

WATER SHIELD

STRATEGIC CLIMATE ADAPTATION PROGRAM FOR THE FOREST PROTECTION OF MEDELLÍN

Environmental Mission — Resilience and a Green Future

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WATER SHIELD — FOREST PROTECTION

Adaptation • Sustainable • Strategic

STRATEGIC CONTENT

Climate Adaptation Program — 2026 Operational Plan

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15. Conclusion and Request for Institutional Action

1. THE CLIMATE CRISIS IN THE ABURRÁ VALLEY

Context of Environmental Vulnerability and Strategic Risk

Escalating Threat

More than **400 hectares are lost annually to fires**. The intensification of dry seasons places our vital ecosystems at critical risk.

Social Impact

Deterioration of air quality for **2.5 million inhabitants** and compromising the geological stability of hillsides in relation to mass movements.

Critical Response

The guardian hills — **El Volador, Nutibara, and Picacho** — require an urgent reduction in response time given the recurrence of fires.

2. THE OPERATIONAL CHALLENGE OF CRITICAL TOPOGRAPHY

Analysis of Structural Limitations and Response Times in Medellín

Critical Response

The average response time is **60 minutes**, exceeding effectiveness standards given the rapid spread of wildland fires.

Limitations

Extreme difficulty in interface zones and a lack of dedicated water infrastructure at difficult-to-access locations.

Hills at Risk

- El Picacho & El Volador
- Cerro Nutibara
- Pan de Azúcar
- Santa Elena Corridor

Gap Analysis

The urban network does not reach higher elevations, creating a structural gap that Water Shield seeks to close permanently.

3. IDENTIFIED STRUCTURAL WATER-SUPPLY GAP

Hillside Limitations

The urban aqueduct does not reach higher elevations. Water tanker trucks face mobility restrictions and a lack of filling points in elevated areas.

External Dependence

The current network depends on remote supplies and dispersed natural sources, which are insufficient for large-scale emergencies.

Dedicated Water Network

It is urgent to establish a **strategic, decentralized network independent of the urban network** to guarantee an agile response in high-risk areas.

4. WATER SHIELD: A PARADIGM SHIFT

From Reactive Response to Proactive Climate Adaptation

Program Vision

We redefine the approach by transitioning from simply responding to fires toward a comprehensive **climate adaptation strategy**.

It is not only about supplies, but about strengthening installed capacity and **community governance**.

Impact and Commitment

Aligned with the **2050 Climate Action Plan and the C40 Network**, the program positions Medellín as a benchmark in territorial resilience, transforming physical assets into strategic tools for a sustainable future.

5. PILLAR 1: NETWORK OF STRATEGIC WATER POINTS

Technical Advantage

Water decentralization minimizes dependence on tanker trucks.

Through **2.5-inch Storz couplings**, firefighting operations are optimized at critical locations that are difficult to access.

Total Capacity: 50,000 gallons

Active Tanks: 10 locations

Permanent coordination with **EPM, rural aqueduct systems, and rainwater collection systems** to guarantee continuous filling.

Technical standards based on Q4 2025 emergency management protocols.

6. PILLAR 2: TACTICAL DECENTRALIZATION

Shield Warehouses

Satellite Centers

Five strategic locations will be established in:

- Santa Elena
- AltaVista
- San Cristóbal
- Guardian Hills
- Alto de Las Palmas

These locations are intended to provide an immediate response.

Physical Capacity

Equipment consisting of **motor pumps and PPE** will serve as the physical operational core for local Community Wildland Fire Brigades.

7. PILLAR 3: SPECIALIZED HILLSIDE MOBILITY

Interface Doctrine

We implement an operational doctrine differentiated from the urban response and specifically designed for the complex **wildland-residential interface of the Aburrá Valley**.

"Total versatility in critical terrain."

Required Adapted 4x4 Fleet

2 Wildland Water Tankers: Robust capacity for large-scale fires.

4 Rapid-Attack Pickups: Agile vehicles for narrow roads and steep slopes.

2 Versatile UTVs: Full access to trails and difficult-to-traverse areas.

8. PILLAR 4: AERIAL SHIELD AND COORDINATION

Strategic Aerial Availability

A system providing **50 annual hours with a helicopter bucket** for inaccessible areas, maximizing response capabilities in difficult terrain.

Integration with SIATA

Institutionalization of a ground-air protocol with the **Early Warning System** to optimize early detection.

Role of Liaison Officers

Medellín Firefighters lead ground-air coordination, ensuring fluid communication and efficient joint operations.

