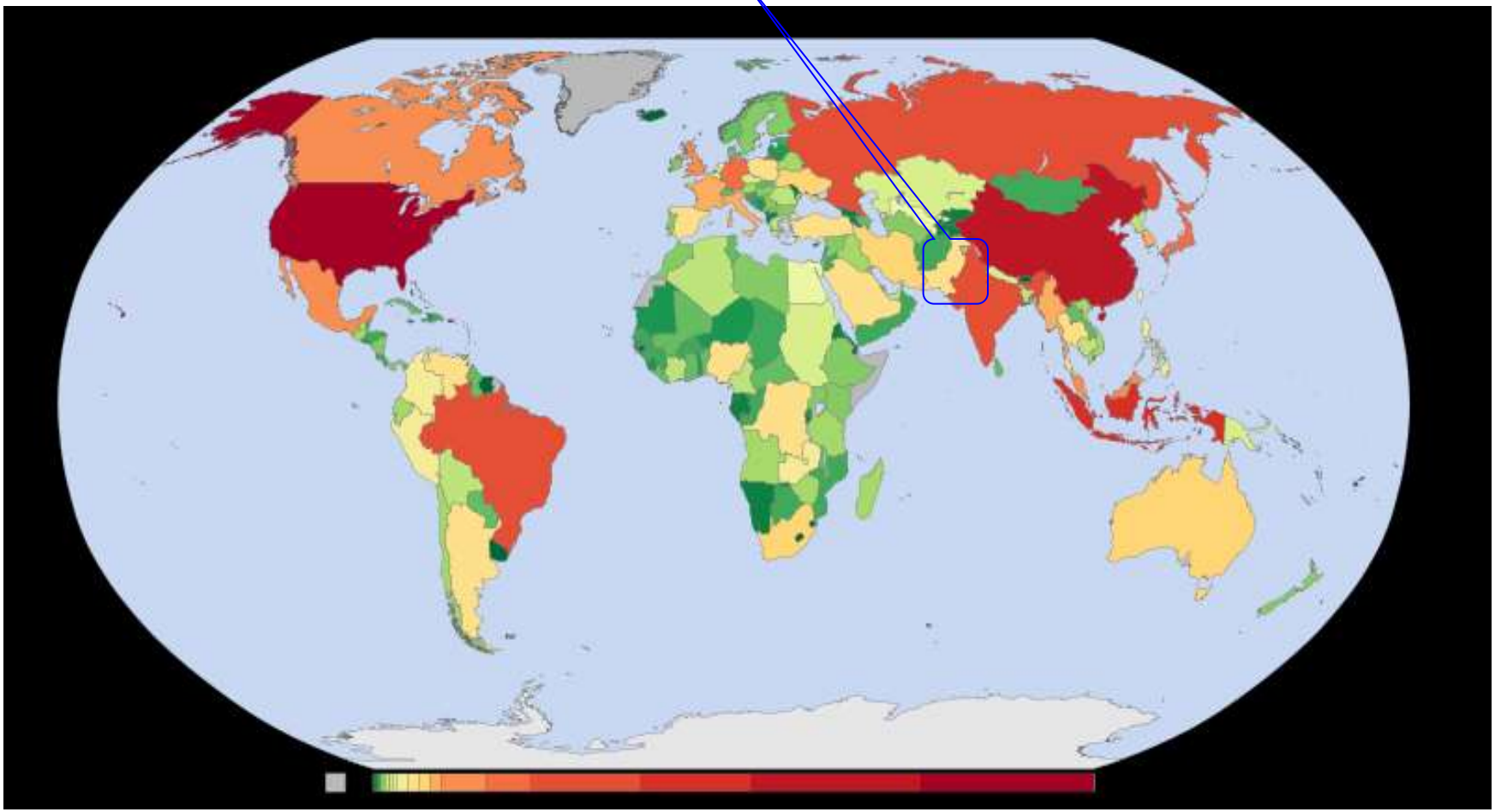
Managing GLOF in Karakoram-Hindukush region through grafting Indigenous and scientific management practices

