



USAID
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BIODIVERSITY — REDUCED EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION PROGRAM

FINAL REPORT



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BIODIVERSITY — REDUCED EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION PROGRAM

**BIOREDD+
FINAL REPORT**

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Cover photo: Bajo Mira y Frontera, Narino, Colombia. These young girls reflect the
youth and vibrancy of Afro-Colombian communities in the Colombian Pacific.
(Credit: All photos by BioREDD+)**

DISCLAIMER

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ACRONYMS

ASM	artisanal small-scale gold mining
BioREDD+	Biodiversity — Reduced Emissions from Deforestation and Forest Degradation Program
CC	community council
CCBA	Climate, Community & Biodiversity Alliance
DO	development objective
EAF	Environmental Activity Fund
ENREDD+	National REDD+ Strategy
UPM	<i>unidad de producción minera</i>
VCU	verified carbon unit
ZEPA	Exclusive Artisanal Fishing Zone

OVERVIEW

The Biodiversity — Reduced Emissions from Deforestation and Forest Degradation Program (BioREDD+) was one of the most ambitious environmental programs of its kind in USAID’s recent history. It combined traditional community-based approaches to development and high levels of beneficiary participation with the design and use of innovative, cutting-edge methodologies, led by some of the industry leaders in their fields (including Ecological Carbon Offset Partners, LLC (ecoPartners), Terra Global Capital LLC, and Code REDD), as well as prestigious U.S. institutions (the National Aeronautics and Space Administration and the Smithsonian Institution, for example) and respected Colombian organizations such as the Alexander von Humboldt Biological Resources Research Institute and the Colombian National Forest Research and Development Corporation. The program maintained a close, respectful relationship with its key stakeholders and invested the bulk of its funding at the community level, yet it was unashamedly ambitious in “pushing the envelope” in terms of scope, scale, and innovation. BioREDD+ counts several Colombian and global “firsts” among its achievements. These are expanded on throughout this report.

The project was undoubtedly challenging, operating along an enormous tract of Colombia’s Pacific coast and a large chunk of the Department of Antioquia. Technically and socially demanding, it was unsurprising that BioREDD+ had a hard time finding its feet in the first year. However, once the program was on track, it began to resemble a Los Angeles freeway at rush hour, with multiple activities dispersed over a large area, all jostling for position, and all moving in the same direction, albeit at different speeds. At its peak, BioREDD+ had more than 70 instruments financed under its Environmental Activity Fund (EAF) operational at the same time. Its network of partners, operators, and beneficiaries ranged from remote indigenous reserves, or *resguardos*, to Bogota investment banks to artisanal gold miners to world-class scientists, specialized consultancies, private carbon investors, and all manner of stakeholders.

So, as much as the experience was challenging, it was also rich in outputs, impact, and learning — far too rich to adequately capture in a final report. Given this, BioREDD+ developed three manuals, one for each component, which detail how the most effective elements of its work were designed and implemented and what lessons were generated. It is not the task of this report to repeat this, rather to summarize the main elements of the program, why certain approaches were selected, and how things worked in practice. Not every activity has been included. Every attempt has been made to simplify where possible, without “dumbing down,” but some of the work was technically complex and is a challenge to digest. Apologies in advance for this. Moreover, some conclusions should be dealt with at the start because they provide important context for what follows.

Climate change and REDD+. REDD+ is an innovative and well-meaning approach to mitigate greenhouse gas emissions by reducing deforestation and forest degradation, but the concept is difficult for a non-specialist to understand, its methodologies are complex,

and it is costly to implement. In some respects, it reflects the adage that “the environment is too important to be left in the hands of environmentalists alone.” Without specialized support and financing, it would have been impossible for communities living in potential REDD+ project areas to undertake this task. Although the REDD+ community is fully cognizant of the need for technical rigor, economic viability, legal due diligence, and environmental and social safeguards, if costs do not come down and processes are not simplified, it risks inadvertently undermining the potential for scaling-up REDD+ and the benefits that could accrue to the very stakeholders REDD+ aims to assist: isolated communities with few assets other than their land, forests, and the biodiversity contained therein. This is a particularly important risk in Colombia because REDD+ is closely aligned with Afro-Colombian and indigenous goals regarding territorial consolidation and control, natural resource conservation, and improved livelihoods. Far from being something imposed from outside, REDD+ is highly compatible with the worldview of these communities. Moreover, well-structured, participatory REDD+ processes can transfer knowledge, generate new skills, and positively affect the environmental dynamic. In fact, as one Afro-Colombian leader said to the Colombian vice minister of environment at the BioREDD+ closeout event in Bogota: “We are so far ahead of the government. Let’s meet and talk to allow you to catch up!”

Biodiversity conservation.

Biodiversity conservation is difficult. It is virtually impossible to find anybody who claims to be against biodiversity conservation, but it is hard to come up with workable solutions to stem the constant tide of biodiversity loss. This is as true with communities as at the level of large private companies or governments. Maintaining the diversity of Colombia’s rich biological heritage is universally espoused, yet laudable environmental goals almost always yield to economic reality. Although it was challenging, BioREDD+



Bahía Malaga, Colombia. Local Afro-Colombian women still display colorful traditional dress, and brightly painted boats remain the main mode of transportation along the Pacific coast.

experienced two concrete illustrations of positive change with the potential to conserve biodiversity. The first and most prominent was the ability to design, negotiate, and implement multi-stakeholder conservation agreements. These ranged from a small number of large, formal ones to a plethora of small local agreements; both models have merit in Colombia and beyond. It is clear that with support, education, and motivation, communities can protect their biological resources. Second, is the importance of developing economic incentives to underpin biodiversity conservation and support these agreements to address poverty issues that remain one of the greatest threats to biodiversity. This is hard, but can be done, in particular via the restructuring of value chains to reduce, but not eliminate, intermediation and guarantee a bigger slice of the pie (or in the BioREDD+ case, the fish) to local producers and fishers.

Small, artisanal gold mining. For most outsiders, gold mining is a parallel universe full of strange terminology, degraded areas reminiscent of lunar landscapes, contradictions, conflict, and the promise of hitting “pay dirt.” It was the context BioREDD+ confronted as it immersed itself in the world of Colombian gold mining. Perhaps the greatest achievement of this component was to not be overly influenced by naysayers at the start who said little could be achieved to improve the performance of the sector. Nor to be overwhelmed by the enormity of the challenge, but rather to take a systematic approach to break the problem into manageable chunks and work with the government, private sector, and small miners themselves to generate incremental, positive change. It was also an opportunity to debunk prejudices based on half-truths or ignorance: to find miners who were willing to change, government entities that wanted to do things better, and even “miracle trees” capable of growing in barren, post-mining wastelands, bringing life and promise. As one informal miner said: “I was once a large part of the problem; doesn’t it make sense then to involve me in the solution?”

The overriding lesson from BioREDD+ is the importance of partnerships for sustainable change: partnerships between the government and the private sector, between large and small stakeholders, between communities and specialized companies, and between U.S. entities and Colombian ones. Not everything worked of course, but this rich melting pot of diverse experiences, personalities, and perspectives succeeded in doing some extraordinary stuff along the way. And in the final analysis, USAID should be proud of its vision and boldness in designing, nurturing, and financing a program like BioREDD+.

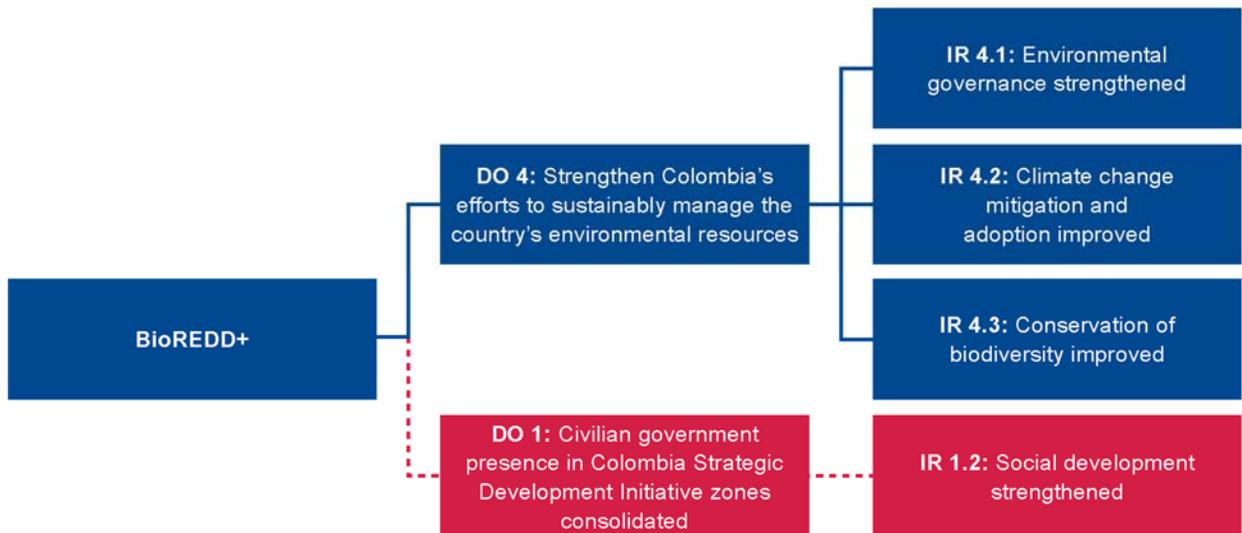
SECTION I

INTRODUCTION

BioREDD+ was the flagship environmental program of USAID in Colombia and one of the largest USAID environmental programs in the world. Recognizing that Colombia’s ecosystems, which provide benefits well beyond the country’s borders, are being compromised and its biodiversity threatened by habitat destruction, USAID designed a program to support the country in mitigating and adapting to climate change and conserving biodiversity. BioREDD+ worked in a section of Colombia’s Pacific coast covering more than 1 million hectares, from the border with Ecuador in the south to the border with Panama in the north. Halfway through the program, a mining component was included to remediate the impact of artisanal small-scale gold mining (ASM), primarily in the Northeast and Lower Cauca regions of the Department of Antioquia. The program began in September 2011 and ended in May 2015, with a final contract value of \$31,855,230 million.

The BioREDD+ results framework contributed to achieving USAID’s Development Objectives (DOs) 4 and 1 and is presented in Exhibit 1. The work of the program in the Colombian Pacific region was designed to meet DO 4 climate change, biodiversity conservation, and environmental governance objectives, while program interventions under DO 1 sought greater security and state presence in key mining areas of northern Antioquia through improvement of the environmental, economic, and social performance of informal mining activities.

EXHIBIT 1. BIOREDD+ RESULTS FRAMEWORK AND USAID DEVELOPMENT OBJECTIVES



The key technical components were weighted differently in terms of resource allocation and level of effort. Mitigation, particularly development of a large portfolio of REDD+

projects, was the largest (45 percent), while biodiversity conservation and ASM had smaller, but similar, levels of funding (31 and 32 percent, respectively), and adaptation constituted a minor part of the program (3 percent).

Although the program's mining component was a standalone activity, thematically and geographically, significant effort was invested in integrating the biodiversity and climate change components (mitigation and adaptation). In practice, this was primarily done through supporting sustainable production activities (cocoa, acai, fishing, etc.) that responded to demonstrable biodiversity threats and by directly or indirectly reducing pressure on coastal or upland forests, including fragile mangroves. However, it was not always possible to achieve synergies across all areas while complying with independent biodiversity, mitigation (sustainable landscapes), and adaptation earmark objectives and funding under the BioREDD+ contract.

Policy support by BioREDD+ in mining, biodiversity, and climate change was aimed at improving the enabling environment in which these activities play out, rather than a standalone set of activities per se. In the same vein, development of stronger local governance and public-private partnerships, leveraging of external resources, sustainable livelihoods initiatives, and solid communications and outreach were important crosscutting mechanisms essential for successful climate change, biodiversity, and mining initiatives.

SECTION II

CLIMATE CHANGE

The BioREDD+ climate change component focused on mitigation and preparing Afro-Colombian and indigenous communities along Colombia's Pacific coast to develop REDD+ projects for the voluntary carbon market. Some targeted work on adaptation was also undertaken in the same geographic areas.

WHY REDD+ IN THE COLOMBIAN PACIFIC?

Climate change is perhaps the biggest global challenge of this century. It is estimated that almost 20 percent of global greenhouse gas emissions arise from deforestation and forest degradation, so conserving and restoring tropical forests makes good sense for everyone. REDD+ is an innovative climate change mitigation strategy that tries to do just that: compensate communities in developing countries for the economic value attributed to lower emissions resulting from reduced deforestation and forest degradation. Individuals and private organizations from around the world can invest in REDD+ initiatives to reduce global CO₂ emissions, and in turn, promote sustainable development in needy communities, motivating them to manage and conserve their traditional territories, protect biodiversity, and improve their livelihoods through generating sustainable incomes based on new agricultural and non-agricultural activities. All this reduces community need to degrade forests. Projects are internationally validated under the Verified Carbon Standard and the Climate, Community & Biodiversity Alliance (CCBA).

The focus on the Colombian Pacific was apt. Forming part of the Choco Bio-geographic Corridor — one of the 10 most mega-diverse locations on the planet — the area is inhabited mostly by Afro-Colombian and indigenous communities with land titles and ownership rights protected by the Colombian Constitution. Their livelihood systems, which have traditionally been based on a respectful relationship with the natural environment, have increasingly come under pressure from population expansion and greater interaction with the rest of Colombian society. The area's forests in particular have suffered sustained degradation due to selective logging, cultivation of illegal crops, gold mining, extensive cattle farming, and the expanding agricultural frontier. The average forest biomass is just 40 to 60 percent of its full potential (see Exhibit 2 for an illustration of projected long-term reduction in forest cover in Carmen del Darien, Choco). As a consequence, more sustainable options for economic development have

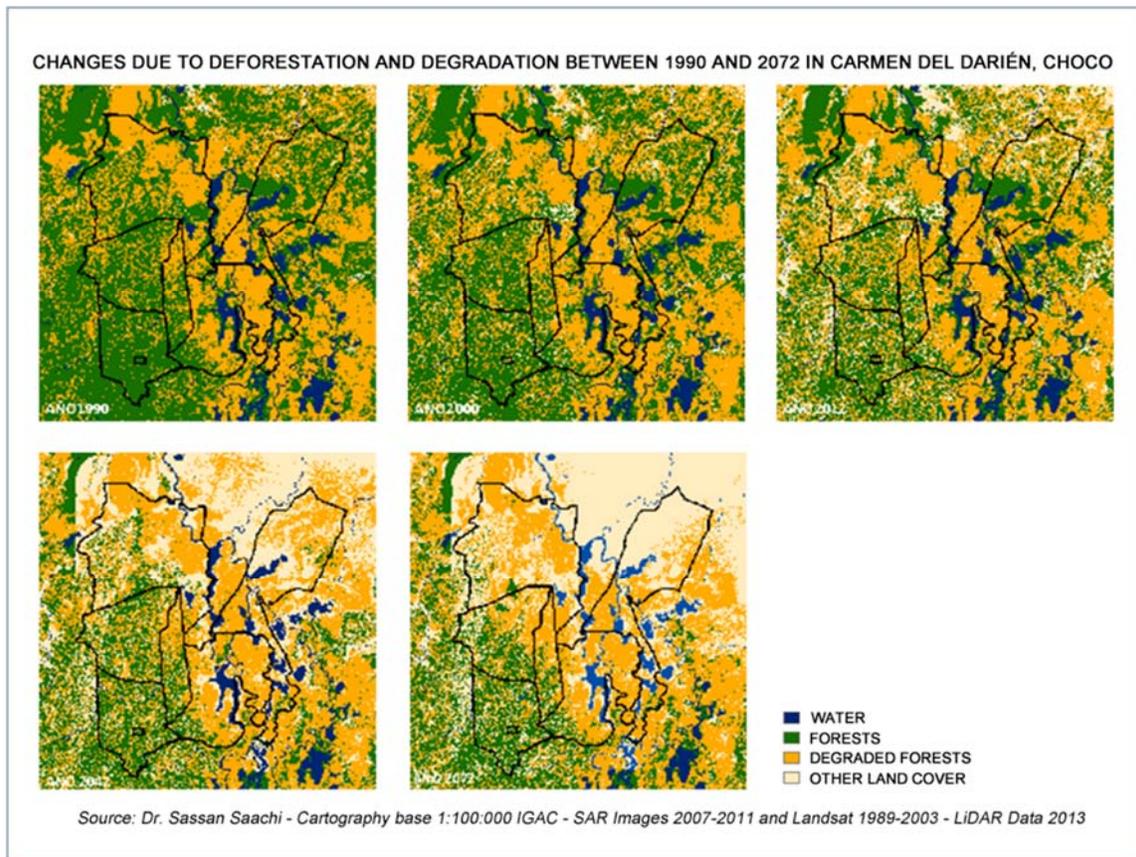


Concosta Afro-Colombia Community Council, Colombia. Meandering rivers cut through expanses of tropical rainforest that look deceptively pristine but are often degraded by illegal selective logging.

been sought. REDD+ provides one option for communities that partnered with BioREDD+ and exercised their free, prior, and informed consent to develop a portfolio of REDD+ projects.

