UNODC
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Colombia
Alluvial Gold Exploitation
Evidence from Remote Sensing, 2020

July 2021

El futuro es de todos

Minenergía

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INTRODUCTION

The national reality in 2020 placed the mining and energy sector in a predominant spot in the economic recovery plans proposed by the Colombian government. In this sense, gold exploitation stands out within the government's plans due to the price of an ounce of gold at the close of 2020. If these high prices remain, the Colombian Government projects duplicating its gold production to reach 60 t by 2030 as part of the economic reactivation plan, since the challenge is to control illegal gold exploitation.

The increase in the price of gold on international markets and the territorial conditions of the municipalities largely increased the profitability of this illegal activity. Therefore, attending to the structural causes of exploitation in territories and increasing state presence is pressing, in order to configure scenarios of entering legality, environmental conservation and territorial development surrounding mining, especially that of precious metals, such as alluvial gold exploitation.

This document presents the results of the study on evidence of alluvial gold exploitation (EVOA in the Spanish original) in 2020 obtained by implementing the monitoring model developed in coordination between the Ministry of Mines and Energy (MinEnergía) and United Nations Office on Drugs and Crime (UNODC), with the support of the International Narcotics and Law Enforcement Affairs Section (INL) of the United States Embassy in Colombia as of 2016. Using remote sensing tools, geographic information systems (GIS) and work on the field, it seeks to improve the framework of knowledge of alluvial gold exploitation, supported by the detection and analysis of EVOA to contribute to formulating policies and designing intervention strategies.

With this study, the Government of Colombia and UNODC seek to contribute to generating evidence and monitoring to dimension the dynamics of this highly complex sector due to the processes that occur between legality and illegality. They also seek to identify alerts and help determine a multidimensional problem.

The findings of the monitoring performed in the national territory during 2020 show that 12 of the 32 provinces in the country have EVOA on land, with a total of 100,752 ha compared to 98,028 ha reported the previous year. Eighty-seven percent of it is focused in three provinces: Antioquia, Chocó and Bolívar. In the municipal sphere, there are 98 municipalities with EVOA on land, of which 10 concentrate 53% of the EVOA on land (53,811 ha). The most evidence was detected in Zaragoza, in Antioquia, with 8,841 ha (8.8%).

This document begins with a review of the current political and regulatory framework that governs mining in the country. It contextualizes the monitoring model and fundamental pillars supported by geography as a tool of knowledge and analysis. It also presents the main findings related to EVOA and law arrangements based on the three categories established in the model: exploitation with technical and/or environmental permits, exploitation in transition to legality and illegal exploitation. The document covers the management framework for intervention in the territories and presents the results of the EVOA dynamic, its relationship with environmentally valuable land covers and gold production.

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ACPM	Diesel oil
ANLA	National Authority for Environmental Licenses
ANM	National Mining Agency
ANT	National Land Agency
ARE	Special Reserve Area
CAR	Autonomous Regional Corporation
CTI	Technical Investigative Force
DANE	National Administrative Department of Statistics
ELN	National Liberation Army
EVOA	Evidence of alluvial gold exploitation
g	Gram(s)
GAO	Organized Armed Groups
ha	Hectares
IDEAM	Institute of Hydrology, Meteorology and Environmental Studies
IGAC	Agustín Codazzi Geographic Institute
km	Kilometer(s)
m	Meter(s)
MinAmbiente	Ministry of Environment and Sustainable Development
MinEnergía	Ministry of Mines and Energy
PNN	National Natural Parks of Colombia
Ramsar	Convention on Wetlands of International Importance
RNN	National Natural Reserve
RUCOM	Unique Registry of Mineral Dealers
RUNAP	Unique National Registry of Protected Areas
RUT	Unique Tax Registration
SI.Minero	Integrated Mining Management System
GÉNESIS	Subsistence Mining Registry
SIJIN	Section of Criminal Investigation
SIMCI	Integrated System for Monitoring Illicit Crops
t	Tons
IUCN	International Union for Conservation of Nature
UNODC	United Nations Office on Drugs and Crime
ZRF	Forest Reserve Zone

EXECUTIVE SUMMARY

The mining and energy sector is a fundamental pillar of the country's economy. Gold production, though it is not the main mineral resource mined, plays an important role in the sector's momentum and growth. Gold production moved from 37.5 t in 2019 to 47.8 t in 2020, when the price of gold was at its historical highest, with prices close to US $2,100 dollars per ounce (August 2020). As reported by the National Government, this sector could be key to the country's sustainable economic recovery, and it could be an opportunity for the reactivation of employment and royalty income.

With the expansion of legal and formalized extractive activities, the favorable conditions of the gold market have been driving informal exploitation, which is one of the most complex problems, with significant repercussions on the economic, social and environmental sectors. The increase in EVOA has been permeated by organized crime in some regions, which has had the possibility of consolidating its structures and facilitating the development of other illegal activities, such as weapons smuggling, human trafficking and extortion. Illegal exploitation uses money laundering to give the appearance of legality to money obtained by transgressing mining regulations.

According to studies carried out on evidence of alluvial gold exploitation (EVOA) between 2014 and 2020, the territory with evidence is an area of 149,157 ha. Illegal exploitation is carried out with toxic substances, and it is characterized by the indiscriminate use of heavy machinery on land and in water such as dredges, backhoes, motor pumps and engines. This impacts the ecosystems in ways that, in many cases, are irreversible: the alternation of riverbeds, contamination of bodies of water, among others.

Concentration of EVOA on Land in 3 Provinces and 10 Municipalities

The results of the 2020 study show that 12 of the 32 provinces have EVOA on land, with a total of 100,752 ha, which is 3% more than the figures in 2019. Close to half on this EVOA on land is in excluded mining areas. These are territories in which, due to their role protecting and preserving environmental heritage, mining is not allowed.

EVOA on land is highly concentrated in three provinces: Antioquia, Chocó and Bolívar, with 87% of the national total. Concentration in the municipal sphere also prevails: 98 municipalities have EVOA on land (of 1,122[1] in the country) and 10 have 53% of the total: Zaragoza, Nechí and Nóvita lead the municipalities, with 22,190 ha, which represents 22 % of the national total.

52% of EVOA on Land is in Excluded Mining Areas or Environmentally Protected Areas

Excluded Mining Areas correspond to territories set aside to protect and develop renewable natural and environmental resources, where the law has mining exploration and exploitation works cannot be performed. However, by 2020, *52,263 ha of EVOA on land were detected, which corresponds to 52% of the total identified for that period.* The category with the highest presence of EVOA on land corresponds to Forest Reserve Zones (Law 2), with

1 Colombia is divided into 1,101 municipalities, 20 non-municipal areas and the Islands of San Andrés and Providencia. For the report, they are assumed to be 1,122 municipalities.

a total of 49,011 ha, and Reserva Forestal del Pacifico (Forest Reserve of the Pacific), located in the biogeographic area of Chocó, has 66% of the reported area.

48% of EVOA on Land is in Areas without Environmental Restrictions

Areas without environmental restrictions correspond to territories in which there are no environmental restrictions for mining, and exploration and exploitation permits can be requested. The results of detecting EVOA on land indicate that, as of 2020, 48% of the consolidated national total (48,488 ha) is in areas without environmental restrictions for mining. Fifty-seven percent of the EVOA identified in areas without environmental restrictions is considered illegal exploitation, since it coincides with the territories in which this activity is performed without the corresponding mining title.

In the EVOA – Law Arrangements Relationship, 69% Correspond to Illegal Exploitation and Over Half are Located in Excluded Mining Areas or Protected Areas

Upon analyzing the relationship between EVOA and the law arrangements, *69,198 ha correspond to Illegal Exploitation* (69%); 24,677 ha have the technical and environmental for exploitation (24%) and 6,876 ha are making the transition to legality (7%). The provinces of Valle del Cauca, Guainía, Caquetá, Putumayo, Córdoba, Cauca and Chocó have more than 80% of their EVOA on land in the Illegal Exploitation category. Sixty percent of EVOA (41,472 ha) under the Illegal exploitation category is located in Excluded Mining Areas or Environmentally Protected Areas.

48,092 ha (48%) of EVOA were Detected in Special Management Territories, which Includes Ethnic Groups and RUNAP Areas (Unique National Registry of Protected Areas)

Of the total EVOA detected in 2020, 41,006 ha were located in the Lands of Black Communities, which represent 41% of the national total, with a 5% increase compared to last year. Chocó is the province with the highest concentration (83%), followed by Nariño and Cauca. The detection of EVOA on land in indigenous reserves was 627 ha (less than 1% of the national total) and is concentrated in the reservations of the embera-katío and curripako ethnic groups.

Gold Production Reported in 2020 was 47.8 t

Gold production reported in 2019 and 2020 show an increase from 37.5 to 47.8 t, respectively. When reviewing the behavior of production between 2010 and 2020, an average of 52.4 t is reported, and it decreases as of 2017. This behavior may not be directly related to actual production levels due to the illegality in exploiting this mineral in the country and the implementation of production controls for subsistence mining, which was reduced by 20.4 t between 2016 and 2017, as well as the decrease in requests for legalization.

The productive structure in 2020 shows a concentration between two types of miners: 41% comes from miners with mining titles (19.6 t), 40% from artisan miners (known as *barequeros* in the Spanish original)[2] (18.9 t) and the remaining 19% (9.3 t) is distributed among subcontracts, Special Reserve Areas (ARE in

2 Artisan mining was defined in article 155 of Law 685 of 2001 as “the activity performed by cleaning sand manually without help from any machinery or mechanical means, in order to separate and collect the precios metals in the sand”.

the Spanish original), scrap dealers and requests for legalization. The report on subcontracts is especially relevant because it showed a significant change in 2019 with respect to the previous year, with a 154% increase.

Furthermore, in this year, 75% of gold production came from two provinces: Antioquia and Chocó, of which the first recorded a significant share equal to 62%. On its part, the remaining 25% is contributed by Córdoba (7%), Caldas (6%), Bolívar (4%) and other provinces (8%).

Subsistence Mining

Subsistence mining includes the work of artisan miners and prohibits underground activities and the use of mechanized and explosive equipment to pull out the mineral. Subsistence mining establishes the obligation to comply with a ceiling of 35 g per month on average or 420 g per year on maximum annual production for precious metals (gold, silver, platinum). In 2020[3], 41% of production corresponded to subsistence mining - 40% from artisan miners and 1% from scrap dealers -, and an equal proportion (41%) was registered in mining titles.

In 2020, Antioquia reported the most registered artisan miners (50,395) and 66% of the national production of this type of miner. In second place was Chocó, with the highest number of artisan miners (18.940) and 18% of national production by this type of miner. Furthermore, according to the 2020 report, 100% of the provincial production in Guainía, Sucre and Valle del Cauca comes from artisan miners, and this type of extraction is predominant in Chocó. In addition, it was observed that the highest number of artisan miners registered in the country was focused in 10 municipalities in the same period, located mainly in Antioquia and Chocó, which corresponds to 48% the country's total.

According to the above, special and comprehensive support from national mining institutions is recommended with respect to designing mechanisms to provide incentives for legality in the sector, in coordination with regional and local authorities, increasing the capacities of local governments to face the challenges of mining in the territories and design strategies to integrate subsistence miners in corporate projects with social responsibility.

The Problem of Coca Crops and Illegal Exploitation Converge in some Territories of the Country

Coca crop cultivation was identified in 2019[4] in Colombia, in 41% of the territories with EVOA on land in 2020. In these areas, the area with coca crops reached 10,780 ha and EVOA reached 28,610 ha on land. The territories with the two phenomena of illegality are characterized by being vulnerable areas with conditions of poverty, marginality and difficult access. In this sense, a coordinated intervention between institutions that control and monitor mining, institutions that promote rural development and institutions in charge of maintaining safety and order in the region is recommended.

Actions of the Colombian Government against Illegal Exploitation

Illegal exploitation became an issue of national and public security. Colombia and the members of the Andean Community of Nations, in the Thirty-Fifth Meeting of the Andean Council of May 3rd, 2012, considered illegal

3 The production information obtained for this study corresponds to the period between January 1st and December 31st, 2020.

4 The EVOA and coca crop analyses were performed in 25 km^2 grids of the framework of areas, since territorial coincidence, not geographic coincidence was being sought.

exploitation an "issue of a multidimensional nature that, in all its aspects, is a serious threat to the peace, security, governance, economy and stability of the Member Countries".

The strategy of the National Government is focused on reducing Illegal Exploitation in the production, extraction, transportation and sales stages. To this end, the strategic objectives it proposes are the following: 1) to affect the value chain of illegal exploitation; 2) disassemble and negatively impact criminal structures, which requires both capturing members of the structures and effectively prosecuting and penalizing them; 3) strengthening interinstitutional coordination, and 4) strengthening international cooperation.

In 2020, 586 intervention operations on gold mines were performed, in which 1,114 operational results were accumulated on a national level. This represented a 31% increase in operations compared to the report for 2019 and a 58% increase in operational results compared to the same reference year.

Illegal exploitation has developed a complex value system in which various legal and illegal actors participate simultaneously and other crimes coalesce, including crimes that negatively affect the life, integrity and heritage of citizens.

In this study, it was identified that 69% of alluvial gold exploitation with machinery on land in Colombia is performed outside of the law arrangements in setting that are favorable for the involvement of armed structures in this activity in some regions of the country. In fact, the two provinces with the highest presence of this phenomenon were Antioquia and Chocó. These are territories in which the authorities have reported an active presence of Organized Armed Groups (GAO in the Spanish original) in some areas. The armed presence of the groups indicated in these territories has brought about the consequence of the inclusion in all the phases of the value system associated with illegal gold exploitation (exploration, extraction, transportation and sales).

The pursuit of illegal exploitation must guide its actions towards dismantling the criminal structures that control or participate in any of the phases of illegal gold exploration, extraction, transportation or sales. Moreover, international cooperation may be useful to determine the scopes of the global trade, in order to develop the due diligence and traceability of the metal exported to other countries.

TABLE OF RESULTS

NATIONAL PRESENCE OF EVOA ON LAND, 2020		
100,752 ha		
2020 EVOA on land and law arrangements (percentage of national participation)		
Category	**EVOA on Land (ha)**	**% of National Participation**
Exploitation with technical and/or environmental permits[1]	24,677	24
Exploitation in transition to legality	6,876	7
Illegal exploitation	69,198	69
Special Management Territories not itemized in the management model		
Category	**EVOA on Land (ha)**	**% of National Participation**
Ethnic Territories		
Black Community Territories	41,006	40
Indigenous Reserves	627	< 1
Total Ethnic Territories	***41,633***	***41***
RUNAP Areas		
Regional Integrated Management Districts	6,459	6
Total RUNAP Areas	***6,459***	***6***
Total Special Management Territories	**48,092**	**48**
Excluded mining areas with EVOA on land, 2020[2]		
Category	**EVOA on Land (ha)**	**% of National Participation**
Restricted mining areas within excluded mining areas	22,984	23
Excluded mining areas without restricted mining areas	29,279	29
Total	**52,263**	**52**
Areas without environmental restrictions with EVOA on land, 2020[3]		
Category	**EVOA on Land (ha)**	**% of National Participation**
Restricted mining areas outside of excluded mining areas	8,555	8
Areas without environmental restrictions without restricted mining areas	39,933	40
Total Areas without Environmental Restrictions	**48,488**	**48**

National Natural Parks with EVOA on land			
PNN	**EVOA on land inside a PNN (ha)-2018**	**EVOA on land inside a PNN (ha)-2019**	**EVOA on land inside a PNN (ha)-2020**
Puinawai	75	75	97
Los Farallones de Cali	2	18	15
Paramillo	50	0	0
Total	**126**	**93**	**111**

Dynamics of EVOA on land (2019-2020)	Area (ha)
Stable	87,385
New	3,424
In Expansion	9,942
Signs of vegetable succession	10,642

Provinces with EVOA on land								
National detected area of EVOA on land	2016 83,620 ha		2018 92,046 ha		2019 98,028 ha		2020 100,752 ha	
Province	2016 EVOA on Land (ha)	2016 % of National Participation	2018 EVOA on Land (ha)	2018 % of National Participation	2019 EVOA on Land (ha)	2019 % of National Participation	2020 EVOA on Land (ha)	2020 % of National Participation
Antioquia	30,897	37	36,447	40	40,201	41	40,890	41
Chocó	33,024	39	35,194	38	35,105	36	36,552	36
Bolívar	7,820	9	8,913	10	10,642	11	10,583	11
Córdoba	3,592	4	3,982	4	4,976	5	4,975	5
Nariño	2,677	3	2,921	3	3,171	3	3,374	3
Cauca[4]	3,702	4	3,004	3	2,697	3	2,807	3
Valle del Cauca	1,023	1	889	1	608	1	765	1
Putumayo[4]	537	< 1	437	< 1	291	< 1	405	< 1
Guainía[4]	117	< 1	139	< 1	135	< 1	185	< 1
Caquetá[4]	54	< 1	50	< 1	53	< 1	78	< 1
Vaupés[4]	32	< 1	0	0	0	0	0	0
Amazonas[4]	0	0	0	0	0	0	0	0
Guaviare[4]	0	0	0	0	0	0	0	0
Otros	146	< 1	70	< 1	147	< 1	139	< 1

Municipalities with the most presence of EVOA on land in 2020			
Municipality	Province	EVOA on Land (ha)	% of National Participation
Zaragoza	Antioquia	8,842	9
Nechí	Antioquia	7,996	8
Nóvita	Chocó	5,322	5
Cáceres	Antioquia	5,285	5
El Cantón de San Pablo	Chocó	5,253	5

[1] The ANLA's System has not been properly updated by the other institutions that have jurisdiction over environmental licensing.

[2] Excluded mining areas have restricted mining areas inside of them.

[3] Areas without environmental restrictions include restricted mining areas.

[4] Alerts due to EVOA in water were also detected in these provinces.

Note: all the data presented in this document (text, tables and figures) have decimal figures approximated to the nearest whole number. Therefore, the individual sum of any of these amounts may be different than the official result.



Fotograph:
Alluvial gold exploitation on land, Magüí Payán (Nariño)

SECTION I FRAME OF REFERENCE

This section presents the current political and regulatory framework of the mining sector. It contextualizes the monitoring model and its fundamental pillars, supported by geography as a tool for knowledge and analysis.

POLITICAL AND REGULATORY FRAMEWORK

This chapter covers the context from which this document arises, with respect to the implementation of the public policies and regulations that govern mining. As of the creation of the Mining Code[5], covered in Law 685 of 2001, the Ministry of Mines and Energy (MinEnergía) has the function of formulating, adopting, managing and coordinating the policies, plans and programs of the mining and energy sector. On its part, the National Mining Agency (ANM in the Spanish original) includes managing mineral resources within its functions, as well as promoting, entering into, managing and following up on mining titles and developing support, technical assistance and promotion strategies as a mining authority, among others.

Law 1755 of 2015 classifies the types of mining as subsistence, small, medium and large-scale. On its part, the Mining Code establishes the territorial characteristics that limit or prohibit mining, as well as the parameters for granting mining concession contracts and mining titles. These elements are essential for the legalization and oversight of mining.

It is worth noting that Law 685 of 2001 defines Illegal Exploitation in article 159 as: "Illegal reserve exploration and exploitation, criminalized in article 244 of the Penal Code, occurs when an exploration, mining or collection operation is performed on privately or state-owned property without the corresponding valid mining title or the authorization of said property's owner".

Furthermore, article 338 of Law 599 of 2000 establishes the illegal exploitation of minerals and other materials as, "mining, exploring or extracting from a mineral deposit, or mining sand, stony material or dragging from the channels and banks of the rivers by means that may cause serious damages to the environment, without permission from the competent authority or in violation of the existing regulation".

Taking into account its legal definition, illegal exploitation is not considered a mining activity and, as it is contrary to mining according to Title X of Law 1801 of 2016, it is subject to control and gives "[...] place to corrective measures or the imposition of preventive measures referenced in Law 1333 of 2009, as the case may be, and notwithstanding those of a criminal or civil nature derived from them" by Police Authorities.

In this sense, in accordance with article 306 "Mining without a title" of the Mining Code, it is the responsibility of municipal mayors to attend to this type of situation, ex officio or at the request of a party, by suspending activities under penalty of disciplinary action, in the following terms:

> "Mayors will proceed to suspend mining without a mining title registered in the National Mining Registry at any time by law or due to any person's notification or complaint. This suspension will be indefinite and will not be revoked until the operators present said title. If the mayor neglects this measure after having received the notification or complaint, they will be sanctioned for serious infraction".

In accordance with the indicated regulations, it is the power of MinEnergía to formulate the policies and programs that correspond

5 The Mining Code's primary function is to regulate the relationships between State institutions and individuals when it comes to standards and regulations for mining.

to mining exercised or to be exercised in the framework of legality, in accordance with the current regulations.

Conscious of the negative impacts of illegal exploitation in the environmental, economic and social spheres in the regions in which it occurs, MinEnergía supports the competent authorities in controlling it with its technical support and sectoral information in exercising their coordination function to control Illegal Exploitation[6].

The National Government understands that one way to close the gaps for the illegality of mining is to generate conditions and instruments that encourage formal miners to enter and operate legally, as well as to perform rigorous follow-up on the mining activity to ensure operations that fulfill technical and environmental standards and protect human life. In this context, MinEnergía is developing a strategy aimed at identifying small-scale miners who require support to operate within the framework of the law and raise standards with a vision of achieving legal, entrepreneurial, responsible, inclusive and reliable mining. According to article 13 of Decree 0381 of 2012, modified by Decree 1617 of 2013, which established the structure of MinEnergía, the Directorate of Mining Formalization, under the leadership of the Vice-Ministry of Mines, is responsible for coordinating the design and formulation of programs and policies for the legalization and development of traditional and small-scale mining. To this end, all performed actions are determined in the regulatory framework presented in table 1.

Table 1. Regulatory Framework.

Type of Regulation	Content
Law 685 of August 15th, 2001	"By which the Mining Code is issued and other provisions are dictated".
Decree 381 of February 16th, 2012, modified by Decree 1617 of 2013	"By which the structure of the Ministry of Mines and Energy is modified".
Law 1658 of July 15th, 2013	"By means of which the provisions for selling and using mercury in the country's various industrial activities are established". Through this law, provisions are established for the sale and use of mercury in the different industrial activities of the country, requirements and incentives are set for its reduction and elimination, and other provisions are dictated.
Decree 480 of March 6th, 2014	"By means of which the conditions and requirements for entering into and executing mining formalization subcontracts are regulated".
Resolution 91267 of November 18th, 2014	The definition of small-scale miners in formalized subcontracts and return of areas.

6 Clause 14, article 13, Decree 381 of 2012.

Type of Regulation	Content
Decree 276 of February 17th, 2015	"By means of which measures related to the Unique Seller Registry (RUCOM) were adopted". Article 112 of Law 1450 of 2011, provides that: "for the purposes of controlling the sale of minerals, the Colombian Institute of Geology and Mining (INGEOMINAS), or whoever is acting on its behalf, must publish the list of the mining titleholders who are in the mining stage and have the required environmental authorizations or licenses. This list must also include information on the agents authorized to sell minerals.
Decree 1073 of 2015	Unique Regulatory Decree of the Mining and Energy Administrative Sector. It compiles the regulatory standards that govern in the sector.
Law 1753 of June 9th, 2015	By means of which the 2014-2018 National Development Plan "Everyone for a New Country" was issued. This law, in which all of the State's governing entities participated, allowed the sector to classify mining as subsistence, small, medium and large-scale. Furthermore, it established goals for green growth that promote technological development and innovation for strengthening national competition. These aspects clearly aligned with the Ministry of Mines and Energy's strategies for eliminating mercury. "Article 19. Mechanisms for work under the protection of a mining title in small-scale mining. The following are mechanisms for work under the protection of a mining title: 1. Subcontract for mining formalization… 2. Returning areas for mining formalization…" "Article 20. Reserve areas for mining development. The following will be reserve areas for mining development: Strategic Mining Reserve Areas… Reserve Areas for Formalization… Reserve Areas for mineral-energy development…" "Article 21. Classification of Mining. For the purpose of implementing a differentiated public policy, mining activities will be classified into subsistence, small, medium and large-scale mining. The National Government will define them and establish the requirements considering the number of hectares and/or production of the mining units according to the type of mineral".

Type of Regulation	Content
Decree 1886 of September 21st, 2015	By means of which the Underground Mining Works Safety Regulation was established. "Article 1. Purpose. The purpose of this Regulation is to establish the minimum standards for preventing risks in underground mining works, as well as to adopt the procedures to inspect, monitor and control all underground mining and open pit mining works that are related to them, in order to preserve occupational health and safety where these projects are executed".
Decree 2504, of December 23rd, 2015	By means of which Unique Regulatory Decree No. 1073 dated 2015, which defined the technical, technological, operational and administrative aspects for performing *differential oversight on mining* was amended, and other determinations were made.
Resolution 1258 of 2015	This Resolution was promoted alongside with the Ministry of Environment and Sustainable Development. It contains the environmental Guide for formalizing traditional mining.
Resolution 40144 of February 15th, 2016	By which the Management System of Procedures, Processes and Mining Services is adopted; i.e. the "SI.Minero".
Resolution 40359 of April 8th, 2016	"By means of which the protocol is created to develop the mediation established in chapter 4 of Unique Regulatory Decree 1073 of 2015" for non-regulated small-scale mining.
Resolution 0565 of April 2016	"By means of which the requirements and procedures for the Mercury Users Registration – RUM was established for the mining sector". From 2013 until the date the regulation was published, the Ministry of Mines and Energy supported the Ministry of Environment and Sustainable Development in formulating the document that regulates the registration of mercury users for the mining sector.
Decree 1421 of September 2016	By means of which the Unique Regulatory Decree of the Mining and Energy Administrative Sector, 1073 dated 2015, was amended and modified with respect to adopting measures related to Processing and Selling minerals, and the Unique Regulatory Decree on the Environment and Sustainable Development, 1076 dated 2015del, was amended and modified with respect to *environmental licensing for processing plants.*
Decree 1666 of October 21st, 2016	By means of which Unique Regulatory Decree of the Mining and Energy Administrative Sector, 1073 of 2015, related to *classifying mining*, was amended.
Decree 1975, of December 6th, 2016	By means of which the Unique Regulatory Decree of the Mining and Energy Administrative Sector, 1073 dated 2015, was amended in terms of the integration of areas and extensions to concession contracts.

Type of Regulation	Content
Decree 2133, of December 22nd, 2016	"By means of which control measures were placed on importing and selling mercury and the products contain it in the framework of the provisions of article 5 of Law 1658 dated 2013". The Ministry of Commerce, Industry and Tourism, jointly with the Ministry of Mines and Energy, Ministry of Finance and Public Credit, Ministry of Health and Social Protection and the Ministry of Environment and Sustainable Development, actively participated in developing this regulatory document, which established aspects regarding importing and selling mercury, such as: the Unique National Register of Authorized Importers and Sellers, import quotas and management, previous authorizations, sales and transitional provisions, among others that are especially of interest for the mining sector.
Resolution 41265 of December 27th, 2016	"By means of which the parameters and conditions for exercising the preferential right discussed in article 2.2.5.2.2.13 of Decree 1975 of 2016 are established and by means of which Unique Regulatory Decree of the Mining and Energy Administrative Sector, 1073 dated 2015, was amended in terms of the integration of areas and extensions to concession contracts".
Resolution 40103 of February 9th, 2017	By means of which the *maximum production volumes of subsistence mining* were established.
Decree 1102 of June 27th, 2017	"By means of which the Unique Regulatory Decree of the Mining and Energy Administrative Sector, 1073 of 2015, was amended and modified with respect to adopting measures related to Selling Minerals. 1. Subsistence miners must have the production declaration to sell the mineral product of their activity through the form established by the National Mining Agency (ANM), which is published in the webpage www.anm.gov.co. 2. Subsistence miners who extract precious metals, precious and semi-precious stones must provide the Unique Tax Registration ("Registro Único Tributario" or RUT in the Spanish original) at the time of registration with the respective Mayor's Office, as a requirement for publication in the RUCOM. 3. Subsistence miners that extract precious metals, precious and semi-precious stones that are already registered with the corresponding Mayor's Office and published in RUCOM will have a term of six (6) months, starting on June 27th, 2017, to present their RUT to the Mayor's Office where they are registered, under penalty of being eliminated from the RUCOM publication lists.

Type of Regulation	Content
	4. It has been established that once the national mining authority has knowledge of the excess of the production limits established by the Ministry of Mines and Energy through Resolution No. 40103 of 2017 for subsistence miners, it will proceed to eliminate its publication in RUCOM after advancing the respective action in the terms established in the Code of Administrative and Contentious-Administrative Procedure".
Decree 1949 of November 28th, 2017	"By means of which Unique Regulatory Decree No. 1073 of 2015 is modified and amended in terms of the mechanisms for work under the protection of a mining title in small-scale mining, and other determinations are made".
Law 1873, of December 20th, 2017	"By which the income and capital resources budget and appropriations law is decreed for the fiscal period from January 1st to December 31st, 2018" and article 111 specifies: "The Ministry of Mines and Energy, in developing the National Mining Policy, may support small-scale miners and mining communities by acquiring and assembling specialized mining equipment required for improving mining operations and cleaner production. Moreover, it may structure and implement productive projects for the labor reconversion of small-scale and/or subsistence miners. The Ministry of Mines and Energy will determine the requirements and other necessary actions to develop this article and will finance it with the available appropriations".
Law 1892 of May 11th, 2018	By means of which the "Minamata Convention on Mercury, held in Kumamoto (Japan) on October 10th, 2013" was approved.
Resolution 41052 of October 17th, 2018	By means of which the "Mesa de Interlocución Territorial Minera (MINA)" was created.
Law 1955 of 2019	The National Development Plan, which includes articles: "22. Temporary environmental license for mining formalization. 30. Strengthening the oversight, monitoring and control of mining activities. 325. Processing applications for the formalization of traditional mining. 326. Differential requirements for mining concession contracts. 327. Subsistence mining".

MONITORING MODEL

In order to improve the understanding of alluvial gold exploitation in Colombia, MinEnergia and UNODC, with the support of the International Narcotics and Law Enforcement Affairs Section (INL) of the Embassy of the United States of America in Colombia, has focused its efforts and expertise since 2016 on implementing a monitoring model that allows dimensioning the activity and its dynamics based on studying the geography of the phenomenon, as well as identifying relationships in the territory. This is all to have a framework of knowledge for formulating public policy, designing and focusing intervention strategies and, consequently, following up on these interventions and evaluating the implemented policies.

The model is based on the integration and analysis of three pillars. This first is based on detecting *evidence of alluvial gold exploitation (EVOA)* using satellite images and remote sensing tools. This pillar covers two categories: EVOA using machinery on land and alerts due to EVOA using machinery in water. In both cases, the detection methodology is based on using remote sensing tools that allow identifying and dimensioning the exploitation sites and building a layer of EVOA on land for the entire Colombian territory and a layer of alerts due to EVOA in water for the study area[7]. In identifying EVOA on land, methodologies are currently being used to quantify the volume of land removed and, subsequently, the loss of mining resources. However, the current model still does not incorporate this variable in analyses.

The second pillar, *law arrangements*, is comprised of the official information provided by the Government of Colombia related to the technical and environmental permits necessary to perform mining. This information is structured and organized in three categories established by MinEnergía: 1) With technical and environmental permits, 2) In transition to legality and 3) Illegal exploitation.

Framework of Areas

In 2011, the SIMCI project developed a tool for analyzing the territories based on sampling units. This tool, known as the framework of areas, facilitates geographic continuity and the spatial and statistical analysis of activities monitored by the project, such as EVOA.

The framework of areas covers the entire country with a systematic arrangement of 1 km^2 (100 ha) units and is a part of the cartographic equipment of the UNODC/ SIMCI for calculating and following up on the indicators with a geographic approach. For more details, consult previous publications [1].

The third pillar is focused on the model of actions for interventions in the territory**,** which is maintained in the regulatory framework of mining restriction: Law 685 of 2001 (Excluded mining areas, Areas without environmental restrictions and Restricted mining areas). The Government of Colombia has multiple tools to address the problem of Illegal Exploitation. However, selecting the right tool to address the problem also depends on the conditions of the territory: This model offers policy and strategy designers elements to improve their effectivity and efficiency. For example, formalization tools can only operate outside of Excluded mining areas. Knowing the dimension and location

7 This study includes detecting alerts due to EVOA in water in ten rivers located in the Amazon and Orinoco regions. The model applies to rivers in the entire national territory with a minimum width of 45 meters, in accordance with the methodological scope in terms of the pixel size of the satellite images that are used.

of different arrangements of the management model, with the EVOA and other elements in the territory, facilitates designing models or strategies for intervention.

The three pillars are in the framework of areas, which includes multidisciplinary information on other dimensions of the territory. In this sense, there is a historical series for monitoring the phenomenon[8] that allows, among other activities, focusing actions in areas with EVOA, executing prevention actions in light of spatial tendencies and identifying the way the territories evolve after the intervention.

The EVOA monitoring system feeds off the geographic information developed in the framework of monitoring illicit crops since 2000 and incorporates additional specialized information from both primary and secondary sources related to mining. Using geographic information systems (GIS) enables the possibility of incorporating other variables of the environment that are useful for sampling and characterizing the socioeconomic conditions of the populations immersed in the activity, as well as to perform territorial analyses of the population related to EVOA. With respect to this point, the system performs large-scale studies to know the social, cultural, economic and, in general, all conditions associated with the vulnerability of the territories for the occurrence of illicit activities, such as Illegal exploitation and the cultivation of illicit crops. These analyses are useful for designing public policies aimed at reducing the conditions of vulnerability in the territories.

Lastly, the monitoring system offers publishing the research, delivering the data and analyses to government entities in a timely manner and presenting the most outstanding findings. To this end, a model for accessing EVOA data was designed and implemented from 2019, using new information technologies. The result allows viewing, consulting and analyzing georeferenced information on EVOA that is technical and strategic for MinEnergía, by means of a connection to the internet.

8 As of the date of this study, there is a historical series of five moments in time: 2014, 2016, 2018, 2019 and 2020.

EVIDENCE OF ALLUVIAL GOLD EXPLOITATION (EVOA)

In general, gold exploitation in Colombia includes two types of deposits, in accordance with the geological conditions of the formation: 1) primary, known as seams or veins[9], which are mainly characterized by underground mining and 2) secondary, or alluvial[10], which include open pit exploitation. In turn, mining deposits, both vein and seam deposit and alluvial deposits, have two basic modalities in terms of material extraction: 1) manually, which is to say without using machinery, and 2) using machinery. In this sense, the type of mining and machinery that is used generates physical evidence on the territory[11]. As a function of their dimension, they may be detectable[12] and measureable through remote sensing with satellite images.

Through remote sensing tools, the monitoring model covers the detection of evidence of alluvial gold exploitation (EVOA). That is, evidence of *exploitation in secondary deposits with machinery used to initially extract the material*. In this context, it is necessary to specify that the type of evidence depends on when and how mining is performed. For mining developed in alluvial landscapes with machinery on land (backhoes), the evidence is characterized by changes in the surrounding landscape related to alterations in bodies of water, deforestation and the degradation of soils, among others [1]. On the other hand, for mining in water with machinery, mining performed directly in water flows using dredges or settling basins leaves evidence based on the alteration of suspended sediments, which are detected through spectral indices[13].