9. GOVERNANCE MODEL: WATER SHIELD REGIONAL ROUNDTABLE

A cooperative structure that distributes technical and financial responsibilities for addressing metropolitan wildfire risk:

Medellín Mayor's Office & DAGRD-Firefighters

Operational Leadership — **\$1.500M**

AMVA

Regional Coordination — **\$800M**

Government of Antioquia

Model Scalability — **\$500M**

EPM

Logistical Support — **\$300M**

CORANTIOQUIA

Ecological Recovery — **\$200M**

ISA / ISAGEN

Technological Monitoring — **\$305M**

Total Proposed Investment

\$3.605.000 COP as written in the presentation.

Interinstitutional commitment to forest protection.

10. PROPOSED CO-FINANCING AND STRATEGIC COMMITMENT

Water Shield Regional Roundtable

Justification

Collective investment builds robust institutional capacity, essential for resilience and the protection of vital infrastructure.

Critical Assets

- **Replicability:** Scaling by the Departmental Government.
- **Operability:** EPM water-supply support.
- **Connectivity:** ISA/ISAGEN monitoring.

Proposed Contributions

Medellín Mayor's Office

Leadership and unified operational command

\$1,500,000,000

AMVA

Regional coordination and impact mitigation

\$800,000,000

Departmental Government

Scalability of the model to other subregions

\$500,000,000

EPM

Water supply and logistical support

\$300,000,000

CORANTIOQUIA

Environmental authority and risk maps

\$200,000,000

ISA / ISAGEN

Protection of transmission lines

\$305,000,000

11. COMMUNITY STRENGTHENING — WILDLAND FIRE BRIGADES

First Line of Defense

Formation of **10 volunteers per prioritized sector**, strengthening the early-warning and immediate-response network for vegetation fires.

Certification and Coordination

A **40-hour technical training cycle** led by Firefighters and DAGRD, integrating the **Community Action Boards (JACs)** to ensure community ownership.

Infrastructure Custody

Responsibility for the keys to Shield Warehouses and valves, guaranteeing activation **within less than 10 minutes** from detection of an incipient fire.

12. RESPONSE PROTOCOL — FOUR KEY MOMENTS

"The focus is on early intervention, drastically reducing response times and minimizing the impact of fire."

1. Community Report

Detection and georeferenced reporting by the community.

2. Parallel Activation

Simultaneous alert to the DAGRD Central Office and Wildland Fire Brigade.

3. Initial Response

Action in **less than 10 minutes** using Shield Warehouse equipment and Water Points.

4. Escalation

Mobilization of the Shield Fleet in **less than 15 minutes**.

Simultaneous communication integrated between the community and official agencies.

13. IMPLEMENTATION TIMELINE

Strategic Roadmap Toward a Medellín More Resilient to Climate Change

Months 1-2 — Phase 1: Diagnosis and Partnerships

- Establishment of the Regional Roundtable
- Signing of Framework Agreement
- Fire recurrence map
- Identification of water sources

Months 3-8 — Phase 2: Physical Capacity

- Installation of **10 Water Points**
- Implementation of **5 Shield Warehouses**
- Specialized mobility fleet

- Protocols with EPM and aqueduct systems

Months 4-12 — Phase 3: Ownership and Completion

- Aerial Shield agreement
- Community Wildland Fire Brigades
- Execution of **two drills**
- Final indicator report

Total implementation period: 12 months.

14. MEASURABLE IMPACT: TOWARD A RESILIENT MEDELLÍN

Reduction in Response Time

Response will move from **60 minutes to less than 15 minutes**, protecting lives and property along the urban edge.

Protection of Key Ecosystems

Goal of reducing affected hectares by **40%**, preserving Andean forests and connectivity.

Optimization of Water Resources

Prioritization of rainwater for emergencies, relieving pressure on the potable water supply.

Social Benefit

Protection for rural aqueduct systems and the communities of **Santa Elena and San Cristóbal**.

15. CONCLUSION AND REQUEST FOR INSTITUTIONAL ACTION

Water Shield is not simply an acquisition of equipment, but rather the installation of the **climate adaptation capacity that the territory needs to overcome the historical gap in wildfire response**.

Formal Requests

- ✓ Adopt Water Shield as a priority program within the Risk Management Plan.
- ✓ Authorize detailed studies of territorial and hydraulic suitability.
- ✓ Convene the formal establishment of the Water Shield Regional Roundtable.

✓ Define installed-capacity indicators for comprehensive evaluation.

"We do not replace what exists. We install what is missing."