Adaptation to climate impacts in water regulation and supply for the area of Chingaza-Sumapaz-Guerrero, Colombia

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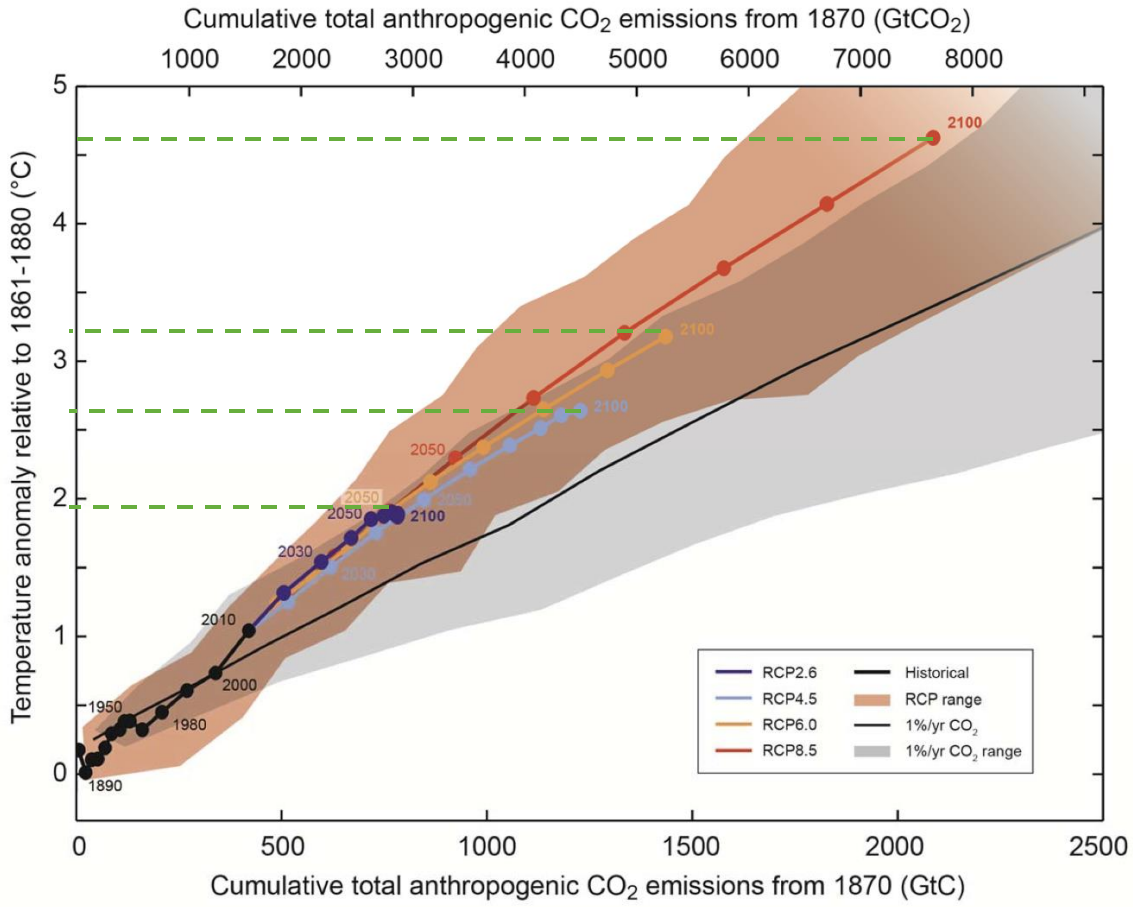
Second Forum of the Standing Committee on Finance: Mobilizing adaptation finance
Montego Bay, Jamaica, June 21-22, 2014

Temperature anomaly vs Cumulative total CO2 emissions



Source, IPCC, Assessment Report V

1. Adaptation to climate impacts in water regulation and supply for the area of Chingaza-Sumapaz-Guerrero; Bogota, Colombia