9 Primary deposits refer to *in situ* mineral deposits.

10 Secondary deposit are deposits that arise after meteorization processes on a primary deposit, where there is a natural mechanical disgregation and, using water, gold particles are transported to certain distances that tend to focus on water channels, bringing about the renowned "placer deposits" [21].

11 Physical evidence is all the significant sensitive material perceived with the senses and that has a relationship with a fact [20].

12 Subsistence mining is not covered in this study because the evidence of the activity is not detectable.

13 Spectral indices are based on the algebraic combination of bands with corrected and radiometrically calibrated spectral values (reflectance). The objective is to group and minimize the different responses of the sensors in one unique value by pixel, which can be successfully related to a phenomenon to be investigated [1].

LAW ARRANGEMENTS CONSIDERED IN THE MINING REGULATORY FRAMEWORK

The second pillar of the monitoring model is based on the law arrangements that, in their territorial approach, allows the institutions in charge of formulating public policy and managing, administrating and controlling resources, to have objective information that helps improve the characterization of the phenomenon and, thereby, focus the different interventions enabled by the Government in light of the conditions of the territory.

The study covers the relationship between EVOA and the law arrangements[14] whose official source is the National Mining Agency (ANM) for technical permits and National Authority for Environmental Licenses (ANLA)[15] for environmental permits [2].

The study has official information from the ANM regarding concession contracts or mining titles, Recognitions of Private Property, Concession Contract Proposals, Mining Legalization or Formalization Requests, Ethnic Community Mining Areas and Special Reserve Areas (ARE) that are in process and have been declared.

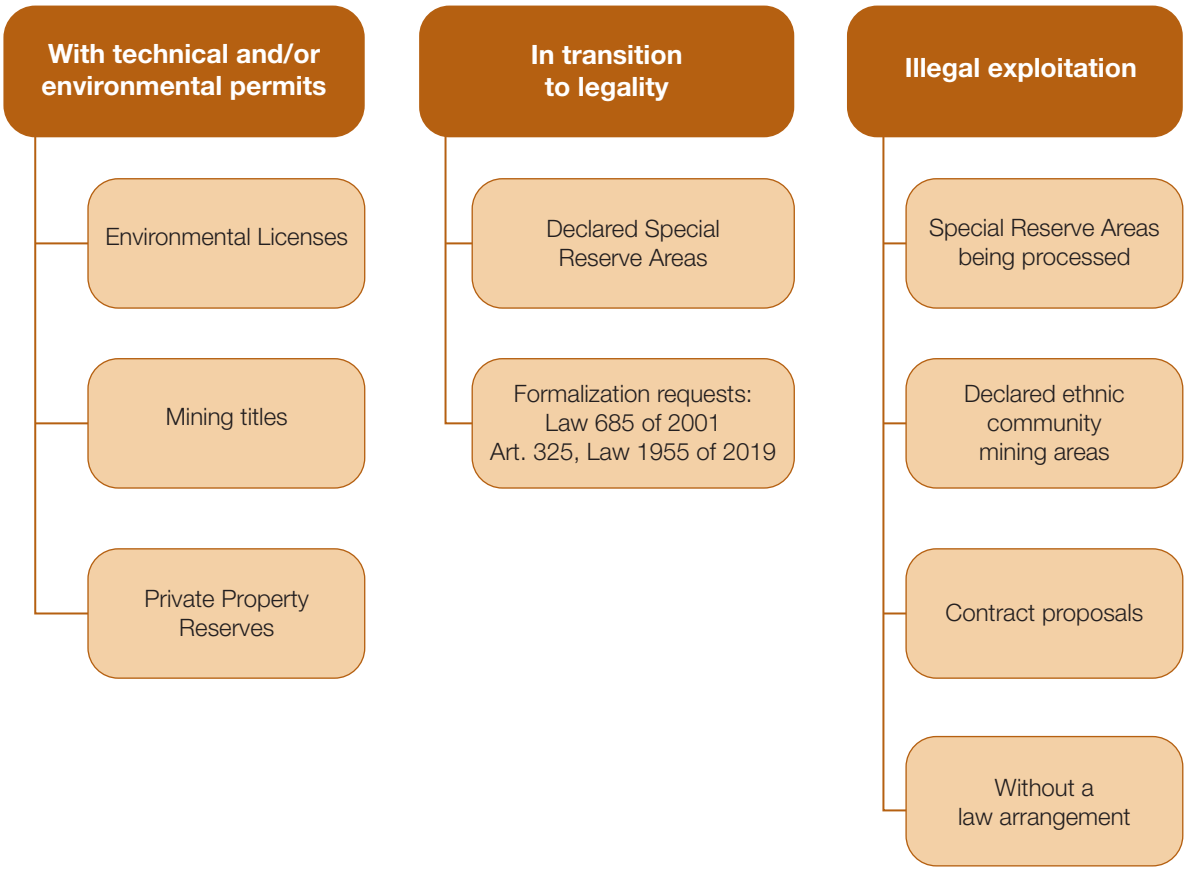
In this context, Antioquia, through the Secretary of Mines, is the only province with a mining delegation [3]. Consequently, the Secretary of Mines of Antioquia is the institution in charge of that province's information related to these legal arrangements.

Figure 1 below illustrates the categorization of the law arrangements, and a brief explanation of each category can be found afterward. For more details, see previous publications [4].

14 For the purposes of this study, law arrangements are understood to be any aspect of mining regulations with geographic attributes and regulated conditions that can be ascribed to a territory.

15 The ANLA's System has not been properly updated by the other institutions that have jurisdiction over environmental licensing. In light of this circumstance, the information and geographic analyses related to environmental licensing must be interpreted with prudence.

Figure 1. Law arrangements included in the classification system.



Category I: With technical and/or environmental permits. This category includes EVOA that spatially coincide with mining titles (concession contracts, mining licenses, recognitions of private property, etc.) and environmental instruments (environmental licenses, environmental management plan, etc.).

Category II: In transition to legality. This category refers to mining legalization/ formalization requests (Law 685 of 2001 and article 325 on Law 1955 of 2019) and declared and delimited ARE requests, where the regulations grant exploitation prerogatives while the concession contract or mining title is being processed, without using machinery. In this regard, although the EVOA detected is not illegal, the areas must be subject to follow-up, monitoring and oversight by the mining and environmental authority in charge of the territory, in order to make sure the agreements established by the regulations regarding the use of machinery are being followed.

Category III: Illegal exploitation. It is considered this type of exploitation when work is performed to explore, extract or collect minerals owned by the nation or privately owned minerals without the corresponding valid mining title, without the authorization of the owner of the property or without a legal authorization that authorizes the mining.

This category includes contract proposals, ethnic community mining areas with mining activities in their territories without legal authorization for mining and ARE being processed, as well as areas where there are no law arrangements.

MANAGEMENT MODEL FOR INTERVENTIONS IN THE TERRITORY

The third pillar of the monitoring model is based on the regulatory framework (articles 34 and 35 of the Mining Code), which divides the territory according to the limitations to mining, based on the specificities of environmental protection and/ or its cultural characteristics. This framework allows expanding the basis of objective information for decision-making according to the features of each geographic space. In addition, it contributes to designing strategies aimed at ordering the resource, controlling and monitoring mining activities in the country.

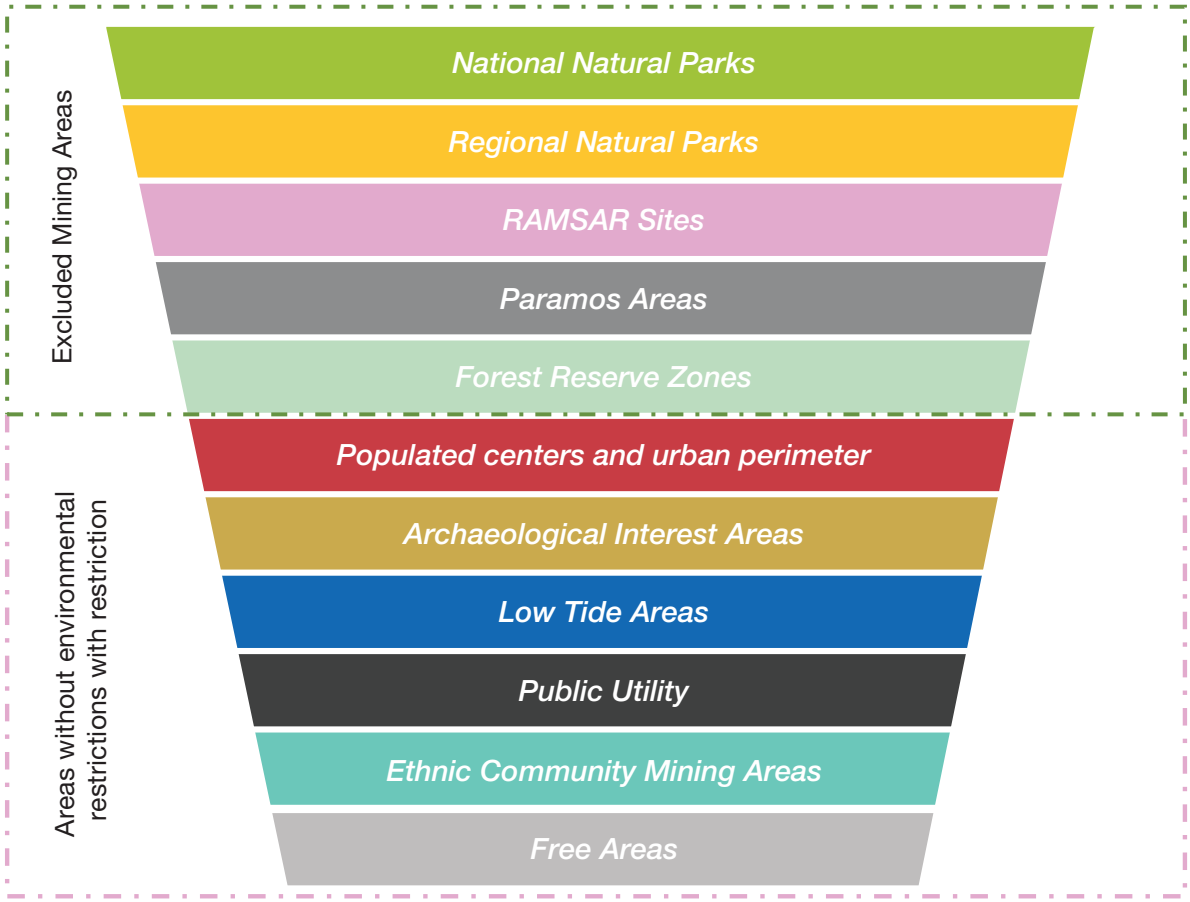
The model classifies the grids, in accordance with the regulations, in excluded areas such as PNN, other restricted areas such as ethnic territories, and others considered free for mining, most certainly with the corresponding technical and environmental permits[16]. The integration was performed by means of a hierarchy model (figure 2) in which it can be observed how the classes of the base lose territory if they are at a higher level.

According to the data of the management model (table 2), 50% of the territory in Colombia is considered excluded from mining. Within these spaces, there is an additional 5% that, in addition to being excluded, has some restriction. The rest is considered free of environmental restrictions to request the respective permits, but 6% of these have conditions of restrictions.

In Colombia, 33%[17] of the territory was classified as Forest Reserve Zone (ZRF, which can be subject to subtraction), followed by PNN areas (13%) and Ramsar sites (2%). The remaining were classified as *páramo* areas and regional parks.

16 For more details, see https://biesimci.org/fileadmin/2020/Documents/evoa/evoa_2019_esp.pdf, p. 37.
17 The percentage is calculated based on the SIMCI project's framework of areas.

Figure 2. Hierarchization model for integration into the UNODC grid framework.

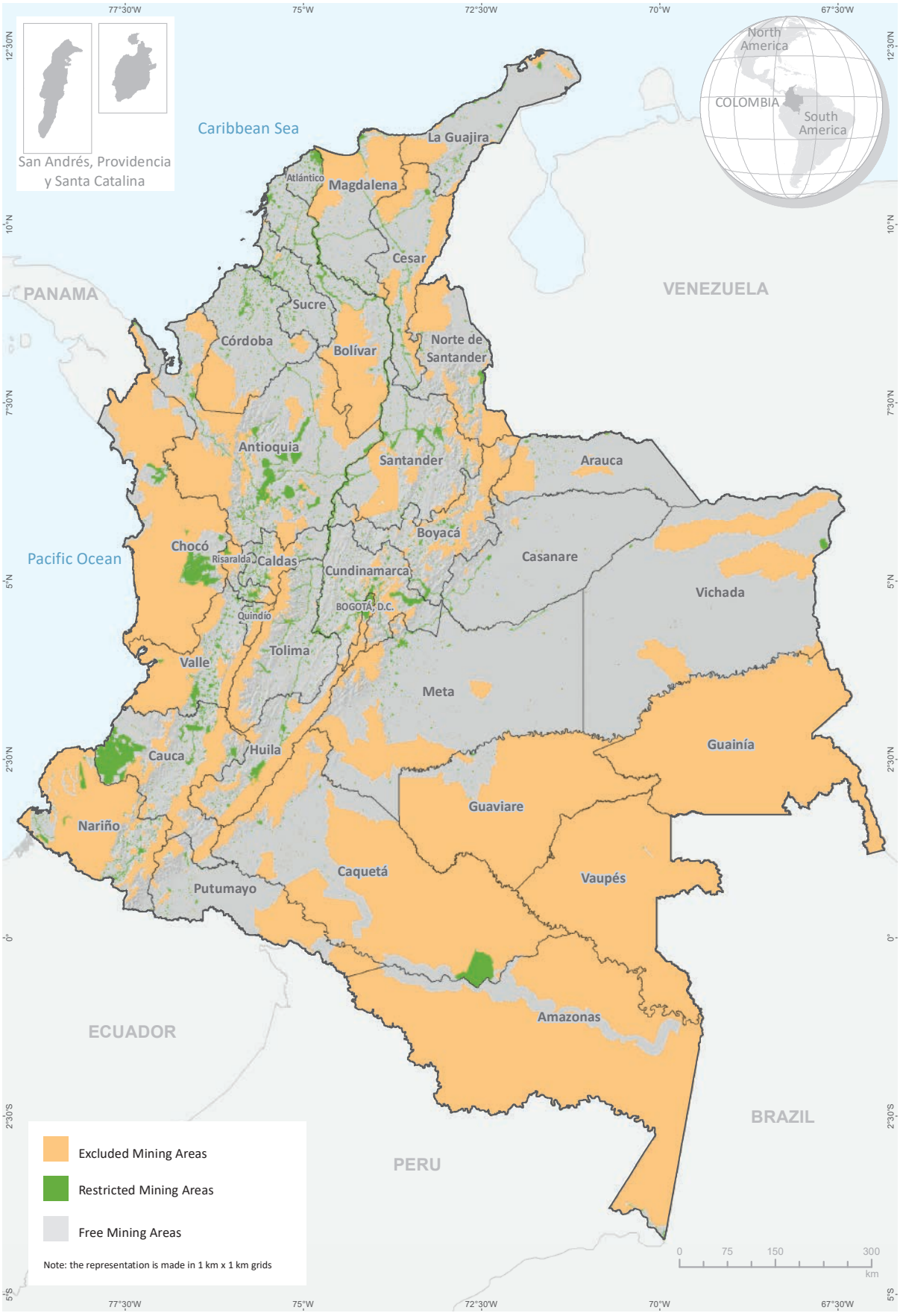


For free zones (zones in which a mining title and environmental licensing can be requested), approximately 7% of the territory has a condition of restriction - 3% due to the urban perimeter of cities or populated centers, 1.6% due to ethnic community mining areas and 1.7% due to areas occupied by a public work (map 1).

Table 2. Management model for interventions in the territory.

Name	Territory (km²)	Percentage with Respect to the Total
Excluded mining areas, including restricted mining areas declared in these territories	567,940	50
Areas without environmental restrictions, not awarded	529,719	46
Restricted Mining Areas in Free Areas	35,979	3
Titled free areas or areas with mining permits or requested mining permits	7,487	1
Total	**1,141,125**	**100**

Map 1. Model of actions in the territory – Excluded and free areas, 2020.



Source: Government of Colombia - Monitoring system supported by the UNODC.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Excluded Mining Areas

Areas in which the law[18] expressly states that mining exploration or extraction work cannot be performed are considered excluded areas. These territories correspond to zones declared and delimited in accordance with current regulations as areas for the protection and development of renewable natural resources or the environment, areas that are part of the System of National Natural Parks (SPNN)[19], regional natural parks, other areas of the National System of Protected Areas (SINAP)[20], Protective Forest Reserve Zones, *páramo* ecosystems and wetlands designated within the list of international importance of the RAMSAR Convention[21]. A brief description can be found below. For more details, consult a previous publication [4].

Forest Reserve Zones

With the enactment of Law 2 in 1959, seven large Forest Reserve Zones were declared throughout the Colombian territory for the development of the forest economy and the protection of soil, water, and wildlife [5]: Cocuy, Sierra Nevada de Santa Marta, Central, Serranía de los Motilones, Magdalena River, Pacific and Amazon.

Due to their nature, these areas are of public use and social interest, and have become the primary integrating element of environmental, territorial and forest ordering. These zones are referenced in article 34 of the Mining Code.

Despite being a part of the Excluded mining areas, in Forest Reserve Zones by Law 2, the environmental authority, by means of a substantiated administrative order, may decree the subtraction of the required area and authorize mining to be carried out in the mentioned areas in a restricted manner or conditional upon mining methods that do not affect the objectives of excluded mining areas.

Areas for the Protection and Development of Renewable Natural Resources and the Environment

In the framework of the Convention of Biological Diversity (CBD) approved by means of Law 165 of 1994, the Ministry of Environment and Sustainable Development (MinAmbiente), through resolutions 1628 and 1814 of 2015, declared 57 Areas for the Protection and Development of Renewable Natural Resources and the Environment in sites of ecosystemic importance where conservation gaps were identified. This declaration is a strategic action to increase the ecological representativity of the National System of National Natural Parks. Therefore, protection measures in these areas are temporary while processes are carried out to declare them as protected areas.

RAMSAR Sites

The Ramsar Convention on Wetlands of International Importance was adopted in 1971,

18 Article 34 of the Mining Code, Law 685 of 2001.

19 The geographic coverage of PNN corresponds to the official information of the Special Administrative Unit of Natural Parks (2017).

20 The geographic coverage of the National System of Protected Aras corresponds to the official information of the Special Administrative Unit of Natural Parks (2017).

21 These exluded mining areas generate, in the event of complete overlap with a concession contract proposal, rejection of the request. In the event of a partial overlap, they generate a reduction of the area, in order to grant the area that does not overlap with the areas declared as excluded mining areas.

and its objective is to promote national actions and international cooperation for the conservation and rational use of wetlands and their resources. Colombia has been a part of the Ramsar Convention since January, 1997 when the Congress of the Republic of Colombia approved the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. In light of this decision, the country is responsible for managing the wetlands in its territory. Colombia currently has thirteen places designated as Wetlands of International Importance (Ramsar sites).

National Protective Forest Reserve Zones

These are geographical spaces that exclusively allow the preservation, sustainable use, restoration, knowledge and enjoyment of forest ecosystems, even if their structure and composition has been modified. There are 59 declared National Protective Forest Reserves in the country.

National Natural Parks

The objective of PNN is to protect natural biodiversity, along with the underlying ecological structure and environmental processes on which it is supported. At the same time, they seek to promote education and recreational use through a special management regime [6]. Colombia has 59 protected areas within the National Natural Park System.

Restricted Mining Areas

In accordance with the Colombian Mining Code, restricted mining areas correspond to places in which mining exploration and extraction work can be performed, taking into account compliance with specific requirements that ensure the protective elements considered in the framework of restrictions[22]. In light of this, and in accordance with the general classification of the Mining Code for data analysis, table 3 includes the categorization of restricted mining areas.

Table 3. Categorization of restricted mining areas in Colombia.

Analysis Group	Category (art. 35, Law 685 of 2001)
Ethnic community mining areas	Indigenous mining areas
	Black community mining areas
	Mixed mining areas
Other restricted Mining Areas	Areas inside the urban perimeter of cities and populated areas
	Areas occupied by rural constructions
	Areas defined as special archaeological, historical or cultural interest areas
	Beaches, low tide areas and river paths
	Areas occupied by a public work or areas attached to a public utility

22 Article 35, Law 685 of 2001.

Ethnic community mining areas, on their part, grant a priority to the ethnic community over third parties to obtain the concession contract. If this does not occur within the established deadline, the mining title may be granted to a third party that requests it, subject to a prior consultation with the ethnic communities[23].

Other restricted mining areas, in which there is a different connotation because the presence of legally protected ethnic groups is not prevalent, include certain conditions that are mandatory to comply with to request the respective permits for mining, in accordance with the provisions stipulated by the managers and/ or owners of the territory (public or private, as the case may be), without affecting interests in each area. In this way, the five categories of other restricted mining areas are mainly differentiated from ethnic community mining areas due to the type of actors involved in the territory and their priority in requesting the authorization to mine. This is because, in any of the cases, there will be no freedom to mine until permits are processed with the respective entities.

Areas without Environmental Restrictions for Mining

These are territories outside of the categories of excluded mining areas, reason why mining permits can be requested in them (Mining Title and Environmental License). They may geographically coincide with restricted mining areas. If that is the case, some conditions to access exploration and mining permits must be met. More specifically, when these areas are on ethnic territories, the community must be consulted before any environmental licensing takes place. In this case, the community can request the area to be declared as a mining area and have priority over any third party for being granted the corresponding permit.

23 Chapter XIV, Law 685 of 2001.

SPECIAL MANAGEMENT TERRITORIES

Independent of the management model for intervention in the territory, this chapter focuses on the territories that, due to their inherent characteristics, have been made or declared within a legal framework in order to conserve and protect cultural and environmental aspects that are not completely defined within mining regulations. In this sense, these particularities are taken into account to establish additional mechanisms protected by the law that ensure control and the prevention of illegal exploitation in these territories.

This section is focused on the classification of special management territories in two categories: 1) areas with mining titles as collective property through the Colombian State for ethnic communities who have traditionally occupied these territories (indigenous and afrodescendant communities), and 2) protected areas not clasasified as excluded mining areas that are registered in the Unique National Registry of Protected Areas (RUNAP).

Ethnic Territories

Colombian law contemplates an inherent and differentiated administrative model for territories with a historical occupation of communities with ancestral traditions for these groups to make the relevant decisions, such as the internal organization of their territories, due to their condition as a minority in the country. This is to preserve their associated cultural values and experience of various centuries with respect to the use of natural resources.

In accordance with this, the Lands of Black Communities[24] and indigenous reserves[25] were formed as a mechanism to hand over land to these ethnic communities, with autonomous administration to define their organization and internal functioning [7], without going against the National Constitution and ensuring prior consultation in light of any intervention by third parties in their territories [8].

Land of Black Communities

Law 70 of 1993 defined a *Black Community* as a population group settled for various generations in wastelands in the Pacific region and other areas in the Caribbean and south of the country, with African ancestors, who inherited their language, ethnicity and culture. This law also regulated the Land of Black Communities to ensure the collective rights these communities have over their territory [9] [10]. On their part, a Community Council is the legal figure that exercises the highest authority in these territories, reason why the black community residing there must become a legally established entity to this end[26].

Biotic and abiotic natural resources are the basis of the environment's sustainability and the subsistence of black communities, in accordance with their territorial vision [9]. Their

24 Law 70 of 1993, "by means of which transitory article 55 of the Constitution is developed," in order to recognize the right to collective property in the areas historically inhabited by black communities of the watershed of the Pacific, in accordance with their production tradition.

25 Decree 2164 of 1995, "by means of which Chapter XIV of Law 160 of 1994 is partially regulated," with respect to the provision and titling (constitution, maintenance, restructuring and/ or expansion) of land to indigenous communities for their appropriate establishment and development, as well as to remedy thos occupied by third parties external to the respective partiality.

26 Decree 1745 of 1995.

use is based on fishing, hunting, artisan mining, forestry use and agriculture, as well as the subproducts of the forest beyond its ecosystemic services and the supply of wood (the healing powers of medicinal plants). For this reason, external interventions in these territories must be approved by means of prior consultations.

Indigenous Reserves

The Colombian State establishes the requirements for guaranteeing the provision and/or endowment of land to indigenous communities to the proper extent for their establishment and development. This is in order to recognize the historical ownership and occupation of these populations in territories, preserve their ancestral customs and improve the quality of life of the inhabitants[27]. In light of the above, an indigenous reserve is a sociopolitical legal institution comprised of a recognized territory in which indigenous communities reside[28]. There are three key legal concepts for territorial management and ordering in indigenous reserves: 1) Traditional authorities, 2) Indigenous councils and 3) Life plans.

In terms of worldview [11], indigenous communities underpin their existence in the concept of Mother Earth. For this reason, the environment is the result of harmony between people and natural resources and forces them to perform specific roles within their internal organization to prioritize the conservation of their natural environment and ensure their survival. In this way, life plans prohibit any kind of activity that harms the sacred heritage of indigenous communities in reservations and, therefore, all external intervention must carry out prior consultations.

Protected Areas Included in the National System of Protected Areas (SINAP), Registered in the Unique National Registry of Protected Areas (RUNAP) that are not part of the Excluded Mining Areas

In addition to the National Natural Park System, there is a great variety of protected area categories in Colombia that are part of the SINAP[29]. These areas are registered by the Environmental Authorities in the Unique National Registry of Protected Areas (RUNAP) and, thereby, are geographically defined and designated, regulated and managed to achieve specific conservation objectives.

Although their objective is conservation, environmental regulations establish the possibility of subtracting protected areas in some categories when using them or performing activities not allowed within them is provided for public use or social interest reasons [2].

27 Decree 2164 of 1995, with which the National System of Agrarian Reform and Rural Peasant Development (Law 160 of 1994), through the constitution, expansion, restructuring or remediation of indigenous reserves.

28 Article 2.14.7.5.1, Decree 1071 of 2015.

29 A set of protected areas and the social actors, strategies and management instruments that coordinate them to contribute to complying with the country's conservation objectives as a whole. It includes all public, private or community governance protected areas and all those that are managed by national, regional or local institutions (Article 2.2.2.1.1.3 of Decree 1076 of 2015).



Fotograph:
Alluvial gold exploitation on land, Nechí (Antioquia)

SECTION II FINDINGS

This section includes the findings related to EVOA on land and alerts due to EVOA in water, and their dynamics. The relationship between EVOA and law arrangements is presented, as well as the management model for interventions in the territory.

This chapter, according to the monitoring model, covers the findings from the entire national territory in terms of EVOA on land and for the baseline of EVOA in water developed for ten rivers in the Colombian Amazon and Orinoco Region (Putumayo, Caquetá, Apaporis, Guainía, Amazonas, Yarí, Inírida, Cotuhé, Puré and Atabapo). In this sense, it is necessary to highlight the reading and interpretation of the results for EVOA on water, since the study exclusively addresses the mentioned rivers[30].

The first part of the chapter covers the law arrangements from the three categories established in the model, which allow an approximation to the legality and illegality of EVOA. Subsequently, findings are consolidated based on the management model that frames, in accordance with the particularities of the territories, the feasibility of mining. Finally, a consolidated report of the presence of EVOA in the provinces is presented, along with a special section focused on alerts due to EVOA in water using machinery.

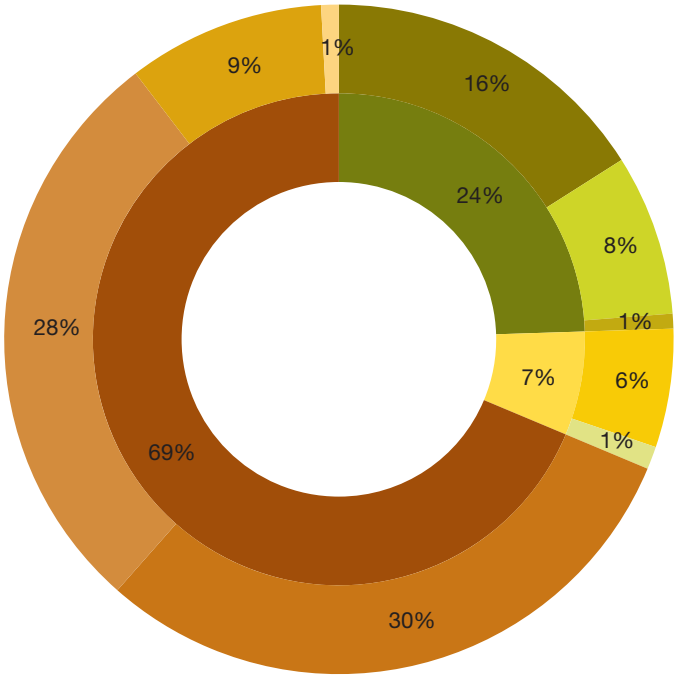
30 The EVOA monitoring system is projected to extend the analysis to other rivers with this type of exploitation, starting in the next study.

EVOA AND LAW ARRANGEMENTS

Although the methodology used to detect EVOA does not allow directly identifying the legal nature of the activity, it does offer information based on technical evidence for decision-making by the competent authorities related to resource management and the control of illegal exploitation. For this purpose, observing EVOA and the areas under the law arrangements in the study with respect to gold exploitation allows obtaining a territorial view of the phenomenon.

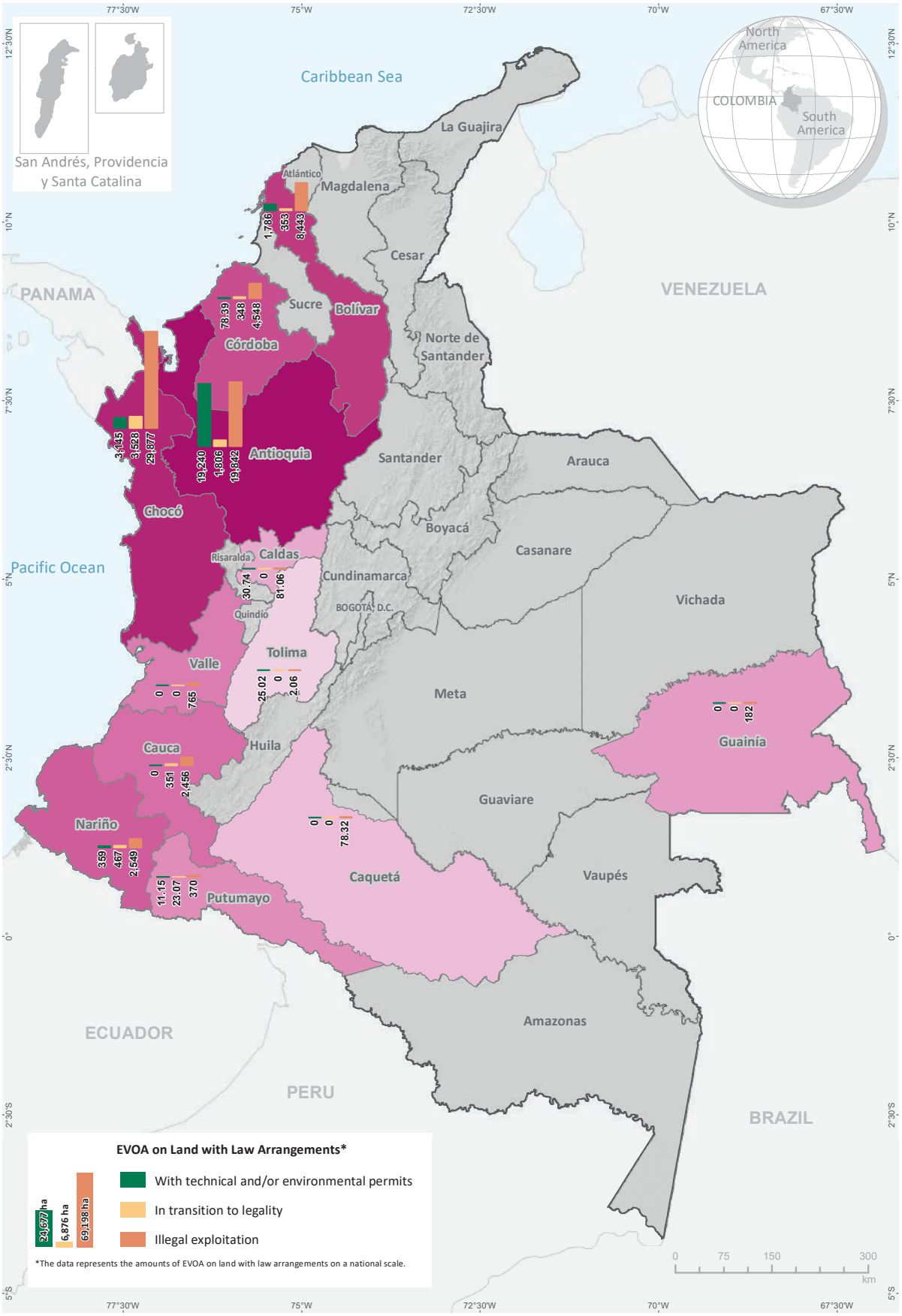
The EVOA coincides geographically with three categories that bring together the different law arrangements (map 2) according to their legal condition for mining: *with technical and environmental permits, in transition to legality and illegal exploitation*[31]. In accordance with this categorization (figure 3), only a low portion of the detected EVOA is within a legal framework (mining and environmental).

Figure 3. 2020 national percentage of EVOA on land by law arrangement.



31 The model is based on a structuring and ranking of the information provided by the ANM (as of October 2020), the Secretary of Mines of Antioquia and the ANLA (as of October 2020) and subsequently a spatial superimposition with the EVOA. The data provided by the ANM does not differentiate between mining methods or types of deposits. Because of this, the files represent all of the law arrangements regarding gold exploitation without differentiating between vein and alluvial gold exploitation.

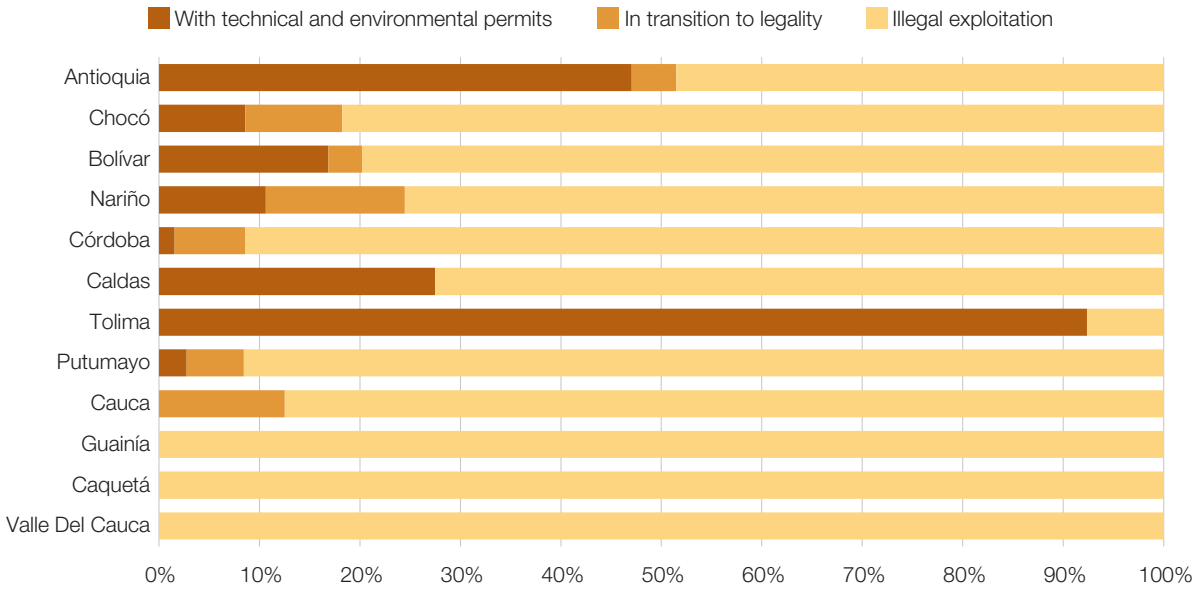
Map 2. Provincial distribution of EVOA on land and law arrangements.



