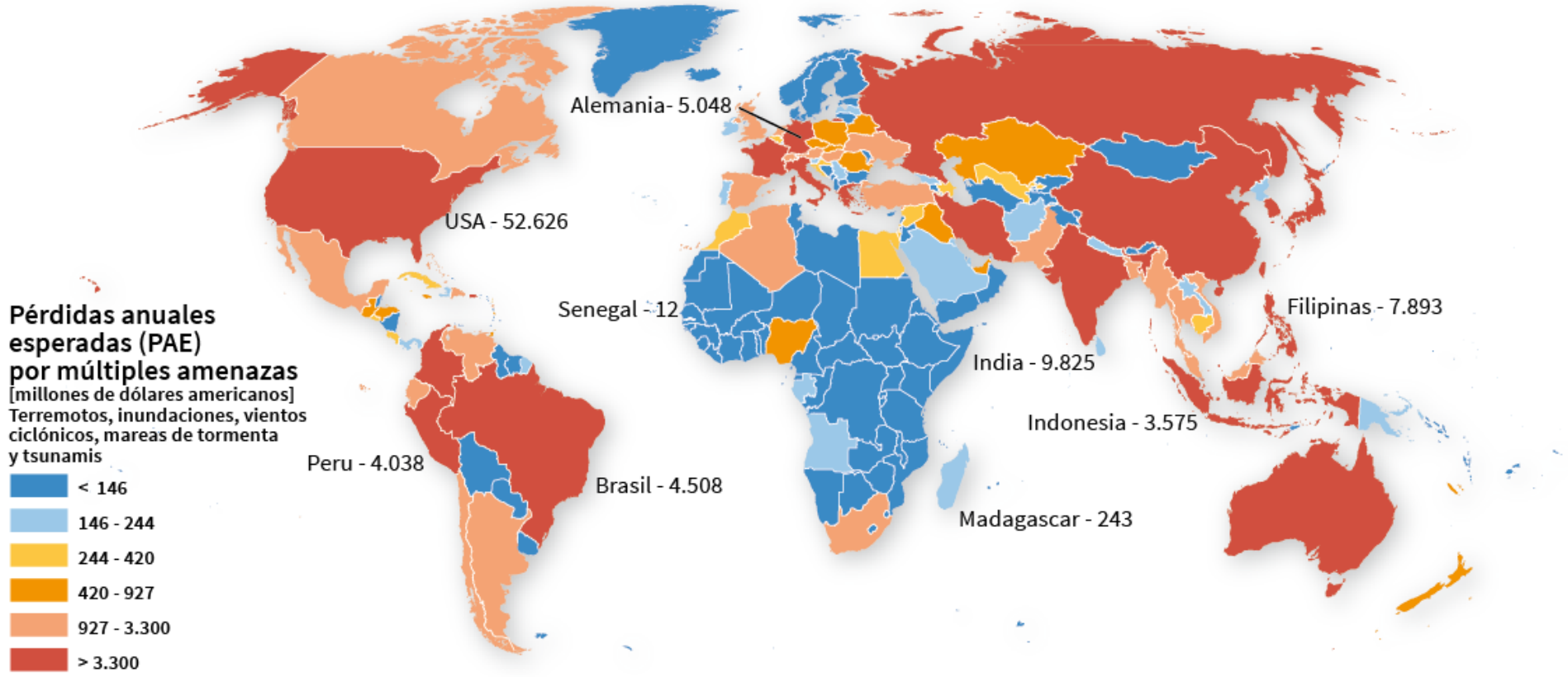
Enhancing Resiliency in Peru: climate related risk management

APEC Climate Symposium 2015
From science to action: the use of weather and climate information for efficient disaster risk management

Manila, november2015

A World at Risk



Future expected losses due to multiple hazards
(US $ millions/year)
GART Report, 2015

Escenarios de vulnerabilidad ante el Cambio Climático en el territorio peruano

El Perú es uno de los países más vulnerables del mundo ante los efectos del cambio climático

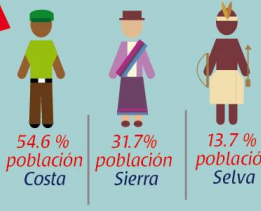
Datos del PERÚ

Población:

al año 2011: 29, 789 millones de habitantes

Proyección 2021: 33 millones de habitantes

Fuente: INEI



54.6 % población Costa | *31.7% población Sierra* | *13.7 % población Selva*

Razones porque el PERÚ es vulnerable al C.C

7

1. Zonas costeras bajas
2. Zonas áridas y semiáridas
3. Tiene zonas de alta contaminación atmosférica.
4. Tiene ecosistemas montañosos frágiles
5. Zonas expuestas a inundaciones, sequías y desertificación
6. Zonas propensas a los desastres naturales
7. Zonas con cobertura forestal expuestas al deterioro de la misma

Fuente: Segunda Comunicación Nacional de Cambio Climático (SCNCC)

El 9.5 % de su PBI

está compuesto por actividades sensibles a cambios en el clima: agricultura, ganadería, pesca y electricidad

Efectos directos del Cambio climático:

