

EXECUTIVE SUMMARY

BIODIVERSITY MANAGEMENT GOVERNANCE MECHANISMS THROUGH NATURE-BASED SOLUTION IMPLEMENTATION (NBS) IN THE BIOGEOGRAPHIC CHOCÓ OF COLOMBIA

TASK 2: LOCAL ENGAGEMENT AND CAPACITY BUILDING FOR NBS IMPLEMENTATION

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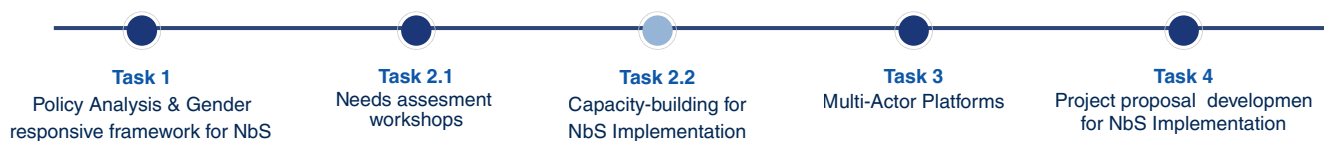
01 · PROJECT OVERVIEW

Building Institutional Capacity for Nature-Based Solutions

This brief presents the results of Task 2 of the Climate Change Governance Mechanism through the Implementation of Nature-Based Solutions in the Biogeographic Chocó of Colombia, focusing on the capacity-building component for public officials in three cities of the Biogeographic Chocó corridor.

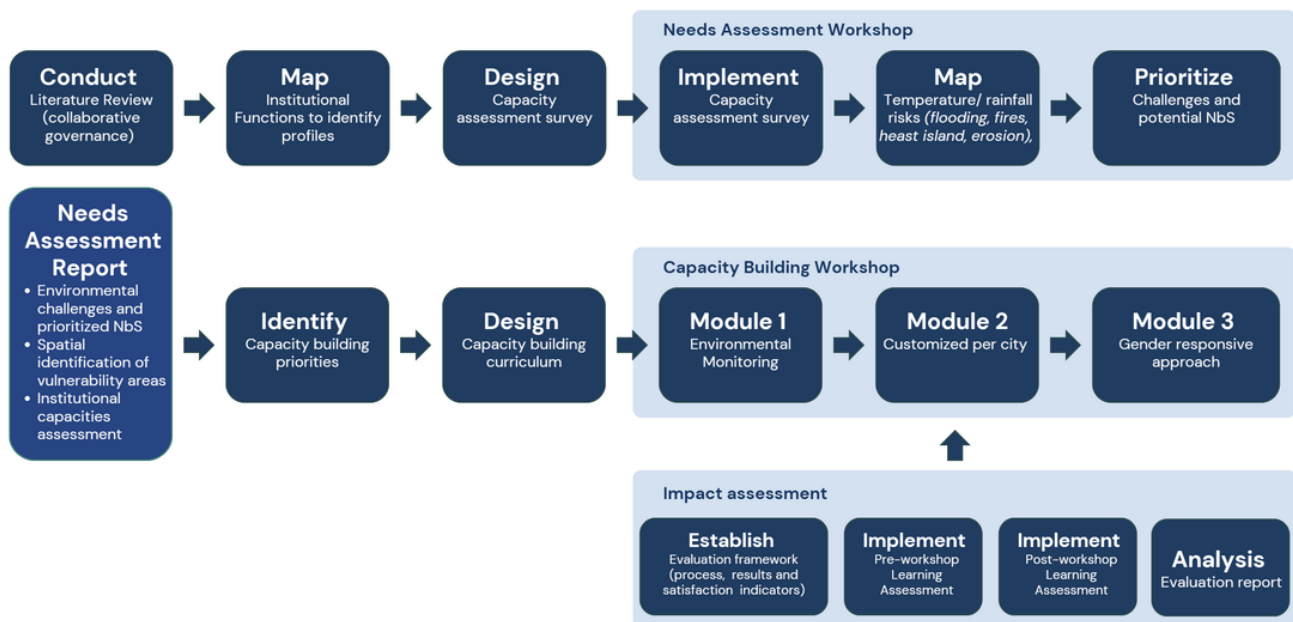
This document summarizes the results of (1) a needs assessment conducted across participating cities to identify existing assets, knowledge gaps, and capacity constraints related to the implementation of Nature-Based Solutions (NbS); (2) the establishment of an NbS Task Force per city and the development of customized capacity-building curriculums delivered through city-level workshops covering three priority modules: gender-responsive climate change governance, environmental governance enforcement, and nature-based solutions implementation; and (3) a learning assessment evaluating the effectiveness of the curriculum. Together, these components build on the comprehensive policy assessment developed in Task 1, and form a cohesive framework for strengthening Nature based solutions implementation across the three pilot cities: Cali, Quibdó and Buenaventura.

