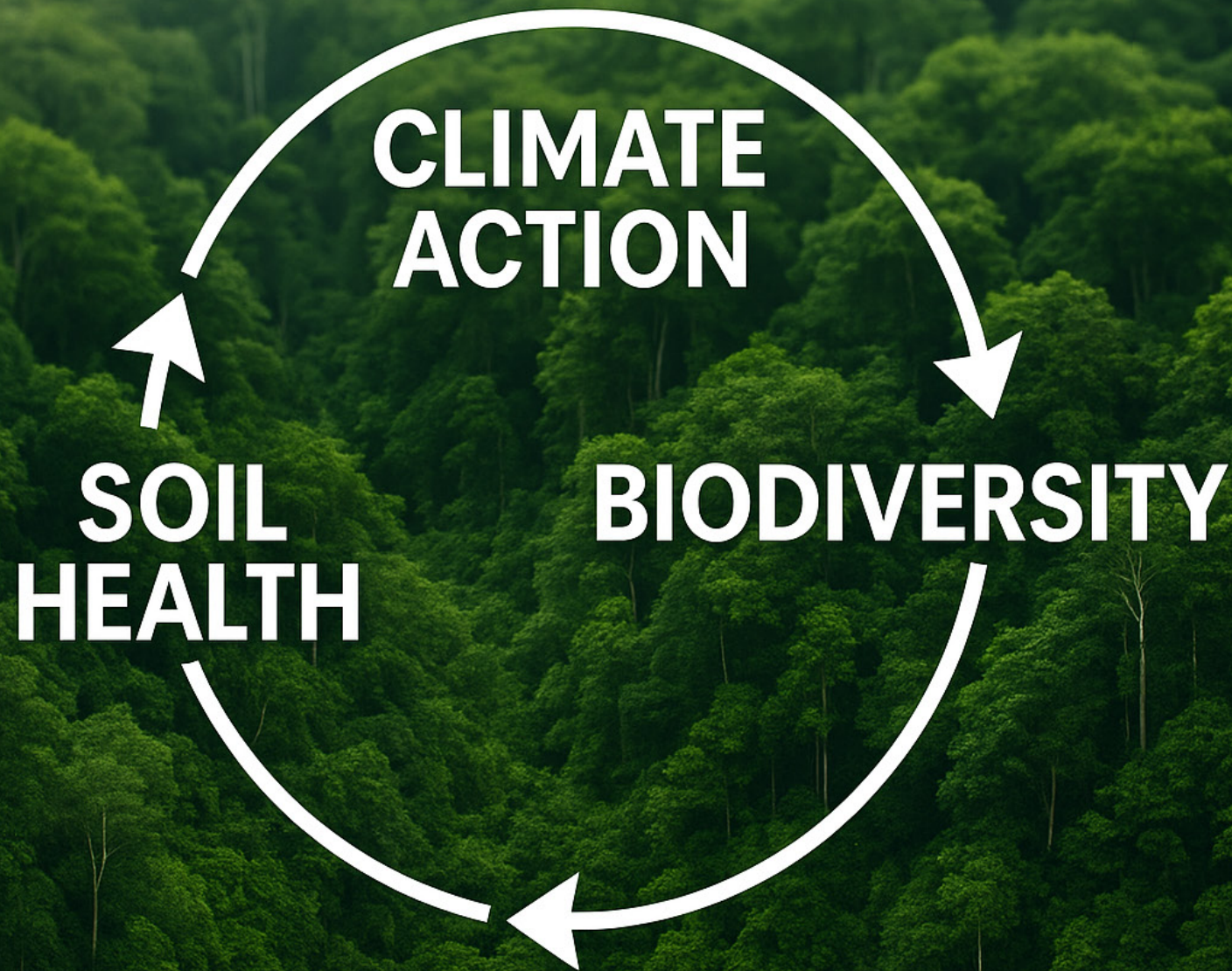


MicrobeBio®

**REVIVING THE DOMINICAN
REPUBLIC'S FORESTS WITH
MICROBEBIO:
SUSTAINABLE SOIL
SOLUTIONS FOR HEAVY
METAL CLEANUP AND
BIOREMEDIATION**



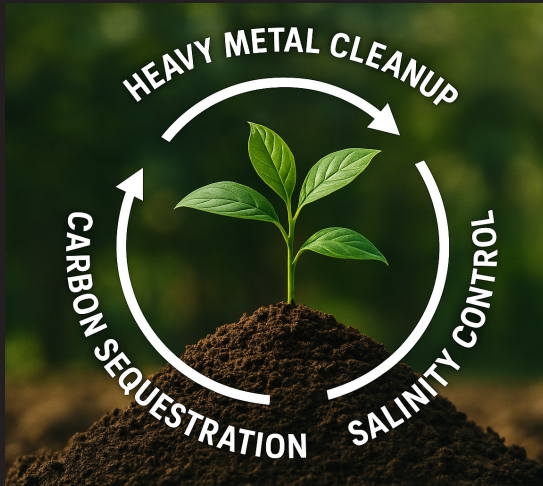




The Dominican Republic's lush forests, from the tropical rainforests of Los Haitises National Park to the pine-covered Sierra de Bahoruco, face mounting threats: heavy metal contamination from mining, soil degradation due to erosion, and pollution from agricultural runoff. These challenges jeopardize biodiversity, water quality, and local agriculture, including coffee and cacao production. At MicrobeBio, we're transforming restoration with microbial solutions that harness microbe-plant interactions for phytoremediation—using plants and beneficial bacteria to detoxify soils and revive ecosystems. Our organic biofertilizers and inoculants promote sustainable cleanup, carbon sequestration, and a greener future.