To develop the portfolio, BioREDD+ played the role of REDD+ project formulator, unique among REDD+ initiatives in that it is the only project of its size in the world whose development has been financed by an international cooperation agency and implemented by an international consulting firm. The portfolio consisted of eight REDD+ projects bringing together 18 Afro-Colombian community councils (CCs) and one indigenous *resguardo* on the Colombian Pacific coast. The projects cover almost 823,000 hectares, with an estimated potential of preventing 71,625,812 tons of CO₂ emissions during a period of 30 years. In terms of area and emission reductions, BioREDD+ was one of the largest REDD+ initiatives of its type on the planet.

EXHIBIT 2. FORECAST CHANGES IN FOREST COVER IN THE ABSENCE OF A REDD+ PROJECT



THE SIZE OF THE CHALLENGE

REDD+ has enormous potential, but project development is costly and demanding, requiring that certain conditions be met. On the “supply side,” communities need to show:

- The existence of a sufficient area of forest cover that is under pressure (40,000 to 70,000 hectares) to support viable REDD+ projects

- Reasonable probability of a change on “business as usual” to decrease the rate of deforestation or forest degradation and increase carbon stocks over time
- Clear title over forested land and carbon environmental services and capacity to govern and control their territory
- An understanding of, and commitment to, implementation of REDD+ projects, including forest conservation and sustainable production alternatives

On the “demand side,” potential investors look for:

- Projects developed under verifiable, internationally vetted methodologies that allow carbon stocks to be reliably estimated and variations monitored thereafter
- Confidence in community-level commitment and capacity to regulate and protect resources and develop economic alternatives to unsustainable timber extraction
- A sustained, clear commitment from local communities to prevent future deforestation and allow forest recovery by adopting and effectively implementing productive and governance activities funded by carbon finance
- A reputable, in-country institution, fund, or financing mechanism — validated by beneficiary communities — to allow investments to be properly channeled

Over and above these, all parties must be willing partners, open to negotiate fair agreements based on enforceable contracts, and aware of derived obligations and rights.

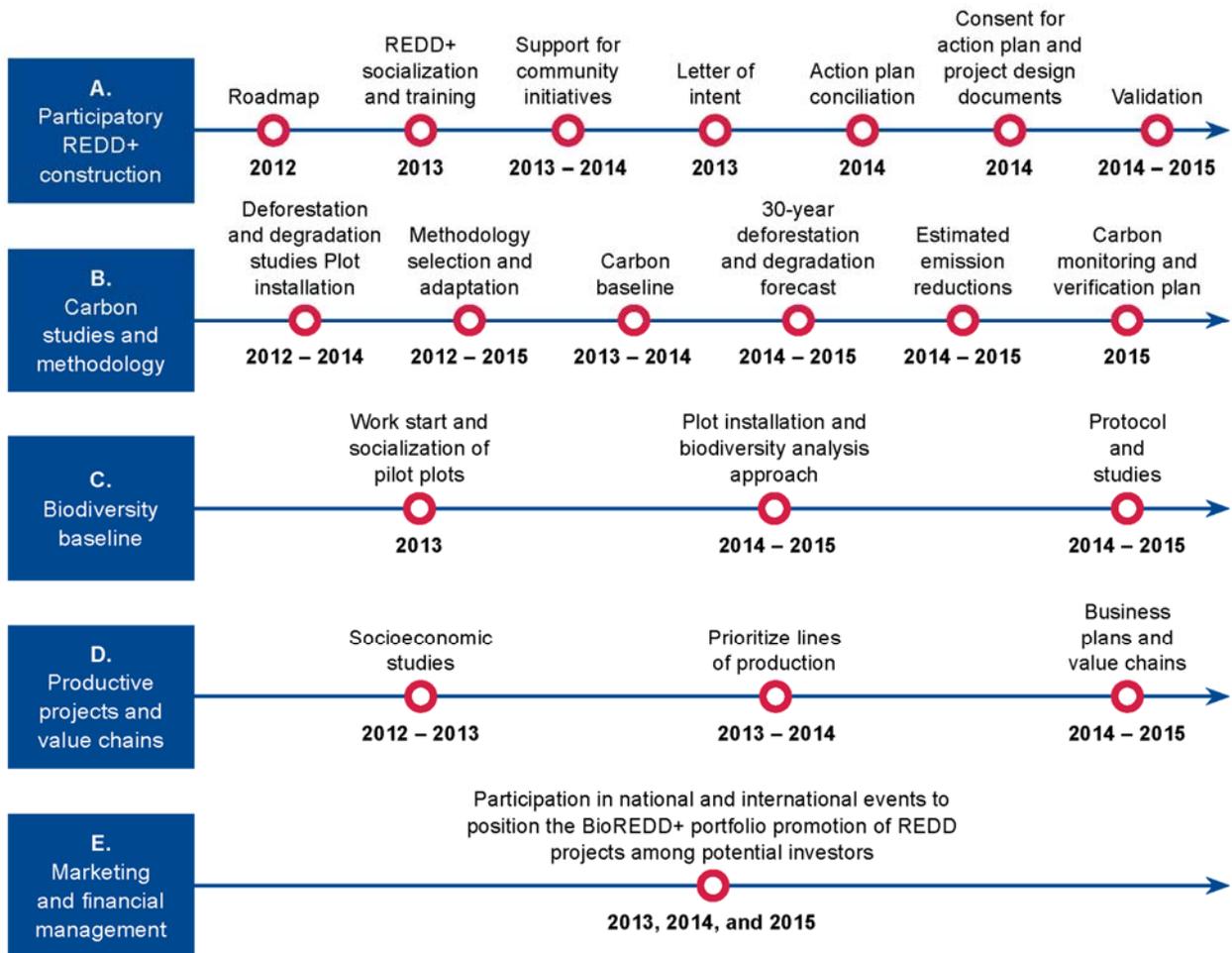
PIECING THE REDD+ JIGSAW PUZZLE TOGETHER

BioREDD+ started developing its portfolio of REDD+ projects in November 2011, together with communities and other key participants. This process was complex, due to the large number of projects and stakeholders, significant logistical challenges, ambitious scope of the portfolio, short amount of time available, and technical issues arising from the methodology. A gap analysis undertaken at the start of the process was critical to targeting resources, guiding development of project design and documentation, and ensuring the program was on track to achieve validation. Exhibit 3 describes the five key programmatic tracks, which were implemented in parallel and intricately linked, where completion or delay of individual activities in one track usually affected others.

BUILDING COMMUNITY INVOLVEMENT

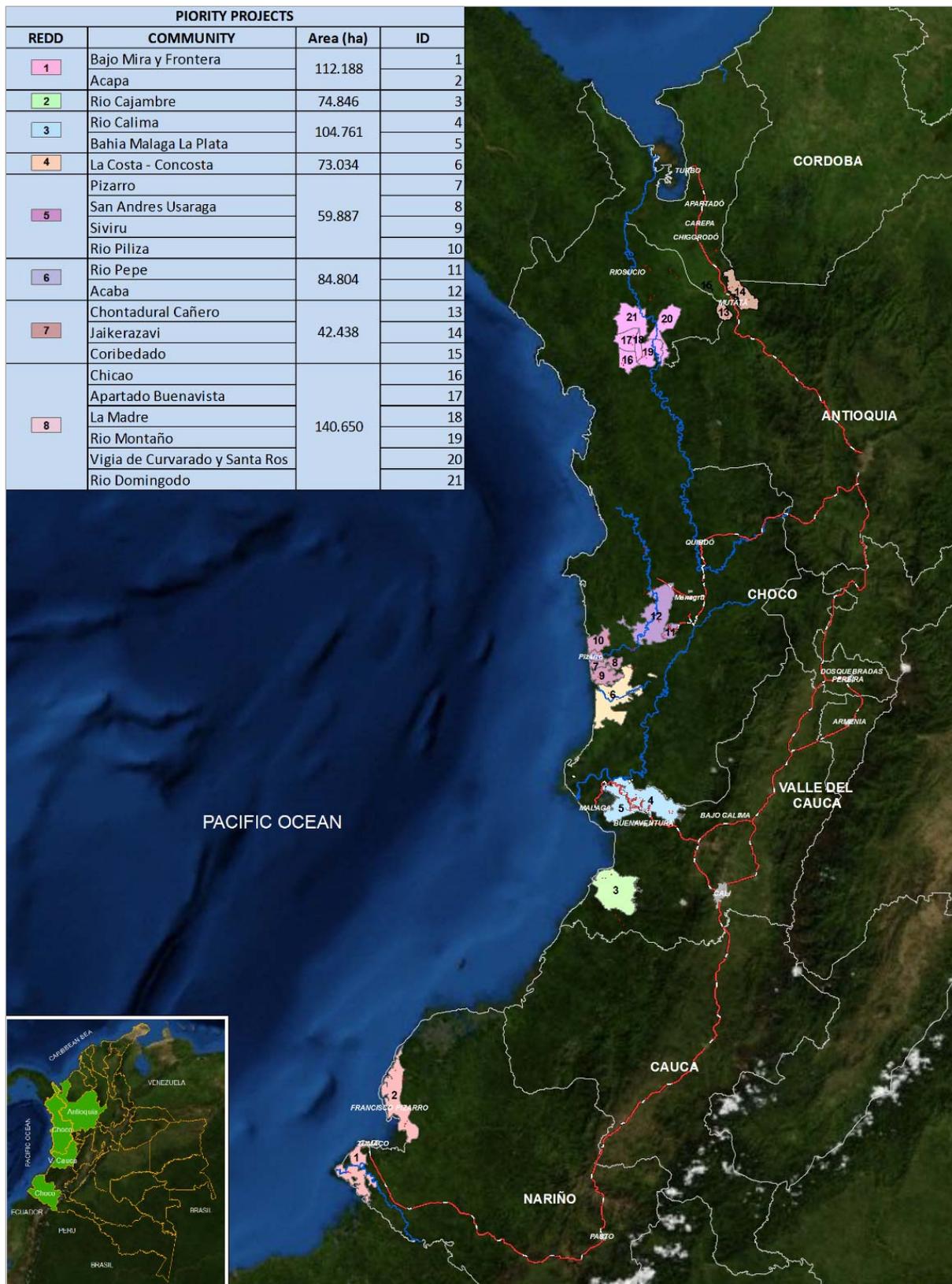
Successful REDD+ projects place communities at their heart. This makes sense because they are the protagonists in ensuring that by changing “business as usual,” promised carbon emission reductions are actually delivered. On the one hand, most communities in the Colombian Pacific intuitively understand the REDD+ proposition that links territorial control to natural resource conservation and sustainable economic development; this is after all what they struggle with on a daily basis. On the other hand, understanding the mechanics of REDD+ is hard, not always intuitive, and governed by strict “rules of the game” as dictated by approved methodologies, standards, legal requirements, and decision-making internal to the community that have to be applied correctly.

EXHIBIT 3. BIOREDD+ PROJECT DEVELOPMENT PROCESS AND TIMELINE



With a view to developing eight REDD+ projects, BioREDD+ began its work with an invitation to 52 promising organizations (made up of one or more communities), including Afro-Colombian community councils and indigenous *resguardos*. This initial group was analyzed during the process, taking into account technical, security, and socio-organizational criteria, and the program ended up supporting 19 organizations, representing 9,475 families, distributed over four geographic nodes — Tumaco, Buenaventura, Choco Sur, and Darien-Uraba — and grouped into eight REDD+ projects (see Exhibit 4, noting that the three communities listed under Project 7 form one indigenous *resguardo*, Mutata, so that the 21 communities make up 19 organizations).

EXHIBIT 4. ORGANIZATION AND LOCATION OF REDD+ PROJECTS IN THE BIOREDD+ PORTFOLIO



Reflecting the program’s commitment to free, prior, and informed consent, a letter of intent was signed at the outset between BioREDD+ and communities to ensure clarity on objectives, approach, and commitments, as well as formally expressing community consent for BioREDD+ to act as an honest broker in identifying investment options. This was followed by development and approval of an action plan to underpin the REDD+ projects for 10 months (see text box for a description) that had two important stages: 1) participatory construction of core elements of the plans and 2) approval of drafts containing elements developed by the communities themselves, as well as information arising from technical studies financed by BioREDD+.

Training was undertaken in parallel with action plan development, and BioREDD+ held initial workshops with communities to enhance their knowledge of climate change and REDD+, deforestation and forest degradation drivers, carbon markets, and social and environmental safeguards. During the final year of the program, the *Fondo Acción Ambiental y de la Niñez* played an important role, capitalizing on its successful involvement with the Acandi REDD+ project to motivate and train 637 people from 107 villages in 19 workshops. Twenty leaders also visited Acandi. *Fondo Acción* implemented its innovative “Harmos” coaching methodology to strengthen the skills of a select group of 75 REDD+ leaders in each of the 19 communities during 12 additional workshops.

At the end of 2014, a series of large, formal community assemblies were held where the 19 organizations involved in the eight projects approved the action plans and project design documents drawn up by ecoPartners based on interactions between the community and the program. A project design document is a long, detailed technical document that meets all Verified

BUILDING BLOCKS OF REDD+ PROJECTS

Forest Governance. Including area demarcation (project zone, area, leakage belt, and reference zone), identification of deforestation and degradation drivers, definition of logging reduction activities and their effectiveness, oversight and control, and land-use planning mechanisms.

Carbon, Biodiversity, and Community Monitoring. Including defining a baseline and monitoring, reporting, and verification tools to demonstrate activity implementation and achievements.

Productive Activities. Existing and new, along with transformation processes and technical assistance, to generate alternative incomes for communities while reducing pressure on forests.

Capacity Building and Management. To ensure good project management, transparent use of funds, and an equitable distribution of benefits.

Budget and Activity Schedule. Showing funds allocated to prioritized activities and calculated over 30 years. Any year-on-year cash surplus to be used for prioritized social investment.