Project Context



Methodology

This study drew on a thorough literature review¹ informing three key processes: the design of needs assessment workshops, a pedagogical approach for capacity-building for NbS implementation, and an impact assessment framework for the three pilot cities: Cali, Buenaventura and Quibdó.



02 · TASK 2.1 – NEEDS ASSESSMENT

Needs Assessment Summary-Gaps, Priorities & Opportunities

A mixed-methods process — participatory workshops, institutional surveys, and cognitive mapping — was conducted with the Task Force in each of the three cities.

Establishment of a task force per city

The selection of key strategic officials per city to form the Task Force, the primary audience for the needs- assessment and capacity-building efforts and first entity of the multi-stakeholder platform, was a critical step to ensure traction and relevance throughout the process. Selection was based on an analysis of the institutional architecture of bodies related to environmental management and NbS-enabling functions, including a mapping of city-level and regional dependencies through a review of organizational charts, administrative reforms, and functional manuals. This analysis also included a selection criteria across five analytical dimensions: data governance, operational competency, financing, inclusion and benefits, and the identification of decision-makers within each category in every city and the direct invitation and inclusion of decision makers, including directors of key entities in each city.

¹ Key normative references considered in the design of the project include:

- Law 2476/2025 (Green cities Law): primary framework for NbS obligations in Colombian cities with more than 100,000 inhabitants.
- Constitutional Sentence T-622/2016: recognizes the Atrato River as a rights-bearing subject and provides a legal foundation for PES and community governance in Quibdó.
- IUCN Global NbS Standard (Criterion 8): foundation for the monitoring and adaptive management components of the cross-city curriculum.
- Decrees 870/2017 and 1007/2018: establish Colombia's regulatory framework for Payments for Ecosystem Services and informed the PES module.
- Resolution 1491/2025: establishes private-sector conservation obligations related to Áreas de Vida and informed the Buenaventura green zone adoption module.

Actor type	Cali	Buenaventura	Quibdó
Regional environmental authority	Área Metropolitana del Suroccidente (AMSO)	Corporación Autónoma Regional del Valle del Cauca (CVC)	Corporación Autónoma Regional para el Desarrollo Sostenible del Chocó (CODECHOCO).
City environmental authority	Departamento Administrativo de Gestión del Medio Ambiente (DAGMA)	Entidad pública ambiental (EPA)+ Oficina Asesora de Medio Ambiente	Secretaría de medio ambiente
Key secretariats	- Secretaría de Gestión del Riesgo de Emergencias y Desastres - Departamento Administrativo de Planeación Distrital - Unidad Administrativa Especial de Servicios Públicos (UAESP) - Empresa de Desarrollo y renovación urbana (EDRU) - Secretaría de la Mujer	- Oficina de Asesora de Planeación - Secretaría de la Mujer	
Other key actors	- Empresas Municipales de Cali (EMCAL) - Parques Nacionales Naturales (PNN) - Universidad Javeriana		- Gobernación del Chocó - Instituto de Investigaciones Ambientales del Pacífico - Universidad Nacional Abierta y a Distancia (UNAD) - Universidad Tecnológica del Chocó (UTCH)

