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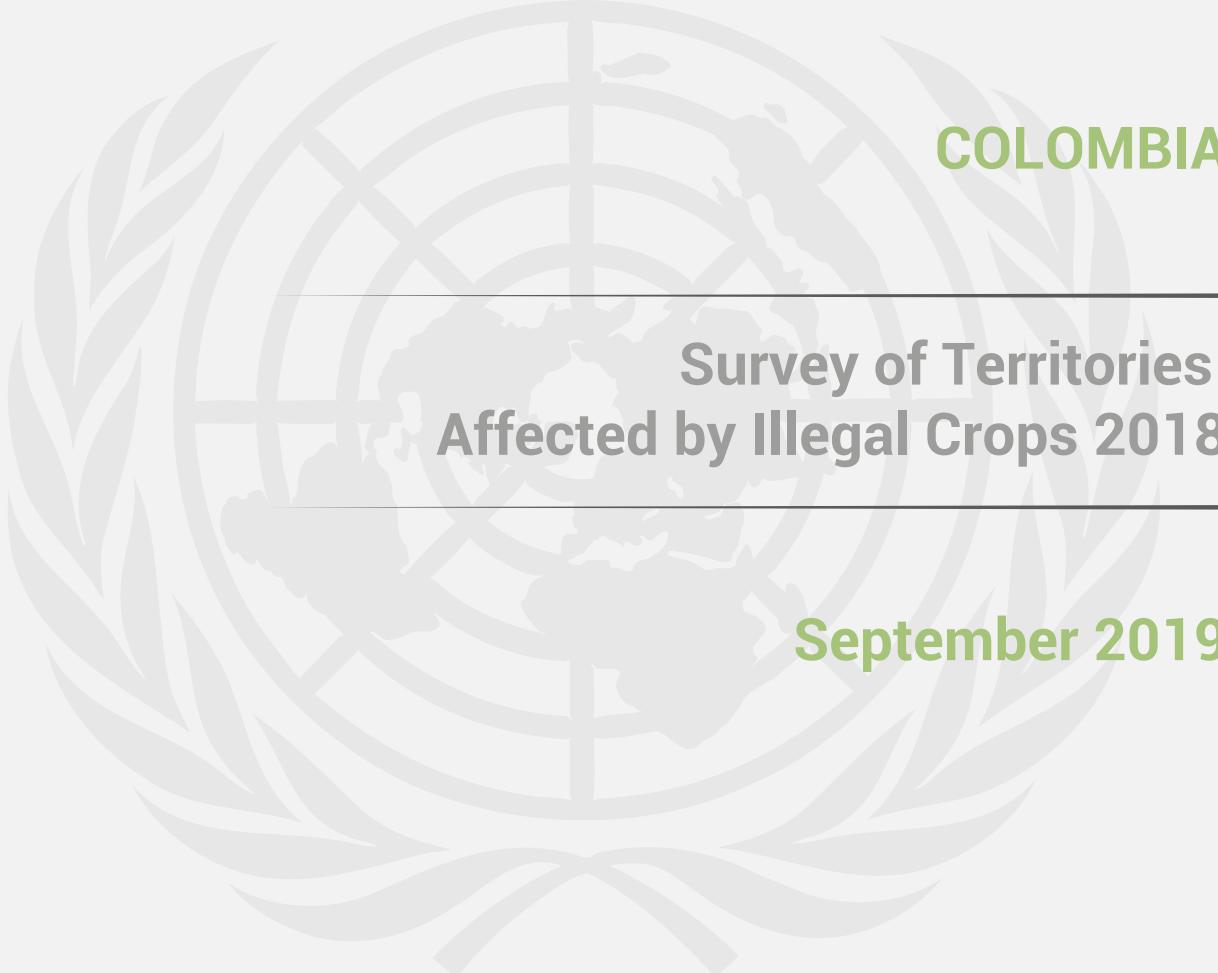


# Colombia

## Survey of Territories Affected by Illegal Crops 2018

September 2019





**COLOMBIA**

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Affected by Illegal Crops 2018**

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*Survey of Territories Affected by Illegal Crops 2018.*

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Ministry of National Security

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National Police

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National Natural Parks of Colombia

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## EXPLANATORY NOTES

The Survey of Territories Affected by Illegal Crops 2018 was developed under the framework of the SIMCI Project, with the close collaboration of the Government of Colombia, particularly the Ministry of Justice and Law. This collaboration is not limited to the financial and logistical aspects, as it also includes technical and strategic elements resulting from joint construction of a monitoring model

focused on technical and objective evidence.

The territorial maps and analyzes were based on the official cartography provided by the Government of Colombia under the framework of the inter-institutional technical committee. Data on actions by the Government of Colombia to address the drug problem were provided by the Drug Observatory of Colombia.





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# SUMMARY FACT SHEET

## COLOMBIA COCA CULTIVATION SURVEY, 2018

	2017	Variation (%)	2018
Net coca cultivation area calculated as of December 31st (rounded to the nearest thousand) <sup>1</sup>	171,000 ha	-1.2	169,000 ha
Pacific Region	65,567 ha	-4.8	62,446 ha
Central Region	52,960 ha	13.9	60,319 ha
Putumayo-Caquetá Region	41,382 ha	-7.8	38,170 ha
Meta-Guaviare Region	10,500 ha	-30.6	7,285 ha
Orinoco Region	774 ha	-28	557 ha
Amazon Region	302 ha	-24.5	228 ha
Sierra Nevada Region	10 ha	40	14 ha
Average fresh coca leaf yield	5.6 mt/ha/year 930,900 mt	1.8	5.7 mt/ha/year 977,400 mt
Potential fresh coca leaf production <sup>2</sup>	(804,863 <sup>3</sup> mt-1,095,900 mt) <sup>4</sup>	5.0	(853,188 mt-1,150,436 mt)
Potential cocaine hydrochloride production <sup>4</sup>	1,058 mt (915 mt-1,246 mt)	5.9	1,120 mt (978 mt-1,318 mt)
Average potential cocaine hydrochloride/hectare harvested <sup>2</sup>	6.3 kg/ha harvested	3.2	6.5 kg/ha harvested

<sup>1</sup> Corresponds to the area with coca crops as of December 31st 2017 and December 31st 2018.

<sup>2</sup> The national average yield per hectare per year and the potential production of cocaine per harvested hectare are calculated based on the productive area during the year (PA). It is important to note that the 2017 figure was adjusted due to the update of the production potential of cocaine hydrochloride (see Chapter 3).

<sup>3</sup> The lower limit of the interval was adjusted as a result of the revision of the percentage in areas without information at 8.7%.

<sup>4</sup> For 2017 and 2018, an update of the methodology of the potential production of pure cocaine hydrochloride was carried out. This update includes the relationship between mass and purity levels in the estimation of the potential production of cocaine base on and off farm, due to new available evidence. It is important to note that this update only affects the potential level and not annual growth trends (see Chapter 3).

	2017	Variation (%)	2018
Cocaine seizures <sup>5</sup>	434,730 kg	-4.7	414,505 kg
Illegal laboratories destroyed <sup>6</sup>	4,259	7	4,556
Reported manual eradication of illicit crops <sup>7</sup>	52,000 ha	15	59,978 ha
Families that are part of the National Plan for Illicit Crop Substitution (PNIS)	54,027	83	99,097
Average coca leaf price at production sites <sup>8</sup>	COP \$2,100/kg (USD \$0.71/kg)	7.1	COP \$2,250/kg (USD \$0.76/kg)
Average cocaine paste price	COP \$1,633,500/kg (USD \$554/kg)	1.9	COP \$1,665,000/ kg (USD \$563/kg)
Average cocaine hydrochloride price	COP \$4,449,500/kg (USD \$1,508/kg)	11.7	COP \$4,970,600/ kg (USD \$1,682/kg)

<sup>5</sup> These figures are subject to verification and adjustment by the data generating source, which may be modified during the year. Validation processes may alter data trends and figures. The 2017 data were adjusted by the source.

<sup>6</sup> Only includes cocaine laboratories and infrastructure for the production of basic cocaine paste and cocaine base. The 2017 data were adjusted by the source.

<sup>7</sup> These figures are subject to verification and adjustment by the data generating source, which may be modified during the year.

<sup>8</sup> The market representative rate used for estimating Colombian pesos to American dollars was COP \$2,951/USD in 2017 and COP \$2,956/USD in 2018. This rate corresponds to the yearly average as estimated from the rates reported every month by the Central Bank.

# EXECUTIVE SUMMARY

**A**fter four consecutive years of increasing the area with coca crops, Colombia managed to stop the trend in 2018. Albeit the crops remain at the peak of the historical series (169,000 ha), stabilization between 2017 and 2018 (i.e. reduction of 1.2%) represents an opportunity to reverse trends.

The geographical analysis shows that the impact on coca crops continues

to increase in some territories, but is reduced in others. This generating a "balance" effect. Nine departments showed change towards reduction<sup>9</sup>. Of the latter, Nariño, Putumayo, Meta, Chocó and Amazonas are worth highlighting, where a reduction of more than 11,000 ha has been achieved. However, this contrasts with an increase of 9,000 ha concentrated in Norte de Santander, Bolívar and Cauca.

## MORE COCA IN LESS TERRITORY

The territory affected by coca in 2018 reached 11,125 km<sup>2</sup>. This represents 63% of the territory affected by coca in the last ten years and 51% if the entire historical series 2001-2018 is considered. The reduction in the territory with coca crops contrasts with the increase in the area planted in the last five years, which means that there is more coca in less territory.

One of the important conditions of this dynamic is the fact that the territory affected by coca has stabilized, i.e. not only is a trend towards concentration observed, but said concentration occurs in historically affected territories. 25% of the territory with coca in 2018 completed ten years or more of affectation; this proportion for 2011 was 15% and for 2013—at the lowest point in the historical

<sup>9</sup> The following scale is used to rate the change: change less than -10% is considered reduction; 10% change (+/-) is considered stability; change greater than 10% is considered an increase.

series of coca crops— it was 17%. The 82% of the coca identified in 2018 is in these historically affected territories.

The tendency to concentrate and stabilize coca also prevails at the municipal level. It is estimated that 17% of Colombia's municipalities had

coca crops, of which the first ten (Tibú, Norte de Santander; Tumaco, Nariño; Puerto Asís, Putumayo; El Tambo, Cauca; Sardinata, Norte de Santander; El Charco, Nariño; El Tarra, Norte de Santander; Orito, Putumayo; Tarazá, Antioquia, and Barbacoas, Nariño) accounted for 44% of the country's total coca crops in 2018.

## COCA IS DECREASING IN 54% OF THE TERRITORY...

Coca was reduced in 54% of the territory with by coca crops in 2018, with an average of 1.35 ha/km<sup>2</sup>; however, only 29% of the grids with reduction were left without coca crops. This means that while coca is decreasing, it persists in half the territory. As long as coca persists in the territory, so shall the interest of armed groups, insecurity, corruption risks and restrictions on legality will, which in turn constitutes a limitation for sustainability.

The concentration of the area with coca crops implies that the problem becomes increasingly complex in some specific territories, but also that there is less and less territory affected by coca crops,

which creates favorable conditions for the conformation of territories liberated from said problem.

Thus far —although 37% of the territory has remained without coca crops for three years or more— Caldas is the only department where coca crops ceased to exist and conditions favorable to the legality were created. For this reason, Caldas was declared as a "coca-free territory" in 2019<sup>10</sup>. 22 departments are affected by coca crops in 2018, eight of which (Arauca, Vaupés, Guainía, Cesar, Santander, Boyacá, Magdalena and La Guajira) have less than 100 ha and are ready to move towards consolidation as coca-free territories.

<sup>10</sup> For more details on lessons learned, good practices and sustainability recommendations derived from the Caldas declaration process, see: United Nations Office on Drugs and Crime (UNODC), *Caldas coca-free territory: achievements and challenges* (Bogotá: Author, 2019).

## 62% OF THE PROBLEM IS CONCENTRATED IN 5% OF THE TERRITORY

At the other end of the spectrum are the territories where the problem becomes increasingly complex. In El Tambo-Algeria (Cauca), El Charco-high basin of the Telembí River (Nariño); El Naya (Valle del Cauca); Tarazá-Valdivia (Antioquia), and San Pablo (Bolívar), coca shows high concentration – exceeding 10 ha/km<sup>2</sup>. These cores are the ones with the highest planting density per square kilometer in the country.

The presence of increasingly stable and productive lots during the year is one of the alerts we reiterate in this report. The national yield of fresh coca leaf per hectare went from 4.7 mt/ha/year in 2014 to 5.7 mt/ha/year in 2018 (21% increase).

This higher productivity is due to the following: 1) the majority of lots (73%) are in ages of higher productivity; 2) better agricultural management techniques are observed –for example, pruning of coca bushes in order to favor leaf growth, improve air flow, avoid friction between the branches, as well as facilitating coca plant management in the harvest; 3) there has been a renewal of the bushes, replacing existing plants with a variety of cultivations<sup>11</sup> which (according to agricultural producers with coca- PAC, for its acronym in Spanish), they have higher leaf yield, more resistance

to weather or disease, allow greater alkaloid production or facilitate handling at the extraction stage, and 4) Most PACs report the application of agricultural fertilization practices, weed control and pest control. In fact, 88% of PACs perform weed control using chemicals, whilst 10% report a combination between the manual and the chemical methods for this purpose.

More than half of the farmers sell the coca leaf they produce on their farms. This proportion has been increasing mainly due to incentives associated with the coca leaf prices. The potential production of pure cocaine hydrochloride in Colombia reached 1,120 mt in 2018<sup>12</sup>. It is estimated that 1 ha of productive coca throughout the year would have a potential production between 8.2 kg and 9.6 kg of cocaine base/ha harvested, and between 6.2 kg and 6.9 kg of pure cocaine hydrochloride/ha harvested<sup>13</sup>.

The potential production of cocaine concentrated in a reduced territory implies a strong interaction between the actors involved, not only in farming/harvesting processes but also in the extraction, processing and trafficking of cocaine. Income for farmers derived from the sale of coca leaf or transformation thereof into

<sup>11</sup> Variety of cultivations is understood as the common or commercial names with which PACs in the different regions of the country identify the types of plants or seeds that they grow.

<sup>12</sup> For 2018, it is estimated that the potential production of pure cocaine hydrochloride ranges between 978 mt and 1,318 mt. It is worth noting that an adjustment was made in the 2014-2018 period in the estimation of the annual production of cocaine hydrochloride, after the incorporation of the relationship between the levels of mass and purity of the cocaine paste, processed within agricultural production unit with coca (*Unidad de Producción Agropecuaria con Coca - UPAC*), and the cocaine base, processed inside and outside the UPAC (see Chapter 3).

<sup>13</sup> These estimates correspond to the national scenario, in which everything that is grown is extracted on the basis of cocaine and refined to cocaine hydrochloride, accepting regional dynamics and yields according to the results produced by productivity studies.

cocaine paste or base is still low (COP \$859,200 monthly for leaf, COP \$399,300 monthly for basic cocaine paste, and COP \$394,000 monthly for base per crop). However, the volume of money associated with the illegal activity that circulates in the region suffices in concentrating economic power on traffickers.

It is estimated that the potential production of cocaine hydrochloride would have a value of COP \$5.3 trillion at production complexes<sup>14</sup>. 50% of this amount remains in farms, which corresponds to payment for coca leaf, cocaine paste and cocaine base produced there. Bearing in mind that the price of 1 kg of cocaine hydrochloride at the port of departure in Colombia is COP \$12,650,000 as of FY2018 –and assuming that all the production potential is exported<sup>15</sup>–, its value is calculated at COP \$16.5 trillion. It is estimated that 68% thereof stays along the route between production areas and the port of departure.

The network of actors involved in the process means that not only do coca farmers depend economically on illegal activity, so the sustainability of interventions goes beyond coca-producing farms. Only 19% of the grids intervened in 2018 were without coca. Although interventions directly on coca through (forced or voluntary) manual eradication generate a reduction in coca crops (up to 25%), this effect is greatly reduced should intervention be interrupted.

The persistence of coca crops is due to several factors: 1) crop yield, associated with soil fertility and the use of production technologies; 2) the price dynamics of the different by-products of the coca plant and the favorable economic balance of the productive activity; 3) the problem of licit production related to technical and economic risks, and 4) the pressure of the agents of the drug trafficking chain to boost the establishment of crops in the producing regions.

## SPECIAL MANAGEMENT ZONES ARE THE AREAS MOST AFFECTED BY COCA CROPS

Coca continues to be concentrated in special management zones: 47% of the crops are found in Natural National Parks (PNN, for its acronym in Spanish), indigenous reserves, lands of afro Colombian communities or areas defined by Act 2/1959. Coca participation in these

territories increased from 44% in FY 2006 to 65% in FY 2010; since then, it has been declining to 47% in FY 2018.

According to the classification established in *Política Ruta Futuro* ("Roadmap to the Future" Policy), the

<sup>14</sup> For this estimate, an average price of cocaine hydrochloride at 2018 of COP \$4,097,200/kg was taken into account as reported in the departments of Nariño, Putumayo and Norte de Santander. The above is taken as a proxy variable to producer's price.

<sup>15</sup> In this scenario, it is considered that all the production potential leaves national ports; national consumption, product losses and seizures of coca leaf, cocaine base and cocaine hydrochloride nationwide are not factored in.

reduction achieved in PNNs (-8%)<sup>16</sup> and reserves (-6%) was not enough to offset the 11% increase that took place in forest reserve areas established by Act 2. This increase has remained constant since FY

2014. The increase in coca cultivation in these reserve areas poses a challenge for the Colombian State, not only from the perspective of drug production control, but also of land use planning.

## INVESTMENT FOR SUBSTITUTION IS BEING CONCENTRATED IN THE MOST AFFECTED MUNICIPALITIES

As of December 31st, 2018, 57,186 families of the 99,097 linked to the National Comprehensive Program for the Substitution of Illicit Crops (*Programa Nacional Integral de Sustitución de Cultivos Ilícitos* - PNIS), i.e. 57.71%, have received at least one payment

from the program. The magnitude of the investments planned by the PNIS is proportionate to the intensity of the effects of coca crops, thus ensuring that a large part of the resources will be allocated to the municipalities where the problem of illicit crops is stronger.

## COCA CROPS CONSTITUTE A RISK FACTOR FOR COMMUNITIES

80% of homicide victims in the context of the armed conflict in 2018 lived in municipalities that were affected by coca crops. 76% lived in municipalities where development programs with territorial approach (PDET, for its acronym in Spanish) were being carried out, according to information provided by the Unit for Comprehensive Care and

Reparation for Victims (UARIV, for its acronym in Spanish).

On the other hand, larger presence of coca crops is directly related to internal forced displacement, with the inherent affectations on law enforcement agencies (murders or injured), and with terrorist acts, attacks and combats carried out at the municipal level.

<sup>16</sup> The Future Route Policy prioritizes indigenous reservations over other special management areas. Some territories overlap, such as indigenous reservations and PNN. When the Future Route Policy refers to PNN, these overlapping territories are excluded.



# PRESENTATION

The United Nations Office on Drugs and Crime (UNODC) works in partnership with the countries more affected by the production of natural origin drugs in order to monitor the extension and evolution of illegal crops through the implementation of the Illicit Crop Monitoring Program (ICMP). This program is currently in Colombia, Peru and the Plurinational State of Bolivia for coca crops, and Afghanistan, Mexico and Myanmar for poppy crops.

The objectives of the ICMP are establishing data collection and analysis methodologies to increase the capacity of governments to monitor illegal crops in their territories, as well as help the international community to monitor the extent and evolution of crops under the context of the elimination strategy adopted by the Member States in the Action Plan, Session 53 of the United Nations Drug Commission held in March 2009.

SIMCI is a joint project of UNODC and the Colombian Government that is led by the Ministry of Justice and Law, which also chairs the National Drug Enforcement Board. The project is supported by an inter-agency group that guarantees the

transfer and adoption of technologies in beneficiary national institutions. It is supported by experts in remote sensing, geographic analysis, and economic, social and territorial analysis. Also, in recent years, it has been supported by an information technology team, which makes available the extensive information that has been collected thanks to the integration of qualitative/quantitative research methods through the Drug Observatory of Colombia (ODC, for its acronym in Spanish) and through the website [www.biesimci.org](http://www.biesimci.org).

In 1999, UNODC presented for the first time a report on coca crops in Colombia. It was the first product generated by the Integrated System for Illegal Crop Monitoring (SIMCI). Since then, the SIMCI Project produces every year a report focused on drug production, which is one of the basic inputs to design the public policies to combat this scourge in Colombia.

The 1999 report was entirely focused on estimating the area with coca crops based on the use of remote sensors. The first major finding of the SIMCI Project was that the data available so

far had a tendency to underestimate, mainly because the area being explored was smaller than the area affected by coca crops. The first two years of the project were devoted to consolidating the detection methodology. In 2001, total exploration of the national territory was possible with a consolidated methodology, and the construction of the historical series that feeds with annual surveys begins.

Thanks to an effective cooperation model with the Government of Colombia, it has been possible to jointly develop research strategies to solve the complexities associated to the study of illegal issues. In this regard, the Ministry of Justice and Law has not solely worked a political and financial counterpart, as it has also been as a strategic actor guiding the areas of research, and has provided technical support through its expertise in the fight against drugs.

As a result of the experience gathered by SIMCI in its twenty years of existence as a project, the results exceed the

exposure of the area with coca crops and the production potential of cocaine hydrochloride. They also make an emphasis on the territorial affectation of the phenomenon, based on the categorization established by the second pillar of the Future Route: Comprehensive Policy to Address the Drug Problem 2018-2022: "Reduce the availability of drugs in internal and external markets".

Likewise, the report integrates information on the transformation of the territories after the implementation of the peace agreement between the Colombian Government and the Farc-EP, including the inputs required to understand the recent dynamics of illegal crop production in the country.

Through the SIMCI Project, UNODC and the Government of Colombia expect to offer reliable and complementary data to public policy designers and evaluators, academia and the civil society to contribute to understanding the complex dynamics of drug production and its relationship with the territories.

## COCA CROPS

This chapter provides an overview of the area with coca crops in Colombia as of December 31, 2018. Besides providing figures on the area with coca crops, the information is based on the historical series to present the trends and geography of the phenomenon to then describe the distribution of coca crops. The distribution is based on two geographical areas. First, the territorial categories established by the second pillar of the Future Route: Comprehensive Policy to Address the Drug Problem 2018-2022<sup>17</sup>: "Reduce the availability of drugs in internal and external markets. Second, the distribution by departments in Colombia.

The area planted with coca (in hectares) as of December 31, 2018 shows stability when compared to the estimate of 2017. Stability refers not only to the total area with coca crops, which

went from 171,000 ha in 2017 to 169,000 ha in 2018 (1.2% reduction), but also to the steady presence of the same lots of coca, since 78% of the lots found in 2018 were planted with coca in 2017.

After four consecutive years of increase (2013 to 2017), when coca grew 3.7 times, stability with respect to 2017 is a positive signal. Coca was stabilized in 2018, although both the area planted and the potential production of cocaine remain close to the highest point in the historical series (Figure 1).

90% of coca is in the same territories as in 2017. However, the affected territory<sup>18</sup> was reduced by 8%, indicating a persistent concentration of the phenomenon. The 169,000 hectares found in 2018 covered 39,152 km<sup>2</sup>, while in 2017 171,000 ha covered 42,450 km<sup>2</sup>.

<sup>17</sup> Future Route (Ruta Futuro) is Colombia's comprehensive policy to address the drug problem. It is based on seven principles: comprehensiveness, coordination, technical evidence, inclusive and differential approach, participation, sustainability, and flexibility and innovation. The policy is based on four pillars: "Reducing the use of psychoactive substances and their impact", "Reducing the availability of drugs in internal and external markets"; "disarticulating and affecting criminal structures", and "Affecting criminal economies and income" (Ministry of Justice and Law, *Future Route: Comprehensive Policy to Address the Drug Problem 2018-2022 [2018]*, [http://www.odc.gov.co/Portals/1/Docs/POLITICA\\_RUTA\\_FUTURO\\_ODC.pdf](http://www.odc.gov.co/Portals/1/Docs/POLITICA_RUTA_FUTURO_ODC.pdf)).

<sup>18</sup> Affected territory refers to the 1 km<sup>2</sup> grids with coca crops in the last two years.

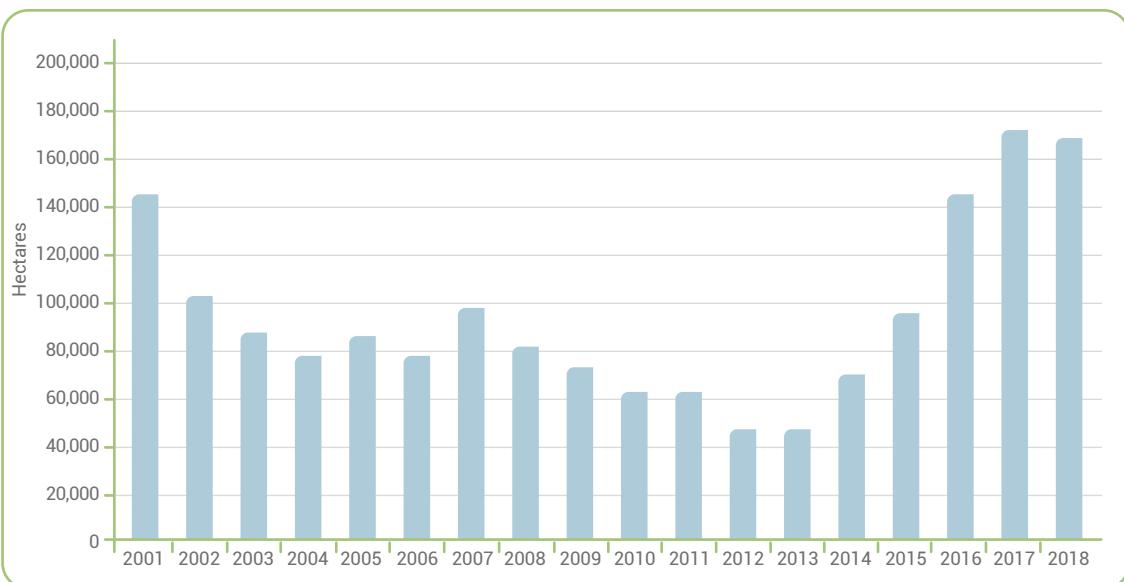


Figure 1. Historical series of coca crops (hectares), 2001-2018

By integrating geographically the 2018 coca survey and the classification proposed in the Future Route Policy, it can be observed that, as it has been happening since 2002, about half (47%) of the coca crops are located in special management areas (parks, shelters, Afro-Colombian community areas, and reservation areas as stated in Law 2)<sup>19</sup>.