CONSERVACIÓN INTERNACIONAL Colombia
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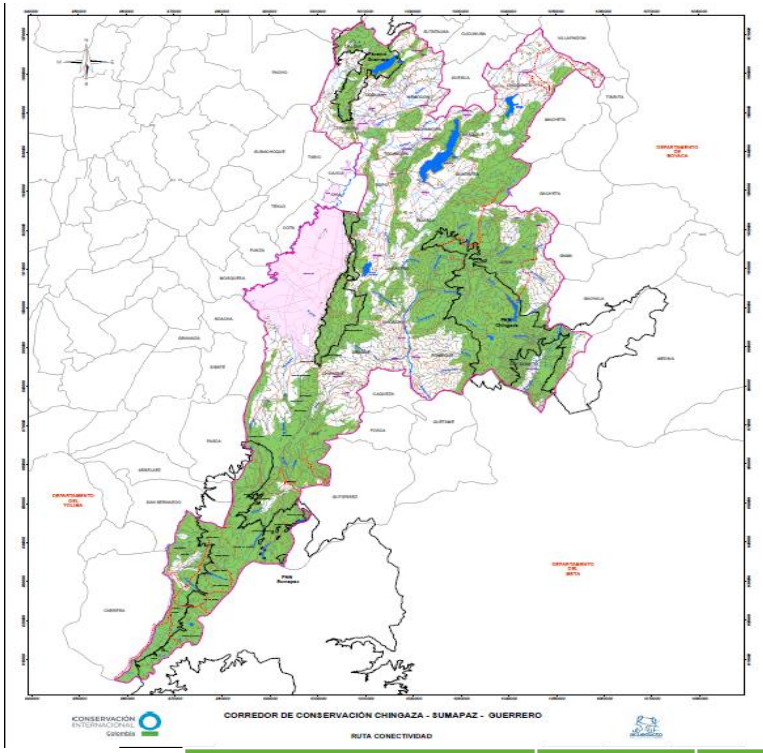
1. The Chingaza-Sumapaz-Guerrero Conservation Corridor



Located in the high Andean zone of the Eastern Cordillera in Colombia's central-eastern region

→ Area of 557,000 hectares

→ Approx. 20% of country population lives here

→ Approx. 69% of water supplied to the country's capital comes from this area

Páramo complex	Area (ha)	Provision of water (m^3/s)	Population served (millions)
Guerrero	39,240	2.3	1.5
Chingaza	64,500	14	5.6
Cruz-verde Sumapaz	266,750	n/a	n/a

2. Project at a glance

Development objective: "To strengthen the hydrological buffering and regulation capacity of the upper watershed of Chingaza-Sumapaz-Guerrero that supplies drinking water to the Bogota metropolitan area and the adjoining rural municipalities"

Value proposition/transformative opportunity

Water regulation function of these ecosystems to be seriously affected by changes in the water cycle:

- higher indices of rainfall concentration and lengthening of drought periods
- higher evaporation rates, and shifting of altitudinal dew points.

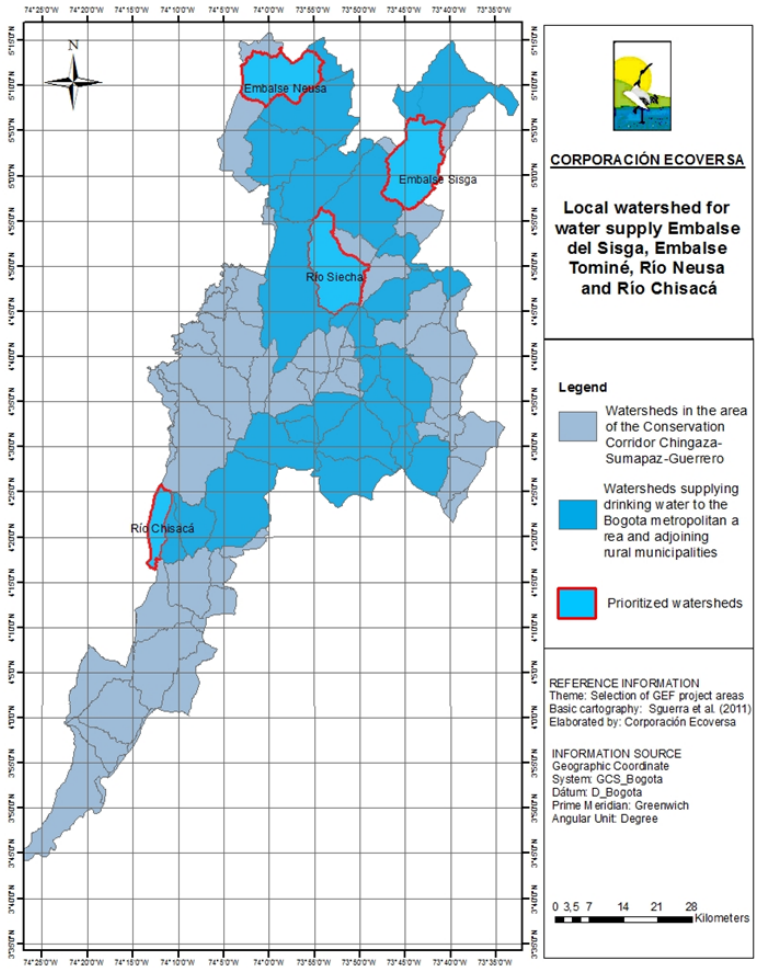
Project overall impact

- Hydrological buffering and regulation capacity of high mountain ecosystems (*paramos* and high Andean forests) is maintained or increases under conditions of climate change and variability

