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Green Gold -an Innovative Sustainable Mining Scheme

Ever since Lina Villa took over as Oro Verde Corporation's Executive Director in 2000, she had been working on the development of the corporation's model. She was eager to develop a model that leveraged Chocó communities' traditional mining practices to build a socially and environmentally sustainable production scheme. As Lina put it, the Corporation wanted "to create a differentiated product that could reach out to international green markets." After seven years, Oro Verde (OV) had become a trademark associated with sustainable mining, exporting gold and platinum to developed markets and relying on a production network that encompassed over 1,300 miners.

While for many these outcomes proved the program successful, oddly enough, some of the stakeholders this initiative intended to serve harbored some doubts about the benefits drawn from their support. These groups analyzed ways to venture into new production schemes with greater reach, including medium-scale mechanized mining. For obvious reasons, this notion kept Lina awake at night: was OV failing to create value for its key beneficiaries?

Chocó and Mining

Chocó, located in Western Colombia, is one of the country's poorest districts. With an area of 46,530 square kilometers (17,965 square miles) and a population of 454,030, of which 80% are of African descend (see **Exhibit 1A**), this region, known as the Biogeographic Chocó, is the world's

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Este caso fue escrito por la asistente de investigación Ana Lucía Trujillo, junto a Ezequiel Reficco e Iván Darío Lobo, estos últimos profesores de la Facultad de Administración de la Universidad de los Andes, como parte de la colección de casos SEKN. En distintas etapas del desarrollo del caso, participaron como comentaristas Diana Trujillo y Roberto Gutiérrez, también profesores de la Facultad de Administración de la Universidad de los Andes. Los casos SEKN son desarrollados exclusivamente para servir como base de discusión en un ámbito educativo y no constituyen respaldo a personas u organizaciones, no ilustran el manejo efectivo o inefectivo de una situación administrativa, ni deben considerarse fuentes primarias de información.

second largest natural reserve, following Amazonia, with nearly six million forest hectares.[1] It also ranks as one of the regions with the greatest biodiversity,[2] as it houses around 20% of all the plant species around the world and the largest share of birds, some of them quite unique.[3]

Colombia's 1991 constitutional reform acknowledged ethnic minorities' ancestral right to their lands. As a result, Law 70 of 1993 formally granted collective land ownership rights to Afro-Colombian communities. About 36% of Chocó's overall area was allocated to these communities as "collective ownership territories." These lands were internally managed by community representation bodies, known as **Community Councils**, which were vested by the law with the power to divide and assign plots inside allocated lands, to safeguard collective ownership rights, to preserve the local cultural identity, and to exploit and preserve natural resources. By 2004, 176 Greater Community Councils managed 4,015,515 hectares (9,922,553 acres), where some 75,000 families dwelled.

At collective territories, Afro-Colombian populations' economy hinges on traditional multi-focus production systems[4] associated with the region's natural and environmental offerings. One of the leading livelihood sources for these populations involves precious metals. Traditionally, metals were extracted in an artisan fashion, using elements from the local culture –like wooden trays, pickaxes, and *mates* (bowls made with emptied squash fruits)- to wash the gold and platinum found in rivers. This extraction method is said to have a low environmental impact, as it involves little gold gravel volume movement in reduced areas, which allows for quick alteration assimilation by the ecosystem.[5]

Despite its exceptional natural wealth, Chocó has been one of Colombia's less developed areas (see **Exhibit 1B**). By 2007, it had one the nation's highest unsatisfied basic needs' rate (UBN)[6] and suffered from forced displacement by armed groups and the development of informal economies based on gold and forest exploitation.[7] At collective territories, players that did not belong to regional

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[1] Ayala, H. (2006), "La minería en pequeña escala MAPE como estrategia de sostenibilidad en territorios colectivos mineros de afrocolombianos en el Chocó biogeográfico," in *Colombia Boletín Respomin*, Responsible Mining Network.

[2] For more information on this region's diversity and endemism, see Guevara and Campos, "Identificación de Áreas Prioritarias para la Conservación de Cinco Ecorregiones en América Latina: GEF/1010-00-14 Ecorregión Chocó – Darién".

[3] Ayala, H. (2004), "Proyecto Estructuración del Diagnóstico Situacional de la Minería Artesanal y en Pequeña Escala desarrollada por los Afrocolombianos en los Territorios Colectivos de las Comunidades Negras del Chocó Biogeográfico en el Pacifico colombiano," IIAP (Pacific Environmental Research Institute), accessed in May 2009 at: http://www.idrc.ca/uploads/user-S/11177448771iiap.pdf.

[4] Multi-focus systems imply that no single business practice is pursued exclusively –rather, several practices are complemented with other farming and forestry activities closely related to family ventures.

[5] Ayala, H. (2006). ibid.

[6] According to National Planning Department's statistics, 78.54% of the population lived below the poverty line, and 48.7% lived in extreme poverty (DNP 2007).