As for the most affected areas, Nariño continues to be the department with the greatest impact (41,903 ha), despite experiencing an 8% reduction in the area planted with coca. Conversely, coca crops were reduced in Putumayo, Meta and Chocó. The biggest increase was seen in Norte de Santander (19%), Bolívar (39%) and Cauca (7%).

## FUTURE ROUTE POLICY

Based on the classification of territories proposed by the Future Route Policy, it can be seen that 47% of coca is in special

management areas, 33% in strategic interest areas, and 20% in free intervention areas (Table 1).

<sup>19</sup> Colombian Congress, Law 2 of 1959 (December 16) [Ley 2 de 1959]. Sobre economía forestal de la Nación y conservación de recursos naturales renovables, [http://www.ideam.gov.co/documents/24024/26915/C\\_Users\\_hbarahona/Desktop/Monica+R\\_normas+pag+web\\_ley+2+de+1959.pdf/11ec7647-b090-4ce2-b863-00b27766edf8](http://www.ideam.gov.co/documents/24024/26915/C_Users_hbarahona/Desktop/Monica+R_normas+pag+web_ley+2+de+1959.pdf/11ec7647-b090-4ce2-b863-00b27766edf8).

Table 1. Coca crops according to the classification of territories by the Future Route Policy

Future Route Classification	Coca crops 2018 (ha)	Coca crops 2018 (% of the national territory)	Territory (km <sup>2</sup> )	Territory (% of the total)
<b>Special management areas</b>	<b>79,574</b>	<b>47</b>	<b>19,215</b>	<b>49</b>
Indigenous reservations	16,589	10	3,153	8
Afro-Colombian community areas	26,985	16	5,812	15
Natural National Parks	7,039	4	2,091	5
Law 2	28,961	17	8,159	21
<b>Strategic interest areas</b>	<b>54,978</b>	<b>33</b>	<b>12,602</b>	<b>32</b>
10 km border areas	17,140	10	2,329	6
Productive integration	21,141	13	5,994	15
Buffer areas	16,685	9.99	4,262	10.99
Regional National Park	12	0.01	17	0.01
<b>Free intervention areas</b>	<b>34,467</b>	<b>20</b>	<b>7,335</b>	<b>19</b>
Areas with a density over 8 ha/km <sup>2</sup>	21,504	12.5	1,881	5
Permanently affected	9,418	5.5	3,664	9
Less than 15 km away from a populated area	2,800	1.5	1,429	4
Remainder	745	0.5	361	1
<b>Total</b>	<b>169,019</b>		<b>39,152</b>	

## Future Route, a Comprehensive Policy to Address the Drug Problem 2018-2022 (Ministry of Justice and Law, 2018)

Future Route is a comprehensive policy approved in December 2018 by the National Drug Enforcement Board to address the drug problem in the Republic of Colombia. It emphasizes the current situation of illegal crops, production, traffic, consumption and related crimes, from a comprehensive, territorial and differential perspective. It specifies the principles, approaches, objectives and strategies to address the multiple causes and effects of this scourge for the next four years. For the first time ever, the country now has an anti-drug policy to face this problem.

### **Strategic pillars of the Future Route Policy**

The Future Route Policy is based on four strategic pillars and a transversal pillar to combat drugs effectively, from the demand for psychoactive substances (consumption); supply of drugs (availability and production); criminal structures (disarticulation and involvement), and criminal economies (money laundering). These strategic pillars are connected to each other from the illegal drug system or drug trafficking value chain (from crops to national consumption or export); the generation of income by organized crime due to the production of illegal drugs, and the concentration of wealth generated through money laundering.

The four pillars are: 1) reduce the consumption of psychoactive substances and their impact; 2) reduce the availability of drugs in internal and external markets; 3) disarticulate and affect criminal structures, and 4) affect criminal economies and income. These pillars lie on a fifth transversal pillar referring to the transformation of the territory and the transit to legal economies, the generation of knowledge, international policies and the cannabis market for scientific or medicinal purposes.

As part of the comprehensive policy, the territorial approach seeks to characterize the level of affectation and, mainly, to identify the ability of the territories to strengthen them and improve the sustainability of the interventions. Therefore, the intervention strategy is defined not only by the conditions of the problem (the amount of coca crops, economic dependence

or drug production), but by the capacities and strengths of the territories where it takes place, as well as by the environmental management of the territory.

The territorial approach becomes material through the geographical delimitation of the territorial intervention categories (TIC), the measurement of the magnitude of the problem in each category (and subcategory), and the definition of a specialized institutional network for each of them, which deals with the implementation of the strategy.

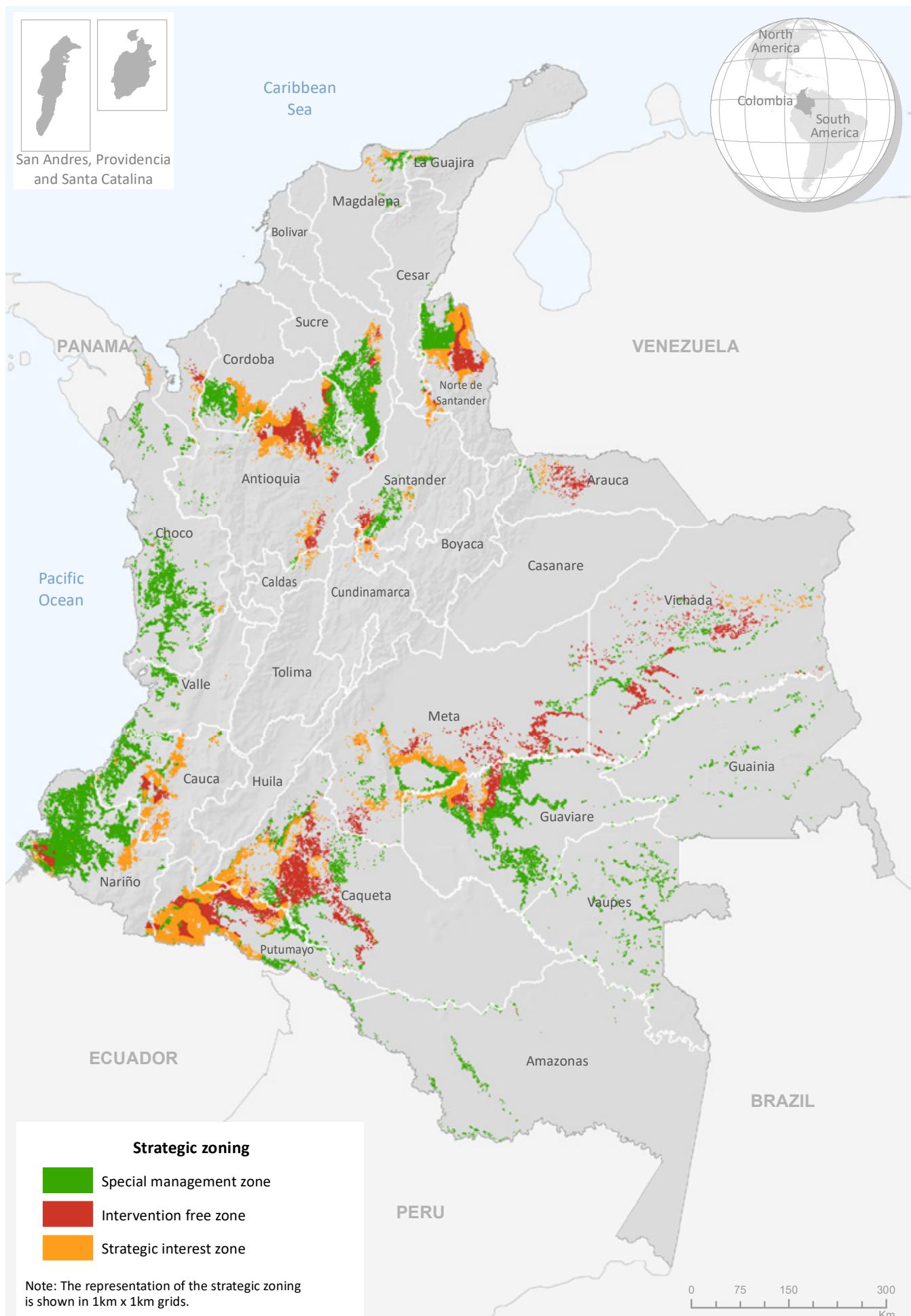
The territories with illegal crops were classified into three large TIC areas: special management, strategic interest, and free intervention areas (Map 1).

**Special management areas.** This category refers to the areas with illegal crops in indigenous reservations, Afro-Colombian territories, National Natural Parks, forest protection reservations and forest reservation areas (Law 2 of 1959).

**Strategic interest areas.** This category corresponds to territories where there are no regulatory or strategic conditions to be considered when designing the intervention strategies. Some of them are those permanently affected (according to SIMCI permanence index); areas with coca crop density greater than 8 ha/km<sup>2</sup> and all the areas less than 15 km away from a populated center.

**Free intervention areas.** Those where there are no regulatory or strategic conditions to be considered when designing the intervention frameworks specified by the Future Route Policy, specifically level one categories, which are called territorial intervention categories.

## Map 1. Future Route Policy: Overview of Affected Territories, 2009-2018



Source: Colombian Government - UNODC Supported monitoring system.  
Boundaries, names and titles used herein do not constitute acknowledgement or acceptance by the United Nations.

Figure 2 shows the historical series of coca participation in level 2 territorial units proposed by the Future Route Policy. It can be observed that coca crops have predominated in special management areas since 2002. The share of coca in these territories increased from 44% in 2006 to 65% in 2010. Since then, participation has been declining to 47% in 2018. Despite the reduction in participation, crops have been increasing since 2012.

On the other hand, the participation of strategic interest areas in 2001 was 39%, which was the same as special management areas. Until 2010, participation decreased to 18% and since then it has been increasing to 33% in 2018. Unlike special management areas and free intervention areas, where coca remained stable between 2017 and 2018, it went down in strategic interest areas. Finally, in free intervention areas participation moves from 17 to 28% throughout the historical series.

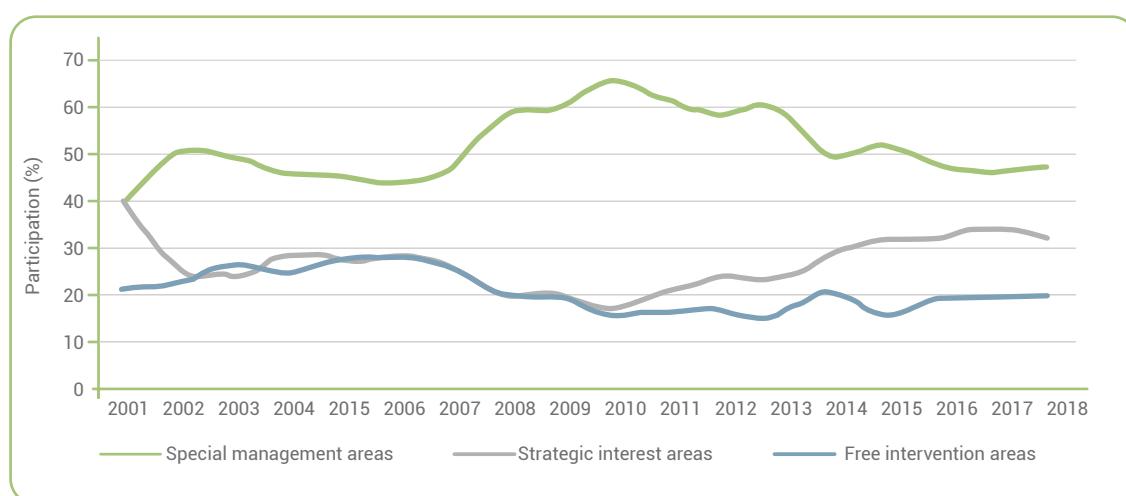


Figure 2. Historical series of coca crops in Future Route Policy territorial units

## SPECIAL MANAGEMENT AREAS

These are territorial units "with conditions established by law to implement specific mechanisms before applying any intervention strategy"<sup>20</sup>. These include the PNN, indigenous reservations, Afro-Colombian community areas and forest reservation zones established by Law 2.

This predominance throughout the historical series shows that coca remains a threat to Colombia's cultural and biological diversity, not only because of its widespread presence in the territories, but also because of the social, cultural and environmental implications it entails.

<sup>20</sup> Special management areas have their own regulations setting conditions for the interventions, which include mechanisms such as prior consultation for reservations and Afro-Colombian areas, management plan for PNN, and restrictions on uses allowed, among others (Ministry of Justice and Law, *Future Route: Comprehensive Policy*).

The concentration of coca in special management areas implies remarkable challenges for the design of intervention strategies, as it requires articulating a vision of development with a vision of conservation of the country's natural and cultural wealth. Such challenges include the development of specific strategies based on regulations that can lead to effectively protecting biological and cultural diversity. Some cases studied by UNODC<sup>21</sup> indicate that the strengthening of communication channels with communities, the construction of a joint vision of the territory and the empowerment of local authorities are strategic to achieve this articulation (Figure 3).

The amount of coca in special management areas remained stable between 2017 and 2018, due to a balance between the reduction observed in

national parks and reservations and the increase in areas belonging to Law 2. Coca in Afro-Colombian community areas remained stable.

Coca crops in the PNN<sup>22</sup> have been increasing since 2010, so the 8% reduction (according to the Future Route Policy) between 2017 and 2018 is significant. However, coca remains in three of them: Paramillo, Nukak and La Macarena. The historical series of coca in the PNN can be found in Annex 1.

The lowest point in the series in indigenous reservations corresponds to 2006, when 5,600 ha were reported. From then on, that number grew threefold, reaching 17,600 ha in 2017. In 2018, there was a slight reduction of 6% from 2017. The historical series in indigenous reservations is available in Annex 2.

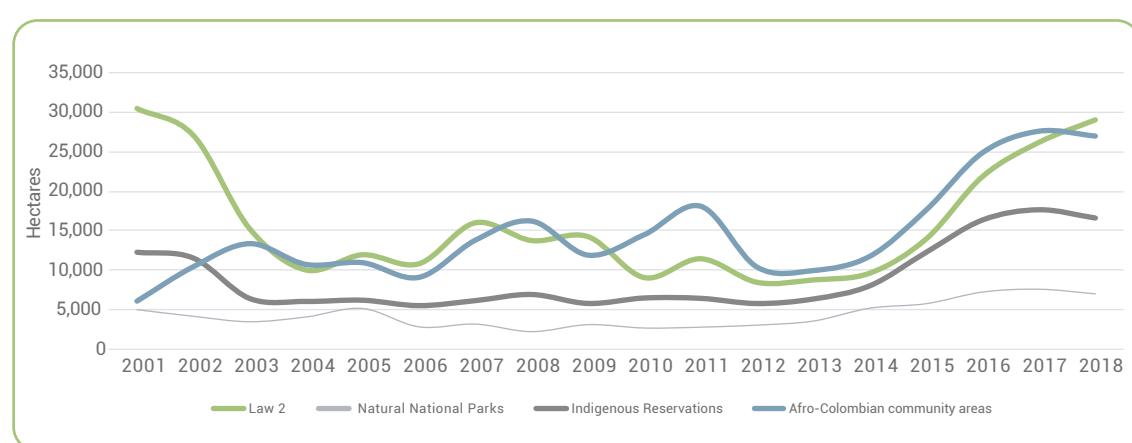


Figure 3. Historical series of coca crops in special management areas

<sup>21</sup> Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC), *Atlas geofísico y cultural resguardos Honduras-Agua Negra-Chimborazo* (Bogotá: Authors, 2015); Ministry of Justice and Law, United Nations Office on Drugs and Crime (UNODC), Corporación Punto de Vista. *Coca, cultura y territorio. Caracterización de la producción y usos tradicionales de la coca en los resguardos de Honduras, Agua Negra y Chimborazo (Morales, Cauca)* (Bogotá: Authors, 2015); Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC), *Caracterización agropecuaria del cultivo de amapola y de los territorios afectados-Síntesis de resultados de investigación* (Bogotá: Authors, 2019).

<sup>22</sup> The Future Route Policy prioritizes indigenous reservations over other special management areas. Some territories overlap, such as indigenous reservations and PNN. When the Future Route Policy refers to PNN, these overlapping territories are excluded.

The reduction achieved in PNN and reservations was not enough to compensate for the 10% increase that occurred in the forest reservation areas established by Law 2 and that has remained

constant since 2014. The increase in coca crops in these reservation areas is a challenge for Colombia, not only from the perspective of drug production control, but also for land planning in the territories.

## STRATEGIC INTEREST AREAS

These are territories where "no specific conditions have been established by regulations, but these areas of a strategic interest"<sup>23</sup>. These include land border areas, productive integration areas, natural park system buffer areas and protected areas national system areas (SINAP, for its acronym in Spanish) different from PNN<sup>24</sup>. Figure 4 shows the historical series for these categories.

In 2001, there were 53,370 hectares of coca under this category. By 2010, this amount had been reduced by a fifth, reaching 9,076 ha, but since then it has been growing continuously, returning in 2017 to its initial levels.

SINAP areas still show very low levels, since only 12 ha were detected under this category. The other three categories of strategic interest show a similar behavior throughout the historical series.

It is worth mentioning that in the border area<sup>25</sup> there were 1,934 ha of coca

in 2010 and that this increased 10 times between 2010 and 2017. Between 2017 and 2018, coca reduced by 11%. However, the sustainability of this reduction is not guaranteed yet, as it is strongly related to manual and voluntary eradication actions that have not been articulated with others which are necessary. Therefore, the transformation of the territories is not always achieved to reduce their vulnerability and to create conditions conducive to legality<sup>26</sup>. The displacement of coca crops to border areas, mainly with Ecuador and Venezuela, requires designing strategies specifically aimed at solving the difficulties found in these territories, but mainly, at developing their potential.

The buffer zones of the PNN are a transition between developmental interests and conservational interests<sup>27</sup>. This is the reason why the presence of 16,685 ha of coca is a concern. This indicates that the PNN system and the biodiversity that we expect to preserve may be affected in the short term due to the growth of coca

<sup>23</sup> Ministry of Justice and Law, *Future Route: Comprehensive Policy*.

<sup>24</sup> The Future Route Policy includes PNN in special management areas and the other areas of SINAP in strategic interest areas, especially regional national parks. Therefore, when SINAP areas are mentioned in this document, PNN are considered to be excluded.

<sup>25</sup> The Future Route Policy establishes a 10 km strip from the border limit as a border zone.

<sup>26</sup> The Colombian Government has established strategic areas of comprehensive intervention to intervene with the objective of transforming illegal economies into legal ones, achieve institutional control of the territories, protect the population, preserve water, biodiversity and the environment, strengthen border control and development, and accelerate the implementation of Territorial Approach Development Programs (PDET).

<sup>27</sup> Parques Nacionales Naturales de Colombia, *Manual para la delimitación y zonificación de zonas amortiguadoras* (2008), [http://www.parquesnacionales.gov.co/portal/wp-content/uploads/2014/08/Anexo-3-PNN-2008-Manual-delimita\\_zonifica-ZA.pdf](http://www.parquesnacionales.gov.co/portal/wp-content/uploads/2014/08/Anexo-3-PNN-2008-Manual-delimita_zonifica-ZA.pdf).

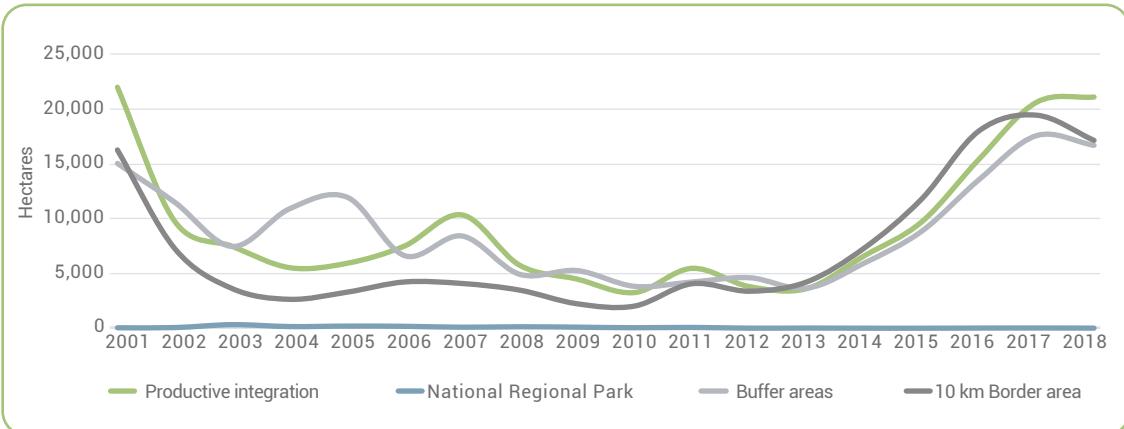


Figure 4. Historical series of coca crops in strategic interest areas

crops already present in the buffer area. The parks with the greatest risk due to the presence of coca in their buffer zones are Catatumbo-Barí, Paramillo, Sierra de la Macarena, Nukak and Munchique.

The "productive integration" category<sup>28</sup> refers to territories that are close to populated centers to promote economic articulation under a framework of legality. This area is appropriate for

the implementation of development programs to diminish the presence of 21,141 ha of coca that were found in 2018. 64% of coca in this category is close to the following municipal capitals: Tibú and Sardinata, Norte de Santander; Puerto Caicedo, Puerto Asís, Orito, La Hormiga and Puerto Guzmán, in Putumayo; Cáceres, in Antioquia; Algeria, in Cauca; and Puerto Rico, in Meta.

## AREAS

This level refers to "areas where there are no normative or strategic conditions that should be considered when designing intervention strategies"<sup>29</sup>. In 2001, there were 30,000 ha of coca in these areas, which went down to 8,000 ha in 2013. From then on, coca crops rose steadily until 2017, the

## FREE INTERVENTION

highest point in the series, with 35,000 ha. The categories in this level do not belong to any of the previous ones and can be classified into isolated areas<sup>30</sup>, permanently affected areas, areas with high coca density, and other areas. Figure 5 shows the historical series of coca crops in these areas.

<sup>28</sup> The Future Route Policy establishes a productive integration area as one which is less than 15 km from a municipal capital.

<sup>29</sup> Ministry of Justice and Law, *Future Route: Comprehensive Policy*.

<sup>30</sup> The Future Route Policy establishes as isolated areas those that are more than 15 km from any populated center.

By 2018, 21,500 hectares were in the high-density category and 9,418 ha in the permanently affected territories category. This corresponds to areas where the problem of coca crops is strongly established in the territory and where there are no conditions conducive to immediate economic articulation, because they are isolated from populated areas. Communities depend on illegal activities not only at the coca grower level, but their economy (both legal and illegal) is largely activated

by money of illegal origin. In addition, illegal armed groups have a strong presence and capacity for coercion and corruption in these territories. In consequence, sustainability of the actions taken is a challenge in these territories, where it is very important to recover security.

Furthermore, coca in isolated areas has been declining since 2001. There were 11,455 ha under this category until 2018, when 2,800 ha were detected.

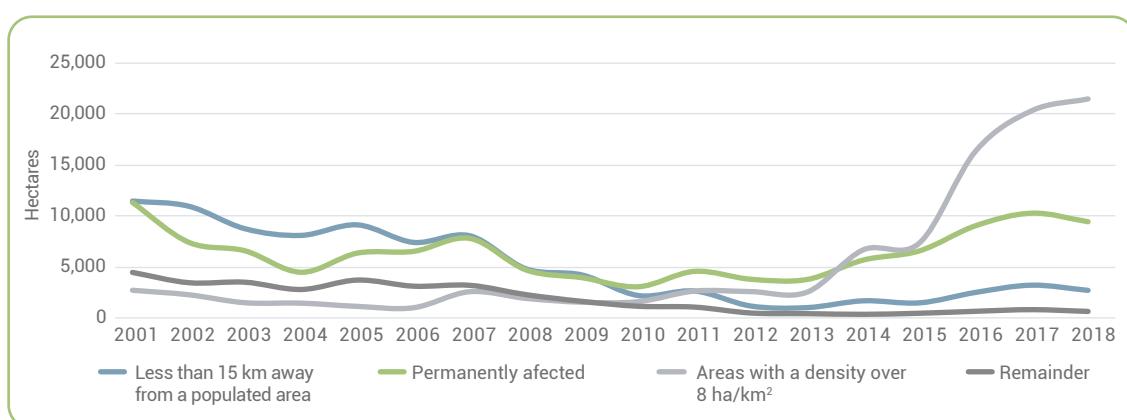


Figure 5. Historical series of coca crops in free intervention areas, 2001-2018

## DEPARTMENTS AFFECTED BY COCA

Caldas is the only department where coca crops stopped since 2013, but on top of that, the actions taken resulted in the creation of conditions that led to legality. For this reason, it was declared a "coca-free territory"<sup>31</sup> in 2019. In 2018, 22 departments were affected by coca crops. Eight of them –Arauca, Vaupés, Guainía, Cesar, Santander, Boyacá, Magdalena

and La Guajira– have less than 100 ha of coca and are ready to become coca-free territories (Figure 6).

The departments of Guainía, Santander, Boyacá, Magdalena and La Guajira have had less than 100 ha of coca crops for more than five years. However, the efforts made have not been sustainable

<sup>31</sup> For more details on lessons learned, good practices and sustainability recommendations derived from the Caldas declaration process, see: Oficina de las Naciones Unidas contra la Droga y el Delito (UNODC), *Caldas territorio libre de cultivos de coca: logros y desafíos* (Bogotá: Author, 2019).

