (1900-2014)
- Current knowledge on the impact of extractive industries on glaciers and snow-masses
- Impacts of glacier retreat (water supply, quality and biodiversity)
- Projections for the 21st Century
- Identification of adaptation strategies, covering technological, scientific and policy instruments



Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

b. Mountainous Watershed Case study

- *Use of climate information to understand water availability at the watershed scale*
- *Different Case studies: Comparing different methodologies*
 - ✓ **Proposed pilot catchment: Huasco basin**

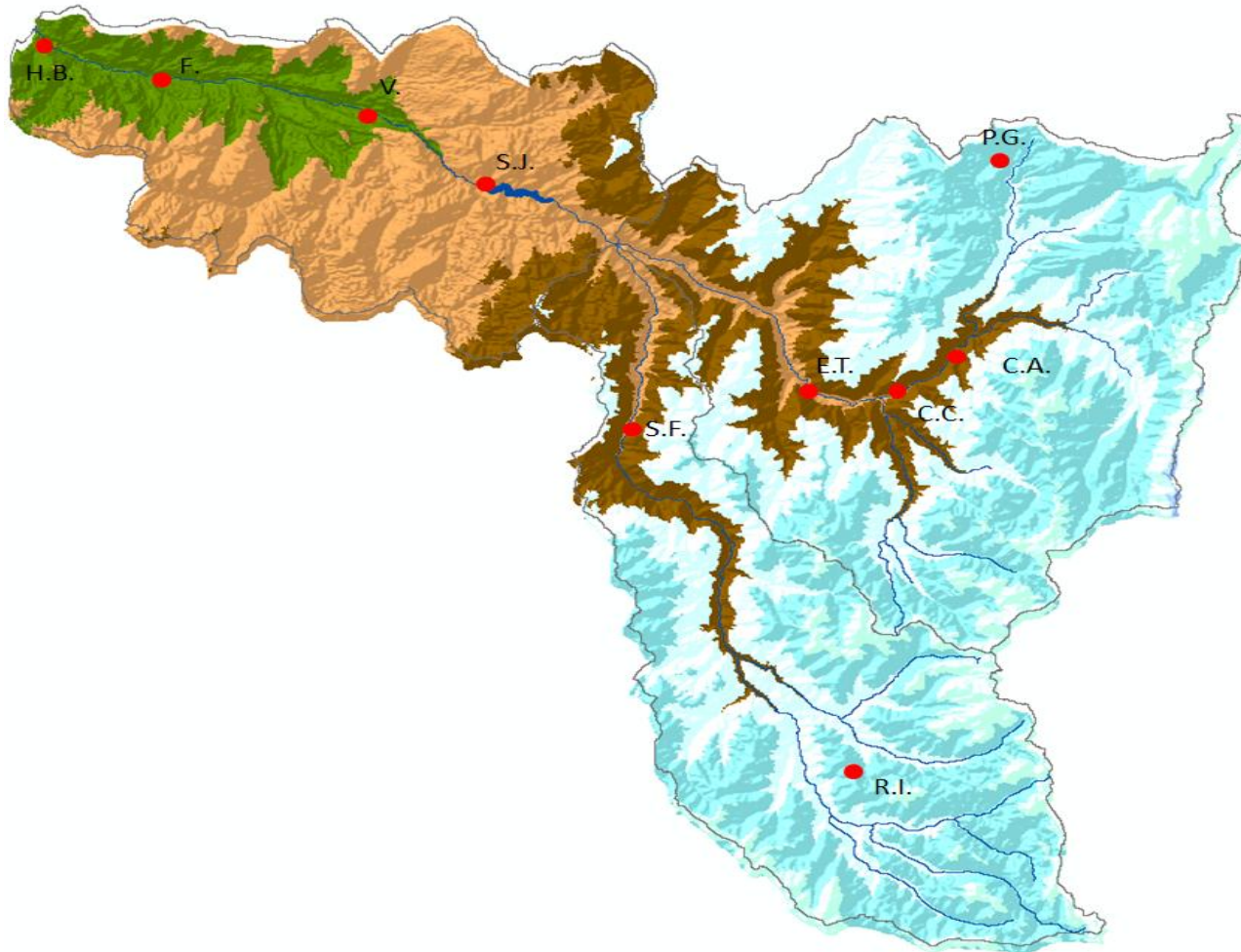
Test-bed for different data and products, and the application of Integrated Water Resource Management Techniques of different partners (e.g. Princeton University, UCIrvine, CEAZA, Birmingham University, Imperial College of London)





Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

b. Mountainous Watershed Case study





Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

b. Mountainous Watershed Case study



ACTIVIDADES ECONÓMICAS PRINCIPALES EN LA CUENCA DEL RÍO HUASCO

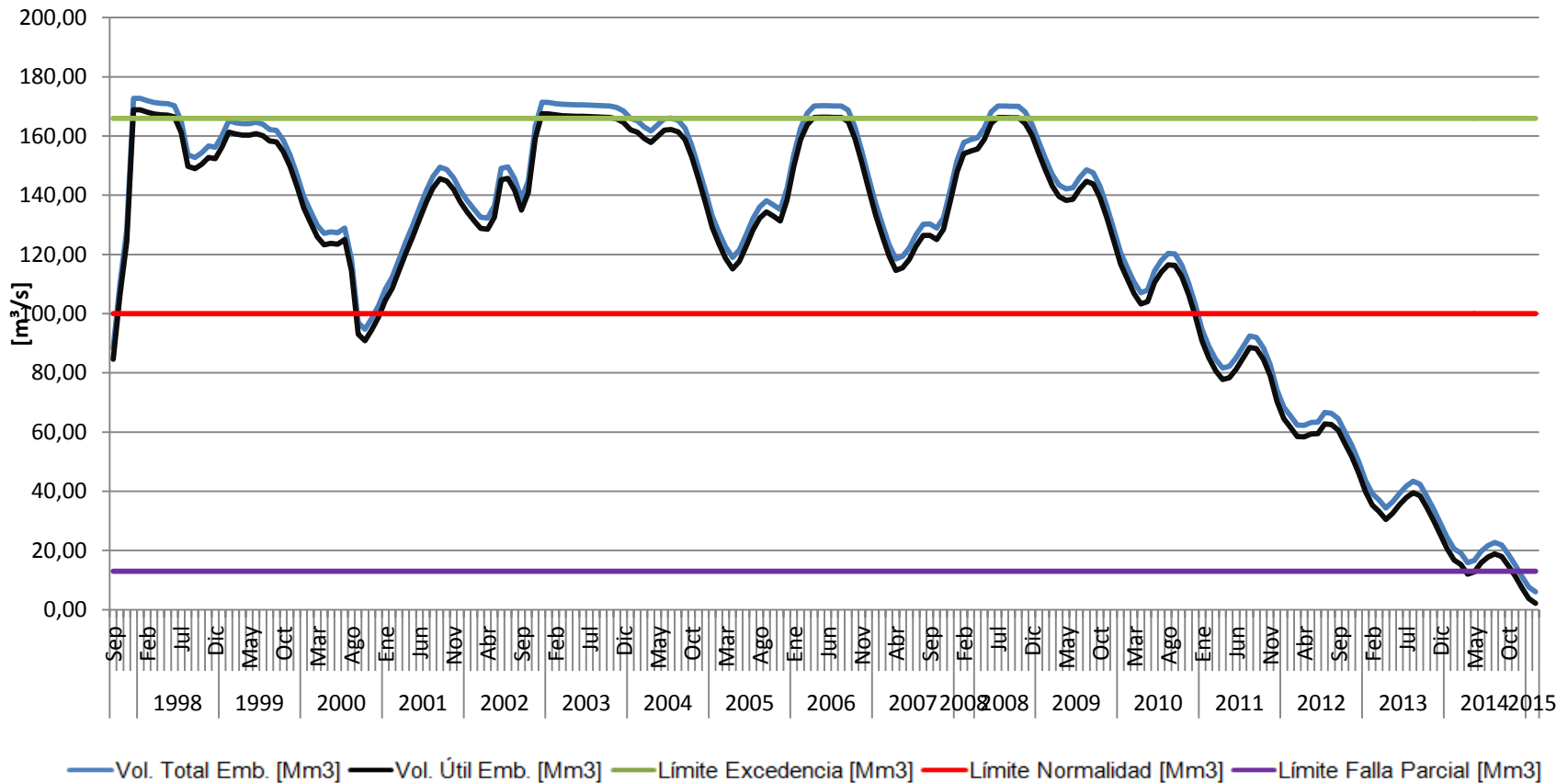




Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

b. Mountainous Watershed Case study

Evolución Embalse Sta Juana Septiembre 1997 - Febrero 2015
Volumen Acumulado (Millones de m³)





Proposed Activities: *1 Climate impact assessment: snow, glacier, and water resources*

b. Mountainous Watershed Case study





Proposed Activities: 1 *Climate impact assessment: snow, glacier, and water resources*

c. Training course on mountain hydrology and ecosystem services

To address the impact of climate change on mountain communities, storage of water resources in snow driven watersheds and related complex hydrological interactions.

First workshop (in collaboration with and co-funded by ITT, Köln, Germany)



Symposium and Professional Training

Understanding the role of Andean hydrology for water management: tools and concepts

17th – 20th November 2015
Santiago, Chile



Proposed Activities: *1 Climate impact assessment: snow, glacier, and water resources*

d. Strengthening of ongoing mass balance research

- Scientific conference in Valdivia
 - ✓ As follow-up on the training course on mountain hydrology
 - ✓ Presenting current knowledge
 - ✓ Presenting advances of the UNESCO Working group on Snow and Ice
- Publication of manual for mass balance analysis



Proposed Activities: 2 *Vulnerability assessment in the Andean Region*

2014

- ✓ Detailed assessment to identify the impact of glacier melt on water resources in the region
- ✓ Highlighting of vulnerable areas in the Andean Countries

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- ✓ Editing and publishing this material for a broad and general public. (e.g. an atlas of water availability through snow and ice contributions)

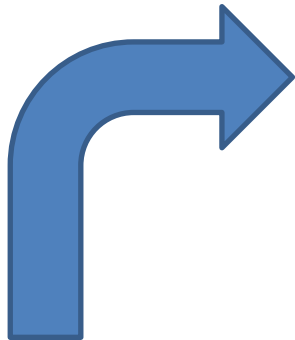




Proposed Activities: 3 *Policy assessment in the Andean Region*

Currently available

- ✓ *Education, climate change, water and glaciers*
- ✓ *Prioritizing scientific research for developing adaptation policies*
- ✓ *Policy needs and gaps to address vulnerability (environmental and non-environmental) challenges in the Andean Region*
- ✓ *Climate Change Adaptation local practices in the Andean Region*



- Further translating, editing and publishing existing background papers and Policy Briefs
 - Release of additional Policy Brief
 - ✓ by Ms. Elma Montaña (Director of the Science Programme at IAI)
- ‘Existing climate change adaptation policies and challenges and opportunities for their implementation’



Proposed Activities: 4 Crosscutting

a. Website of the Working Group on Snow and Ice

- ✓ Updating the website with direct products of the activities
- ✓ Proposal for data portal tool

b. Education and capacity building

- ✓ In collaboration with the Education for Sustainable Development programme
- ✓ A regional conference on Education and Climate Change hosted by UNESCO in Costa Rica





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