EvK2CNR conference Islamabad

10 September 2013

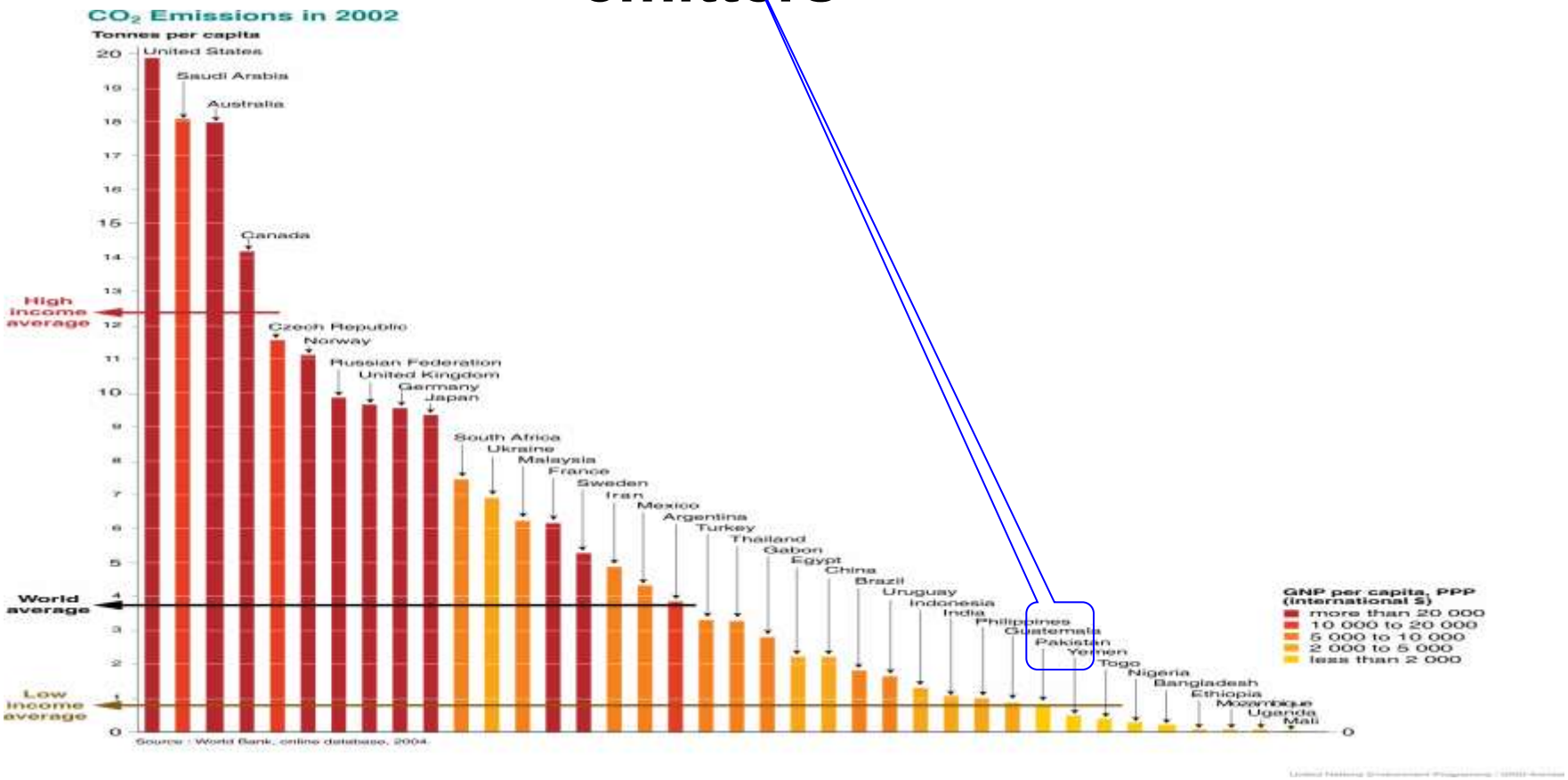
Pakistan’s contribution to the Global GHG emissions

0.8 % of Global GHG emissions



Pakistan – where we are on the climate front?