Source: Government of Colombia - Monitoring system supported by the UNODC; for law arrangements: Ministry of Mines and Energy.
The limits, names and titles used in this map to not represent recognition or acceptance by the United Nations.

In the analysis of the 2020 national consolidated report, *69% (69,198 ha) of EVOA corresponds to illegal exploitation.* Chocó and Antioquia stand out in this category, with 43% and 29%, respectively, of the national total for the category. Twenty-four percent (24,677 ha) have technical and environmental permits, and Antioquia holds 78% in this category. Finally, the remaining 7% is in transition to legality (6,876 ha). Chocó and Antioquia once again stand out in this category, with 51% and 26%, respectively, of the national total for the category. The provinces of Valle del Cauca, Guainía, Caquetá, Putumayo, Córdoba, Cauca and Chocó have more than 80% of their EVOA on land in the illegal exploitation category. On the other hand, 92% of detected EVOA in Tolima has technical or environmental permits (Figure 4).

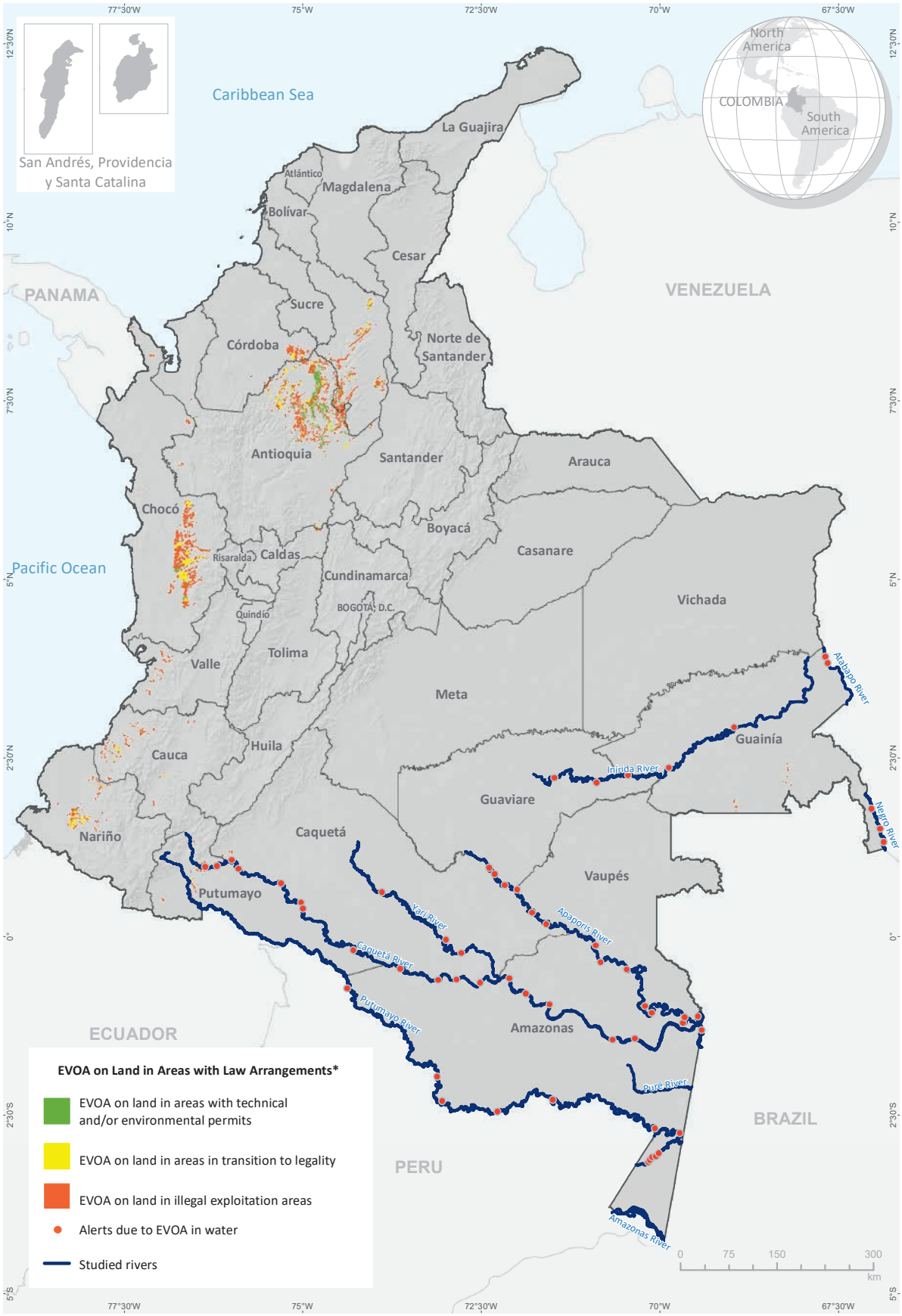
Figure 4. 2020 provincial percentage of EVOA on land by law arrangement.



Moreover, it is highlighted that, in the national sphere, in the illegal exploitation category, 44% refers to EVOA in territories without any law arrangements, and 41% refers to declared ethnic community mining areas. When it comes to the category of "in transition to legality," 84% refers to detection in territories with requests for formalization. Lastly, of the detection under the category of "with technical and environmental permits," 65% are under mining titles and 32% are under environmental licenses. In this context, it is important to mention that the alerts identified in the studied rivers located in the Amazon and Orinoco Region are in the illegal exploitation category (map 3).

Sixty percent of detected EVOA (41,472 ha) under the illegal exploitation category is located in excluded mining areas, which means environmentally protected areas by Colombian law.

Map 3. Distribution of EVOA in categories of the law arrangements.



Source: Government of Colombia - Monitoring system supported by the UNODC; for law arrangements: Ministry of Mines and Energy.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

EVOA AND MANAGEMENT MODEL FOR INTERVENTIONS IN THE TERRITORY

Observing the territory's particularities contributes to improving knowledge on the dynamics, targeting of efforts and design of specific strategies to face problems in each one of these aspects. In agreement with the classification for territory management, the results for excluded mining areas, restricted mining areas and areas without environmental restrictions are presented, which lead to different models of action within the regulatory framework in terms of resource management and controlling illegal exploitation. Nevertheless, it is necessary to clarify that restricted mining areas can be found within excluded mining areas, which entail the same connotations. In other words, they imply all the regulatory elements with respect to the nature of protection, but are catalogued in areas in which granting mining permits is prioritized for the ethnic communities that inhabit them, as long as the requirements provided by the mining authority are complied with and environmental authority performs the respective geographic subtraction of the excluded area and grants permission for mining.

Furthermore, there are also ethnic community mining areas within areas without mining restrictions[32], which have the special characteristic that they are catalogued as restricted mining areas and include the right of preemption for granting concession contracts or mining titles in the event the ethnic community inhabits the territory carries out the proceedings provided in regulations to become beneficiaries of the mining permit. In this context, the following sections are focused on the territorial management model, and the respective clarifications are made.

Excluded Mining Areas

Excluded mining areas correspond to geographic spaces in which the law[33] expressly states that mining exploration or extraction work cannot be performed. Despite the importance of these territories for the conservation and protection of the country's environmental heritage 52,263 ha of EVOA on land were detected in 2020 in these areas. This figure corresponds to 52% of the total identified for this period. Furthermore, alerts due to EVOA in water were identified in rivers that are a part of these special management areas for conservation.

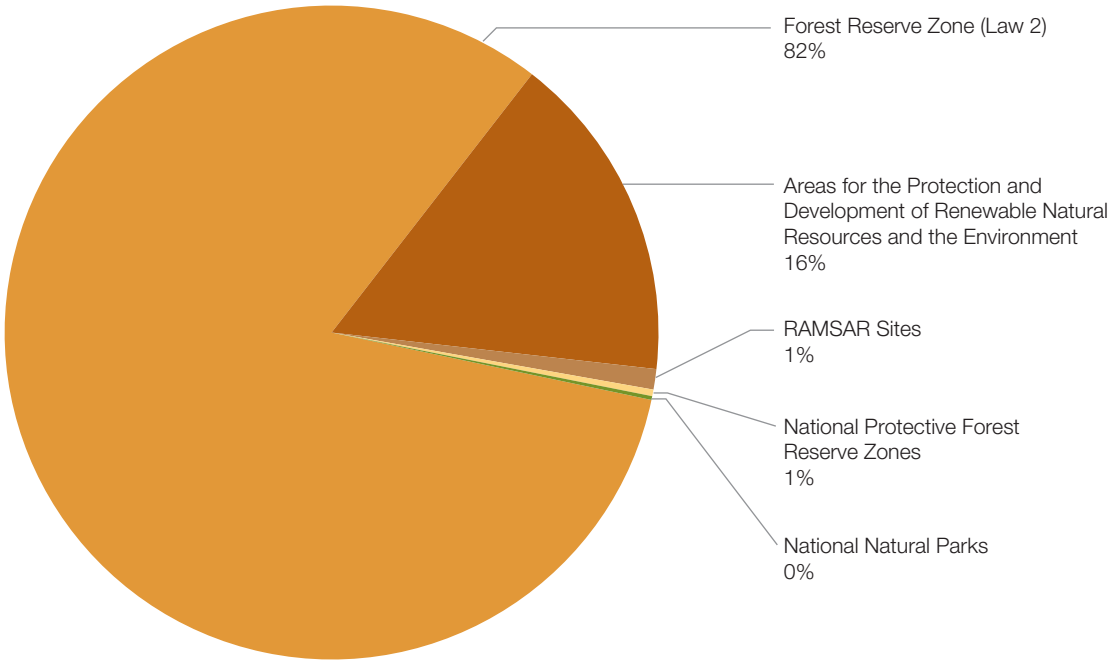
The category with the highest presence of EVOA on land corresponds to Forest Reserve Zones due to Law 2. In this land, 49,011 total ha were identified. However, it is necessary to explain that other protected areas particularly coexist in the geographic space delimited for this category. 7,103 ha coincide with Areas for the Protection and Development of Renewable Natural Resources and the Environment, 150 ha belong to Protective Forest Reserve Zones, 111 ha correspond to National Natural Parks and the remaining 41,646 ha are exclusively a part of Forest Reserve Zones due to Law 2.

On the other hand, in territories that do not geographically coincide with Forest Reserve Zones due to Law 2, EVOA on land was detected in Areas for the Protection and

32 These areas are free to be the subject of exploitation permits for third parties.
33 Article 34 of the Mining Code, Law 685 of 2001.

Development of Renewable Natural Resources and the Environment, which add up to 2,607 ha, 602 ha in Ramsar wetlands[34] and, finally, 43 ha in National Protective Forest Reserve Zones. Figure 5 shows the distribution by management category.

Figure 5. EVOA on land in excluded mining areas by management category, 2020.



Moreover, alerts due to the presence of EVOA in water were detected for the Apaporis, Caquetá, Cotuhé, Atabapo, Yarí and Inírida Rivers in Forest Reserve Zones, Ramsar sites and National Natural Parks. Table 4 summarizes the share of EVOA on land in the different categories of the excluded mining areas in 2020.

34 The geographic coverage of Ramsar sites corresponds to the official information of the Ministry of Environment and Sustainable Development obtained at http://mapas.parquesnacionales.gov.co/arcgis/services/IGAC/SINAP/MapServer/WMSServer (2017).

Table 4. Excluded mining areas with EVOA on land, 2020.

Excluded Area			EVOA on Land (ha)	
Forest Reserve Zone (Law 2)[35]	Amazon	National Natural Parks	RNN Puinawai	96
		Without an overlap[36]		91
	Magdalena	Areas for the Protection and Development of Renewable Natural Resources and the Environment	Serranía de San Lucas	7,094
		Without an overlap		9,525
	Pacific	Areas for the Protection and Development of Renewable Natural Resources and the Environment	Reserva Natural Río Bravo	9
		National Protective Forest Reserve Zones	Anchicayá River	146
			Escalarete River and San Cipriano River	4
		National Natural Parks	Los Farallones de Cali	15
		Without an overlap		32,031
	Subtotal			49,011
Areas for the Protection and Development of Renewable Natural Resources and the Environment[37]			Serranía de San Lucas	45
			Bajo Cauca - Nechí	2,139
			Humedal El Sapo II	363
			Bosques Secos del Patía	60
National Protective Forest Reserve Zones			Darién	43
RAMSAR Sites			Ayapel Wetland Complex	602
Total				**52,263**

Forty-nine percent (49,011 ha) of the total EVOA on land in the country (map 4 and 5) is located in Forest Reserve Zones due to Law 2. Within these protected territories, the Forest Reserve of the Pacific, located in biogeographic Chocó, has 66% of the area reported for this category. This means approximately a third of the national EVOA on land in located in this area. With respect to the detection of EVOA in water, eight of the studies rivers registered alerts: Apaporis, Atabapo, Caquetá, Cotuhé, Yarí, Inírida, Puré and Negro, which are located in the Forest Reserve of the Amazon. The highest concentration can be observed along the Apaporis river.

On the other hand, in the analysis period, 9,710 ha of EVOA on land were identified in Areas for the Protection and Development of Renewable Natural Resources and the Environment, which represent 10% of the national total, while 74% of EVOA detected in this category is located in Serranía de San Lucas (7,139 ha), province of Bolívar. When it comes

35 Other protected areas coexist in the geographic space delimited for Forest Reserve Zones by Law 2.
36 Layering or overlapping refers to geographic intersections with other categories – excluded areas in this case.
37 7,103 ha detected in these protected areas coincide with the territories of Forest Reserve Zones by Law 2.

to Ramsar sites, 602 ha of EVOA on land were reported, which is 0.6% of the national total, in the Ayapel Wetland Complex[38]. In addition, alerts due to EVOA in water in the Estrella Fluvial Inírida (EFI) Wetland Complex[39] along the Atabapo River.

They also identified 193 ha of EVOA on land in territories categorized as National Protective Forest Reserves, with a share of 0.2% of the national total for this period. Seventy-eight percent of EVOA on land in these areas is in two reserves located in the jurisdiction of Buenaventura, Valle del Cauca: the Río Anchicayá National Protective Forest Reserves and Río Escalarete and San Cipriano National Protective Forest Reserves, while the remaining 22% is in the municipality of Acandí, Chocó (Darién National Protective Forest Reserves).

Finally, 111 ha of EVOA on land were identified in PNN territories, which represent 0.11% of the total national area. It is worth indicating that these protected territories are also part of the category of Forest Reserve Zones due to Law 2. The Puinawai National Natural Reserve has the highest presence of EVOA on land, with 96 ha. This protected area represents 95% of the total detected in the System of National Natural Parks. On the other hand, PNN Los Farallones de Cali registered 15 ha, which is a slight decrease of 3 ha compared to 2019.

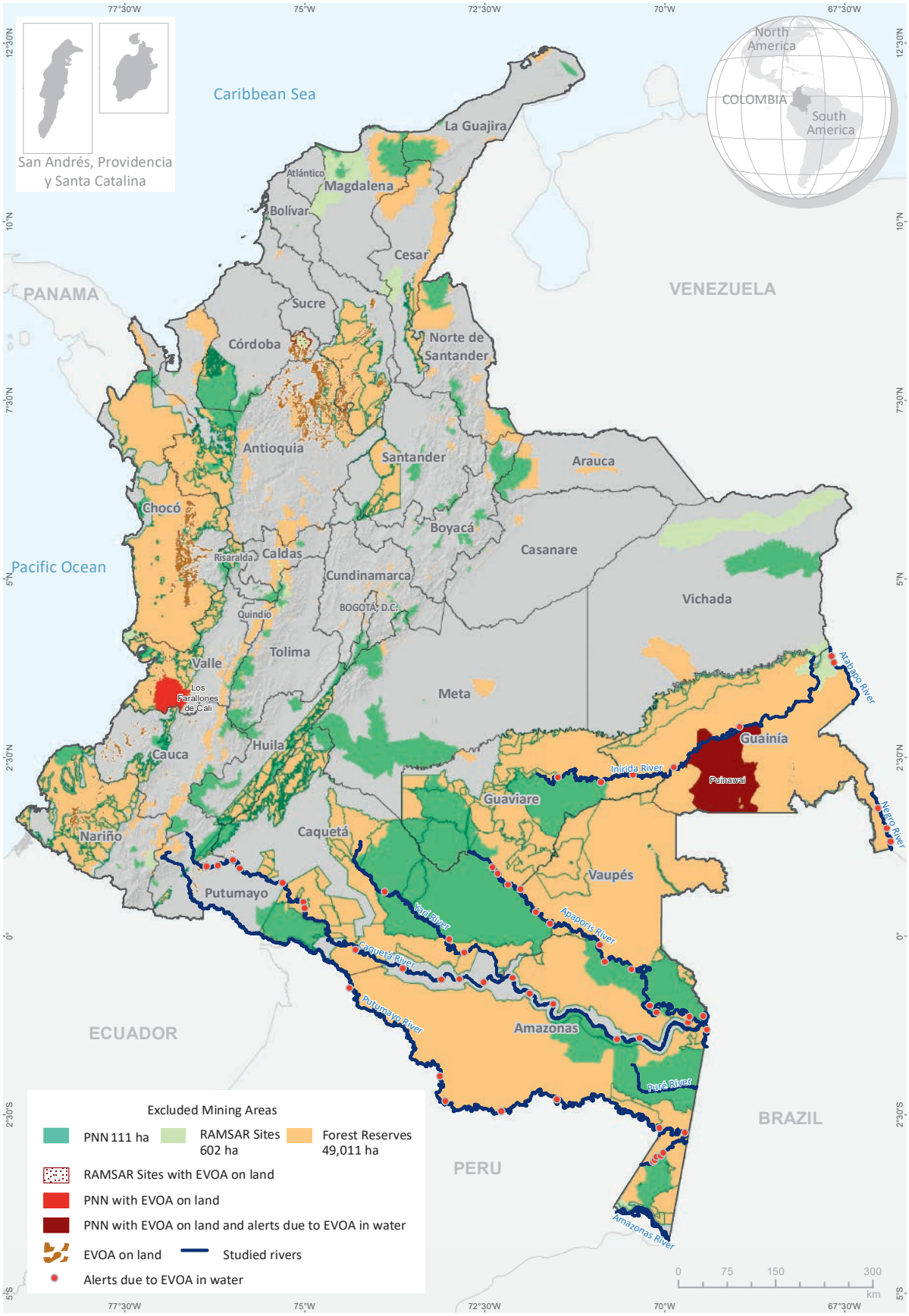
It is evident that the advancement of this phenomenon is exerting strong pressure on these territories when considering the proximity of EVOA on land to PNN. The results show that three additional parks: Paramillo, Munchique and Serranía de los Churumbelos, are at risk due to EVOA on land less than 10 km from them. Added to these are PNN los Katíos, Plantas Medicinales Orito Ingi Ande, Tatamá, Acandí Playón, Las Orquídeas and Alto Fragua Indi-Wasi, which have evidence of the phenomenon ranging between 10 km to 20 km from them (Table 5). It is worth highlighting that a warning sign can be observed in PNN Serranía de los Churumbelos, where a 57% increase in EVOA on land detected in the areas of influence was registered, moving from 276 ha in 2019 to 434 ha in 2020 [12].

Table 5. EVOA on land detected in PNN, 2020.

National Natural Park	EVOA on land in PNN (ha)	EVOA on land up to 10 km from PNN (ha)	EVOA on land up to 20 km from PNN (ha)
RNN Puinawai	96	0	0
Los Farallones de Cali	15	275	369
Paramillo	0	107	803
Los Katíos	0	0	53
Munchique	0	46	514
Serranía de los Churumbelos	0	105	329
Plantas Medicinales Orito Ingi Ande	0	0	22
Tatamá	0	0	10
Acandí Playón	0	0	43
Alto Fragua Indi-Wasi	0	0	89
Las Orquídeas	0	0	14
Total	**111**	**533**	**2,247**

38 Declared as a Ramsar Site by means of Decree 356 on February 2nd, 2018.
39 Declared as a Ramsar Site by means of Decree 1275 on July 8th, 2014.

Map 4. Excluded mining areas with EVOA on land and alerts due to EVOA in water, 2020.

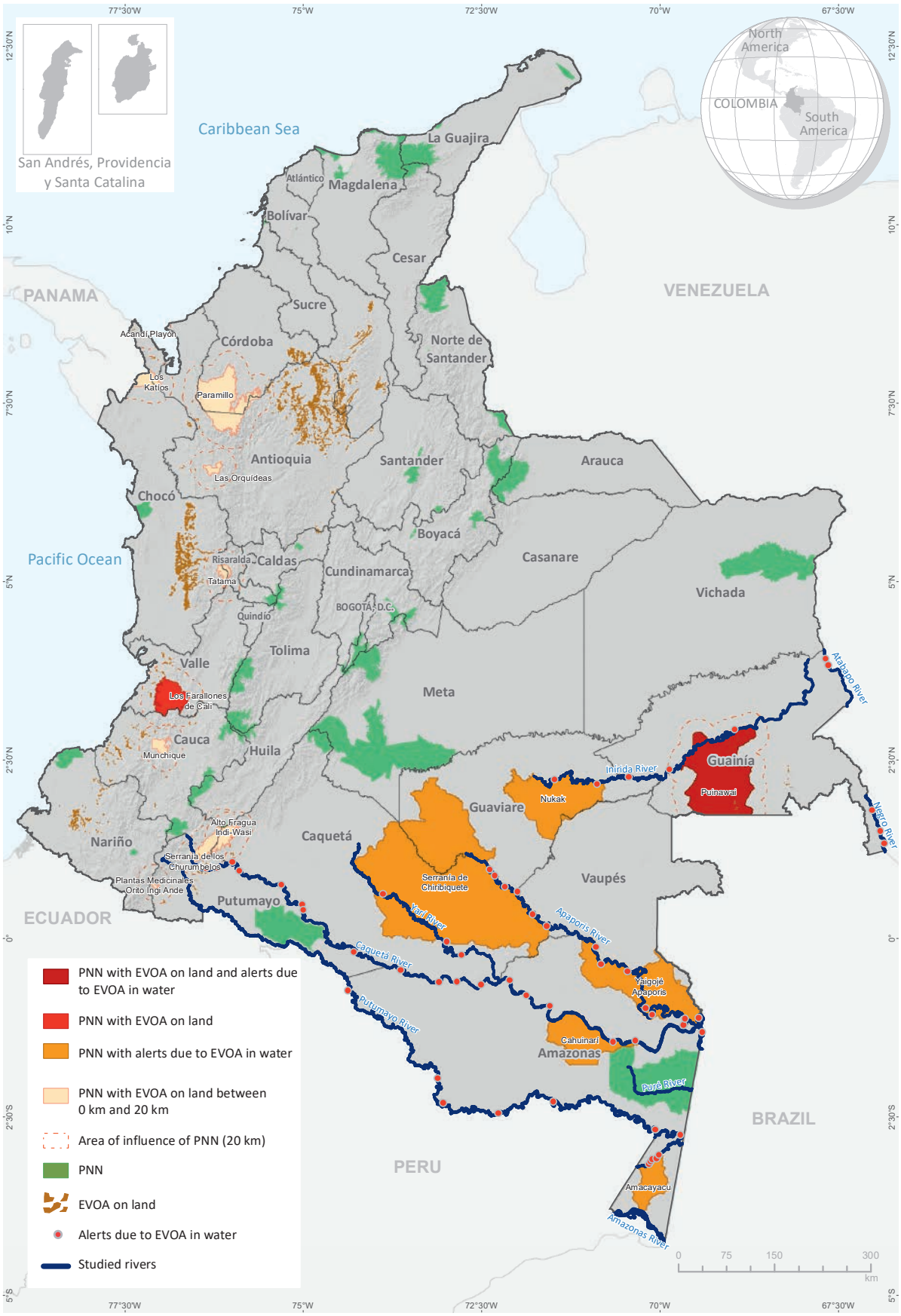


Source: Government of Colombia - Monitoring system supported by the UNODC; for PNN: National Natural Parks, 2019. For Forest Reserve Zones and RAMSAR Sites: Ministry of Environment and Sustainable Development, 2017.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

In 2020, alerts due to the presence of EVOA in water were identified in seven PNN: Serranía de Chiribiquete, Yaigojé Apaporis, Río Puré, Nukak, Cahuinarí, Amacayacu and Puinawai.

The highest concentration of alerts due to EVOA in water in 2020 were identified at Serranía de Chiribiquete National Natural Park in the upper basin of the Apaporis River, mainly in the San Fernando sector, where this body of water is the limit between the provinces of Caquetá and Guaviare. This protected area also has alerts due to EVOA in water along the Yarí River. It is worth indicating that alerts due to EVOA in water were observed for the Puinawai National Natural Reserve along the Inírida River, in the municipalities of Inírida and Barranco Minas, of the province of Guainía. This protected area also has EVOA on land. This situation makes it especially vulnerable to the environmental damage caused by this activity.

Map 5. System of National Natural Parks and EVOA, 2020.



Source: Government of Colombia - Monitoring system supported by the UNODC; for PNN: National Natural Parks, 2019.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

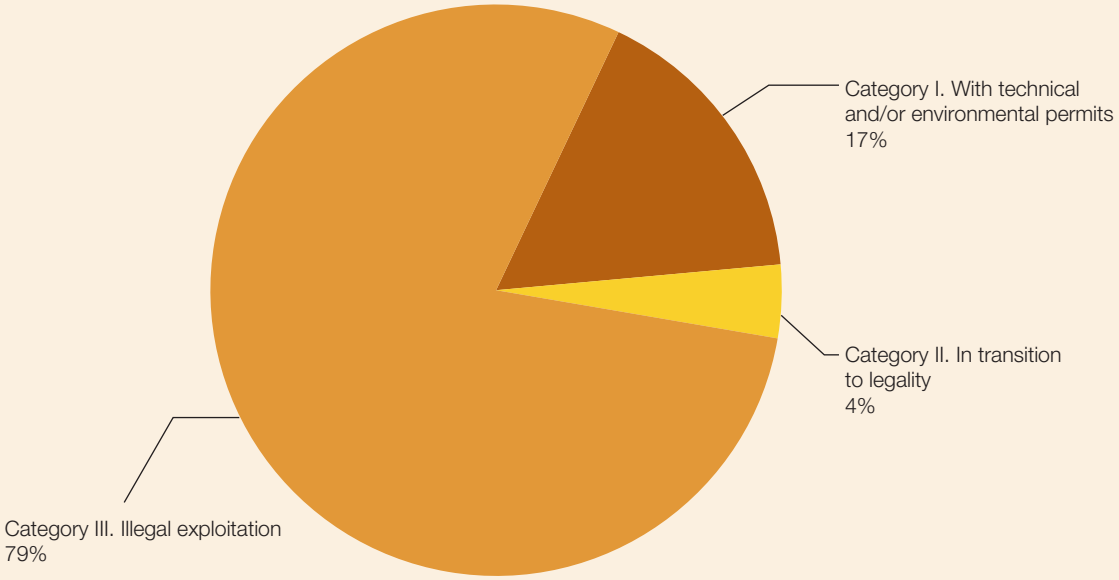
Excluded Areas and Law Arrangements

Seventy-nine percent (41,472 ha) of EVOA identified in excluded mining areas is considered illegal exploitation, since it coincides with territories in which this activity is carried out without the corresponding valid Mining Title or without the authorization of the owner of said property. It is worth highlighting that, in this category, there are 22,984 ha of EVOA on land in ethnic community mining areas: in these territories, the community has the priority over third parties when it comes to obtaining a mining title.

On the other hand, 17% (8,626 ha) of EVOA in these areas coincides with areas that have been titled. That is to say, they have technical and/ or environmental permits. However, with the information that is available for this study, the percentage of these technical permissions that have the respective approval of the environmental authority cannot be dimensioned. In that sense, it must be taken into account that, once environmental permits have been granted, the environmental authority begins the respective environmental subtraction process.

The remaining 4% (2,165 ha) of EVOA corresponds to territories in which legalization processes are being carried out for the activity, protected by the regulatory frameworks of Law 685 of 2001 and Law 1955 of 2019, as well as the processes carried out by traditional mining communities with the approach of declared ARE (figure 6).

Figure 6. EVOA on land in excluded mining areas and law arrangements, 2020.

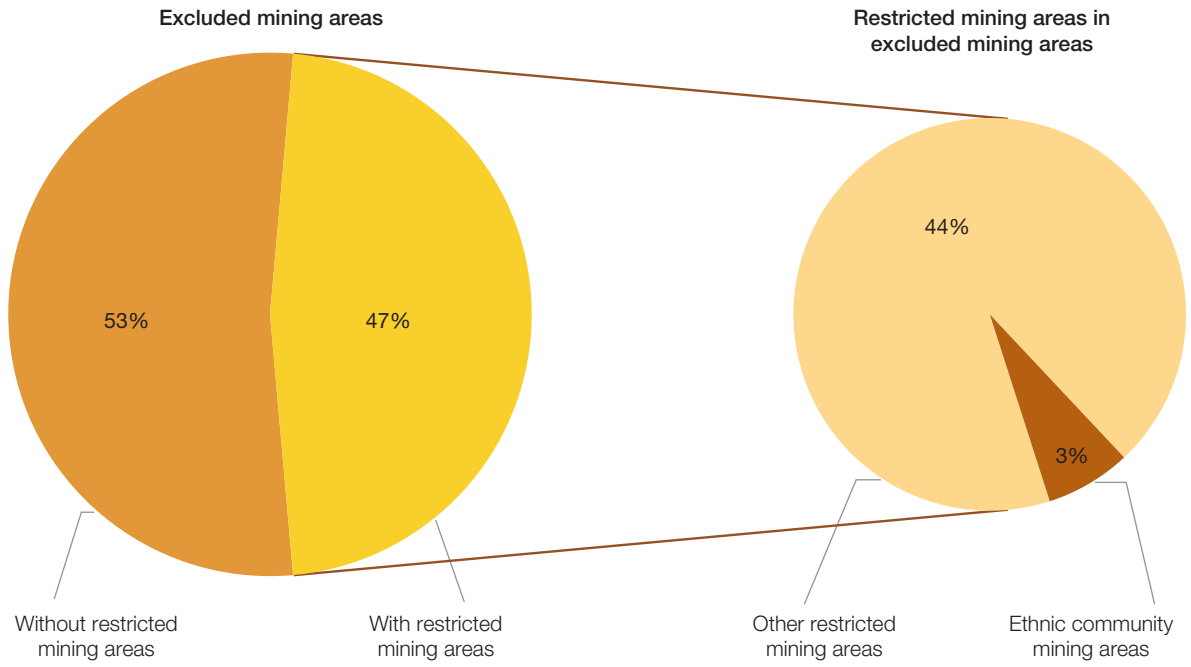


Restricted Mining Areas in Excluded Mining Areas

Ninety-three percent of this analysis group (22,984 ha) corresponds to detection in ethnic community mining areas in excluded mining areas, while the remaining 7% (1,659 ha) is EVOA on land in other restricted mining areas ("within the urban perimeter of cities" and "areas occupied by a public work or areas attached to a public utility") inside of these excluded mining areas. Figure 7 presents the distribution of EVOA on land according to this data.

Forty-seven percent of the total EVOA on land detected in excluded mining areas (24,643 ha) coincides spatially with restricted mining areas, which is equal to 25% of the total national figure for 2020.

Figure 7. EVOA on land in restricted mining areas within excluded mining areas.



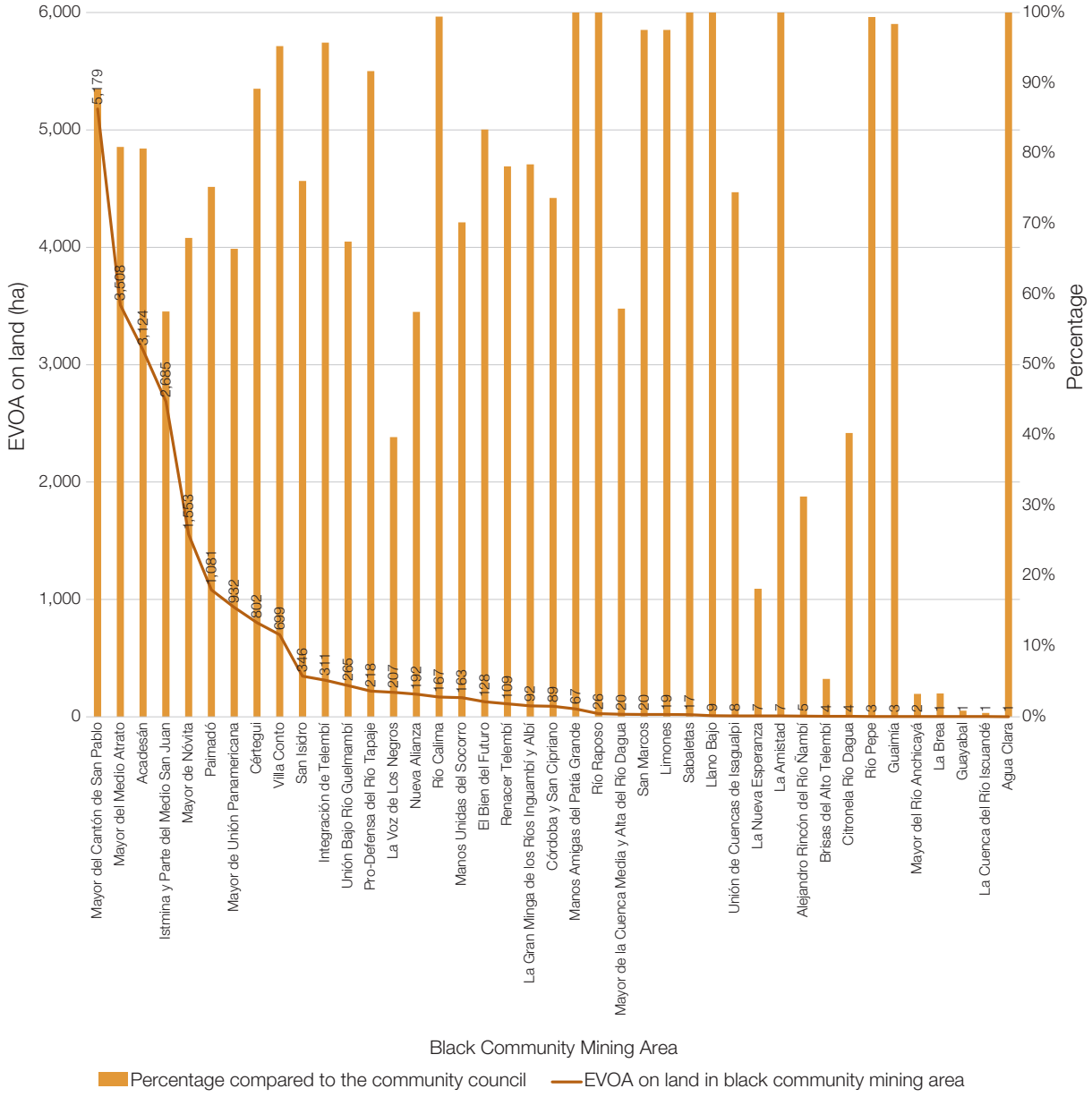
Ethnic Community Mining Areas

EVOA on land within ethnic community mining areas that coincide with excluded mining areas was primarily concentrated in the Land of Black Communities (black community mining areas), since 22,080 ha were detected (96% in ethnic community mining areas and 90% in restricted mining areas in excluded mining areas). This translates into the fact that, of the 51 community councils in which EVOA on land was detected in 2020 in excluded mining areas, 41 of them had the phenomenon concentrated in their corresponding restricted mining areas. Of these areas, in 14 of these councils, over 90% of detection was in the respective mining area. The figure for 18 of them was between 50% and 90% and, in the remaining 9, the figure ranged between 1% and 50% (figure 8).