Capacity gaps - Cali

Capacity Dimension	Capacity Assessment Survey Results
Data Governance	Strong water management and land-use planning. Weak monitoring of climate risks, biodiversity, and GHG emissions, which are key inputs for advanced NbS projects.
Territorial Governance	Cali Buenaventura Quibdó
Financing	Instruments known (surcharges, cooperation, royalties), but effective financial execution is weak. Gap between knowing instruments and deploying them
Inclusion	DAPD leads with co-creation and differential monitoring. UAESP and Risk Management are weaker. Co-benefits most valued by officials: local employment, social cohesion can be an entry point to link NbS with urban development agendas
Incentives	Concentrated in DAPD, DAGMA, and EMCALI. UAESP and Risk Management lack capacity here. Critical gap: no clear governance pathway defining who decides, formulates, executes, and maintains NbS projects
Benefits	The capacity to generate benefits and co-benefits is primarily linked to the role of the bioeconomy and sustainable economic development.

Prioritized Challenges & NbS Opportunity Zones - Cali

The tables below map priorities related to NbS families (World Bank catalogue) and the specific opportunity zones identified through participatory mapping and voting exercises with the Task Force.

CALI — PRIORITIZED CHALLENGES & NBS OPPORTUNITY ZONES

PRIORITIZED CHALLENGES	NbS FAMILIES	OPPORTUNITY ZONES
Water contamination from discharges 6/17 votes – Top priority	Natural inland wetlands	El Pondaje, Charco Azul
	River & stream renaturation	Navarro wetland
	River floodplains	Cauca River & jarillón
	Bioretention areas (SUDS)	La Flora, Avenida 6ta, Comuna 22
Waste management from maintenance & pruning 4/17 votes - High priority	Circularity in Urban farming	Navarro Environmental Park
	Open green spaces	Urban green infrastructure, East of the city
	Urban & upland forests	Biomass restoration in Comunas 17, 18, 20 and 22

Cross-cutting: Green corridors & urban forests · Ecological connectivity · Metropolitan environmental management observatory · Ecosystem services



Capacity gaps - Buenaventura

Capacity Dimension	Capacity Assessment Survey Results
Data Governance	Climate and environmental data fragmented across entities: The city hall holds GIS data of urban area, CVC holds environmental data, EPA only has citizen participation records. Critical blind spot: no entity tracks port sector environmental activity.
Territorial Governance	Potential for green infrastructure and public space, CVC focus on mangrove restoration and moderates in water quality, EPA focuses on basic infrastructure. No entity has specialized NbS staff; all depend on external consultants. The city hall has the richest data (GHG, heat islands, ethnic territories) but still outsources formulation
Financing	High dependence on national transfers (SGP). CVC relies on national funds for over 90% of its budget. Gap in accessing international climate calls; EPA allocates only 5% of its budget to strategic ecosystems
Inclusion	The city has a broad perspective of co-creation and differential monitoring, Co-benefits most valued by officials: local employment, social cohesion can be an entry point to link NbS with urban development agendas
Incentives	Not explored, there is an implicit gap due to the low environmental budget.
Benefits	The identified benefits are associated with biocultural heritage and the relationship between ethnic communities and their ecosystems.

BUENAVENTURA – PRIORITIZED CHALLENGES & NBS OPPORTUNITY ZONES

PRIORITIZED CHALLENGES	NbS FAMILIES (WORLD BANK)	OPPORTUNITY ZONES
Water contamination and sedimentation (illegal mining) 2/8 votes – tied high priority	Urban & upland forests	Dagua, Naya, Raposo, Anchicayá, Yurumanguí rivers
	Green corridors	Farallones National Natural Park (PNN)
Mangrove degradation & coastal erosion 2/8 votes – tied high priority	Mangrove forests	River mouths & estuaries, Bay of Malaga
	Sandy shores	Ladrilleros, Juanchaco, La Bocana, La Barra, Punta Soldado, Pianguita
Bay & Estuary pollution from waste 2/8 votes – tied high priority	Natural Inland Wetlands	San Antonio Estuary, El Pailón, La Chanflanita Canal
	Other coastal wetlands	Bazán Bocana, Chucheros, Ensenada El Tigre, La Bocana, Juanchaco, Ladrilleros