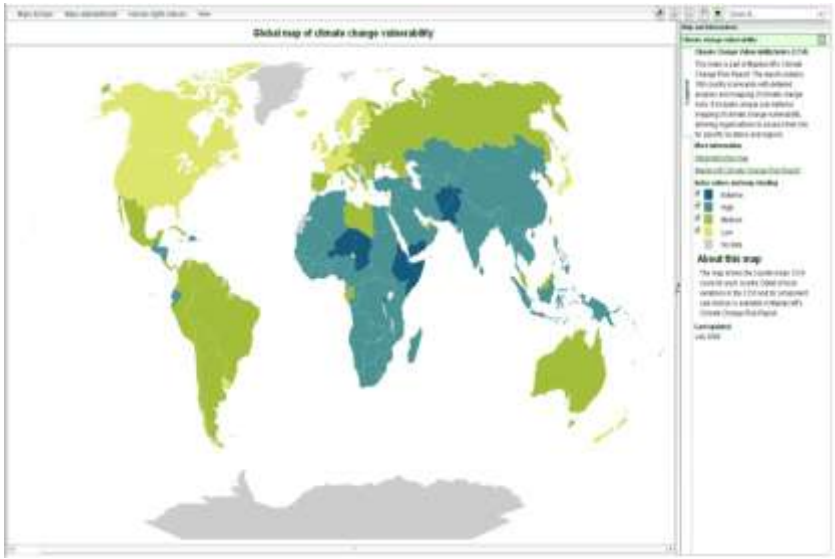
One of the lowest per capita emitters

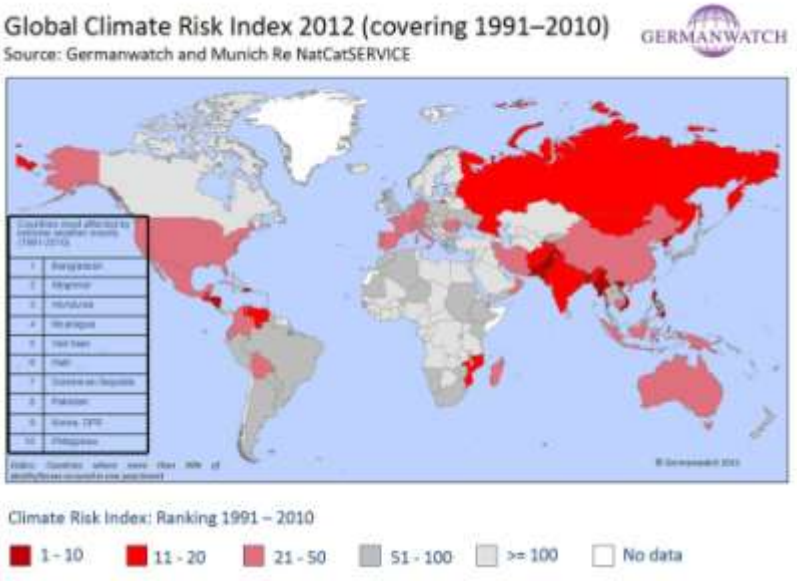


Pakistan – where are we ?

One of the worst victims of climate change & best examples of climate injustice :

- **Maple croft vulnerability index places Pakistan in High/Extreme category**
- **Germanwatch places Pakistan as "Most affected" for 2010 and in "TOP 10" for 1990-2010**





Key GLOF Issues for Pakistan

Melt flows of major river systems during the summer months have increased to more than double their amount over the past 10 years

Glacial retreat is evident from the base of the affected glaciers and continuous thinning of ice along their entire length

The area is annually affected by a number of climate-related GLOFs; these include floods, avalanches and landslides including loss of lives and material

Local impacts of GLOFs are devastating and often go unreported

GLOFs considered as a national challenge in Planning Commission's Task Force Report and National Climate Change Policy

Potentially dangerous glacial lakes in the Indus River Basin

River Basins	Glaciers			Glacial Lakes		
	No.	Area (km^2)	Ice Reserve (km^3)	No.	Area (km^2)	Potentially dangerous
Indus River Basin						
Swat	233	223.55	12.221	255	15.86	2
Chitral	542	1903.67	258.817	187	9.36	1
Gilgit	585	968.1	83.345	614	39.17	8
Hunza	1050	4677.34	808.794	110	3.21	1
Shigar	194	2240.08	581.27	54	1.09	0
Shyok	372	3547.84	891.8	66	2.68	6
Indus	1098	688	46.38	574	26.06	15
Shingo	172	36.91	1.009	238	11.59	5
Astor	588	607.03	47.931	126	5.52	9
Jhelum	384	148.18	6.943	196	11.78	5
	5218	**15040.7**	**2738.51**	**2420**	**126.32**	**52**