With respect to EVOA on land in mining areas that spatially coincide with indigenous reserves (indigenous mining areas) and are within excluded mining areas, the detected

area was 13 ha, which represents less than 1% of the total in these ethic community mining areas. This only occurs in two reserves (El Venado and Cuenca Media y Alta del Río Iníriida), whose detected EVOA on land is entirely in their respective mining area. In light of the above, 892 ha were considered mixed mining areas (4% of the total ethnic community mining areas in excluded mining areas)[40].

Figure 8. Relationship between EVOA on land in black community mining areas and their respective community councils in excluded mining areas.



40 The spatial analysis model by centroid in 1 km² grids showed no evidence of coincidence with Land of Black Communities or indigenous reserves. For this reason, they are classified in the study as mixed mining areas within exluded mining areas.

In terms of alerts due to EVOA in water in ethnic community mining areas within excluded mining areas, only one of the 59 nuclei with detected with alerts in the ten evaluated rivers had this condition: it is located on the Yarí River, north of the mining area of the Monochoa indigenous reserve, in the province of Caquetá.

Other Restricted Mining Areas

Eighty-four percent of EVOA on land in other restricted mining areas corresponds to the category "within the urban perimeter of cities or populated centers," with 1,391 ha (this means 6% of the total in restricted mining areas within excluded mining areas). This situation is present in 21 populated centers in Antioquia, Bolívar, Chocó, Nariño and Valle del Cauca, among which Chocó has the highest representativity in both quantity of populated centers (12) and the concentration of hectares (875 ha; 63% of EVOA detected in this category).

On the other hand, 268 ha of EVOA on land were detected under the category of "areas occupied by a public work or areas attached to a public utility," which represents 16% of the other restricted mining areas in excluded mining areas and, in turn, is only 1% of all detected EVOA in restricted mining areas within excluded mining areas. This only occurs in Antioquia and Valle del Cauca, among which the former is the province with the highest concentration on EVOA in this category, with 246 ha (92% of the area reported for the category).

In terms of alerts due to EVOA in water detected in other restricted mining areas within excluded mining areas, there are nuclei that influence the category of "within the urban perimeter of cities or populated centers" in 10 populated centers on the Atabapo, Caquetá, Cotuhé, Inírida, Negro and Putumayo Rivers (Table 6).

Table 6. Alerts due to EVOA in water close to other restricted mining areas "within the urban perimeter of cities or populated centers" in excluded mining areas.

Province	Municipality	Name of Populated Center	River	Distance and Location of Alert Nuclei
Amazonas	Tarapacá	Tarapacá	Putumayo	21 km - upstream
			Cotuhé	98 km - upstream
	Puerto Arica	Puerto Arica	Putumayo	100 km - upstream
				55 km - downstream
	Puerto Alegría	Puerto Alegría	Putumayo	95 km - upstream
Caquetá	Solano	Solano	Caquetá	9 km - upstream
				63 km - downstream
	Solano	Peñas Blancas	Caquetá	71 km - upstream
				2 km - downstream

Province	Municipality	Name of Populated Center	River	Distance and Location of Alert Nuclei
Guainía	La Guadalupe	La Guadalupe	Negro	19 km - upstream
				16 km - downstream
	Inírida	Chaquita	Atabapo	12 km - downstream
	Cacahual	San Juan	Atabapo	25 km - downstream
	San Felipe	San Felipe	Negro	15 km - downstream
	Morichal	Morichal Nuevo	Inírida	19 km - downstream

Note: only populated centers 100 km or closer to alert nuclei due to EVOA in water are included (upstream and downstream refers to the location of the alert nuclei on the river with respect to the populated center).

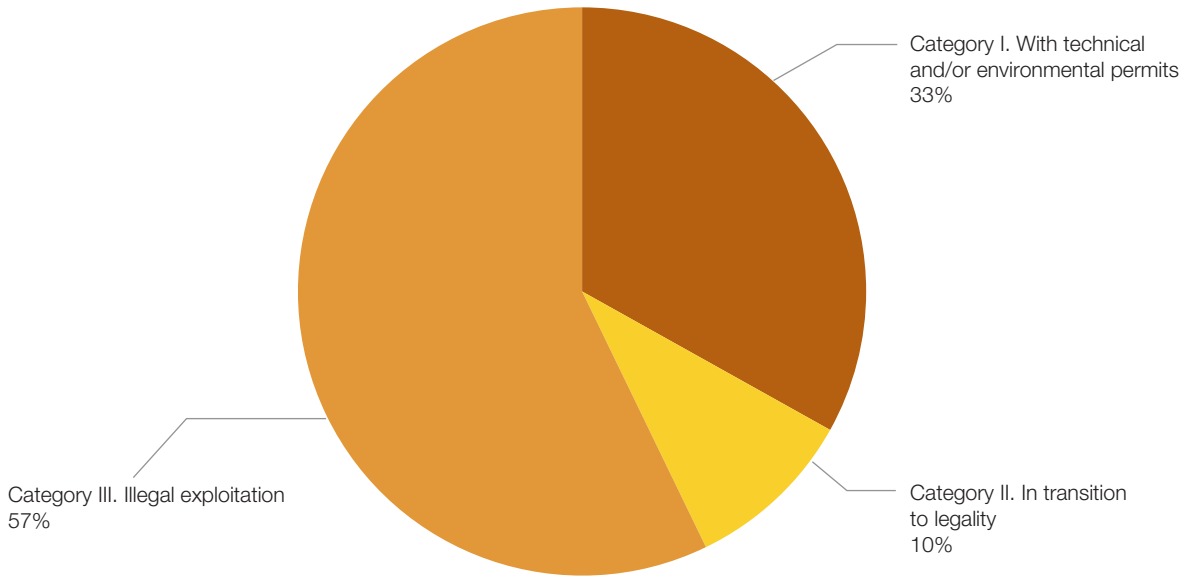
Areas without Environmental Restrictions

The results of detecting EVOA on land indicate that, as of 2020, 48% of the consolidated national total (48,488 ha) is in areas without environmental restrictions for mining.

With respect to the law arrangements, 57% of the EVOA identified in areas without environmental restrictions is considered illegal exploitation, since it coincides with the territories in which this activity is performed without the corresponding mining title.

On the other hand, 33% of the EVOA in these areas coincides with areas with mining titles. In other words, they have technical and environmental permits, according to an environmental license or mining title. The remaining 10% of the EVOA corresponds to territories in which formalization processes are being carried out for the activity, covered in the regulatory framework of Law 685 of 2001 and Law 1955 of 2019, as well as processes carried out by traditional mining communities with the approach of declared ARE (Figure 9).

Figure 9. EVOA on land in areas without environmental restrictions for mining and law arrangements, 2020.

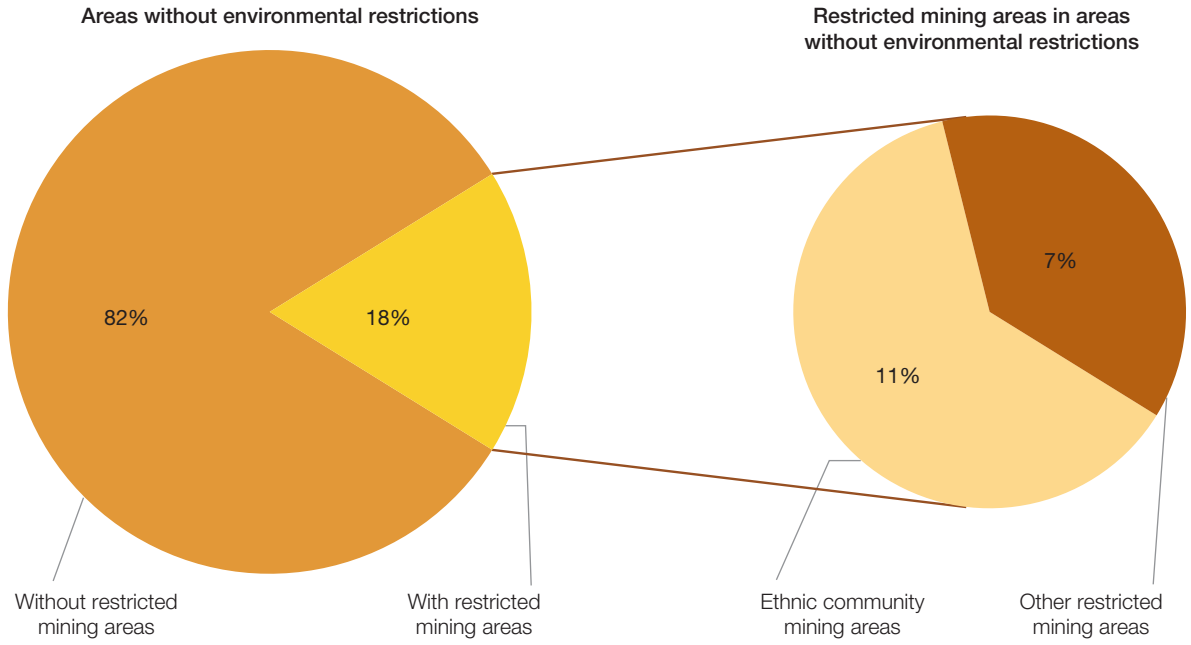


Restricted Mining Areas in Free Areas

Sixty-two percent of EVOA on land in restricted mining areas within areas without environmental restrictions (5,326 ha) is concentrated in ethnic community mining areas, while the remaining 38% (3,229 ha) corresponds to detection in restricted mining areas (the categories of "within the urban perimeter of cities or populated centers" and "areas occupied by a public work or areas attached to a public utility") within these excluded mining areas (Figure 10).

Eighteen percent of the total EVOA on land detected in areas without environmental restrictions (8,555 ha) overlaps with restricted mining areas, which is equal to 8% of the national figure for 2020. Moreover, this means 26% of what was reported for restricted mining areas is located in areas without environmental restrictions.

Figure 10. EVOA on land in restricted mining areas within areas without environmental restrictions.

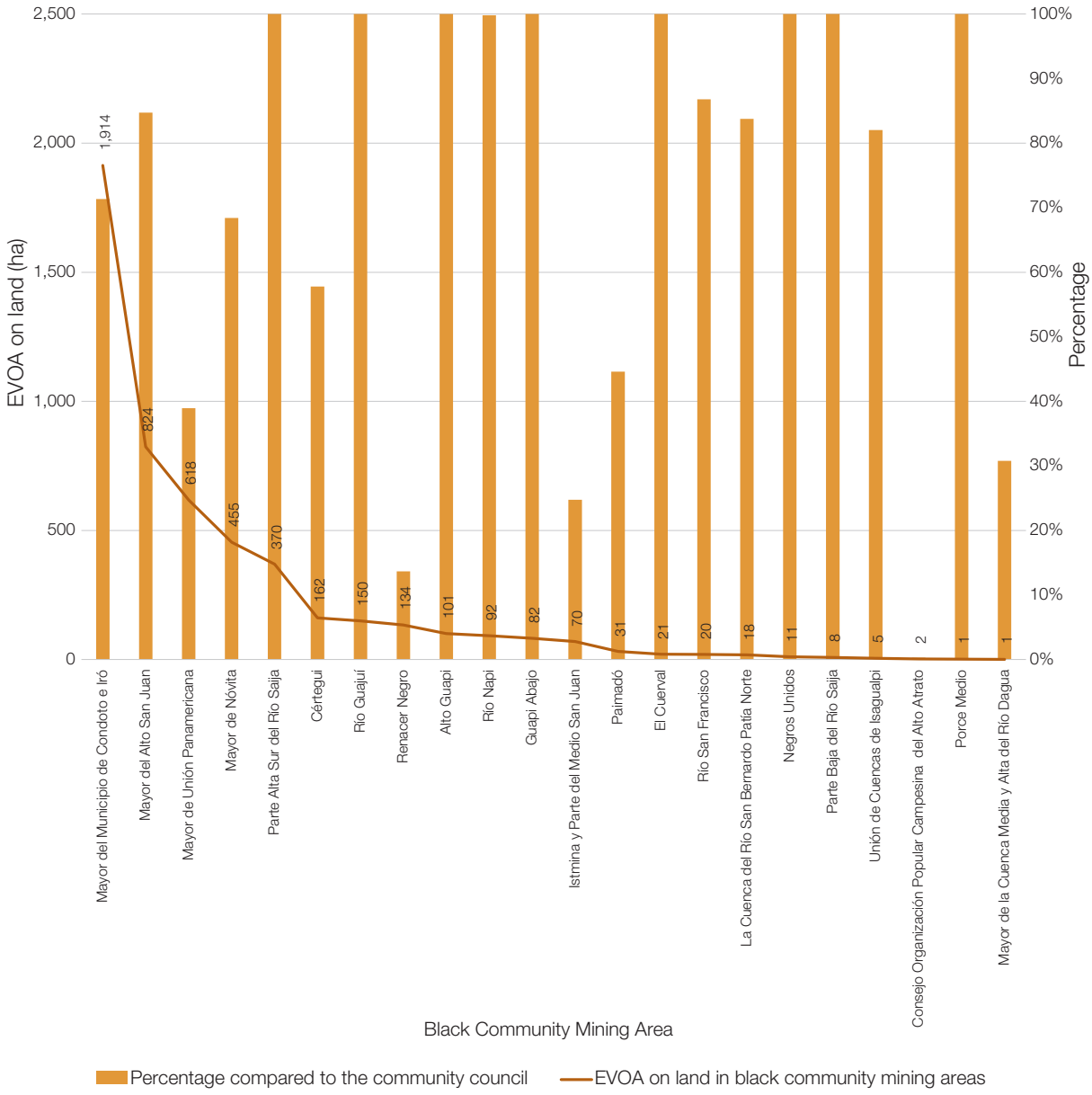


Ethnic Community Mining Areas

EVOA on land within ethnic community mining areas that are in areas without environmental restrictions was primarily detected in the Land of Black Communities (black community mining areas), since 5,091 ha were reported (96% in ethnic community mining areas and 62% in restricted mining areas in areas without environmental restrictions). In this sense, of the 32 community councils with EVOA on land in 2020 in areas without environmental restrictions, 22 had the phenomenon in their corresponding restricted mining area. In 9 of these 22 councils, there is a 100% concentration in terms of EVOA located in their corresponding mining areas. In 7 community councils, this item has figures between 50% and 90%, and another 6 have between less than 1% and 50% of detection in these areas (Figure 11).

With respect to EVOA on land in mining areas that spatially coincide with indigenous reserves (indigenous mining areas) and are in areas without environmental restrictions, 41 ha were detected, which is less than 1% of the total in these ethnic community mining areas. This only occurs in one reserve (Yaberaradó). Consequently, there are 193 ha catalogued as mixed mining areas, which represent 4% of the total ethnic community mining areas in areas without environmental restrictions[41].

Figure 11. Relationship between EVOA on land in black community mining areas and their respective community councils in areas without environmental restrictions.



41 The spatial analysis model by centroid in 1 km² grids did not indicate any overlapping with Land of Black Communities or indigenous reserves. For this reason, they are classified in this study as mixed mining areas in areas without environmental restrictions.

With respect to the presence of alerts due to EVOA in water in ethnic community mining areas that coincide with areas without environmental restrictions, only 1 of the 59 nuclei detected with alerts in the 10 evaluated rivers had an influence on this type of territory. It is located on the Caquetá River, on the southern border of the mining area of the Monochoa indigenous reserve in the province of Caquetá.

Other Restricted Mining Areas

Seventy-two percent of the phenomenon in other restricted mining areas refers to the category of "within the urban perimeter of cities or populated centers," with 2,309 ha (22% of the total in restricted mining areas within areas without environmental restrictions). This occurs in 28 populated centers of 7 provinces (Antioquia, Bolívar, Cauca, Chocó, Córdoba, Putumayo and Valle del Cauca), with Antioquia and Chocó as the once that hold 88% of this area and the most populated centers with this condition.

For the category of "areas occupied by a public work or areas attached to a public utility" in areas without environmental restrictions, 920 ha of EVOA on land were detected, which represents 29% of the other restricted mining areas in excluded mining areas and, in turn, is only 9% of all detected EVOA in restricted mining areas within excluded mining areas.

When it comes to alerts due to EVOA in water identified in other restricted mining areas within excluded mining areas, only two nuclei have been identified that influence the populated center of Puerto Santander (Araracuara, Amazonas) on the Caquetá River: one 22 km upstream and another one 34 km downstream from the populated center. Other populated centers are over 100 km from the detected alert nuclei.

EVOA AND SPECIAL MANAGEMENT TERRITORIES

In order to have a general outlook of the presence of EVOA in areas with specific particularities, using a different approach than the management model for interventions in the territory, this section presents the results reported for ethnic territories and environmental protection areas outside of the regulatory framework of environmental restrictions.

In light of this, two major groups are contemplated: 1) ethnic territories, with 41,633 ha of EVOA on land and alerts due to EVOA in water identified in the area of influence of only one of the two types of these territories in the Amazon region (indigenous reserves), and 2) RUNAP areas, with 6,459 ha of EVOA on land without the identification of alerts due to EVOA in water (these territories are in the north of the country, and the alerts were detected in the south).

Ethnic Territories

In 2020, 41,633 ha of EVOA on land were detected in ethnic territories, which corresponds to 41% of national detection. This represents a slight increase in this percentage compared to 2019. It was 40% that year. In terms of the amount of hectares reported under this condition, there was a 2% increase with respect to the previous year.

Ninety-eight percent of the phenomenon in ethnic territories in 2020 was concentrated in Land of Black Communities, while the remaining 2% was located in indigenous reserves. Table 7 presents the general findings under this item by province.

Table 7. Distribution of EVOA on land in ethnic territories, 2019.

Province	Ethnic Territories (ha)	Land of Black Communities (ha)	Indigenous Reserves (ha)	Share
Chocó	34,721	34,491	230	83%
Nariño	3,149	3,101	48	8%
Cauca	2,434	2,399	35	6%
Valle del Cauca	737	721	17	2%
Antioquia	408	295	113	1%
Guainía	185	0	185	0%
Total	**41,633**	**41,006**	**627**	**100%**

When it comes to alerts due to EVOA in water, the studied area is located in the Amazon region, where indigenous reserves are predominant. For this reason, it is the only type of ethnic territory with the detection of alert nuclei due to this type of alluvial gold exploitation.

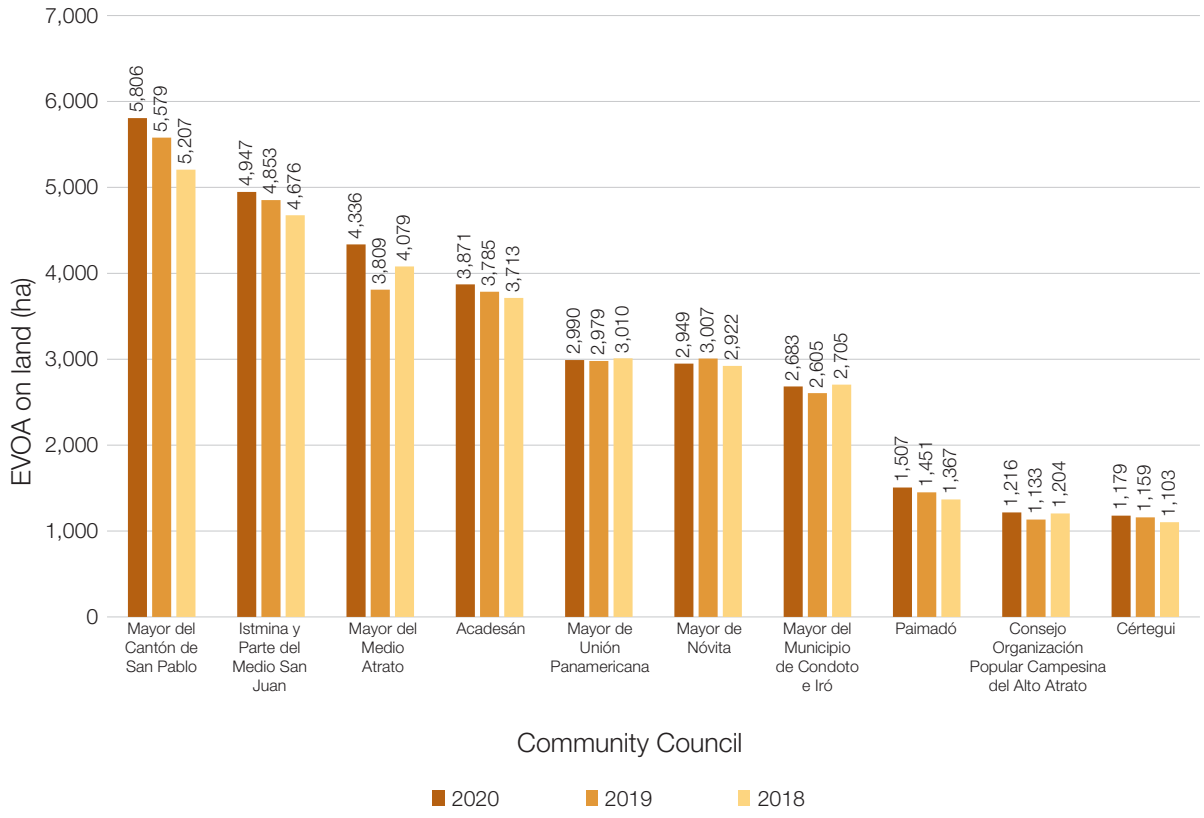
Land of Black Communities

The 41,006 ha detected in Land of Black Communities in 2020 represent 41% of the national figure. This shows a 5% increase from what was reported in this type of ethnic territory

in 2019. Chocó is the province with the highest concentration of the phenomenon recorded in these territories, with an 83% share of the figure for this item. It is followed by Nariño (8%), Cauca (6%), Valle del Cauca (2%) and Antioquia (1%).

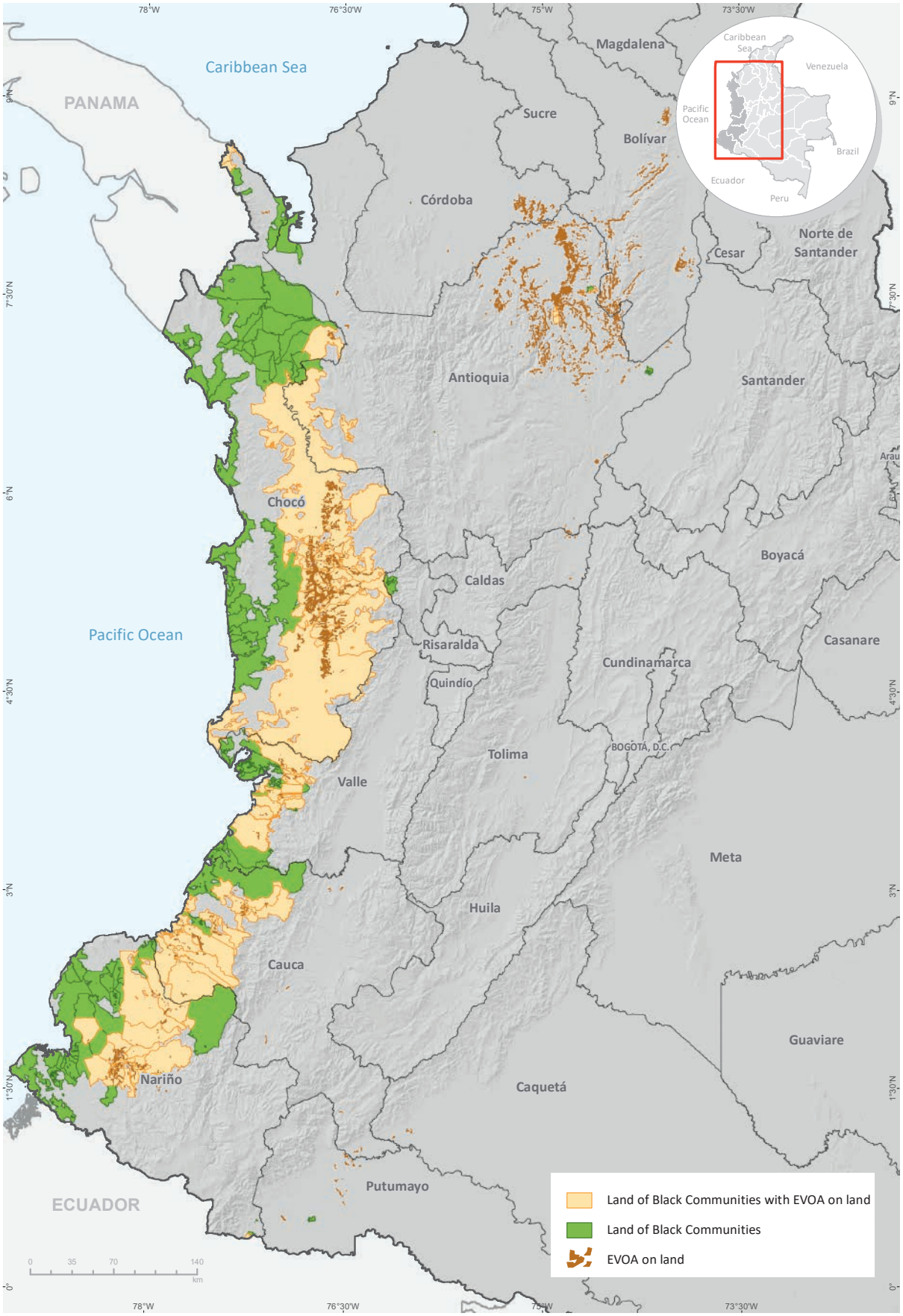
In 2020, 78 community councils registered the presence of EVOA on land, 1 more compared to 2019 and 3 less than 2018. Of these territories, 10 of them each have over 10,000 ha of EVOA detected and bring together 77% of the total in Land of Black Communities. It is worth highlighting that, in the last three years, this behavior has been present in the same 10 councils, and the only one to get out of this group in 2019 and 2020 was the High Community Council of Alto San Juan (in 2018, it reported over 1,000 ha). Meanwhile, an increasing trend has been identified in the 2 councils with the highest presence of EVOA, as can be observed in Figure 12.

Figure 12. The ten community councils with the highest presence of EVOA on land (2018-2019-2020).



It is necessary to emphasize that studying alerts due to EVOA in water was focused on the Amazon region, reason why there is no data on the presence of this modality of exploitation in Land of Black Communities. Map 6 presents the distribution of EVOA in these ethnic territories.

Map 6. EVOA on land in Land of Black Communities, 2020.



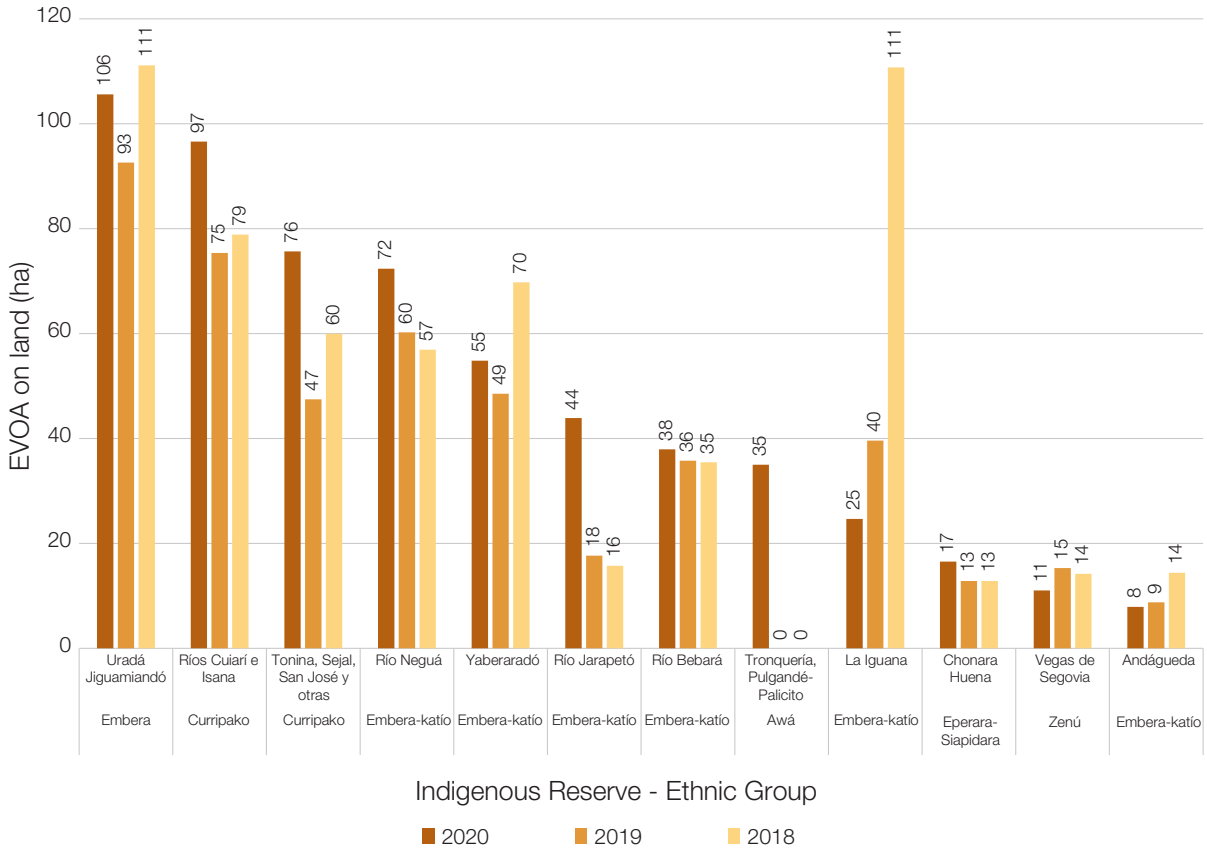
Source: Government of Colombia - Monitoring system supported by the UNODC; for Land of Black Communities: National Land Agency (ANT).
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Indigenous Reserves

The detection of EVOA on land in indigenous reserves for 2020 was 627 ha (less than 1% of the national consolidated figure), which indicates a 27% increase in the figure reported the previous year. Chocó is the province with the highest concentration of the phenomenon in reserves (84%), and it is followed by Guainía (29%), Antioquia (18%), Nariño (8%), Cauca (6%) and Valle del Cauca (2%).

EVOA on land was detected in 22 indigenous reserves in 2020, which was 4 more than 2019 and 2 less than 2019. The phenomenon is present in the territories of 6 indigenous communities, but is concentrated in the reserves of the embera-katío (58%) and curripako ethnic groups (29%). The territory of these reserves (Uradá Jiguaimiandó) has over 100 ha detected and, in the last three years, has reported the greatest area. The ten reserves with the highest detected area hold 90% on the phenomenon in reserves and, in general, no defined trend has been evident in terms of the growth or reduction of the phenomenon in the last years, as observed in figure 13.

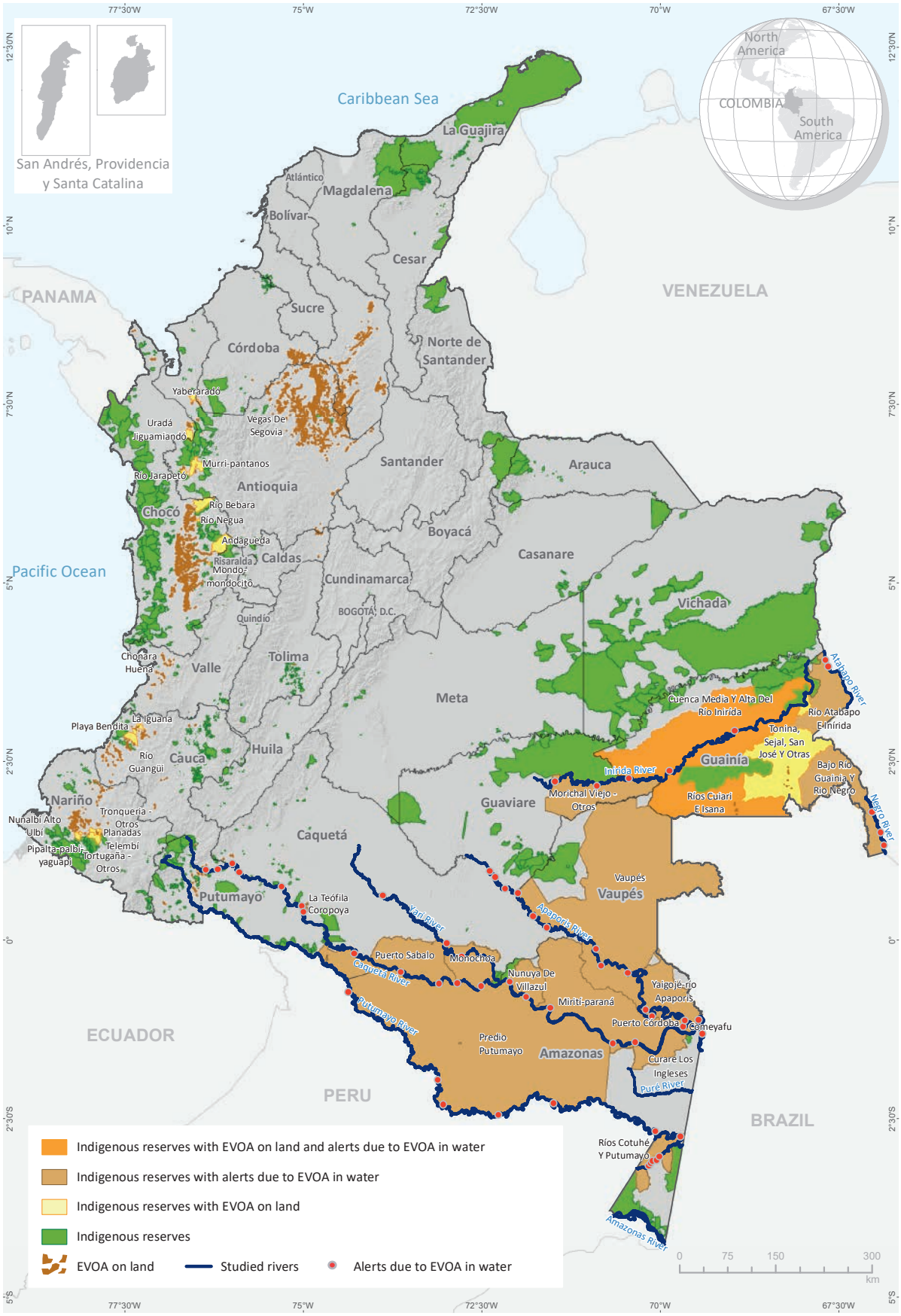
Figure 13. The ten indigenous reserves with the highest presence of EVOA on land (2018-2019-2020).