Aumento en la frecuencia e intensidad del Fenómeno del Niño

Pérdida de glaciares

Aumento en el nivel del mar

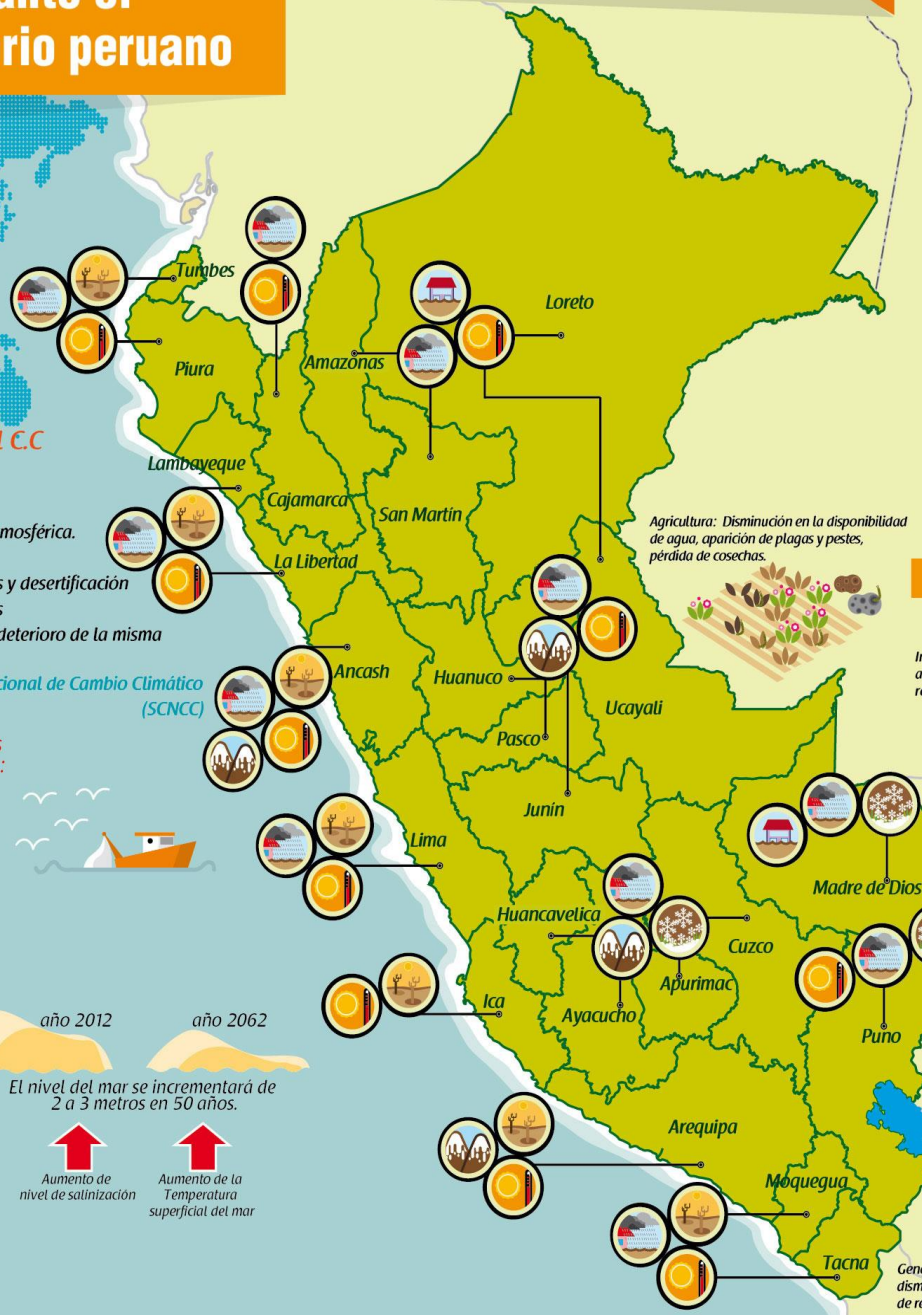
Fuente: SCNCC

El nivel del mar se incrementará de 2 a 3 metros en 50 años.

Aumento de nivel de salinización

Aumento de la Temperatura superficial del mar

Efectos desencadenantes del cambio climático



Actividades afectadas:

Agricultura: Disminución en la disponibilidad de agua, aparición de plagas y pestes, pérdida de cosechas.

Industria pesquera y artesanal: Reducción de recursos hidrobiológicos.

Ganadería: Reducción de tierras para pastoreo.

Turismo: Pérdida de vías de acceso y comunicaciones.

Infraestructura: Pérdida de viviendas y carreteras por desastres naturales extremos.

Salud: Aparición de enfermedades relacionadas con el deterioro del agua, alimentos y aire, aumento de mortalidad, inseguridad alimentaria

Generación de Electricidad: disminución en la disponibilidad de recursos agua.

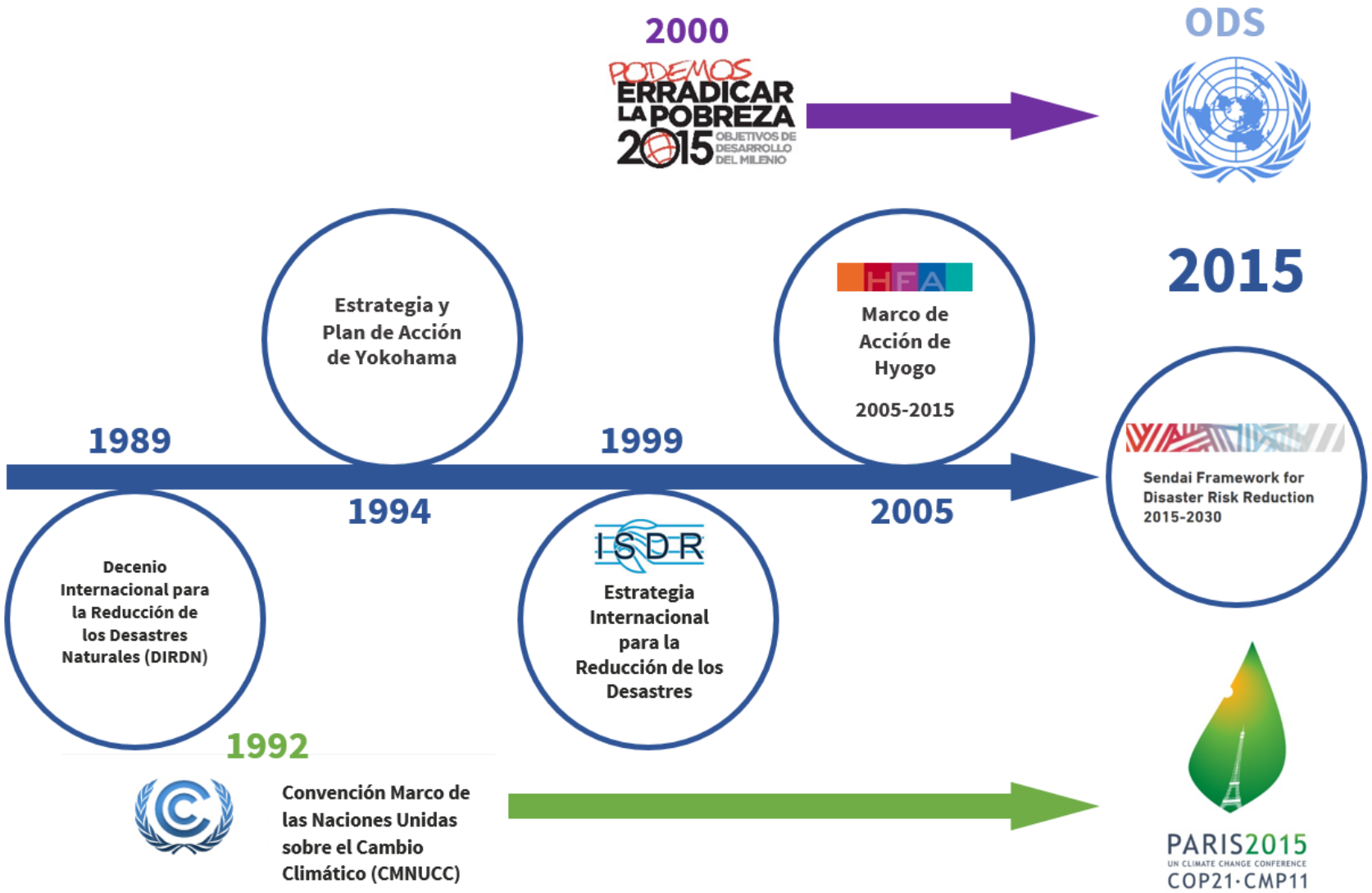
SPDA 25 Años

MacArthur

Our challenge: to learn to live with multiple risks..