Financing. Required to take the eight REDD+ projects from validation to verification and then to oversee commercial development for the next 30 years.

TOP-NOTCH PARTNERS UNDERPINNED BIOREDD+

The use of cutting-edge technology and new methodologies for carbon verification and calculation was made possible thanks to the inclusion of U.S. industry experts in the program, including Terra Capital Global, GeoEcoMap, and ecoPartners, supported by recognized Colombian organizations such as the National Forest Research and Development Corporation, the Humboldt Institute, the *Fondo Acción Ambiental y de la Niñez*, and well-known regional and national universities.

Carbon Standard and Climate, Community & Biodiversity Alliance requirements for REDD+ projects, which draws its core content from the action plans. With these documents in place and with community consent, the eight projects were submitted for Verified Carbon Standard validation, meeting the CCBA requirements at the same time. The validation audit was undertaken by Rainforest Alliance, ending in April 2015 with all projects validated to Gold Standard and registered with Markit Ltd. Once the emission reductions are verified, a step contemplated for 2016, verified carbon units (VCUs) can be issued for sale.

APPLYING CUTTING-EDGE SCIENCE AND TECHNOLOGY

REDD+ is a technically demanding mechanism to apply, as it should be, because the very thing that is being conserved and traded is the carbon stored in the forests above and below ground biomass that must be accurately estimated to determine net carbon emission reduction changes over time. This being the case, innovations in science and technology played an important role in development of the BioREDD+ portfolio, particularly the use of sophisticated remote-sensing tools, which, when combined with traditional field plot data, greatly improve the quality of carbon emission reduction estimates. Although initially high-cost, when applied over large, isolated tracts of tropical forest (in the BioREDD+ case, almost 1 million hectares), unit costs drop significantly.



Bahia Malaga, Colombia. Expanses of ocean and sky are separated by a thin line of tropical forest in this remote and pristine region of Colombia's Pacific coast, an ideal backdrop for development of ecotourism in the region.

RESOLVING METHODOLOGICAL CHALLENGES

The foundation for any REDD+ project is the carbon calculation, and so carbon measurement methods must be scientifically and mathematically rigorous. REDD+ projects must work with Verified Carbon Standard-approved tools and methodologies and include: 1) the definition of historic carbon pools and deforestation and degradation rates, 2) a baseline to serve as a reference for determining CO₂ reductions achieved as a result of the project (or emissions avoided), 3) expected additionality, i.e., reductions in CO₂ emissions thanks to REDD+ interventions, 4) leakage, caused by displacement of deforestation or degradation to neighboring areas as a result of the project, and 5) a monitoring, verification, and reporting plan to be followed during development and implementation for the life of the project: 30 years in the case of the REDD+ project supported by BioREDD+. Although methodologies developed by scientists and approved by international entities exist, few explicitly incorporate forest degradation, which is considered the main driver of forest biomass and therefore carbon loss in the Colombian Pacific.

This being the case, BioREDD+ was challenged to develop a new methodology reflecting these conditions or modify an existing one. With technical inputs from Terra Global Capital, and after examining four approved methodologies for REDD+ as well as two for improved forest management, program staff decided to modify the Verified Carbon Standard VM0006 methodology, originally designed to include deforestation and degradation. Adjustments included developing a tool to estimate carbon density using Light Detection and Ranging imagery and several novel image composition methods, generated by GeoEcoMap. This model can be applied globally, where degradation plays a role in forest loss.

U.S. SMALL BUSINESS ADDS VALUE TO BIOREDD+

Almost constant cloud cover in the Pacific complicated analysis. GeoEcoMap solved this by creating a set of comparatively cloud-free mosaics that were used to undertake a historical analysis of changes in canopy cover over three time periods (1990, 2000, and 2012) for the entire region to comply with requirements of VM0006.

PREDICTING FUTURE DEFORESTATION AND FOREST DEGRADATION AND ESTABLISHING A CARBON BASELINE

REDD+ projects are designed to be long-term (30 to 60 years) and need to project future carbon reductions. Like most mathematical modelling exercises, REDD+ methodologies try to predict the future, in part, by understanding what has happened in the past. For this reason, historical deforestation and degradation rates needed to be properly defined. This may sound simple, but is in fact complicated. For this reason, BioREDD+ hired GeoEcoMap, a California-based company owned and led by Sassan Saatchi, a renowned scientist from the National Aeronautics and Space Administration Jet Propulsion Laboratory, to do the work. The analysis incorporated four types of information:

- Radar images of the Pacific coast taken at a resolution of 50 meters
- Light Detection and Ranging imagery from 49 transects covering 83,000 hectares taken at a resolution of just 1 meter, which when combined with radar, permitted a more precise interpretation of forest biomass
- Landsat satellite mosaics for the entire region taken at a 30-meter resolution to classify different land uses and, together with radar, determine how land use has changed over time
- Field plot data to validate remote sensor data and extrapolate information to determine relative tree sizes (diameters and height)

THE HIDDEN ENVIRONMENTAL COST OF FOREST DEGRADATION

The carbon baseline analysis shows that the amount of carbon found in degraded forests is less than half (45 percent) of that found in intact forests.

This innovative “blending” of data sets allowed for extremely precise measurements to be taken, reducing uncertainty levels. Besides determining the changes in carbon dioxide emitted over time, it also permitted establishment of a carbon baseline to be used as a reference point for monitoring future changes in forest cover to help evaluate the effectiveness of REDD+ (see below). For the first time in Colombia, rigorous scientific studies were used to measure degradation.

Over and above establishing REDD+ project areas per se, a comparable reference zone — which VM0006 requires to be at least 250,000 hectares — was defined to serve as a “control” element against which project performance is compared. In addition to this, leakage areas were selected to encompass forests around the project that could come under pressure from displacement of deforestation and degradation drivers as a result of project implementation. The underlying premise of this analysis is that deforestation and degradation do not occur randomly, but in locations where specific factors exist (for example, around human settlements, near sawmills, within a certain distance from the main roads and waterways). Identifying and mapping these “spatial drivers” and then modeling their impact on historic land-use change data permitted extrapolation of future land-use/land-change dynamics. The spatial model developed for BioREDD+ shows universal high forest losses over time in the absence of REDD+ projects.

BIOREDD+ CONTRIBUTION TO REDUCING GLOBAL WARMING

Overall, the BioREDD+ portfolio has an estimated capacity to prevent 71,625,812 tons of CO₂ emissions over 30 years.

ESTIMATING CARBON EMISSION REDUCTIONS

Estimated carbon emission reductions are the Holy Grail for all REDD+ projects, bringing together a diverse group of stakeholders who are all interested in knowing how many VCUs a REDD+ initiative will generate. The calculation is complex and has to strictly adhere to the methodology, in this case VM0006. Given this, experienced carbon practitioners ecoPartners undertook the task, running more than 120 iterations of the model to ensure high levels of accuracy. More than just a mathematical exercise however, credible net carbon emission reductions must be generated, and this is far from an easy task. VM0006 requires identifying one or more deforestation/degradation drivers, defining specific mitigation activities to address them, and estimating the probability of success through “effectiveness factors” assigned to each proposed activity. In general, BioREDD+ strategy emphasized forest governance as a way to control the behavior of specific stakeholders (particularly loggers), as well as sustainable production activities to generate alternative income streams to reduce the general pressure on forest resources. Successful project implementation is reflected by emission reductions and in turn, credit generation. Afterwards, the probable volume of carbon emissions due to leakage plus a carbon buffer or reserve to insure against unforeseen emission events are deducted from emission estimates to yield an estimate of “net emission reductions.”

MONITORING, REPORTING, AND VERIFICATION

The viability of REDD+ projects depends on communities achieving sustained reductions in carbon emissions over time. Thus, monitoring future changes in land use, leakage areas, project boundaries, and reference zones, and updating carbon pool estimates are all part of the monitoring, reporting, and verification plan. Given the high level of precision achieved with Light Detection and Ranging data, calibrated and validated using field plot information, ecoPartners recommended that the BioREDD+ portfolio monitoring, reporting, and verification plan be based solely on remote-sensing data. This is an innovative approach that is scientifically rigorous and efficient in the use of scarce resources for evaluating changes in forest cover and carbon pools over time.

INCORPORATING BIODIVERSITY

Biodiversity conservation is a key co-benefit of REDD+ initiatives and is particularly relevant to the BioREDD+ portfolio. Illegal logging and expansion of arable land for subsistence agriculture reduce forest cover, disrupt vital ecosystem functions, and diminish natural levels of biodiversity.

Despite the global biological importance of the Choco Bio-geographic Corridor, scientific studies had been isolated and sporadic, and not enough information existed to generate an *ex ante* baseline, which is critical for validation under CCBA. Given this,

BioREDD+ worked with Colombia's prestigious Humboldt Institute to undertake studies in four representative monitoring sites. This was the first systematic study of its type undertaken in the Colombian Pacific and produced a wealth of information that will form the scientific basis for monitoring biodiversity in the region in the future, supported by 50 people from local and regional institutions and communities trained in participatory biodiversity monitoring.

NEW TECHNOLOGY FOR BIODIVERSITY MONITORING IN THE COLOMBIAN PACIFIC

The BioREDD+ biodiversity monitoring protocol, developed by the Humboldt Institute, used "photo traps" and bio-acoustic recording equipment for the first time in the Pacific. Photo traps help determine the presence, diversity, activity patterns, and behaviors of recorded species, and estimate the abundance of land-based vertebrates. The acoustic sensors document the ecosystem's environmental sounds and identify bird species in particular.

BUILDING ECONOMIC SUSTAINABILITY INTO REDD+

The "classic" approach to REDD+ doesn't just bring together economically and financially disperse stakeholders into a long-term (30-year) financial relationship, it also provides poor and marginalized communities with economic incentives to preserve their ecosystem assets to benefit the global climate. Undisputedly, REDD+ has strong economic potential for communities along the Colombian Pacific coast; however, in 2015, the international REDD+ market has been weak, characterized by low carbon prices from limited demand and over-supply, and future prices remain uncertain. This being the case, a growing group of REDD+ investors is seeking to mitigate carbon market risks by promoting non-carbon, productive activities to generate alternative sources of income. This makes good business sense for the investor, is typically greeted enthusiastically by local communities, and was the approach taken by BioREDD+ — albeit with a new twist. Beyond traditional sustainable livelihoods options found in many REDD+ projects (and which also formed part of the BioREDD+ portfolio), the program took the additional step of attempting to harness carbon funding to build regional value chains, linking production to improved processing and sales. A particularly novel aspect of the financial model that underpinned the REDD+ plans was to use revenues from the sale of carbon credits to finance community participation and equity as minority stakeholders in new businesses with Colombian private investors.

The starting point for the work was to finance large-scale, socioeconomic studies in potential REDD+ project areas, undertaken by recognized Colombian universities and research foundations with community participation, to understand the social context, most common productive activities, importance of timber for family incomes, and potential for economic alternatives. Based on these studies, expressed community

priorities, and potential for business development (see text box), five value chains were identified: cocoa, coconut, annatto, peach palm, and acai. With a view to developing viable business models, investment bankers and market consultants were hired to draw up business plans, identify strategic partners with interest and experience in each value chain, and propose a potential shareholding structure, combining community and private sector investment. The approach involved creating new companies to transform raw materials into value-added products, identifying production targets, equipment and machinery needs, and the most appropriate location for each plant based on market studies and partner experience.

Although the internal rate of return for each business was promising (peach palm, 22 percent; annatto, 20 percent; cocoa, 19 percent; coconut, 16 percent, and acai, 8 percent), it proved difficult to reach an agreement for implementing these value chains during the life of BioREDD+. It may have been too optimistic to try to implement such an innovative model in barely two years, with all the challenges inherent in the Colombian Pacific. In addition, Colombian partners in the value chains were ultimately unwilling to agree to a payment of a percentage of the income to overseas REDD+ investors to compensate for perceived carbon risk. Despite this, and while acknowledging the challenges inherent in the approach, it seems too early to pass judgment on the idea of developing value chains with community shareholding and a commitment to sustainably produce, process, and market products from the Colombian Pacific.

VALUE CHAIN SELECTION CRITERIA

- Products and services well adapted to local ecological conditions
- Compatibility with biodiversity conservation and decreased pressure on forests
- High-value, low-volume, and low-perishability products well suited to logistical realities
- Good demand on the national market and with international potential
- Attractive rates of return
- Potential for scaling-up and adding value
- Easy processing with few sophisticated inputs required
- Natural raw materials, regionally available and easily accessible within communities

INTERNATIONAL MARKETING OF THE BIOREDD+ PORTFOLIO

BioREDD+ presence at a wide range of national and international events increased awareness of its activities in the Colombian Pacific and attracted the attention of potential investors and other stakeholders. At most of these events, BioREDD+ presented its work and participated on panels and roundtables. At 20th session of the Conference of the Parties to the UN Framework Convention on Climate Change, held in Lima in 2014, several members of Pacific coast REDD+ communities had the opportunity to interact with potential investors and other stakeholders and were more easily able to comprehend the global importance of their REDD+ commitment. Because BioREDD+ projects did not yet have VCUs for sale during the program, the portfolio was more aggressively promoted to a small group of investors with experience and interest in forward purchases at discounted prices. BioREDD+ also contacted potential buyers and investors for

agricultural products to be developed within the BioREDD+ projects (including supermarkets and food companies).

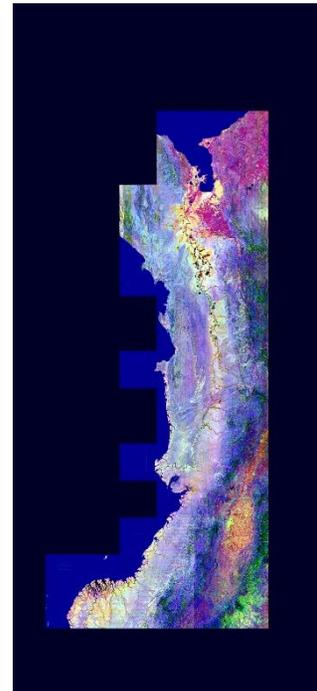
Despite the program investing some \$375,000 in international marketing, it proved insurmountable to overcome the depressed state of the market in 2014-2015; concrete interest was limited to three international investors during the entire program. Despite the enormity of the challenge, BioREDD+ came within a whisker of closing a deal with a major European REDD+ investment fund that would have resulted in \$12 million in private financing backed by a tailor-made credit guarantee mechanism developed by USAID/Colombia under the Development Credit Authority. However, concerns over clauses in the proposed term sheet and implications for communities led to an 11th-hour decision not to move ahead. The communities were comfortable with this decision, and collectively all parties agreed that it was likely that better terms could be negotiated once the REDD+ projects were verified.

CONTRIBUTING TO NATIONAL REDD READINESS

BioREDD+ worked hand-in-hand with the Colombian government on several aspects of the National REDD+ Strategy (ENREDD+). Colombia's national meteorological institute, IDEAM, was supported in developing a baseline scenario for greenhouse gas emissions for the Pacific region, helping it to fulfill a key part of its national commitments to ENREDD+. BioREDD+ supported the Ministry of the Environment and Social Development with high-level, targeted consultancies to coordinate ENREDD+ development between different government entities and international donors, and in particular, to facilitate effective participation of indigenous and Afro-Colombian communities in the process. Additionally, the program supported development of a legal framework and a draft resolution for registering voluntary REDD+ projects in Colombia, which is the first of its kind in the world.