Project Goal & Objectives

GOAL: ‘To enhance adaptive capacity to prevent climate change-induced GLOF disasters in Pakistan’

OBJECTIVES:

1.To develop the human and technical capacity of public institutions to understand and address immediate GLOF risks for vulnerable communities in Northern Pakistan

2.To enable vulnerable local communities in Northern Pakistan to better understand and respond to GLOF risks and thereby adapt to growing climate change pressures

Project Outcomes

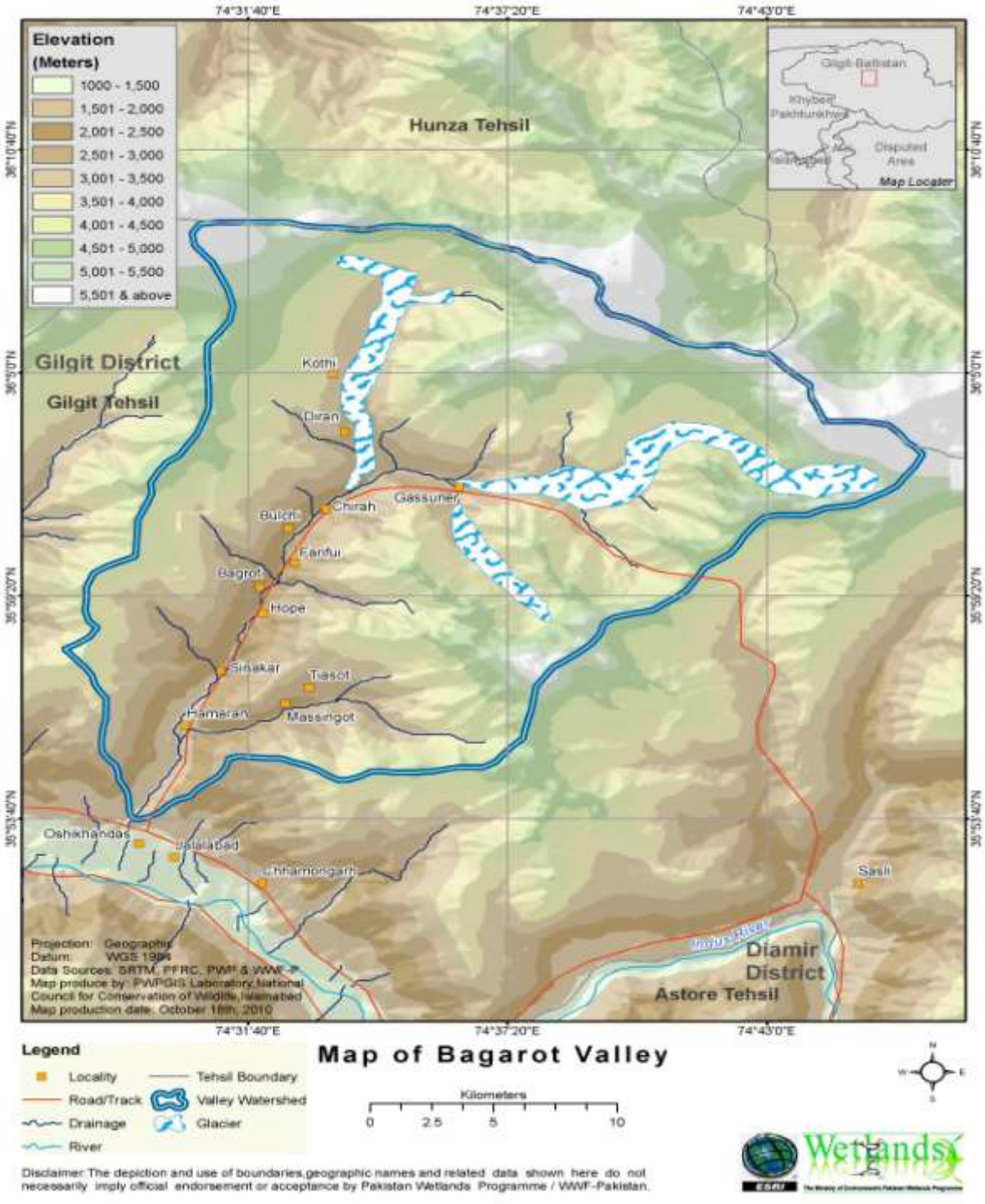
1.Policy Recommendations & Institutional Strengthening