[7] Ramirez and Ledezma (2007), "Efectos de las actividades socioeconómicas sobre los bosques del departamento del Choco," . *Universidad Tecnológica del Chocó Institutional Magazine*, Issue Nbr. 26.

native communities conducted illegal mining operations to extract precious metals in a semi-industrial scale. Illegal mining technologies and methods had a significant impact on natural systems (see **Exhibit 2**) and went virtually uncontrolled.[8] As a result, these operations paid neither taxes nor royalties; for the local ecosystem, illegal mining caused swift subsoil depletion, land impoverishment, and family fragmentation and displacement.

Illegal mining operations prevented accurate estimates of Chocó's precious metal output. However, official data reported in 2007 ranked the area as the second largest domestic gold producer, with 1,589 kilos, and the first platinum producer, with 1,521 kilos.

The Green Gold Corporation and AMICHOCÓ Foundation

The El Choco's Friends Foundation (AMICHOCÓ) was created in 1996 by Nicolás and Catalina Cock as a civil society environmental organization, intended to contribute to the preservation of Chocó's natural systems. While the Foundation originally focused on raising awareness on the region's environmental significance, as a result of its founders' relationships with local communities and grassroots organizations, AMICHOCÓ eventually expanded its mission to work on local development.

The **Green Gold Program** was conceived in the late 1990s. To launch the Program, **Green Cold Corporation** (COV, for its Spanish acronym) was incorporated in 2001 as a cross-sector partnership,[9] linking AMICHOCÓ with three allies: Las Mojarras Foundation, a civil society organization devoted to Chocó's environmental conservation and local development, and two Community Councils – ASOCASAN (Alto San Juan's Higher Community Council) and COCOMACOIRO (Condoto's Higher Community Council). COV's mission was "to contribute to the well-being of Biogeographic Chocó's communities, promoting responsible mining practices as sustainable livelihood means within the framework of green, fair-trade markets."

As COV members, these four organizations worked on Green Gold Program's development and execution, all contributing their specific competencies. As a result of its highly qualified management and staff, AMICHOCÓ played a central role in the design and execution of the Program's marketing model, resource management, and administrative processes. In addition to serving as AMICHOCÓ's executive head, Lina Villa also served as COV's executive director. In turn, on account of their leadership and their knowledge of the region and its production systems, Las Mojarras Foundation and the Community Councils focused on consolidating and strengthening the local productive base.

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[8] Ayala, H. (2004), ibid.

[9] This type of collaborations is typically built around the joint production of a good or service, with every partner contributing their key assets, combining them innovatively to create a formerly non-existing value. See James Austin, Gustavo Herrero, and Ezequiel Reficco, "La nueva ruta: alianzas sociales estratégicas." *Harvard Business Review* (Latin American Edition) 82, nbr. 12 (December 2004), pp. 42-56.

The Green Gold Program

The Green Gold Program's key purpose was to develop a gold business model based on low-impact mining practices, leveraging the artisan mining tradition developed by local communities over decades to produce "environmentally-friendly" metals that could prove attractive in specific market niches. This goal presented a number of daunting challenges. The global precious metal market traded commodities. While there were some precedents for the creation of "green" niches for commodity industries, such as the Forest Stewardship Council, many analysts wondered if the market would actually translate those good intentions into a willingness to pay a price premium. The existence of a "virtuous" demand niche and the size of that market remained unknown.

In any case, the first step to get the market to acknowledge and reward the value added by this new offering called for the creation of a standard that clearly specified what it actually meant to produce precious metals in a "sustainable" fashion. The definition of standard legitimized by all relevant players in the global industry –especially, small producers, marketers and consumers- accounted for a considerable challenge faced by COV member organizations led by AMICHOCÓ. This definition required a consultation and standard validation process that started at a local level and produced ten criteria for metal extraction (see **Exhibit 3**). The definition of this standard was just the first step: the next challenge consisted of designing certification mechanisms to ensure end consumers that the entire production chain complied with this standard. The Pacific Environmental Research Institute (IIAP, for its Spanish acronym) was chosen as the certifying agency, in charge of controlling criterion compliance and issuing a certificate for mines qualifying to produce *Green Gold* ("Oro Verde" in Spanish).

Once these processes had been consolidated, the challenge laid in expanding the Green Gold environmental certification internationally. To this end, AMICHOCÓ fostered the creation of the **Alliance for Responsible Mining** (ARM), a cross-sector agency with representatives from small miners' organizations around the world. ARM's mission was to "*improve artisan and small-scale mining communities' equal standing and well-being, promoting the improvement of labor, social and environmental conditions, good governance practices, and ecosystem recovery.*" The ARM focused its efforts in mining communities in Latin America, Africa, and Asia, providing global visibility to large-scale mining issues and the environmental advantages associated with Small-Scale Traditional Mining (MAPE, for its Spanish acronym). The ARM contributed to making the Green Gold environmental certification internationally recognized and reliable.

The Business Model

With a standard and a certification mechanism in place, a model was built to trace and market Green Gold. This process, that took over three years, engaged stakeholders from several links in the production chain, as explained below.