When it comes to alerts due to EVOA in water, all the rivers in which nuclei were detected have alerts in the area of influence of indigenous reserves. Although 13 of the 59 identified nuclei are located in rivers inside of 9 indigenous reserves, there are another 32 nuclei that are on rivers that delimit one or more reserves, reason why there is a total of 15 indigenous reserves[42] with alerts due to EVOA in water (river in the reserve or bordering the reserve). Of the remaining 15 nuclei, 5 of them are in a range of 2 km to 10 km upstream or downstream of a reserve, and the other 10 are at distances greater than 30 km in one direction of the river with respect to these ethnic territories. Map 7 shows the distribution of EVOA in indigenous reserves.

42 These reserves correspond to ten indigenous communities of the cubeo, curripako, muinane, nukak, puinave, tanimuca, ticuna, uitoto and yakuna ethnicities.

Map 7. EVOA on land and alerts due to EVOA in water in indigenous reserves, 2020.



Source: Government of Colombia - Monitoring system supported by the UNODC; for indigenous reserves: National Land Agency (ANT).
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Protected Areas Included in the SINAP Registered in the RUNAP[43]

For 2020, 6,459 ha of EVOA on land were identified in the category of Regional Integrated Management Districts[44] that are part of the SINAP, with a slight increase of 2% with respect to the previous year (table 8).

Table 8. EVOA on land detected in other SINAP categories, 2020.

Name of Protected Area	EVOA on Land (ha)
Integrated Management District of Natural Resources of the Ayapel Wetlands Complex	4,757
Ciénagas El Sapo y Hoyo Grande Regional Integrated Management District	1,330
Ciénagas Correales y El Ocho Regional Integrated Management District	362
Cacica Noría Regional Integrated Management District	8
Total	**6,459**

Seventy-four percent of all the EVOA on land detected in protected areas (4,757 ha) is concentrated in the Integrated Management District of Natural Resources of the Ayapel Wetlands Complex. This district, located in the province of Córdoba, is part of the macrosystem of wetlands and flood zones of the Momposina Depression [13]. With respect to 2019, the trend in this territory is towards stability: a variation of less than 0.5% is observed between the two periods.

On the other hand, 1,330 ha (20% of the total) of EVOA on land were identified in the Ciénagas El Sapo y Hoyo Grande Regional Integrated Management District[45] in the Lower Cauca River Basin of Antioquia, a protected area declared in October 2017.

Finally, 362 ha of EVOA on land were identified in the Ciénagas Correales y El Ocho Regional Integrated Management District[46], a protected area declared in 2019, which represents 6% of the total, while 8 ha were detected in the Cacica Noría Regional Integrated Management District[47] were detected in Antioquia.

43 These areas are not included in excluded mining areas.
44 A geographic space in which landscapes and ecosystems maintain their composition and function even if their structures have been modified, and whose associated natural and cultural values are within the human population's grasp, destined to sustainable use, preservation, restoration, knowledge and usufruct (Article 14 of Decree 2372 of 2010).
45 Declared as a protected area on October 26th, 2017 by means of Resolution 508 of the Board of Directors of CORANTIOQUIA.
46 Declared as a protected area on December 10th, 2019 by means of Agreement 576 of the Board of Directors of CORANTIOQUIA.
47 Declared as a protected area on November 29th, 2016 by means of Agreement 480 of the Board of Directors of CORANTIOQUIA.

PROVINCES WITH THE PRESENCE OF EVOA

The results of detecting EVOA on land indicate that 12 of the 32 provinces of the country have EVOA on land, with a total of 100,752 ha, which is 3% more than what was detected in 2019 (Table 9). The greatest provincial increase with respect to the EVOA detected said year was in Putumayo (39%), where it is mainly concentrated in the municipality of Puerto Guzmán of Ayapel. In second place is the province of Valle del Cauca (26%), and it is focused on the municipality of Buenaventura (Table 9).

Concepts:

Affected municipality: municipality with detection by means of remote sensing of EVOA on land or EVOA in water.

EVOA on land: a footprint or indication detected by means of interpreting and processing digital satellite images, which is characterized by alterations to the landscape in alluvial terrain.

EVOA in water: a footprint or indication detected by means of spectral indices in satellite images, which is characterized by the alteration of sediments in suspension in the body of water.

Table 9. EVOA on land by province.

Province	EVOA on Land, 2019	EVOA on Land, 2020		
	Hectares	Hectares	% of the National Total	% of Change between 2019-2020
Antioquia	40,201	40,890	41	2
Chocó	35,105	36,552	36	4
Bolívar	10,642	10,583	11	-1
Córdoba	4,976	4,975	5	0
Cauca	2,697	2,807	3	4
Nariño	3,171	3,374	3	6
Valle del Cauca	608	765	1	26
Putumayo	291	405	0	39
Others	337	401	0	19
Total	**98,028**	**100,752**	100	3

Along this line, the presence of EVOA on land covers 98 municipalities (9%) of the 1,122 there are in the country[48]. First place in the amount of municipalities with EVOA is shared by Antioquia and Chocó, each one with close to 22 municipalities with EVOA. In Antioquia, EVOA remains concentrated in Zaragoza, Nechí, Cáceres and El Bagre, all municipalities that contribute 66%

48 The spatial files of municipalities and other administrative units were updated in 2017. According to the above, the data on the dynamic in some municipalities can differ from those published in previous studies.

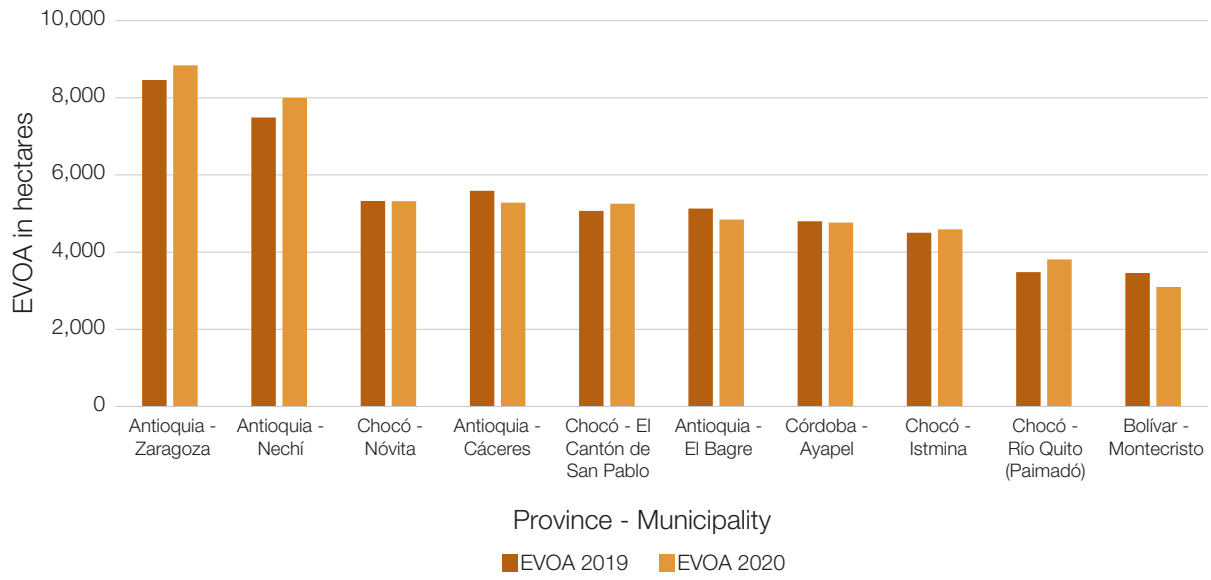
of EVOA on land in the province. Furthermore, EVOA in Chocó remains concentrated in five municipalities: Nóvita, El Cantón de San Pablo, Istmina, Río Quito and Unión Panamericana (Figure 14), which contribute 60% of the EVOA on land in the province.

Figure 14. EVOA on land, Chocó.



There is a high concentration of EVOA on a national level: 53% of national detection is located in ten municipalities of the provinces of Antioquia, Chocó, Córdoba and Bolívar (Figure 15). Zaragoza, Nechí and Nóvita lead the list of the top ten municipalities with the most detected EVOA, with 22,190 ha, which represent 22% of the national total. It is worth noting that, in this top 10, Río Quito had a 10% increase compared to 2019, while Montecristo demonstrated a 10% decrease compared to 2019.

Figure 15. Top 10 municipalities with the most EVOA on land, 2019-2020.



Finally, a comprehensive focusing of the findings by province shows that 52% of the national total was in excluded mining areas, in which 41% of the national figure corresponds to illegal exploitation and the remaining 11% is distributed as follows: 2% in the category of "In transition to legality" and 9% with a mining title. The remaining 48% of the national figure are located in areas without environmental restrictions, in which 28% of the national figure is illegal exploitation. In this context, and in accordance with the previous findings, it is noteworthy that more than half of the EVOA detected is located in territories where, as a function of the protection and conservation of the nation's environmental heritage protected by the current regulatory framework, mining is not permitted (table 10).

Table 10. Territory and EVOA on land, 2020.

Province	EVOA (ha)	Excluded mining areas				Areas without environmental restrictions (%)			
		With technical and/or environmental permits	In transition to legality	Illegal exploitation	Percentage of the province	With technical and/or environmental permits	In transition to legality	Illegal exploitation	Percentage of the province
Antioquia	40,890	10	0	14	24	37	4	35	76
Chocó	36,552	7	4	66	77	1	6	16	23
Bolívar	10,583	13	2	73	87	4	2	7	13
Córdoba	4,975	0	0	12	12	2	7	79	88
Nariño	3,374	11	14	75	100	0	0	0	0
Cauca	2,807	0	0	2	2	0	13	85	98
Valle del Cauca	765	0	0	100	100	0	0	0	0
Putumayo	405	0	0	1	1	3	6	91	99
Guianía	185	0	0	100	100	0	0	0	0
Others	218	0	0	0	0	26	0	74	100

In the national sphere, Antioquia is first place in EVOA with 40,890 ha, followed by Chocó, with 36,552 ha, and Bolívar in third place with 10,583 ha. This corresponds to 41%, 36% and 11%, respectively, of the national consolidated total. However, Chocó is the province with the highest amount of EVOA in excluded mining areas (28,031 ha), which represents 28% of the national consolidated total and corresponds to 77% of the detected EVOA in the province. Bolívar and Antioquia are next with 10% and 9%, respectively, of the national consolidated total, which represent 87% and 24% of the consolidated total within then territories.

In this context, it is worth noting that 100% of EVOA are illegal exploitation in Valle del Cauca, Guainía and Nariño, and they coincide with these territories for protection.

With respect to areas without environmental restrictions, Antioquia is the province with the highest representation in these territories, at 31% (30,887 ha) of the national detected EVOA and 76% of the consolidated total within the province (figure 16), followed by Chocó with 8% of the national consolidated total and 23% of detected EVOA within the province. In these territories, the fact that the provinces of Cauca, Putumayo and Caquetá hold almost all of the EVOA in areas without environmental restrictions stands out.

Figure 16. Alluvial gold exploitation on land, Antioquia.



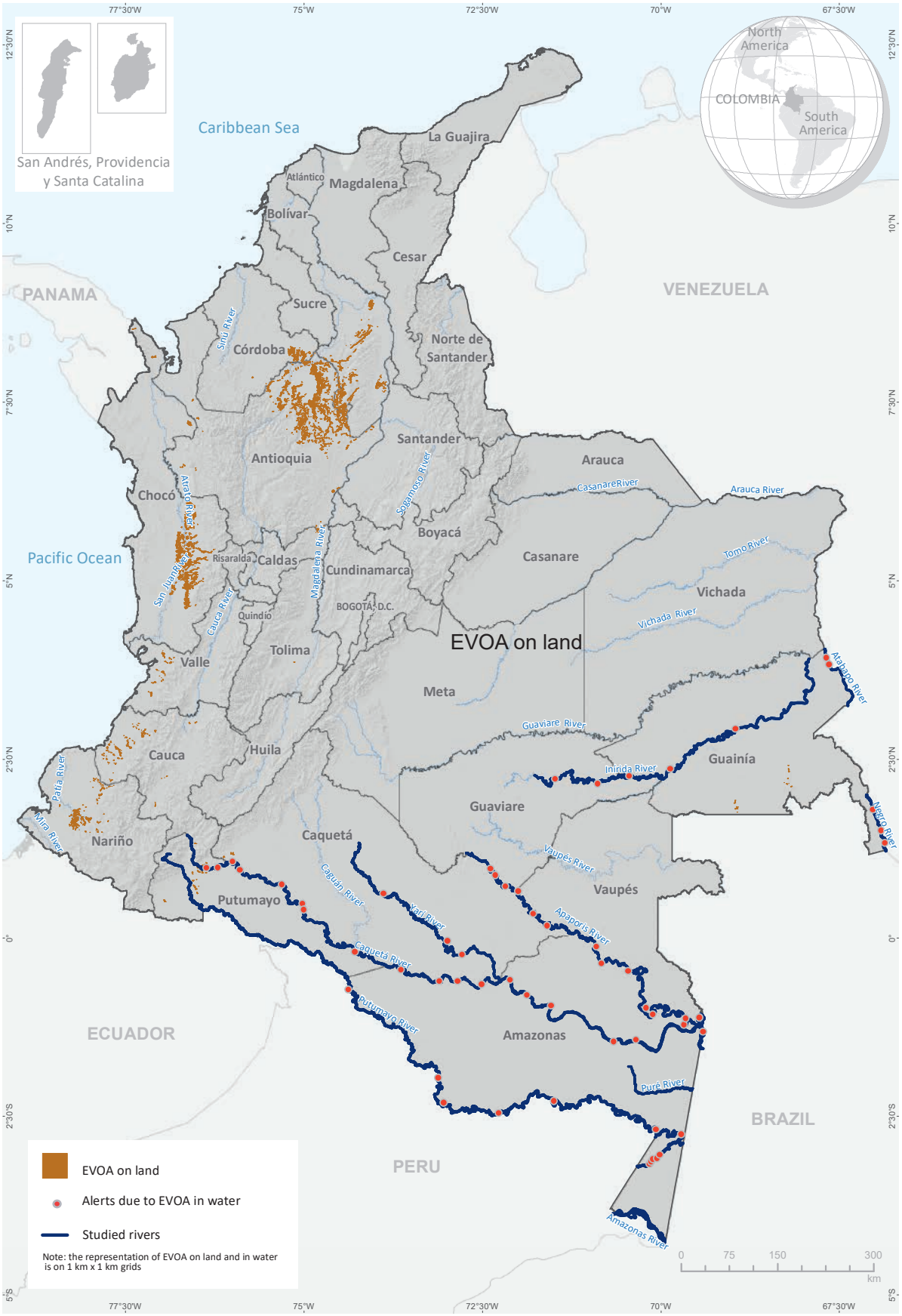
On the other hand, as has been mentioned, restricted mining areas may be found within excluded mining areas and in areas without environmental restrictions. In this sense, at a provincial level, Chocó is the province with the highest concentration of these areas, with 24,970 ha, which represents 88% of the total EVOA in declared ethnic community mining areas and are equal to 25% of the national consolidated total. In light of this data, focusing control strategies in the province on these areas that coincide with ethnic territories in which exploitation outside of the regulatory framework leads to direct negative effects on the conservation of the biotic and cultural heritage is necessary.

Chocó is second place in the national consolidated report on EVOA. Seventy-six percent of it is in excluded mining areas.

Bolívar holds third place in the detection of EVOA on a national level; 88% of it is located in excluded mining areas.

The distribution of EVOA in Colombia is presented below (map 8):

Map 8. EVOA detection in Colombia, 2019.



Source: Government of Colombia - Monitoring system supported by the UNODC.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Alerts due to EVOA in Water

The study, in accordance with the methodology based on the alteration of suspended sediment presented in previous studies, covered the detection of alerts due to EVOA in water in ten rivers of the Amazon and Orinoco Region. The findings of detecting EVOA in water in the ten studied rivers: Putumayo, Caquetá, Apaporis, Amazonas, Atabapo, Cotuhé, Yarí, Guainía (Río Negro), Puré and Inírida, report alerts in the provinces of Amazonas, Caquetá, Cauca, Guainía, Guaviare, Putumayo and Vaupés. On the other hand, the provinces *of Putumayo, Caquetá and Guainía reported both kinds of mining* (table 11).

The detection of alerts due to EVOA in water was base don the spectral dynamics of the 10 rivers that measure approximately 7,000 km in the Colombian territory.

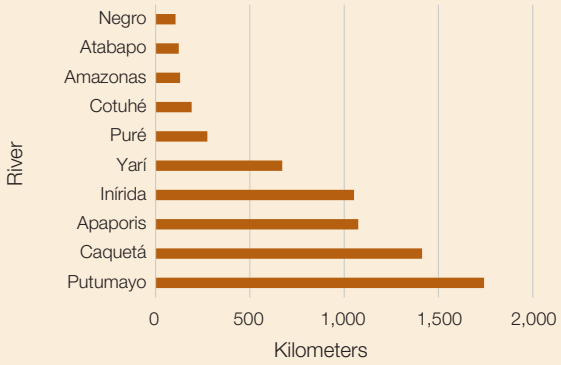


Table 11. Provincial presence of EVOA in water.

Municipalities with alerts due to EVOA in water[49]		
Province	**Municipality**	**Studied River**
Amazonas	La Pedrera	Apaporis River
		Caquetá River
	La Victoria (Pacoa)	Apaporis River
	Leticia	Cotuhé River
	Miritíi-Paraná (Campoamor)	Caquetá River
	Santander (Araracuara)	Caquetá River
	Tarapacá	Cotuhé River
	El Encanto	Putumayo River
	La Chorrera	Caquetá River
	Puerto Arica	Caquetá River
Caquetá	Curillo	Caquetá River
	Solano	Apaporis River
		Caquetá River
	San Vicente del Caguán	Caquetá River

49 The 2019 study only covers 10 rivers, reason why this data is confined to only them and does not account for the presence of this type of exploitation in the entire Colombian territory.

Municipalities with alerts due to EVOA in water		
Province	**Municipality**	**Studied River**
Cauca	Piamonte	Caquetá River
Guainía	Inírida	Inírida River
	La Guadalupe	Negro River
	Morichal (Morichal Nuevo)	Inírida River
	San Felipe	Negro River
Guaviare	Miraflores	Apaporis River
	San José del Guaviare	Inírida River
Putumayo	Puerto Guzmán	Caquetá River
	Puerto Leguízamo	Caquetá River
Vaupés	Pacoa	Apaporis River
	Taraira	Apaporis River

Note: For analyzing this table, use only the digital version information as a reference, the analog has a printing error.

Caquetá, which has EVOA on land at San José del Fragua, also has EVOA in water in other municipalities, among which are Solano, San Vicente del Caguán and Curillo. Alerts due to EVOA in water were mainly detected on the Caquetá River, with the exception of Solano, which also has alerts for the Apaporis River.

The province of Amazonas, on its part, only reports this mining modality and has alerts in four rivers: Caquetá, Apaporis, Putumayo and Cotuhé.

In this context, as in Caquetá, the province of Guainía registered presence of EVOA on land in the municipalities of Paná Paná and Puerto Colombia, as well as alerts due to EVOA in water in the municipalities of Inírida and Morichal on the Inírida River and La Guadalupe and San Felipe on the Negro River. Detected EVOA in these three municipalities coincides with the rivers that border Venezuela.

Among the ten studied rivers, the Puré and Amazonas Rivers in Amazonas and Yarí in Caquetá did not have any alerts due to this type of mining for the period. Nevertheless, it is worth mentioning that the Putumayo River, which is the jurisdiction of the province of Amazonas, had unusual values for the indicator, which could be related to this type of exploitation, but were not validated by local authorities.

The presence of EVOA covers 118 municipalities (11%) of the total 1,122 municipalities in the country: 95 have EVOA on land, 20 only have EVOA in water and 3 (Puerto Guzmán in Putumayo, Inírida in Guainía and Piamonte in Cauca) have both exploitation modalities.

TERRITORY WITH EVOA AND COCA CROPS

The UNODC has been Colombia's official source for coca crop figures since 2003 and EVOA figures since 2018. These two phenomena converge in some parts of the country, making them complex territories for both State intervention and due to the vulnerabilities of the communities that inhabit them. In order to know which ones these territories might be, the convergence of coca crops and EVOA in 25 km^2 areas was evaluated. It is highlighted that, in many cases, mining with the regulatory framework in order can be found in territories with the presence of coca crops, which creates a context of illegality (due to the coca crops). However, it is assumed that there may be actors performing other illegal activities, such as, for example, illegal exploitation of minerals, specifically gold exploitation, in these territories.

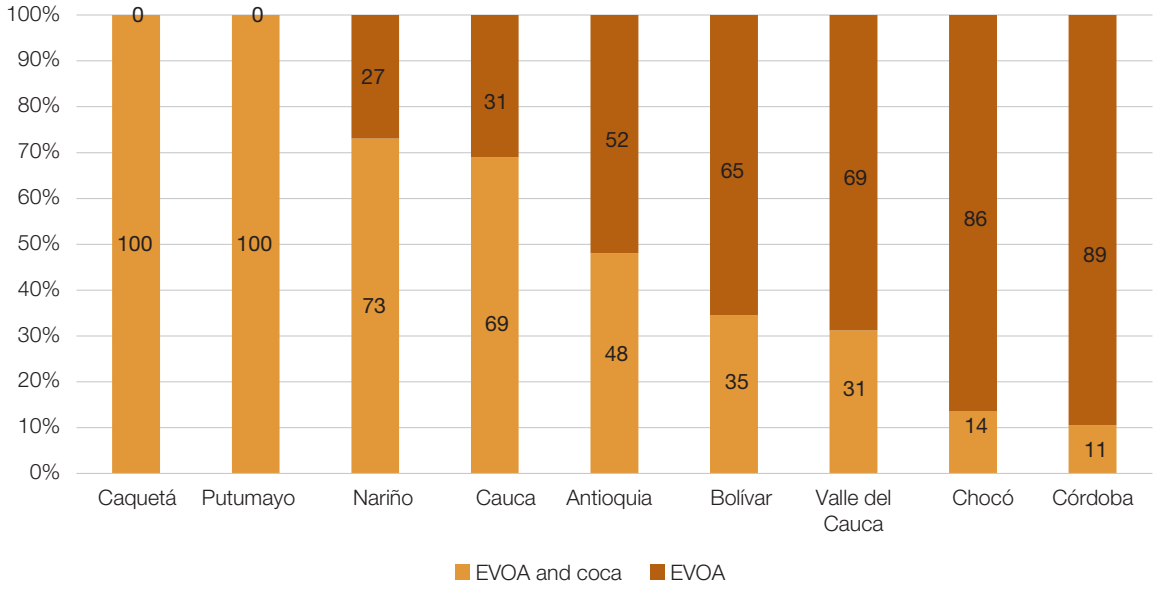
These two phenomena, even though they have different production cycles and market characteristics, are in some cases carried out in vulnerable areas with conditions of poverty, marginality, difficult access and the presence of illegal armed groups. The presence of these phenomena not only generates negative impacts on natural ecosystems but is also a determining factor in the economic and social dynamics of the territories. For this reason, knowledge of the areas in which these activities coincide facilitates developing comprehensive public policies in accordance with these complexities (figure 17).

Figure 17. Areas with alluvial gold exploitation on land and coca crops, Central Region.



In Colombia, coca crop cultivation was identified in 2019 in 41% of the territories with EVOA on land in 2020[50]. In these areas, the area with coca crops reached 10,780 ha and EVOA reached 28,610 ha on land. By comparing these figures to the previous period, a 6% reduction is evident in the territories in which both activities converge. In these areas, although coca cultivation decreased by 2,925 ha, EVOA increased by 490 ha (figure 18). This situation could be reflecting two situations. The first is the tendency for the phenomena of illegality to concentrate in the territory. This pattern was identified in the cultivation of coca crops to increase illicit earnings and in which territorial control is highly significant for the groups that perform the activity. For this reason, a coordinated intervention by the Armed Forces and police in necessary. The second situation may be related to a greater profitability of gold exploitation on land. The activities related to alluvial gold exploitation become stronger and coca crops move to the background. A coordinated intervention between institutions that control and monitor mining, institutions that promote rural development and institutions in charge of maintaining safety and order in the region is recommended in both cases.

Figure 18. Percentage of overlapping territories with EVOA on land (2020) and coca crops (2019).



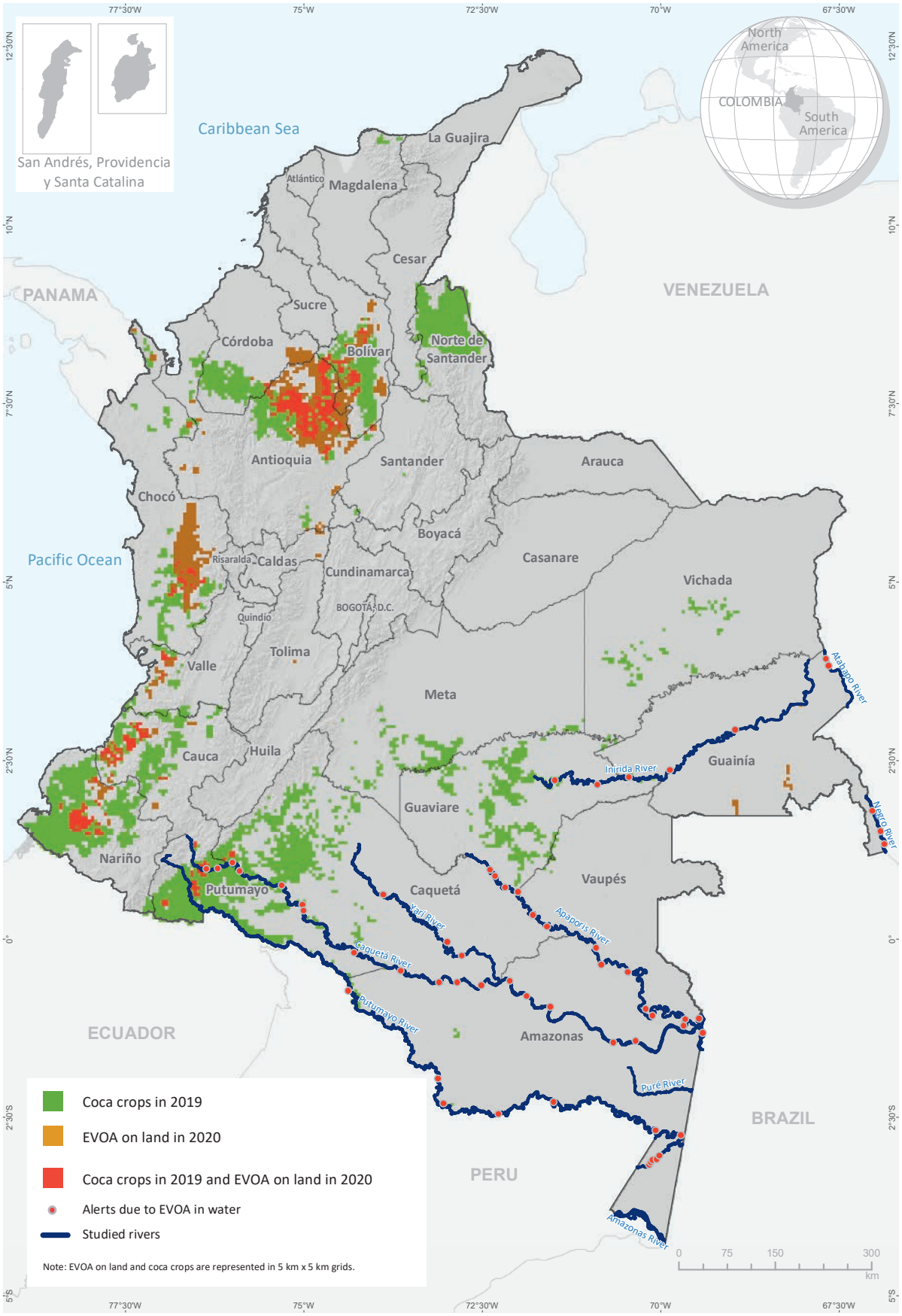
On a provincial level (figure 19), an increase in territories with EVOA and coca crops was identified in Nariño, Córdoba and Caquetá. In Caquetá and Putumayo, all the grids with EVOA in 2020 has coca crop cultivation in 2019. In terms of the percentage of territories with EVOA on land (2020) with coca crops (2019), Nariño and Córdoba increased by 2% and 5%, respectively.

Except for Caquetá, where the grids identified with EVOA in 2020 had a 6% increase in the area cultivated with coca crops, all provinces reduced their coca crops in the territory with EVOA on land by an average of 26%. Chocó, Valle del Cauca and Antioquia stand out, with coca crop reductions of 53%, 50% and 32%, respectively. This dynamic reflects a greater incidence of alluvial gold exploitation.

50 The EVOA and coca crop analyses were performed in 25 km^2 grids of the framework of areas, since territorial coincidence, not geographic coincidence was being sought.

On a municipal level, of the territories with EVOA, 66 had coca crops (6 less than the previous period), with a total of 76,079 ha (49% of the national total of coca crops in 2019). Of the 10 municipalities with the most EVOA on land in 2020, 7 reported coca crops in 2019 (all with a decreasing trend). Cantón de San Pablo did not report coca crops in 2019, Río Quito has not reported coca crops since 2015 and Ayapel has not reported coca crops in the entire historical series. The decreasing trend of both EVOA and coca crops in Montecristo, El Bagre and Cáceres stands out. On the other hand, Nechí, Zaragoza, El Cantón de San Pablo and Istmina, although they reduced the negative impacts of coca crops, increased EVOA in small proportions, which could indicate a transition towards this activity (map 9).

Map 9. Territories affected by coca crops and with EVOA.



Source: Government of Colombia - Monitoring system supported by the UNODC.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Figure 19. 2018-2019 series of coca crops and 2019-2020 EVOA on land in the municipalities with the most EVOA In 2019.

Municipality	EVOA 2019 (ha)	EVOA 2020 (ha)	% Change EVOA	Coca 2018 (ha)	Coca 2019 (ha)	% Change coca
Zaragoza	8,461.34	8,841.93	4	471.23	346.37	-26
Nechí	7,489.01	7,996.43	7	708.03	530.37	-25
Nóvita	5,326.48	5,321.69	-0,1	130.29	69.32	-47
Cáceres	5,592.17	5,284.61	-5	1,826.23	1,101.54	-40
El Cantón de San Pablo	5,069.25	5,253.17	4	5.51		-100
El Bagre	5,131.51	4,842.97	-6	811.02	648.31	-20
Istmina	4,503.03	4,592.61	2	577.36	228.85	-60
Montecristo	3,458.85	3,099.79	-10	716.53	635.21	-11

As a complement to the study on ten municipalities with the most EVOA, a municipal analysis was performed with the 2019-2020 information on EVOA and 2018-2019 information on coca crops. Four classes were created to classify the municipalities with an increasing trend in both phenomena and opposing trends between coca crops and EVOA.

Map 10 shows nodes of growth for both activities in Nariño (Roberto Payán, Magüí, El Charco), on the borders of Putumayo and Cauca (Mocoa, Santa Rosa), north of Chocó (Riosucio, Carmen del Darién) and south of Bolívar (Río Viejo, Arenal, Simití). A total of 12 municipalities showed growth in both activities (4 less than the previous period) and accumulated 7% of 2020 national EVOA on land and 8% of national coca crops in 2019.

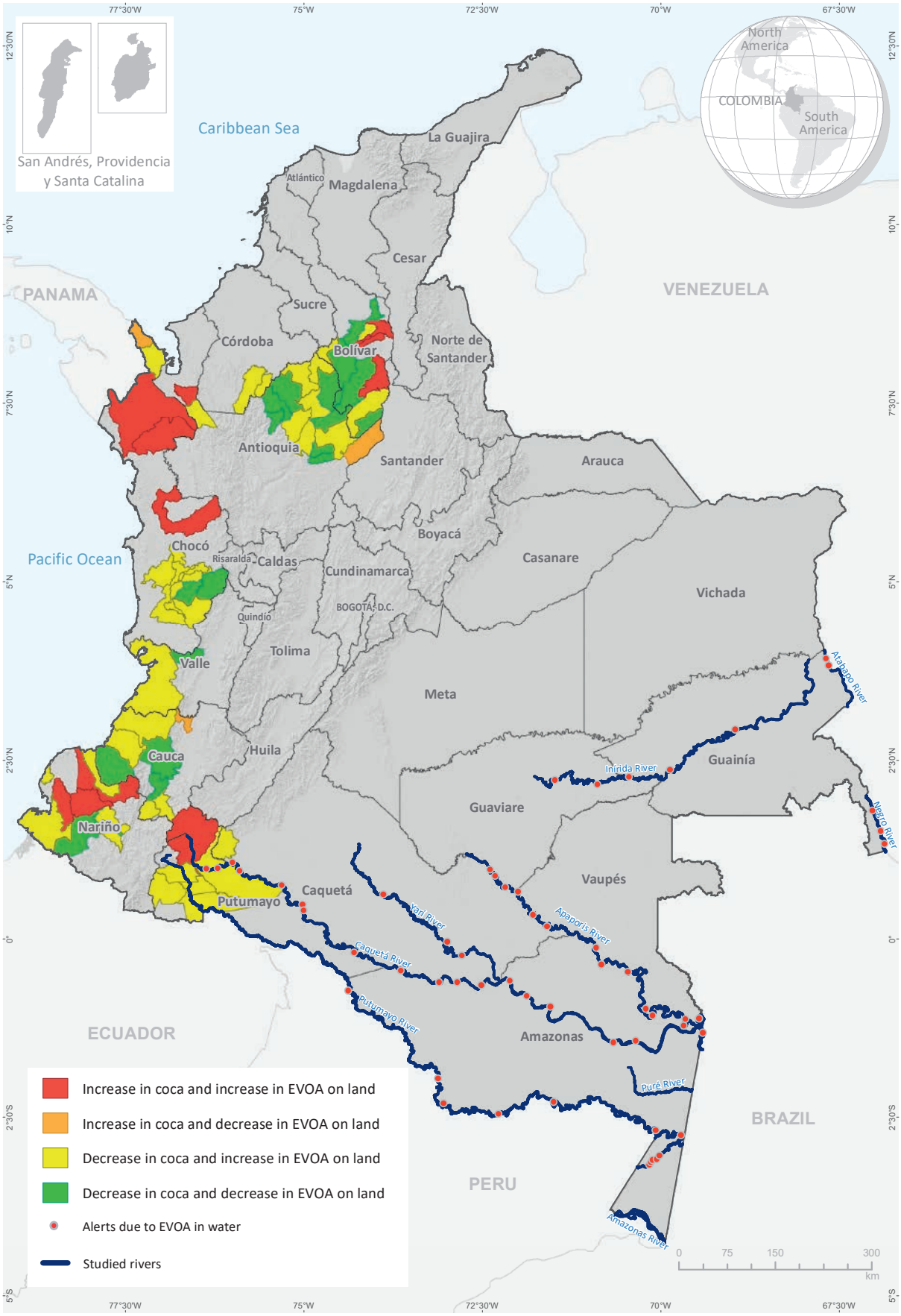
On the other hand, it is noteworthy that coca crops decreased and EVOA on land increased in 36 municipalities (8 in Chocó, 7 in Antioquia, 5 in Cauca, 5 in Putumayo, 4 in Nariño, 3 in Bolívar, 2 in Córdoba, 1 in Caquetá and 1 in Valle del Cauca). This preference for alluvial gold exploitation could indicate highest profitability in this activity.