ADAPTATION MEASURES

Resilience and readiness are the main two pillars of an effective adaptation strategy, and most adaptation plans emphasize these two things. At the local level, experts accept that adaptation can be achieved through strengthening community capacity to overcome hazards caused by climatic events. Typical response strategies (See the Global Alliance for Improved Nutrition's methodology, for example) include planning, food production, water, health, and infrastructure. In practice, adaptation is often an expensive venture, and with limited resources available for adaptation within BioREDD+, it was deemed sensible to limit level of effort to just two areas.



Colombian Pacific coast. This composite radar image was generated with data from the Advanced Land Observing Satellite using Synthetic Aperture Radar to map forests and estimate forest biomass baselines and historical changes.

Firstly, BioREDD+ worked with the Mayor's Office from the coastal town of Tumaco to identify strategies to improve local capacity to prevent, mitigate, and adapt to climate change events (with a focus on the risk of rising sea levels and tsunamis) as part of a highly participatory municipal land-use planning process, following guidelines established by the Ministry of the Environment and Social Development. Secondly, the program supported the government's Unit for Territorial Consolidation to strengthen productive and economic resilience through development of naidi, a fast-growing native palm species that quickly colonizes deforested areas. It is not only flood-resistant, but also limits soil erosion when planted on slopes. The fruit (acai) and heart of this palm are part of a large global market.

**STAND FOR TREES:
THE WORLD'S FIRST INTERNET PLATFORM TO ALLOW CITIZEN PURCHASES OF CARBON CREDITS**

REDD+ projects are already protecting 14 million hectares of threatened tropical forest and reducing emissions by 22 million tons of CO₂ annually. However, large-scale demand for the emission reductions (VCUs) that REDD+ is generating has not materialized, and there are no easy-to-use, effective mechanisms for individuals to purchase carbon credits.

At the same time, social media in today's highly globalized and networked environment provide opportunities for individuals to contribute to climate change mitigation efforts through crowd-funding to leverage contributions for a variety of social causes. The Facebook platform, for example, has inspired democratic uprisings and responsible corporate marketing. Social media can serve as a platform for raising awareness on climate change and providing a mechanism for individuals and groups to purchase REDD+ carbon credits at scale.

Given this opportunity, BioREDD+ worked closely with Code REDD, a non-profit organization working to support and scale the REDD+ mechanism, to develop and implement a strategic information technology platform to catalyze purchases of REDD+ VCUs by individuals at scale. By opening an alternative retail market for the sale of REDD+ credits, this platform can contribute to the long-term sustainability of BioREDD's projects in Colombia and REDD+ projects worldwide, continuing beyond the life of the program and making a meaningful contribution to climate change mitigation efforts.

Code REDD implemented this initiative in collaboration with the BioREDD+ program in Colombia, USAID, the communications strategy firm Citizen Group, and the API registry development firm Markit, and with advice from Facebook.

By the close of BioREDD+, the Stand for Trees platform had retired nearly 35,000 tons of carbon, which was purchased by about 18,000 individuals. Stand for Trees continues to operate successfully.

Naidi offered a potentially profitable economic opportunity for five CCs in southern Choco (in the lower basin of Baudo River), as well as two others in the rural area of Buenaventura. Building on previous BioREDD+ work to identify and map native populations of naidi in the region, BioREDD+ supported these seven CCs (Pizarro, Piliza, Siviru, San Andres de Usaraga, Concosta, Cajambre, and La Plata-Bahia Malaga) to develop best practices for the natural harvesting of naidi and to improve local marketing capacity. The program harnessed the experience of the *Espavé Foundation* to develop management plans for each of the CCs, which were presented to relevant regional environmental authorities to obtain sustainable harvest permits. BioREDD+ used USAID funds to build 11 storage centers at the main villages of each of the CCs, purchase six outboard motors to complement the purchase of six new boats by the Unit

for Territorial Consolidation, train 141 community members on naidi harvesting, and form a new community-based company, Pacific Naidi. This initiative appears promising, and the new company has already identified a potential buyer, *Comercializadora Acai*, willing to buy fruit. Over and above this, it remains an ideal option for including in future REDD+ projects in the region.

SECTION III

BIODIVERSITY CONSERVATION

The biodiversity conservation component worked in partnership with Afro-Colombian and indigenous groups along the Pacific coast of Narino, Valle del Cauca, Choco, and in the Uraba region of Antioquia; all areas that combined high biodiversity and vulnerability. It was designed to respond to explicit threats to biodiversity, combining conservation agreements with market approaches. Although limited work was done in agroforestry and forest conservation in upland forest areas, the emphasis was firmly on coastal and marine resources, particularly artisanal fisheries, with some work undertaken on ecotourism.

WHY CONSERVE BIODIVERSITY IN COLOMBIA?

The Colombian Pacific coast is considered one of the world's most biodiverse regions, with more than 9,000 species of vascular plants, 200 species of mammals, 600 species of birds, 100 species of reptiles, 120 amphibian species, and 2,000 marine species, many of which are endemic to the country. It is known for the periodic migration of marine mammals like the humpback whale and has a great variety of transitional ecosystems, from coastal mangrove forests and wetlands, to *paramós* and high mountain forests. Colombia's biodiversity is threatened by forest loss and forest degradation, soil erosion, contamination of its water sources and oceans by chemical runoff, unmanaged fisheries, and a growing presence of exotic, invasive species. USAID/Colombia states that 30 percent of the country's biodiversity has been lost in recent decades.



Utria National Natural Park, Nuqui, Colombia. Wide expanses of remote beaches and rainforests are testimony to the remoteness and unspoiled nature of this part of Colombia.

BIODIVERSITY FOCUS AND APPROACH

Biodiversity conservation activities were designed to mitigate two key threats in priority areas: 1) overexploitation of fisheries resources, which is disturbing the ecological dynamics coastal and estuarine systems, with serious economic, social, and cultural consequences, and 2) degradation and/or deforestation of land ecosystems, particularly in watersheds and forests along a range of altitudes from mangroves and *guandal* forests (seasonally flooded forests) on the coast to high, upland forests. In line with USAID/Colombia's biodiversity conservation focus, some 70 percent of resources under

this component were directed toward marine and coastal issues in areas that did not widely overlap with the REDD+ project areas.

The program intervention strategy combined three things:

- Strengthening formal and informal governance mechanisms for natural resource management
- Creating and/or strengthening value chains for products linked to sustainable practices by improving prices, adding value, identifying specialized markets, and building commercial alliances
- Building local capacity via training, technical assistance, and targeted investment in infrastructure

CONSERVING FISHERIES RESOURCES

BioREDD+ focused much of its effort on promoting responsible fisheries on the Colombian Pacific coast. The logic was simple, yet powerful. Colombia's coastal and marine areas are vast, yet its institutional capacity to ensure compliance with fishing regulations is limited. This being the case, interventions that combine economic incentives for communities to fish more responsibly with local or regional agreements on how to better manage fisheries were deemed, a priori, to offer the best chance of success.

The program was particularly successful in building stakeholder consensus to develop new fisheries management schemes that were ratified via national or community agreements. On a large scale, formal agreements endorsed by Colombian government authorities were supported, in particular on the north coast of Choco, where the program worked with a former USAID partner — *Fundación MarViva*, an international environmental NGO with an experienced technical team and established relationships with local



Cajambre, Colombia. Local fishermen from the fishing cooperative, PINPESCA, bring in a bumper catch of red snapper caught with sustainable fishing methods.

communities in target areas. Prior to BioREDD+ involvement, local communities from Bahia Solano and Nuqui had established the Choco North Pacific Artisanal Fishery Inter-Institutional and Community Group, which was moving slowly toward agreements for local management and the legal delimitation of protected fisheries areas or marine reserves to promote long-term resource sustainability. With BioREDD+ funding, *MarViva* provided technical and logistical support to reach consensus on fisheries management, including collection of fisheries monitoring data, spatial analysis, organization of community meetings, workshops, and two Artisanal Fishery Inter-Institutional and Community Group annual assemblies.

This work was critical in that it provided the technical and social underpinning for a request to expand and permanently designate an Exclusive Artisanal Fishing Zone (ZEPA), which was declared by the Colombian Fisheries Authority in July 2013, encompassing nearly 100,000 hectares. Industrial, commercial, and exploratory fishing is forbidden within the ZEPA, as are the use of gillnets and purse seines. The restrictions promote greater selectivity in the extraction of fisheries resources, reducing incidental fishing and the proportion of juvenile fish captured. They also allow the natural recovery of seafloor habitats previously damaged by dragnet fishing. With the ZEPA designation in place, the Colombian Fisheries Authority then declared a Zone for Special Fisheries Management covering more than 300,000 hectares, with the intention of further expanding the regulation of industrial fishing. With program finance, *MarViva* was also able to promote a regional coastal-marine protected area called the Regional Integrated Management District of the *Golfo de Tribuga and Cabo Corrientes*, declared in December 2014 by the regional environmental authority, *CODECHOCÓ*. This area, covering 60,138 hectares, includes a gradient of ocean depths and ecosystems from coastal mangroves to underwater coral and rocky reef formations, thus offering protection to the life cycle of many marine species of economic and ecological importance.

The designation of the ZEPA, Zone for Special Fisheries Management, and Regional Integrated Management District (see Exhibit 5) were all “bottom-up” processes, with a high degree of participation by communities and resource users, resulting in a sense of ownership that encourages compliance with new management measures. All areas offer artisanal fishers and, more generally, inhabitants of coastal communities, an unprecedented opportunity to play an active role in decision-making related to marine resource use in the Colombian Pacific. These agreements constitute historic landmarks in Colombian coastal and marine management.

Over and above this, on the coasts of Narino and Valle del Cauca, BioREDD+ developed direct grant agreements with 13 community councils to improve local fisheries management. Taking advantage of the existing governance structure of the CCs (basically a central board of directors, supported by local committees) and local knowledge on the state and dynamics of fisheries resources, a highly participatory process was carried out to reach consensus among fishers and black conch collectors (known as *piangüeras*) from more than 89 coastal communities. The process included discussions and workshops to identify the main challenges for fisheries conservation, as well as identifying practical ways to address them. Management measures included increasing the mesh size of fishing nets, closures of some fishing grounds, use of declared fishing seasons, and respect for juveniles. As a result of this work, seven agreements were signed with nine CCs, bringing about 150,000 hectares under improved local management. Additionally, a formal fisheries management plan was agreed on for the Uramba Bahía Malaga National Natural Park, between four of the CCs that skirt the protected area and the Office of National Natural Parks. This was achieved on a scale never before seen in Colombia.

To provide an objective underpinning for monitoring these agreements, an innovative participatory monitoring system to generate new primary data on fishing captures was designed in cooperation with the Colombian Fisheries Authority and with CC support in

Narimo and Valle del Cauca. Community leaders, who were also fishers or black conch collectors themselves, were trained to use standard templates to collect basic information. Analysis of the data showed 80 percent compliance by program close, with 163,543 hectares brought under improved fisheries and black conch management (see Exhibit 6). Management measures such as rotation of black conch collection sites, respect for minimum black conch sizes, and respect for fish nursery grounds, were more widely adopted than measures to restrict fishing gear or control the capture of juvenile fish. That being the case, direct program investments were made to help fishers in selected communities replace their traditional nets with new gear with a mesh size of 3 inches or larger, exceeding Colombian regulations.

BUILDING RESPONSIBLE FISHERIES VALUE CHAINS

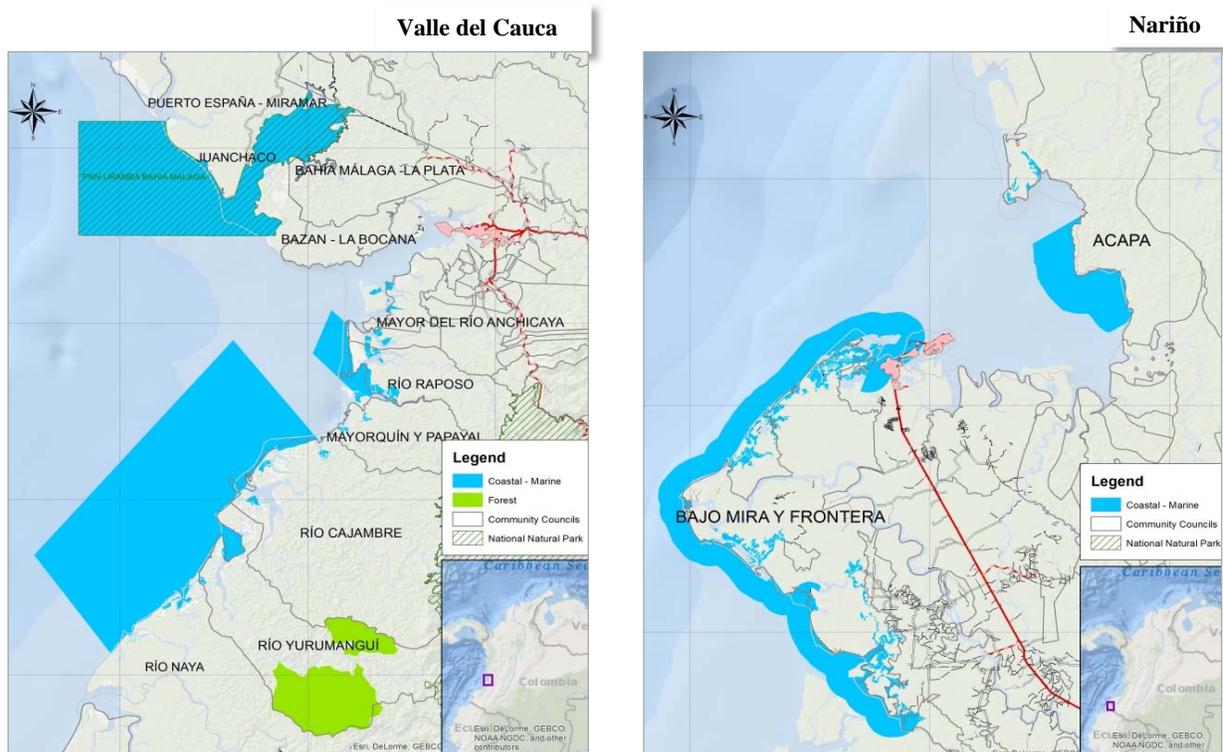
A value chain exists insofar as its links are capable of responding to demand for a product in sufficient volume and regularity and with sufficient quality and safety standards that consumers are willing to pay for it. In the case of artisanal fisheries, the major challenge to building robust value chains is dealing with the fundamental asymmetry between supply and demand. Artisanal fishing supply is by definition seasonal and unstable and based on a small, diverse catch. Demand however, tends to be large, stable, and focused on a reduced range of species. Things are complicated further by the inherent perishability of fish, which only remains “fresh” for some 72 hours with adequate refrigeration.

Historically, this situation has been managed in two ways: 1) by freezing to better control supply and 2) intermediation to better link supply to demand in distant urban markets from a range of buyers, differentiating between high- and low-value fish species. The problem with freezing is that most fishing communities along the Pacific coast lack electricity and infrastructure, so freezing is not an option. In any case, fresh fish brings significantly better returns (often a fourfold difference), so freezing is not the preferred choice. Although intermediaries can serve an important market function, in the fish supply chain, transactions are skewed in favor of these middle men, squeezing profit margins along the entire chain, particularly for fishers.