In 2005, gold was produced by 194 Family Production Units (UFP, for its Spanish acronym)[10] that had been certified as Green Gold Program members. These UFPs used traditional mining practices to

[10] Family Production Units (UFP) are the key social organization and production structure in Pacific Chocó's rural areas. Every UFP typically consists of five to seven extended family members –some of them, together with their own nuclear

extract gold and platinum and sold these metals to the Community Council that had founded COV.[11] An artisan mine has an average daily output ranging between 0.5 and 1.0 grams, and UFPs typically work 18 to 20 days a month.

Buyers would weigh the gold output and immediately pay miners at international market prices. Despite ongoing fluctuations (prices would even change from one day to the next), by 2007, the price neared US$ 25 per gram (see **Exhibit 4**).[12]

COV members made their purchases three times a week at municipal hubs. After checking out the product, buyers would record the mine where the metal came from, issue a purchase receipt for every miner, pack metals in plastic bags with the Green Gold label, and seal the bags. Then, they would transport metal bags from municipal hubs to Istmina, a municipal district some 75 kilometers (47 miles) southwest of Quibdó, Chocó's capital city, for delivery to a private company called Inversiones Gutiérrez S.A. (CIIGSA).

CIIGSA was in charge of safeguarding and transporting metals to Medellín, Antioquía's capital city, where the company refined, stored and, if necessary, conducted quality analyses to determine iron contents. As output levels were low, CIIGSA agreed to provide custody services for free (typically, this cost accounts for 1.5% of the total value of traded metals).

Then, refined metals were delivered to Biodiversa (a nonprofit commercial firm created by AMICHOCÓ),[13] which was responsible for gold sales. Biodiversa was expected to identify market niches appreciating Green Gold's unique production features and to formulate strategies to capture these markets. According to Carolina Sánchez, Biodiversa's Green Market Manager, "Green Gold market clients are not ordinary customers. They can afford to pay a premium price over international gold prices. They are informed of this premium price, and they are willing to pay it because they know and value the way the metal is produced."

Average prices for sales to end users was estimated with the purchasing price paid to miners (PP), plus analysis and refining costs (C), plus a 15% premium over the purchasing price on account of the Fair Trade or Fair Mining certification, and a 2% commission on sales for Biodiversa.

$$\mathbf{SP_J} = PP + C + 2PP\% + 15\%PP$$

where

SPJ: Selling price for jewelers.
PP: Purchasing price paid to producers.
C: Analysis and refining costs.

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families. COV views UFPs as a livelihood adaptive strategy that combines farming and mining operations and hinges on family labor.

[11] The standard unit for purchases was the *Castilian* –equivalent to 4.6 grams. Other units commonly used in these transactions included the half-Castilian (2.3 grams) and *tomín* (0.6 grams). A gram equals 5 gold grains.

[12] By late 2007, the exchange rate was Col$ 2,000 = US$ 1, and gold was traded at Col$ 50,000.

[13] Due to Colombian regulations, Amichocó found it hard to secure a license to create a nonprofit business firm.

2% PP: Commission for Biodiversa, of two points over purchasing price to producers.
15% PP: 15% premium on purchasing price paid to producers.

AMICHOCÓ was in charge of planning, administrative tasks, accounting, human resources management, networking, and cross-institutional relationships. These activities proved instrumental for this business model. AMICHOCÓ also promoted efforts to strengthen the program and to raise awareness, via the ARM, on the impact of traditional mining in international markets, as well as to foster local training processes for UFP and Council members. It also managed financial donations to fund these initiatives and other social programs for local communities.

Results

Out of the 19,000 people who lived in Condoto and Tadó, in the area under the purview of the ASOCASAN and COCOMACORIO Councils, the program managed to associate 194 UFPs –with some 1,365 people- by 2007. The area assigned as collective ownership territory to these Council added up to approximately 134,517 hectares (332,399 acres),[14] and every UFP affiliated to the program accounted for some 42 hectares (104 acres) each. Thus, the program roughly encompassed an 8,000-hectare (19,768-acre) area, nearly 6% of the overall area managed by both Councils.

In 2005, 2006 and 2007, a total of 2, 3.8, and 6.4 kilograms of Green Gold were sold, respectively, accounting for sales revenues to the tune of US$ 46,000, US$ 87,000, and US$ 164,800, respectively (Col$ 92 million, Col$ 174 million, and Col$ 329 million, respectively). According to COV officials, these revenues –viewed as very low by some observers- could be largely attributed to the difficulties found to build an innovative value chain with non-traditional players. In 2006, 18% of sales to end users were made in domestic markets, while 82% of revenues came from international sales to the United Kingdom (51%), the United States (22%), the Netherlands (6%), and Canada (2%).

With the 15% premium price for end customers, a fund was built for miners participating in the program and viewed as collective profits. The moneys in this fund were managed by Community Councils, and members determined how to use these funds during meetings. Typically, 50% of the fund total was used as working capital to pay miners for gold purchases at the time the money was delivered to Councils. Out of the remaining 50%, a share was set aside to be handed over to miners on the basis of the sales made during the year, and the rest was invested in regional development projects (healthcare, education, leisure, etc.). The total sum in this sum grew from US$ 15,000 in 2005 to US$ 75,000 in 2007 (from around Col$ 30 million to Col$ 150 million). On average, a UFP's yearly revenues totaled US$ 750 (Col$ 1.5 million).