to move from *victims to citizens*

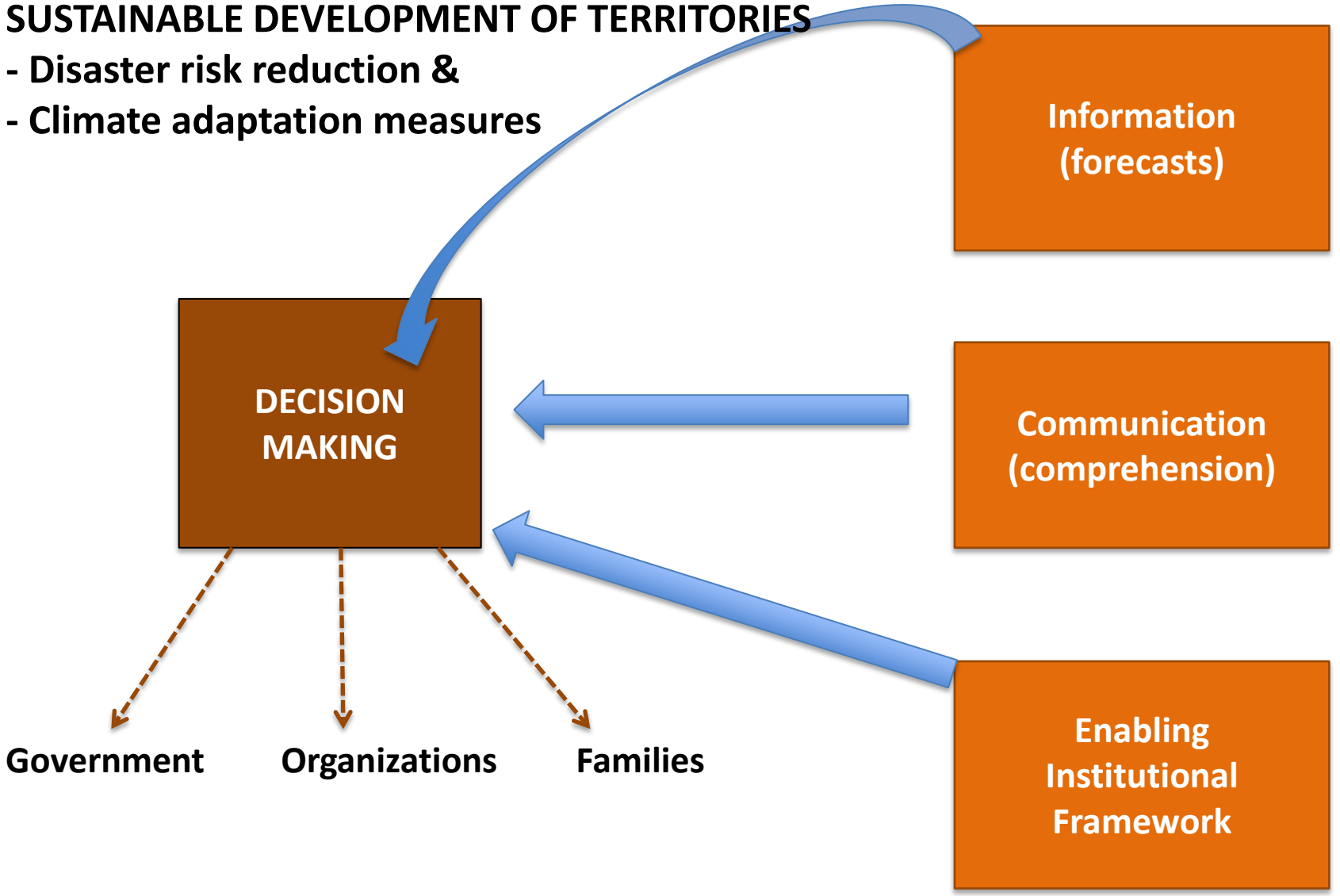
International Agreements to reduce Risks



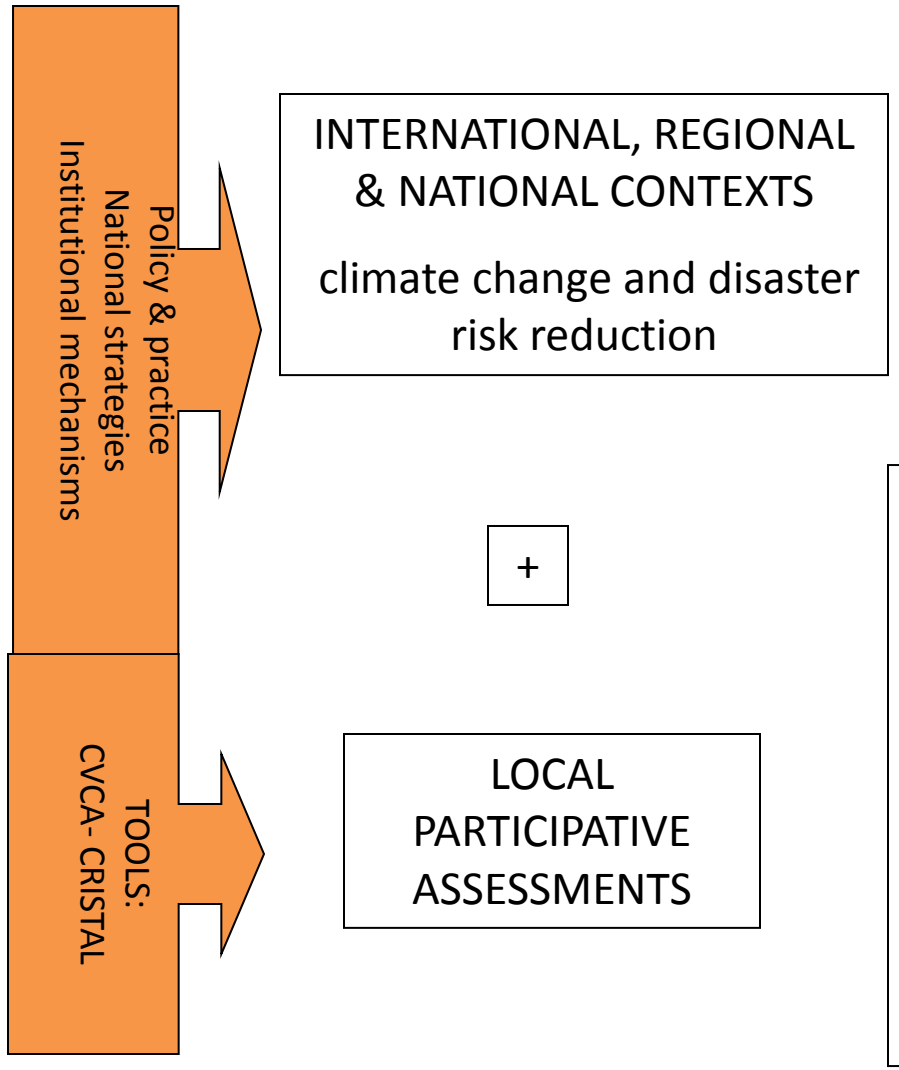

Sendai
FRAMEWORK
Scope and Purpose
1 Global Outcome
1 Goal
7 Global Targets
13 Guiding Principles
4 Priorities for Action
at 4 Levels
Local, National, Regional and Global
Role of Stakeholders
International Cooperation and Global Partnerships


4 PRIORITIES FOR ACTION
Priority 1
Understanding disaster risk
Policies and practices for DRR should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.
Priority 2
Strengthening disaster risk governance to manage disaster risk
Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk.
Priority 3
Investing in disaster risk reduction for resilience
Public and private investment in DRR are essential to enhance the economic, social, health & cultural resilience of persons, communities, countries, their assets, as well as environment
Priority 4
Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction
Strengthened disaster preparedness for response, recovery, rehabilitation and reconstruction are critical to build back better
National and local dimensions
Regional and global dimensions

SUSTAINABLE DEVELOPMENT OF TERRITORIES
- Disaster risk reduction &
- Climate adaptation measures