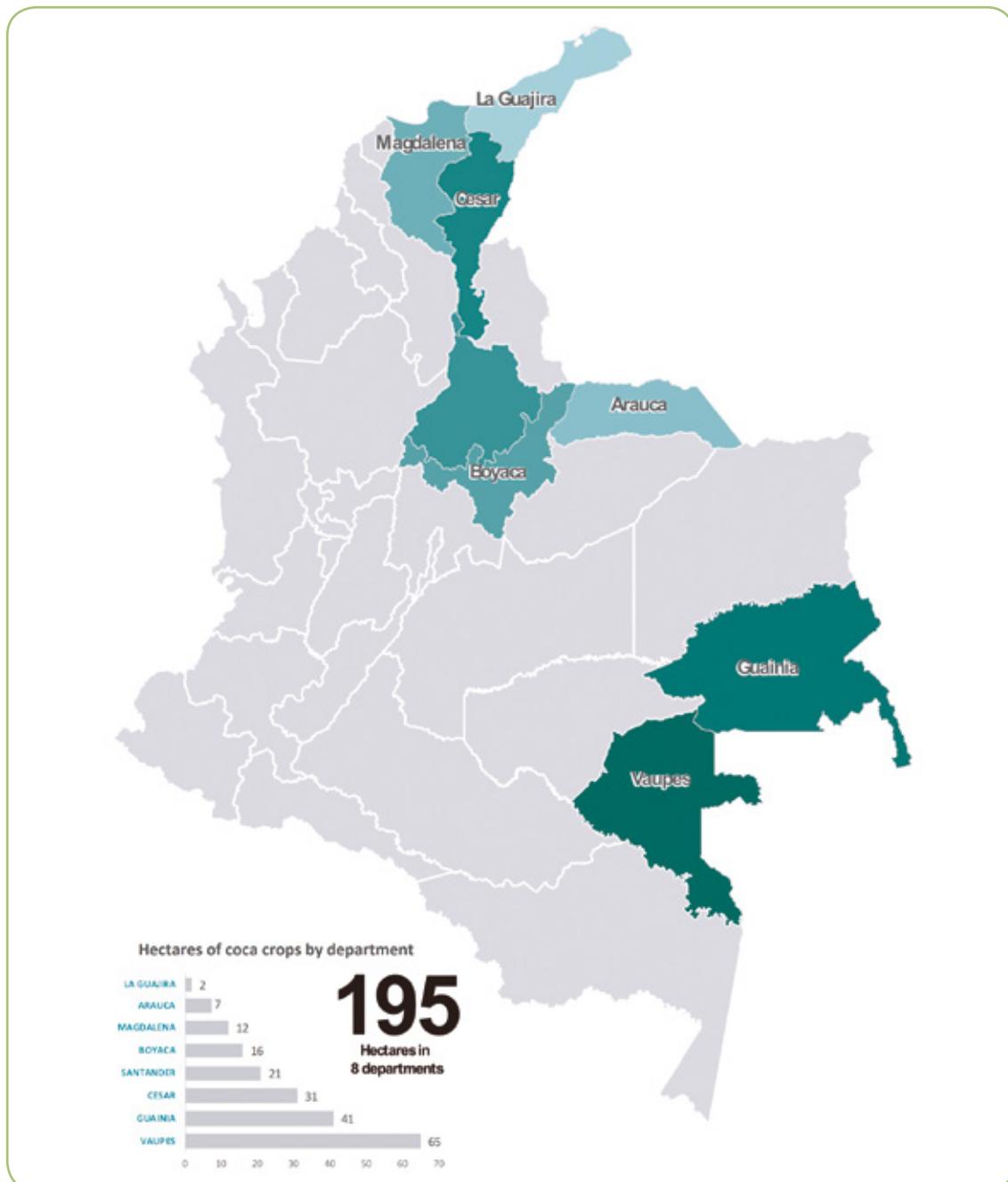


Figure 6. Departments with less than 100 ha of coca

enough to liberate those territories. The Caldas' experience shows that, in order to consolidate the coca territories, besides eradicating coca, it is necessary to create conditions conducive to legality. This implies transforming the territories, building capacities together

with the communities and strengthening institutional presence.

The area with coca crops in the 22 departments that are currently affected is shown in Table 2. Nine departments showed a clear trend towards reduction<sup>32</sup>.

<sup>32</sup> The following scale is used to rate the change: less than -10% is considered reduction; 10% change (+/-) is considered stability; change greater than 10% is considered an increase.

Table 2. Coca crops by department (ha), 2010-2018

Departament	Dec.-2010	Dec.-2011	Dec.-2012	Dec.-2013	Dec.-2014	Dec.-2015	Dec.-2016	Dec.-2017	Dec.-2018	Change 2017-2018(%)	Total 2018 (%)
Nariño	15,951	17,231	10,733	13,177	17,285	29,755	42,627	45,735	41,903	-8	25
Norte de Santander	1,889	3,490	4,515	6,345	6,944	11,527	24,831	28,244	33,598	19	20
Putumayo	4,785	9,952	6,148	7,667	13,609	20,068	25,162	29,589	26,408	-11	16
Cauca	5,908	6,066	4,327	3,326	6,389	8,660	12,595	15,960	17,117	7	10
Antioquia	5,350	3,105	2,725	991	2,293	2,402	8,855	13,681	13,403	-2	8
Caquetá	2,578	3,327	3,694	4,322	6,542	7,712	9,343	11,793	11,762	-0.3	7
Bolívar	3,324	2,207	1,968	925	1,565	1,043	4,094	6,179	8,614	39	5
Córdoba	3,889	1,088	1,046	439	560	1,363	2,668	4,780	4,636	-3	3
Guaviare	5,701	6,839	3,850	4,725	5,658	5,423	6,838	4,923	4,340	-12	2
Meta	3,008	3,039	2,699	2,898	5,042	5,002	5,464	5,577	2,945	-47	2
Chocó	3,158	2,511	3,429	1,661	1,741	1,489	1,803	2,611	2,155	-17	1
Valle del Cauca	665	981	482	398	561	690	752	1,261	1,271	1	0.80
Vichada	2,743	2,264	1,242	713	511	683	699	653	550	-16	0.30
Amazonas	338	122	98	110	173	111	167	166	122	-27	0.07
Vaupés	721	277	254	184	109	33	97	105	65	-38	0.04
Guainía	446	318	301	81	66	37	22	31	41	32	0.02
Cesar	0	0	12	13	10	33	26	24	31	29	0.02
Santander	673	595	110	77	25	21	37	30	21	-30	0.01
Boyacá	105	94	10	17	14	8	15	22	16	-27	0.01
Magdalena	121	46	37	37	9	7	35	8	12	50	0.01
Arauca	247	133	82	69	26	17	9	121	7	-94	0.00
La Guajira	134	16	10	6	0	0	0	2	2	0	0.00
Caldas	45	46	16	8	0	0	0	0	0	N. A.	0.00
Cundinamarca	32	18	0	0	0	0	0	0	0	N. A.	N. A.
<b>Total</b>	<b>61,811</b>	<b>63,765</b>	<b>47,788</b>	<b>48,189</b>	<b>69,132</b>	<b>96,084</b>	<b>146,139</b>	<b>171,495</b>	<b>169,019</b>	<b>-1</b>	
<b>Rounded total</b>	<b>62,000</b>	<b>64,000</b>	<b>48,000</b>	<b>48,000</b>	<b>69,000</b>	<b>96,000</b>	<b>146,000</b>	<b>171,000</b>	<b>169,000</b>	<b>-1</b>	
Number of affected departments	23	23	23	23	21	21	21	22	22		

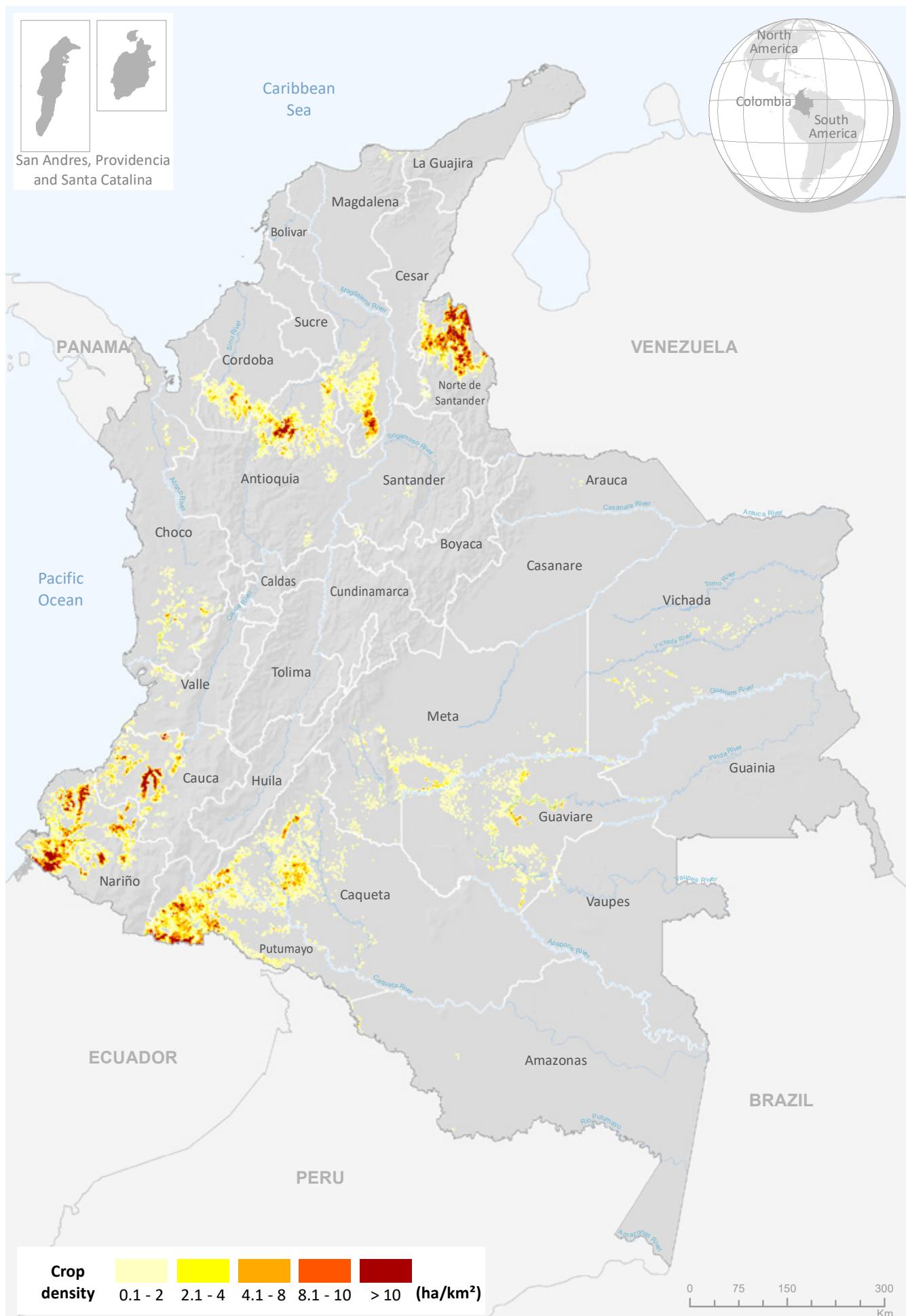
The most representative are Nariño, Putumayo, Meta, Chocó and Amazonas, with the most significant reductions, reaching more than 11,000 ha. However, these were compensated by a 9,000 ha increase in Norte de Santander, Bolívar and Cauca.

Map 2 shows the density of coca crops in 2018. Areas of concentration continue to

be the borders both with Ecuador –Nariño and Putumayo–, and with Venezuela –Norte de Santander–.

In El Tambo-Algeria (Cauca); the Charco-upper basin of the Telembí River (Nariño), El Naya (Valle del Cauca), Tarazá-Valdivia (Antioquia) and San Pablo (Bolívar), coca has a high density, exceeding 10 ha/km<sup>2</sup>.

**Map 2. Coca crops density in Colombia, 2018**



Source: Colombian Government - UNODC Supported monitoring system.

Boundaries, names and titles used herein do not construe acknowledgement or acceptance by the United Nations.



# 2

## MAIN FINDINGS

This chapter presents the main findings after integrating the 2018 coca survey with the historical series of coca crops. It focuses on three of them: the concentration trend of coca

crops in permanently affected territories during the last ten years; the increased size of coca lots, and the stabilization of the area planted with coca.

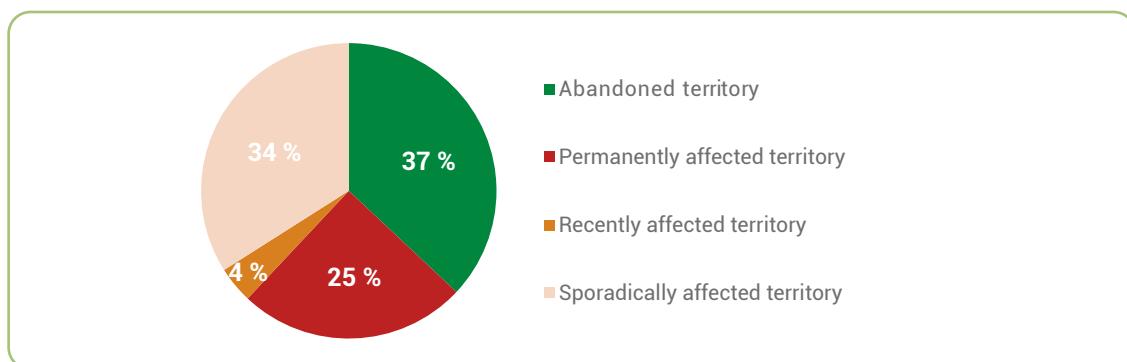
### CONCENTRATION TREND OF COCA CROPS AND STABILIZATION OF THE AFFECTED TERRITORY

The territory with coca crops reached 11,125 km<sup>2</sup> in 2018. This corresponds to 63% of the territory affected by coca in the last ten years and 51% if the entire historical series is considered. The reduction in the coca-affected area contrasts with the increase in the area planted in the last five years, which means that there is more coca in less territory.

An important condition of this dynamic is that the coca-affected territory stabilizes. This means that there is a tendency towards concentration (more coca in less territory), and that such concentration occurs in historically affected territories. In 2018, 25% of the territories with coca completed ten years or more of affectation. By 2011,

this proportion was 15% and by 2013, at the lowest point in the historical series of coca crops, it was 17% (Figure 7).

Figure 7 refers to the permanence of the grids that were affected by coca at some point in the last ten years. The geographical representation of this analysis is shown in Map 3. It is worth noting that the expanding territory is only 4%, and the abandoned territory is 37%. While coca increased by 77% in the last three years, the territory only expanded by 4%. The result is a higher density of coca in the territories that have been affected; that is, more hectares of coca per square kilometer in the same territories where coca has historically been.



Region	Total		Abandoned Territory		Permanently abandoned territory		Sporadically affected territory		Recently affected territory	
	km <sup>2</sup>	%	km <sup>2</sup>	%	km <sup>2</sup>	%	km <sup>2</sup>	%	km <sup>2</sup>	%
Amazon	19,600	8.7	17,850	21.2	350	0.6	1,275	1.7	125	1.6
Catatumbo	10,325	4.6	1,250	1.5	4,525	7.9	4,100	5.4	450	5.6
Central	38,975	17.3	15,900	18.9	7,575	13.2	13,925	18.3	1,575	19.7
Meta-Guaviare	39,725	17.6	11,875	14.1	10,325	18.1	16,025	21.1	1,500	18.8
Orinoco	23,150	10.3	14,925	17.7	1,475	2.6	6,025	7.9	725	9.1
Pacific	49,350	21.9	12,900	15.3	17,775	31.1	17,100	22.5	1,575	19.7
Putumayo-Caquetá	41,375	18.4	7,200	8.5	15,150	26.5	17,025	22.4	2,000	25.1
Sierra Nevada	2,950	1.3	2,425	2.9	25	0.0	475	0.6	25	0.3
Total	225,450	100	84,325	100	57,200	100	75,950	100	7,975	100

Figure 7. Permanence of territories with coca crops, 2009-2018

## Concentration of coca crops

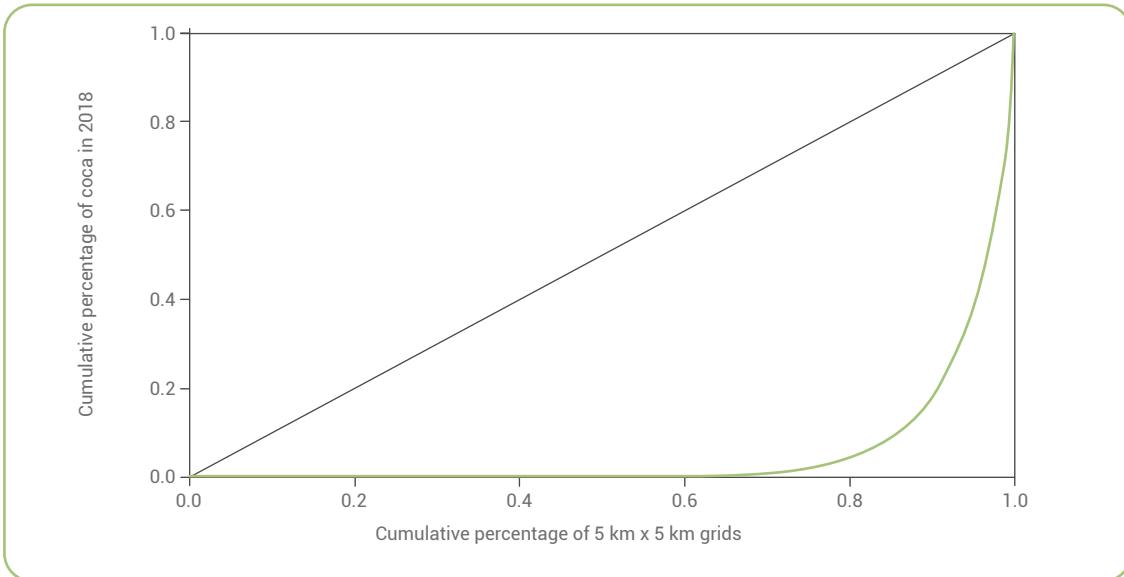
To characterize the concentration, the Lorenz curve and the Gini index were used as methodological references. The Lorenz curve is a graphic representation of the distribution of a variable. It was originally used to illustrate inequality, in particular to assess the proportion of total income or wealth assumed by the percentage of households with higher income<sup>33</sup>. For this analysis, this tool is used to analyze the relationship of the number of hectares with the presence of coca crops in the territory. The graph

shows the high concentration of coca in the territories, in a small number of 5 km x 5 km grids. In fact, it was found that only 5% of the territory with coca reached 62% of the crops nationwide, while the remaining 95% was just 38% (Figure 8).

Another measure frequently used to measure inequality between distribution values is the Gini index<sup>34</sup>. Based on the 5 km x 5 km grid areas, the Gini index for the spatial distribution of coca crops in 2018 was calculated. The resulting value was 0.899, which is the highest in the entire

<sup>33</sup> Lorenz, M., "Methods of Measuring the Concentration of Wealth", *Publications of the American Statistical Association* 9, n.º 70 (1905): 209-219.

<sup>34</sup> The Gini coefficient or index is a measure of inequality, which can be used as an indicator of the concentration of coca crops in Colombia. The coefficient takes values between zero (0) and one (1), where values close to zero (0) correspond to perfect equality, that is, maximum crop dispersion, and one (1) corresponds to perfect inequality, that is, maximum concentration.



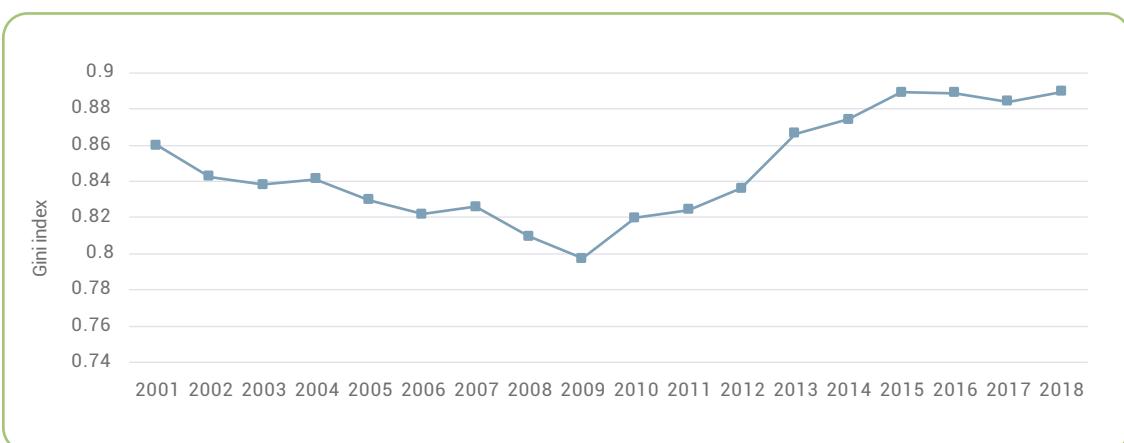
**Figure 8. Lorenz curve and Gini index, 2018**

Note: The Lorenz curve is utilized in order to represent the unequal amounts of coca in the territory. The vertical axis shows a graphic rendering of the accumulated percentage of hectares with coca detected in FY 2018, whilst the horizontal axis shows a graphic rendering of 5 km X 5 km grids. If the curve represents a 45 degree straight line, then it is indicative of the fact that each grid has the same amount of coca –i.e. there is perfect equality. Contrarily, a perfectly unequal distribution would be one where a single grid contains all the ratio of crops nationally.

historical series of coca crops since 2001, which indicates that crops have never been so concentrated at this geographical level. Such Gini value increased by almost 1% when compared to 2017, when it was 0.884 (Figure 9).

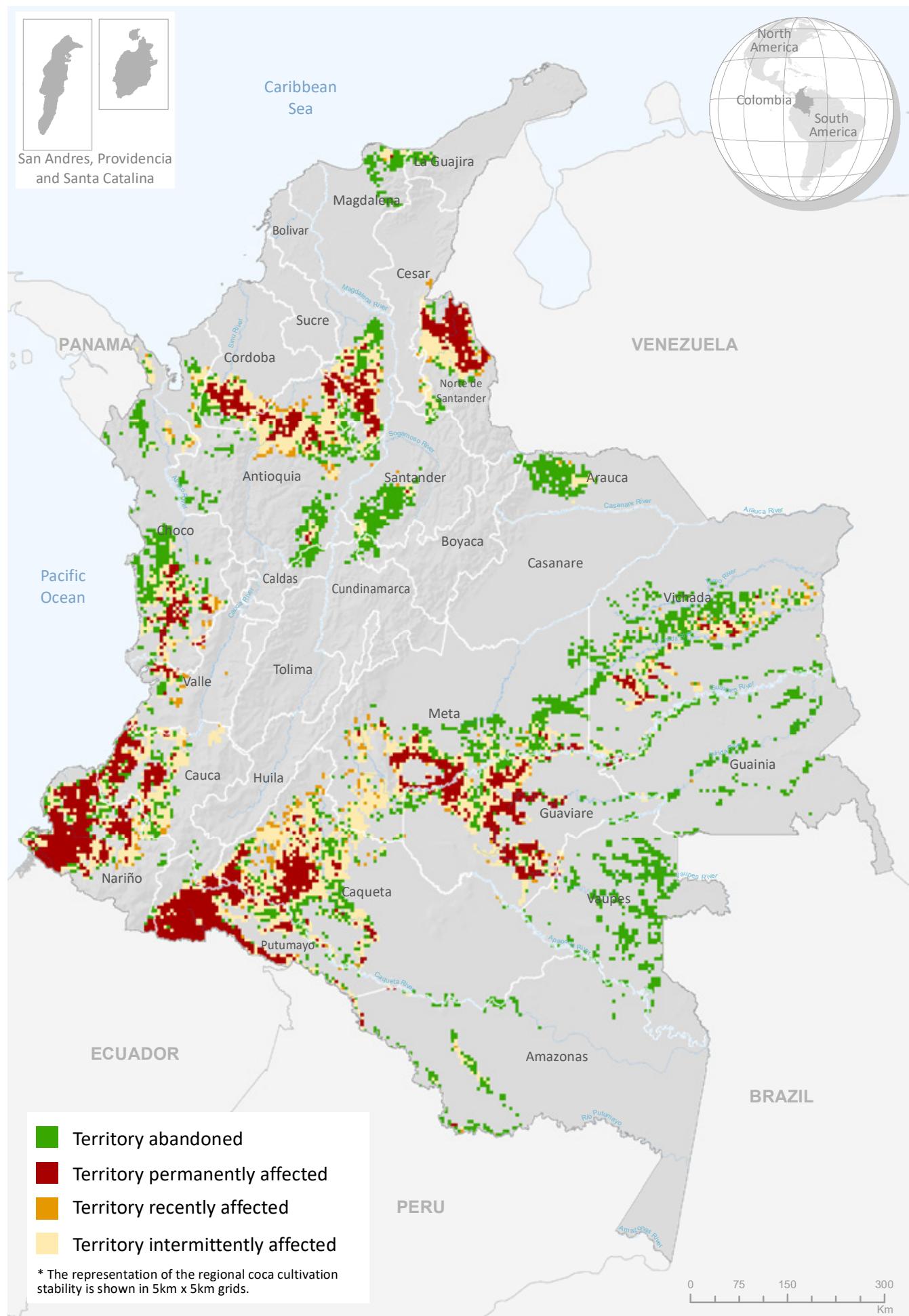
At the municipal level, there is also a tendency towards concentration. It is

estimated that 17% of the municipalities of Colombia had coca crops. The top ten (Tibú, Tumaco, Puerto Asís, El Tambo, Sardinata, El Charco, El Tarra, Orito, Tarazá and Barbacoas) represented 44% of the country's total coca crops in 2018. The Gini index of the amount of coca crops at the municipal level in 2018 was 0.872.