2.Strengthening Knowledge and Information about GLOF

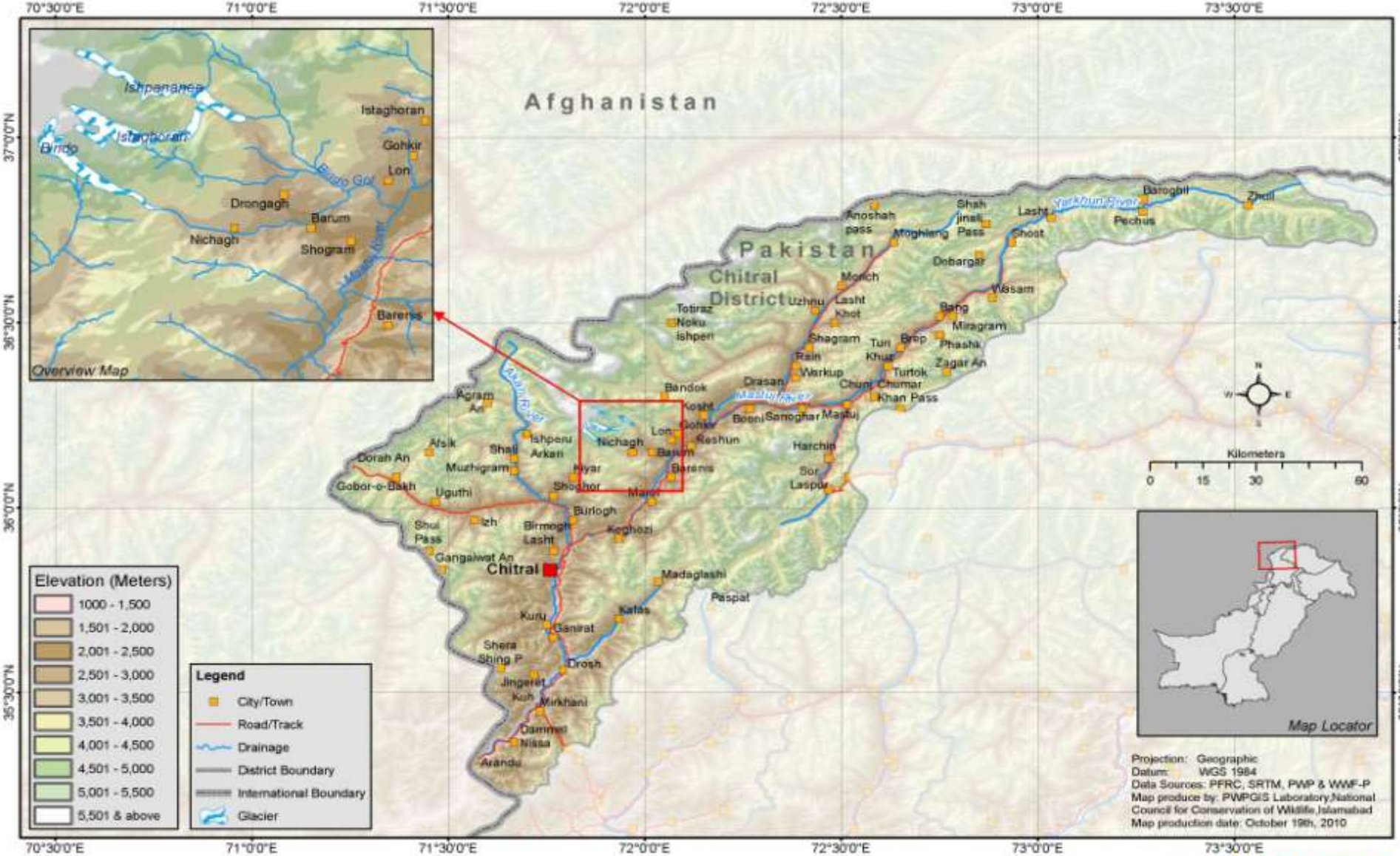
3.Demonstration of Community-Based GLOF Risk Management