Social and Environmental Impact

According to observers, the value created by The Green Gold Program was not just economic, but also social and environmental. Several studies revealed the displacement and social fabric

[14]The Asocosan Council encompassed 30 communities represented in 20 local councils. Most of its territory (98%) was located in Tadó, and 2%, in Certeguí. Its collective ownership land spanned over 54,517 hectares (134,714 acres). The Condoto Council oversaw 87,803 hectares (216,966 acres), where 53 communities were gathered in 21 local councils.

fragmentation effects of medium-scale illegal mining.[15] Instead, the program's scheme contributed to maintaining UFP cohesion. In this regard, a miner who participated in the program noted,

> Illegal mining operations make families quarrel. Not everyone agrees to having their land exploited, because it's not good for everyone: sometimes because, when all the gold has been extracted, it's impossible to make the land productive again, and other times because, with illegal mining practices, machine owners –and not land owners- are the ones who benefit the most. Land owners only get 10% of the money from extracted metals. Instead, with artisan mining, lands continue to produce, and there is a more even distribution of revenues; the money is shared by family members working on this business.

It was also equally recognized by several program participants that Council engagement and the training they had received as a result both contributed to the development of organizational bases, strengthening the region's social capital. As a Council member pointed out, "This does not only favor organizations' performance in the operations involved in Green Gold production chains; it also enhances the performance of Councils as political and administrative authorities at collective territories." Participating members also attended program courses for technical and personal training. Many recognized the benefits drawn from these training courses; others, instead, did not seem to take advantage of them. One of them referred to his experience at these courses in the following terms:

> They taught me some stuff there, but I've forgotten quite a lot already. We were told how to sow the plants, or rather to plant rice. They taught us all that, but, as I haven't practiced it for days now, I've forgotten most of it already (…) I've been going to some workshops with my wife, and I don't even remember what they were about. I've forgotten; the thing is, I got sick when I got there, and so I forgot.

For some local stakeholders, like Councils and IIAP, the program made positive environmental contributions, as opposed to the negative impact of illegal mining. According to IIAP's calculations,[16] while medium-scale mining degraded a forest hectare in two weeks and had severe consequences for the local ecosystem, small-scale, traditional mining provided a sustainable exploitation alternative with a low impact on natural systems, taking a toll of less than a hectare over a one-year period. According to Mariela Ríos, ASOCASAN's technical promoter,

> Although artisan mining does affect local vegetation, it does not deplete soil capacity. It is possible to reuse the land to farm for analogous species, which, at the same time, contributes to ensure local population's food supply.

Program results became more internationally visible. The Green Gold Program received several awards as a social and environmental development initiative for Chocó communities, including an

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[15] According to Ayala (2006), out of the nine communities standing on the Condoto River coastline in 1980, only two communities were left by 2006: four communities were abandoned as a result of mechanic mining pressures, and three were displaced by paramilitary armed groups.

[16] Ayala, H. (2006). Op. Cit.

award from the United Nations' Development Program.[17] These awards underscored, among other things, the program contributions for people who faced a large number of risks and hardship on account of the nature of their business endeavors. Statements made by some of the miners who participated in the program revealed some of their difficulties:

> Typically in this line of work, the land is like a lottery. In a lucky metal extraction, you can get as much as four pounds of platinum, which, at the current price, adds up to Col$ 200 million [US$ 100,000]. Obviously, it is very hard to get four pounds of platinum –more so with traditional mining practices. If a land assigned to a family has no gold, it makes no difference to participate or not in the program. [If you're lucky] you get a good piece of land, with gold in it. But, if not, you can get a barren plot, where you can get nothing out. Some families are only driven by greed, and they rarely commit to community work and land preservation. For many families, the land is just that –land. But some of us think differently. Here, at the Green Gold Program, artisan miners have learned from our elders: we have to take good care of the land, because that's where our livelihood lies.

The Emergence of Opposing Voices

Despite the reputation earned by COV and its Green Gold Program at the miners' community, as well as among civil society organizations and development cooperation agencies, some questioning voices among program beneficiaries themselves emerged. The Green Gold Program seemed to bring environmental benefits and social capital, but its financial benefits for the community caused some hesitation among its members. While estimates expected producers to get –either directly or indirectly- over half of the revenues from metal premium prices as soon as the program reached commercial stability (see **Exhibit 5A**), some viewed that scenario as too far away. Guaranteeing the scheme's business and financial sustainability became a key concern for COV members and, particularly, for AMICHOCÓ officials. As Clara Hidrón, Green and Fair-Trade Markets manager, pointed out,

> Biodiversa's subsidized operating costs include 70% of the marketing manager's dedication, 50% of the administrative assistant's salary, parafiscal taxes, accountant's fees, fiscal reviewer's fees, messaging, lease, utilities, insurance payments, office supplies, postal fees, cafeteria, cleaning service, and a salesman. Additionally, the salaries –minimum wages- of ACOCASAN and COCOMACOIRO Council members, who work in auditing, purchasing and metal transportation operations.