Community-Based Adaptation & risk management



INTERNATIONAL, REGIONAL & NATIONAL CONTEXTS

climate change and disaster risk reduction

+

LOCAL PARTICIPATIVE ASSESSMENTS

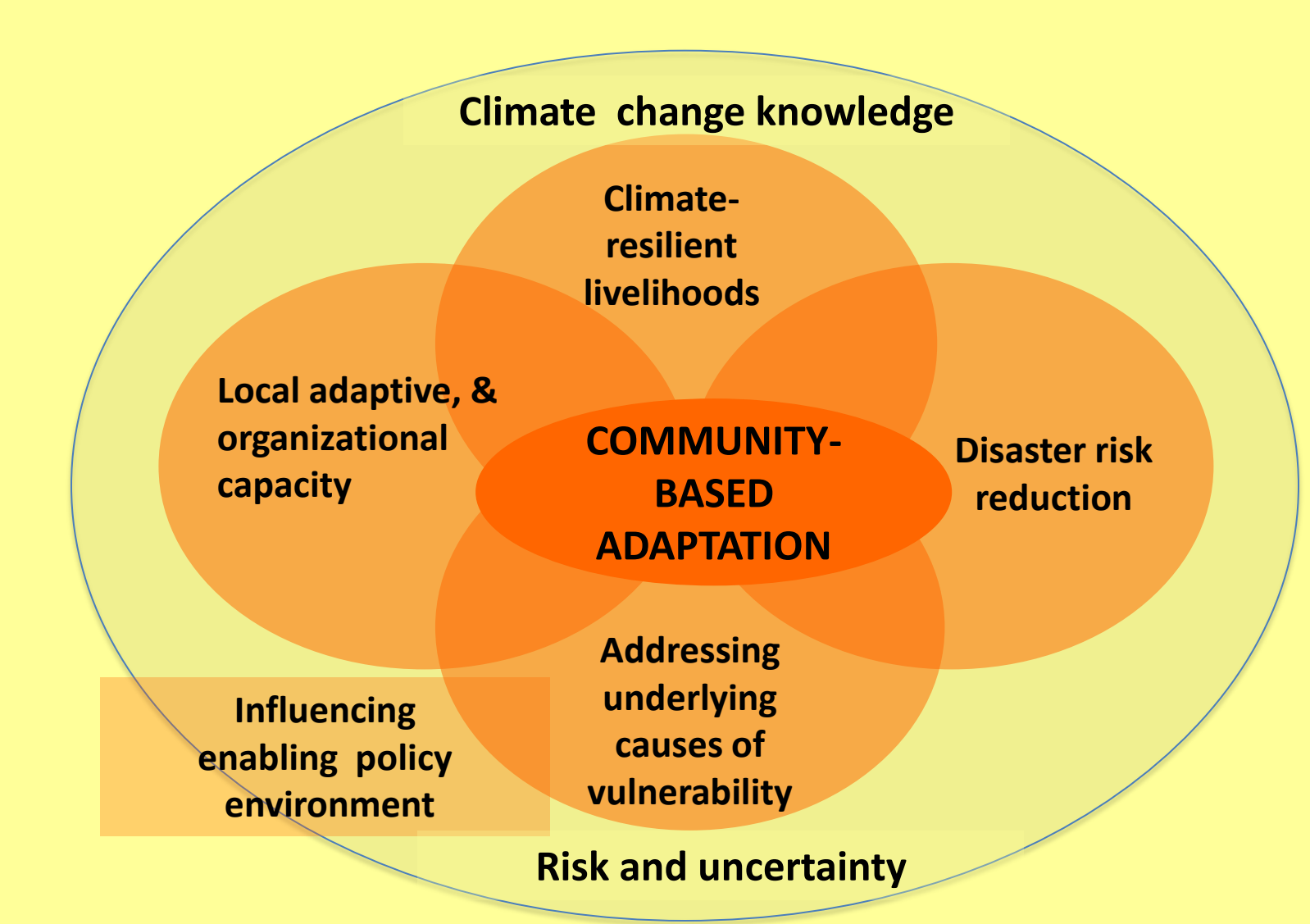
Advocacy practices and design intervention programs

- Adaptation and DRR mesures
- Partnerships
-Knowledge management
-Technical assistance

Integration of ACC and DRR in development projects

-Identification of its importance to sustainable development
- Project implementation to learn & build evidence
-Partnerships
-Knowledge management

Community-Based Adaptation Framework

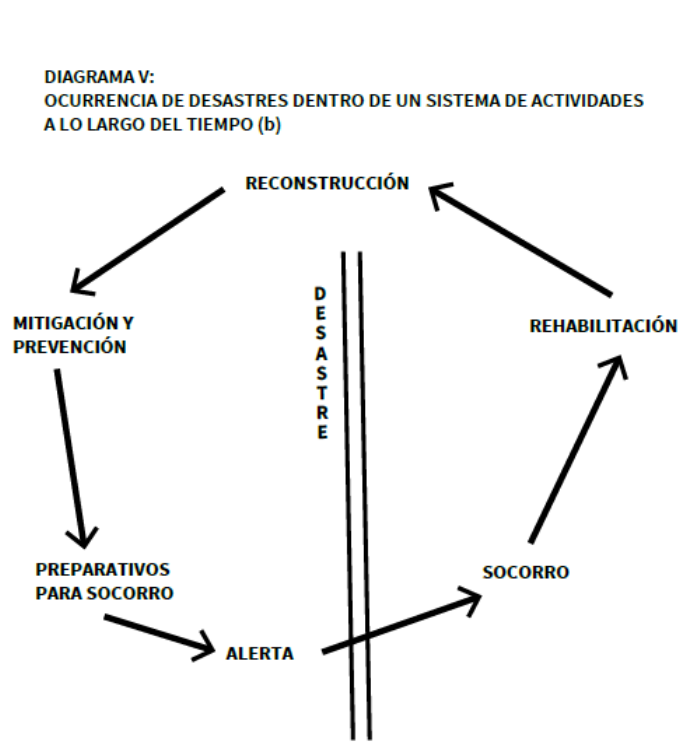


NATIONAL RISK MANAGEMENT POLICY

1. Institutionalize and develop processes for risk management through the national risk management system (SINAGERD)
2. Strengthen capacities at all levels of the national system for decision taking in the 3 government levels
3. Incorporate and implement risk management in development planning and priorization of resources
4. Strengthen a culture of prevention and resilience capacities for sustainable development

(Aprobada como una Política Nacional de Obligatorio Cumplimiento, por Decreto Supremo Nº 111-2012-PCM

From emergency response to risk management…



1975

2011

Ciclo del manejo de desastres

UNISDR
The United Nations Office for Disaster Risk Reduction

GAR

Strategic Alignment for Disaster Risk Reduction

Projects: Glacier Retreat

PERÚ Ministerio del Ambiente

About the project

Overall Objective

To help improve adaptive capacity and disaster risk reduction to address glacier retreat in Peru, particularly in the Regions of Ancash and Cusco