Financials

Project size	$27.9 M
Climate Funding GEF-SCCF	$4.2M
IDB Finance	$12.3 M
Others (EAAB, CARs, SECCI)	$11.4M
Complementary funding	**$23.7M**

3. Definition of project areas



Steps for the selection of project sites

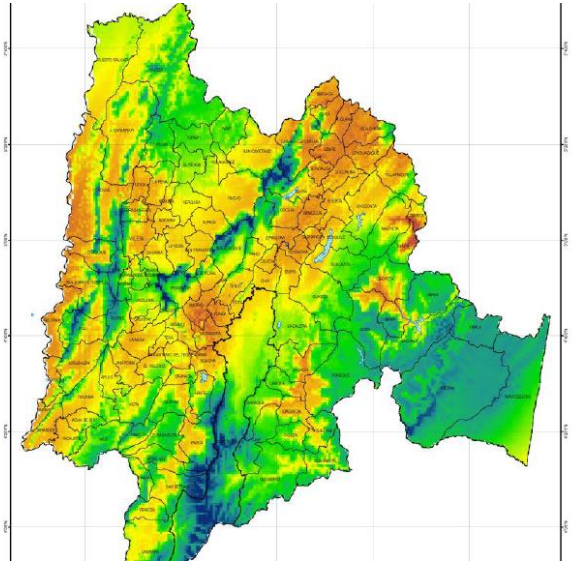
1. Identification of hydrological units and zoning
2. Selection of hydrological units with local and regional importance for water supply and flood control
3. Multi-criteria evaluation for selected hydrological units

Hydrological Unit of Analysis	Micro-watersheds	Beneficiaries
Sisga Reservoir	Río San Francisco–Chuscales and Río Chipatá	Urban area of Guatavita, rural area of Sesquilé, and the Bogotá aqueduct system
Río Cuevas	Río Guandoque	Urban area of Tausa and rural areas of Sutatusa, Nemocón and Cucunubá; and the Bogotá D.C. aqueduct system
Río Chisacá	Río Chisacá mainstream	Bogotá water supply aqueduct system

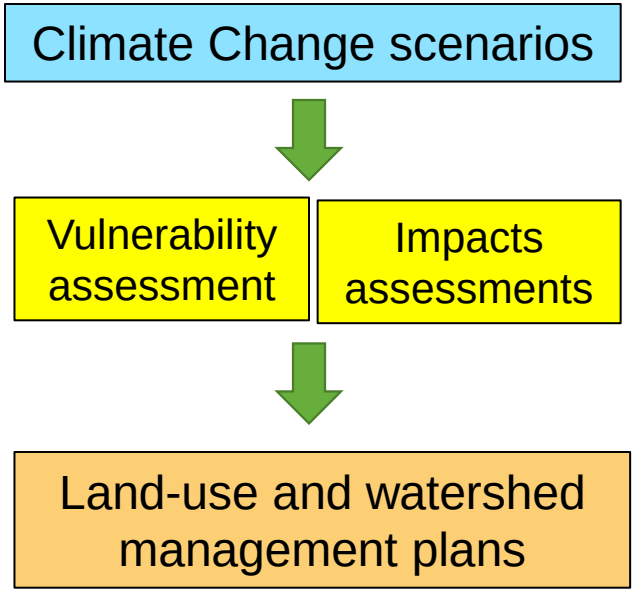
4A. Project outputs by components

Component 1. Knowledge Management:

(i) Climate change scenarios at high resolution (watershed level)
(ii) Vulnerability assessment of water related ecosystem services
(iii) Monitoring system to track impact of adaptation measures
(iv) Assessments of changes in expected hydrological response



Changes in water availability for the Cundinamarca region, based on climate change scenarios; source: PRICC, UNDP



4B. Project outputs by components

Component 2. Adoption of adaptation measures to address the impacts of climate variability and change on the water balance of priority areas

(i) At least 3 Protocols for restoration of strategic areas
(ii) 250 ha of strategic areas in high mountain ecosystems under restoration process
(iii) At least 9 re-vegetation gender-focused pilot projects designed and implemented in three areas that are critical for water supply
(iv) Municipal and community organizations, with emphasis in potatoes and milk producers, trained in climate change risk management and adaptation measures

5. Ex-ante economic analysis, basics

Adaptation measures implemented → Land-use change → Water availability
Natural regulation capacity

Regulating effect in the water cycle → Aggregated!