Other costs supported by organizations sponsoring the program as a result of AMICHOCÓ's efforts included: market research, environmental impact studies, business plan development, some advertising materials, promotion and dissemination campaigns, and the attendance at international fairs to develop new markets. The program's certification process and its positioning strategy via ARM were also supported with resources from international cooperation agencies. According to model forecasts, it was expected that, when the program reached a 30-kilogram yearly output, these

[17] Among other awards, this initiative won one of Colombia's topmost business plan competitions, "Ventures" (www.ventures.com.co), in 2004. It was also awarded a prize by an NGO called *Compartamos con Colombia* (2005-2006) (www.compartamos.org).

subsidies would be dismantled (see **Exhibit 5B**), and all costs would be paid for with a share of premium sale revenues. Thus, Council members' auditing and purchasing tasks would be afforded with 16% of those revenues. A fifth of AMICHOCÓ's and Biodiversa's operating costs –adding up to US$ 150,000 a year- as well as the program's marketing costs would be funded with a 14% share of revenues.

For some, these and other forecasts were severely endangered by adverse market conditions. On average, every one of the 194 UFPs associated to the program was able to produce 18 grams of gold per month. However, a number of factors, including water availability, technological limitations, and difficult access to mining areas, made it necessary to adjust overall average production capacity by a factor of 0.7. In addition, Councils could not afford to buy all the gold miners were able to produce. As an AMICHOCÓ top officials explained, "This comes as a result of a number of things. In terms of logistics, purchases are carried out three times a week, but many miners sell on a daily basis. Additionally, there are some traditional intermediaries around, with whom miners have dealt for a long a time. As a result, these production chains feature some very strong dependence relationships."

The financial incentive that selling their gold at international prices meant for miners was sometimes undermined by the economic dynamics deriving from illegal mining operations. These illegal practices had high yields, and the price offered to miners could exceed the price paid to artisan miners by the Green Gold Program. Additionally, gold price asymmetries made it difficult to persuade miners about the financial benefits brought by the program. Exclusive membership was not a feasible option, as many miners in this region chose to sell their gold "to the best bidder." As a program head put it, "The gold business is tied to exchange rates and many other uncertain, complex drivers. The 15% premium price paid by customers can amount to a significant profit one day, only to cover metal price and dollar exchange rate changes the very next day."

This setting sparked some conflicts within UFPs. Some family members, realizing that they could make as much as Col$ 20 million (US$ 10,000) in three months if they rented their lands off to foreign miners, demanded to have their share of the lands back to start machine-based exploitation practices, neglecting the fact that, by the end of that three-month period, their lands would be obsolete. With no regulatory framework in place, backhoe miners forged agreements with local councils and town halls, offering as much as 1% to 2% of the output. These arrangements might include the construction of parks, healthcare unit repairs, school repairs, etc. For communities, benefits were immediate, but they failed to see that, in ten years' time, there would be no river left, no land left, no traditional practices left.

Community Councils started to consider exploitation alternatives that helped enhance their lands' productivity in order to get greater financial returns. One of these options was to license land exploitation to a private company. The social and environmental costs of illegal private exploitation were clear, and none of the COV members was willing to sponsor those operations. However, authorizing a medium-scale operation with a legal, formal framework that guaranteed environmental regulation compliance, royalty payments, and investments in regional and community development programs was an attractive option. Some experiences in other latitudes supported this alternative: in Argentina's Santa Cruz region, for example, gold mining companies operated with an

Environmental, Safety and Occupational Healthcare System certification in compliance with ISO 14,001 international standards.[18]

For some miners, these examples proved that, while mechanized, medium-scale mining did have a much greater environmental impact than artisan mining, this impact was largely caused by the bad practices associated with illegal mining in the region. These bad practices notably included the fact that companies abandoned the area once profitable exploitation was over, leaving long-lasting negative effects behind –many of them exceeding those caused during exploitation.[19] Also, financial cost savings typically heightened environmental costs, as no environmental studies were conducted beforehand to anticipate negative effects and to craft a plan to mitigate them. As a leading miner representative noted,

> Here at Chocó, medium-scale illegal mining is everywhere. You see bulldozers everywhere –this is a reality across this territory. We have to acknowledge that and find a way to control it. Communities and councils cannot do away with this type of mining on their own. This calls for more support from the State and more presence. A good control of the territory is needed, so that there are more resources to support public policies that last over time.

Some Council members argued that, if it was impossible to abolish these mining practices, they should be formalized via the creation of partnerships with private companies. This alternative –they claimed- could provide Councils and public institutions with substantial resources, which could be partly invested to strengthen the control over the use of resources in the area.