**Figure 9. Gini index of coca crops, 2001-2018**

**Map 3. Regional distribution by coca crop permanence, 2009-2018**



Source: Colombian Government - UNODC Supported monitoring system.

Boundaries, names and titles used herein do not constitute acknowledgement or acceptance by the United Nations.

Coca concentration occurs mainly in areas that have been permanently affected<sup>35</sup> during the last ten years (Figure 10). By 2011, 50% of coca was present in permanently affected areas, while in 2018 it reached 82%.

## Stabilization of coca-affected territories

The concentration of areas with coca crops implies that there is increasingly less territory with coca crops, which creates two opposite situations: areas where there is a high concentration of coca and areas where favorable conditions are created for the formation of territories liberated from this problem.

37% of the territory that had coca at some time during the last ten years completed, in 2018, three years or more without the presence of this crop; 87% of the territories defined as abandoned in 2017 remained without coca for the second consecutive year, and 10% of abandonment of 2017 does not report coca since 2009. Eight departments have less than 100 ha of coca in 2018, so an action specifically aimed at reducing vulnerabilities and improving competitiveness could quickly lead to the consolidation of coca-free territories. In 2001, there were about 14,000 ha of coca in the areas that are now three years old without the presence of these crops (Figure 11).

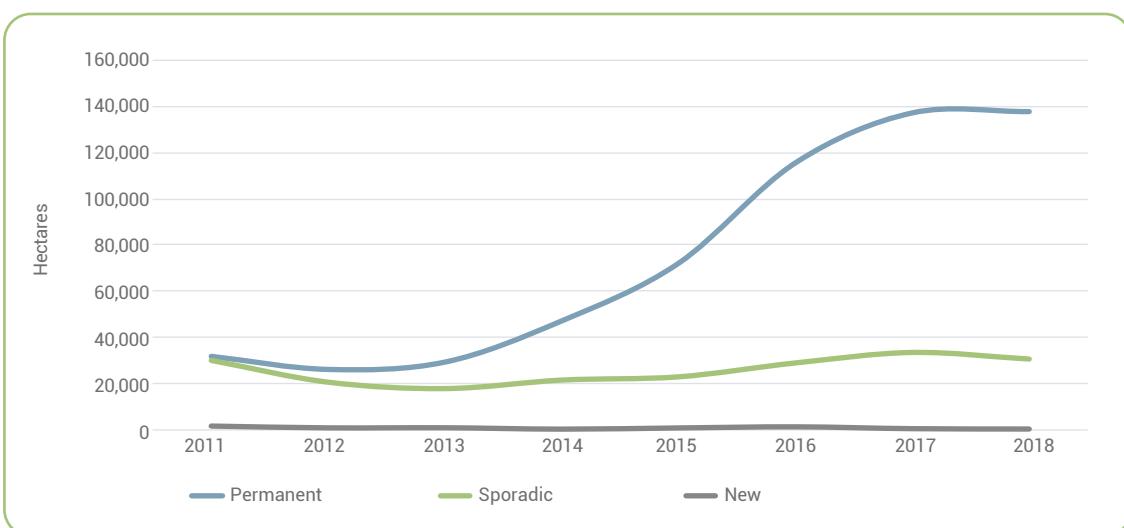


Figure 10. Coca crops (hectares) according to permanence category, 2011-2018

<sup>35</sup> It refers to the grids where coca has been constantly detected in the last ten surveys.

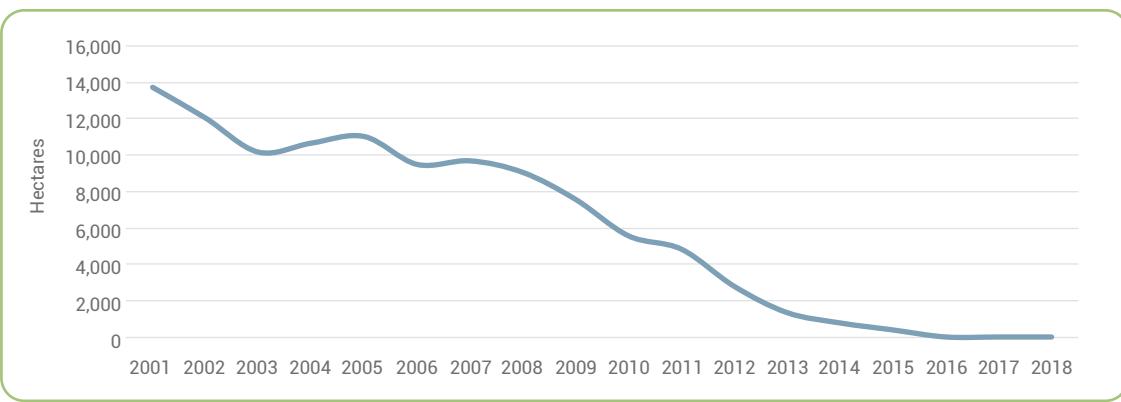


Figure 11. Coca crops (hectares) in the abandonment category, 2001-2018

Map 4 shows the time since coca was last detected in the territories. It shows that coca can be a thing of the past in many territories. Nevertheless, the

sustainability of this situation depends on the continuity of security conditions, the decision of the communities and institutional presence.

#### Caldas Department: coca-free territory

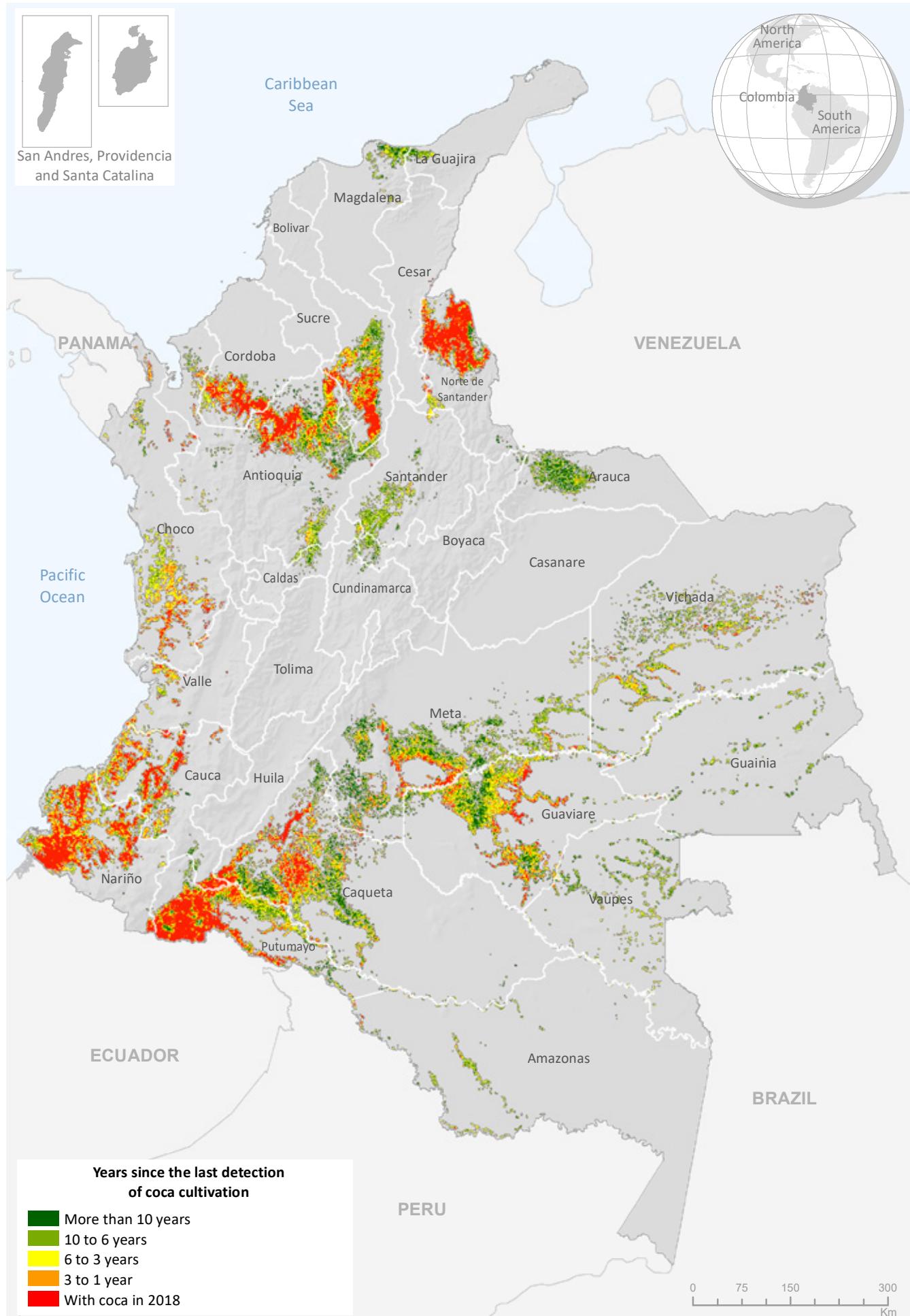
Amidst a complex scenario in terms of security due to the rearrangement of illegal armed groups and the increase in the production of illegal crops in the rest of the country, the Caldas department became an example after being declared a coca-free territory by the United Nations Office on Drugs and Crime (UNODC) Colombia. This was due to the sustained abandonment of coca production, moving from the maximum production of 461 ha in 2006 to 0 ha in 2013. Since 2013, no coca crops have been registered in the department and there is a continuous improvement in terms of security conditions, legal markets and institutional presence.

The presence of armed groups, the coffee crisis, institutional weakness and road isolation in the 1990s were the factors that influenced the momentum of coca production in the affected areas of the department. The transformation of this reality into a coca-free territory was possible thanks to the will of the community to leave this practice behind and regain legality, together with some institutional facts and policies such as the recovery of security by the increased presence of the public force and attacks on guerrilla structures, crop eradication, the

demobilization of the Self-Defense Peasants of Magdalena Medio (Autodefensas Campesinas del Magdalena Medio), and alias "Karina", a woman in charge of the Farc-EP in the region. Other drivers were the improvement of the road network, which went from 256 km of roads in 2006 to 560 km in 2018, the implementation of alternative development projects such as Ranger Families (Familias Guardabosques) and Families on their Land (Familias en su tierra), the recovery and momentum of legal production, the promotion of associative efforts and social organization, and the coordinated work between the community and State under the crime prevention approach.

The first certified case of sustained abandonment of illegal crop production is a benchmark for the territories that have been affected by this problem in the country. Caldas' experience shows that confronting the armed groups driving this illegal economy is possible objective as long as security is strengthened and guaranteed in the territories, the communities and public institutions work in a consolidated way, and comprehensive development programs with a territorial approach are implemented.

#### **Map 4. Years since the last detection of coca crops**



Source: Colombian Government - UNODC Supported monitoring system.  
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It is important to mention that without proper transformation of territories, communities and institutions, the absence of coca alone is not enough to guarantee the sustainability of coca-free territories. Public policy strategies must be designed both at the central and territorial level to promote sustainability in areas where coca is no longer present, in order to protect these territories from such scourge.

At the other end, the situation in concentration areas is completely different. Security conditions are complex due to the interests of drug traffickers in

the area and they affect the communities' ability to make their own decisions.

The coca concentration trend also implies greater dependence of communities on illegal production in permanently affected areas. Not only do coca growers depend on the illegal economy. Traders of chemical substances, *raspachines*, agricultural product suppliers, transporters and other forty actors with different roles make a living from this type of economy, which deepens the imbalance and the problems caused by drug trafficking<sup>36</sup>.

## LOT SIZE INCREASE

The historical series of coca lot size<sup>37</sup> shows that in 2001 they reached an average size of 1.8 ha. From then on, the size was constantly reduced. By 2013, it dropped to 0.57 ha and, from that moment on, the trend changed and the lots grew to 1.07 ha on average in 2018 (Figure 12). This represents a 7% nationwide increase (from 1 ha to 1.07 ha) compared to 2017. The most important increase in the average size of lots occurred in the Sierra Nevada region, where it went from 0.23 ha in 2017 to 0.35 ha in 2018, although these figures

still remain below the national average (Figure 13). At the departmental level, coca lot size increased significantly in Magdalena (55%), Cesar (33%) and Bolívar (22%). On the other hand, the average lot size decreased in Arauca, going from 1.19 ha in 2017 to 0.82 ha in 2018.

It is worth mentioning that this increase is also related to a high standard deviation, given the existence of larger lots mainly in the departments of Guainía (3.3 ha) and Vaupés (1.31 ha).

<sup>36</sup> Ministry of Justice and Law and United Nations Office on Drugs and Crime (UNODC), *Modelo piloto para la caracterización de la cadena de valor del narcotráfico (CVN), con enfoque territorial. Informe institucional interno* (Bogotá: Authors, 2018).

<sup>37</sup> Lot size is calculated based on the interpretation of medium resolution images (15 m). A coca lot is defined as the group of continuous pixels making up an object or entity that meets the following premises: 1) spectral behavior matching the range occupied by this coverage in the electromagnetic spectrum and with primary elements of specific interpretation (pictorial-morphological elements); 2) geographical validation through analysis of the landscape, biophysical conditions for the development of crops and territorial congruence with its historical dynamics, and 3) spectral traceability of the crop during the last period (inter-surveys), for identification of the different phenological stages and thematic confirmation of the crop.

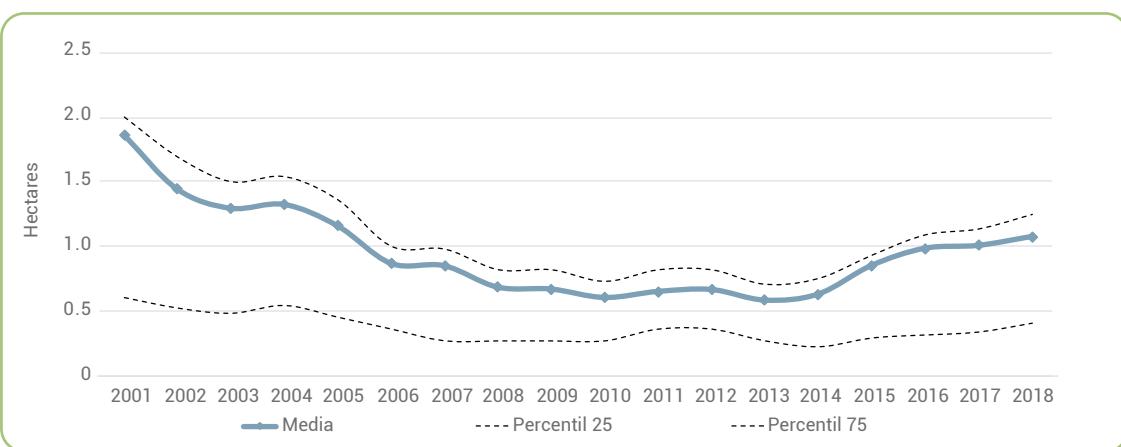


Figure 12. Historical series of average coca lot size, 2001-2018

Note: The dotted lines in the graph represent the 25 and 75 percentiles of the distribution of medium size lots. The area between both lines shows where 50% of the total data are concentrated.

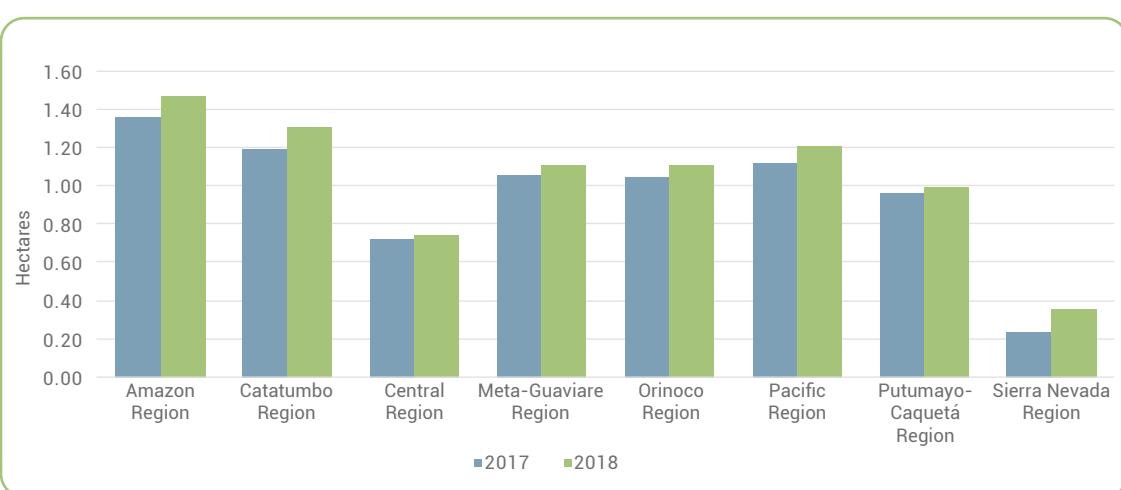


Figure 13. Average of coca lot size by region, 2017-2018

The growth of the average lot size supports the concentration of coca, as it implies more coca in less territory, and the stabilization of the territory affected by coca, because the increase in areas with coca crops is associated with pre-existing coca.

It is not possible to establish a direct relationship between lots and families, since there is no property delimitation in these territories, and it is impossible

to identify internal boundaries such as fences, walls or other similar elements. Additionally, field surveys indicate that one family may own one or more lots in one or more properties. However, the increase in the area is related to the increase in lot size and not to new lots, which would indicate that the number of families planting coca does not grow at the same rate as the area planted with coca. The increase in the average lot size implies that the coca-

based economy is strengthening in the territory and that the families obtain greater income from this activity. The

decision to have larger lots implies competitive conditions that favor coca cultivation over other legal alternatives.

## STABILIZATION OF THE AREA WITH COCA CROPS

Coca crops had been increasing in Colombia since 2013, when the lowest point was reached in the entire historical series with 46,000 ha. In 2017, the highest point was reached with 171,000 ha, three times higher than in 2013. Although in 2018 the crops are still near the upper limit of the series, it is important to highlight a change in the growth trend (see Figure 1).

In 2017, the increase was reduced and in 2018 the area planted with coca stabilized. This situation of stability at the national level is the result of a compensation effect given the dynamics of the changes at the local level (Map 5).

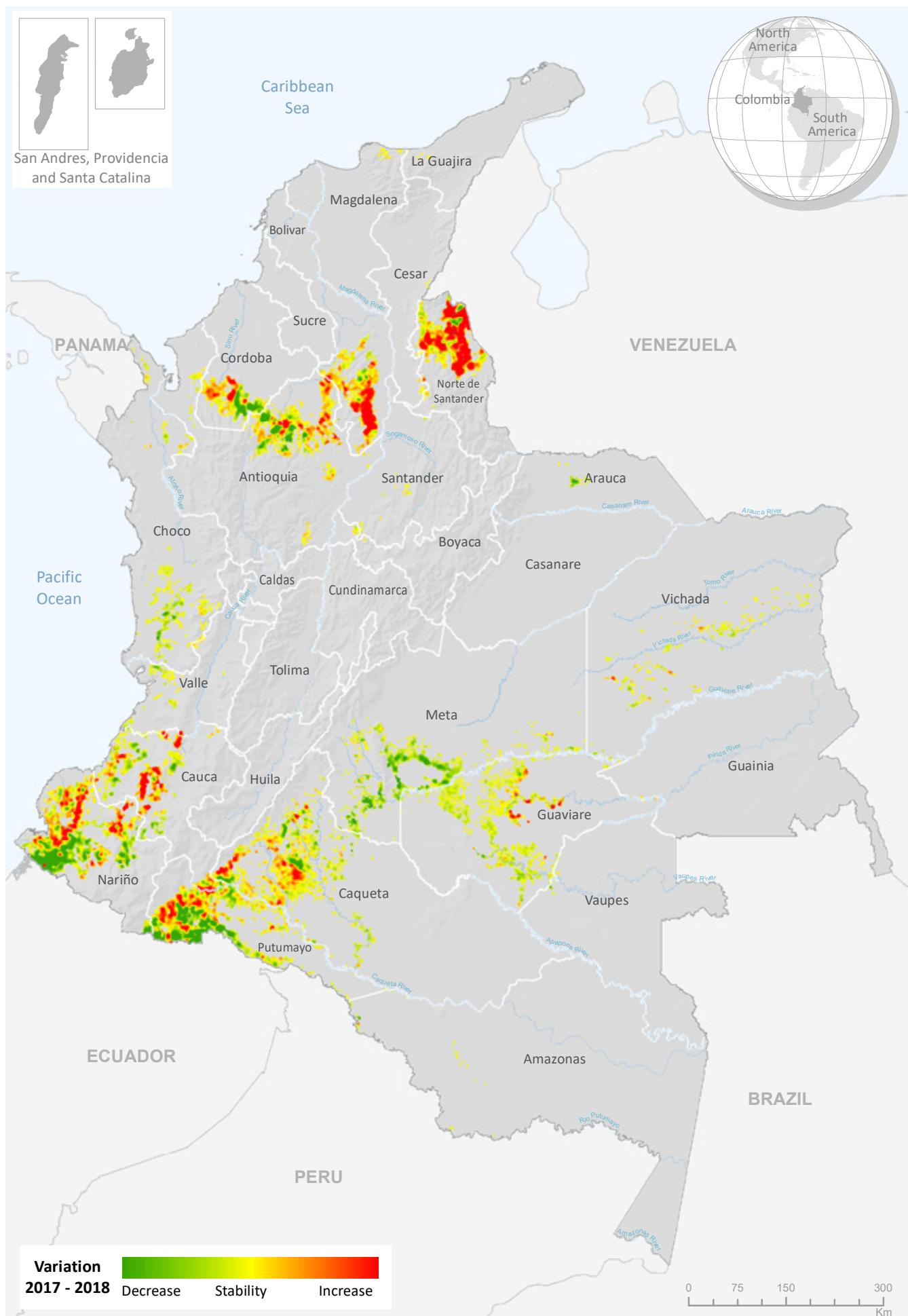
In 2018, coca was reduced in 54% of the territory with coca crops, with an average reduction of 1.35 ha/km<sup>2</sup>. However, only 29% of the reducing grids had no coca crops. This means that, although coca

decreased in half the territory, it has not disappeared. As long as coca persists in the territory, so will the interests of armed groups, insecurity, corruption risks and restrictions on legality, which limits sustainability.

It is important to note that this reduction is occurring in areas with high crop density, such as the border with Ecuador or the Lower Cauca in Antioquia, which is positive because it has a direct impact on the most consolidated clusters. The spatial analysis also shows that this reduction is strongly related to the intervention<sup>38</sup>, since 36% of the reducing grids were intervened in 2018, and 66% of the intervened grids had a reduction. The decision to concentrate the intervention in high density areas generates positive impacts on the figures, but uncertainty regarding the sustainability of these impacts prevails.

<sup>38</sup> In Colombia there are multiple tools to deal with the problem of coca crops. When intervention is mentioned in this document, reference is made to actions directly aimed at impacting/eradicating coca lots.

### **Map 5. Absolute variation of the area with coca crops, 2017-2018**



Source: Colombian Government - UNODC Supported monitoring system.

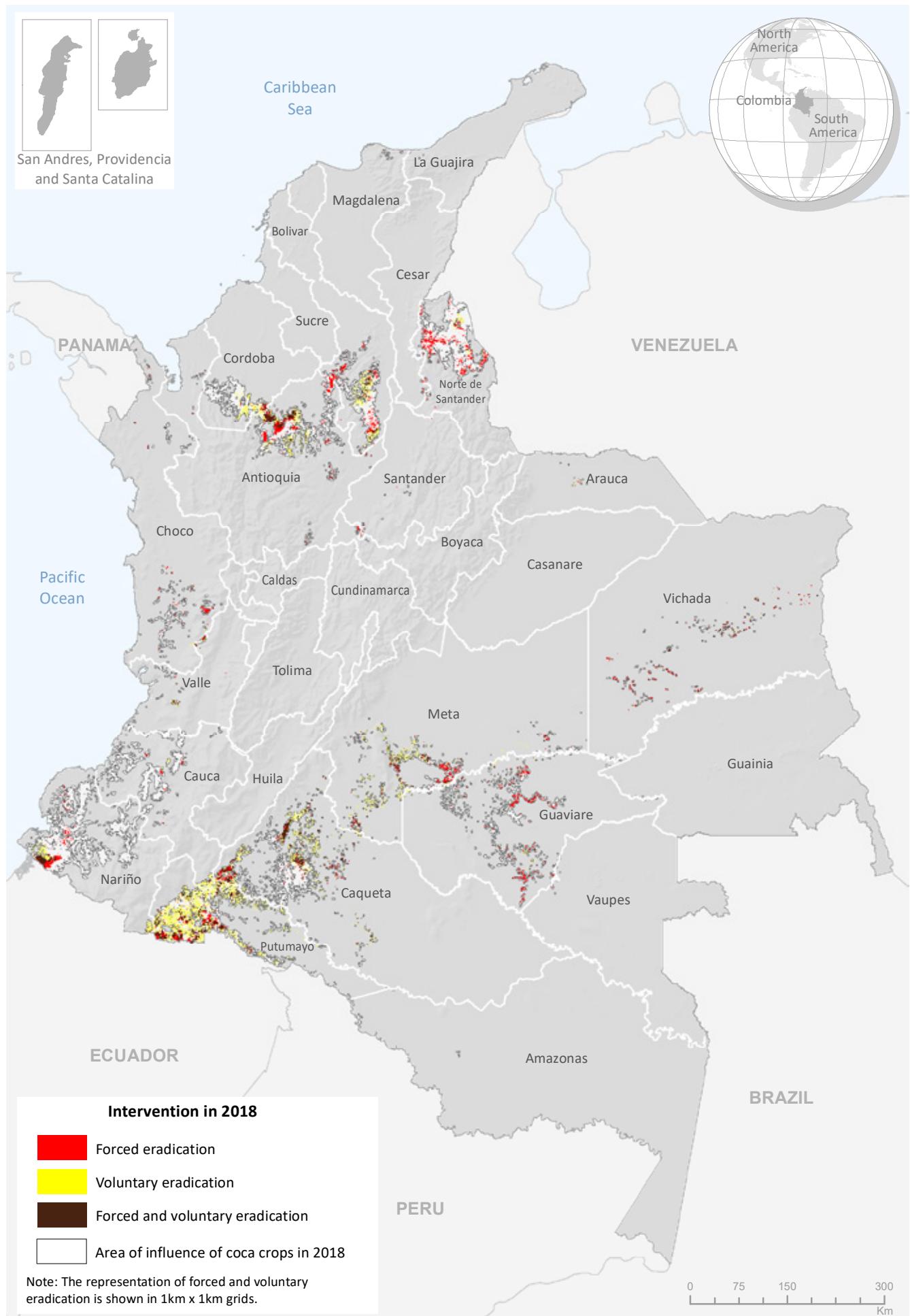
Source: Colombian Government - UNODC Supported monitoring system.  
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## The intervention reduces coca, but does not cover enough territory

The intervened grids had an average reduction of 18%, while the non-intervened ones had an 8% growth. The compensation effect is due to the fact that although the reduction in the intervened grids is greater than the increase in those that were not intervened, the number of these grids

only reaches 29% of the total affected grids (Map 6). It is also important to mention that the intervention reduces coca, but it does not eliminate it from the territory. Only 19% of the intervened grids had no coca after these actions were implemented. This indicates that intervention strategies reduce coca, but their coverage is still too low to reverse the national trend and too scattered to generate territories without coca.