4.Documentation, Analysis and Application of Lessons Learnt

Project Location Bagrot Valley



Project Location – Drongagh Valley



Topographic Map of Drongagh Area, District Chitral

Sites to be Covered

Bagrot Valley in Gilgit-Baltistan considered at high risk of GLOF from the Bagrot Glacier. Bagrot covers 1100 households with a population of 10,000 people and lies at a distance of 40 KMs from Gilgit City

Bindo Gol Valley (Drongagh) in Chitral lies in the vicinity of Gohkir and Bindogol Glaciers. It covers 1500 households with a population of almost 13,500 people and lies at a distance of approximately 65 KMs from Chitral municipality

Major Intervention/Activities

- Inventory update through GIS & Remote Sensing and ground truthing by PMD and developing of SOPs for early warning systems (EWS)
- Strengthening of indigenous Early warning system
- Hazard and Vulnerability risk Assessment
- KAP Studies
- Study on Social Economic Impact of GLOF
- Assessment of impact of GLOF on Biodiversity
- Developing GLOF Risk management Manual and DRM Trainings

Major Intervention/Activities

- Google & Hazard Mapping
- International Conference on GLOF
- Communication & awareness
- GLOF DRM committees
- GLOF Hazard Watch Groups
- GLOF DRM Fund
- Adaptation (Bio-engineering) structures
- Automated Weather Station & Early Warning system
- Safe Heavens articulation
- GLOF Disaster Emergency Response Cell

Streams of knowledge

Comparisons between traditional and scientific knowledge *in use*

Indigenous Knowledge	Scientific Knowledge
lengthy acquisition	rapid acquisition
long-term wisdom	short-term prediction
powerful prediction in local areas	powerful predictability in natural principles
weak in predictive principles in distant areas	weak in local areas of knowledge
models based on cycles	linear modeling as first approximation
explanations based on examples, anecdotes, parables	explanations bases on hypothesis, theories, laws
Classification: • a mix of ecological and use • non-hierachical differentiation • includes everything natural and supernatural	Classification: • based on phylogenic relationships • hierarchical differentiation • excludes the supernatural

Some interventions that integrate both the knowledge

Hazard and Vulnerability risk Assessment

Indigenous Knowledge	Scientific Knowledge
• Observations such as the springs drying-up as the source does not receive water which is stored in the lake due to landslip/landslide; • Water shortage at house hold level that indicates that the discharging holes are obstructed, pressure is mounting	• Hazard mapping done by using satellite images, followed by Ground Truthing and using the Ground Penetrating Radar GPR
Local knowledge indicates the mounted hazard	**Hazard is scientifically investigated**

Automated Weather Station & Early Warning system

Indigenous Knowledge	Scientific Knowledge
• To warn the communities the shepherds smoke on the tops, now done with the help of loudspeakers, nevertheless on observations by local communities; • Strengthening of indigenous Early warning system (LOA with community is signed)	• Early Warning System devised by the PMD based on prevailing technologies installed. • Community is trained in the use of this system
The trained community already had indigenous knowledge, so now equipped with both the streams	

Structural measures

Indigenous Knowledge	Scientific Knowledge
• Biological measures such as planting various species with anchorage and productivity capacity. • Improvised low cost, lighter structures, maintained locally.	• Engineering structures, heavy in size and cost. • Biological measures with exotic species but done in parallel.
Bio-engineering structures that integrate all biological measures with locally suitable engineering measures.	

Conclusion

1. We count on the scientific knowledge of other organizations at least in the beginning
2. Grafting of both the streams of knowledge works well, however needs systematic analysis.
3. This needs to be part of the overall Knowledge Management process
4. Integration together leads to sustainability in terms of ownership, continuity, its low cost nature
5. The tacit knowledge that is endangered will not lost once it is converted in implicit knowledge and translated in grafted practices.

THANK YOU