The promoters of this alternative argued that, by partnering with private companies, they would be able to establish common criteria for mining operations in collective ownership territories. These criteria would rule exploitation conditions, mitigating the negative effects with controls over the environmental impact -operation size (area, depth, output), intervention location, and exploitation methods.[20]

Some policies supported these alternatives. The Mining Promotion Policy, the 2006-2010 National Mining Development Plan, the Domestic Agenda for Chocó's Productivity and Competitiveness,[21] and the National Productivity and Competitiveness Program all intended to merge national interests with local communities' concerns as well as their economic, social and territorial dynamics. Several of these initiatives would establish mechanisms to enable citizens to monitor mining royalties'

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[18] Bariloche's news website (2009), "Proyecto para avanzar en la minería del oro sin producir daño ambiental," accessed at http://www.barinoticias.com.ar

[19] Montenegro, R. (2002), "Situación ambiental Argentina. Mina de oro Esquel. Estudio sobre el impacto ambiental y sanitario de las minas de oro. El Caso Esquel," accessed at http://www.dsostenible.com.ar/situacion/esquel/esquelnoalamina.html

[20] Kussmaul (sf), as quoted in Montenegro, 2002. Op Cit.

[21] As established in the Domestic Agenda for Productivity and Competitiveness, Chocó sought to turn mining into the cornerstone of its economic support, as it aimed to become the leading precious metal (gold, silver and platinum) producer, using clean mining practices and improving technical production conditions.

invoicing, payment and investment, as well as to orchestrate programs and agendas to guarantee corporate social responsibility and compliance with environmental regulations.

These intervention schemes were primarily meant to develop fair and egalitarian investments to foster regional development. According to estimates made by the agencies in charge of their design, these policies would produce royalties for local towns to the tune of 4% of the overall value of extracted metals. They were also expected to contribute to the creation of formal employment and to fuel local economies as well as the development of small ventures for support service supply.

Some estimates claimed that Chocó's medium-scale mining demanded investments nearing US$ 3 million in machinery, equipment, physical infrastructure and social investment, among others (see **Exhibit 6**). In exchange, it would bring output flows of around 120 kilograms/year, according to the estimated rate of 5 grams extracted from 2,000 cubic meters of removed soil. Considering investments and all operating costs, including social investment and environmental expenses, a project of this kind was estimated to have a 40% internal return rate. Approximately 30 miners were required to operate such a scheme, with an expected per-capita yearly income of US$ 500 each (approximately Col$ 1 million).

COV viewed increasing gold selling prices in international markets as possible solution. The 15% premium price did not ensure greater revenues for miners, and the current scheme called for an output increase in order to become sustainable. As a result, an auction scheme emerged, with consumers valuing producers' work and paying for it.

This scheme's underlying intent was to add social and environmental value to the product, offering an additional benefit: artisan miners safeguarding over 48,000 hectares (118,611 acres) and the local biodiversity. Some program members hoped that their gold would be sold to socially-aware consumers at a premium price 200% to 300% higher than the regular price. Their estimates were based on action experiences conducted with other superior quality commodities, like "*paso fino*" cattle. With this scheme, miners would receive 50% instead of 15%, which would make this business more appealing to producers. However, observers questioned this assumption and noted that, in practice, the demand plummeted when the premium price exceeded commodity prices by more than 15%.

A Hesitant Community

COV members' positions revealed a paradox. For Lina Villa and other AMICHOCÓ officials, mechanized mining caused a severe environmental impact that went against the Foundation's mission –preserving the environment. AMICHOCÓ's primary and philosophical approach promoted the development of "livelihood means" for local families, so that local communities could work the land and mines at a small scale, relying on AMICHOCÓ for support. As a result, from AMICHOCÓ's standpoint, it made more sense to opt for an initiative with a moderate economic impact and greater premiums and incentives for those who committed to environmental preservation.

However, the concerns voiced by some community members seemed legitimate and could not be disregarded. As a community leader put it,

As COV's executive head, Lina has the fiduciary duty to maximize her "shareholders'" interests –in this case, the Councils'. Any initiative that complies with legal and environmental regulations and brings wellbeing to traditionally neglected communities in this country must be taken into account. The key issue here is to recognize that Community Councils have the power to determine how their territories are exploited.

After serving as the Foundation head for seven years, Lina could not remember a similar dilemma. Consolidating the Green Gold Program model demanded an alignment of its economic, social and environmental dimensions –the key to the Corporation's value proposition. By 2007, Colombia's government had announced its intention to strongly promote the country's mining industry as a means to reactivate its economy, fostering foreign investments from large extraction companies. Many grassroots organizations feared the significant social and environmental risks involved in these measures. Moving forward to consolidate the Green Gold scheme, Lina Villa and her team faced a difficult challenge. Lina remembered what an advisor had told her when they discussed several options: "As a leader of social venture in the 21st century, your challenge is not only to make social, economic and environmental development compatible but also to find the synergies among those dimensions." After pondering her dilemma for a while, Lina picked up the phone and asked her associates to call for an extraordinary meeting with the Councils. The time had come to make some important decisions.

Exhibit 1A Chocó's Location and Socio-Economic Features

San Juan River at Tadó municipal district.

Main square at Quibdó, Choco´s capital city.