Cross-cutting: Mangrove forests · Green corridors · Urban & upland forests · Áreas de Vida (La Plata, Calambre, Calima, Naya, Papagayo, Chucheros, Gamboa) · Climate finance & port sector environmental compensation mechanisms

Capacity gaps - Quibdó

Capacity Dimension	Capacity Assessment Survey Results
Data Governance	The city hall and CODECHOCÓ have relevant environmental data. The Governor's office and IIAP have critical gaps: no departmental biodiversity inventory, outdated land-use plan (POT), and no desertification map, basic inputs for any NbS planning
Territorial Governance	The city hall is the most operationally active: community gardens, riparian buffer management, drainage and nature tourism. CODECHOCÓ focuses on rural restoration and PES. Gobernación and IIAP more limited in direct implementation. Highly asymmetric. CODECHOCÓ has its own multidisciplinary team. City hall, Governor's office, and IIAP all depend on external consultants.
Financing	The city hall invests only ~1% of its budget in NbS and faces barriers accessing international climate calls. CODECHOCÓ relies on national funds and cooperation for over 90% of its budget. The Governor's office has very scarce own resources
Inclusion	All entities declare participatory co-creation. IIAP has differential monitoring capacity, the Governor's office lacks formal inclusion protocol. Illegal mining is the largest informal employer, therefore NbS strategy must offer viable economic alternatives to communities.
Incentives	CODECHOCÓ leads with productive incentives (conservation employment). IIAP's priority unfunded NbS: bioeconomy, risk management, restoration, and conservation jobs. CODECHOCÓ's priority: coastal and riverbank erosion mitigation works. Other entities have no reported experience
Benefits	Institutions face challenges related to the workforce transition of individuals and communities whose livelihoods depend on mining, and therefore see the development of bioeconomy projects as an opportunity.



QUIBDÓ – PRIORITIZED CHALLENGES & NBS OPPORTUNITY ZONES

PRIORITIZED CHALLENGES	NbS FAMILIES (WORLD BANK)	OPPORTUNITY ZONES
Water contamination from mining & waste 4/14 votes – Top priority	Urban & upland forests	COCOMACIA, COCOMIRO, Guayabal
	River & stream renaturation	Atrato, Ichó, Neguá, Guayabal, Cabí rivers y ravines
	Green corridors	San Vicente, Valencia, Pablo VI, Niño Jesús, Palenque
Unplanned expansion in flood/slide zones 3/14 votes - High priority	Green corridors	Atrato boardwalk · El Reposo–Pacurita & Quibdó–Yuto, Atrato
	Urban & upland forests	San Vicente, Valencia, Palenque, Monserrate, Yesca/Caraño/Cabí floodplains

Cross-cutting: Urban & upland forests · Green corridors · Urban farming · COCOMACIA, COCOMIRO & Guayabal community councils · REDD+ DRMI Selva Pluvial · Ecotourism & bioeconomy (Tutunendo) · Forest conservation · Ecological restoration · Sustainable livelihoods · Community governance

03 · TASK 2.2 — CURRICULUM DESIGN & TRAINING DELIVERY

A Differentiated Curriculum built on Real Territorial Gaps

Six training modules were designed and delivered in April 2026, structured around four pedagogical principles: problem-based learning anchored in each city's real challenges, co-construction of knowledge among institutional peers, intercultural and ethnic-territorial approach and experiential learning with immediate institutional applicability.

All modules used national peer references: the Bogotá SUDS case, DAGMA Cali's green zone program, and Vida Manglar REDD+, generating stronger ownership and faster adoption than broader international frameworks.