Micro-watershed	Mean water supply (m3/yr)	Dry conditions** water supply (m3/yr)
Guandoque river	28.985.449	16.742.389
San Francisco river	19.210.301	10.307.408
Chipatá river	14.741.359	8.278.430
Chizacá river	47.682.088	28.551.005

Use of a linear regression analysis to find relation between:

High-mountain ecosystems

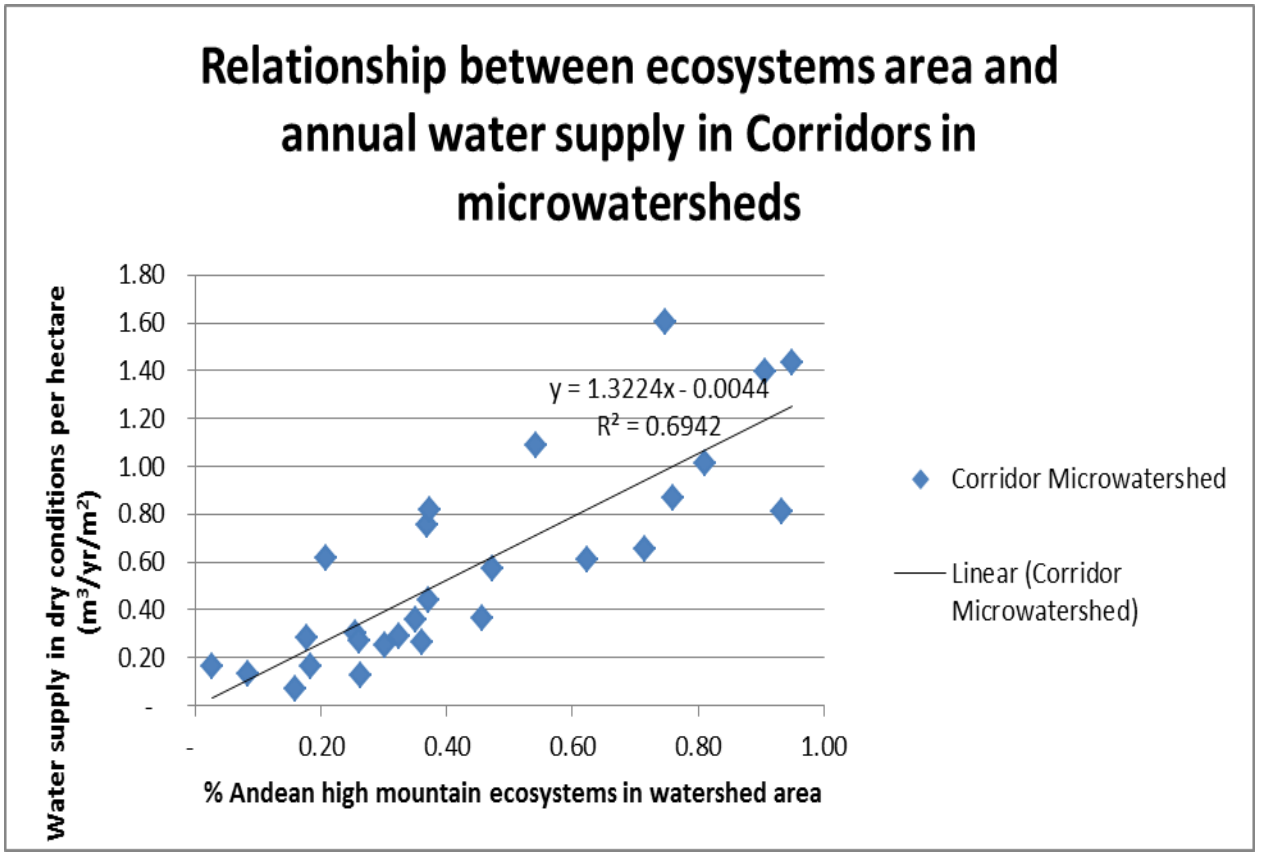
and

Water supply in dry conditions

6. Ecosystem area (*páramos & forest*) and water yield in dry conditions (m^3/year/m^2)

Cross-section based on 27 micro-watersheds of the corridor:

Dry conditions measured as the water flow that is surpassed with a probability of 97,5% according to historic registers (1970-2000).



7. Expected results: water yield in dry conditions (m^3/year/m^2) and vegetation cover

Could farmers be enticed by the proposed adaptation measures? → Economic analysis at the farm level

Does the benefit of the project outweigh its associated costs ? → Aggregate analysis

Micro-watershed	Baseline % of vegetation cover	Baseline Water supply per m2 (m^3/yr/m^2)	With project % of vegetation cover	With project water supply per m2 (m^3/yr/m^2)	% of increase in water supply
Guandoque River	28%	0,41	32%	0,45	12%
San Francisco River	16%	0,26	19%	0,30	17%
Chipatá river	51%	0,33	55%	0,40	18%
Chizacá river	60%	0,55	64%	0,61	10%

Main assumption: Project will increase water availability 10-20%

8. Key project outcomes

- (i) the hydrological buffering and regulation capacity of high mountain ecosystems (paramos and high Andean forests) is maintained or increased under conditions of climate variability and change; and

- (ii) increased awareness of adaptation options and lessons learned from field experience in high mountain ecosystems.

Thanks!

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