Exhibit 1B Chocó's Social and Economic Indicators[22]

Sector Metrics	Chocó	Nationwide
Unsatisfied Basic Needs (UBNs)	81.5%	37,6%
Economics		
Yearly per-capita GDP (in USD)	794,02	1.897,0
Unemployment rate	7,4%	15,5%
Education		
Gross primary coverage	149%	112%
Gross secondary coverage	65%	79%
Illiteracy	18.6%	7.5%
School absenteeism	3.29%	-
Health		
Life expectancy at birth (in years)	66.8	72.2
Child mortality (every 1000 births)	90.0	26.3
Global fertility rate	3.77	2.62
Housing and Infrastructure		
% of drinking water coverage	47.7%	81.7%
% of sewer coverage	9.2%	59.4%

Source: http://www.colombiassh.org

[22] Sources: *Sector Data*: DANE, Banco de la República, Social Welfare Ministry, DNP; PIB 2001, unemployment, healthcare in 2002, education in 2003 (2002 national data), illiteracy in 1993, vaccination in 2001, homicides in 1999, other in 2000, Mining Observatory until December 2003. *Demographics:* DANE 2004, Indigenous Population DANE 2000, Calculation on DANE 2004, 85% are Afro-Colombian according to COMPES 1997. *Displacement Data:* SUR/SEFC RSS, CODHES. (1) As of October 31, 2004 SUR; September 30, 2004 CODHES. (2) Accumulated data 1995-October 31, 2004 SUR; 1999-September 30, 2004 CODHES; (3) Calculations based on 2003 DANE population. **Note:** Population census (DANE/93) projections are likely to have been changed as people move from one town to another, and the data have not been adjusted accordingly, causing coverage figures over 100%. These calculations have been made on the basis of DANE's population estimates.

Exhibit 2 Illegal, Medium-Scale Mining Schemes' Economic, Social, and Environmental Impacts

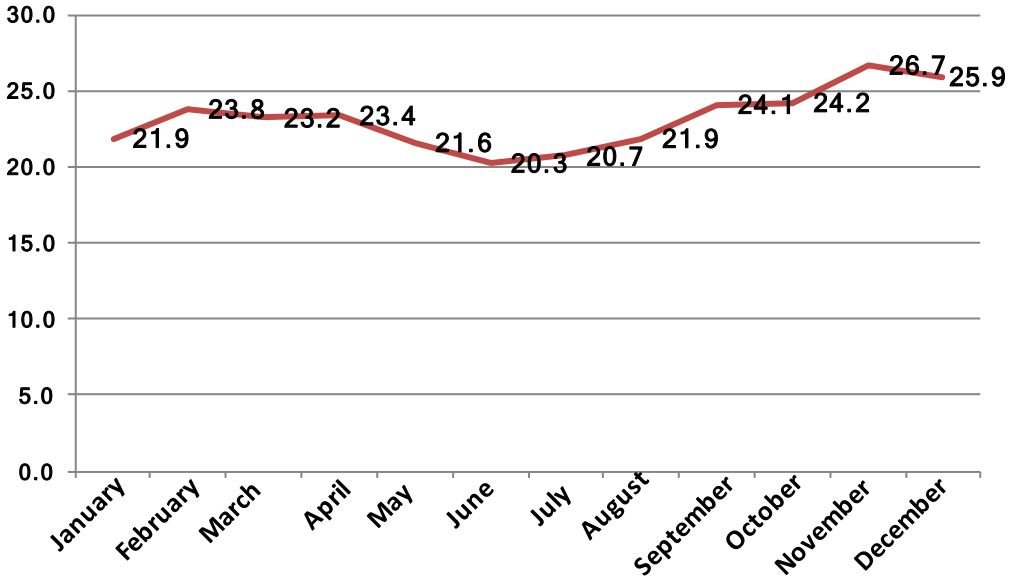
Variable	Impact
Economic	Surpluses in excess of US$ 2,000 per week. Approximately 12% to 20% is given back to extended families. Short-term resource depletion, with no medium-term economic sustainability guarantee. Resources are not reported under the name of the territorial agency of origin. No investment in mining communities.
Social and Cultural	Mining population displacement. Family rifts as a result of surplus distribution. Weakening social, ethnical and cultural fabric, compromising community members' ability to come together and to exercise collective leadership. Violent conflict resolution practices (disappearances, threats to leaders, murders, etc.) may be introduced. Ethnic territorial rights may be neglected and delegitimized. There may be a growing disrespect for ethnical, cultural, and environmental rights.
Environmental	**On water resources:** Changes in physical, chemical and biological features. Reduced resource supply. Waterway detours and/or lake overloads.
	On surface waters: Quality changes (pH, T, conductivity). Suspended solids. Changes in natural volumes and riverbeds.
	On groundwater: Water depression.
	On the soil: Loss of vegetation. Soil destabilization. Erosion, landslides. Changes in soil use and physical, chemical and biological quality impairment. Landscape changes.
	On forests and wildlife: Changes in ecological regions. Biodiversity loss. Migration. Changes in animal behavior patterns. Changes in natural habitats for endemic and migratory species.
	On the atmosphere: Emission of solid particles, gases and fumes.
	On mankind: Intoxication. Accumulation.