Curriculum Structure

Module	Type	City	Invited Expert Co-facilitators	Core Objective
Environmental Monitoring for NbS	Transversal	All	Diana Marcela Ruiz – Urban Biodiversity Specialist, Humboldt Institute	Design & prioritize monitoring systems, IUCN NbS Standard, open data platforms
Climate Governance with Gender Lens	Transversal	All	Carolina López – Specialist in Environmental Management for Development and Conservation, Biodiversa Corporation	Gender-responsive indicators and women as ecosystem stewards
Sustainable Urban Drainage Systems (SUDS)	City-specific	Cali	Alejandro Martínez – SUDS Design Specialist, TYPASA Group	Bogotá model lessons; inter-institutional governance route for SUDS implementation
Green Zone Adoption (Public-Private Alliances)	City-specific	Buenaventura	William Andrés Contreras – Green Zone Adoption Program Lead, DAGMA, Cali	DAGMA Cali Green Zone Adoption model replicability; normative framework; port sector engagement
Mangrove Restoration	City-specific	Buenaventura	William Andrés Contreras – Green Zone Adoption Program Lead, DAGMA, Cali	Vida Manglar REDD+ model; biocultural protocols; blue carbon financing
Payments for Environmental Services (PES)	City-specific	Quibdó	Oscar Perenguez – PES Formulation Lead, DAGMA, Cali	PES design & financing; T-622 Atrato Sentence; alternatives to illegal mining income

Knowledge Exchange Between Cities

The program actively transferred lessons learned within and across cities and government entities. Cali's DAGMA green zone adoption model was used as a reference for Buenaventura. Payment for Ecosystem Services (PES) experiences from CODECHOCÓ and Cali informed Quibdó's Secretariat of Environment approach to PES. Similarly, Cali benefited from knowledge exchange with the city of Bogotá on the institutional and regulatory mechanisms used to integrate Sustainable Urban Drainage Systems (SUDS) into territorial planning instruments. All three Task Forces were introduced to the Alliance of Cities for the Biogeographic Choco — seeding a regional NbS learning network connecting Colombia, Ecuador, Panama, and Costa Rica.

Bridge building: Cali is collaborating with the University of Turku to deploy the NbSOS scanner — a spatial NbS prioritization tool — using data co-developed in the workshops. With results expected in June 2026, the tool represents an opportunity to provide Cali with valuable data while providing the IADB and Turku University with a real-world implementation laboratory.

Actions pathways identified per city

City	Potential projects	Potential Policy Instruments
Cali	Support the consolidation of the SUDS Network (AMSO to lead, linking to Bogotá & Medellín national networks); SUDS incorporation into POT; AMSO-EMCALI-DAPD pilot coordination for 3 strategic zones. Formulation of a monitoring center project led by AMSO, with technical support from experts. To strengthen data collection and environmental monitoring.	Development of a recommendations document to integrate Sustainable Urban Drainage Systems (SUDS) into Cali's Land Use Plan. This will also inform the development of a policy resolution to establish and institutionalize Cali's SUDS network.
Buenaventura	Design of a pilot green zone adoption program with Sociedad Portuaria to support the adoption and management of urban green areas, in partnership with community action boards, ensuring inclusive and sustainable implementation. Mangrove restoration pilot in Nayita & Mayolo with Conservation International.	Development of a forestry policy draft agreement as a public policy instrument to enable green space adoption, urban forestry, and Nature-based Solutions (NbS) in Buenaventura, providing a clear framework for coordinated implementation.
Quibdó	Design of a PES pilot project with the Departmental Government and the Secretariat of Environment of Quibdó, engaging local communities such as Siete Sabias and COCOMACIA to ensure inclusive design and effective on-the-ground execution.	Development of an operational manual for Payments for Ecosystem Services (PES), including a set of agreed indicators to support the design, implementation, and evaluation of PES schemes in Quibdó. This will also include recommendations to inform the new Climate Change Management Plan.