When it comes to alerts due to EVOA in water in 2020, overlap was observed in the provinces of Caquetá, Cauca, Guainía, Guaviare and Putumayo according to 25 km^2 grids in both activities, accumulating 221 ha of coca crops in the last detection. This behavior is an alert for institutions that exercise control in the area, especially in the Amazon, to prevent the same behavior of EVOA on land continuing to grow due to the possibility of obtaining greater earnings in gold exploitation than in coca crop cultivation.

Upon analyzing intervention data with respect to EVOA and operations, it can be concluded that coverage is limited compared to the territory: only 30% of the territory with some activity had intervention. Upon observing the operations to control mining in the municipalities

in which EVOA is increasing and coca crops are decreasing, only 11% of the operations are located in these territories. However, good coverage of the programs related to reducing the offer of drugs can be observed. In conclusion, it was inferred that the municipalities with both activities are highly complicated scenarios in which isolated intervention strategies could result in failed efforts or the migration from one activity to another.

Map 10. Dynamics of the territories affected by coca crops and with EVOA.



Source: Government of Colombia - Monitoring system supported by the UNODC.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.



Fotograph:
Alluvial gold exploitation on land, López de Micay (Cauca)

SECTION III
DYNAMICS OF THE PHENOMENON

This section covers the results of the dynamics of EVOA, it relationship with high environmental value plant cover and the official production of gold.

DYNAMICS OF THE PHENOMENON

This chapter presents the changes detected in the 2019-2020 period in the provinces and municipalities with EVOA. Five key concepts from the study of this issue were used to do so (see text box). Between 2019 and 2020, the territory with EVOA on land was 111,394 ha, and 77% of the territory was concentrated in Antioquia and Chocó, with 43% and 34%, respectively, which is similar to the dynamic of 2019.

In terms of the mentioned concepts (see text box), the incidence of mining in the territories in 2020 stands out, where close to 80% of the total corresponds to stable areas and is concentrated in the provinces of Antioquia, Cauca, Córdoba and Chocó.

This phenomenon of stability can be interpreted based on two approaches: 1) the wealth of the alluvium being mined is so large that the activity continues, and 2) these are abandoned areas but, due to the degree of intervention, nature has not been able to begin the recovery process with the installation of pioneering species inherent to secondary vegetation. Anthropic actions are required for the latter, in order to help these processes begin.

The provincial data regarding the dynamics of the territory in the 2019-2020 period (table 12) are presented below. Most of the concentration occurred in stable areas, with a total of 87,385 ha (78% of the national total) and were focused on Antioquia and Chocó. The total new area for 2020 was 3,424 ha (3%), concentrated in the provinces of Antioquia, Chocó and Bolívar. The expanding areas observed in 2020 were 9,943 ha (9%), which is half of the focused areas in Antioquia. Moreover, 10,642 ha were reported as abandoned, and the largest records were made in Antioquia, Bolívar and Chocó (Figure 20). The analysis with a risks approach to this dynamic will allow the competent entities to identify the necessary control and prevention measures in the territories that are most vulnerable to expansion.

Concepts:

Affected territory 2019-2020: the geographic sum of the detection of EVOA on land in the 2019 – 2020 period.

Stable area: an area with permanent EVOA on land detected in the 2019 and 2020 studies.

New area: an area with EVOA on land detected in 2020 that did not have EVOA on land in 2019.

Expanding area: an area with EVOA on land detected in 2019 with new mining areas and whose previously detected EVOA shoes continuity.

Area with signs of grasslands and pastures: these are areas with EVOA detected in 2019 that, in 2020, have herbaceous vegetation or short stubble, which are characteristic of the initial stages of plant succession.

Area without information: these are areas with EVOA detected in 2019 that are under the cover of clouds during the study period.

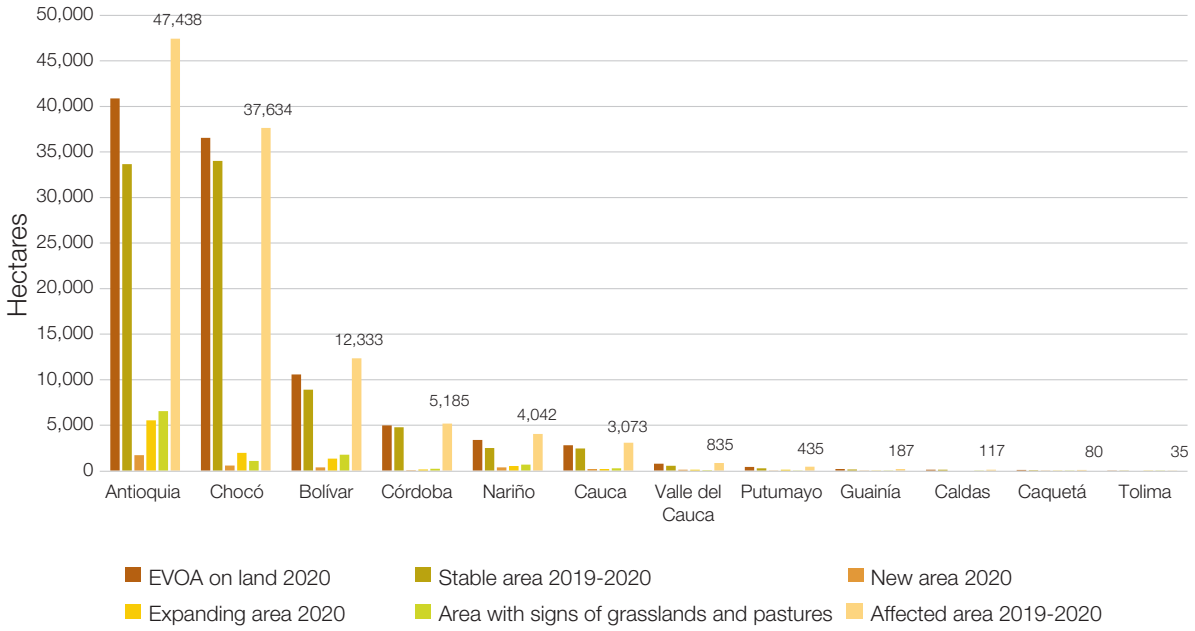
Table 12. Territory with the presence (ha) of EVOA on land, 2019-2020.

PROVINCE	EVOA on Land, 2020	Stable Area, 2019-2020	New Area, 2020	Expanding Area, 2020	Area with Signs of Grasslands and Pastures	Affected territory, 2019-2020	Total Affected, 2019-2020 (%)
Antioquia	40,890	33,653	1,701	5,535	6,548	47,438	43
Chocó	36,552	34,023	573	1,956	1,083	37,634	34
Bolívar	10,583	8,892	373	1,318	1,750	12,333	11
Córdoba	4,975	4,765	59	150	211	5,185	5
Nariño	3,374	2,504	359	512	667	4,041	4
Cauca	2,807	2,431	179	197	266	3,073	3
Valle del Cauca	765	538	115	112	70	835	1
Putumayo	405	260	41	103	31	435	<1
Guainía	185	133	13	39	2	187	<1
Caldas	112	112	-	-	5	117	<1
Caquetá	78	52	10	17	2	80	<1
Tolima	27	22	-	5	8	35	<1
TOTAL	**100,752**	**87,385**	**3,424**	**9,943**	**10,642**	**111,394**	**100**

In terms of the area with signs of grasslands and pastures, the 10% trend for these areas over the total hectares continues, as recorded in the 2018-2019 period. Sixty-seven percent of these first indications of plant succession occurred in illegal exploitation areas and 26% occurred in areas with technical and environmental permits. With respect to the distribution of these areas by provinces, the 20% increase in Antioquia stands out, which, for 2018-2019, recorded 42% of the total area with this characteristic and, for 2019-2020, increased its share to 62%. This phenomenon may be related to the high mobility of gold exploitation in this province, as well as the resource's exhaustion in areas where mining has been ongoing for years. It is worth noting that Antioquia has been the province with the most hectares recorded since 2014. The provinces of Chocó and Bolívar held 10% and 16%, respectively, while Putumayo, Guainía, Caldas, Caquetá and Tolima held <1% of the areas with signs of grasslands and pastures.

It must be taken into account, however, that in those stages, the requirement for germplasm or genetic material to begin the succession process is less demanding in terms of diversity and wealth of species in comparison with the higher stages of plant succession. Successfully concluding the succession process will depend, therefore, among other factors, on the quantity, feasibility and diversity of the germplasm, as well as on the physical and chemical conditions of the soil [14]. It is therefore not possible to definitively ensure that the areas in this category are moving toward a recovery of the original conditions of forest cover.

Figure 20. Area with detected EVOA on land, 2019-2020.



Dynamics of the Phenomenon and Law Arrangements

Upon analyzing the dynamics in the territories and their relationship to law arrangements (table 13), it was observed that, of 76,446 ha reported in the illegal exploitation category, close to 60,000 ha were recorded and a stable area. Provinces such as Chocó, Córdoba, Caldas, Cauca, Valle del Cauca and Guainía maintain over 70% of the illegal exploitation in stable areas. That is to say, the fact that close to 69% of the territory is in the illegal exploitation category and has reported high stability in the last years in an alert indicator for the State and shows the need for interventions that affect this dynamic in terms of reducing this category.

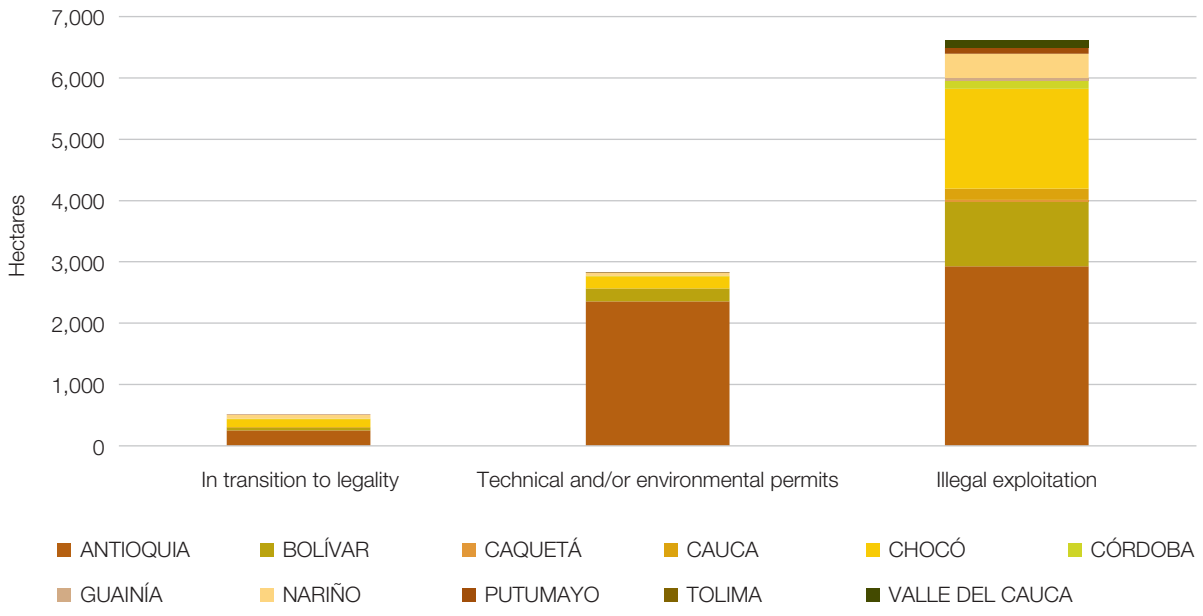
Table 13. 2019-2020 dynamics and their relationship with law arrangements.

Dynamics of 2019-2020	In Transition to Legality	Illegal Exploitation	Technical and/ or Environmental Permits
Stable	21,199	6,190	59,997
Abandoned	2,839	625	7,179
New	2,831	507	6,605
Expanding	649	177	2,596
Total	**27,518**	**7,499**	**76,377**

With respect to abandonment, Antioquia reported 6,548 ha for 2020, most of which were in the category of technical/ environmental permits (2,301 ha) and illegal exploitation (3,907 ha). The provinces of Bolívar and Chocó presented a high abandonment rate within illegal exploitation in 2020, with 1,349 ha and 896 ha, respectively.

It stands out that, in the category of illegal exploitation, 6,605 ha of new areas were reported, primarily focused in Antioquia, Chocó and Bolívar (87%) and in the municipal sphere of Remedios, Segovia and Zaragoza in Antioquia. Figure 21 shows the concentration of hectares without any type of law arrangement or of illegal exploitation for 2020. This may be attributed to the increase in the international price of gold and the high profitability of illegal exploitation.

Figure 21. New hectares by type of law arrangement.



EVOA AND GOLD PRODUCTION

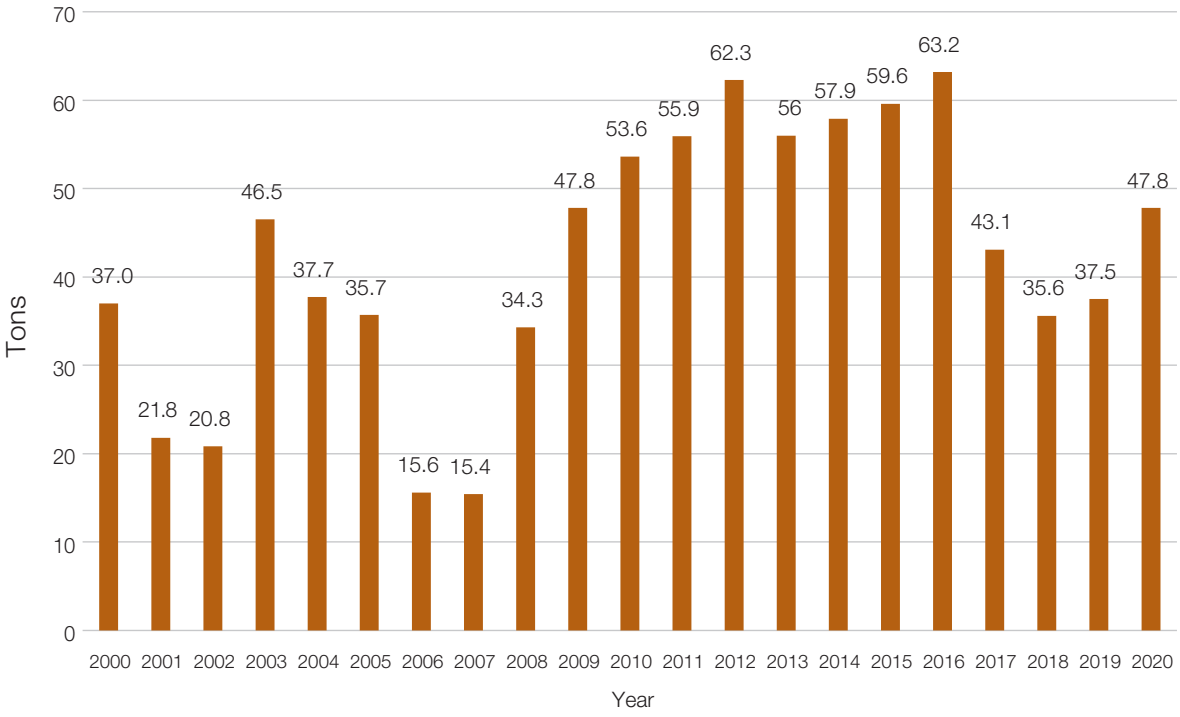
The mining and energy sector is a fundamental pillar in the country's economy. Gold production, though it is not the primary mineral resource that is mined, may have significant potential for the sector's growth. According to information from the National Mining Agency (ANM)[51], Colombian gold production represented approximately 1.3% of global production in 2019: Colombia is sixth place in gold production in Latin America (the main producers are Peru and Mexico) and twenty-fourth in the world.

The gold market is characterized by its strategic character in connection with the global economy and, in light of global economic uncertainty, gold becomes a highly attractive investment tool with low unit costs for transportation [15]. This can be observed through the current behavior: the price of gold is currently at its historical maximum levels. The highest price was recorded in August 2020, at USD 2,100 per ounce (an international measurement that is equal to 31.1 g of gold), and prices have remained between USD 1,800 and USD 2,000 during this year. Experts attribute this behavior to the global pandemic, which has given indications of affecting economies, with the tendency to demand gold as a stable asset.

The unstable behavior of gold production in Colombia can be viewed in figure 22: the greatest decrease was recorded between 2006 and 2007, when average production was at 15.5 t. It subsequently began increasing, with an average production for 2010-2016 of 59 t (the average price in 2012 and 2013 was USD 1,668.85 and USD 1,409.81 per troy ounce). As of 2017, production levels decreased compared to the previous periods due to the implementation of controls over the production of subsistence mining, which dropped by 20.4 t (51.4%) between 2016 and 2017. Formalization requests decreased in that same period by 8 t. Gold production reported in 2018 and 2019 was 35.6 and 37.5 t, respectively, while 47.8 t were reported in 2020.

51 The ANM is in charge of the official report on the country's production of minerals, and it is obtained through the declaration of production by the six types of miners authorized to mine and the corresponding liquidation and payment of royalties. In the case of precious metals, productive level, amount of mined minerals and origin with respect to municipality and province are determined by type of miner.

Figure 22. Gold production in Colombia (t).



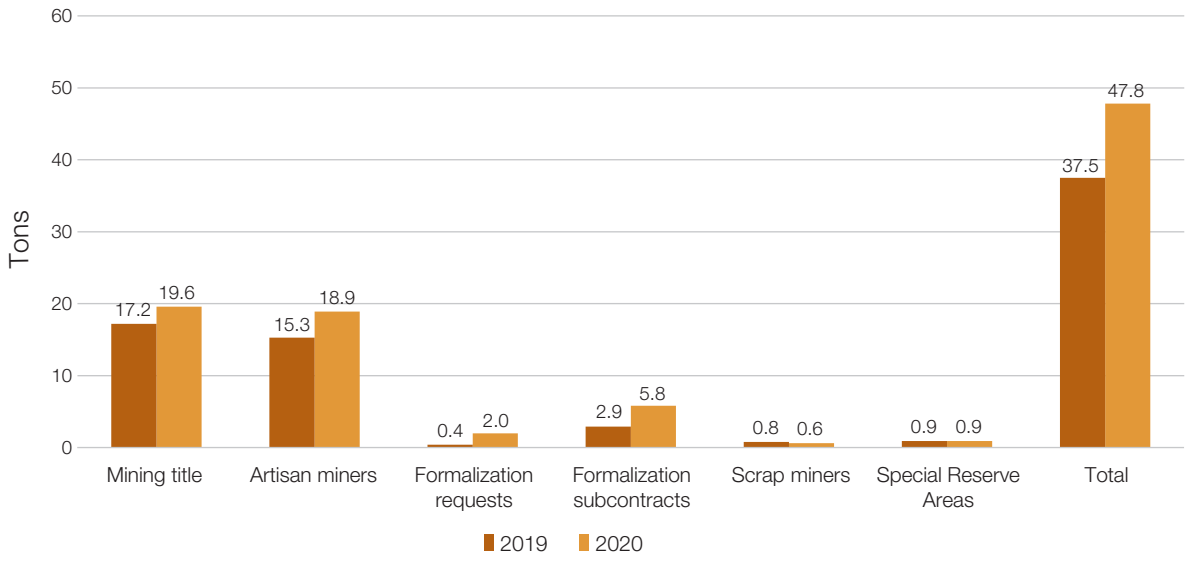
Source: [16].

The productive structure in 2019 on a national level shows a concentration between two types of miners: 45.9% comes from miners with mining titles (17.2 t), 40.8% from artisan miners (15.3 t) and the remaining 13% (5 t) is distributed among subcontracts, ARE, scrap dealers and formalization requests. The report for subcontracts is especially relevant, which in 2019 demonstrated a significant change compared to the previous year, with a 154% increase (table 14). On their part, in 2020, 41% came from mining titles and 39.6% from artisan miners. Formalization subcontracts had a 12.1% share of the total (figure 23).

Table 14. Production by type of miner (t), 2019-2020

Type of exploitation	2019	2020
Mining title	17.2	19.6
Artisan miners	15.3	18.9
Formalization requests	0.4	2.0
Formalization subcontracts	2.9	5.8
Scrap miners	0.8	0.6
Special Reserve Areas (ARE)	0.9	0.9
Total	**37.5**	**47.8**

Figure 23. Gold production by type of miner, 2019-2020



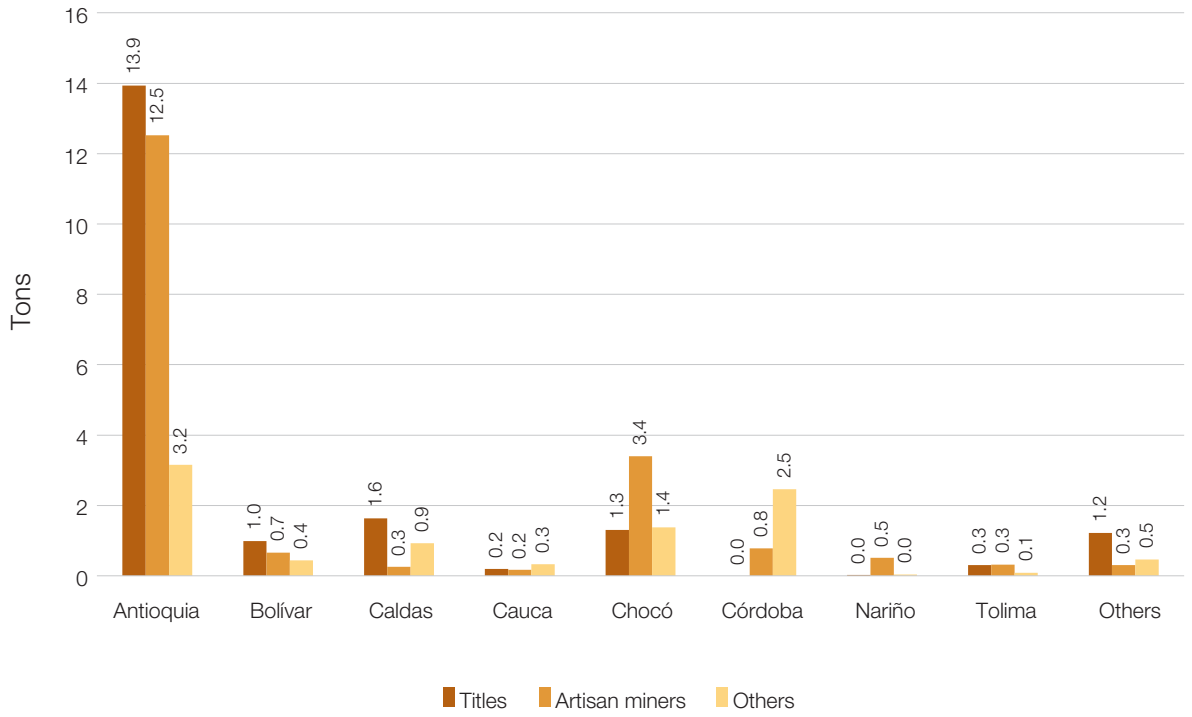
Source: [16].

In 2019, 88.5% of gold production came from five provinces: Antioquia, Chocó, Bolívar, Córdoba and Caldas, which registered differences in forms of exploitation. Antioquia reported the highest production, with close to 21 t, which is equal to 55.9% of the national total, and Chocó had a production of 5.2 t (13.9% of the national total).

Following them are the provinces of Bolívar, with 3.2 t (8.5% of the national total); Córdoba, with 2.2 t (5.8% of the national total); Caldas, with 1.6 t (4.4% of the national total), and 11 other provinces 4.3 t (11.5% of the national total).

In 2020, 82% of gold production came from three provinces, which were Antioquia, Chocó and Córdoba. Antioquia reported the highest production in the country with 29.6 t (62% of the national total), of which 13.9 came from mining titles, 12.5 from artisan miners and 2.3 from subcontracts. Next in importance was the province of Chocó, which reported a production of 6.1 t (13% of the national total) – 3.4 t from artisan miners, 1.3 from mining titles and 0.8 from subcontracts. Córdoba recorded a production of 3.2 t (7% of the national total), of which 2.5 t come from subcontracts and 0.8 from artisan miners (figure 24).

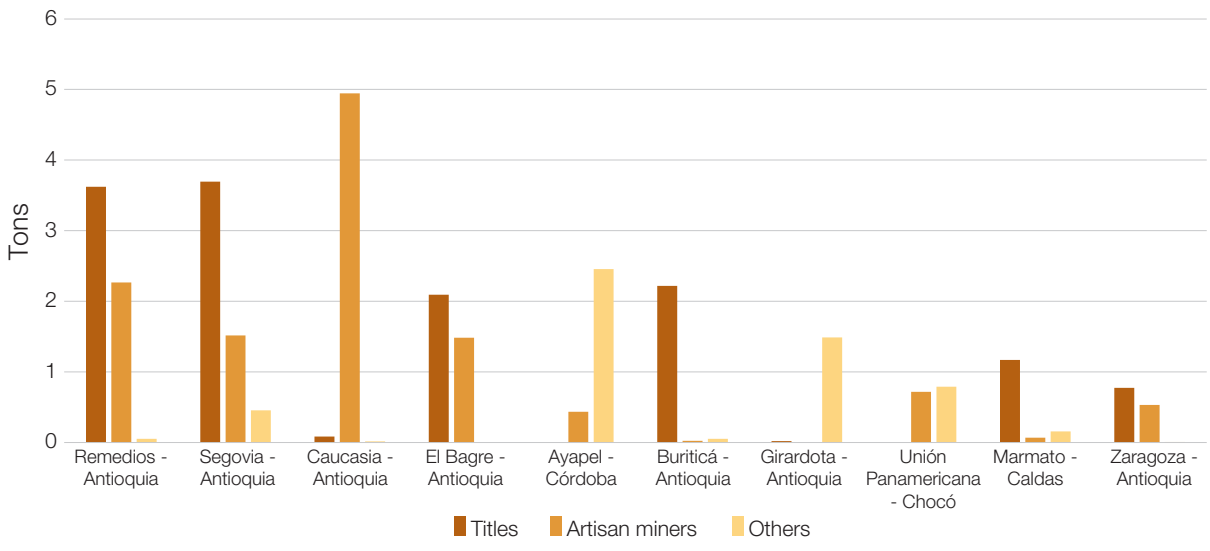
Figure 24. Gold production by province and type of miner, 2020.



Artisan miners produce 100% of the gold registered in Guainía, Sucre and Valle del Cauca. On its part, extraction in Chocó by means of artisan miners reaches 56%.

On a municipal level, the 10 municipalities with the highest reported gold production in 2020 hold 65% (31.1 t) of national production. Seven are in the province of Antioquia, 1 in Córdoba, 1 in Caldas and 1 in Chocó. The municipalities of Remedios, Segovia, Caucasia and El Bagre, in the province of Antioquia, and the municipality of Ayapel, in Córdoba, account for 48% of national production (23.1 t) (figure 25).

Figure 25. Main municipalities that produce gold by type of miner, 2020.



Gold Production and Areas Detected with EVOA in the Illegal Exploitation Category

In accordance with the studies performed on the evidence of gold exploitation by the UNODC and MinEnergía, the trend on a national level is an increase in the area detected with EVOA on land. The territory with EVOA moved from 78,939 ha in 2014 to 83,620 ha in 2016, 98,028 ha in 2019 and 100,752 ha in 2020 (a 28% increase between 2014 and 2020). Close to half of it is in excluded mining areas, territories in which mining is prohibited due to their function protecting and conserving the environmental heritage.

In 2019, 66% of alluvial gold exploitation with machinery on land was performed outside of any law arrangement (64,727 ha). In the first semester of 2020, mining corresponded to 69% of EVOA (69,198 ha). In other words, it is in the category of illegal exploitation that occurs in scenarios that are favorable for the involvement of armed structures in this activity (table 15).

Table 15. Gold production and EVOA (illegal exploitation category) by province, 2019-2020.

	EVOA (2019)	Illegal exploitation (2019)	Percentage	Gold production (2019)	EVOA (2020)	Illegal exploitation (2020)	Percentage	Gold production (2020)
Antioquia	40,201	20,744	52	20.953	40,890	19,842	49	29.613
Chocó	35,105	27,543	78	5.190	36,552	29,878	82	6.079
Bolívar	10,642	5,799	54	3.202	10,583	8,444	80	2.082
Córdoba	4,976	4,723	95	2.175	4,975	4,549	91	3.240
Nariño	3,171	2,862	90	0.982	3,374	2,549	76	0.562
Cauca	2,697	1,885	70	0.875	2,807	2,456	87	0.688
Valle del Cauca	608	608	100	0.230	765	765	100	0.081
Putumayo	291	285	98	0.003	405	370	91	-
Guainía	135	135	100	0.135	185	185	100	0.064
Caldas	117	86	74	1.654	112	81	72	2.807
Caquetá	53	53	100	0	78	78	100	-
Tolima	30	3	10	1.279	28	2	7	0.709
Others	0	0	0	0.80038	0	0	0	1.837
Total	**98,028**	**64,727**	**66**	**37.478**	**100,752**	**69,198**		**47.762**

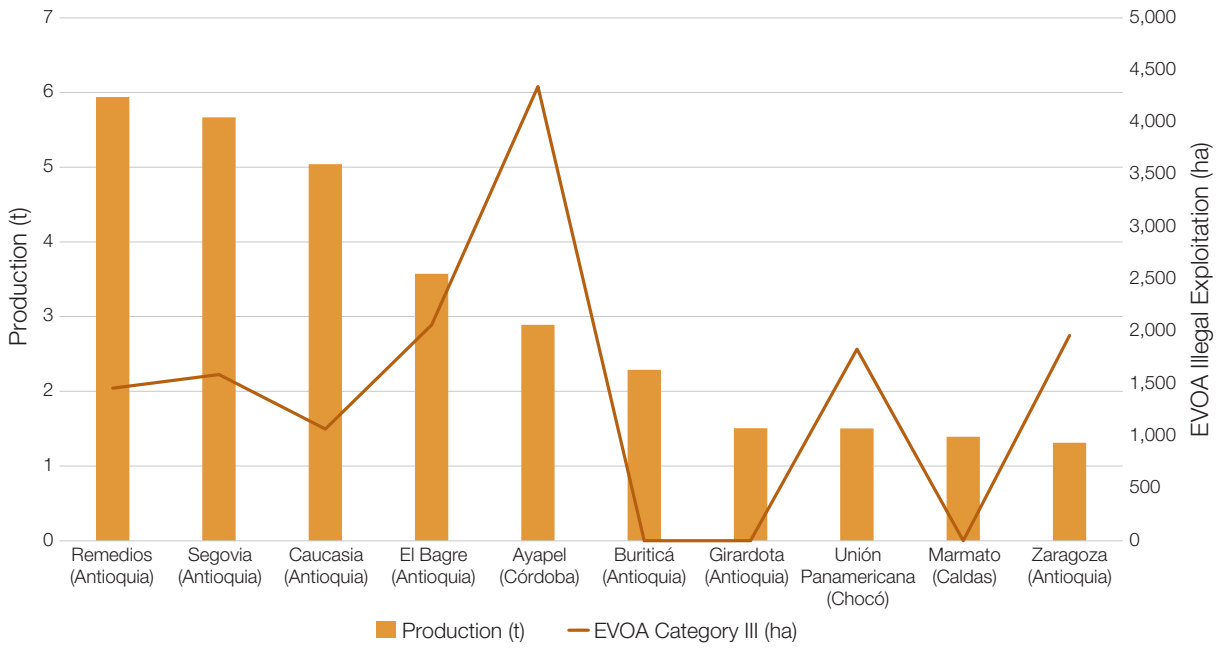
Antioquia is the province with the highest presence of EVOA on land: close to half is in the illegal exploitation category, and it is the province that reports the most gold production in the country, with 56% for 2019 and 62% for 2020. On its part, Chocó is the province with the second highest presence of EVOA: close to 80% is in the illegal exploitation category, and it

has a 14% share in 2019 and 13% in 2020 of the gold production reported in the country for these two years in 2020.

Although the provinces of Córdoba, Nariño, Cauca and Valle del Cauca are above 80% in the illegal exploitation category (between 2019 and the first semester of 2020), the reported production is relatively lower than that of Antioquia and Chocó. However, it is pertinent to deeply know and understand the real levels of production due to the illegality of gold exploitation in various parts of the country.

On a municipal level in 2020, the 10 municipalities with the highest gold production were Remedios, Segovia, Caucasia, El Bagre, Buriticá, Girardota and Zaragoza in Antioquia, Ayapel in Córdoba, Unión Panamericana in Chocó and Marmato in Caldas. These municipalities contributed 65% of the national total (31.1 t). The highest presence of EVOA was registered in Zaragoza, El Cantón de San Pablo, El Bagre, Ayapel and Istmina. For the category of illegal exploitation related to EVOA, the municipalities of El Cantón de San Pablo (99%), Ayapel (91%), Segovia (64%), Istmina (64%), Remedios (62%) and Unión Panamericana (60%) stand out (figure 26).

Figure 26. Main municipalities that produce gold and with the presence of EVOA (Category III), first semester of 2020.



More area with detected EVOA can be observed in productive regions with a high participation of artisan miners than regions with mining titles. Although the data show a higher association between the variables on a provincial level and less on a municipal level, this variation may be partially caused by distortions in the report on the real origin of production. Therefore, it is pertinent to strengthen the development of the mining activity in the territories with a significant participation of subsistence mining, as well as its controls and requirements. Moreover, the above allows calling attention to the municipal mayor's offices for them to improve their follow-up on this activity in their jurisdictions, especially when it comes to registering and approving miners.

LOSS OF HIGH ENVIRONMENTAL VALUE PLANT COVER 2019-2020

Among the main tasks associated with alluvial gold exploitation with machinery on land is removing large amounts of soil, which entails the loss of land cover in sites destined to mining these types of deposits [17]. Consequently, mining has been identified as one of the direct causes of deforestation in Colombia [18]. However, the chapter's objective is not to analyze deforestation caused by EVOA on land[52].

The analysis of high environmental value land covers is approached according to the methodology established years prior between the UNODC and MinEnergía to define the categories of interest [1]. In this sense, based on identifying the levels of intervention of original land covers using remote sensing, determined by spectral response as a function of biomass content and vigor of the vegetation, it is possible to achieve the respective categorization (table 16)[53].

Table 16. Categorization of high environmental value land covers.

Category	Description	Temporality
Primary vegetation	Primary natural forests and other plant covers that have had no type of intervention.	Hundreds or thousands of years since the last intervention.
Secondary vegetation*	Plant covers that have experienced various stages of natural succession after the primary vegetation was anthropically or naturally, and have achieved great recovery.	5 or more years since the last intervention.
High stubble*	Plant covers in an intermediate stage of plant succession resulting from the natural regeneration process subsequent to the intervention on primary vegetation.	2 to 5 years since the last intervention.
Short stubble*	Plant covers in the first stage of plant succession, once primary vegetation has been intervened or altered.	6 to 24 months since the last intervention.

* Categories grouped under the denomination "plants in succession".

It is worth highlighting that units corresponding to the category of primary vegetation were identified by updating the layer prior to these wooded land covers, according to expert criteria. Moreover, it is clarified that the total time window for interpreting high environmental value plant cover follows the period between August 18th, 2019 and September 12th, 2020, with a concentration of 70% of the data in satellite images of 2020.

52 The official institution in charge of presenting the figures of deforestation in Colombia is the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM).