THE DOMINICAN REPUBLIC'S SOIL CONTAMINATION CRISIS: HEAVY METALS, EROSION, AND POLLUTION



The Dominican Republic's diverse landscapes grapple with environmental strain. Mining in the Cordillera Central leaves soils rich with heavy metals like zinc, cadmium, copper, and nickel, contaminating rivers and farmlands. Erosion, intensified by deforestation and hurricanes, strips topsoil in the Samaná Peninsula, reducing fertility for crops like plantains. Agricultural runoff, laden with pesticides, pollutes soils and waterways, while historical industrial activities add to the burden. These issues disrupt soil ecosystems, threatening the country's rich biodiversity and agricultural output.

MicrobeBio's microbial blends, featuring plant growth-promoting rhizobacteria (PGPR) like *Pseudomonas* and *Bacillus*, pair with hyperaccumulator plants like sunflowers to extract and neutralize these pollutants, restoring soil health for thriving forests and farms.



MICROBE-PLANT INTERACTIONS

A NATURAL TOOL FOR HEAVY METAL REMEDIATION

Our solutions leverage microbe-plant partnerships for phytoremediation, where plants absorb heavy metals while microbes enhance uptake and tolerance:

- **Enhanced Metal Accumulation:** PGPR boost sunflower growth in contaminated soils, increasing zinc and cadmium uptake by 1.7–2.5 times in shoots. These bacteria produce siderophores, acids, and hormones to solubilize metals and improve plant resilience.
 - **Stress Tolerance:** Microbes help plants withstand erosion-related nutrient loss and metal toxicity by regulating hormones, chelating metals, and enhancing nutrient bioavailability like phosphorus.
 - **Site-Specific Benefits:** In mining zones like San Juan or agricultural areas near Santo Domingo, our inoculants turn sunflowers and native plants into efficient cleaners, reducing metal levels while rebuilding soil structure.
- This approach is eco-friendly, cost-effective, and supports crop yields in polluted regions.



REDUCING SOIL SALINITY WITH MICROBIAL POWER

Soil salinity, exacerbated by irrigation in arid regions like the Azua Valley, threatens agriculture. MicrobeBio's halotolerant bacteria address this directly and indirectly:

- **Direct Salt Reduction:** Salt-loving *Bacillus* strains consume excess ions, lowering salinity and producing acids to neutralize alkaline compounds, improving nutrient access.
 - **Indirect Plant Support:** PGPR and mycorrhizal fungi form root symbioses, enhancing soil aggregation to prevent salt buildup and helping plants absorb water under stress.
- Our solutions restore saline soils, supporting resilient crops and reforested areas.

BREAKING DOWN CYANIDE FROM MINING WASTE

Cyanide pollution from gold mining in Cotuí contaminates soils and rivers. MicrobeBio's degrading bacteria offer a natural fix:

- **Enzymatic Breakdown:** Strains like *Pseudomonas* and *Bacillus* metabolize cyanide into harmless ammonia and carbon dioxide, using it as a nutrient source even in alkaline conditions.
- **Efficient Cleanup:** Our microbial consortia achieve high removal rates in mine tailings, providing a sustainable alternative to chemical treatments. This protects waterways and enables land rehabilitation for farming or reforestation.



REMEDIATING HISTORICAL POLLUTANTS

Persistent pollutants from past industrial activities linger in soils near urban centers. MicrobeBio's enhanced bioremediation tackles this:

- **Microbial Degradation:** Specialized bacteria break down chlorinated compounds by using chlorine as an energy source, converting toxins into non-harmful forms.
- **Biochar Boost:** Combined with plant-derived biochar, our microbes thrive on surfaces that facilitate detoxification, accelerating cleanup in contaminated sites. This restores polluted soils for safe agriculture and forest regrowth.






SOIL
HEALTH

CLIMATE
ACTION

MITIGATING MINING POLLUTION AND ACID MINE DRAINAGE

Acid mine drainage from nickel and gold mines acidifies soils and leaches metals. MicrobeBio's sulfate-reducing bacteria (SRB) neutralize this:

- **Metal Precipitation:** SRB convert sulfate to sulfide, binding metals into insoluble precipitates and generating alkalinity to counter acidity.
- **Engineered Systems:** Our bioreactors and wetland formulations treat drainage efficiently, outperforming chemicals in cost and sustainability. This rehabilitates mining sites for reforestation and prevents downstream pollution.



WHY MICROBEBIO FOR THE DOMINICAN REPUBLIC'S SOIL REVIVAL?

MicrobeBio's products, like Nature Phenom, are tailored for the Dominican Republic's tropical climate, enhancing plant growth, metal extraction, and soil resilience. Benefits include:

- **Higher Efficiency:** Boost metal uptake and plant tolerance for faster cleanup.
- **Climate Resilience:** Improve carbon storage and stress adaptation.
- **Cost Savings:** Reduce chemical needs, lowering expenses and environmental impact.
- **Biodiversity Boost:** Restore microbial diversity for thriving ecosystems.

Ideal for projects in Jaragua National Park or coffee agroforestry zones.

JOIN MICROBEBIO'S REVOLUTION FOR A CLEANER DOMINICAN REPUBLIC

Empower your restoration efforts with MicrobeBio's microbial technology. Visit www.microbebio.com to discover our solutions and get started. Let's heal the Dominican Republic's soils—one microbe at a time!



A photograph of a strawberry field with rows of plants and ripe red strawberries. The background is slightly blurred, focusing on the foreground plants.

MicrobeBio®

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A photograph of various fresh vegetables and fruits, including green lettuce, yellow bell peppers, and red and yellow tomatoes, with a head of garlic on the right.

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