04 · IMPACT EVALUATION & STRATEGIC OUTLOOK

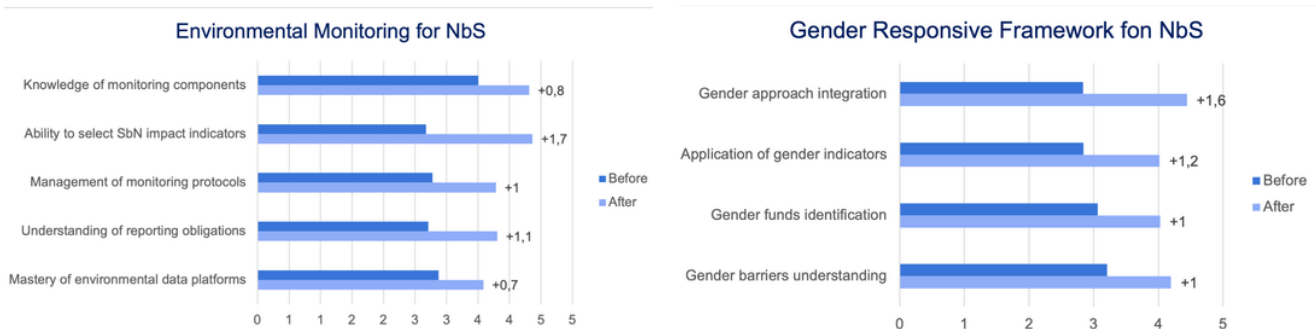
Learning Assessment Reach & Participation

43 CERTIFIED PARTICIPANTS	10 TRAINING SESSIONS (3 CITIES)	22 INSTITUTIONS REACHED	57% WOMEN PARTICIPANTS
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Perceived Knowledge Gains — Pre→Post Workshop Shifts in Transversal Modules

All dimensions showed positive gains across all three cities. Highest gains recorded (Likert scale 1-5):



Environmental Monitoring for NbS

- The largest gain was in the ability to select NbS impact indicators (+1.7), which was also the most underdeveloped skill before training.
- Understanding of reporting obligations under Green Cities Law 2476/2025 improved significantly (+1.1), with particular depth where the Law was discussed within the context of local capacities.

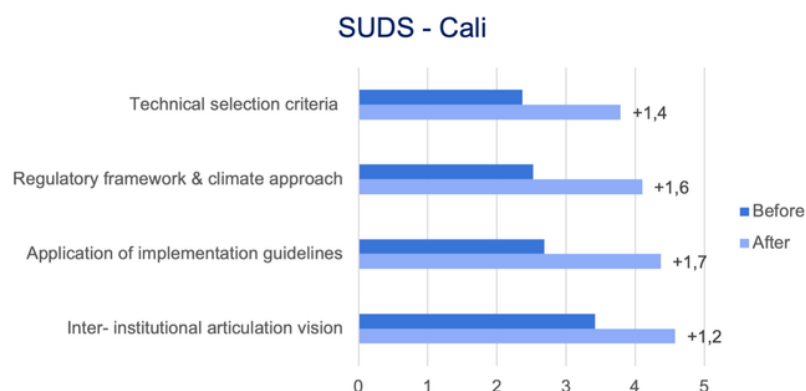
Gender Responsive Framework for NbS

- Gender approach integration in NbS project design produced the highest gain (+1.6), driven by the participatory indicator-building exercise where teams transformed neutral indicators into gender-responsive ones.
- Application of gender indicators showed strong improvement (+1.2), with participants producing concrete outputs: tables of gender-sensitive indicators for water resources management, PES, coastal governance, and green infrastructure.