53 For more information, see [3].

During the 2019-2020 study period, 5,763 ha of high environmental value plant cover were lost in Colombia due to new EVOA, which represents 6% of the total national figure of the phenomenon detected in 2020.

Ninety-three percent of the plant cover lost during this period (5,353 ha) is in the two categories with the presence of arboreal individuals (primary and secondary vegetation) that offer most ecosystemic services. The remaining 7% (410 ha) corresponds to areas with brushes and grass intervened by this phenomenon (high and short stubble).

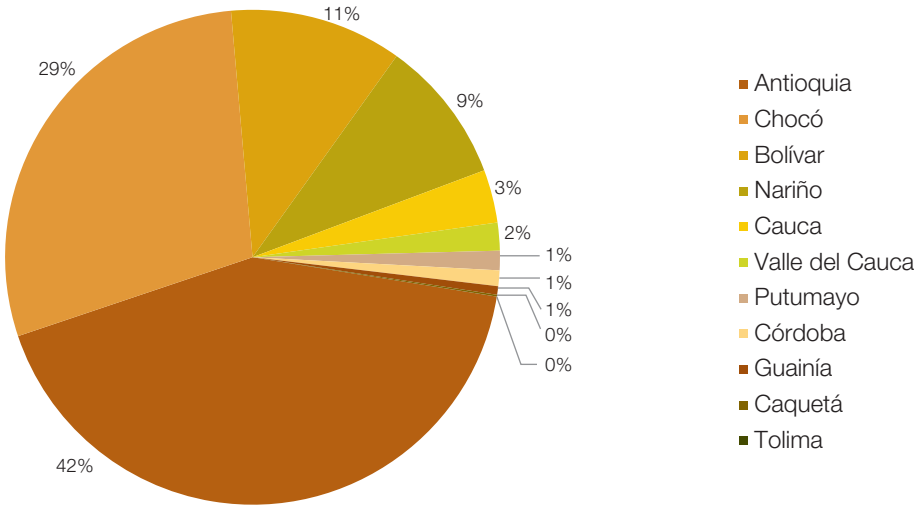
In terms of plant succession, 63% of the intervention (3,614 ha) has occurred on original plant cover (primary vegetation) or cover without evidence of intervention. The remaining 37% (2,149 ha) included the presence of plant cover classified as plants in succession because it was in some successional stage when the EVOA on land appeared.

Some type of loss of high value plant cover was registered in 11 of the 12 provinces with EVOA on land in 2020 as a caused of this phenomenon, with respect to 2019. This situation is primarily concentrated in Antioquia and Chocó, since these provinces bring together 71% of the national total in terms of loss of plant cover. Figure 27 shows the national distribution of these losses.

In Chocó, the loss of high environmental value plant cover was concentrated in the category of primary vegetation, since 93% of the changes in this province occurred on this plant cover (1,579 ha). This, in turn, represents 44% of the national intervention in the category.

In Antioquia, even though it is the province with the highest loss of high environmental value plant cover due to EVOA on land with 42% of the national total area with this type of intervention (2,437 ha), intervention on plant covers in some stage of plant succession is predominant (secondary vegetation, high stubble and short stubble): 1,423 ha in these areas, which represents 58% of provincial losses and 66% of the changes to plants in succession in the country.

Figure 27. Loss of high environmental value plant cover by province, 2019-2020.



Another two provinces (Bolívar and Nariño) concentrated 21% of the modifications to plant cover, in which the change was focused on primary vegetation, at 61% and 62% of provincial intervention, respectively. The seven remaining provinces hold 8% of the total loss in the country.

Upon deepening the analysis scale for the 2019-2020 period of the 102 municipalities with EVOA on land detected in 2020, 92 of them recorded losses in high environmental value plant cover as a consequence of this phenomenon. Losses of over 100 ha were observed in 19 municipalities, and they group 77% of the national total of changes for this reason, while the ten municipalities with the most loss concentrated 51% of the figure in the country (table 17).

Table 17. The ten municipalities with the highest loss of high environmental value plant cover due to EVOA on land, 2019-2020.

Municipality	Province	Loss of land cover (ha)	% of National Participation
Zaragoza	Antioquia	489	8
El Bagre	Antioquia	324	6
Montecristo	Bolívar	321	6
Anorí	Antioquia	279	5
Río Quito	Chocó	274	5
Nechí	Antioquia	263	5
Cáceres	Antioquia	255	4
Barbacoas	Nariño	244	4
Nóvita	Chocó	235	4
Quibdó	Chocó	230	4

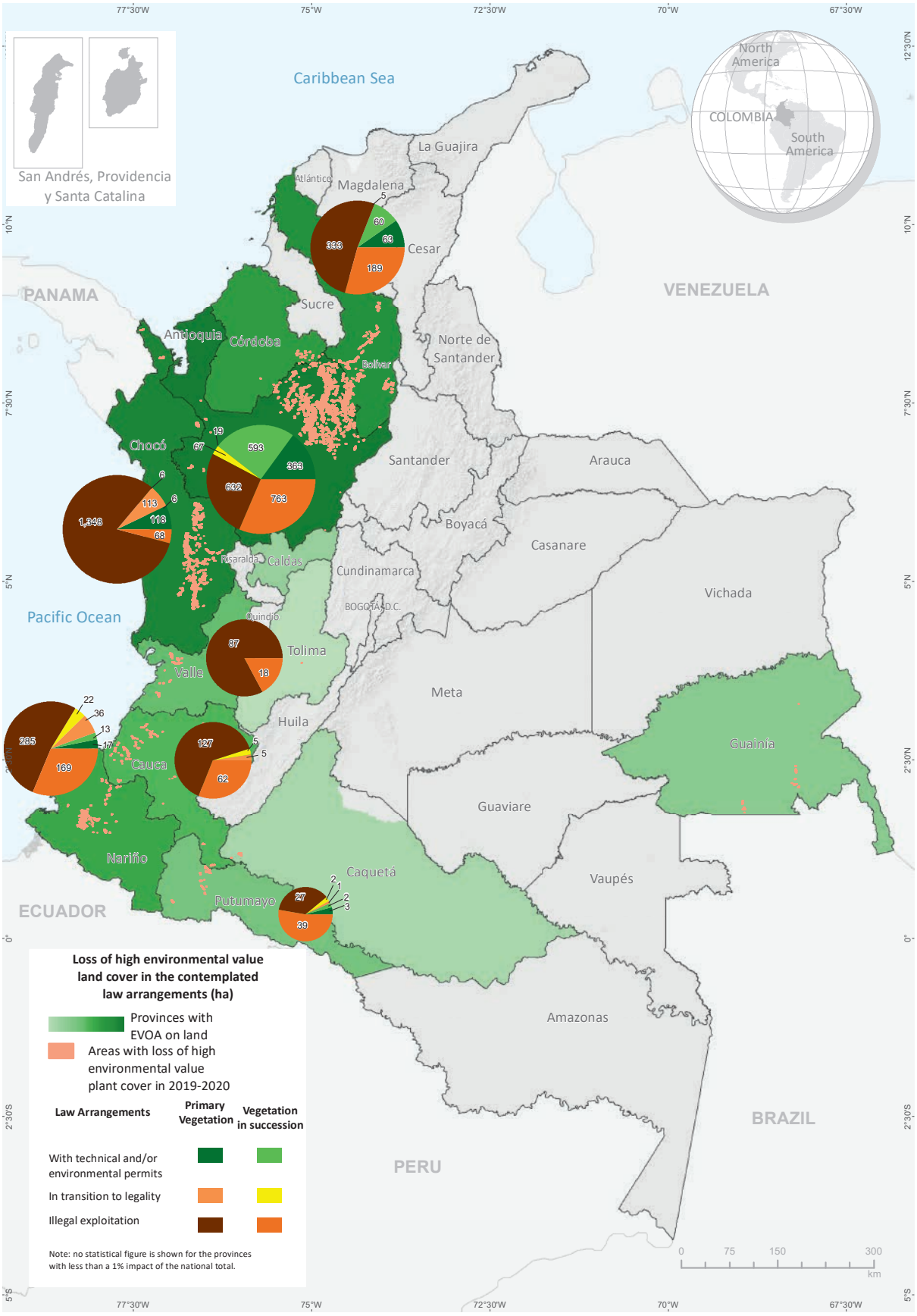
Of these ten municipalities, the three in the jurisdiction of Chocó registered over 90% of their internal losses on primary vegetation: Río Quito (99%), Nóvita (95%) and Quibdó (92%). Upon extrapolating the loss of plant cover to the entirety of municipalities with loss of high environmental value plant cover, 26 municipalities concentrate over 90% of the change inside of them on primary vegetation, most with a low proportion compared to the national total. However, municipalities such as El Cantón del San Pablo and Medio Atrato (also in Chocó) stand out in this group because they registered more than 100 ha in their total loss of high environmental value plant cover.

Findings According to the Classification of the Contemplated Law Arrangements

In terms of the loss of high environmental value plant cover due to EVOA on land between 2019 and 2020 and its associated with the current law arrangements (figure 28), 74%

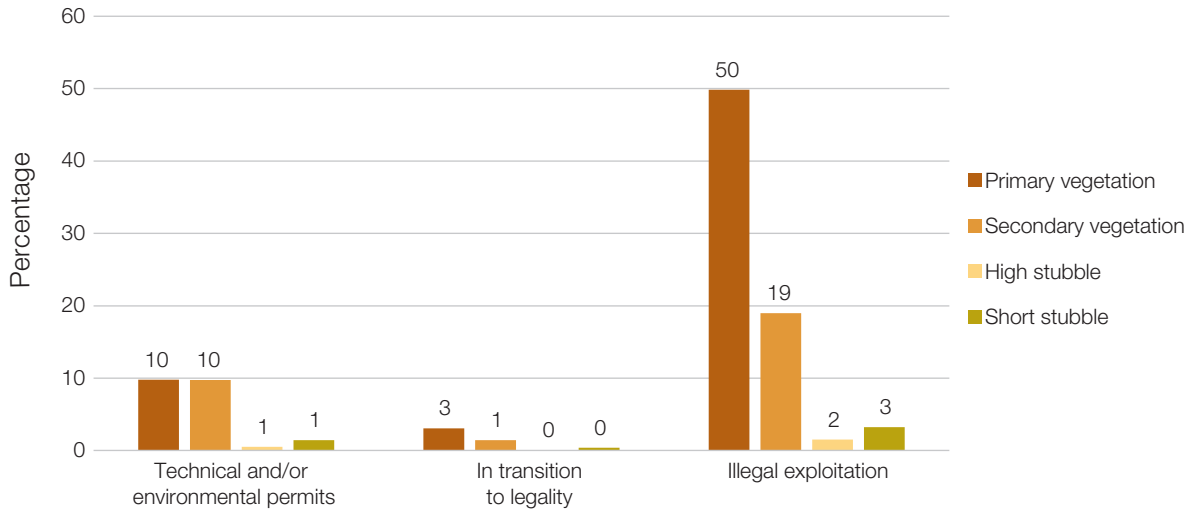
of the total loss (4,240 ha) occurs in areas defined as illegal exploitation areas, as the significant group in which there were losses in the 11 provinces of interest. Twenty-one percent were losses in areas with technical and/ or environmental permits for mining (1,239 ha), in which only Antioquia concentrated 77% of the loss in this group of law arrangements, and 39% of its intervention is in areas in which all requirements are met. The remaining 5% (284 ha) corresponds to the loss of plant cover in areas that are in transition to legality. In this group, Chocó has the greatest share at 42%. Map 11 shows the national distribution of this situation.

Map 11. Loss of high environmental value plant cover in the contemplated law arrangements, 2019-2020.



Source: Government of Colombia - Monitoring system supported by the UNODC. For law arrangements: Ministry of Mines and Energy.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

Figure 28. Loss of high environmental value plant cover due to EVOA on land according to the contemplated law arrangements, 2019-2020.



Only in areas with technical and/ or environmental permits for mining was the loss of primary vegetation lower than intervention in areas with plants in succession: 46% compared to 54%, respectively. The loss of primary vegetation was predominant over other categories in areas in transition to legality and illegal exploitation areas, with 62% and 68%, respectively, compared to the total in each group of law arrangements.

When there are new areas and areas in which EVOA on land is expanding, they are usually established outside of a law arrangement (illegal exploitation) and in places where the continuous mass of arboreal vegetation is primarily removed. This puts the offer of vital ecosystemic services inherent to this type of vegetation at risk.

On the other hand, if the loss of plant cover occurs in areas in transition to legality, compliance with the commitments of applicants to this modality must be verified, since the prerogative of mining limits them to manual means. Therefore, any large-scale removal of plant cover should not exist. Moreover, it is necessary to determine if there are ongoing administrative protection actions in the event of disturbances by third parties in these areas.



Fotograph:
Alluvial gold exploitation on land, Villagarzón (Putumayo)

SECTION IV INSTITUTIONAL MANAGEMENT

This section presents the data related to control actions on illegal exploitation and their relationship with EVOA. It raises awareness on the different tools the Government has for regularization and formalization, in order to formalize strategies and formulate policies. Finally, this section proposes alternatives for legal development in light of the particularities of the territory.

INSTITUTIONAL MANAGEMENT

Illegal exploitation is considered an "issue of a multidimensional nature that, in all its aspects, is a serious threat to the peace, security, governance, economy and stability of the Member Countries[54]".

The monitoring by UNODC shows there are territories in which the illicit economies associated with drug trafficking and illegal gold exploitation converge. The Military Forces and Police have observed, in some areas, the indiscriminate use of heavy machinery on land and in water, as well as the use of substances such as mercury, which has had heavily negative impacts on the ecosystems that, in many cases, are irreversible. In light of the high profitability of illicit economies, illegal armed groups diversify their portfolio of resources that work as financial support and can be used to strengthen their structures.

The country faces many challenges with multidimensional responses aimed at transforming environments and territories, in which mining can become a driving agent of positive development. Nevertheless, it requires effective control over illegal gold exploitation, which converges with other illicit economies, such as drug trafficking. This requires institutions that have been strengthened on a national and territorial level, as well as coordination and synergies between institutions, in order to approach these problems.

On a national level, the national government, led by MinEnergía, is in charge of designing the policies of the country's mining and energy sector, establishing strategies to lead miners with a vocation for performing the activity towards legality taking into account the particularities of the territories and nature of the mining, providing guidelines for the use of mineral resources with respect to the development of mining businesses. Moreover, it provides legal tools for a clear and stable legal framework for the sector that contributes to the transition to legality of miners to perform activities in areas where it is allowed and with a vocation for mining, in conditions where the security and life of people is the priority.

In order to strengthen the capacities for implementing the operational actions of the National Police against the illegal activity in the territory by means of an inter-administrative agreement with this institution, support was provided in this matter and they were able to develop operatives in the provinces of Antioquia, Bolívar, Cauca, Chocó, Nariño and Valle del Cauca. The obtained operational results allowed the National Police to destroy and seize equipment, intervene in mines and capture offenders. On the other hand, and in other to contribute more detailed information on the areas with illegal exploitation by means of aerophotography, the capacities provided by the Colombian Air Force were used in the Provinces of Amazonas, Antioquia, Caquetá, Chocó, Nariño and Valle del Cauca to take images and for georeferencing.

Furthermore, MinEnergía has reached various regions in order to train and strengthen the authorities that control the established processes and procedures to make sure all mining activities and performed legally and according to the current regulations. In 2020 (table 18), 11 virtual and 3 on-site training sessions were held for regional, provincial, municipal and local authorities who control illegal exploitation.

54 Andean Community of Nations, Decision 774 of June 30, 2012.

Table 18. Strengthening capacities in the framework of training on "Regulatory coordination tools for controlling illegal exploitation".

Province	Date	Number of Participants
Boyacá	February 24th – 25th and 26th	45
Huila	March 5th	65
Chocó	March 12nd and 13rd	40
Risaralda and Caldas	May 20th and June 19th	137
Córdoba	June 3rd and July 23rd	56
Putumayo, Caquetá and Amazonas	June 24th and July 8th and 15th	202
Nariño	August 5th, 12nd and 18th	189
Cauca	September 2nd, 9th and 16th	96
Antioquia	October 7th, 15th and 22nd	162
Valle del Cauca	November 4th and 18th	72
Boyacá	December 3rd	137

On the other hand, the ANM is responsible for executing and implementing policies. Among its functions is managing mining resources by encouraging, promoting, granting titles, following up on and controlling exploration and mining.

On a local level are the municipal mayor's offices that also operate as auditing agents. Social organizations related to mining and institutions in charge of protecting the environment, such as Regional Autonomous Corporations (CAR), are also highlighted. The mining sector has great potential of increasing its participation in the national and regional GDP sustainably and becoming a driver of development, since the beneficiaries of the resources are mainly the territories. The aim is for the resources to be destined to financing social, economic and environmental development projects on a municipal and regional level.

It is responsibility of the General Attorney's Office to investigate the crime called illegal exploitation of mineral deposits and other materials, established in the Penal Code (art. 338). In addition, the Military Forces and Police are responsible for controlling and interdicting the illicit activity and looking after compliance with mining and environmental legislation, in accordance with the provisions of current regulations. There are currently great challenges in light of the good conditions of the gold market. This situation dynamizes and drives illegal exploitation. Moreover, there are criminal structures that, in light of high profits, fight over control of the territories due to the economic and strategic value of developing illicit economies, such as that of gold exploitation.

Illegal exploitation generally requires the presence of and actions by the State in its entirety to attend to the structural causes of these territories. Therefore, strengthening and empowering the provincial and municipal governments to formulate, implement and evaluate action plans based on their own particularities is necessary, taking into account the heterogeneity of the mining areas and the differential approaches to intervention. This requires

alliances, synergies and close coordination between central, provincial and municipal levels, in order to build trust regarding the actions taken in the territories.

Actions of the Colombian Government against Illegal Exploitation

The objective of the control actions implemented by the Colombian Government to fight illegal gold exploitation is to reduce the mining performed without complying with the technical and environmental permits established by the Government. The results of control actions can be summarized by seizure processes, the destruction of machinery and closure/ decommissioning of mines.

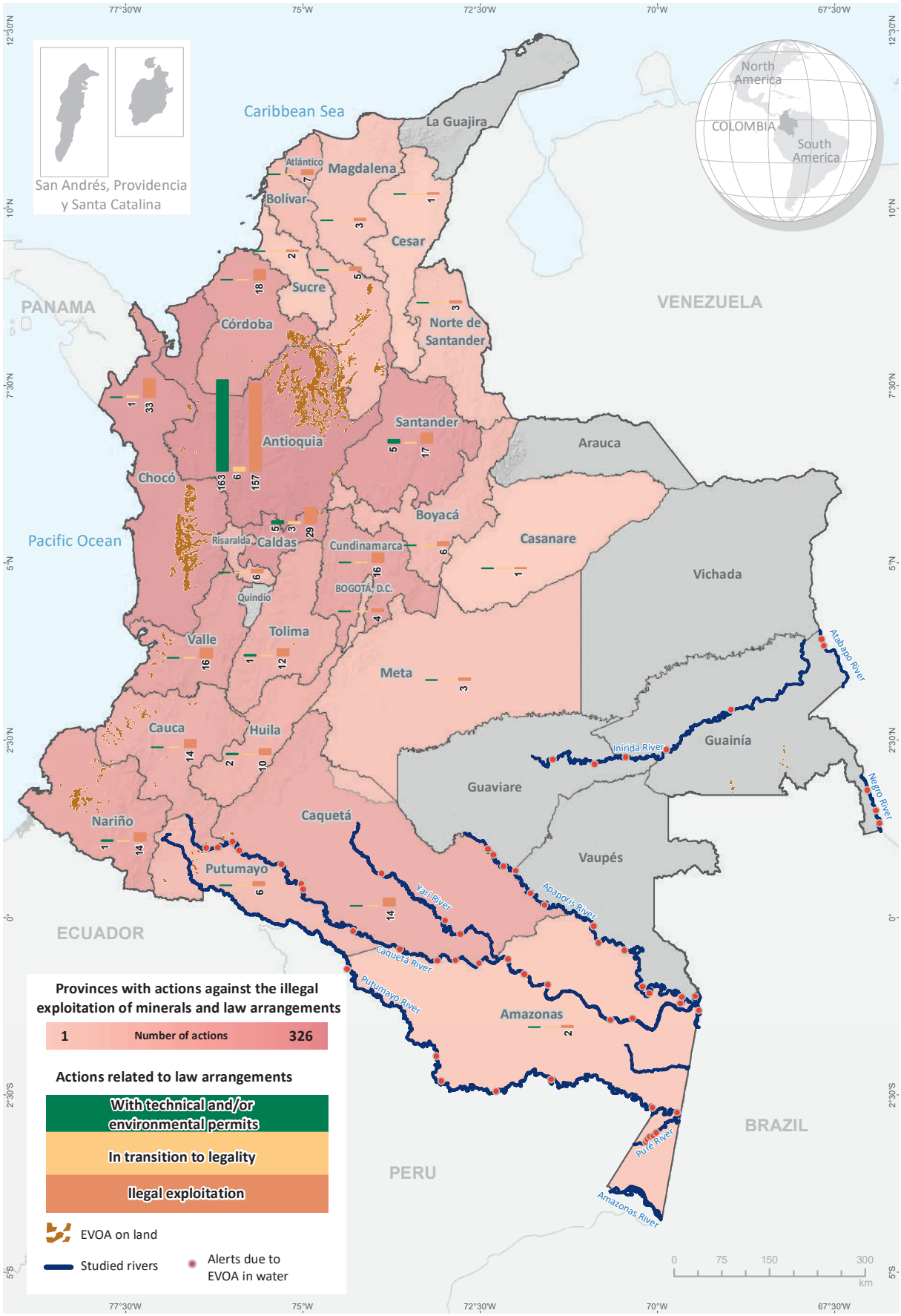
It is important to take into account that there are cases in which illegal exploitation is identified or reported, but is not performed by the holder of the mining permit. These reports are consolidated in administrative titles that guide control interventions on these titles, in order to safeguard the rights of the titleholders and perform the activity within the legal framework, which includes implementing appropriate technical and environmental work models.

Control operations are the competency of the Directorate of Carabineers, assigned to the National Police. However, the National Army provides support for these operations through the Brigade against Illegal Exploitation. In 2020, 586 intervention operations on gold mines were performed, in which 1,114 operational results were accumulated on a national level. This represented a 31% increase in operations compared to the report for 2019 and a 58% increase in operational results compared to the same reference year.

When it comes to control operations and the territories with EVOA on land, it was determined that less than 1% of the operations performed in 2020 were related to territories with detected EVOA. There were operations related to territories with alerts due to EVOA in water, which are located on the Puré and Amazonas Rivers in the Province of Amazonas. As a result of the operations, dredges were destroyed in every case. It is important to mention that the file provided for this analysis does not differentiate the type of mining. Therefore, this report includes illegal exploitation related to veins or seams (map 12).

According to the current regulatory framework for mining metals and precious and semi-precious stones, control operations can be performed in any part of the Colombian territory in which mining is not carried out under the parameters established and agreed upon in each law arrangement established by law, whose source is the ANM and ANLA.

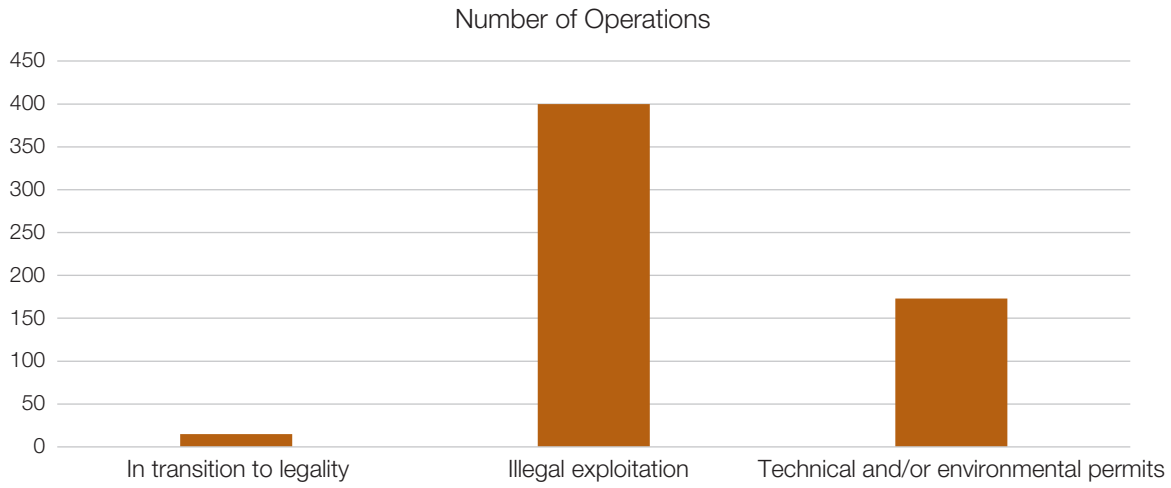
Map 12. Actions against illegal gold exploitation, 2020.



Source: Government of Colombia - Monitoring system supported by the UNODC; for law arrangements: Ministry of Mines and Energy; for actions against illegal exploitation: Ministry of National Defense, 2020.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

In 2020, when it comes to the relationship between control operations and law arrangements (figure 29), the analysis was approached according to the classification system for law arrangements: 1) In transition to legality; 2) with technical and/ or environmental permits, and 3) illegal exploitation. It was identified that, of the total operations performed in the Colombian territory, 68% were concentrated in illegal exploitation areas. The operations performed in areas without any reference regarding the previously established law arrangements were predominant (76% of the total for the type of law arrangement).

Figure 29. Number of control operations performed in areas with a law arrangement, 2020.



Furthermore, 30% of the operations were performed in areas with technical and/ or environmental permits, of which 73% had mining titles. This finding helps identify that those operations could have been performed on titles with administrative protection.

Antioquia is the province that concentrates 40.6% of the area reported with EVOA, which coincides with the highest number of control interventions: 55.6% of the national total, of which 50% was performed in areas with technical and/ or environmental permits and 48% in illegal exploitation areas. In order of concentration, Antioquia is followed by the provinces of Caldas and Chocó, with 6.3% and 5.8%, respectively. However, this number is much lower for control operations. Caldas is tenth place in terms of concentration of EVOA and Chocó is second. On their part, Buriticá and San Roque (municipalities of Antioquia), had a higher number of operations (90 and 69 operations, respectively).

From the approach of the model of actions in the territory, excluded mining areas and areas without environmental restrictions, 89% of control actions are concentrated in free areas. A greater concentration stands out in areas without any restrictions (57%) and areas without environmental restrictions, but with restrictions due to their proximity to populated centers and urban perimeters (33%). In terms of excluded mining areas, the highest number of operations occur in ZRF.

The ZRF where control operations were performed the most was the Pacific ZRF (60% of the total in ZRFs), declared in the west of Colombia on the Pacific Ocean and aimed at protecting the biodiversity in the tropical wet forest that is predominant in the area. Interventions

were particularly located in the municipality of Quibdó, on the Quito River.

In PNNs, three intervention operations were performed in Farallones de Cali (Valle del Cauca). When it comes to Ramsar sites, three operations were performed in Sistema Delta Estuarino del Río Magdalena, Ciénaga Grande de Santa Marta and Laguna de la Cocha, as well are three in areas declared as *páramos*.

Typification of Control Operations

The operational results of the control interventions are typified into three conducts: destruction, seizure and intervened mines. For the first two cases, it is specified whether or not the action was performed on some type of supply (diesel fuel, sodium cyanide, mercury) or machinery dedicated to mining (dredges, clarifiers, backhoes, motors) or the result of mining (gold).

On their part, intervention operations are performed by task forces of the Military Forces and National Police. In some cases, in accordance with the nature of the crime, the operations are carried out with other institutions, such as the General Attorney's Office, Technical Investigative Force (CTI), CAR, SIJIN and others.

In 2020, the 586 operations carried out led to a total of 1,114 operational results. Of these, 56% are related to seizures, 27% to intervened gold mines, and the remaining percentage to destruction. Motors, motor pumps and backhoes concentrate 76% of the total results related to seizures. Mercury, on the other hand, is the chemical substance that is seized the most.

Antioquia, Caldas, Chocó and Santander are the provinces in which operational results were concentrated (78%), with 65%, 5%, 5% and 3%, respectively. Of the 165 municipalities with some operational result, only five concentrate 50% of the total results: Buriticá, San Roque, Cáceres, Caucasia and Yolombó, all of which are in Antioquia. Processes that involve the seizure of motors and motor pumps are predominant in all of these municipalities. Close to 50% of the recorded mercury seizures in the country were concentrated in Buriticá.

Registration and Control of Subsistence Mining

Subsistence mining includes artisan mining activities and is regulated by Article 327 of Law 1955 dated 2019. This type of mining requires personal and free registration before the Mayor's Office of the municipality in which the activity is carried out for its development. It does not include underground activities, and does not allow using machinery or mechanized equipment for removing ore, explosives, nor can it exceed the production volumes indicated by MinEnergía. In order to exercise this activity, miners must comply with the restrictions established in articles 157 and 158 of Law 685 of 2001:

"Subsistence miners, including artisan miners, cannot be registered in more than one municipality at a time, but only in the jurisdiction in which they carry out their activity. Registration must be renewed every year personally, and the information can be updated by miners at any time, in the event there is a change in the execution of the activity. It is the responsibility of the mayors to monitor compliance with the provisions of the aforementioned article and to impose the necessary measures, notwithstanding the preventive and punitive measures imposed by the environmental authority for prevention or due to the commission of environmental damage, in accordance with the provisions of Law 1333 of 2009 or the

regulation that modifies, adds to or replaces it. Additionally, the mayor may refrain from registering or canceling the registration of the subsistence miner in the following events:

a) If the activity takes place in excluded areas or areas in which mining is prohibited.

b) If the activity is not carried out with the restrictions established in articles 157 and 158 of Law 685 of 2001.

c) If the activity is carried out in a different place other than the one indicated in the registration.

d) When it exceeds the production volumes indicated by the Ministry of Mines and Energy or the competent authority.

e) When it uses machinery, mechanized equipment or explosives to remove the minerals.

f) If the activities are carried out underground.

g) When they mine a mineral other than the one established in the registration.

A subsistence miner whose registration has been cancelled will not be able to register before any municipality for a term of six (6) months. If the requirements of this article for the performing subsistence mining are not met, the miners will be considered illegal miners of mineral deposits under the terms of the Colombian Penal Code or the regulation that modifies or replaces it".

In this context, and in order to facilitate institutionalizing mining and its users, the information system for managing proceedings for the administration of mining resources, called SI.MINERO, was provided to the public towards the end of 2010. As of 2014, it has provided a module for subsistence miners themselves to be able to carry out the registration and proceedings related to subsistence miners with the mayor's office support online [19]. The ANM has had the Genesis platform[55] since March 31, 2020 for this purpose. Subsistence miners can renew their registration through this platform, by fulfilling the mentioned requirements within the following six months. However, due to the heavy pressure illegal economies exert upon vulnerable populations with regard to gold exploitation, MinEnergía established the maximum volumes of monthly and annual production for subsistence mining by means of Resolution 40103 of 2017 (table 19).

It is worth noting that subsistence mining is related to alluvial mining, and using machinery and explosives for the activity is completely prohibited. MinEnergía establishes the obligation of complying with the following production limits (table 19):

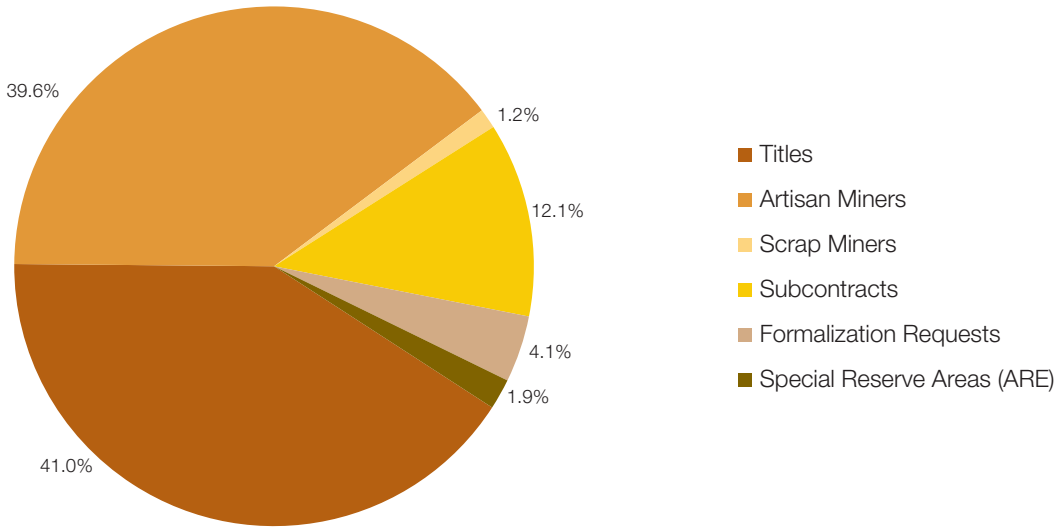
55 See https://www.anm.gov.co/?q=genesis

Table 19. Authorized gold production for subsistence mining in Colombia.

Mineral and/ or Materials	Average Monthly Amount	Maximum Annual Amount of Production
Precious metals (gold, silver, platinum)	35 grams (g)	420 grams (g)

In 2020[56], *41% of production corresponded to subsistence mining, 40% came from artisan miners and 1% from scrap miners. An equal proportion (41%) comes from mining titles (Figure 30)*. Antioquia recorded the highest number of artisan miners, with a production report this year of 55,265 and 66% of national production by this type of miner. Eighty-nine percent of the artisan miners with production reports in this province are located in seven municipalities: Caucasia, Remedios, El Bagre, Segovia, Zaragoza, Nechí and Frontino. Chocó is the second province with the most artisan miners, with a production report on a national level of 14,952 and 18% of national production from this type of miner. Seventy-seven percent of artisan miners with production reports in this province were in five municipalities: El Cantón de San Pablo, Unión Panamericana, Condoto, Lloró and Istmina.

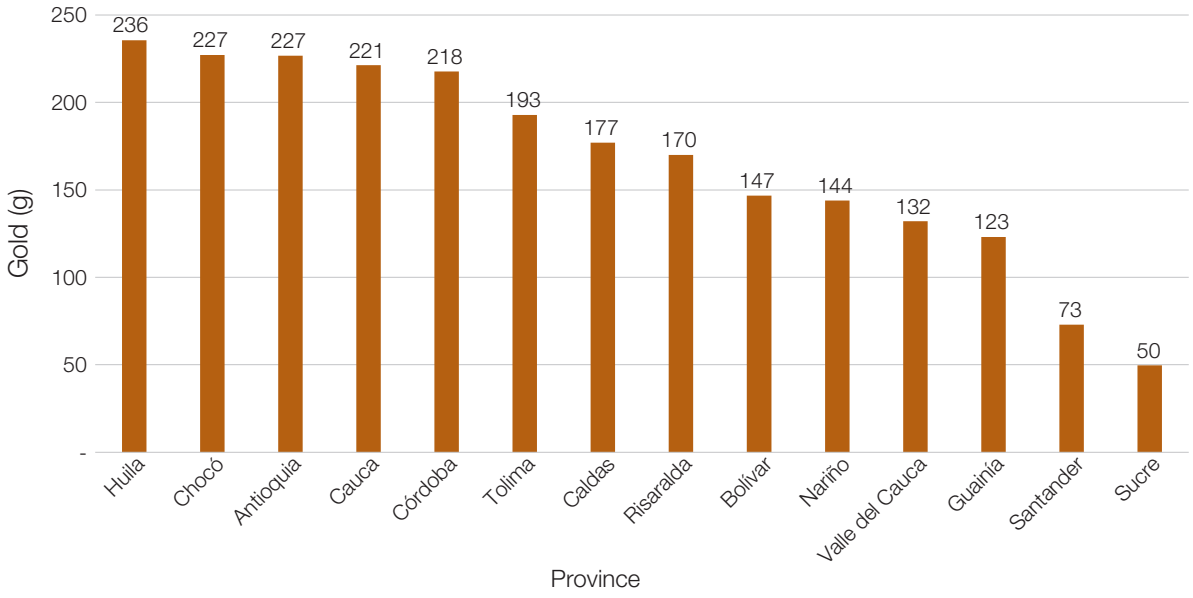
Figure 30. National production reported for 2020.