EXHIBIT 5. FORMALLY RECOGNIZED CONSERVATION AREAS (ZEPA, ZONE FOR SPECIAL FISHERIES MANAGEMENT, AND REGIONAL INTEGRATED MANAGEMENT DISTRICT)



EXHIBIT 6. FISHERIES AND BLACK CONCH AREAS UNDER IMPROVED LOCAL MANAGEMENT



As a response to value challenge, BioREDD+ tested three models or approaches.

- *From the ocean to the restaurant.* This model was based on a historic commercial alliance between the *Red de Frío in Bahía Solano* (made up of four responsible fishing associations and a fish collection operation called *FishMare*) and the *Wok* restaurant chain in Bogotá and replaced intermediation with a direct business relationship between fishers and buyers. On the plus side, fishers received a better price per kilogram for their products (about 50 percent on average), and the restaurant is able to trace the fish's origin, offering greater quality control and assurance to discerning clients that the fish were sourced responsibly. More complicated was the time needed to develop a trusting relationship between buyer and seller (built over a number of years) and the need to have a skilled technical partner (in this case *MarViva*) with both interest and funding to

THE NETWORK FOR RESPONSIBLE FISHERIES AND TRACK AND TRACE

BioREDD+ launched the Network for Responsible Fisheries (www.pescaresponsable.co) to create and strengthen alliances among stakeholders along the responsible fisheries value chain. Because one key characteristic of this chain is the possibility to track and trace the origin and route of fisheries products, the Smithsonian Institution designed an online system to reduce time and resources spent on data collection and promote information exchange between producers and consumers (<http://ourfish.org/trace>). This online database can be customized according to users' needs. This system will be used by *COOMULPESAB* and other members of the network.

“internalize” the costs of intermediation in this formative period (e.g., logistics support, transport, client relationships).

- *A regional community cooperative links buyers and sellers.* This model recognized the legitimate role of intermediaries, but “internalized” this operation in a regional cooperative with links to artisanal fishing community members themselves. In this case, *COOMULPESAB*, strategically located in the port of Buenaventura (Valle del Cauca) expanded a regional collection, distribution, and sales center to sell responsible fisheries products and improve fishers’ incomes. Although fishers received a better price per kilogram for species for which there is demand in gourmet markets (prices rose 11 to 34 percent per kilogram, depending on the species), commercially less-valuable species continue to receive lower prices largely due to the absence of a sufficiently large customer base to absorb all the supply.
- *A national distributor in Bogota.* The model was the closest to business as usual, linking fishers to a commercial distributor. The difference being the interest by the distributor, in this case *CENDISMAR* operating from Bogota, to develop a new product line of “Colombian responsible fish and seafood” and pay slightly better prices to fishers than is typically the case (about 6 percent). The big plus of this arrangement was *CENDISMAR*’s capacity to receive a wide variety of fish species, thus generating greater market stability for fishing groups. The downside was twofold: the price paid per kilogram is lower than that offered under the two previous scenarios, and there is less concern about compliance with responsible fishing criteria.

PRODUCING SUSHI-GRADE TUNA

Training of fishers included a special module on improved manipulation of tuna to position higher-quality fish with gourmet sushi restaurants in Colombia’s main cities, which can increase the price almost tenfold. This was undertaken based on guidelines provided by the Smithsonian Institution.

In all cases, and independently of the value chain model, BioREDD+ supported fishing communities in:

Educating fishers on responsible fishing. This started from the catch, the point at which fishers begin to internalize the importance of responsible fishing and the need to reduce the impact of indiscriminate extraction. In many cases, this involved a radical shift in practices, based on an understanding of commercial species and their vulnerability, respect for maturity sizes, use of appropriate fishing nets, compliance with regulatory “no-catch” periods, and use of permitted fishing sites.

Building new skill sets. Capacity building activities were undertaken by Smithsonian Institution experts, often supported by chefs from restaurants in Bogota and Cali, training 200 fishers, black conch collectors, and staff from fisheries reception centers on proper handling, manipulation, and storage of fisheries products. Recognizing that these organizations need to function as businesses, BioREDD+ also linked technical training with improvements in accounting procedures, tax compliance, inventory management, legal issues, and implementing a cooperative business model in practice.

Investing in infrastructure to enhance product quality. BioREDD+ improved six community-managed fisheries storage centers in Nuqui, Mayorquin, Cajambre, and Buenaventura, using USAID funding to leverage additional funding from government sources. Direct investments were made to purchase ice machines (for Nuqui and Buenaventura), a water treatment plan (Nuqui), and other equipment and materials (such as freezers, fiberglass coolers, scales, stainless steel tables, and trays) so that fisheries storage centers complied with relevant quality standards.

**WOK:
AN EXAMPLE OF RESPONSIBLE
PURCHASING**

WOK is a company with 11 restaurants that specializes in fresh seafood and is a pioneer in supporting responsible fishing initiatives in the country. It is the first restaurant to apply the Environmental Responsibility Standard for the Sale of Ocean Fish developed by *MarViva* as part of a BioREDD+ grant.

And what did the experience show? In the final analysis, there is merit in all three value chain models used during BioREDD+. Although the first, where intermediation is eliminated and a bigger share of profits flows to fishers, is the ideal scenario, there are challenges in replication, not least in that it is hard to find buyers like WOK elsewhere in Colombia. Where applicable, it is great, but it is difficult to envisage too many scenarios where it can be easily used. Thus, some variant of the second model, where a regional organization with links to the fishing communities assumes the intermediation role, is probably more feasible. Indeed, it is interesting to note that *COOMULPESAB* is now positioned as one of Colombia's main regional providers of fresh, responsible fisheries products from the Pacific, signing four sales agreements with new clients in Cali and Bogota in the last six months alone. The final model, while probably appearing to maintain the commercial status quo, offers the big advantage of commercial sustainability with little or no donor support, as well as providing a single outlet for the bulk of fisheries products from a fishing community or region. It is a useful fallback option.

COMMUNITY ECOTOURISM

Due to its outstanding natural beauty and cultural attributes and despite significant challenges posed by its geographic isolation, the Pacific region has been long recognized as an area with high ecotourism potential. If done well, ecotourism combines incentives to preserve natural resources with alternative income-generation and was deemed particularly compatible with future REDD+ initiatives. Based on the results of two rapid assessments conducted at the start of BioREDD+ by international consultants, the work focused on improving the quality of ecotourism services, building local capacity for managing community



Off the coast of Bahia Malaga, Colombia. Humpback whales are seasonal visitors to several areas along the Pacific coast and a main attraction for visitors and locals alike. They are a symbol of the rich biodiversity of the Colombian Pacific coast.

tourism enterprises, and implementing a marketing strategy to attract more visitors. Two pilot areas were selected — Nuqui and La Plata/Bahia Malaga — with emphasis on Nuqui, given its greater potential for international tourism.

BioREDD+ used small grants to strengthen three nascent community tourism organizations in Nuqui (*Coquí Eco* guides, the *Pichindé Association* and *Cocoter* from Termales), improving their boat transport and communications capacity through enlarging boats and equipping them with new outboard motors and radio equipment. In Bahia Malaga, five community tourism organizations were able to improve their tourism services through boat and pier improvements, construction of two eco-cabins in La Plata and Puerto Espana-Miramar and a new cultural center in Ladrilleros, and improvements to mangrove and river trails to more comfortably and safely accommodate tourists.

In addition, Solimar International was hired to apply an innovative, hands-on training program with tourism enterprises managed by community-based groups. Thirteen members of community tourism organizations from Nuqui and Bahia Malaga attended a four-week workshop, during which they developed business plans and operations manuals. Constant follow-up and supervision from Solimar's field staff were provided for six months after the workshop, which helped the organizations implement what they had learned. Visible improvements arising from this activity included the use of inventory registers and visitors' registers, application of best environmental practices, and improved visitor guidance.

AGROFORESTRY AND FOREST CONSERVATION

Agroforestry and forest conservation can be generating biodiversity and carbon benefits, so it is of little surprise that they formed part of BioREDD+. Indeed, had more resources been available for supporting the biodiversity conservation in forests, this work would no doubt have been expanded.

Building on previous USAID interventions in Tumaco (particularly, the MIDAS Program), BioREDD+ continued to support cacao-based agroforestry as a means of encouraging compliance with forest conservation agreements and improving livelihoods

A NEW WAY TO MARKET THE CHOCO AS A TOURIST DESTINATION

Greater capacity to receive tourists and better quality in the community-tourism offering has little impact on local livelihoods unless more visitors arrive. With this in mind, Solimar brokered an agreement in May 2014 between the *Pichindé Association*, *Coquí Eco* guides, *Cocoter*, and the *Playa Blanca Association* to create the Choco Community Tourism Alliance. In parallel, a sales and marketing agreement was signed between the Community Alliance and *Palenque Tours*, a tourism operator based in Medellin, whereby *Palenque* became the main commercial partner of the alliance for two years, with responsibility for marketing, bookings, sales, and logistical coordination for alliance tourism products and services. In support of this, Solimar designed an online marketing strategy and trained staff from *Palenque* on its implementation. The strategy included design and launching of a website for the Community Tourism Alliance, which was launched on July 1, 2014 (www.visitchocho.com). The impact was almost immediate, with the number of visitors to organizations making up the Nuqui Community Tourism Alliance increasing 28 percent in 2014.

of families that were previously dependent on timber. Nearly 1,600 hectares of cacao were planted or maintained with CCs during BioREDD+, 75 percent of which are in Bajo Mira y Frontera, 19 percent in Acapa, and 6 percent in Cajambre. With significant counterpart funding from the administrative Unit for Territorial Consolidation of the Department for Social Prosperity and the Swiss NGO, Swiss-Contact, BioREDD+ was able to build capacity to improve planting material, pest control, harvesting, post-harvesting, and commercialization.

In Bajo Mira, the program invested in completing a large gas-powered reception, fermentation, and drying facility, originally built with Colombian government funds. With a capacity to process up to 5 tons of cacao per day, it will support Bajo Mira in accessing specialized cacao markets that pay significant price premiums. In a similar vein, BioREDD+ supported another Unit for Territorial Consolidation project with the CCs of Rio Pepe and ACABA, developing a nursery to produce 45,000 achiote plants linked to one of the REDD+ projects in the BioREDD+ portfolio.

In the indigenous *resguardos* of Mutata and Chigorodo, BioREDD+ implemented projects designed to strengthen internal control of forest exploitation, whereby indigenous patrol units made up of local “environmental sheriffs” patrol areas of their territory to supervise forest use. This traditional enforcement strategy was strengthened via development and implementation of new conflict management measures. The strategy had an immediate payoff, with community patrols confiscating a number of chain saws used to illegally harvest trees. In the case of Mutata, which brought almost 34,000 hectares under improved management, this was a terrific precursor to REDD+ implementation, because control of illegal timber extraction is key to meeting carbon emission reductions.

SECTION IV

ARTISINAL GOLD MINING

This mining component was designed to support Colombian institutions in reducing the impact of artisanal small-scale gold mining, primarily in the Northeast and Lower Cauca regions of the Department of Antioquia (see Exhibit 7). The work included targeted policy reform, small miner legalization and formalization, recuperation of degraded lands, and mercury reduction or elimination, supported by an effective social communications campaign. BioREDD+ also undertook targeted activities in Choco, developing a protocol to help define mining rights in Afro-Colombian collective territories and guide negotiations between these communities and mining title holders.

WHY ARTISANAL GOLD MINING?

ASM has been practiced in Colombia for thousands of years. However, the sector experienced vigorous growth during recent decades, largely due to big increases in the price of gold, and in 2015, 65 percent of all gold produced in Colombia comes from small-scale mining. The gold boom not only exceeded the government's capacity to regulate it, it also generated a major negative impact. In addition to the social challenges posed by thousands of people settling in areas with few or no public services, can be added the presence of illegal



Rio Cauca, Antioquia, Colombia. This “moonscape” shows the extent of small-scale alluvial gold mining and the associated environmental impact on soil, water, vegetation, and biodiversity.

armed groups drawn to easy targets for extortion and a long list of environmental effects, especially when it concerns alluvial mining. Deforestation and indiscriminate mining have had a devastating impact on the soil, flora, fauna, and water supply. The use of mercury and the lack of adequate practices and equipment put the safety and health of miners at risk, as well as anyone breathing the air or using contaminated water sources, and thousands of hectares of land have been destroyed. In the Lower Cauca region of Antioquia alone, mining activity contributed to degradation of 42,000 hectares, or about 5 percent of the territory, and the town of Segovia has one of the highest recorded levels of airborne mercury in the world.

THE ROLE OF BIOREDD+

The role of BioREDD+ was not to promote more or less mining, to favor one group over another, or to reward or penalize one type of mining in particular. BioREDD+ was tasked with working with diverse stakeholders to identify practical and tangible ways to improve

the performance of ASM and to mitigate the enormous environmental impact that the activity has generated in the region. Given the complexity of the mining sector in Colombia, this tenet of “neutrality” proved to be an effective operating strategy and became enshrined in an informal mission statement by staff: Not more, nor less, just better! Over and above neutrality per se, legality became the other operational watchword for BioREDD+ because improvements to business, social, and environmental performance within ASM are impossible without legal security. This proved easier said than done.

GROWTH IN COLOMBIAN GOLD PRODUCTION

Gold production rose from 15.48 tons in 2007 to 53.60 tons in 2010 and 55.74 tons in 2013. The forecast is for 80 tons in 2016 and 93 tons in 2020.