Knowledge Gains Pre→Post Workshop Shifts in City-specific Modules

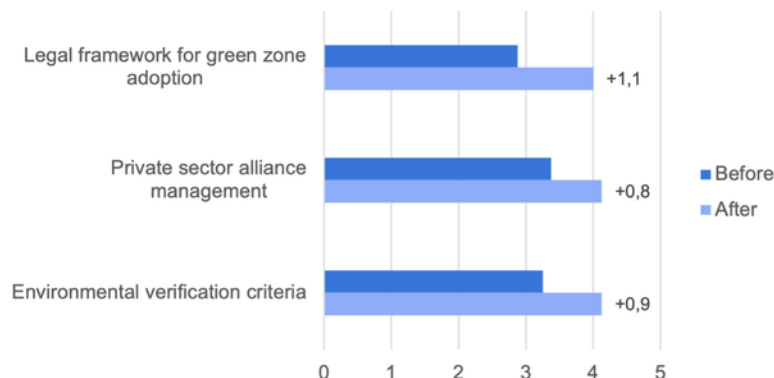
CALI

Sustainable Urban Drainage Systems (SUDS)

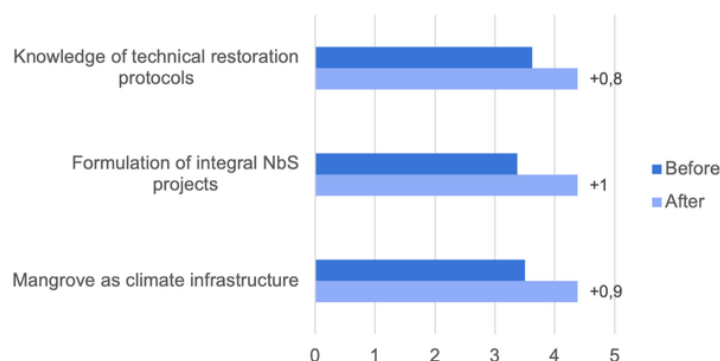


EMain Knowledge Gains

- The highest gain was recorded in the application of implementation guidelines (+1.7), reflecting the practical value of the Bogotá SUDS case as a concrete, replicable model for Cali.
- Regulatory framework & climate approach improved by +1.6, as participants deepened their understanding of the normative pathway from Bogotá's POT 2024 to SUDS deployment (a key institutional gap identified in the needs assessment).
- Technical selection criteria (+1.4) and inter-institutional articulation vision (+1.2) both showed meaningful gains, with the latter laying the groundwork for the Cali SUDS institutional Network subsequently proposed by AMSO, EMCALI, and DAPD.

BUENAVENTURA**Green Zone Adoption by the Private Sector****Green Zone Adoption - Buenaventura****Main Knowledge Gains**

- Legal framework for green zone adoption showed the largest gain (+1.1), as participants discovered that Buenaventura lacks a local ordinance enabling the private sector to maintain green spaces in the city,, leading to the proposal to develop a draft District Agreement for the Planning Office and the Environmental Advisory Office, which will lead its review and submission to the District Council for approval
- Environmental verification criteria (+0.9) and private sector alliance management (+0.8) improved meaningfully, providing EPA and the Alcaldía with practical tools for private sector engagement from DAGMA Cali's experience.
- The Port Association was identified and interest confirmed as the private actor for a first green zone adoption agreement pilot.

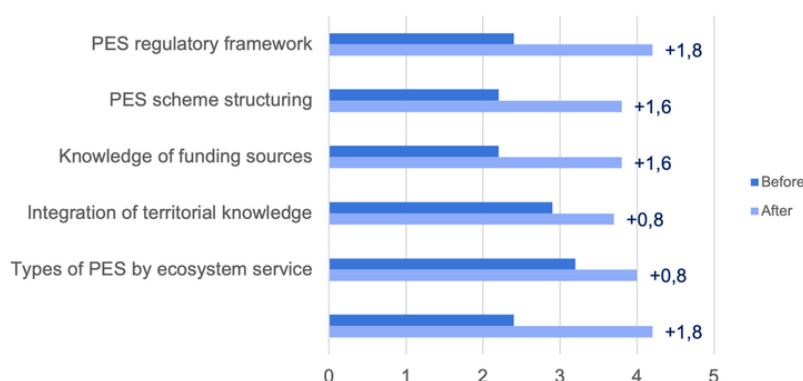
BUENAVENTURA**Green Zone Adoption by the Private Sector****Mangrove Restoration - Buenaventura****Main Knowledge Gains**