In accordance with the production report of artisan miners and their volumes registered in 2020, it was observed that each artisan miner reports an average of 214 g of gold, close to half of the maximum amount of production established for this type of mining. The limit is 420 g annually under the assumption of a monthly average of 35 g (figure 31).

56 The production information obtained for this study corresponds to the period between January 1 and December 31st, 2020.

Figure 31. Distribution of gold production (g) by artisan miner/ province average, 2020.



According to the 2020 production report (table 20), 100% of the provincial record in Guainía, Sucre and Valle del Cauca came from artisan miners. Mining by artisan miners is predominant in Chocó, at 56% (14,952 artisan miners with reports). In this same period, the greatest number of artisan miners with reports in the country is centered around ten municipalities that are primarily located in Antioquia and Chocó, which corresponds to 63% of the country's total. On their part, gold production in these municipalities corresponds to 69% in this category (map 13).

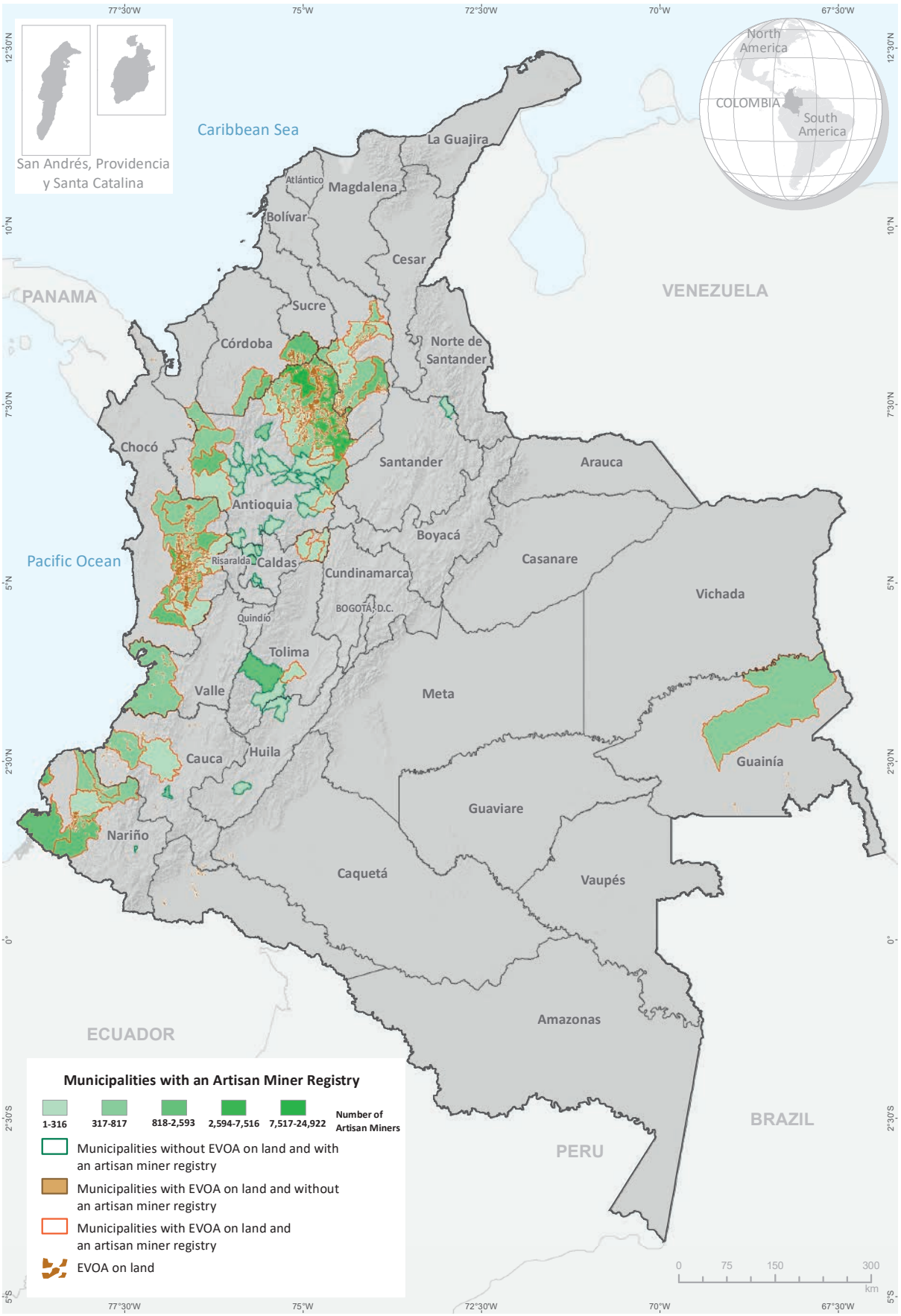
Table 20. Municipalities with the highest number of registered artisan miners, production and EVOA detected in the "Artisan Miner" category.

Province	Municipalities	Number of Artisan Miners with Production Reports	2020 Gold Production (gr)	2020 EVOA (ha)
Antioquia	Caucasia	24,922	4,945,718	2,047
Antioquia	Remedios	7,516	2,267,716	2,347
Antioquia	El Bagre	7,128	1,482,131	4,843
Antioquia	Segovia	5,686	1,515,897	2,479
Chocó	El Cantón de San Pablo	4,741	1,034,518	5,253
Chocó	Unión Panamericana	2,593	716,079	3,077
Chocó	Condoto	1,848	483,444	2,522
Bolívar	Simití	1,777	224,277	1,878
Córdoba	Ayapel	1,772	435,279	4,768
Antioquia	Zaragoza	1,555	531,101	8,842
Total 10 municipalities		**59,538**	**13,636,160**	**38,056**
Country total		**88,224**	**18,922,771**	**100,752**

As noted, for subsistence mining to be legal requires the miners to be registered before and approved by the Mayor's Office, in the Génesis platform and in the Unique Registry of Mineral Dealers (RUCOM), which enables them to sell the product of their work. They must sell volumes no greater than the 420 g per year or 35 g per month and must not use machinery to extract the material, which includes motor pumps, small dredges or any mechanical means. Reports currently indicate that there are 102,116 artisan miners who have been registered and approved.

The above requires heavy support from national and regional institutions in the territories, in order to discourage illegal extractive activities, taking into account that there are factors of illegality in the mining phase of subsistence mining. In this sense, increasing the capacities of local governments is required to face the challenges of mining in the territories, as well as designing strategies for integrating subsistence miners in business projects with corporate social responsibility.

Map 13. Distribution of the registration of artisan miners (SI.MINERO), 2020.



Source: Government of Colombia - Monitoring system supported by the UNODC; for the artisan miner registry: Ministry of Mines and Energy, 2020.
The limits, names and titles used in this map do not represent recognition or acceptance by the United Nations.

From Illegality to Legality: Formalization

Strategies for Legalizing and Encouraging Mining

The 2018-2020 National Development Plan (PND in the Spanish original), "Pact for Colombia, Pact for Equity," Law 1955 of 2019, is the framework in which MinEnergía focuses its efforts in the short and medium-term. The two objectives of the PND that are directly related to the sector are: 1) consolidating the mining and energy sector as a driving force of development of sustainable territories and 2) promoting the development and competitiveness of the mining and energy industry.

That is how Law 1955 of 2019, in pact IX "Pact for mining and energy resources for sustainable growth and the expansion of opportunities," concretely highlights the mining sector as one of the drivers of growth in the country and provides for designing and implementing strategies and mechanisms that contribute to strengthening it for it to comply with technical, mining safety, work, economic and environmental standards.

Within this framework, the mining sector has proposed working within its Strategic Plan along the following lines: 1) promoting quick, efficient and coordinated management; 2) diversifying the mineral production matrix, and 3) promoting legality and encouraging mining, as well as strengthening the political framework for consolidate mining with a business vision and with the challenges of social and environmental responsibility.

In favor of elevating standards of legality and promoting mining, MinEnergía frames its actions in the provisions of the bases of the PND:

- "In light of new technical, environmental and social challenges of mining and energy, the National Government will develop a clear and stable legal framework that will cover the following challenges: […] (iii) adjusting the strengthening Special Reserve Areas, the legal figures for formalizing mining and implementing new mechanisms for formalization, including ethnic communities; (iv) establish a special contract for small-scale mining in formalization processes and for ethnic communities; and (vii) strengthening the regulations that apply to subsistence mining.
- "… strengthening the formalization and mining encouragement program by incorporating an entrepreneurial vision and financially including the mining business and technological innovation, hard technology, access models to investment resources, among others. MinEnergía will implement technical assistance projects and programs for small-scale miners, with the requirement of standards and good mining practices focused on cleaner production, technological transfers, training and technical support, in order to promote better work conditions and more environmentally efficient and responsible productive practices. The hope is that they will contribute to generating trust in the mining sector and having better operators in the territory".

To achieve this goal, MinEnergía is working to comply with this Government's provision to develop a sector with legality and entrepreneurship that will generate equality in the country. The sector can be transformed with miners with businesses who, independent of their productive scale, have five fundamental attributes: legal, entrepreneurial, responsible, influencing and reliable.

It is fundamental to recognize that legality is the starting point and means mining operations are performed under the protection of a mining and environmental instrument. Due to the above, the regulatory framework was adjusted in Law 1955 of 2019, seeking to have tools that would encourage the legality of mining communities. In this way, with article 325, over 9,500 miners recovered their legal ability to mine, protected by requests presented to the mining authority before May 10th, 2013.

Likewise, article 326 of Law 1955 of 2019 was adopted, which establishes differential requirements for granting contracts to small-scale miners, the beneficiaries of area repatriation and ethnic groups, without making the basic conditions of mining security and environmental responsibility more flexible. This article was regulated for the two first populations described by Decree 1378 of October 21, 2020. In this Decree, small-scale miners that access the concession contract by means of differential requirements will have: 1) comprehensive technical support from the national mining authority and 2) differential legalization, in accordance with the guidelines of the cited regulation.

In addition to the above, by means of Resolution 614 of December 22th, 2020 issued by the ANM, the criteria for evaluating the economic capacity and conditions for embracing the modification of requests at the proposal of the concession contract with differential requirements are established, and the terms of reference for presenting the technical annex of the proposals of concession contracts with differential requirements are adopted.

In light of the regulation of article 326 of the PND for ethnic communities, the regulation proposal that applies for differential requirements for these communities is being developed and will move on to the consultation process.

Now, considering that legality must not only be for mining, but also the environment, MinAmbiente was supported in including article 22 of Law 1955 of 2019, which corresponds to the temporary environmental license for formalization aimed at mining activities seeking to obtain a mining title in the framework of the requests protected by article 325 of the PND, delimited and declared AREs and the authorized and approved formalization subcontracts, or subcontracts seeking to be covered by one of the formalization mechanisms under the protection of a mining title in small-scale mining.

With that in mind, resolutions 447 (Environmental Impact Study for small-scale mining) and 448 of May 20th, 2020 (differential Terms of Reference for the temporary environmental license for formalization) were issued jointly with MinAmbiente. The latter was modified by Resolution 669 of August 2020.

On the other hand, seeking to strengthen follow-up on mining to ensure operations that comply with technical and environmental standards and standards for protecting human life, article 30 of Law 1955 of 2020 expanded the coverage for all legal mining work to be subject to control, including those with a prerogative to mine without a mining title because they are protected by one of the figures of transition to legality, such as delimited and declared AREs, the traditional mining formalization requests of article 325 of the PND and the legalization requests of de facto mining.

Lastly, article 327 of Law 1955 of 2020 covers the conditions for subsistence mining, establishing the requirements for registering those miners and the grounds for cancellations and non-registration, as well as follow-up and

control for this activity. The ANM provided the Génesis platform as of March 31st, 2020 in order for mayors' offices to register these miners. Subsistence miners must be registered and updated through this platform, in compliance with the requirements mentioned by the regulation. As of December 31st, 2020, there were 143,890 subsistence miners.

When it comes to the formalization of mining, specifically, it is worth remembering it has two basic lines: 1) legality, whose objective is to support small-scale miners who have performed the activity without the protection of legality by identifying alternatives in the framework of the mechanisms provided by mining and environmental regulations, and 2) promoting mining for those who work under the protection of a mining title and have the corresponding environmental instrument, seeking to elevate levels of operations in technical, environmental and business matters.

Therefore, as mentioned, work was carried out to comply with the Government's precept to develop the sector in terms of legality and entrepreneurship, in favor of equity in the country. This all was within a strategic vision of the mining business that would allow achieving an ideal mining entrepreneur by 2030, as well as contributing effectively to the local development of the environment where that mining entrepreneur operates. This aspiration has been conceived as Miner 5.

Along the line of legality, there is a group of miners comprised of those who have begun their proceedings to enter mining and environmental legality. In this case, these miners are usually protected by exceptional proceedings established by mining regulations and that do not correspond to the ordinary process for granting a mining title. These exceptional proceedings are framed in different tools (table 21):

Table 21. Alternatives for entering legality.

El futuro es de todos · Minenergía	ALTERNATIVES FOR ENTERING LEGALITY	
MECHANISM	LEGAL SUPPORT	REQUIREMENTS
Legalization of De Facto Mining	Article 165, Law 685 dated 2001.	• Issued until January 1st, 2005. • Must have a free area for contracting. • They have a prerogative for mining until the mining authority makes a final decision. • They are subject to oversight during the prerogative stage.

MECHANISM	LEGAL SUPPORT	ALTERNATIVES FOR ENTERING LEGALITY REQUIREMENTS
Special Reserve Area	Article 31, Law 685 of 2001. Article 22, Temporary environmental license for formalization.	• Free area and demonstrate traditionality. • Have a prerogative for mining, and be subject to the temporary Environmental License as of the enactment of Law 1955 of 2019. • Subject to oversight during the prerogative stage.
Operating Contract	Article 221, Law 685 of 2001.	• A valid and updated mining title.
Subcontract for mining formalization	Law 1658 of 2013, Law 1753 of 2015. Article 22. Law 1955 of 2019 Temporary Environmental License for Formalization.	• Mining performed since before 2013 in areas with mining titles. • Once the subcontract has been authorized, they have a prerogative for mining. • They are subject to the temporary Environmental License as of the enactment of Law 1955 of 2019. • They are subject to oversight during the prerogative and differential oversight stage.
Returning areas for mining formalization	Law 1753 of 2015, Decree 1949 of 2017 and Article 326 and 22 of Law 1955 of 2019.	• Once the return is approved, they have a prerogative for mining. • They are subject to a temporary Environmental License. • They are subject to oversight during the prerogative and differential oversight stage.
The formalization of traditional mining	Law 1955 of 2019, Article 325, Article 22. Temporary Environmental License for Formalization.	• Requests submitted before May 13, 2013 that, as of the date of issuance of Law 1955 are valid for the mining authority. • They have a prerogative for mining. • They are subject to a temporary Environmental License for formalization. • They are subject to oversight during the prerogative stage.

El futuro es de todos · Minenergía		ALTERNATIVES FOR ENTERING LEGALITY
MECHANISM	LEGAL SUPPORT	REQUIREMENTS
Differential requirements for granting the concession contract to small-scale miners	Law 1955 of 2019, article 326; Decree 1378 of 2020 and Resolution 614 of 2020 of the ANM.	• They do not have a valid mining title. • They require a maximum of up to 100 hectares in concession under the mining linework system. • Their production must attend to the maximum annual volumen established according to the type of mineral, in accordance with the regulation. • Interested parties may not simultaneously present more than one concession contract proposal with differential requirements. • There is an option to change proceeding for interested parties with requests for: (i) a concession contract proposal; (ii) the legalization or formalization of traditional mining, and (iii) special reserve area, in the conditions established in the regulation.

To date, it has been calculated that there are 11,220[57] miners in transition to legality, who are protected by the various instruments indicated in table 21:

- 29 delimited and declared ARE, which allow close to 236 miners to work legally in 24 municipalities of 14 provinces.
- 95 mining formalization subcontracts, which protect the legal work of close to 1,874 miners in 40 municipalities of 7 provinces.
- Over 1,015 requests for the legalization of traditional mining protected by article 325 of the PND, located on free areas in 408 municipalities of 28 provinces, which can protect the legal work of more than 8,256 small-scale miners.
- Over 17 operating contracts, under which more than 854 miners work in 4 municipalities of Antioquia.

In addition, by means of Resolution 40237 of August 14th, 2020, it was decided to "establish guidelines for exercising mediation as an instrument that can contribute to solving the conflicts between mining titleholders and miners who have performed their activities within the area of the mining title, in order to support the formalization of small-scale mining". That is how, as a result of the dialogue processes carried out and the application of the different regularization mechanisms for work under the protection of a mining title, as of December 21st, 2020, there are 305 ongoing support and mediation processes in 18 provinces.

57 Information as of December 21st, 2020 (governance period).

Now, as was mentioned, the legality of mining also implies obtaining the environmental instrument. In that sense, MinEnergía is carrying out actions for this purpose. Its goal for 2021 is to support 1,000 miners in obtaining their environmental instrument.

MinEnergía works to implement an environmental and legal support strategy by means of a system that will allow small-scale miners in transition to legality and/ or the beneficiaries of figures of mining formalization to receive continuous advising in the territory while they obtain the environmental instrument required by the national legal system, especially in accordance with the terms of reference of the temporary Environmental License for formalization established in article 22 of Law 1955 of 2019.

The *mining promotion line* is aimed at working with miners once they attain conditions of legality. MinEnergía is currently working on a new *mining promotion* vision aimed at generating the conditions and providing the services that allow miners, but especially small-scale mining, to become a profitable, responsible, inclusive and reliable business.

In that sense, they seek to create a portfolio of services that attends to miners in a comprehensive manner, adapted to their needs and involving and strengthening the available installed capacity, particularly in the territories. Considering the processes carried out in the past, it is pertinent to involve strategic partners and institutions for the different services to be offered, for them to have the knowledge, suitability and experience to do so in light of each service.

Among the premises of this new mining promotion vision, in addition to being based on mining and environmental legality, are regional presence, targeting criteria (i.e. mineral, scale, ethnicity) and financial sustainability, based on operable and measurable actions.

Access Model for Data from Monitoring EVOA

From 2016, the UNODC, in coordination with MinEnergía, has published the monitoring of EVOA, which includes data on the area, the analyses of figures authorized for mining and their geographic relationship with the activity, its analyses related to the territory protected by mining restriction regulations, socioeconomic analyses and other research regarding the data and territories with EVOA in Colombia. The efforts to publish research, deliver data in a timely manner and perform analyses for government institutions seek for the design of interventions by the State and development of public policy to be based on technical evidence, in accordance with the reality of each territory.

In order to maximize the use of information provided by the monitoring system, a model for accessing the data on EVOA was designed and developed in 2019 with new information technology and the technological ecosystem of the UNODC. The result allows viewing, consulting and analyzing georeferenced information on EVOA in Colombia. During 2020, the access model was improved in terms of the platform's performance and migration to a clustered infrastructure, and the database was restructured for the model. In terms of user experience, all the modules were redesigned and adjusted to a responsive structure for them to be viewed on any kind of device. In terms of access, it moved from a static model with users and limited access to a guided solution on the internet with roles and credentials.

The final product is a web application with different modules with the available information on EVOA from 2014 to 2020. The application

centralizes the available geographic information related to EVOA from various institutions and allows viewing, consulting and analyzing, promoting the use and exchange of data and information. The tool, used by the ministry, is intended for any type of user that is not an expert handling geographic data and, since it is on the internet, no specialized software is necessary.

Geographic Information Available in the Application

The information compiled as an input for the application considers geographic data from different sources that is related with alluvial gold exploitation. Table 21 shows the information used to design and develop the application.

Table 22. Information managed in the model.

Information	Description	Source	Validity
Evidence of alluvial gold exploitation (EVOA)	EVOA polygons corresponding to the detection of areas with evidence of alluvial gold exploitation.	UNODC	2014, 2016, 2018, 2019,2020
Provinces	Territorial information corresponding to the political-administrative delimitation of provinces.	IGAC-DANE	2016
Municipalities	Territorial information corresponding to the political-administrative delimitation of Municipalities.	IGAC-DANE	2016
Indigenous Reserves	Special territorial information corresponding to the delimitation of Indigenous Reserves.	National Land Agency	2019
Community Councils	Special territorial information corresponding to the delimitation of Black, Afro-Colombian, Raizal and Palenquera communities.	National Land Agency	2018
National Natural Parks	Territorial delimitation of areas declared as national protection areas corresponding to the National System of National Natural Parks.	National Natural Parks	2020
Regional National Parks	Territorial delimitation of areas declared as national protection areas corresponding to Regional Natural Parks.	SINAP	2018
RAMSAR Sites	Delimitation of páramo ecosystems and wetlands designated within the list of international importance of the RAMSAR Convention.	Ministry of Environment and Sustainable Development	2018

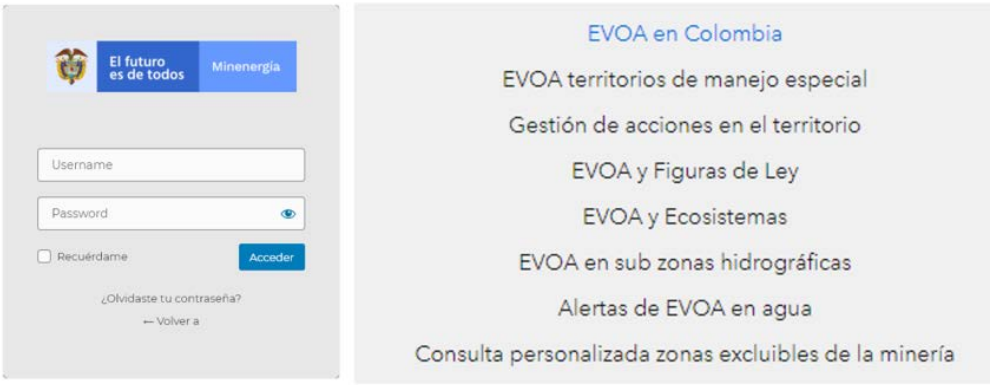
Information	Description	Source	Validity
Forest Reserve Zones	Territorial delimitation of areas declared as national protection areas corresponding to Protected Forest Reserve Zones.	RUNAP	2018
Populated Centers	Territorial information corresponding to the delimitation of urban areas.	IGAC-DANE	2018
Ethnic Community Mining Areas	Territories recognized by the law that belong to ethnic communities with autonomy for decisions on the use of their natural resources.	ANM	2019, 2020
Environmental Licenses	Delimitation of the area with permission granted by the environmental authority (ANLA).	ANLA	2018, 2019, 2020
Exploration and Mining Titles	Delimitation of the area in which the right to explore and mine the soil and subsoil is granted.	ANM	2018, 2019, 2020
Special Reserve Areas	Delimitation of areas where there are traditional informal mining operations, at the request of a mining community.	ANM	2018, 2019, 2020
Legalization Requests of Law 685 of 2001	Delimitation of the area that contemplates the legalization of mining activities by means of a concession to the miners of state-owned mines without a title registered in the National Mining Registry.	ANM	2018, 2019, 2020
Legalization Requests of Decree 933 of 2013	Delimitation of the area that contemplates the legalization of requests under this decree.	ANM	2018, 2019, 2020
Map of Ecosystems	Delimitation of continental ecosystems.	Humboldt Institute	2016
Change in the surface area of natural forests (Deforestation)	It corresponds to the cartographic delimitation of the change in the surface area of natural forests in Colombia.	IDEAM	2017-2018

In addition, the cartography of roads and rivers is included in a vector format that, along with base maps, allows contextualizing the topical information. The framework of areas is used in order to facilitate integration and spatial analysis. This framework makes sure the changes and updates to the limits of territorial entities do not alter the results and allows updating information efficiently.

Application

The application for accessing information on EVOA was developed based on a modular topical system, in accordance with the interest of the consultation. These modules are accessed through a web interface. Illustrative figures 32 and 33 refer to the data for 2019.

Figure 32. General view of the application.



EVOA in Colombia

In the first consultation model (figure 33), it contemplates a general outlook of EVOA in the Colombian territory and allows knowing detection data for this phenomenon using machinery on land by province and municipality.

Figure 33. Application, module for EVOA in Colombia.

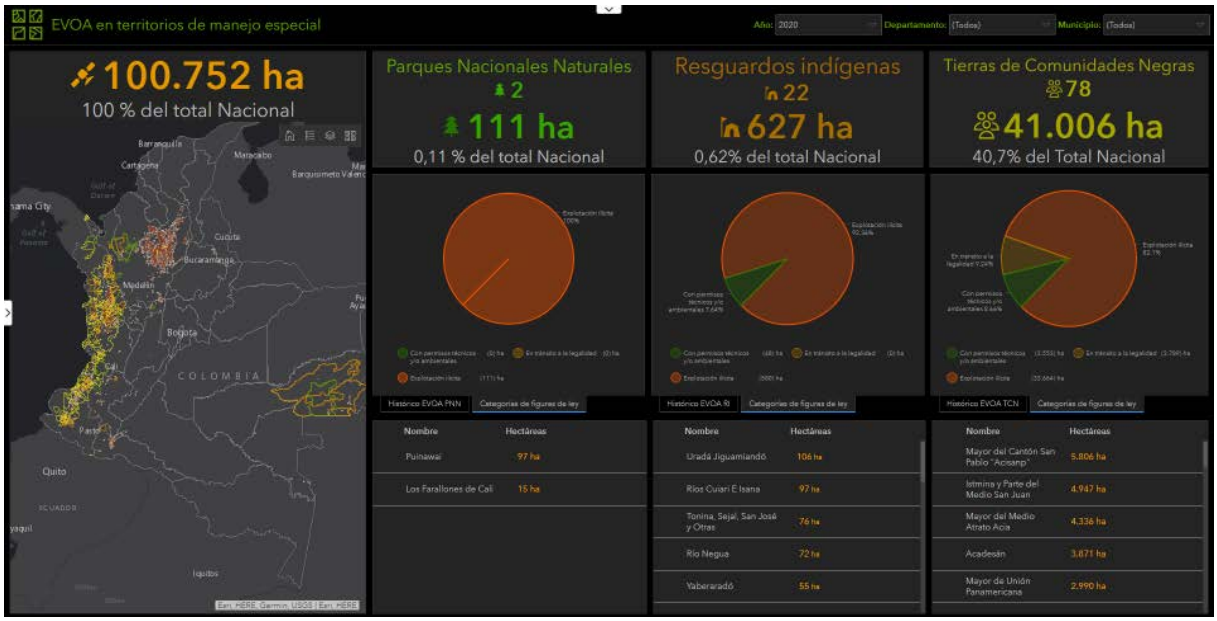


EVOA in Special Management Territories

This module shows the data for PNN, indigenous reserve and Land of Black Communities.

The application allows filtering by year, province and municipality, personalizing the consultation. Furthermore, the map allows viewing where the highest density of the presence of EVOA is (figure 34).

Figure 34. Application, module for EVOA in special management territories.



EVOA and Territory Management

This module integrates the data of the chapter on territory management based on a territorial classification model. As has been mentioned, it prioritizes territories according to the Mining Code.

Just like in the first module, the application allows performing consultation of a provincial and municipal level. In addition, it shows excluded mining areas and free areas with restrictions, and details for each one (figure 35).

Figure 35. Application, module for the territory management model.

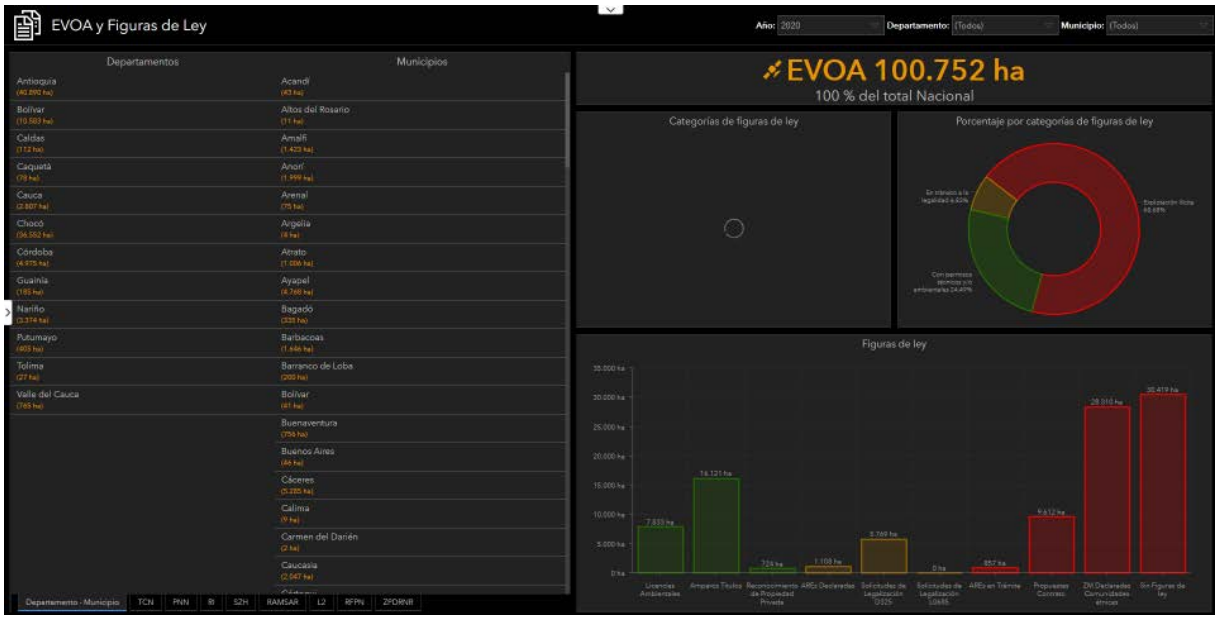


EVOA and Law Arrangements

The application based on the methodology used to detect EVOA does not characterize the legality of alluvial gold exploitation. However, there are certain figures within Colombian regulations that regulate mining. This data intersects with the data on EVOA on land. This viewer seeks for the competent entities to have objective information that facilitates formulating public policies, as well as managing, administrating and controlling the country's natural resources.

The viewer allows consulting the amount of EVOA on land (2018, 2019 and 2020) by province and municipality with a figure authorized by regulations. It must be clarified that, in terms of the evolution of the monitoring system, these categories are different for each year. The tool shows the information according to the agreements from 2020 (figure 36).

Figure 36. Application, module for law arrangements.



EVOA in Ecosystems

One of the impacts of mining in alluvial terrain is the negative effect on ecosystems. This viewer allows knowing the ecosystems with presence by overlaying EVOA. The data can be consulted by province and municipality. The information from the Alexander von Humboldt Institute from 2016 was used for ecosystems (figure 37).

Figure 37. Application, module for ecosystems.



EVOA and Hydrographic Subzones

EVOA is associated with sediment as a product of extracting the mineral deposited in water currents. By knowing the rivers with presence, the state of impact of the basin can be established and the information can be integrated in ordering plans. The viewer allows knowing (Figure 38), by province and municipality, what hydrographic subzones and hydrographic areas have EVOA (2014, 2016, 2018, 2019, 2020).

Figure 38. Application, module for Hydrographic Subzones.



Alerts due to EVOA in Water

In order to complete the national outlook for the detection of EVOA using machines in water, sediment alternation analyses have been carried out using spectral indices (Modification for Normalized Difference Water Index - MNDWI).

As a result, alerts were identified for possible EVOA in water by means of associated points with geographic coordinates. There are alerts for 2018, 2019 and 2020 (figure 39).

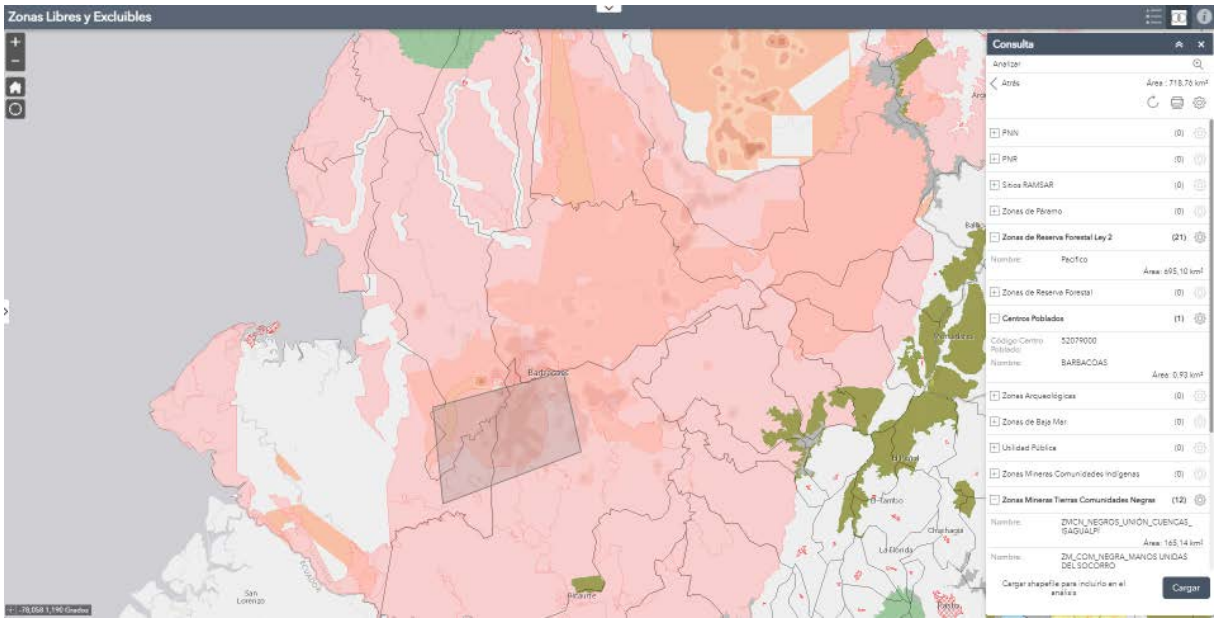
Figure 39. Application, module for EVOA in water.



Spatial Consultation in Excluded and Restricted Areas

Allows carrying out a personal consultation by means of a spatial analysis. The user draws the polygon they are interested in on the screen, and it is intercepted with the excluded and restricted mining areas defined in the Mining Code. The result is a report in PDF format with the report on area in square kilometers of all excluded or restricted mining areas contained in the point or polygon of interest.

Figure 40. Application, module for excluded mining areas and restricted mining areas.



Dynamics of EVOA

The viewer shows the data on stable area with EVOA on land, new area, expanding area and area with signs of grasslands and pastures.

Figure 41. Application, module for the dynamics of EVOA.



Type of Law Arrangements in Colombia

Disaggregates information on law arrangements and their type for other special management territorial units, such as PNN, indigenous reserves, Land of Black Communities and others.

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