

The value of nature-based solutions

Nature-based solutions to water security offer innovative, cost-effective, integrative approaches to aid progress of the SDGs and contribute to solving complex challenges around water management



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High in the Andes, under the leafy canopy of tall kapok trees, cotton-top tamarins with manes of white fur jump from branch to branch. Bright yellow, green and red birds appear briefly before they fly deeper into the forest. This captivating beauty only hints at the value of Colombia's forests: a set of natural systems that for millennia have provided water security.

The forests and páramos (alpine tundra ecosystems) across Colombia serve as natural infrastructure to collect, infiltrate, filter, store and move water to thirsty cities at lower elevations. Páramos alone generate around 85% of drinking water in the country. Current estimates project that by 2050 nearly 84% of Colombians will be living in urban areas. Growing cities will be looking to secure more water, even as extreme climate events are increasingly frequent and severe. Already, flooding and drought have stunted crops and exacerbated soil degradation, destroyed built infrastructure and caused economic hardship.

Many other countries face similar challenges. Around the world, leaders are trying to find ways to meet the water, food and energy needs of growing populations at a time when clean, reliable water resources are becoming more scarce and more expensive.

Natural solutions

But there is a solution – nature. The lands around our water sources serve as vital infrastructure that can improve water quality and quantity for cities around the world. By protecting existing forests, replanting barren pastureland and using cover crops, we can reduce the amount of sediment and nutrient pollution entering our waterways. Additionally, these

nature-based solutions can help reduce our carbon footprint, maintain critical ecosystems and build healthier, more resilient communities in the face of climate change.

Many parts of the world have progressed towards ensuring access to clean, reliable water for both people and nature, but more will be needed. The Sustainable Development Goals (SDGs) provide a pathway for working toward solutions that tackle water and food security, alleviate poverty and improve health and well-being. Goal 6 focuses on ensuring available and sustainable management of water and sanitation for all. Solving water security will be essential to meeting so many other vital targets. Yet nature-based solutions to water security in particular offer innovative, cost-effective, integrative approaches that will aid progress in multiple SDG's beyond water security.

Nature-based solutions for water security are the subject of *Beyond the Source: The environmental, economic and community benefits of source water protection*, a new study developed by The Nature Conservancy along with the Natural Capital Project, Forest Trends, the Inter-American Development Bank and the Latin American Water Funds Partnership.

The report illustrates that four out of five cities globally can benefit from nature-based solutions to improve water security. For half of these cities, these investments could be made for as little as US\$2 per person, per year. One in six cities could pay for source water protection activities through annual water treatment savings alone.

In addition, the report analyses the quantifiable co-benefits to carbon mitigation, biodiversity and the health and well-being of rural communities. The report takes a deeper

Optimisation portfolio results for six Colombian cities and their source watersheds

City source watershed	Hectares in portfolio	Percent of total watershed area	Percent improvement from baseline (through restoration and agricultural BMPs)			Percent future degradation avoided (through protection)		
			Carbon storage	Nitrogen reduction	Sediment reduction	Carbon loss mitigated	Nitrogen increase mitigated	Sediment increase mitigated
Cartagena	17,832	7	26	-10	-34	15	20	24
Medellín	12,032	10	15	-10	-14	16	20	20
Cali	2,491	14	9	-11	-12	15	22	27
Bogotá	21,888	8	10	-10	-15	20	19	35
Bucaramanga	11,831	16	9	-10	-14	18	19	22
Cúcuta	41,462	17	10	-10	-15	16	19	22

Results based on restoration targets of 10 percent reduction for sediment and nutrient loads and a 10 percent increase in carbon storage (with results reported as percent change). Protection targets were 17 percent avoided damages to these services (with results reported as percent of future degradation avoided). Results are based on InVEST models using national-level datasets.



look at one country, Colombia, to explore the potential to scale nature-based water security activities to a national level and achieve multiple co-benefits simultaneously.

By investing in the source watersheds of six major cities, Colombia has the potential to make meaningful progress toward its SDG commitments. For example, through forest protection, habitat restoration and agricultural best management practices, Colombia's watersheds could see water base flows increase by an average of 5%, improving water security for over 3.3 million people.

At the city level, nature-based solutions used to reduce nitrogen by 10% in Cartagena's source watershed, for instance, could also generate a 34% reduction in sediment run-off and a 26% increase in carbon storage. Taken together – if investments in carbon mitigation, water security and biodiversity are optimised in a single portfolio – the average savings in public investment in the six watersheds could be up to 60% overall.

Water funds

Models such as water funds can be especially effective in aligning actors to capture the value of source water protection. Water funds enable downstream users to invest in upstream nature-based land conservation activities for the purpose of securing improved water quality and in some cases quantity, providing a public-private partnership mechanism and a framework for governance and finance.

The water funds' monitoring, reporting and verification systems (currently in place or under design) collect data to assess these funds' impacts on local and national carbon, social and water footprints – an essential process for national governments to demonstrate progress toward international goals, particularly the SDGs.

Colombia is a clear leader in recognising the value of nature-based solutions for securing water and moving the needle on other national-level goals. Already, the

country has six water funds in operation and another three in development. Colombia has enacted legislative and institutional mandates that promote sound water management and investment in watershed management through local and regional environmental authorities.

These investments include annual revenues directed either toward payments to landowners for ecosystem services or direct land acquisition in source watersheds. Colombia also committed at UNFCCC's COP 20 in 2014 to restore one million hectares of degraded landscapes by 2020.

The Colombian government included the SDGs as cross-cutting goals for its 2014-2018 national development plan and created a cross-sectoral, multi-agency commission to align efforts and monitor progress across ministries and agencies at the national level.

The case of Colombia exemplifies how a combination of national and local political will, effective partnerships and innovative models can come together for source water protection, and how together these efforts can help a country meet global commitments.

While every watershed and every country will be different in terms of its biophysical, socio-economic, cultural and political contexts, this analysis suggests these results might apply in other geographies. Nature-based solutions can contribute to solving complex challenges around water management that in turn bear multiple co-benefits. Water is core to achieving the vision of the SDGs, and concrete mechanisms such as water funds can demonstrate progress on multiple SDGs. ■

■ Native gallery forest in the Colombian Llanos