BECOMING LEGAL

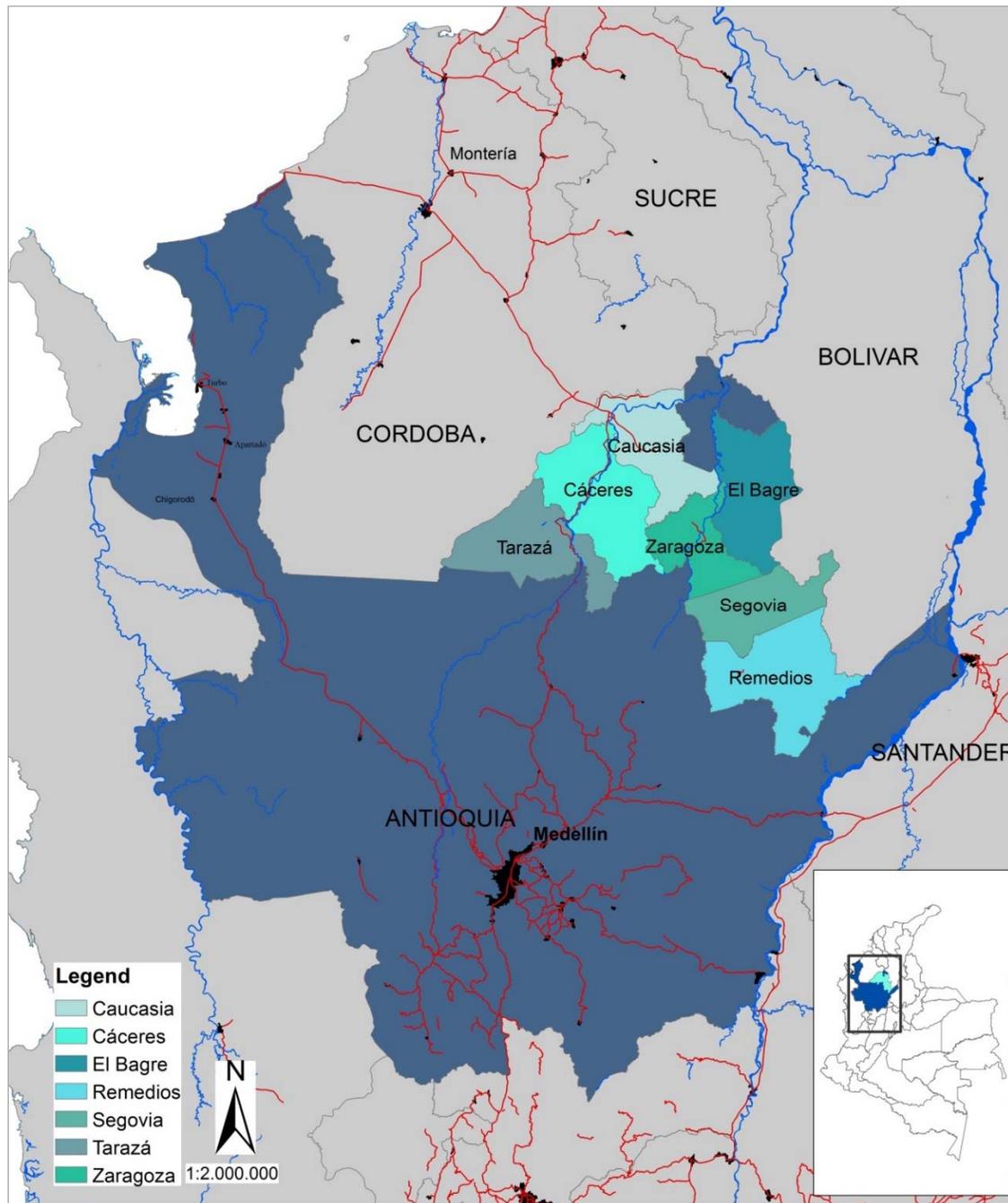
Colombia’s history of legalizing mining is long and complex. In the last 20 years, several large-scale legalization efforts have been implemented, without achieving their objective of legalizing and formalizing mining operations, especially artisanal small-scale mining. There have been multiple problems, including: 1) budget limitations, which thwarted the ability to respond to many applications; 2) transition of the delegated mining authority from the National Mining Company (*Minercol*) to *Ingeominas* (presently, the Colombian Geological Service) that halted the undertaking of important mining studies; 3) the fundamental disconnect between mining and regional environmental authorities, which delayed approval of environmental management plans; 4) a lack of coordination among delegated governing authorities and *Ingeominas*, which limited access to information from the National Mining Registry, and perhaps most significantly; 5) a critical shortage of “free areas” without prior claims where new titles could be granted.

The latter continues to be a major hurdle and arose from removal of restrictions for soliciting mining titles during the mid-2000s, which were quickly snapped up by mining interests and speculators alike. Thus, regardless of clear efforts by the national government to promote legalization of mining operations over two decades, less than 10 percent of applications resulted in mining titles being issued. Despite this context, establishing a mandate to operate legally was non-negotiable for BioREDD+, because a title, or a formal contract, and the protection it offers, opens doors for ASMs to restructure, formalize their operations, and undertake their work responsibly.



La Vega Mine, Bajo Cauca, Antioquia, Colombia. Since becoming a legal operation via an operations contract with Grand Colombia Gold, La Vega Mine carries out exploration to better plan mining operations that reduce costs and the environmental impact.

EXHIBIT 7. LOCATION OF MINING ACTIVITIES



With this in mind, the program identified six legally viable legalization routes (see text box) that provided ASMs with obvious benefits, including the ability to:

- Work in an authorized area and plan operations until the contract expires
- Possess the rights to mine
- Legally purchase and pay market prices for explosives
- Access occupational, health, and industrial safety benefits granted by the law
- Receive legal, technical, and environmental support from state institutions
- Enjoy legal security for investments made in every stage of the mining life cycle
- Enjoy “social benefits” such as identity, recognition, safety, peace of mind, and stability
- Gain credibility among providers and clients

Although the six routes identified were all legitimate pathways to legalization, it was impossible for BioREDD+ to ignore the reality that a large percentage of the country’s mining areas were already titled and some 63 percent of ASMs did not possess a title. The uncomfortable conclusion was that if there were few free or unclaimed areas and a large number of small-scale miners operating illegally, the chances of an ASM becoming legal with clear title, at least through the existing legalization processes, were very slim indeed.

SIX LEGALIZATION ROUTES FOR ASM

Concession for Free Areas. Although this has fewer possibilities for current application due to a shortage of free areas, there remain cases of untitled miners working in free areas who have requested legalization.

Operating Contract. This is granted via a voluntary agreement between the title holder and the unauthorized miner working within the titled area. This contract has the advantage that it does not require approval by the mining authority and although environmental and other obligations remain the title-holder’s responsibility, this option stimulates improved management, and miners enjoy greater stability and legal security.

Transfer of Areas. With this option, the originally titled area can be divided and a new concession contract created. This requires the newly legalized *unidades de producción minera* (UPM) to fulfill mining, environmental, and business regulations and results in reduced social and environmental impact.

Special Reserve Areas. This option can be processed despite the existence of third-party claims, providing there are clearly identified social or economic rationales and it is being undertaken in traditional mining areas. It offers advantages for UPMs, particularly because the government is required to undertake mining and geological research and promote initiatives based on the rational use of existing mining resources.

Formalization Subcontract. This option opens possibilities for UPMs working illegally in concession areas, because the subcontract can be signed even if the mining title is in the exploration phase. It does require approval from the mining authority, but because the subcontract has a duration of at least four years, it guarantees greater stability for miners and sufficient time to make the transition to formal status.

Return of Areas for Formalization. This option is included in Article 11 of Law 1658/2013, and although the decree that regulates the law has only just been passed, it opens additional possibilities for small-scale miners already operating in that area. Once an area has been returned to illegal miners through a government concession, they assume management responsibility and all other obligations, thus, guaranteeing a reduction in social and environmental impact.

The way out of this legal and institutional cul-de-sac was provided by a private agreement between an ASM and a title holder, particularly a large-scale mine. Thus, three of the six viable legalization routes were prioritized as options with the greatest potential for impact in the region: the operating contract, the formalization subcontract, and the return of areas for formalization. Over and above resolving the legality issues per se, working alongside large-scale industry not only facilitates legalization for ASMs, but also offers the potential to establish knowledge- and technology-transfer mechanisms that could generate positive changes for the sector and country. In practice, BioREDD+ used just two legalization vehicles — operations contracts and formalization subcontracts — to legalize 84 UPMs.

THREE IMPORTANT LEGISLATIVE TOOLS FOR LEGALIZATION OF ASMS SUPPORTED BY BIOREDD+

- The resolution by the Ministry of Environment and Sustainable Development that regulates the application of the environmental mining guide for mining formalization
- The subcontract for mining formalization (Decree 480 of 2014 that regulates Article 11, paragraph a, Law 1658 of 2013) endorsed by the ministries of mining and the environment
- The draft resolution to return titled areas (which regulates Article 11, paragraph b, Law 1658 of 2013)

BECOMING FORMAL

Becoming legal is hard for ASMs. However, the bigger challenge typically comes later and involves operating as a formal enterprise. To work formally and under the protection of a mining title means to be in compliance with the industry’s technical, social, occupational, economic, and environmental framework as set out by the National Policy for the Formalization of Mines in Colombia (of May 2014). Formalization is hard in practice, even for medium- and large-scale operators, because compliance with government regulations is costly and onerous and there is a lack of structured, permanent technical support. That being said, it was important for BioREDD+ to avoid the “red herring” of cost. Formalization is usually expensive — but then so too is gold mining in general — but it can generate significant wealth, especially for legal and formal ASM operators that can now sell gold in formal markets at higher process than offered in black markets. Further, management plans, environmental studies, and use of clean technology are all mandatory in other sectors that generate far less cash flow and profit. Indeed, the mistake of many ASMs is to exclude compliance costs from normal operating and cash flow planning, which radically affects the way they are viewed.

This being the case, the program focused on reinforcing the application of best mining practices, particularly management plans, environmental impact assessments, and environmental management plans with legalized UPMs and miners associations. BioREDD+ co-financed consultants to undertake the work, trained associations on their use,

FOUR COMPELLING REASONS FOR ASM FORMALIZATION

- More gold extracted = Greater cash flow
- No mercury = Lower social and environmental impact
- Lower operating costs = Reduced fixed costs
- Greater industrial safety = Improved work environment and fewer risks

and liaised with national and regional entities to ensure they were reviewed in a timely fashion. Rather than emphasize compliance per se, the core argument underlying the use of these key formalization instruments was that when used correctly, they will lead to more efficient gold production without generating excessive social and environmental impact. More generally, the message to the ASM sector was that if more is invested in exploration, planning, and cleaner mining technology, then more gold will be extracted with less damage and risk. It is a win-win situation for the miners, their employees, the community, and the environment.

ELIMINATING MERCURY USE

Mercury is commonly used by the ASM sector in the amalgamation process to extract gold. Metallic mercury is highly toxic and when heated is easily converted to gaseous, mobile forms that are inhaled and accumulate in ecosystems and along the food chain, eventually concentrating in human tissues and causing a range of health problems, from genetic malformations to cancers. Pregnant women and children are especially at risk. Mercury is a major problem in Colombia, which remains one of the world's top five mercury users. In a study co-authored by BioREDD+ staff and consultants, airborne mercury levels in five urban sites (Segovia, Remedios, Zaragoza, El Bagre, and Nechi) were up to 10 times the World Health Organization's limit. Such is the concern over mercury contamination that in 2103, the government established a goal to eliminate its use in gold mining within five years.

There are several metallurgical processes used to recover gold using little or no mercury, the most frequent being gravimetric concentration, mineral flotation, and use of cyanide. (Even though this last option sounds horrible, it is an organic chemical and is far less toxic than mercury.) However, ASM miners continue to use mercury because it is cheap (in the black market) and particularly effective for processing small flakes and specks of gold, which are often what is found by alluvial miners, small dredgers, and gold panners. Typically, these are the least-educated miners in the ASM sector and the most resistant to change.

This being the case, BioREDD+ used a three-pronged strategy to reduce mercury use: 1) education of miners, mining associations, and the public in mining areas about the damage caused by mercury (forming part of the “More legal, more formal, and more environmentally friendly” social communications campaign referred to in Section IV), 2) linking legalized UPMs to larger mining companies that receive their ore as part of an operations contract and process it at non-mercury processing facilities, guaranteeing 100 percent mercury elimination with these miners, and 3) facilitating access to new, no-mercury processing technology, for high-risk mercury polluters. In the latter case, BioREDD+ co-financed three associations of small dredgers (*Jardín*, *Asotramiagro*, and *Guarumo*) to build and equip three centralized facilities to allow their members to process ore away from vulnerable river systems.

REHABILITATING DEGRADED AREAS

Perhaps the most visible impact of ASM — particularly alluvial mining — is damage to land, with thousands of hectares in Antioquia alone turned into lunar landscapes of bare

earth and rocks, punctuated by small, contaminated pools of water. There are two reasons why degraded areas are typically rehabilitated: environmental regulations and supervision by government entities linked to a system of fines for non-compliance and personal motivation fostered by a sound sense of environmental responsibility. The situation in Colombia is less than optimal: The supervisory process is weak, and the mentality of the informal mining sector is not typically pro-environment, thus leaving significant environmental liabilities in their wake once an area has been “played out.” Given this, BioREDD+ worked with regional stakeholders to provide an alternative focus that had been successfully used to restore deteriorated areas. Its great virtue, in addition to rehabilitating mined-out land and mitigating environmental impact, is that it provides an opportunity to quickly reintegrate areas to productive uses, generating local employment and future revenue streams from wood and honey production.

In accord with Colombian law, all mining operations should include a closure plan that outlines land use post-mining and a description of the tasks required to rehabilitate altered environments. The plan helps identify and measure the negative environmental impact that can occur during the project; define actions to prevent, minimize, and/or mitigate the impact; and develop a timeline of activities to be implemented during and at the end of mining. However, it was immediately apparent to BioREDD+ that it was unlikely that unlicensed ASMs would include even a single closing activity at the end of mining operations, because closure is precisely the moment when the mine is no longer generating revenue and the land is no longer useful. Program staff thought that if penalizing non-compliance was necessary and mandatory, it was also essential to devise strategies to incorporate economic incentives to rehabilitate land, beyond just the fear of being fined. Additionally, it was necessary to make long-term, legally enforceable agreements with the owners of degraded land (who are usually distinct from the owners and operators of the mining claim) to ensure that rehabilitated land is not “re-mined.”

So although at first glance, rehabilitating the damaged, desolate landscape caused by indiscriminate alluvial mining for other productive uses may have appeared daunting, BioREDD+ was able to draw on economically viable options to rehabilitate the land, while incorporating an economic model to generate non-mining revenue. The key to the model was incorporation of *Acacia mangium*, a leguminous tree native to Australia, Indonesia, and Papua New Guinea, which when combined with beekeeping, has yielded positive results in rehabilitation activities. Beekeeping is an integral part of the model, becoming a short-term source of income for ex-mining families, who can earn an average monthly income of \$250 from



Rio Rayo, Bajo Cauca, Antioquia, Colombia. The one-year-old *Acacia mangium* plantation prospers in an area extensively degraded by informal gold mining.

managing 40 beehives. This model, implemented with the reforestation company *Reforestadora Integral de Antioquia* and supported by first-rate watershed restoration activities undertaken by the Medellin Botanical Garden, underpinned rehabilitation of 783 hectares of degraded land under BioREDD+. This could be an excellent incentive for ASMs to rehabilitate abandoned land if applied more broadly.

ACACIA MANGIUM – THE “MIRACLE TREE”

It adapts well to various soil types and has a high tolerance of less fertile soil with poor drainage, thus making it the ideal species for rehabilitating mining areas and controlling erosion.

It tolerates a wide variety of weather conditions.

Like all leguminous trees, it fixes nitrogen in the soil, which improves nutrient assimilation (calculated at 50 to 400 kilograms of nitrogen/year/hectare).

It is a popular species for mixed plantations because other plants benefit from its shade and nitrogen fixation.

Because of its rapid growth, it is a major wood producer, good for carbon sequestration programs. It can grow up to 20 meters with a diameter of up to 50 centimeters and can store an average of 22.6 kilograms of CO₂ per tree each year.

Typically, trees can be harvested once they are 10 years old. Based on experience in degraded areas, they can produce an average of 180 tons/hectare of wood timber and 40 tons/hectare of wood chips.

The wood is hard and heavy and can be used for construction (i.e., wood beams and flooring) or for manufacturing furniture, doors, and window frames.

Bees are attracted to *Acacia mangium* because its leaf stalks exude nectar year-round, making bees the primary pollinator for the tree and a good source of honey.

SECTION V

TELLING THE BIOREDD+ STORY

The communications work of BioREDD+ mirrored its approach to the technical work: It was big, bold, well-resourced, and used a combination of products and channels not typically found in most USAID programs. There were a number of reasons for this.

In the case of climate change, the overarching communications goal was to explain REDD+ to distinct audiences in a way that could be understood, assimilated, and acted on. Interestingly enough, this was as much of a challenge with uninformed decision-makers in large private companies who could potentially finance REDD+ projects as it was for isolated, rural communities that needed to develop and implement them. The program used a variety of tools, including social mapping, focus groups, formal surveys, videos, and promotional materials. Without doubt, the stellar communications piece of the climate change program was the Code REDD Stand for Trees website (<https://standfortrees.org>) and associated video produced by the rapper-poet, Prince EA, which went viral, receiving more than 60 million views in the first two weeks alone and generating more than \$345,450 in sales of carbon credits since its launch before Earth Day through the end of May 2015.