Sources: Gómez Cárdenas (2002). *Riesgo Potencial de Alteración de la Calidad Ambiental Derivado de Actividades de Extracción y Beneficio de Oro en la Cuenca Magdalena – Cauca*. Ayala (2006).

Exhibit 3 Green Gold Certification Criteria

1. There is no massive environmental destruction causing ecosystem changes of such magnitude that they prevent medium-term restoration of affected areas.
2. No toxic chemicals –like mercury, cyanide and other significant pollutants- are used in extraction and benefit processes.
3. Exploited areas achieve environmental stability in the next three years.
4. The organic layer removed from the soil during exploitation is restored.
5. The barren gravel material and wells produced by mining do not exceed the local ecosystem's ability to recover.
6. The amount and frequency of sediments added to ravines, rivers and lakes are controlled to avoid impairment of the native water ecosystem.
7. Mining operations are approved by Community Councils.
8. Produced gold and platinum bear the name of their town of origin.
9. In forest areas, no more than 10% of a hectare is used over a two-year period.
10. All national, regional and local regulations are complied with.

Exhibit 4 Gold Price Fluctuation in 2007 (in US$)



Source: Domestic selling price, Banco de la República. SIMCO: Mining Energy Information System.

Exhibit 5 Green Gold Marketing Model Forecasts

A. Share Distribution of Green Gold Premium Revenues

Description	Chain Agent	Share
Environmental service premium	Producers (miners)	10%
Model marketing management	Marketers	30%
Investment in regional development projects	Communities	60%

Source: Elaborated with approximate data provided by COV.

B. Projected Cash Flow for the Green Gold Marketing Model with no Subsidies (base year: 2007; figures in US$)

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Output volume (gold kilograms)	6.45	10	15	20	25	30
Gold price, assumed as stable at 2007 levels (US$ per gram)	25	25	25	25	25	25
Revenues						
Revenues from selling price	161,250	250,000	375,000	500,000	625,000	750,000
Premium revenues (15%)	24,188	37,500	56,250	75,000	93,750	112,500
Biodiversa's fee (2%)	3,225	5,000	7,500	10,000	12,500	15,000
Revenues from analyses and refining (1.5%)	2,419	3,750	5,625	7,500	9,375	11,250
Total revenues	**191,081**	**296,250**	**444,375**	**592,500**	**740,625**	**888,750**
Expenses						
Metal purchases	161,250	250,000	375,000	500,000	625,000	750,000
Operating costs (*)	44,344	53,206	65,574	77,945	90,319	102,696
Other costs (**)	12,900	14,841	17,538	20,235	22,934	25,633
Total expenses	**218,494**	**318,047**	**458,112**	**598,180**	**738,253**	**878,329**
Income (loss)	(27,413)	(21,797)	(13,737)	(5,680)	2,372	10,421

Source: Elaborated with approximate data provided by COV.

(*) Operating costs include certification costs, costs associated with the tracing system, purchasing logistics and local transportation.

(**) Including export costs, such as documentation, permits, shipment and insurance.

Exhibit 6 Projected Cash Flow for a Medium-Scale Mechanized Mining Project (figures in US$)

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Previous Balance	0					
Revenues						
Project investment	2,750,000					
Sales	3,600,000	3,600,000	3,600,000	3,600,000	3,600,000	3,600,000
Total revenues	**6,350,000**	**3,600,000**	**3,600,000**	**3,600,000**	**3,600,000**	**3,600,000**
Expenses						
Investments in infrastructure	2,100,000	0	0	0	0	0
Transportation expenses	300,000	300,000	300,000	300,000	300,000	300,000
Security expenses	270,000	270,000	270,000	270,000	270,000	270,000
Labor expenses	660,000	660,000	660,000	660,000	660,000	660,000
Fuel expenses	150,000	150,000	150,000	150,000	150,000	150,000
Exploration expenses	330,000	330,000	330,000	330,000	330,000	330,000
Taxes and royalties	174,000	174,000	174,000	174,000	174,000	174,000
Administrative expenses	60,000	60,000	60,000	60,000	60,000	60,000
Refining expenses	72,000	72,000	72,000	72,000	72,000	72,000
Marketing expenses	108,000	108,000	108,000	108,000	108,000	108,000
Contingencies	60,000	60,000	60,000	60,000	60,000	60,000
Other expenses	120,000	120,000	120,000	120,000	120,000	120,000
Environmental expenses	150,000	150,000	150,000	150,000	150,000	150,000
Investments in communities	200,000	200,000	200,000	200,000	200,000	200,000
Total expenses	**4,754,000**	**2,654,000**	**2,654,000**	**2,654,000**	**2,654,000**	**2,654,000**
Period balance	1,596,000	946,000	946,000	946,000	946,000	946,000

Source: Elaborated with approximate data provided by Dinamo Consultores, Mining and Energy Division.