**Map 6. Intervened areas with eradication according to modality**



Source: Colombian Government - UNODC Supported monitoring system.

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It is worth highlighting that 81% of the intervened grids in 2018 are still affected by the presence of coca crops despite the intervention. The persistence of coca in the territory is due not only to reseeding, but also to the discontinuity of the intervention and the planting of new lots near those that were intervened.

It is difficult to track the coverage of the intervention (the number of grids intervened against the total number of grids affected by coca), due to failures in the registration systems of the interventions, such as aerial spraying –now suspended– and the National Comprehensive Plan for Crop Substitution (PNIS), which had from the beginning a registration system to delimit the intervened/eradicated coca lots. In the case of alternative development programs, the geographical component was focused on the families that were

served in farms and villages. As for forced manual eradication, a robust registration platform is in the implementation process. However, from the available information, an increase in the coverage of the intervention in the last three years can be seen. In 2017, the intervention reached 13%, while in 2018, it arrived to 29% of the affected territory.

One of the biggest concerns about these interventions is sustainability. The spatial analysis shows that the intervened grids in 2017 and 2018 had a reduction of coca of 25%. Those grids that were only intervened in 2018 and not in 2017 had a reduction of 16%, while those that were intervened in 2017 but not in 2018 had a reduction of 2%. This shows that the effect of the intervention is momentary and that maintaining the presence for more than one year multiplies the impact by four.

#### MANUAL ERADICATION REGISTRATION PLATFORM

The registration model is based on gathering information on manual eradication operations directly on the field, so that it is possible to establish geographical accuracy (features of the site where eradication was carried out); geometric accuracy (area and delimitation of the lot where eradication took place); thematic accuracy (features of the eradicated crop), and spectral accuracy (uniformity of the lot that were eradication was carried out, i.e. the lot containing mostly coca).

This information is collected directly during the eradication process on the field through a mobile application in a mid-upper range device to determine the geographic coordinates through

a global navigation satellite system (GNSS) and later send the data to a central server.

Once on the server, the records are decrypted according to previously established procedures and then they are validated by experts and trained personnel who will determine if the record meets the conditions to be accepted as effective manual eradication.

After the validation, reports are prepared and the validated data are integrated into the illegal crop monitoring system.

Finally, based on the results of the validation, feedback mechanisms are be applied to guarantee continuous improvement of the records and the operations in general.

# 3

## COCAINE PRODUCTION IN COLOMBIA

Cocaine is one of the fourteen alkaloids in the coca leaf. Its extraction is determined by the establishment and productivity of the crop, as well as by the ability to extract basic cocaine paste (BCP) and the conversion of the alkaloid (to obtain cocaine hydrochloride). In order to estimate cocaine production in Colombia, since 2005 UNODC and the National Government have conducted various studies aimed at providing information related to the productivity of coca crops, as well as information on key processes to obtain cocaine hydrochloride<sup>39</sup> from coca leaves.

This chapter focuses on the estimation of the potential production of cocaine in the area planted with coca in 2018. First, the main characteristics of coca crops in different regions of the country are analyzed, based on the results obtained in the regional updates of the *Coca Crop Productivity Studies* in their different phases<sup>40</sup>. Second, the findings of studies related to the alkaloid's extraction, refining and conversion processes are incorporated in the analysis. Third, estimations of the potential production of cocaine are presented.

<sup>39</sup> Through the generation of technical-scientific evidence from research studies such as: 1) Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC), *Estudios de productividad de los cultivos de coca en regiones con afectación* (Bogotá, 2005-2018); 2) Prevención del Desvío de Sustancias Precursoras de Drogas en los Países de América Latina y el Caribe (PRELAC) and the United Nations Office on Drugs and Crime (UNODC)-Sistema Integrado de Monitoreo de Cultivos Ilícitos (SIMCI), *Caracterización del proceso de transformación de la hoja a clorhidrato de cocaína* (Bogotá, 2010 and 2014), and 3) Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC)-Sistema Integrado de Monitoreo de Cultivos Ilícitos (SIMCI), *Caracterización de los complejos de producción de clorhidrato de cocaína* (Bogotá, 2016).

<sup>40</sup> In 2005, information on coca crop productivity studies started to be collected in the eight regions affected by coca cultivation nationwide. From then on, one or two regions are updated every year and each national round is completed in about four years. To date, three national phases have been consolidated, according to the commitments agreed between UNODC and the Government of Colombia: Phase I, baseline of the study, while the regional update carried out between 2007-2010 refers to Phase II; Phase III was carried out between 2011-2014. In 2015, Phase IV began with the gathering of information in the Sierra Nevada, Central and Catatumbo regions, later in 2017 with Putumayo-Caquetá and, finally, in 2018 with Meta-Guaviare and Orinoco Regions. The update of the Pacific region is pending and it is scheduled for the second half of 2019. It should be noted that the timing of information collection could affect productivity levels in the regions that there is no updated information about.

Between 2013 and 2017, a sustained increase in the capacity to obtain cocaine was observed in Colombia<sup>41</sup>. However, the growth rate has decreased in the last year (Figure 14). Between 2014 and 2017, the productive area grew at an annual rate ranging between 29% and 34%, with a similar trend to that of cocaine production (48% on average).

In this period, factors such as changes in agricultural practices, lot age and the selection of cultivars were apparently

vital for yield increase (from 4,700 kg/ha/year in 2014 to 5,600 kg/ha/year in 2017), which resulted in a higher amount of pure cocaine hydrochloride per hectare (from 5.6 kg/productive ha in 2014 to 6.3 kg/productive ha in 2017) (Figure 15).

In 2018, the potential production of cocaine hydrochloride increased by 5.9% when compared to 2017, showing a slower growth rate than in previous years, as a result of a reduction in the production area and the national yield of coca leaves (after

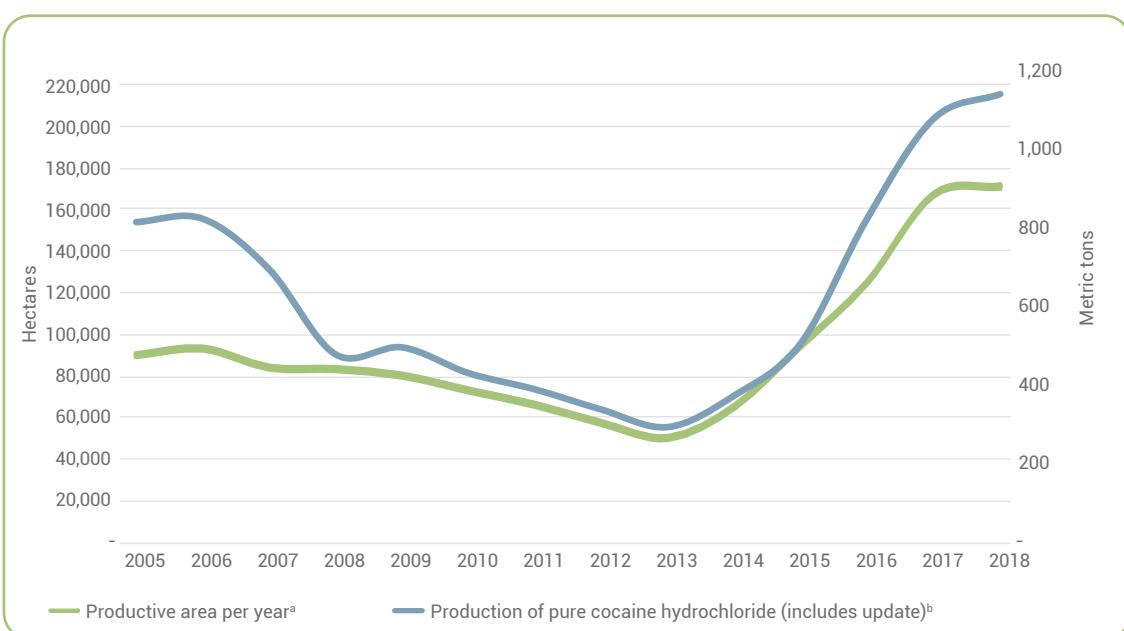


Figure 14. Behavior of the coca productive area and potential production of pure cocaine

Notes:

- a The productive area during the year is calculated through the application of a spatial analysis methodology that allows the estimation of the permanence of coca crops through a factor that allows modeling, lot by lot, the dynamics of the cultivated area in the year, based on the incorporation and systematization of available information on the variables that directly affect stability, such as forced eradication, aerial spraying and vegetation coverage, among others.
- b In the 2014-2018 period, an adjustment was made in the estimation of the annual production of cocaine hydrochloride, after the incorporation of the relationship between the mass and purity levels of the basic cocaine paste processed in agricultural production units with coca (UPAC, for its acronym in Spanish), and the cocaine base processed inside and outside UPACs.

<sup>41</sup> For more information on the methodology used to estimate the potential production of cocaine, see *Monitoreo de territorios afectados por cultivos ilícitos*, Cartilla 6. "Aspectos metodológicos" (United Nations Office on Drugs and Crime [UNODC], Bogotá, 2019).

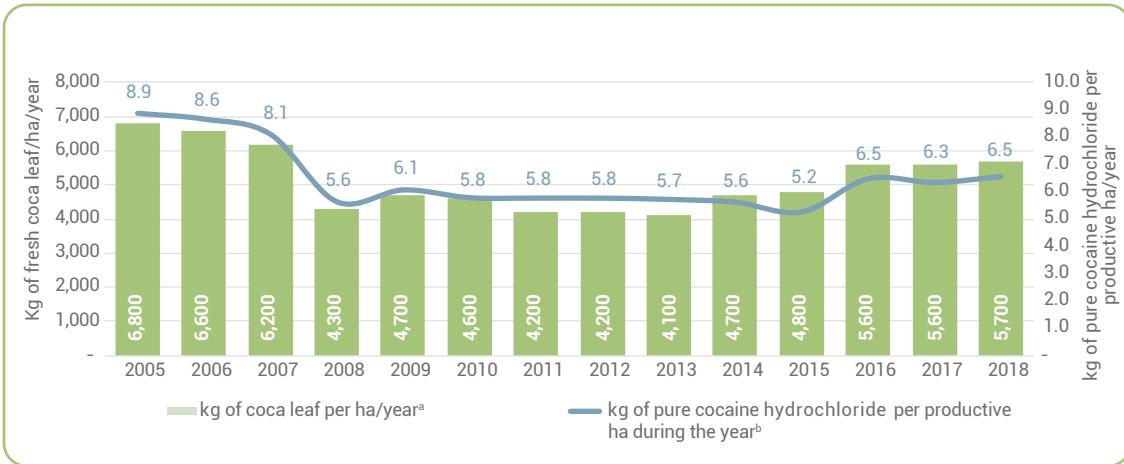


Figure 15. Implicit indexes of coca leaf and pure cocaine yields by hectare

Notes:

- a Implicit yield obtained as a result of the relationship between total tons of fresh coca leaf obtained in the regions affected by coca crops and the nationwide productive area during the year. This relationship includes the Phase IV updates in the Central, Catatumbo, Putumayo-Caquetá, Meta-Guaviare and Orinoco regions that were carried out within the framework of coca crop productivity studies.
- b Implicit yield obtained as a result of the relationship between the productive hectares during the year and the potential production of pure cocaine hydrochloride with the methodological update applied in the 2014-2018 period nationwide, which is estimated according to the relevant methodology.

the update of the Coca Crop Productivity Studies<sup>42</sup> conducted in the Meta-Guaviare and Orinoco regions in 2018). In the Meta-Guaviare and Orinoco regions, the coca leaf extraction ability per hectare exceeded the levels shown in 2013, but they are lower than those in 2005<sup>43</sup>. In addition, the following relevant aspects were observed: 1) during field operations, it was seen that deforestation practices associated with the expansion of coca crops are taking place, in response to the

implementation of eradication programs in local settings, especially in the Meta-Guaviare region, which generates a high risk of expansion to areas close to the boundaries of the agricultural frontier; 2) for the first time ever after the updates of the productivity studies it was seen that in the Orinoco region, specifically in the municipality of Arauquita, no coca was detected in the selected grids, especially due to the community's commitment to voluntary eradication<sup>44</sup>.

<sup>42</sup> Coca crop productivity studies contribute to the characterization of the productive systems associated with the cultivation and transformation of coca within the UPAC. The methodological and thematic structure of these studies contributes to the monitoring of key factors for coca leaf production and to better understand the efficiency of the extraction processes in the primary link, which is calculated by the volume of product derived from processing by agricultural producers with coca (PAC, for its acronym in Spanish).

<sup>43</sup> First, there is a 40% increase in the average yield of coca leaf per harvest in the Meta-Guaviare region, compared to the one recorded in 2013 (1,000 kg/ha), standing at 1,400 kg/ha in 2018. This level is 7% lower than the one from 2005 (1,500 kg/ha). In the Orinoco region, the average yield of coca leaf per harvest increased from 900 kg/ha in 2013 to 1,100 kg/ha in 2018. This level is 15% lower than in 2005 (1,300 kg/ha). Second, the number of harvests per year showed an increase from 4.6 in 2013 to 5.3 in 2018 in the Meta-Guaviare region, while it decreased in the Orinoco region from 5.3 in 2013 to 3.9 in 2018. Based on the results identified in the baseline (2005), the current number of harvests is lower than the one recorded in the Meta-Guaviare regions (6.6 per year) and Orinoco (5.4 per year).

<sup>44</sup> Although the coca crop survey carried out in 2017, 117 ha of the 121 ha in the Arauca department were identified in Arauquita, during field operations the survey team did not find coca crops in the selected grids. When inquiring informally the community about this situation, it was known that there is a general agreement about not planting this crop, as a way to demonstrate their interest in the construction of peace (information obtained under the framework of coca crop productivity studies carried out in the Orinoco region in 2018). According to the 2018 census, in Arauca only 7 ha of coca were detected at December 31st.

# MAIN FEATURES OF COCA CROPS THAT AFFECT LOT PRODUCTIVITY

In Colombia, coca crops have had a tendency to concentrate in specific areas, seemingly in response to interdiction actions and other strategies implemented by the National Government, as discussed in Chapter 2. This dynamic affects the number of hectares of coca but also production capacity, both of leaves and the alkaloid, as well as its permanence and sustainability in the territory.

## Lot stability favors productivity

The presence of increasingly stable and productive lots during the year is one of the alerts emphasized by this document. In the latest updates of the productivity studies, alerts are generated both in the productive structure of Agricultural Productive Units with Coca (UPAC, for its acronym in Spanish) and in the rationale of PAC regarding their perception of risk of the establishment of coca cultivation and transformation<sup>45</sup>.

In the last five years, both productive areas and leaf extraction have increased (Figure 16). On the one hand, the national

productive area went from 65,700 ha in 2014 to 171,000 ha in 2018 (160% increase). On the other hand, according to harvest tests carried out on the field, it was estimated that the national yield of fresh coca leaf per hectare went from 4.7 mt/ha/year in 2014 to 5.7 mt/ha/year in 2018<sup>46</sup> (21% increase).

The convergence of the increase in productive hectares and the ability to obtain more leaf per harvested hectare directly influences the regional production potential of coca leaf. Since 2005, leaf production has increased in a phased manner in the Putumayo-Caquetá and Catatumbo regions, while this variable decreased in Orinoco region in this same period. In the case of the Central and Meta-Guaviare regions, it has been observed that coca leaf production capacity increased in the 2011-2014 period. However, growth continues to be lower than that recorded in 2005<sup>47</sup>, when the highest lot productivity levels in these regions were reported (Figure 17). Map 7 shows crop yield by region for 2018.

<sup>45</sup> See: United Nations Office on Drugs and Crime (UNODC), "Producción potencial de hoja de coca, pasta y base de cocaína", in *Informe de Monitoreo de territorios afectados por cultivos ilícitos 2017* (Bogotá: Author, 2018): 70.

<sup>46</sup> Reported information under the framework of the coca crop productivity studies.

<sup>47</sup> In the case of the Central region, the yield of fresh coca leaf per hectare per year increased from 6.6 mt/ha/year in 2005 (Phase I) to 5.7 mt/ha/year in 2007 (Phase II), while in 2011 it went from 4.0 mt/ha/year to 4.3 mt/ha/year in 2015. In the case of the Meta-Guaviare region, the yield of fresh coca leaf per hectare per year increased from 9.9 mt/ha/year in 2005 (Phase I) to 5.1 mt/ha/year in 2008 (Phase II), while in 2013 it went from 4.4 mt/ha/year to 7.4 mt/ha/year in 2018.



Figure 16. National average yield of coca crops in Colombia and productive area, 2005-2018

Notes:

- a Estimations of coca leaf yield per hectare a year vary according to the updates of the Coca Crop Productivity Studies in various regions of the country, depending on methodological scope.

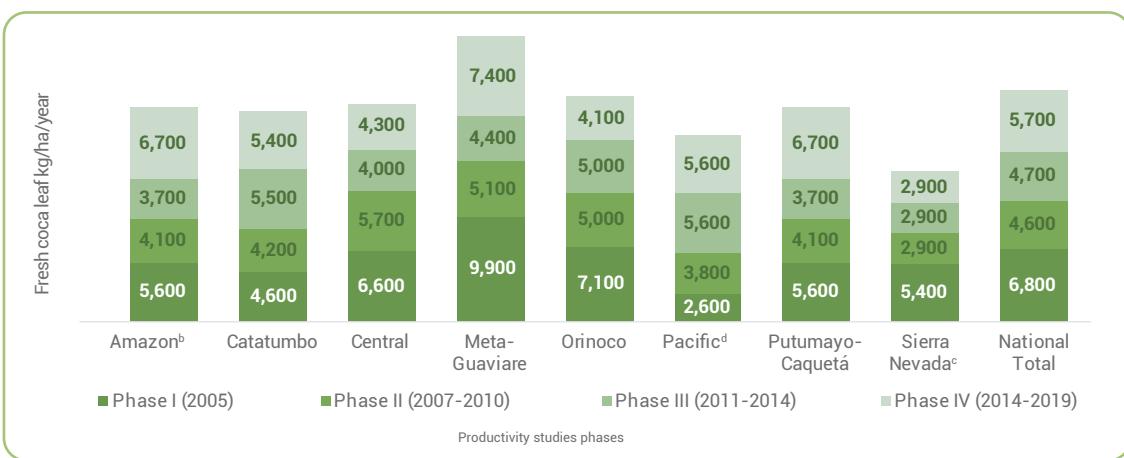
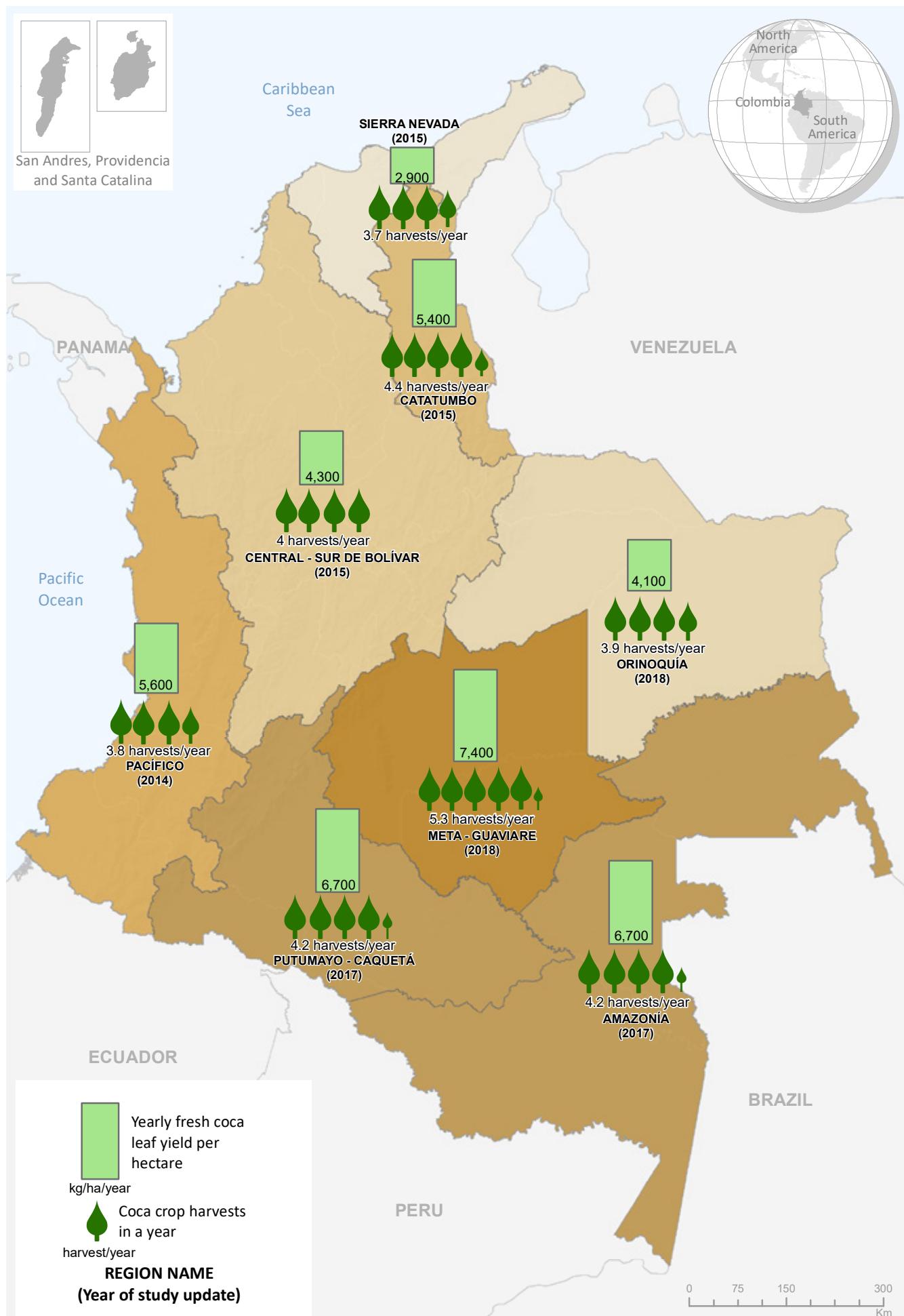


Figure 17. National average yield of coca crops in Colombia by region<sup>a</sup>

Notes:

- a Information obtained through harvest tests in UPACs, according to the specified sampling methodology. It is worth mentioning that in Phase II the performance reported by PACs obtained in the surveys of the Coca Crop Productivity Studies in the Meta-Guaviare, Catatumbo and Central regions was taken.  
b In productivity studies, information on the Amazon region is not collected. Therefore, production is estimated by taking into account the results of the Putumayo-Caquetá region.  
c In the last update for this region, no information on production and yield was reported for the Sierra Nevada region, since only 8 ha with coca were registered in 2015. In recent years, coca crop monitoring has reported a strong reduction of the Sierra Nevada cluster. To update the study, the sample was selected by including the grids that had been reported with coca and those that were identified with coca in 2011. As a result of the field operation, no coca lots were found to do the harvest tests on the selected sample. Therefore, the use of yields from previous studies (2007) for estimating production is recommended.  
d By the end of Phase IV, there will be an update on the Pacific region in the next report (2019).

**Map 7. Coca crop yield by region in Colombia, 2018**



Source: Colombian Government - UNODC Supported monitoring system.

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## Higher productivity age of most lots

Concerning the features of coca lots, the PAC tends to keep bushes in their most productive ages. In fact, it has been observed that more than half of the coca lots are 2 to 5 years age, range in which the highest yields have been reported (Figures 18 and 19).

To achieve this, the farmer uses any of the following strategies. On the one

hand, pruning of the coca bushes to promote leaf growth, improve air flow, avoid friction between branches and facilitate bush handling during the harvest. On the other hand, the bushes are renewed by substituting existing plants with cultivars<sup>48</sup> that, according to the PAC, have higher leaf production, more resistance to weather or diseases, allow greater alkaloid production or facilitate handling at the extraction stage.