Specific Objective

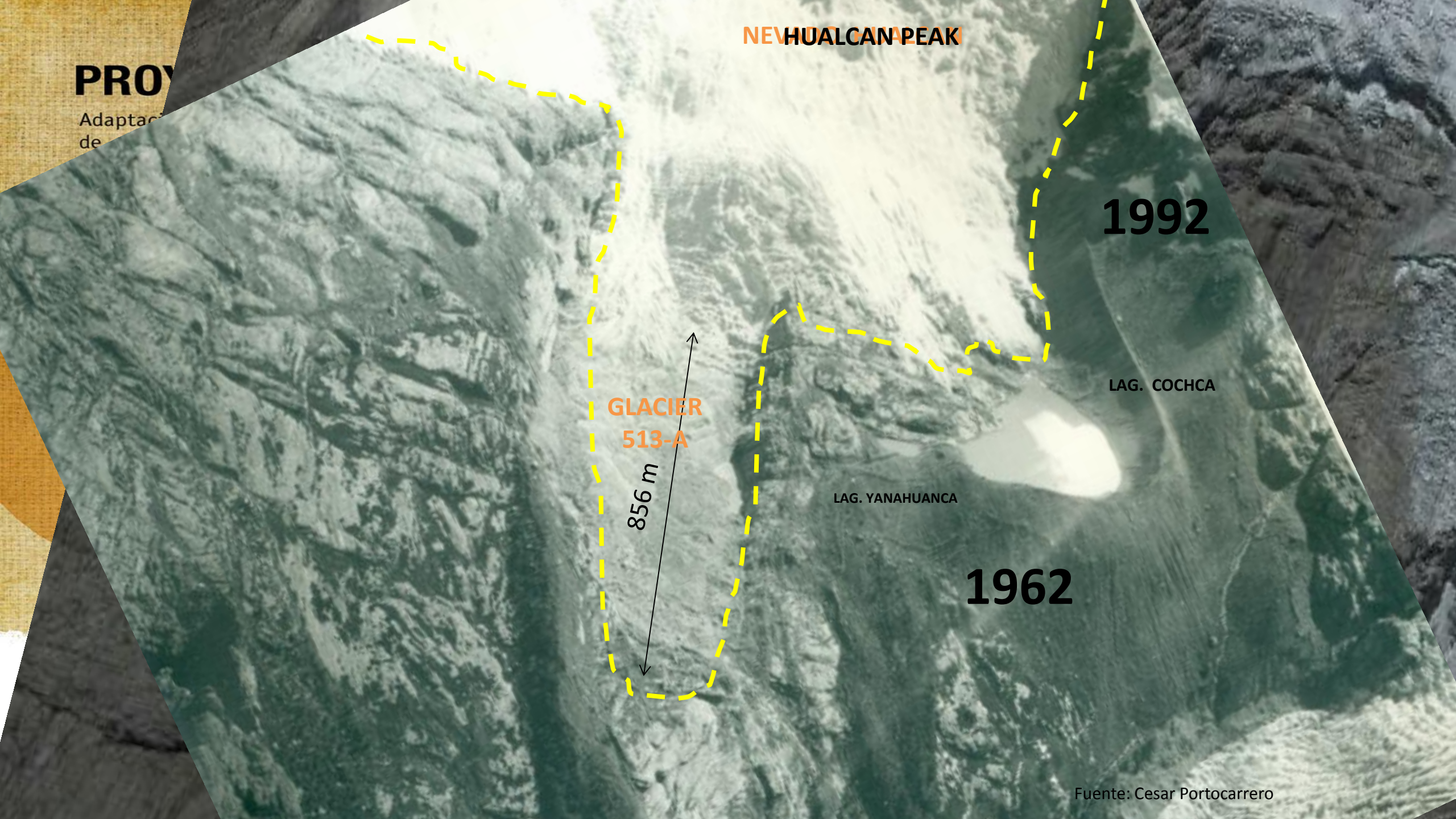
To strengthen scientific-technical, social and institutional capabilities for disaster risk reduction and climate change adaptation

Lines of Action

1. *Local risks from glaciers*
2. *Strengthening of specialized and updated human resources*
3. *Institutional strengthening*

Date	Localtion	People dead
1725	Caraz	1 500
1869	Monterrey	15
1870	Rampac Chico	600
1941	Cojup	1500
1945	Chavín	300
1950,	Caraz	
1962	Ranrahirca.	4 000
1970	Yungay y Ranrahirca (earthquake)	70 000
1997	Ranrahirca.	NA
2002	Safuna Alta	
2003	Caraz	9
2006	Huaraz	
2008	Huaraz	
2009	Carhuaz	5
2010	Carhuaz	
	TOTAL	**76, 829**

La ciudad de Huaraz mostrando la extensa huella blanca del Aluvión de 1941.
A la derecha, la parte antigua de la ciudad quedó intacta.
(Foto Arnold Heim, 24. VI. 1947)



Fuente: Cesar Portocarrero

Community based adaptation **and** Community based disaster managemet

- **To reduce people vulnerability** to current and future impacts of climate change, with a **integrated approach** that **combines** the local and traditional knowledge with innovative strategies to **strengthen local adaptative capacity** to increasing climate change adaptation and disaster risk reduction.

Local knowledge and perception of risk

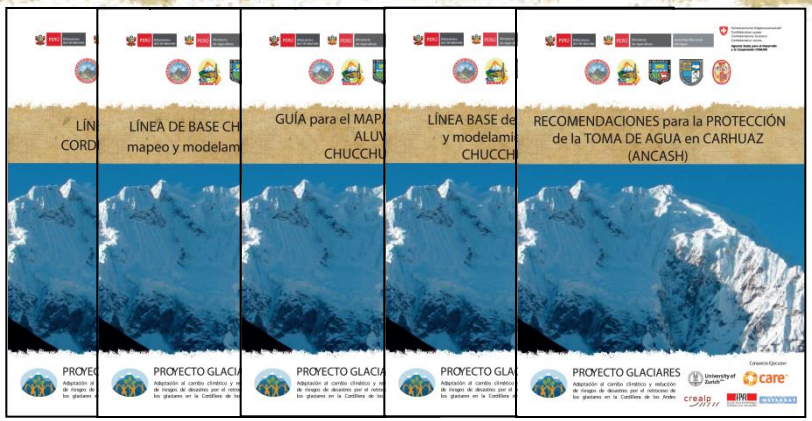
Ethnographic study:

To have a deeper knowledge of people and communities to understand their behavior

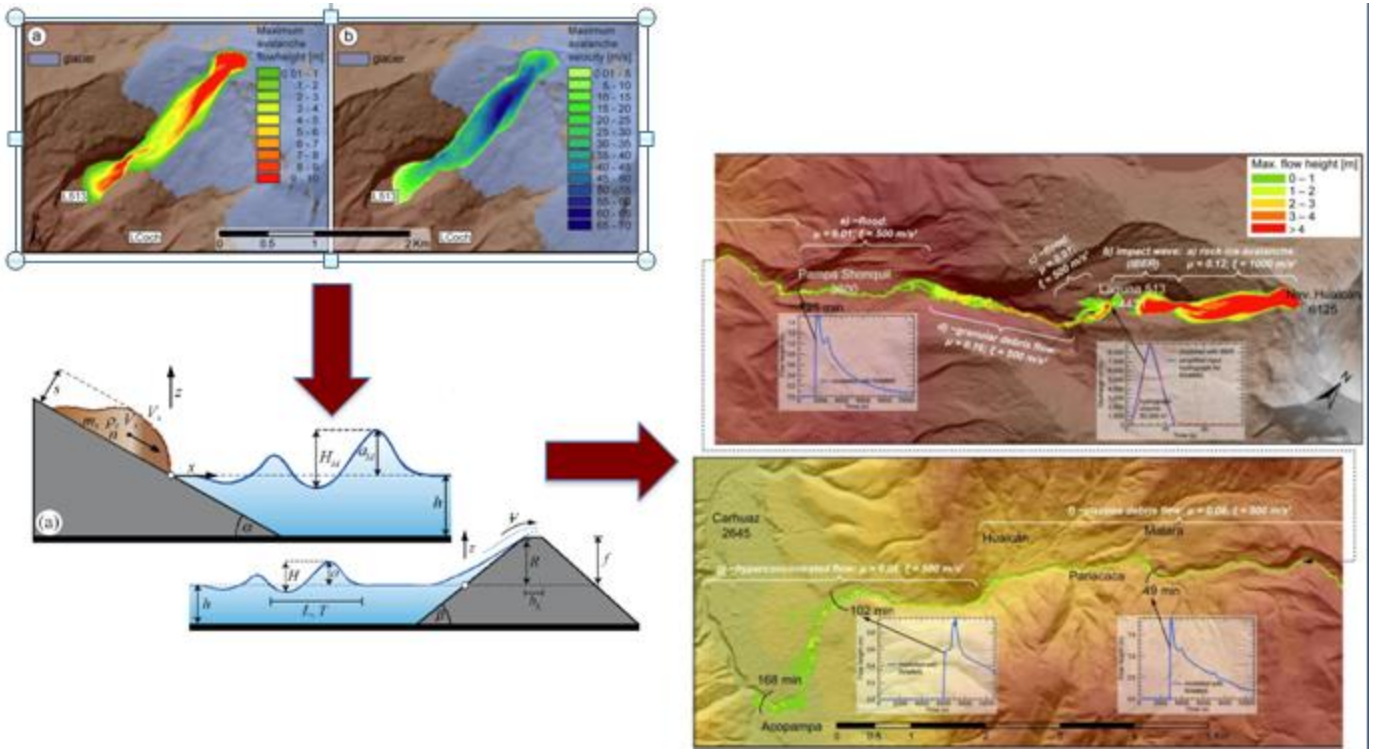
- Oral history
- Local practices
- Understand their risks and concerns
- How do they perceive past, present and future climate changes.