- Formulation of integral NbS projects showed the strongest relative gain (+1.0), giving participants a structured pathway to connect restoration ecology, community governance, and climate financing in a single project proposal.
- The Vida Manglar REDD+ case demonstrated that blue carbon markets are a viable co-financing mechanism for communities like La Plata, Calambre, and Chucheros — shifting perception from theory to precedent.

QUIBDÓ

Payments for Environmental Services (PES)

Payment for Environmental Services (PES) - Quibdó



Main Knowledge Gains

- PES scheme operation and types of PES by ecosystem service both recorded the highest gains (+1.8), confirming that conceptual gaps and institutional barriers remain as primary obstacle in Quibdó.
- PES regulatory framework (+1.6) and scheme structuring (+1.6) improved substantially as participants engaged with Decree 870/2017 and Constitutional Sentence T-622/2016 (Atrato River as rights-bearing subject), providing the legal foundation for community PES agreements with COCOMACIA.

Perspective shifts towards NbS Implementation

The following table compiles selected participant responses illustrating shifts in perspective between the beginning and end of the workshop, highlighting changes in knowledge, attitudes, and perceived roles regarding Nature-based Solutions (NbS) implementation.

PRE response (identified obstacle)	POST response (declared learning)	Shift
"Lack of knowledge, staff, funding, and project planning"	"The need to incorporate environmental criteria from the planning stage of infrastructure works and to establish gender-sensitive indicators"	From a general list of deficiencies to a concrete integration proposal within the participant's own institutional function.
"Lack of commitment and assumption of institutional responsibility for the transition from grey to green infrastructure"	"The need to build a SUDS network across different institutions"	From attributing inaction to others to proposing an inter-institutional coordination mechanism.
"The lack of knowledge and qualified professionals in PES schemes"	"Decision-making instruments, project formulation tools, and investment mechanisms under the 1% environmental mandate"	From a generalized knowledge gap to the identification of specific budgetary tools.
"The main obstacle is lack of knowledge, disinterest among decision-makers, insufficient trained staff, and limited resources"	"Green Cities Law, gender perspective, and the importance of PES implementation in urban contexts"	From a system of obstacles perceived as fixed to an integrated view of available policy instruments.

Participant Satisfaction

CALI 4.9/5 All satisfaction indicators	BUENAVENTURA 4.8/5 All satisfaction indicators	QUIBDÓ 4.5/5 All satisfaction indicators
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Lessons learned and next steps towards task 3

The NbS Committees (NBSC) and Community Researcher Networks (CRN) in Task 3 will build directly on the Task Force relationships, monitoring frameworks, and action pathways identified and activated in Task 2. The Multi-Actor Platforms will confirm whether institutional intentions manifested in post-workshop surveys translate into NbS implementation pathways (project formulation, staff and resources or budget allocations, etc).

Regional scalability: The needs assessment methodology, combined with the design and implementation of differentiated curriculums and pre/post evaluation model is replicable to other Cities in the region through the Alliance of cities for Biogeographic Chocó, which includes cities in Ecuador, Panama, and Costa Rica. The replication of this effort aims to create a regional NbS portfolio, eligible for funding from IKI, GEF, or other bilateral instruments (Norway, Germany, UK, EU).

Relevant Annexes

Relevant Annexes	Link
 Workshop presentations (by module and city)	• Cali • Buenaventura • Quibdó
 Toolkits containing enabling NbS regulations provided to participants	• Green zone adoption • SUDS • PSE • Environmental monitoring • Gender Responsive NbS implementation
 Photographic and audiovisual record of the workshops	• Cali • Buenaventura • Quibdó • Certificates