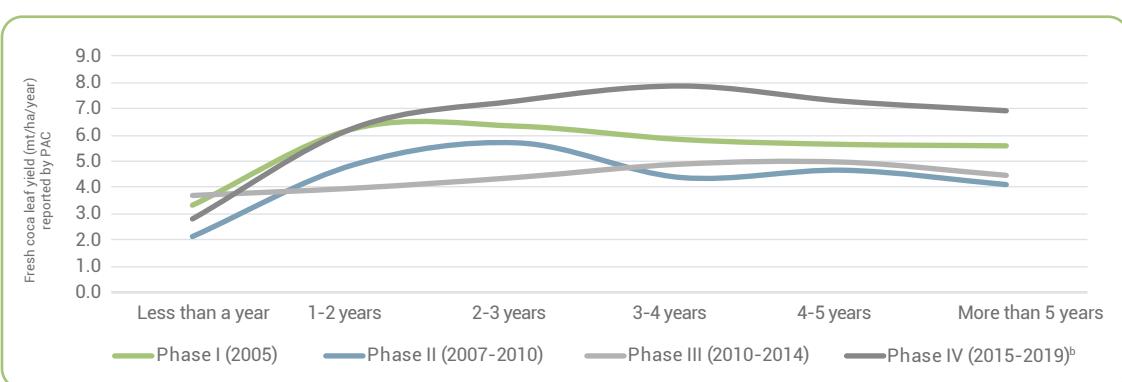


Figure 18. Coca crop yield in Colombia by lot age<sup>a</sup>



Figure 19. Coca lot percentage in Colombia by lot age<sup>a</sup>

### Notes:

- a Information obtained from productivity studies according to the specified methodology.
- b Currently, Phase IV is underway with an update on the Pacific region. For this reason, these are preliminary figures and subject to change.

<sup>48</sup> A cultivar is the common or commercial name used by the PAC in different regions of the country to identify the types of plants or seeds cultivated.

## Improvement of cultivation techniques

When comparing the types of cultivars reported by PACs since 2005 to date, there is a tendency to substitute bushes with increasingly productive cultivars (Table 3). In the last five years, growers have reported the planting of coca bushes of the *injerto*, *tingomaría*, Bolivian, Caucan, cuarentana, chipara and Peruvian cultivars in about 72% of lots, with higher yields in comparison to the previous phases of coca crop productivity studies. It is important to note that, although in 2005 *tingomaría* was the predominant cultivar in 42.7% of the country's lots<sup>49</sup>, its participation went to 16.7% of the lots<sup>50</sup> in the last five years.

Similarly, the participation of cultivars such as cuarentana, Peruvian, bitter, sweet and peluceña has been reduced in the establishment of lots against previous phases. Since 2005, PACs have tended to choose a cultivar because of its availability and low cost (85% of growers on average). In addition, in the last five years the number of growers choosing more weather-resistant coca bushes has increased (20%).

On the other hand, a trend towards greater technification of coca crops has been identified in recent years. For example, during sowing a clearly defined distance between grooves and plants is established, seemingly with the use of agricultural technical assistance, thus

Cultivars	Phase I (2005)		Phase II (2007-2010)		Phase III (2011-2014)		Phase IV (2015-2019) <sup>b</sup>	
	Lot (%)	Fresh coca leaf yield (mt/ha/year)	Lot (%)	Fresh coca leaf yield (tm/ha/year)	Lot (%)	Fresh coca leaf yield (tm/ha/year)	Lot (%)	Fresh coca leaf yield (tm/ha/year)
Tingomaría	25.6	0.7-8.0	19.4	2.2-3.6	36.0	1.6-5.0	15.7	0.9-9.1
Peruana	11.0	0.9-7.7	5.9	0.6-8.0	4.7	0.8-5.3	4.5	4.5-8.2
Injerto							19.0	3.3-7.0
Cuarentana	0.1	1.1-6.9	9.6	2.1-7.7	19.7	2.0-6.0	6.9	1.8-5.4
Chipara							5.2	0.9-8.4
Caucana	0.6	3.1-4.6			0.8	3.2-6.9	9.0	1.5-9.9
Bolivianas	2.3	0.9-6.3	0.6	3.2-5.3	4.9	0.5-6.1	11.9	5.2-8.2
Otras cultivariedades	60.4	0.7-12.0	64.6	0.2-11.5	33.9	0.5-7.5	27.8	1.0-10.3

Table 3. Cultivars in nationwide lots as reported by agricultural producers with coca (PAC)<sup>a</sup>

Notes:

- a Information retrieved from Coca Crop Productivity Studies, according to methodology.
- b Phase IV is currently in progress with the update of the Pacific region, which is why the data is preliminary and may be subject to change.

<sup>49</sup> As of 2005, it has been estimated that, in total, 42.7% of the lots had the *tingomaría* cultivar, both isolated (25.6% of the lots) and together with other varieties or legal crops (17.1% of lots), as reported by growers in the surveys.

<sup>50</sup> To date, 15.7% reported using the *tingomaría* cultivar (isolated) and 1% used it together with other varieties or legal crops, as reported by the PAC in the surveys. It is important to note that this is preliminary information, since the update on the Pacific region is underway as of the closure of the Phase IV analysis.

optimizing plant competition for nutrients, which would yield higher productivity. Most PACs report the use of agricultural practices such as fertilization and weed

and pest control. In fact, 88% of them control weed through the use of chemicals, while 10% reportedly use a combination of manual and chemical methods.

## MAIN FEATURES OF ALKALOID TRANSFORMATION

Since 2005, it has been seen that growers may or may not transform leaves in their farms. This choice is subject to their extraction or refining expertise, as well as their logistic capabilities (adapting the required infrastructure and supplies) and economic capabilities (purchase of chemical substances and other supplies required for the transformation) (Table 4). Through a follow-up to the first transaction on the farm, changes in the growers' choice have been monitored with regards to: 1) sale of unprocessed coca leaf; 2) extraction of

paste, or even 3) refining of the alkaloid as cocaine base paste<sup>51</sup>. This follow-up has shown that since 2005 most PACs tend to sell the leaves. On the other hand, a significant percentage of them transform the leaf to obtain basic cocaine paste on the farm, affecting the processing of cocaine base.

It is important to clarify that PACs can process the leaf by themselves in their farms or close to them, or they may hire someone to carry out this process. The

Region	Phase I (2005)			Phase IV (2015-2019)		
	Farmers processing basic cocaine paste (%)	Farmers processing cocaine base (%)	Farmers selling the leaf (%)	Farmers processing basic cocaine paste (%)	Farmers processing cocaine base (%)	Farmers selling the leaf (%)
Amazon(a)	65	3	32	52	0	48
Catatumbo	20	9	71	73	0	27
Central	5	52	43	76	0	24
Meta-Guaviare	26	65	9	87	0	14
Orinoco	0	85	15	100	0	0
Pacific	31	1	68	5	3	92
Putumayo-Caquetá	65	3	32	52	0	48
Sierra Nevada	22	29	49	4	5	91
<b>National total</b>	<b>31</b>	<b>34</b>	<b>35</b>	<b>44</b>	<b>1</b>	<b>55</b>

Table 4. Processes performed by coca agricultural producers in agricultural productive units with coca (percentage)

<sup>51</sup> Although the terms "basic cocaine paste" and "cocaine base" are used randomly in the different regions of the country, as products with heterogeneous characteristics in terms of quality and volume, it is possible to distinguish them by analyzing the amount of potassium permanganate used while processing.

results of the Coca Crop Productivity Studies show that since 2005, out of the total number of growers reportedly transforming the coca leaf, about 84% do this process themselves in or around the UPAC, while 16% of growers hire someone to do it. Also, most PACs obtain the chemical substances required for this process in the municipality (91% of growers on average), while 9% of them informed that chemical substances are supplied in the UPAC<sup>52</sup>. Some of the chemical substances that are most difficult to obtain according to growers are sulfuric acid, which is essential for alkaloid extraction, followed by potassium permanganate, required for the purification of cocaine. However, when comparing the perceptions of the PACs on the difficulty to obtain these substances, a concern is that in the last five years about 40% of growers have

reported that no substances are difficult to get.

The current trend of a higher proportion of growers processing the coca leaf to obtain basic cocaine paste on farms (UPAC) could be related to any of the following situations<sup>53</sup>: 1) an adaptive strategy based on changes in price levels of leaf, basic paste and cocaine base; 2) the arrival of actors offering cash or financing working capital, such as access to technical advice, chemical and agrochemical inputs and labor, among others, or 3) the transition to more productive cultivars, not only in terms of obtaining the leaf, but also in terms of easier extraction of the alkaloid, which has diminished the use of potassium permanganate, as the cultivars used would tend to be more efficient and would not need to go through a purification process.

## ESTIMATED POTENTIAL COCAINE PRODUCTION

The potential production of fresh coca leaf for 2018 was estimated at 977,414 mt<sup>54</sup>, which represents a 5% increase with respect to the estimated potential in 2017 (930,941 mt), as a result of the growth of the productive area and the yields of fresh coca leaf production in the Meta-Guaviare and Orinoco regions (according to the update of the Coca Crop Productivity Studies). Based on this behavior, it is

important to highlight that in the last year the potential production of fresh coca leaf tends to grow at a slower rate in comparison to the last five years (Figure 20). The Pacific, Putumayo-Caquetá and Catatumbo regions represent 36%, 27% and 18% respectively of the total potential production of fresh coca leaf (Figure 21). Map 8 shows the distribution of fresh coca leaf production by region in 2018.

<sup>52</sup> Estimates made with the information provided by the grower in phases II, III and IV (updated) of the coca crop productivity studies.

<sup>53</sup> Ministry of Justice and Law and United Nations Office on Drugs and Crime (UNODC), *Modelo piloto para la caracterización de la cadena de valor del narcotráfico (CVN), con enfoque territorial. Informe institucional interno* (Bogotá, 2018).

<sup>54</sup> It is estimated that the national potential production of fresh coca leaf ranges between 853,188 mt-1,150,436 mt in 2018.

As seen in Table 4, the harvested leaf may be sold by the grower, or it may be processed on the farm to obtain basic cocaine paste or cocaine base. These three scenarios may vary among regions. In this context, there is persisting concern about the emergence of new actors involved in the purchase of raw material –fresh coca

leaf or basic cocaine paste— from growers for further direct processing. They can also act as suppliers who distribute the collected volumes to groups managing specialized transformation infrastructures for cocaine base (oxidators and reoxidators) and for cocaine hydrochloride (production complexes).

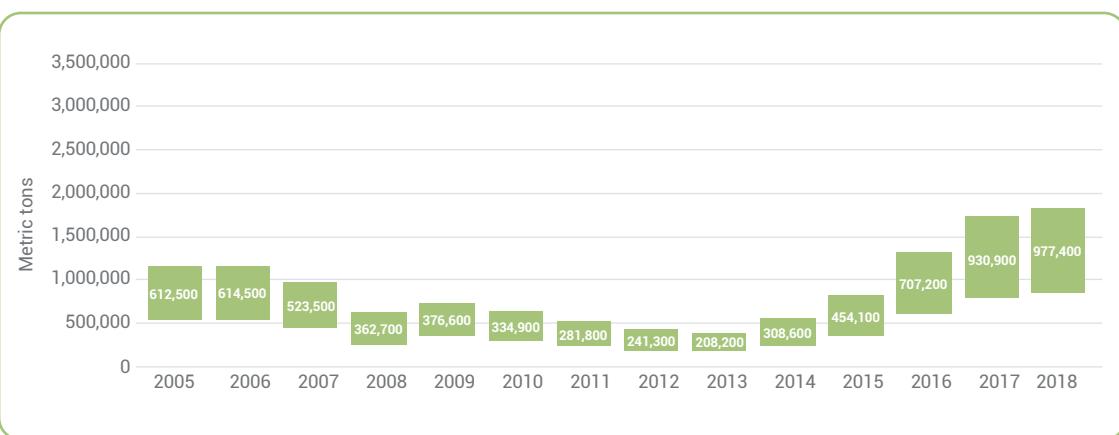


Figure 20. Potential production of fresh coca leaf in Colombia, 2005-2018<sup>a,b,c</sup>

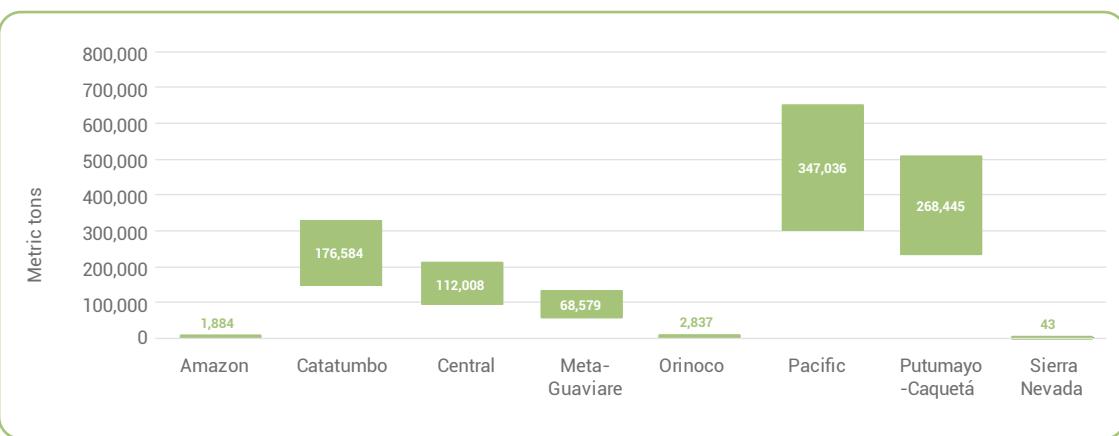


Figure 21. Potential production of fresh coca leaf in Colombia by region, 2018<sup>a,c</sup>

#### Notes:

- a Coca leaf production is estimated from the annual productive area, which is based on the permanence factor and crop yield.
- b Estimated leaf production was rounded to the nearest hundred.
- c Potential production is determined from the calculation of the intervals based on the analysis of the accuracy level of satellite interpretation, considering the adjustment factors by areas with no information due to temporality and intervention. Taking these intervals as a reference and keeping the yield parameters, the production potential is estimated from the upper and lower limits of confidence intervals.

It has been seen that in recent years, cocaine refining has been carried out outside UPACs by new actors who tend to specialize in this process, where alkaloid impurities are oxidized in order to purify cocaine. This productive process is increasingly connected to the production infrastructure of cocaine hydrochloride and cartels that export highly pure cocaine base. Considering that the methodological model developed by UNODC and the Government of Colombia is based on field work with growers, a different methodological approach is necessary to get to know the characteristics of the work carried out by these new actors.

Because of this, in order to estimate the potential production of the alkaloid the information about the purity of the paste and the cocaine base is incorporated to estimate the potential cocaine base<sup>55</sup>. It should be noted that the update of these variables has been adjusted for this report since 2014, when cocaine base processing inside the UPAC was less than 1%, which matches field information about new actors processing the leaf that has been collected from several PACs<sup>56</sup>.

Figure 22 shows the results of the estimated cocaine base production potential obtained through the application of the standard methodology (dotted line), and the results derived from the update (continuous line). In general terms, it can be observed that although the update implies a review of the volume of the cocaine base obtained, growth trends persist. Thus, the potential production of cocaine base (PPCB) for Colombia in 2018 is established at 1,400 mt<sup>57</sup>, with a 5.8% growth if compared to the adjusted PPCB for the previous year (Figure 23).

For on or off-farm processing scenarios, it is estimated that 533,789 mt<sup>58</sup> of fresh coca leaf were sold by PACs, which may be acquired by other actors to sell it or process it outside the UPAC. If all these leaves were processed, 774 mt of cocaine base<sup>59</sup> could be potentially obtained. On the other hand, it has been estimated that 433,165 mt of fresh coca leaf were processed at UPACs to obtain basic cocaine paste, which is equivalent to 610 mt of cocaine base<sup>60</sup>. Finally, only 1% of PACs carry out the extraction and refining processes on the farm to obtain cocaine base. In this case,

<sup>55</sup> This information was collected from the efficiency studies conducted by UNODC-SIMCI and the Government of Colombia. It allows improving the conversion factors of cocaine base paste and leaf when this transformation is not carried out by the PAC.

<sup>56</sup> According to the information obtained under the framework of coca crop productivity studies carried out by the Government of Colombia and UNODC-SIMCI.

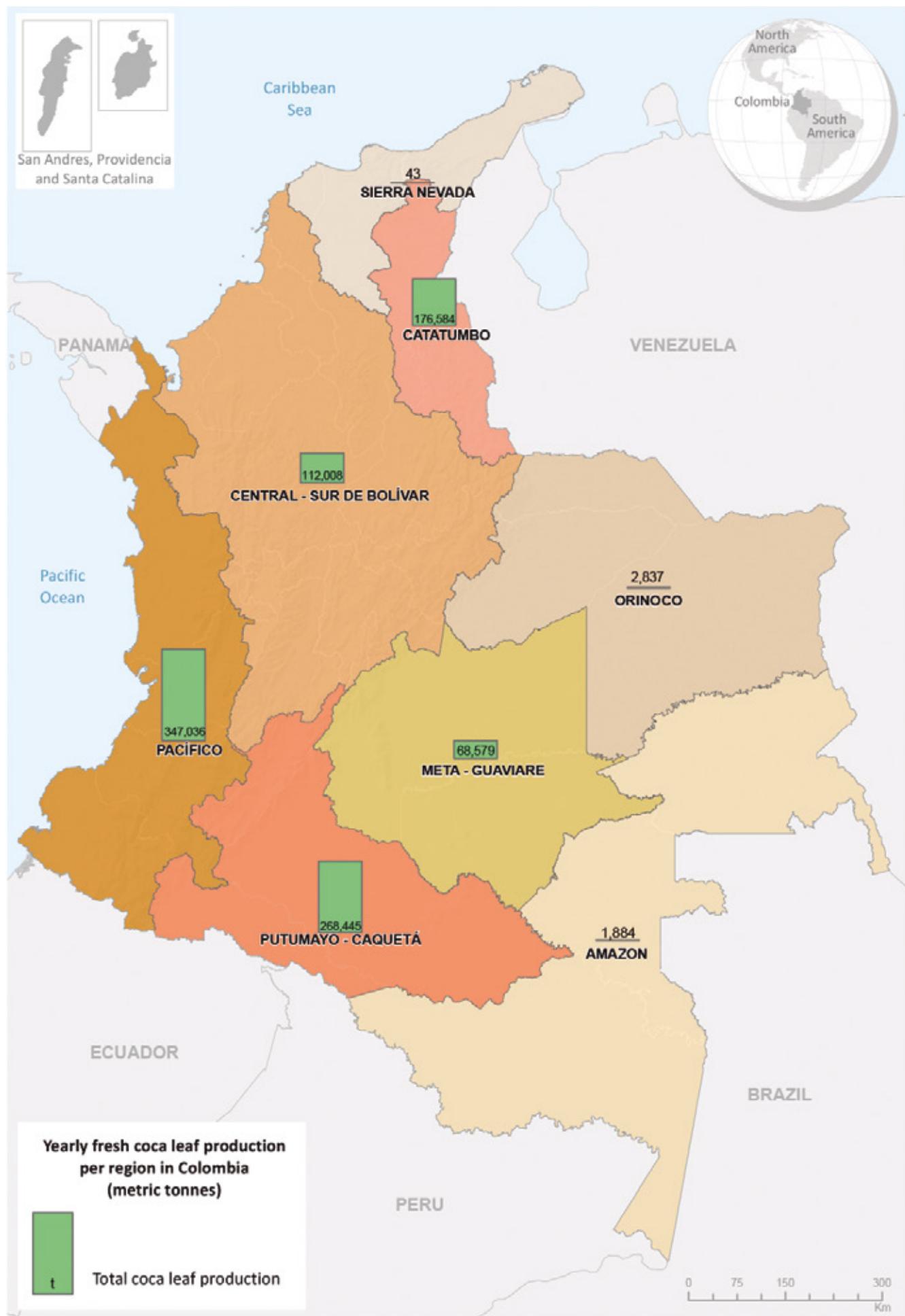
<sup>57</sup> Potential cocaine base production in Colombia in 2018 ranges between 1,222 mt and 1,647 mt. It is important to note that this production volume was estimated considering an 80% purity level, which means that, from 1 kg of estimated cocaine base, 800 g of free cocaine base and 200 g of impurities are obtained.

<sup>58</sup> 55% of growers sell the fresh coca leaf to be processed outside their farms, according to the information obtained under the framework of the coca crop productivity studies.

<sup>59</sup> Given the update in the methodology, the reference volume for estimating the transformation of the coca leaf outside the UPAC, which was 1.8 kg of cocaine base/mt of coca leaf, was updated to 1.45 of cocaine base/mt of coca leaf based on the results of the transformational efficiency studies of the leaf into cocaine hydrochloride carried out by UNODC and the Government of Colombia between 2010-2013. This yield is applicable both to coca leaf processing and direct cocaine base processing. It is important to note that the volume determined in this update is later adjusted based on an 80% level of purity of the cocaine base (free base). In this context, it has been estimated that the production of cocaine base by agents other than the grower ranges between 676 mt and 912 mt. However, more technical-scientific evidence is required in order to determine the effect of large-volume processing to obtain cocaine base, its quality, loss control in the production process and the use of chemicals.

<sup>60</sup> It is important to note that the pasta / base coefficient was updated due to the differences between the purity of basic coca paste and cocaine base. This relationship was adjusted by taking as reference the purity of basic cocaine paste (60%) in relation to the purity of cocaine base (80%), obtaining a ratio of 0.75 kg of cocaine base per 1 kg of basic cocaine paste. Therefore, it has been estimated that cocaine base production, equivalent to basic cocaine paste processed by the PAC, ranges between 533 mt and 717 mt.

**Map 8. Annual production of fresh coca leaf by region in Colombia, 2018**



it has been estimated that 10,459 mt of fresh coca leaf were processed by growers, obtaining around 15 mt of cocaine base<sup>61</sup>. Figure 23 shows the estimated potential

production of cocaine base by region, under the premise that there is a direct relationship between the location of coca crops and leaf processing infrastructures.

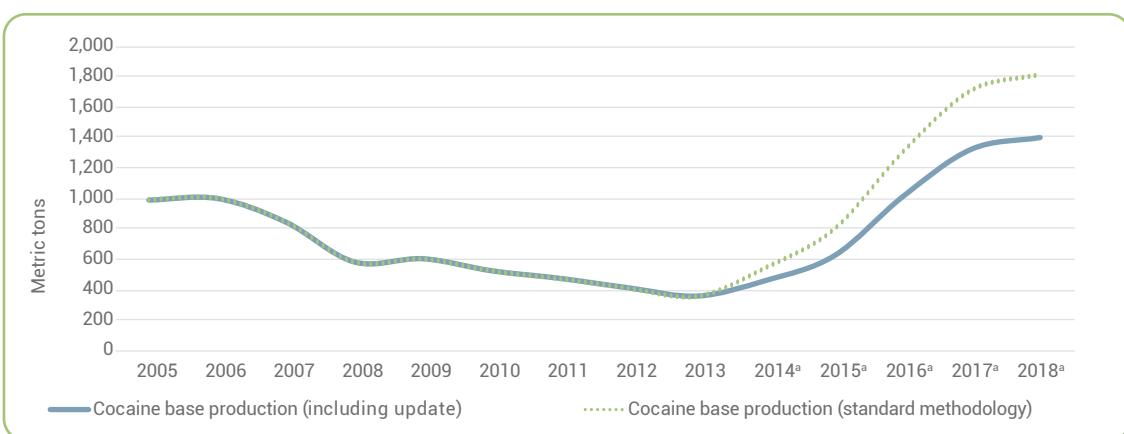


Figure 22. Potential production of cocaine base (PPCB), 2015-2018<sup>a,b,c</sup>

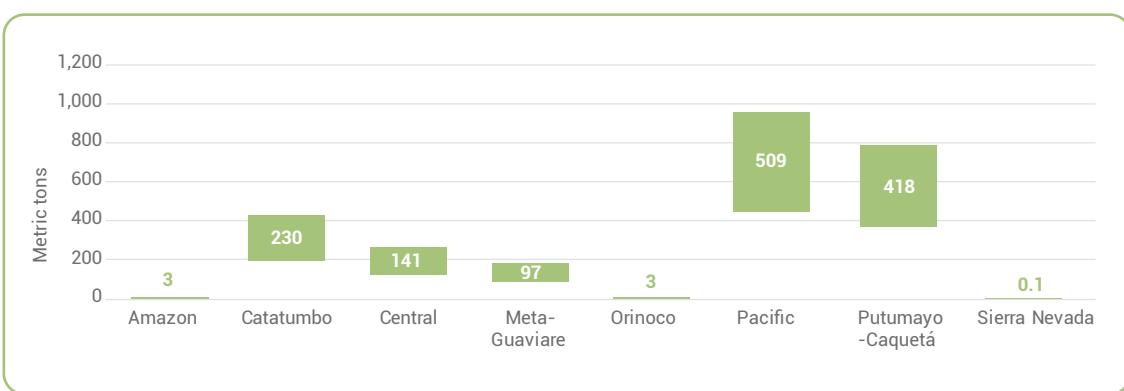


Figure 23. Potential production of cocaine base by region (PPCB), 2018<sup>a,b,c,d</sup>

#### Notes:

- a Production of cocaine base is calculated based on the estimated annual production area (as determined by the permanence factor), the distribution of work in the coca leaf sale and processing processes, and crop and extraction yield processes of each region studied under controlled conditions.
- b The update of the methodology affects the potential production of cocaine base outside the UPAC, the yield ratio between basic paste and cocaine base, and the purity of the cocaine base obtained from illegal crop processing in Colombia.
- c Potential production is determined from the calculation of the intervals based on the analysis of the accuracy level of satellite interpretation, considering the adjustment factors by areas with no information due to temporality and intervention. Taking these intervals as a reference and keeping the parameters of coca leaf, cocaine basic paste and base yields, the market structure determined by the productivity studies and the leaf-to-base conversion factor obtained from transformational efficiency studies, potential production is estimated from the upper and lower limits of confidence intervals. As a result, minimum and maximum estimates of potential production are obtained in the different steps of the chain, which are associated to variance of the cultivated hectares reported in coca surveys.
- d In productivity studies, information on the Amazon region is not collected. Therefore, production is estimated by taking into account the results of the Putumayo-Caquetá region.

<sup>61</sup> The yield used for the PACs converting the leaf up into cocaine base is the same as the one used for processing outside the UPAC: 1.45 kg of cocaine base per mt of fresh coca leaf. Base production within the UPAC ranges between 13 mt and 18 mt.