Knowledge: Research developed

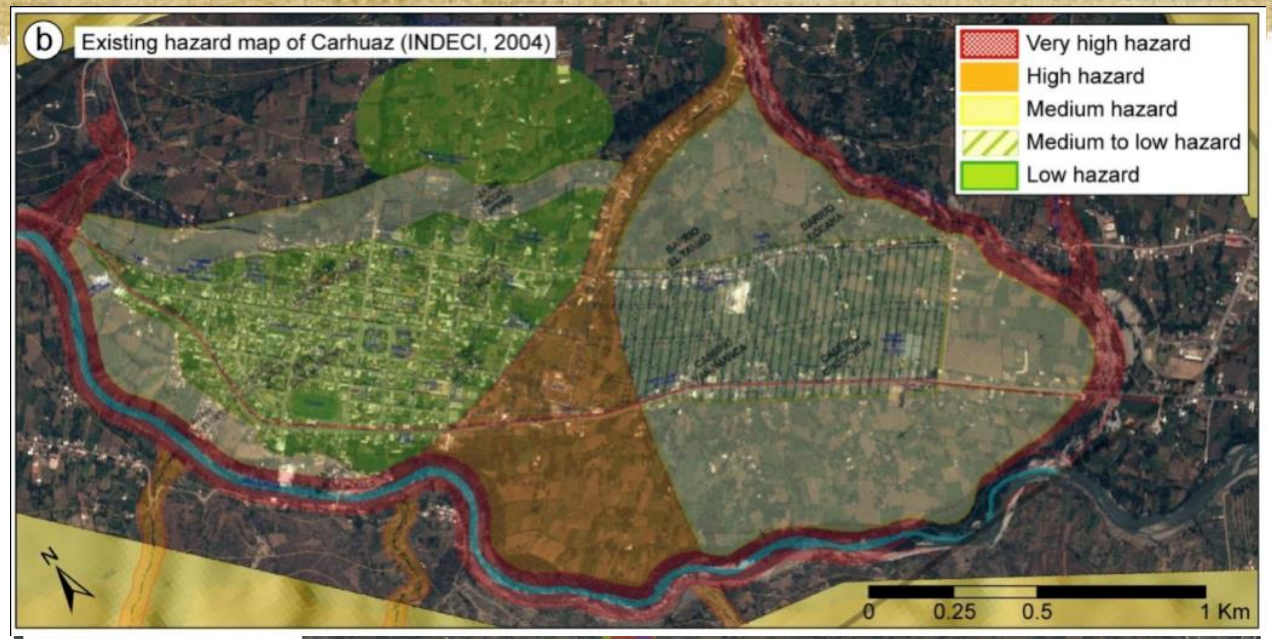
- Climate Datebase
- Hazards mapping
- Specific hazards map
- Water Balance
- Multi-purpose engineering projects