In the context of biodiversity conservation, and particularly responsible fisheries, BioREDD+ had to respond to two key communications challenges to motivate behavior change. At one end of the chain, largely with fishers and black conch collectors, the main issue was to make real the threats to their livelihoods from overexploiting their natural resource base. An innovative participatory monitoring activity embedded within local communities, supported by attractive data recording notebooks and measuring equipment, adequately addressed this issue. In a similar vein, at the other end of the chain, buyers and consumers required education on responsible purchasing. Here, BioREDD+ supported *MarViva's* responsible fisheries campaign, as well as producing a range of materials, including a website, key chains, coasters, and posters, to promote the launch of the Responsible Fisheries Network.

The most comprehensive approach to social communications however, was linked to the gold mining component and was structured around a central campaign, promoting “legal, formal, and environmentally responsible” mining. The campaign was developed jointly with the Mining Secretariat of the departmental government of Antioquia and was quickly assimilated by partners and beneficiaries alike. The key campaign theme was highly relevant and attractive, non-confrontational, and non-partisan, and came to underpin the program’s “mining-neutral” stance, which was ultimately a big part of its success. Activities included large public events, participation in mining trade fairs, broad distribution of technical posters on best mining practices, and use of T-shirts, baseball hats, car stickers, and the like.

The crown jewels of the campaign were two flagship communications products. The first was a full-blown radio soap opera called “Angels Among Us” that documented the lives of a group of young people from mining communities in Antioquia. Professionally produced and mixing experienced Colombian actors with talented youngsters from BioREDD+ intervention communities, the show aired on a dozen commercial and public radio stations during a three-month period, reaching a target audience in excess of 10,000. The second was a commercial documentary, co-produced by BioREDD+ and Miracol TV and presented by the acclaimed Colombian actor Robinson Diaz. The documentary places Mr. Diaz at the center of artisanal gold mining, allowing him to touch on some hard issues while presenting an intimate view of the sector, seen through the lives of a small group of artisanal miners. The documentary recently aired on Caracol TV, one of Colombia’s two premier terrestrial TV channels, pulling in an evening audience of almost 3 million people. It is currently being marketed outside of Colombia to important entertainment companies, including Televisa and Netflix.

Finally, the entire program was backed by a program website (www.bioredd.org), success stories for USAID, and an aggressive free press media strategy, which generated 220 magazine, newspaper, and TV news pieces over the life of the program, including several high-profile articles in important national newspapers *El Tiempo* and *La Semana*, resulting in massive, positive exposure for USAID’s work in Colombia.

SECTION VI

BIOREDD+ BY THE NUMBERS

Although numbers alone are an imperfect way of illustrating a program's achievements and its contribution to USAID's global mission, there is typically a clear correlation between the quality of an overall program and its technical and financial performance. This should come as no surprise because there is a strong underlying relationship of overall program administration, financial management, and technical impact. This was the case for BioREDD+ as shown by the figures presented in this section, which reveal an outstanding overall level of performance, made more impressive by the complexity of the context in which the program operated and its short timeframe.

PERFORMANCE AGAINST INDICATOR TARGETS

This section presents the principal outputs and effects at the close of the program. The indicators and targets have been adjusted in accord with the final contract modification, and the exhibits and text that follow provide an overview of overall performance vis-à-vis the USAID/Colombia performance monitoring plan.

Exhibit 8 provides a summary of BioREDD+ technical performance in climate change and biodiversity conservation during the contracting period. On the set of 14 key indicators, the program achieved an average of 123 percent performance against its life-of-program targets and by the end of the performance period, nine of its 14 indicator targets had been achieved or surpassed. Of particular note are the following:

- The program doubled the number of innovative climate change tools and methodologies expected, reflecting the significant contribution of BioREDD+ to climate change science and practice, creating impact beyond the boundaries of Colombia and the close of the program. These included:
 - A new tool to calculate historical deforestation rates using incomplete remote-sensing imagery developed by Terra Global Capital and GeoEcoMap and adopted for international use by the Verified Carbon Standard
 - A monitoring, reporting, and verification mechanism to monitor deforestation and forest degradation developed by GeoEcoMap and ecoPartners based on remote-sensing data alone
 - A biodiversity measurement protocol developed and implemented in four Pacific coast field plots by the Humboldt Institute
 - A new mechanism to underpin citizen purchases of carbon credits (Stand for Trees), developed by Code REDD
 - A new easy-to-use, online system for tagging and tracing responsibly caught fish to establish chain of custody developed by the Smithsonian Institution

EXHIBIT 8. BIODIVERSITY AND CLIMATE CHANGE INDICATORS, TARGETS, AND PERFORMANCE

INDICATOR	LIFE-OF-PROJECT TARGET	ACHIEVEMENT AGAINST TARGET	
		PROGRAM CLOSE	PERCENT
Number of hectares of biological significance and/or natural resources under improved natural resource management as a result of U.S. government assistance	400,000	738,169	185%
Number of institutions/organizations public and private with improved capacity for effective environmental resource management	30	46	153%
Number of people with increased economic benefits derived from sustainable natural resource management and conservation as a result of U.S. government assistance	7,000	7,176	103%
Number of institutions with improved capacity to address climate change issues as a result of U.S. government assistance	15	25	167%
Number of laws, policies, strategies, plans, agreements, or regulations addressing climate change (mitigation or adaptation) and/or biodiversity conservation officially proposed, adopted, or implemented as a result of U.S. government assistance	24	39	163%
Number of mitigation and/or adaptation tools, technologies, and methodologies developed, tested, and/or adopted	5	10	200%
Quantity of greenhouse gas emissions, measured in million metric tons of CO ₂ equivalents (CO ₂ e), reduced or sequestered as a result of U.S. government assistance	18	25.4	141%
Number of REDD+ projects designed, validated, and marketed	8	8	100%
Number of stakeholders with increased capacity to adapt to the impact of climate variability and change as a result of U.S. government assistance	8	8	100%
Amount of investment leveraged in U.S. dollars, from private and public partnership resources, for climate change as a result of U.S. government assistance	9,000,000	0	0%
Number of communities and other stakeholders adopting sustainable practices to improve biodiversity conservation	17	27	159%
Amount of investment leveraged from public and private partnership sources for management of natural resources in protected areas and buffer zones, indigenous reserves, (<i>resguardos</i>) and Afro-Colombian territories	2,200,000	1,611,225	73%
Amount of economic benefits (U.S. dollars) from payments from ecosystem services and/or ecotourism through public and private partnerships	2,000,000	1,326,209	66%
Number of people receiving U.S. government-supported training on natural resources management and/or biodiversity conservation	4,600	5,272*	115%

* An additional 2,713 people receiving U.S. government-supported training on climate change are not reported under this indicator.

- The significant area (738,169 hectares) brought under improved natural resources management (185 percent achievement) reflects BioREDD+ support to establishment

of three formal marine conservation areas, as well as seven local conservation agreements. Both approaches are noteworthy for Colombia.

- The number of organizations with greater capacity to confront climate change (167 percent achievement) reflects a sterling effort to involve a broad range of stakeholders in REDD+ development and biodiversity conservation. This includes the 19 communities that were immersed in an intensive learning-by-doing process while developing their own REDD+ projects, Colombia's national meteorological institute, IDEAM, by way of a large grant channeled via *Patrimonio Natural*, as well as the Humboldt Institute.
- That the program secured international validation of its entire portfolio of eight REDD+ projects to the CCBA gold standard (100 percent achievement) is an extraordinary feat in less than the four-year life of BioREDD+. More so when one considers that there was only one small verified REDD+ project in Colombia when BioREDD+ began and a mere handful globally.
- Projected emission reductions for the BioREDD+ portfolio amount to more than 25 million tons of CO₂ emission equivalents in the first 10 years (141 percent achievement against target). That is a conservative estimate, using a short time horizon, rather than the full 30 years contemplated in the validation project design documents.
- The number of laws, policies, and regulations significantly surpassed the target (163 percent achievement). A recent decree to establish a national registry system for voluntary REDD+ projects was perhaps the most significant and can be considered a de facto "no objection" by the Ministry of the Environment and Social Development to voluntary REDD+ initiatives in Colombia. It was justified, in part, by validation of the large BioREDD+ portfolio of voluntary REDD+ projects.
- Leverage of counterpart funding for conservation initiatives fell short of its target (73 percent achievement), reflecting the difficulty of harnessing private or public sector funding for conservation initiatives in Colombia.
- The indicator for carbon finance could not be met because of the deterioration of voluntary carbon markets for REDD+ credits during the life of the project. The failure to leverage \$9 million in REDD+ financing (0 percent achievement) was more a reflection of a weak REDD+ market and a paucity of international funding in the voluntary carbon sector than any lack of effort on the part of BioREDD+ or USAID/Colombia per se. Furthermore, a decision was made not to close on a financial contract that was less than ideal for communities but to open negotiations later, when the REDD+ projects are verified and generating marketable VCUs.

Likewise, the figures in Exhibit 9 reflect the effort by BioREDD+ in implementing its mining component, meeting or surpassing all 10 indicator targets by an average of 257 percent in just 22 months. Of particular note are the following:

- The success in rehabilitating 786 hectares of degraded land (131 percent achievement) understates the gargantuan task in identifying sites that met demanding technical and social selection criteria, negotiating with landowners and mining title

holders, and managing the logistics of tree production and planting, which at one stage threatened to overwhelm the component.

- The 84 mining operations with formal mining rights (140 percent achievement against target) is an enormous achievement, particularly because the number of mines legalized/formalized in the whole of Colombia in the previous decade before BioREDD+ is thought to be just over 100. This is also reflected in the 422 miners accessing legal markets (422 percent achievement).
- Thanks to its strategic use of local subcontractors, with close technical supervision by BioREDD+, and a strategy of “taking training to the miners,” the program was able to expand the number of miners trained (430 percent achievement) reaching 1,074 by program close. Another significant number of people were trained on alternative livelihoods, of which a third were women (Exhibit 10).
- The significant number of miners reducing their mercury use by at least 25 percent (353 percent achievement) is in large part explained by the 84 mining operations entering into formal agreements with larger mining operations and processing their gold at mercury-free facilities.
- A pragmatic approach to developing new regulatory instruments to support legalization/formalization (167 percent achievement) included designing two new instruments to improve procedures to guide mining activities in Afro-Colombian collective territories in Choco with participation of government and Afro-Colombian organizations. Given the pressure of uncontrolled mining in Afro-Colombian and indigenous territories, this represents a major step forward.

EXHIBIT 9. BIOREDD+ MINING INDICATORS, TARGETS, AND PERFORMANCE

INDICATOR	BASE PERIOD	ACHIEVEMENT AGAINST TARGET	
		PROGRAM CLOSE	PERCENT
Number of hectares rehabilitated with uses such as rubber, cacao, planted forests, or natural vegetation	600	786	131%
Number of miners accessing new markets that recognize the economic value of gold from mining operations with high environmental and social performance	100	422	422%
Number of mining operations reducing mercury use by at least 25%	30	106	353%
Number of mining operations with formal mining rights	60	84	140%
Number of small producer associations with strengthened capacity to provide legal and technical assistance to their associates and to participate in implementation of environmental monitoring and compliance	3	23	767%
Number of municipalities with strengthened capacity to provide technical, legal, and organizational assistance to small mining operations and organizations	5	5	100%
Number of incentives developed or used to promote and support formalization of small mining operations	3	3	100%

INDICATOR	BASE PERIOD	ACHIEVEMENT AGAINST TARGET	
		PROGRAM CLOSE	PERCENT
Number of miners trained on environmental regulation, labor obligations, improved technology, resiliency, and best practices	250	1,074	430%
Number of new legal and regulatory instruments (designed, proposed, adopted) to facilitate the improvement and formalization of informal miners	3	5	167%
Number of recipients of a communications campaign to foster a culture of legality in the region	10,000	14,770	148%

EXHIBIT 10. BENEFICIARIES OF ALTERNATIVE LIVELIHOODS ACTIVITIES DISAGGREGATED BY SEX

SEX OF DIRECT BENEFICIARY	NUMBER	PERCENT	AVERAGE NO. OF PEOPLE PER HOUSEHOLD
Male	2,094	66.6%	4.55
Female	1,049	33.4%	4.78
Total	3,143	100%	4.63
Female Heads of Household	301	9.6%	4.19

The main economic activities that reflect female participation are artisanal fisheries (52 percent), agriculture (40 percent), ecotourism (4 percent), and other activities (4 percent).

Exhibit 11 illustrates BioREDD+’s effort in structuring and timing training activities to ensure a significant level of participation by women (almost 40 percent), including almost 70 young people from Buenaventura (of which 32 were women) trained on climate change.

EXHIBIT 11. NUMBER OF PEOPLE TRAINED DISAGGREGATED BY SEX AND ETHNIC ORIGIN

SEX OF PEOPLE TRAINED	TOTAL	AFRO-COLOMBIAN	INDIGENOUS	OTHER
Male	5,637	3,969	633	1,035
Percent	62%	62%	62%	64%
Female	3,422	2,456	384	582
Percent	38%	38%	38%	36%
Total	9,059	6,425	1,017	1,617

FINANCIAL PERFORMANCE, INCLUDING THE ENVIRONMENTAL ACTIVITY FUND

Serving as the primary implementation tool of BioREDD+, an \$18.3 million Environmental Activity Fund represented 58 percent of the program’s budget. The fund allowed the program to achieve results by procuring goods and services via subcontracts, purchase orders, and short-term technical consultancies, providing assistance through

grant awards, and covering the costs of organizational and individual training, meetings, local assemblies, and other activities needed to engage local actors. The flexible nature of the fund allowed the program to use different support mechanisms appropriate to the needs of local organizations and have the ability to quickly shift to changing needs.

EAF approach. In line with the program’s main objective of supporting Colombian efforts to sustainably manage the country’s environmental resources, BioREDD+ focused the use of the EAF locally to the maximum extent possible. This allowed the program to:

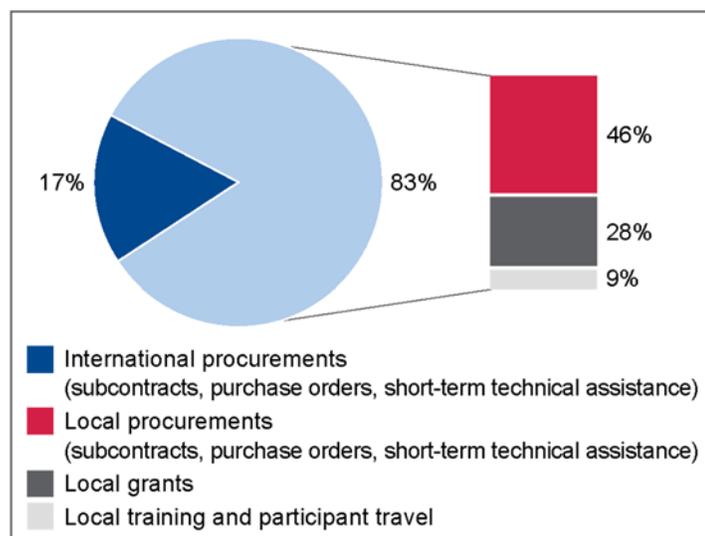
- Maximize the use of Colombian expertise and talent
- Build the administrative capacity of local community organizations via grants and direct assistance and provide continual support through the life of the grant
- Leverage local resources (private and government)
- Support participation of community members and key counterparts in local meetings and training
- Leverage highly specialized technical assistance from international partners in strategic areas

Taking advantage of the expertise in country, BioREDD+ devoted 83 percent of the EAF to local activities. Most of these resources (46 percent) were used to acquire highly qualified services from Colombian entities and individuals via local subcontracts, purchase orders, and short-term technical consultancies. These mechanisms were the main source of technical assistance provided to local communities and mining organizations and included development of socioeconomic studies, establishment of field plots to validate remote-sensing data for REDD+ projects, and construction of three zero-mercury gold processing centers.