The Pacific, Putumayo-Caquetá and Catatumbo regions contribute 36%, 30% and 16% respectively to the total potential production of cocaine base.

It has been estimated that the potential production of pure cocaine hydrochloride (PCH) in Colombia was 1,120 mt in 2018<sup>62</sup> (Figures 24 and 25). These estimates are a benchmark for regional comparability,

since in practice there are no markets for pure cocaine hydrochloride<sup>63</sup>. If the results from alkaloid cultivation, extraction and refining processes are compared, it has been estimated that 1 ha of productive coca during the year would potentially yield between 8.2 kg and 9.6 kg of cocaine base/harvested ha and between 6.2 kg to 6.9 kg of pure cocaine hydrochloride/harvested ha<sup>64</sup>.

<sup>62</sup> The potential production of cocaine hydrochloride in Colombia for 2018 ranges between 978 mt and 1,318 mt, considering the 1: 1 conversion factor ratio of pure cocaine base to pure cocaine hydrochloride. This potential is only a benchmark, since the purity of cocaine hydrochloride sold in different markets is variable and does never reach 100% levels.

<sup>63</sup> See previous note (purity levels).

<sup>64</sup> These estimates correspond to a national scenario where all crops become cocaine base and then are refined into cocaine hydrochloride, following regional dynamics and yields according to the results of productivity studies.

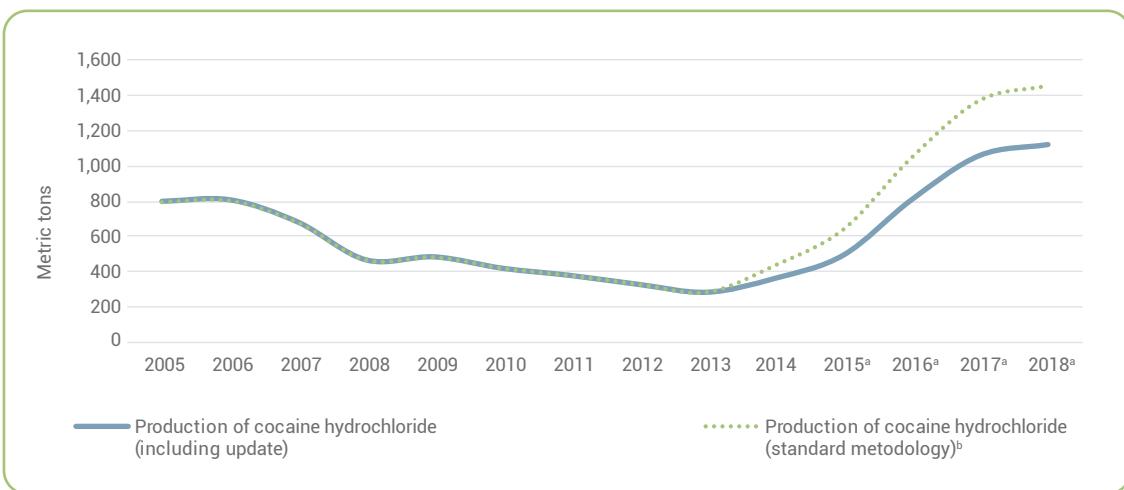


Figure 24. Potential production of pure cocaine hydrochloride, 2005-2018

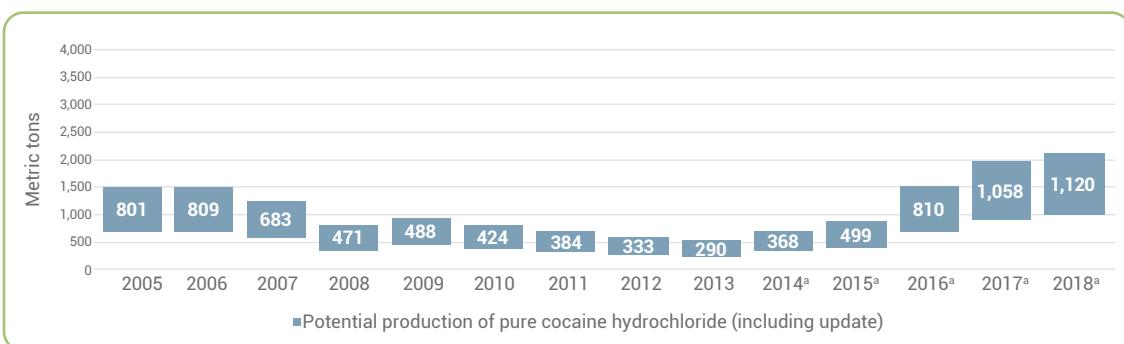


Figure 25. Potential production of pure cocaine hydrochloride (including update), 2005-2018

Notes:

- a Years when the variables related to cocaine base purity, cocaine base production yield inside and outside the UPAC, and the paste/base coefficient for basic cocaine paste processing at UPAC, which were included in the methodology for estimating the potential of cocaine hydrochloride in Colombia, were updated.
- b The estimation of the annual production of cocaine hydrochloride (standard methodology) uses the existing information on productive hectares, yields per hectare, and conversion factors of the extraction and refining processes. This level corresponds to the traditional estimation, without incorporating any purity adjustments.

# ESTIMATION OF POTENTIAL COCAINE PRODUCTION ACCORDING TO THE INTERVENTION CATEGORIES PROPOSED IN THE FUTURE ROUTE POLICY

According to the methodology to estimate the potential production of cocaine, an effort was made to determine the potential production of leaf, base and pure cocaine hydrochloride, based on the intervention categories proposed in the Future Route Policy.

Firstly, 33% of the productive area, out of the national total, is concentrated in strategic interest areas, which were estimated to have produced around 481 mt of cocaine base (equivalent to 385 mt of pure cocaine hydrochloride, under the assumption that all crops are transformed into this product). Within this territorial intervention category, it can be observed that 12.9% of the potential production of national cocaine base is concentrated in the productive integration area, while the border area (10 km) and the buffering area represent 11.7% and 9.8% respectively.

Secondly, 20.4% of the productive area, out of the national total, is concentrated in free intervention areas. Based on this, potential production of cocaine base is calculated to be equivalent to 281 mt<sup>65</sup>. It is important to mention that areas with a density greater than 8 ha/km<sup>2</sup> and permanently affected areas represent 11.2% and 6.6% respectively.

Thirdly, it has been estimated that 46.6% of the productive area with coca is concentrated in special management areas. Based on the information obtained from the Coca Crop Studies (2005-2018), it has been estimated that these hectares produced around 448,025 mt of coca leaf, which were processed to later obtain 637 mt of cocaine base. It has been estimated that the territories of Afro-Colombian communities, Law 2 and Indigenous Reservations represent 15.3%, 14.8% and 10.7% respectively of the potential production of cocaine base nationwide (Table 5).

<sup>65</sup> Under the assumption that all the leaf harvested in this area is transformed into cocaine hydrochloride, a production potential of 225 mt of this product is estimated.

		Productive area during the year		Production of fresh coca leaf	Potential production of cocaine base <sup>a</sup>		Potential production of pure cocaine hydrochloride from the information on productive areas in the year per level <sup>b</sup>
Future Route: Territorial Intervention Categories	Future Route Level 3	ha	Total hectares (%) <sup>c</sup>	mt	mt	Total mt (%) <sup>c</sup>	mt
Special management areas	Indigenous reservations	17,238	10.1	102,048	150	10.7	120
	Afro-Colombian territories	26,093	15.3	146,045	214	15.3	171
	Natural national parks	7,442	4.4	47,094	66	4.7	53
	Law 2	28,899	16.8	152,838	207	14.8	166
	Total	79,672	46.6	448,025	637	45.5	510
Strategic interest areas	Land border (10 km)	17,953	10.5	110,753	163	11.7	131
	Productive integration	21,287	12.4	124,477	181	12.9	144
	Buffering area	17,257	10.1	96,798	137	9.8	110
	Regional national park	12	0	51	0	0	0
	Total	56,509	33	332,079	481	34.4	385
Free intervention areas	Areas with a density over 8 ha/km <sup>2</sup>	20,932	12.3	113,041	157	11.3	126
	Permanently affected	9,964	5.8	61,961	93	6.6	74
	Less than 15 km away from a populated area	3,109	1.8	17,668	25	1.8	20
	Remainder	855	0.5	4,640	6	0.4	5
	Total	34,860	20.4	197,310	281	20.1	225
<b>General total</b>		<b>171,041</b>	<b>100</b>	<b>977,414</b>	<b>1,399</b>	<b>100</b>	<b>1,120</b>

**Table 5. Estimated potential production of cocaine according to the intervention category proposed by the Future Route Policy**

Notes:

- a There is a high correlation between crop location and the primary production infrastructures where extraction and refining take place. For this reason, it has been estimated that the total cultivated hectares are processed as cocaine base in the same area.
- b Production of pure cocaine hydrochloride is estimated under the assumption that the entirety of the crops are processed to obtain the crystallization of the alkaloid in each area. It is important to mention that these estimates should be considered a point of reference, as there is no direct relationship between crop location and the infrastructure for crystallization of the alkaloid.
- c The percentages were estimated based on the national total both of hectares and of the potential production of cocaine base.

## UPDATE OF THE METHODOLOGY TO ESTIMATE THE POTENTIAL PRODUCTION OF COCAINE HYDROCHLORIDE

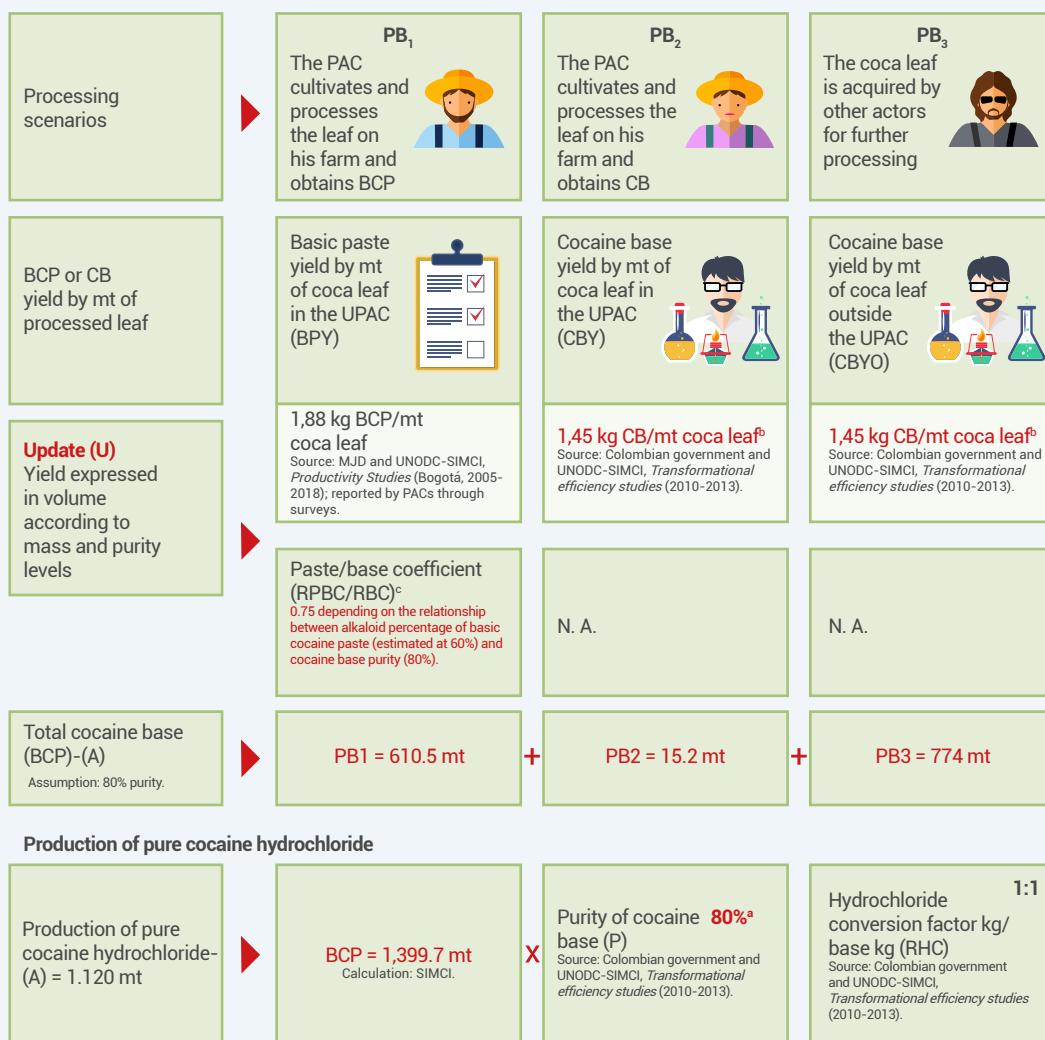
The methodology for estimating the annual production of cocaine hydrochloride resorts to the existing information on hectares, yield per hectare, conversion factors of the extraction and refining processes and purity, among others.

In 2018, thanks to new available information, some factors to estimate the potential production of cocaine were updated and they should be applied starting in 2014, considering the relationship between the levels of mass and purity obtained from efficiency studies carried out by UNODC-SIMCI and the Government of Colombia. Specifically, the following three variables were updated (they were highlighted in red in Figure 26):

- The percentage of purity of cocaine base went from 81% to 80%<sup>66</sup> (see note on the next page).
- The production yield of cocaine base (CB) inside and outside the UPAC was adjusted from 1.8 kg/mt of fresh coca leaf to 1.45 kg/mt after incorporating the existing relationship between mass and percentage of purity of cocaine base (80%). Just as in the out-of-the-UPAC processing scenario, it is assumed that when the PAC processes 1 kg of cocaine base on the farm, 800 g of cocaine and 200 g of impurities are obtained.
- The paste/base coefficient, which is used to estimate the production of basic cocaine paste (BCP) obtained at the UPAC in terms of cocaine base (CB), was adjusted based on the ratio between the percentage of alkaloid in BCP (estimated at 60%<sup>67</sup> [see note on the next page]) and the purity of cocaine base. This results in a paste/base coefficient of 0.75, which means that 1 kg of BCP represents 0.75 kg of CB with an 80% purity<sup>68</sup> (see note on the next page).

Below, an estimation of potential production of cocaine is simulated with updated data (Figure 26):

**Figure 26. Potential production of cocaine base according to update**



It is important to note that the evidence generated by the transformational efficiency studies of coca leaf to cocaine hydrochloride studies carried out by UNODC and the Government of Colombia contributed to validate these adjustments, as well as the chemical analyzes of alkaloid content in leaves carried out by the United States Government through the Drug Enforcement Administration (DEA).

The inclusion of information on the purity of coca-derived products strengthens the methodology used to determine the potential production of drug in Colombia. Using information on paste and cocaine base purity generated from technical and experimental efforts on transformation of the coca leaf into cocaine hydrochloride allows estimations that include differentiated efficiencies for participants in the production chain. The result creates a picture that is closer to the reality of the yields and the efficiency of the transformation processes used for production of cocaine hydrochloride in Colombia.

## OVERVIEW OF OPERATIONS AGAINST DRUG PRODUCTION

The intervention operations carried out by the Colombian authorities in 2018 affect the availability of drugs in different markets. These interventions affect different links in the production chain and are part of four different activities: confiscation of cocaine base, confiscation of cocaine hydrochloride, destruction of primary production infrastructure and destruction of cocaine hydrochloride production infrastructure.

The general results between 2014 and 2018 are shown in Figure 27. Between 2014 and 2017, drug confiscation and cocaine production infrastructure destruction increased, as reported by the

Drug Observatory of Colombia. However, during 2018 there was a decrease in alkaloid confiscation when compared to the data from 2017.

In 2018, 70% of the dismantling of primary production infrastructure, 74% of the affectation to cocaine hydrochloride production infrastructure, and the confiscation of 56% of cocaine base reported in the country took place mainly in four departments: Nariño, Putumayo, Norte de Santander and Cauca. Confiscation of hydrochloride was reported mostly in border areas or those with exit ports used by drug traffickers.

<sup>66</sup> Updated percentage based on the analysis of low processing effort results under controlled conditions carried out under the framework of the *Eficiencia de la transformación de la hoja de coca para la extracción de base de cocaína y conversión a clorhidrato de cocaína* (2010-2013) and *Caracterización de los complejos de producción de clorhidrato de cocaína* by UNODC-SIMCI and the Government of Colombia (Bogotá, 2016).

<sup>67</sup> Ministry of Justice and Law, United Nations Office on Drug and Crime (UNODC) and Proyecto Prevención del Desvío de Sustancias Precursoras de Drogas en los Países de América Latina y el Caribe (PRELAC), *Caracterización del proceso de transformación de la hoja de coca en clorhidrato de cocaína en Colombia* (Bogotá, 2015).

<sup>68</sup> This update adjusts the paste/base coefficient, which was previously estimated from the volume (mass) yields between basic cocaine paste and cocaine base reported by the PAC in the context of productivity studies, in order to express the amount of basic cocaine paste in terms of cocaine base. This scenario has two main limitations. First, the difference between the purity of basic cocaine paste and that of cocaine base is not considered. Second, given the new scenario, where increasingly more growers process the leaf until basic cocaine paste is obtained instead of cocaine base, it was assumed that in volume terms the capacity to obtain 1 kg of basic cocaine paste (PBC) to 1 kg of cocaine base (BC) is 1:1. Given that the experimental tests confirm that the purity of PBC is lower than that of BC and that in bulk between 700 g and 800 g of BC per 1 kg of PBC is obtained, it was necessary to update this indicator since 2014, year in which this 1:1 ratio was established.

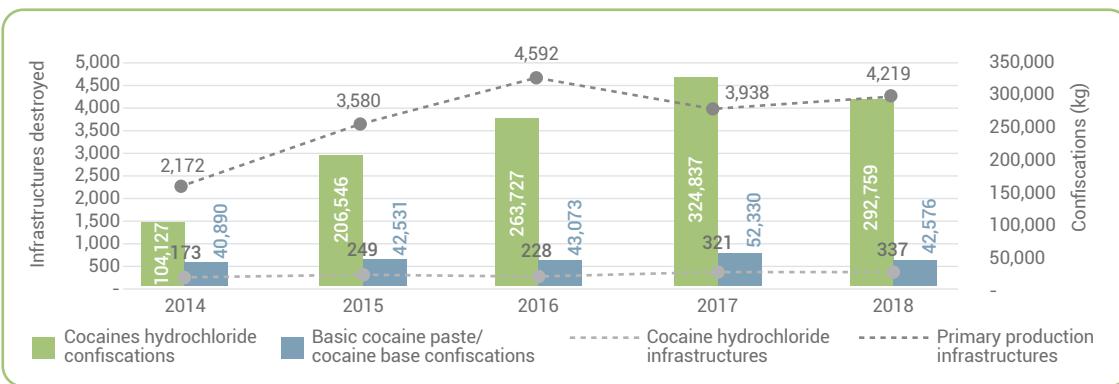


Figure 27. Operations against cocaine production, 2014-2018

Source: Drug Observatory of Colombia<sup>69</sup>.

In 2018, as in previous years, confiscation of cocaine hydrochloride mainly took place in the departments of Nariño (38%), Magdalena (12%), Valle del Cauca (10%), Norte de Santander (7%) and Antioquia (7%).

Total confiscations of cocaine hydrochloride in 2018 amount to 293 mt, which would be approximately 26% of the production potential of pure cocaine hydrochloride, estimated at 1,120 mt. However, it should be considered that the production potential corresponds to 100% pure cocaine hydrochloride, while confiscations are not given any quality factor due to impurities or cutting substances. Thus, the impact on cocaine hydrochloride production would be less than 26% by 2018.

There are different regional dynamics according to the socio-economic context, the geographic location, the presence of illegal crops, and extraction efficiency. Similarly, the results of intervention efforts

respond to different factors that depend on the region where they take place. In order to analyze the regional behavior of the operations against drug production, the dynamics of illegal crops (increase, decrease or similar levels with respect to 2017) and the behavior of intervention operations in recent years were taken into account. As a result, the following characteristics were identified in strategic departments for analyzing the problem of cocaine production and trafficking.

### Putumayo

The number of intervened primary production infrastructures in the department has been increasing from 106 in 2014 to 1,131 in 2018. Because of this, it is the territory with the highest number of dismantling efforts carried out nationwide. Similarly, there was a 50% increase in confiscation of cocaine hydrochloride (which went from 4.7 mt seized in 2017 to 10.8 mt in 2018), together with an 11% decrease (3,000 ha) in the area with illegal crops.

<sup>69</sup> Information retrieved from the Colombian Drug Observatory through the Colombian Information System on Drugs. See: <http://www.odc.gov.co/sidco>, "Infraestructura de sustancias químicas" and "Incautaciones" sections (accessed in July 2019).

## Meta

This territory had a stable coca area since 2014. However, in 2018 there was a significant reduction of 47% (2,600 ha) in the area when compared to 2017. It is interesting to highlight that the reports on affectation of primary production infrastructures have been declining since 2016, which confirms the direct relationship between the establishment of production infrastructure and areas with illegal crops. In the same context, cocaine hydrochloride confiscation increased by 600% from 2017 to 2018, turning Meta into the fourth department with the highest amount of cocaine paste/base seized (3.2 mt in 2018). This could mean that there are new base and hydrochloride traffic routes that would be activated in the Meta department.

## Bolívar

It is one of the few territories with a significant increase –39% (2,400 ha)– in the area with illegal crops in 2018. In recent years, the figures on infrastructure intervention operations have remained almost constant<sup>70</sup>, with a decrease in base and cocaine hydrochloride confiscations. It is worth mentioning that an opposite situation occurs in this department when compared to the rest of the country regarding the presence of illegal crops and affectation operations. In other regions, there has been an increase in illegal crops (implying greater availability of the drug), as well as in interventions. Conversely, crops have increased in

Bolívar but there has not been an increase in the reports of seizures or infrastructure dismantling operations.

## Nariño

In 2018, it is the department with the highest presence of illegal crops, representing 24.7% of the national total. However, the reports of intervention to primary transformation infrastructures in this department are lower than those in Putumayo or Norte de Santander, where there is also a significant number of coca crops (19.8% and 15.6% respectively). It should be noted that by 2018 Nariño is the department with the highest number of cocaine base and hydrochloride confiscations (8.6 mt and 110 mt respectively) and dismantling of hydrochloride production infrastructure (93).

## Catatumbo

With the increase in illegal crops (5,300 ha), intervention operations, both in primary transformation and cocaine hydrochloride infrastructure, have gone up during the last four years in this region. Although the best results of intervention operations have been reported in Tibú, illegal crops continue to increase in this municipality. On the other hand, large cocaine base and hydrochloride confiscations (585 kg and 3.5 mt) have been reported in 2018 in Salazar, while in previous years no intervention operations had been reported in this municipality. This could be interpreted

<sup>70</sup> Between 2015 and 2018, interventions on primary production infrastructure have ranged from 188 to 197 per year. Information from the Drug Observatory of Colombia (ODC). See: <http://www.odc.gov.co/sidco/oferta/infraestructura-laboratorios-drogas> (accessed in July 2019).

as the activation of new traffic routes, since Salazar is far from the areas with the highest concentration of illegal crops in Norte de Santander.

### Antioquia

It is important to highlight that confiscation of cocaine hydrochloride

and base in Antioquia in 2018 decreased by 26 mt (58%) and 5.25 mt (70%) respectively, while illegal crops remained relatively stable (13,681 ha in 2017 and 13,403 in 2018). Similarly, the results of operations against production infrastructures also decreased in this department.



## TOWARDS THE TRANSFORMATION OF TERRITORIES AFFECTED BY COCA CROPS

The Future Route Policy highlights the need to consider the particularities of the territories and proposes in pillar 5 "Generating territorial conditions to boost the rural and urban legal economies, under a framework of environmental sustainability". This consideration is particularly important at present, because the implementation of the Peace Agreement between the Government of Colombia and the Farc-EP has begun, because large investments are being made in alternative development programs under the framework of the Plan Nacional Integral de Sustitución (PNIS - Comprehensive National Substitution Plan), and also because the design of Planes de Desarrollo con Enfoque Territorial (PDET - Development Plans with a Territorial Approach) has been completed.

This national objective, however, is not free from obstacles. The strengthening

of criminal organizations related to drug trafficking and, therefore, the resurgence of the armed conflict, have become hurdles for carrying out the actions provided for in the agreement, requiring increasing technical, fiscal and operational efforts by the Government of Colombia.

The purpose of this chapter is to provide material input for understanding the recent dynamics of coca crop production in Colombia. First, information is presented on some of the driving factors of coca crop production in Colombia. Subsequently, the main challenges faced by the territory with coca crops are reported, in particular those related to the progress in the implementation of the peace agreement, the concentration of coca crops in conservation and special management areas, and the problem of security that pervades the territories affected by the presence of coca crops.

# PERSISTENCE OF COCA CROPS: DRIVING FACTORS

The persistence of coca crops has to do with several factors: 1) crop yield, associated with soil fertility and the use of production technologies; 2) the price dynamics of the different by-products of the coca plant and the favorable economic balance of the productive activity; 3) the problems of illicit production related to technical and economic risks; and 4) the pressure of the actors in the drug trafficking chain to boost the establishment of crops in the producing regions.

## Production and yield of coca crops

Coca crops are, in several parts of the country, one of the main drivers of the local economy. One of the effects of this situation is that crops have undergone an intensive process of technological improvement and innovation, which has generated substantial changes in production dynamics in the different productive regions.

One hectare of coca crop currently produces 5.7 mt of fresh leaf on average per year, although some regions have achieved higher yields. In the case of the Meta-Guaviare region, the yield has exceeded the national average by 32%, and in the Amazon and the Putumayo-Caquetá region the yield is higher by 17%. However, it is striking that the regions with the

highest crop yields are not the ones with the highest production: The Amazon and the Meta-Guaviare region only produce 7% of the total national fresh leaf.

The region that contributes the highest proportion of fresh leaf is the Pacific, where the yield is very close to the average of the national yield<sup>71</sup>. Secondly, we find Putumayo-Caquetá, where yields are higher, and thirdly the Catatumbo region, with yields slightly below the national average (Table 6).