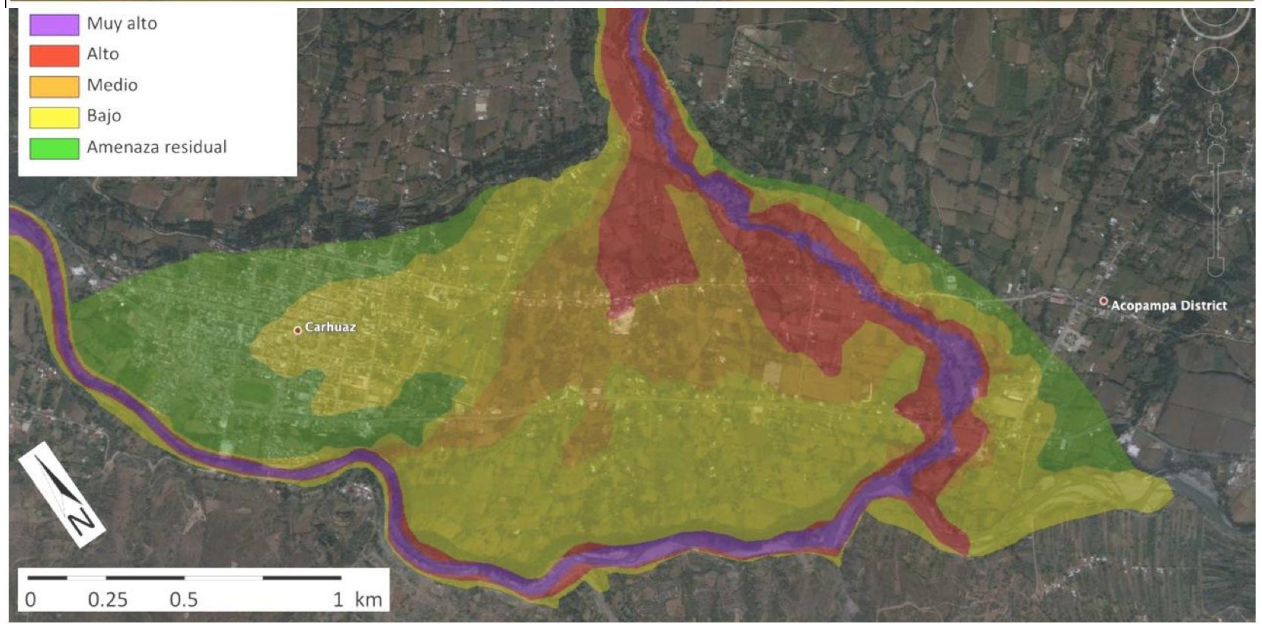


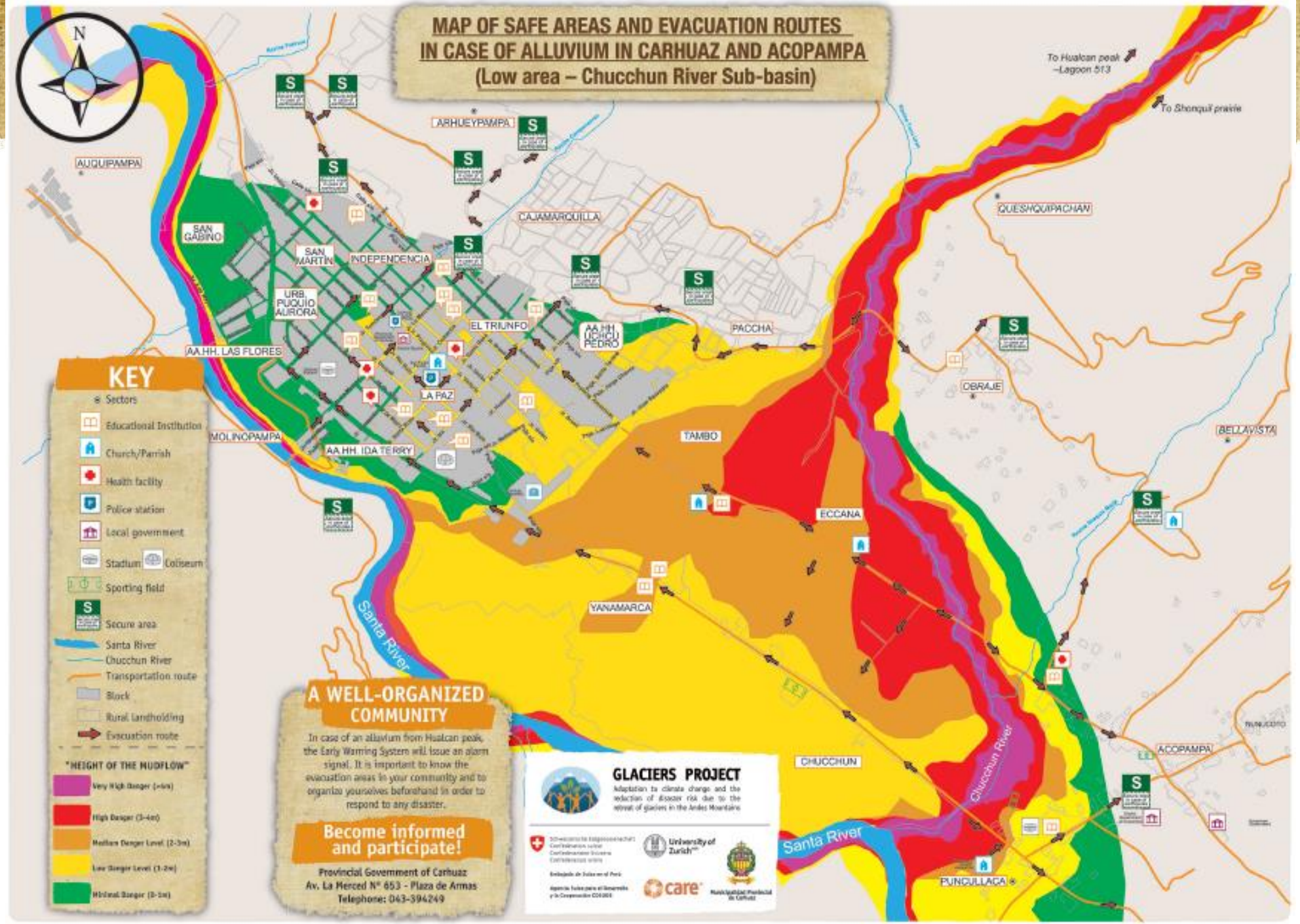
Modeling of overflows in lake 513



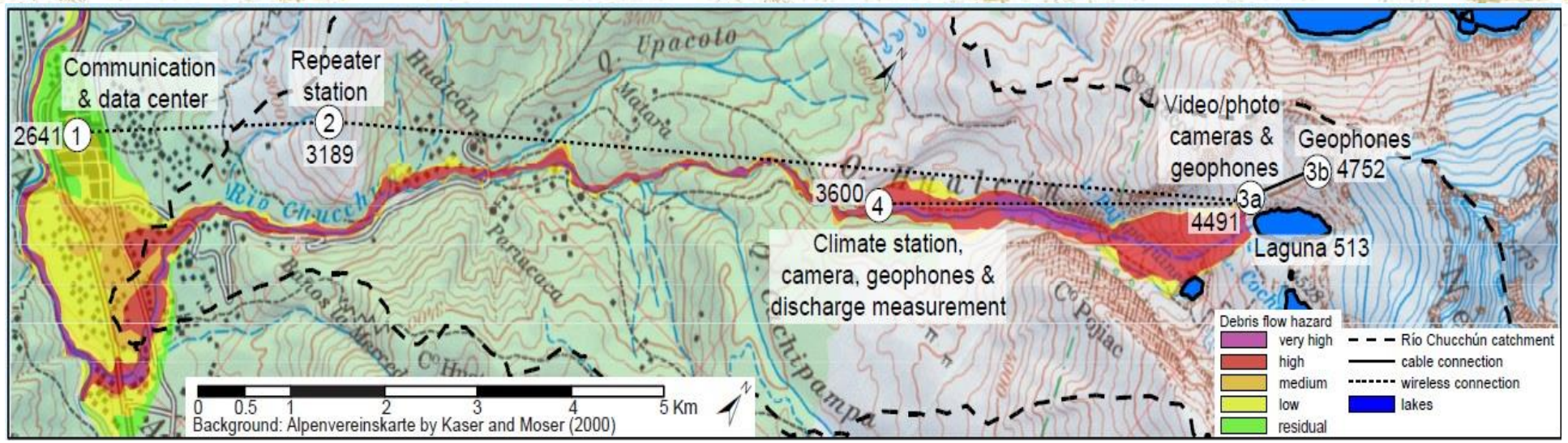
New risk map – UZH & UGRH






MAP OF SAFE AREAS AND EVACUATION ROUTES
IN CASE OF ALLUVIUM IN CARHUAZ AND ACOPAMPA
(Low area – Chucchun River Sub-basin)
N
To Hualcan peak
–Lagoon 513
To Shonquil prairie
AUQUIPAMPA
ARHUEYPAMPA
CAJAMARQUILLA
QUESHQUIPACHAN
SAN GABINO
SAN MARTIN
INDEPENDENCIA
URB. PUQUIO AURORA
EL TRIUNFO
AA.HH. UCHCU PEDRO
PACCHA
AA.HH. LAS FLORES
LA PAZ
OBRAJE
MOLINOPAMPA
AA.HH. IDA TERRY
TAMBO
BELLAVISTA
ECCANA
YANAMARCA
Santa River
CHUCCHUN
Chucchun River
ACOPAMPA
PUNCULLACA
KEY
Sectors
Educational Institution
Church/Parrish
Health facility
Police station
Local government
Stadium
Coliseum
Sporting field
Secure area
Santa River
Chucchun River
Transportation route
Block
Rural landholding
Evacuation route
"HEIGHT OF THE MUDFLOW"
Very High Danger (>4m)
High Danger (3-4m)
Medium Danger Level (2-3m)
Low Danger Level (1-2m)
Minimal Danger (0-1m)
A WELL-ORGANIZED COMMUNITY
In case of an alluvium from Hualcan peak, the Early Warning System will issue an alarm signal. It is important to know the evacuation areas in your community and to organize yourselves beforehand in order to respond to any disaster.
Become informed and participate!
Provincial Government of Carhuaz
Av. La Merced N° 653 - Plaza de Armas
Telephone: 043-394249
GLACIERS PROJECT
Adaptation to climate change and the reduction of disaster risk due to the retreat of glaciers in the Andes Mountains
University of Zurich
care

Design of Early Warning System – EWS



Overview of Chucchum River basin (dotted line, area 50 km^2) with locations of technical components of the monitoring and early warning system (Alpenvereinskarte 1:100,000).