Given the technical nature of climate change mitigation and mining activities, most of these mechanisms were used for these components.

About one-fourth of the EAF was used on performance-based grant awards to engage and build local capacity in communities and organizations. Used primarily under the biodiversity component, the grants allowed the program to reach Afro-Colombian and indigenous communities on the Pacific coast, many of them

EXHIBIT 12. VALUE OF LOCAL ACQUISITIONS, ASSISTANCE AWARDS, AND PARTICIPANT TRAINING/TRAVEL



receiving a USAID-funded grant for the first time. BioREDD+ grants provided them with resources to strengthen their capacity to exercise environmental governance over their territories and to initiate sustainable productive activities to reduce pressure on the natural resources. Grants were also used under the mining component to work with mining associations on compliance with environmental requirements, work with a local entity to support rehabilitation of degraded lands, and support the communications campaign to foster a culture of legality in the Antioquia region.

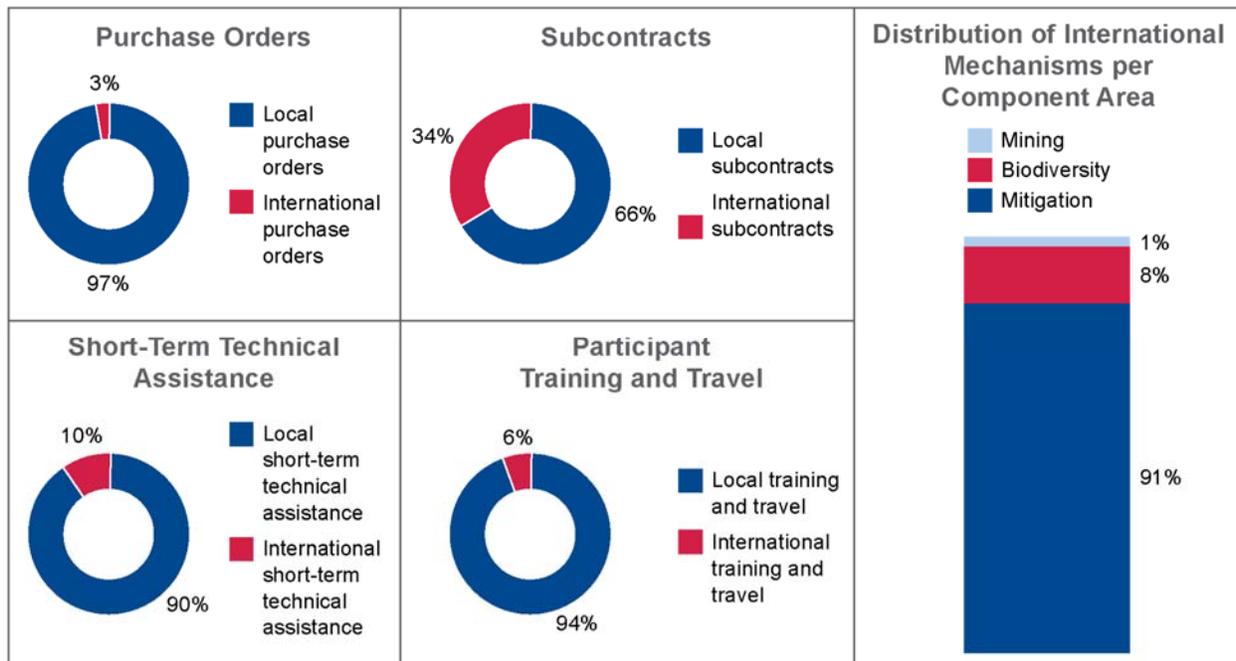
Because grants were mostly used with organizations with low capacity and new to USAID requirements, the program provided continual support throughout the grant lifecycle. New organizations benefitted from working jointly with the technical and EAF teams on design and review of the original grant concept and budget. Standard formats and checklists assisted the application process and when activities were approved, kick-off meetings allowed the technical team and the grantee to work jointly on the work plan and identification of next steps and key issues. Day-to-day supervision and technical support to grantees was provided via the program's technical staff as well as regional coordinators. This reduced delays in implementation of activities, improved coordination among actors, and provided additional support to grantees who required additional assistance. Due to the capacity of the organizations and the nature of the work done, BioREDD+ used mostly fixed-obligation grants, which helped grantees achieve verifiable milestones and results through the life of the grant. Careful consideration was given to the cash flow requirements of grantees, and milestones were developed, priced, and timed to avoid overburdening organizations with frequent reporting requirements.

Grants were also used to leverage resources from local partners with a goal of 25 percent contribution from grantees and third parties. A close partnership with the National Government's Social Prosperity Program ensured that BioREDD+ was able to leverage \$1.6 million in support of productive activities in priority consolidation areas.

The most flexible and rapid to implement mechanism in BioREDD+'s toolbox was participant training and travel funds, which it used to support the mobilization and participation of community members and local stakeholders in program activities, training, and meetings. This was crucial in ensuring that local communities were engaged throughout the life of BioREDD+ because most beneficiaries live in difficult to reach areas where mobilization costs are prohibitive. Coupled with the assistance of local coordinators in four geographic nodes in the Pacific coast, BioREDD+ was able to maintain a strong presence in the region and to rapidly and successfully engage communities. Given the requirement of demonstrating free, prior, and informed consent on REDD+ activities, the use of participant training/travel funds was vital to disseminate REDD+ concepts among communities, bringing key members of local councils to develop inputs for project design documents, and obtaining community approval via general assembly meetings as per local governance covenants. Without the ability to mobilize these funds rapidly, the success of community outreach efforts would have been hampered. Given the high demand and flexible and rapid nature of participant travel/training activities, this mechanism was used the most, representing 49 percent of the 541 registered activities under EAF, yet only amounting to 9 percent of obligated funds, given the small value of these activities.

Although BioREDD+ focused most of its resources locally, it also engaged specialized technical assistance via international subcontracts and short-term consultancies in key thematic areas and via participation in international conferences/events. The value of mechanisms linked to international firms, consultants or events (U.S. and non-Colombian) represented 17 percent of the EAF, (a total of 23 activities from 541 implemented under the EAF). The breakdown by type of mechanism can be seen in the graph below.

EXHIBIT 13. PERCENTAGE OF EAF DEDICATED TO INTERNATIONAL ORGANIZATIONS OR INDIVIDUALS



SOURCE: CALCULATIONS FROM BIOREDD+ DEVRESULTS EAF DATABASE, JUNE 2015

Given the complexity and evolving nature of REDD+ project development, most funds spent on international activities were used under the climate change mitigation component. The program subcontracted highly specialized expertise of United States-based firms such as GeoEcoMap, Terra Global Capital, Ecological Carbon Offset Partners, Rainforest Alliance, and Code REDD at critical stages of the project design document process, including development of carbon baselines, selection of the methodology for REDD+ project development, development of REDD+ project design documents, validation of REDD+ projects under VCS and CCBA standards, and due diligence to attract REDD+ investors. This allowed the project to access the latest technology in REDD+, introduce a series of innovations as detailed at the beginning of Section II and ensure that the eight REDD+ projects developed obtained validation under VCS and CCBA standards in a tight timeframe.

DISTRIBUTION OF THE EAF ACROSS MECHANISMS AND COMPONENTS

Throughout the life of the program, BioREDD+ implemented 541 mechanisms or activities under the EAF. Although the first year of the project was slower in

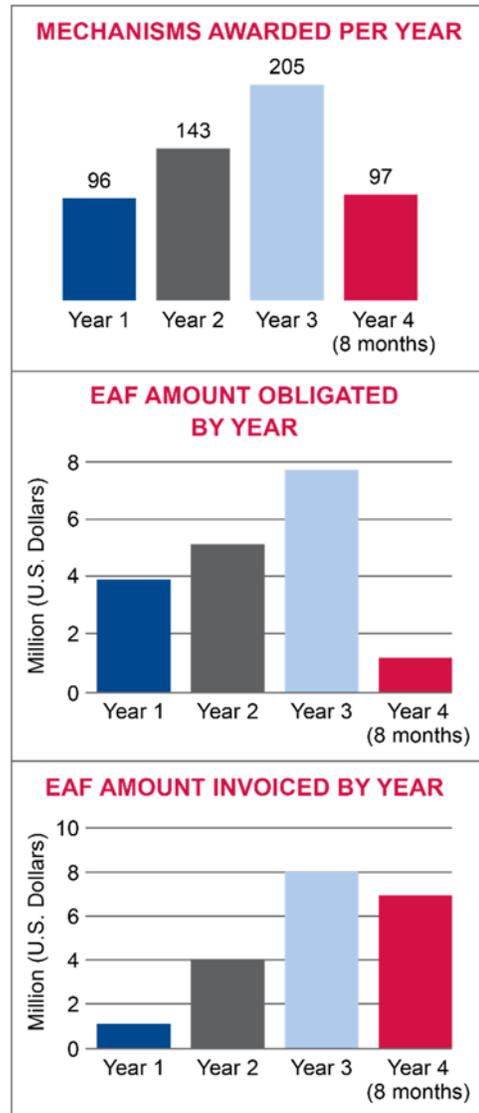
implementation of activities, the second and last year and a half saw a dramatic rise in the number of mechanisms awarded and disbursements. Led by a change in the management of the fund and improvements in internal processes (EAF, operations, monitoring and evaluation, and technical staff), the program quickly geared up to implement a varied range of activities under the three main components.

- Climate Change.** The technical nature of this component required the use of subcontracts and consultancies to acquire specialized technical assistance. About 75 percent of funds were dedicated to these types of mechanisms, which were complemented by grants and travel/training funds to ensure mobilization and training of local communities. The main activities financed under these components resulted in:

- Social engagement of REDD+ and free, prior, and informed consent of project design documents with communities, the project proponents
- Strengthening local governance capacity for Afro-Colombian CCs and indigenous *resguardos*
- Carbon accounting and methodological innovations in setting historical baselines, and monitoring, reporting, and verification
- Project design document preparation and verification to international standards
- Investment and business plans for alternative livelihood activities
- Marketing of project design documents to international investors
- Vulnerability assessment and adaptation plan for urban areas in Tumaco

- Biodiversity Conservation.** Focused primarily on work with community groups, the component used mostly grants to engage communities and build local capacity, supported by target technical assistance hired under consultancies. Due to the capacity of local grantees, the technical team, including regional coordinators, worked hand in hand with grantees to implement project activities, which led to:

- Introduction and dissemination of improved fisheries practices and equipment

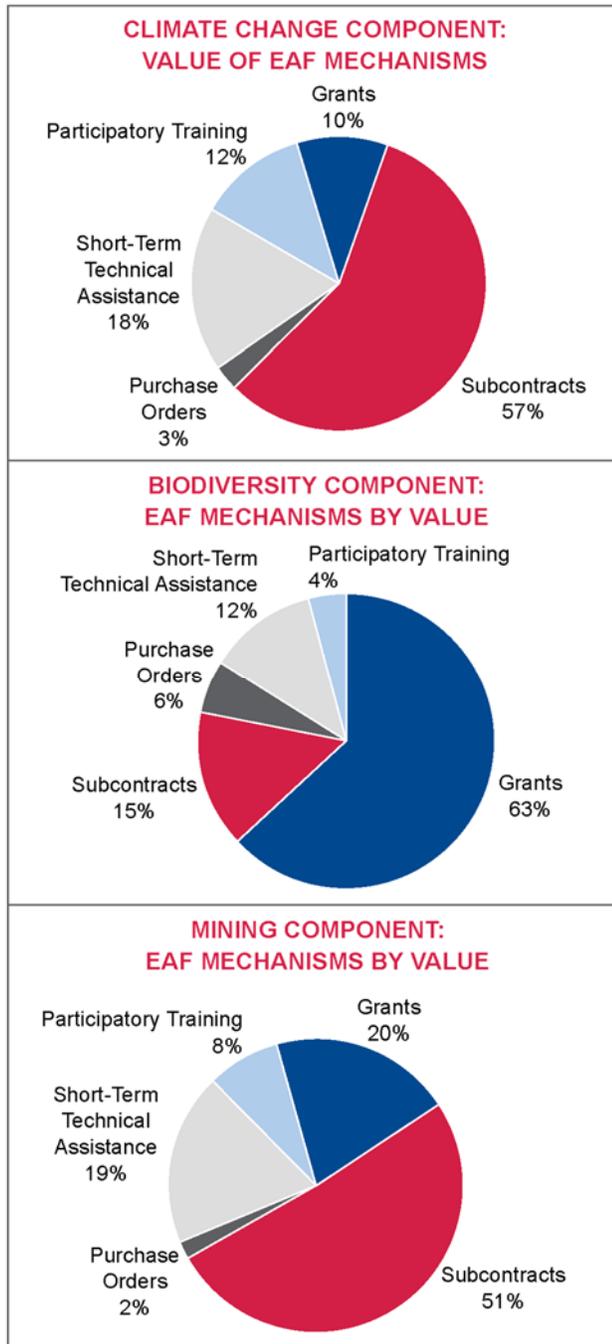


- Organizational capacity building for fisheries and black conch women’s associations
- Delineation and local enforcement of commercial fisheries exclusion zones and no-take seasons.
- Development of a cold chain, traceability protocols, and market links for responsibly caught fish and seafood
- Improvement of national data collection and statistical analyses for coastal fisheries inventories and catch
- Inventory, upgrading services, and promotion of ecotourism in the Pacific coast
- Development of commercial links between local ecotourism operators and a national in-bound travel agency
- Biodiversity baselines and monitoring protocols

- **Artisanal and Small Mining.** The component used mostly subcontracts and short-term consultants to provide technical assistance to UPMS; however given that this was the first time a USAID project in Colombia was working with small-scale gold mining, many stakeholders to be engaged via the EAF were

unfamiliar with USAID procurement processes. To ensure participation of potential partners, BioREDD+ quickly learned that when solicitations were issued, small bidders’ conferences needed to be held to explain desired outcomes and processes for applying and to respond to potential implementing partner questions. Furthermore, once subcontracts were signed, the technical team worked hand-in-hand with these partners to guide implementation and maintain a positive relationships with UPMS assisted. Key activities implemented include:

- Organizational strengthening of mining associations



- Support to policy and regulatory process to clearly define and disseminate alternative routes for legalization
- Formation of links between legalized UPMs and larger mining companies under operations contracts that allow access to non-mercury processing facilities
- Technical assistance through local subcontractors to help UPMs prepare mine operating plans and environmental management plans, which are required to become formalized
- Introduction of better mining practices as part of the formalization process and to reduce environmental impact
- Facilitating access to new, no-mercury processing technology, for high-risk mercury polluters such as small dredgers with design and installation of three small-scale non-mercury processing pilot plants
- Rehabilitation of degraded mining sites with re-contouring of the landscape and planting sites with fast-growing trees
- Assistance to miner families in alternative livelihoods, particularly beekeeping in restoration sites
- Compliance with USAID environmental regulations and implementation of mitigation and monitoring measures in the approved environmental assessment
- Education and social communications campaigns for miners, mining associations, and the public in mining areas about the damage caused by mercury (e.g., “More Legal, More Formal, and More Environmentally Friendly” communications campaign)

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