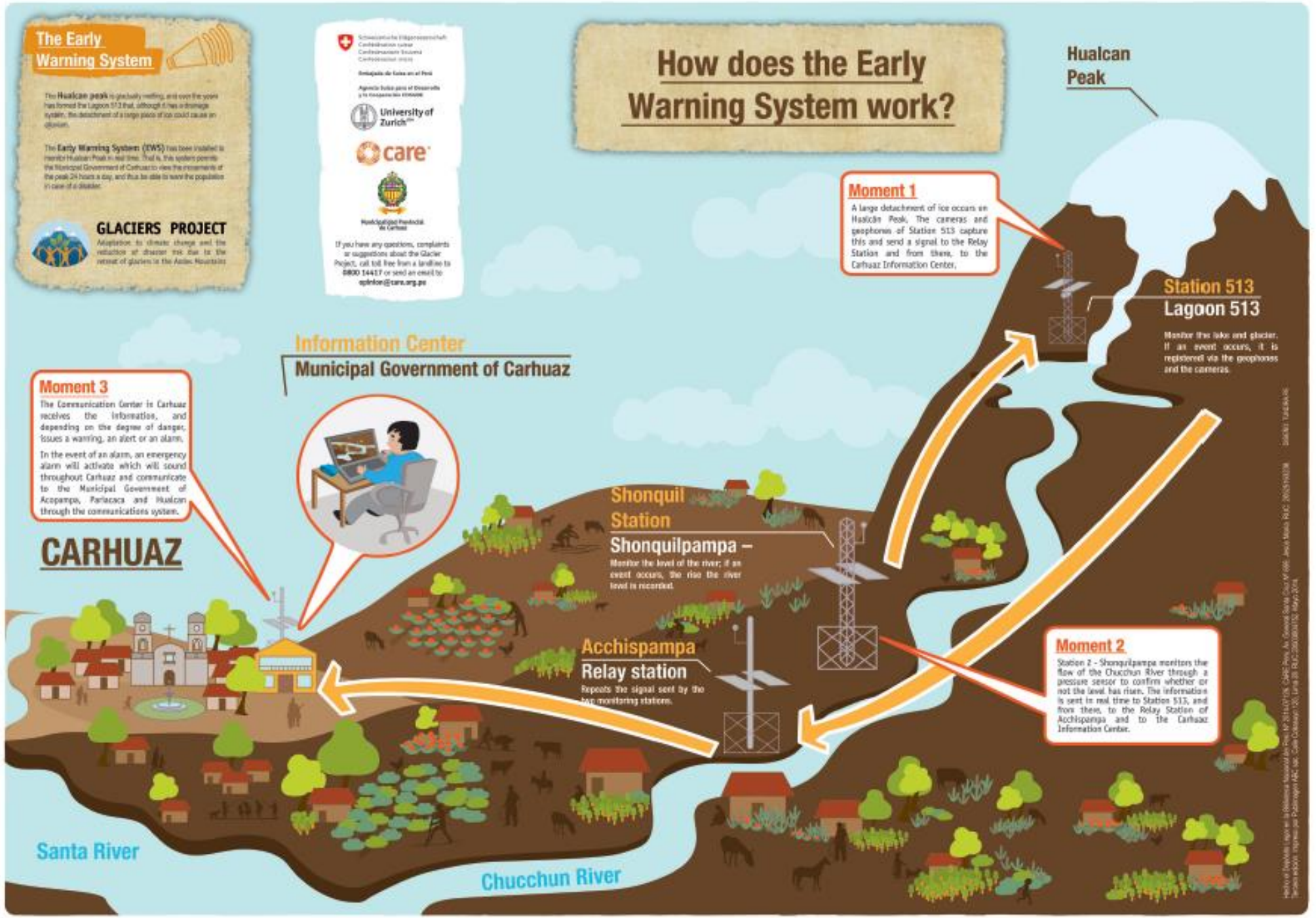
❶ Communication Center in Carhuaz (2641 m.a.s.l.)

❷ Repeater station (~3189 m.a.s.l.)

❸ a) Video /photo cameras for visual montoring, and geophones near Lake 513 (4491 m.a.s.l.)

❸ b) Geophones (4752 m.a.s.l.) connected by cable to station ❸ a)

❹ Climate station / camera / geophone / measurement of discharge in Shonquilpampa (3600 m.a.s.l.)


The Early Warning System
The Hualcan peak is gradually melting, and over the years has formed the Lagoon 513 that, although it has a drainage system, the detachment of a large piece of ice could cause an avalanche.
The Early Warning System (EWS) has been installed to monitor Hualcan Peak in real time. That is, this system permits the Municipal Government of Carhuaz to view the movements of the peak 24 hours a day, and thus be able to warn the population in case of a disaster.
GLACIERS PROJECT
Adaptation to climate change and the reduction of disaster risk due to the retreat of glaciers in the Andes Mountains
University of Zurich
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If you have any questions, complaints or suggestions about the Glacier Project, call toll free from a landline to 0800 14417 or send an email to aplinlor@care.org.pe
How does the Early Warning System work?
Hualcan Peak
Moment 1
A large detachment of ice occurs on Hualcán Peak. The cameras and geophones of Station 513 capture this and send a signal to the Relay Station and from there, to the Carhuaz Information Center.
Station 513
Lagoon 513
Monitor the lake and glacier. If an event occurs, it is registered via the geophones and the cameras.
Information Center
Municipal Government of Carhuaz
Moment 3
The Communication Center in Carhuaz receives the information, and depending on the degree of danger, issues a warning, an alert or an alarm.
In the event of an alarm, an emergency alarm will activate which will sound throughout Carhuaz and communicate to the Municipal Government of Acopampa, Pariacaca and Hualcan through the communications system.
CARHUAZ
Shonquil Station
Shonquilpampa –
Monitor the level of the river; if an event occurs, the rise the river level is recorded.
Acchispampa
Relay station
Repeats the signal sent by the two monitoring stations.
Moment 2
Station 2 - Shonquilpampa monitors the flow of the Chucchun River through a pressure sensor to confirm whether or not the level has risen. The information is sent in real time to Station 513, and from there, to the Relay Station of Acchispampa and to the Carhuaz Information Center.
Santa River
Chucchun River

Challenges

- Indigenous populations can forecast most of the weather conditions they have lived with but Climate Change is affecting this.
- In Perú, the most vulnerable are the Andean or Amazonian communities that concentrate 70% of the poor. Climate change exacerbates existent vulnerabilities.
- To adapt, specifics of the different life zones have to be borne in mind, traditional knowledge should be taken into account to help mitigate negative effects:
  - Provide first hand clues.
  - Facilitate the adoption of adaptation measures
- Communication gap between traditional knowledge and western science, have to be dealt and built.
- PRACTITIONERS ROLE:

  bridge policy makers -scientists-communicators-vulnerable communities

Learned lessons:

The implementation of adaptative measures and risk management measures **should be based** on peoples involvement in the identification, design and implementation of projects

Early establishment of **relationships** between the project participants with technical staff and scientists, strengthens trust processes that are essential for collective work and appropiation of results (ownership)

Articulation of scientific information with local and traditional knowledge is critical to project implementation and the sustainability of adaptative and risk management measures … **communication** is a key word

A condition to select adaptative and risk management measures is the practicity of measure, as well as the benefits at short and long term.

The perception of risk and climate change effects do not necessarily lead to action; it is the **awareness** of responsibility for being part of a collective solution that facilitates civil society and authorities participation

Evidence based on pilot experiences is critical for policy advocacy processes, thinking of sustainability **all the time** is essential

Thank you

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