## Price dynamics

In 2018, there is an increase in the prices of coca derivatives, mainly coca leaf (7.1%) and cocaine hydrochloride (11.7%) (Figure 28). In the case of the prices of basic cocaine paste and cocaine base, these showed a slight increase of 1.9% and 1.3%, respectively.

There have been increases in the prices of fresh coca leaf, basic paste and cocaine hydrochloride in strategic regions such as the Pacific (4.2%, 8.8%, and 8.3%, respectively), and Putumayo-Caquetá (18.4%, 6.3%, and 2.1% respectively; in this region, the price of cocaine base grew by 7.5%). In the case of the Central region (which includes Catatumbo for price analysis), prices for fresh coca leaf and cocaine hydrochloride increased by

<sup>71</sup> It is important to mention that this performance corresponds to 2014, the year in which the last update of the studies was carried out of productivity of coca cultivation in the Pacific region; in the second half of 2019, new information is expected to be collected.

Production region	Productive area during the year (ha)	Annual yield of fresh coca leaf (mt/ha/year)	Potential production of fresh coca leaf (mt)
Amazon	281	6.7	1,884
Catatumbo	32,701	5.4	176,584
Central	26,048	4.3	112,008
Meta-Guaviare	9,267	7.4	68,579
Orinoco	692	4.1	2,837
Pacific	61,971	5.6	347,036
Putumayo-Caquetá	40,066	6.7	268,445
Sierra Nevada	15	2.9	43
National Total	171,041	5.7	977,414

Table 6. Yield and potential production of fresh coca leaf by region

Note: The yield data corresponds, in each case, to the latest performance evaluation by means of surveys and crop tests in production lots in the field.



Figure 28. Level and variation in the prices of coca leaf, basic paste, base and cocaine hydrochloride, 2017 and 2018

Source: UNODC-SIMCI, Policía Nacional (National Police)-DIRAN. Calculations: UNODC-SIMCI.

Note: The percentage variations correspond to the relationship between current prices in Colombian pesos (COP) from 2017 to 2018.

15.6%, and 8.3%, respectively, while in the Meta-Guaviare, Orinoco and Amazon regions there is a high growth in the price of cocaine hydrochloride (Table 7).

The increase in coca leaf prices last year corresponds to a recovery, after a significant reduction in the previous year. As can be seen in Figure 29, in 2015 the price of coca leaf registered a nominal increase close to 40% compared to 2014. In 2017 the price fell by 30% with respect to this value, and in 2018, although the price grew 7.1% compared to the previous year, this level is 25% lower than in 2015. The price of Cocaine

hydrochloride showed a recovery in 2018, returning to the level recorded in 2016. In relation to the prices of basic paste and cocaine base, despite registering a slight increase in 2018, there is a general trend towards reduction, initiated in 2015.

The recent price recovery is not a phenomenon strictly dependent on the national market, since it coincides with an increase in cocaine consumption and availability worldwide<sup>72</sup>. Apparently, there are two factors that directly affect the increase in cocaine production: on the one hand, the increase in consumption and availability in the United States and

Region	Coca leaf		Basic cocaine paste		Cocaine base		Cocaine hydrochloride	
	Average Price (COP)	Variation (%) 2018/2017	Average Price (COP)	Variation (%) 2018/2017	Average Price (COP)	Variation (%) 2018/2017	Average Price (COP)	Variation (%) 2018/2017
National average	2,250	7.1	1,665,000	1.9	2,308,200	1.3	4,970,600	11.7
Weighted average by potential production <sup>a</sup>	2,350	9.6	1,696,000	0.6	2,002,500	-6.6		N. A.
Central	1,850	15.6	1,543,600	-8.1	2,351,900	-4.9	4,751,300	8.3
Pacific	2,500	4.2	1,750,200	8.8	2,225,000	-6.7	4,610,600	8.3
Putumayo-Caquetá	2,250	18.4	1,762,200	6.3	2,170,500	7.5	4,326,200	2.1
Sierra Nevada	1,700	25.9	1,475,000	1.3	2,227,300	11.4	5,835,400	13.0
Meta-Guaviare	1,700	-15.0	1,585,400	-10.3	2,401,400	18.6	4,700,000	11.6
Orinoco	1,550	-31.1	2,006,300	10.9	2,454,200	6.0	5,600,000	26.2
Amazon	4,000	23.1	1,531,900	5.1	2,937,500	-21.7	5,119,400	8.8

Table 7. Average prices of coca leaf, basic paste, base and cocaine hydrochloride by region, 2018

Note:

- a Weighted average prices were estimated from the relationship between the production potential of coca leaf, basic cocaine paste and cocaine base, and the price levels reported in the different producing regions.

<sup>72</sup> United Nations Office on Drugs and Crime (UNODC), *World Drug Report 2019*, [https://wdr.unodc.org/wdr2019/prelaunch/WDR2019\\_B1\\_S.pdf](https://wdr.unodc.org/wdr2019/prelaunch/WDR2019_B1_S.pdf).

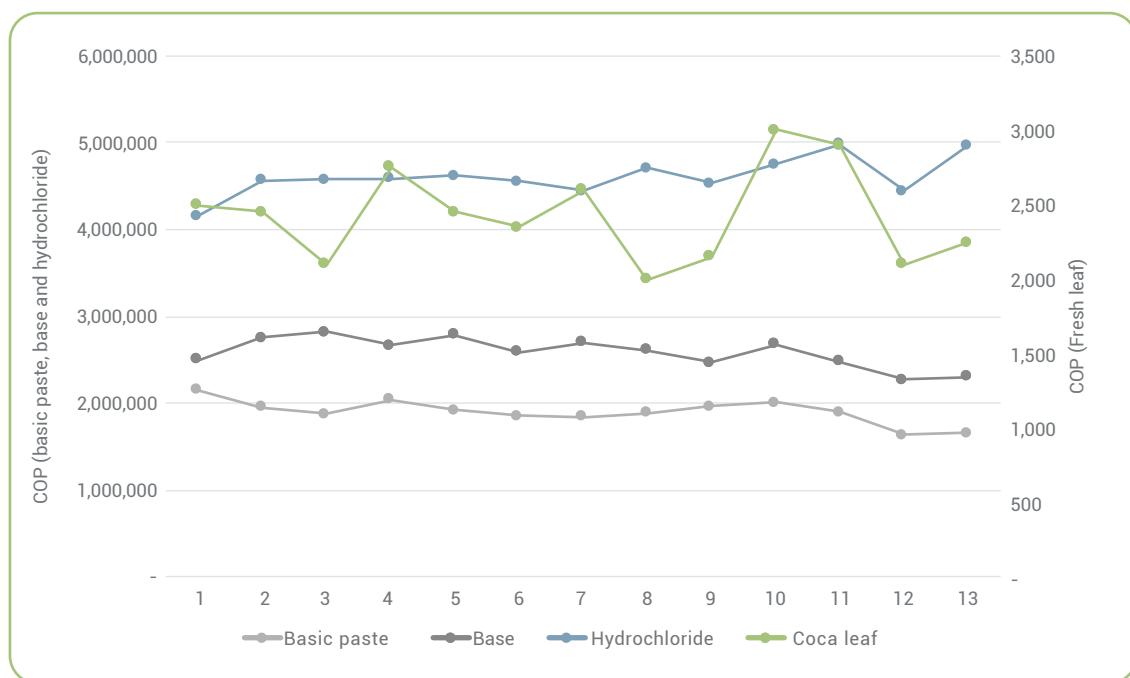


Figure 29. Price variation of coca plant by-products (current value), 2006-2012

Source: Ministry of Justice and Law, National Police and SIMCI. Calculations: SIMCI.

Europe<sup>73</sup>. And on the other hand, the recent presence of international cartels in the production areas, which not only participate in the traffic of cocaine hydrochloride, but also seek to influence the other links of the production chain such as cultivation, extraction, refining and conversion of the alkaloid.

According to the report delivered by the Government of the United States of America<sup>74</sup>, the trend of increased coca production in Colombia is related to increased cocaine consumption in

the United States. In fact, Colombia continues to be the main source of alkaloid supply to this country<sup>75</sup>. Transnational criminal organizations in Colombia continue to impact the illicit drug market in the United States, although not in the same way as in previous decades, as they have given way to Mexican cartels to become their main wholesale suppliers<sup>76</sup>.

In Europe, the consequences of the increase in cocaine production in Latin America are also evident in

<sup>73</sup> According to the European Monitoring Center for Drugs and Drug Addiction, it is especially difficult to estimate the prevalence of problematic cocaine use. Since 2014, the number of consumers who start treatment due to cocaine-related problems, although still relatively low, has increased by more than 35% in two-thirds of countries. In some countries, cocaine is associated with the recent increase in drug-related deaths (*Informe Europeo sobre Drogas. Tendencias y novedades*. 2018, [http://www.emcdda.europa.eu/system/files/publications/8585/20181816\\_TDAT18001ESN\\_PDF.pdf](http://www.emcdda.europa.eu/system/files/publications/8585/20181816_TDAT18001ESN_PDF.pdf); *Informe Europeo sobre Drogas. Tendencias y novedades*. 2019, [http://www.emcdda.europa.eu/system/files/publications/11364/20191724\\_TDAT19001ESN\\_PDF.pdf](http://www.emcdda.europa.eu/system/files/publications/11364/20191724_TDAT19001ESN_PDF.pdf)).

<sup>74</sup> Press release issued by the White House and published in June 2018 (*New Annual Data Released by White House Drug Policy Office Shows Record High Cocaine Cultivation and Production in Colombia*, <https://www.whitehouse.gov/briefings-statements/new-annual-data-released-white-house-drug-policy-office-shows-record-high-cocaine-cultivation-production-colombia/>).

<sup>75</sup> U.S. Department of Justice, Drug Enforcement Administration (DEA), 2018 *National Drug Threat Assessment*, <https://www.dea.gov/sites/default/files/2018-11/DIR-032-18%202018%20NTA%20%5Bfinal%5D%20low%20resolution11-20.pdf>.

<sup>76</sup> *Ibid.*

the market. The European Monitoring Center for Drugs and Drug Addiction has issued a warning in the last two years<sup>77</sup> regarding the increased availability and use of cocaine in the continent, based on the drug detection records in the analysis of wastewater, the purity of the street product and the relative price stability. Current data provided by the authorities reveal that both the number and the quantities seized show historical records. Cocaine enters Europe through different routes and means, but the growth of large-volume traffic in large ports, through containers, easily stands out. The authorities have warned of large seizures of drugs, mainly in cargo ports, in regions other than the Iberian Peninsula, an area that had traditionally been used by drug trafficking organizations to enter cocaine into this continent. Additionally, there are signs of a reorganization in the cocaine trafficking chain and the actors at intermediate and low levels, with the emergence of fragmented, less defined and more horizontal organizational structures<sup>78</sup>.

### Estimated balance of productive activity

In 2005 the baseline of productivity studies was established, grouping in eight regions the territories affected with coca crops in the country. Within the framework of the agreements between UNODC and the Government of Colombia, there is updated regional information throughout

the country every four years, consolidating three national phases to date. The fourth phase has already begun, with the update of the Catatumbo, Sierra Nevada and Central regions (2015), Putumayo-Caquetá (2017), and Meta-Guaviare and Orinoco (2018).

According to these studies, a grower (PAC) could receive income for: 1) the crop, through the sale of the fresh leaf; alkaloid extraction, through the sale of basic cocaine paste (PBC), and 3) alkaloid refining, obtaining cocaine base (BC) for subsequent sale. It is important to mention that the decision on which of these products is marketed does not depend exclusively on the price, nor on the technological and logistic capabilities of the producer. It has been identified that in some territories incentives are generated not associated with the production process, to determine the type of product to be marketed.

On the other hand, it has been identified that, in the last five years, growers tend to sell the leaf without any level of transformation (55%), or process it until obtaining basic cocaine paste (44%), product derived from the first level of transformation of coca. Only 1% of the producers declare that they carry out the entire transformation process up to cocaine base. If each of these scenarios is analyzed, it is evident that they correspond to clearly differentiated

<sup>77</sup> Trends presented in the last two reports of the European Monitoring Center for Drugs and Drug Addiction (*Informe europeo sobre drogas. Tendencias y novedades*. 2018, [http://www.emcdda.europa.eu/system/files/publications/8585/20181816\\_TDAT18001ESN\\_PDF.pdf](http://www.emcdda.europa.eu/system/files/publications/8585/20181816_TDAT18001ESN_PDF.pdf); *Informe europeo sobre drogas. Tendencias y novedades*. 2019, [http://www.emcdda.europa.eu/system/files/publications/11364/20191724\\_TDAT19001ESN\\_PDF.pdf](http://www.emcdda.europa.eu/system/files/publications/11364/20191724_TDAT19001ESN_PDF.pdf)).

<sup>78</sup> Ibid.

productive structures, with specific value contributions according to the type of product they generate. Based on these studies, it is estimated that the income received by growers who process the leaf on the farm has tended to decrease due to the low level and pace of price growth of basic paste and cocaine base during recent years.

In the event that the PAC assumes the costs of sustaining and harvesting the crop, as well as the purchase of the chemical substances necessary for its processing, the net income would be between 26% and 33% of the total income obtained by the sale of basic paste or cocaine base. In contrast, the increase in coca leaf prices could be related to the promotion of its sale, thus favoring the mixed income of the grower over his investment. It is estimated that the mixed income<sup>79</sup> of the PAC that is dedicated to the sale of coca leaf would be around 75%, if it is considered that the majority of the work in the crop is assumed by the household of the PAC. The difference between these productive structures, in the farm processing scenario, is that about 54% and 47% of the income obtained from the sale of one kilogram of basic paste or cocaine base, respectively, must be used for the purchase of agrochemicals and chemical inputs (Figure 30).

The analysis of the mixed income for the producer that sells fresh leaf indicates that the net monthly income for the cultivation

of one hectare of coca is COP \$859.200 (1.04 SMMLV, or Colombian monthly minimum wage). Taking into account that the average cultivation area is 1 ha, illegal activity generates hardly any subsistence income for peasant producers. In this sense, the cultivation of coca does not allow a process of accumulation of capital for agricultural producers.

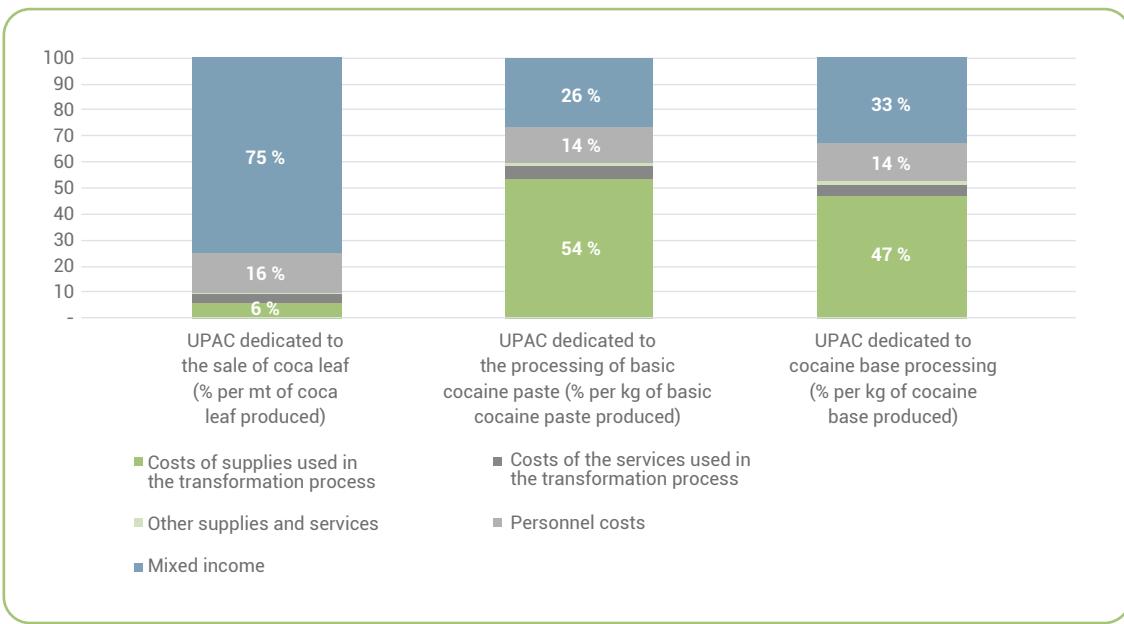
The processing of basic cocaine paste from fresh leaf produces a lower return than the producers who sell the fresh leaf. This behavior, contrary to expectations, may be related to the availability of means of transport for the coca leaf, which may be deficient in many areas, so that producers see transformation as an alternative to reduce marketing costs, or with a local incentive system that only allows the commercialization of basic cocaine paste (Table 8). This phase of the drug trafficking chain should continue to be further studied in order to find possible explanations for what has been observed.

### Economic chains of coca in the producing regions

As of 2018, it is estimated that 55% of growers sold nearly 533,800 mt of coca leaf, equivalent to COP \$1.2 billion (USD \$422 million)<sup>80</sup>, requiring agrochemicals, personnel to work in support and harvest, among other supplies and services, for a value of COP \$282.300 million (USD \$96 million).

<sup>79</sup> After selling their production and paying production costs and salaries, the grower receives an income that becomes into a proportion of his salary and into the gross operating surplus for the productive activities carried out on his farm. This income is considered "mixed income".

<sup>80</sup> La tasa representativa del mercado (TRM) empleada para esta estimación fue de COP \$2.956/USD \$1 para 2018; lo anterior fue estimado a partir de los promedios mensuales reportados por el Banco de La República.



**Figure 30. Productive structure of agricultural production units with coca (UPAC) by product obtained**

Note A: Structures were estimated from the difference between the calculations of production potentials in coca leaf volume, basic paste and cocaine base reported by the PAC in the framework of the coca crop productivity studies, and their production costs associated to the use of agrochemicals, chemical substances and salaries, in the framework of the following studies, prepared by UNODC and the Ministry of Justice and Law: *Economic structure of agricultural production units in areas of influence of coca crops (2016)*, *Characterization of the process of transformation of coca leaf into cocaine hydrochloride in Colombia (2010 and 2014)* and *Characterization of the production complexes of cocaine hydrochloride (2016)*. It is important to note that the price levels were updated based on the evolution of the producer price indices (IPP) reported by the National Administrative Department of Statistics (DANE) for the different inputs demanded by the PAC, while the growth in Salary levels was estimated from the calculation of a composite index, which involves the growth of the current Colombian legal monthly minimum wage (SMMVL) and the growth of the price level of the product sold by the grower (leaf, basic paste or cocaine base). The use of agrochemicals and payment of wages for the maintenance of the crop includes losses that the grower perceives on account of interdiction actions. Therefore, the affected area of coca is assumed, calculated by SIMCI, as a proxy variable.

In turn, this coca leaf was acquired by illegal actors present in the territory, who are presumed to have a higher level of expertise in the extraction and refining of the alkaloid, and who processed it to obtain 774 mt of cocaine base. Although the characteristics associated with its quality, its destination (percentage that goes to the production complexes or goes abroad) and its price are not known, a demand of around COP \$2 billion in supplies and services necessary for its transformation is estimated (USD

\$709 million). For 44% of growers who process basic cocaine paste, it is estimated that they receive around COP \$1.4 billion (USD \$467 million) in sales, and pay about COP \$1 billion (USD \$344 million) for their production costs<sup>81</sup>.

When integrally analyzing these flows associated with the establishment of the crop and its first level of transformation, it is estimated that transactions close to COP \$6 trillion (USD \$2 billion) were carried out, a value that boosts the

<sup>81</sup> See note A (Figure 30).

	UPAC dedicated to the sale of coca leaf		UPAC dedicated to the processing of basic cocaine paste		UPAC dedicated to cocaine base processing <sup>e</sup>	
Annual productivity	mt of coca leaf/ha per year (national average) <sup>a</sup>		kg of PBC/mt of leaf per year (national average) <sup>a, b</sup>	10.7	kg of CB/mt of leaf per year (national average)	8.3
PAC (%)	55		44		1	
	Values per ton of coca leaf produced		Values per kg of basic cocaine paste produced		Values per kg of cocaine base produced	
	Total COP	Total USD	Total COP	Total USD	Total COP	Total USD
Approximate gross income <sup>c, d</sup>	2,337,700	791	1,696,000	574	2,002,500	677
Approximate production costs (supplies, services and labor) <sup>d</sup>	528,800	179	1,248,600	422	1,343,500	455
Approximate net income	1,808,900	612	447,300	151	659,000	223
	Values per ton of coca leaf produced (5.7 mt/ha/year on average)		Values per kg of basic cocaine paste produced (10.7 kg PBC per year on average)		Values per kg of cocaine base produced (8.3 kg BC per year on average)	
If a four-member household grows one hectare of coca	Total COP	Total USD	Total COP	Total USD	Total COP	Total USD
Approximate yearly net income	10,310,700	3,488	4,791,100	1,621	3,756,300	1,271
Approximate monthly net income of the household	859,200	291	399,300	135	313,000	106
Approximate daily net income per person	7,100	2.4	3,300	1.1	2,600	0.9

Table 8. Analysis of gross and net income of agricultural producers with coca (PAC), according to product obtained<sup>f</sup>

Source: see note A (Figure 30).

Notes:

- a For income and cost analyzing, the yields of fresh coca leaf per hectare per year obtained in the harvest tests were used, while the yields of basic paste and cocaine base per metric ton of leaf processed on the farm were reported by the PAC in the framework of the *Coca Crop Productivity Studies*. It is important to note that the latter yields correspond to the target volume by the PAC, without considering purity.
- b The yields of basic paste and cocaine base per year per hectare correspond to the relationship between the potential production and the productive hectares reported by the growers who process in the farm and market these products in each of the regions.
- c 1% of the growers who process the coca leaf in the farm up to cocaine base obtain in volume 2.7 kg of cocaine base per 1 mt of leaf. This performance does not include purity. It is important to note that reference is used for calculating the potential income of the PAC.
- d Value obtained from the average regional income and costs weighted by the potential production of coca leaf, basic paste, and cocaine base sold by the grower.
- e The yield of kg of BC/mt of leaf per year (national average) on the farm includes the methodological update set out in Chapter 3 regarding the potential for cocaine production.
- f Related estimates include regional economic dynamics reported in productivity studies of coca cultivation. The calculations were made under the assumption that the grower buys all agrochemicals and all chemical substances. It does not include the possible scenario of clandestine manufacturing of chemical substances or the incentives associated with external financing or donations.

local economy of the regions affected by the cultivation of coca<sup>82</sup>. From the macroeconomic point of view, it is estimated that by 2018 the added value of the production and transformation of coca generated inside the UPAC represents 0.2% of the national GDP, in which this illegal activity represents 3% of the agricultural sector<sup>83, 84</sup>.

Therefore, the resources generated by coca and its transformation to basic paste or cocaine base can activate the licit economy of a populated center, or even of a municipality<sup>85</sup>. This makes it pertinent to address the problem of coca crops from a territorial perspective, since a fraction of the local economic dynamics may be firmly linked to illicit production, which makes it difficult to transit to licit economies, mainly in those places in which illicit production has been consolidated, eventually replacing or critically reducing licit production.

### Situation of licit production: the problem of Agricultural Performance

The dynamics of licit production in the rural scenario depends mainly on crop yield (volume per unit area), product prices

and production and marketing costs, including transportation. Since there is no precise information on these variables in the regions of coca crop production, one of the ways to approach the dynamics of licit production is to examine the yield of crops and animal species in the territory, making use of the information processed and systematized through the Municipal Agricultural Evaluations (EVA), which is managed by the Ministry of Agriculture and Rural Development) every year from the municipal reports. To this end, an indicator was designed that evaluates the performance of the three main municipal agricultural products<sup>86</sup>, with respect to the yield that would be achieved if appropriate production technologies were used. This indicator has been called Agricultural Performance Lag (RRA, for its acronym in Spanish). The domain of the indicator is from zero (0%) to one hundred percent (100%): a value close to zero (0) indicates that there is no performance lag, and that production is being carried out with high standards of material productivity. A value close to 100% indicates that the difference between what is obtained at the municipal level and the optimum is very high, so the lag is equally high. The

<sup>82</sup> From the point of view of value generation, it is estimated that the added value (GDP) of the activities associated with the cultivation and transformation of coca leaf, processes carried out inside the UPAC, contribute COP \$1.7 trillion to 2018. This estimate was made based on the integration of different indicators provided by the *Estudios de productividad del cultivo de coca, Estructura económica de las unidades de producción agropecuaria en zonas de influencia de los cultivos de coca* (2016), *Caracterización del proceso de transformación de la hoja a clorhidrato de cocaína en Colombia* (2010 y 2014), *Caracterización de los complejos de producción de clorhidrato de cocaína* (2016) (UNODC-SIMCI).

<sup>83</sup> According to DANE, Colombia's GDP at current prices in 2018 (provisional) was estimated at COP \$978,477 billion (USD \$331 billion), while the GDP of the agricultural sector (forestry, hunting and fishing) is estimated at COP \$61,421 billion (USD \$21 billion). See: National Administrative Department of Statistics (DANE), *Gross Domestic Product (GDP) Base 2015*, <https://www.dane.gov.co/index.php/estadisticas-por-tema/cuentas-nacionales/cuentas-nacionales-trimestrales>.

<sup>84</sup> The participation of coca economy in the national economy is established on the basis of the relationship between the added value of the activities associated with the cultivation and transformation of coca leaf in the farm, and the sector and national GDP estimated by the DANE.

<sup>85</sup> There is a licit industry that produces and markets goods that are used for the transformation of the coca leaf into cocaine, but producing or marketing these same goods for the production of cocaine is against the law and has criminal consequences.

<sup>86</sup> Ministry of Justice and Law and United Nations Office on Drugs and Crime (UNODC), *Informe anual de estado del sistema de indicadores para el seguimiento a la problemática de drogas en Colombia 2017. Reporte interno*. Transitional and permanent crops with the largest area with coca crops, and the largest livestock are taken for each municipality.

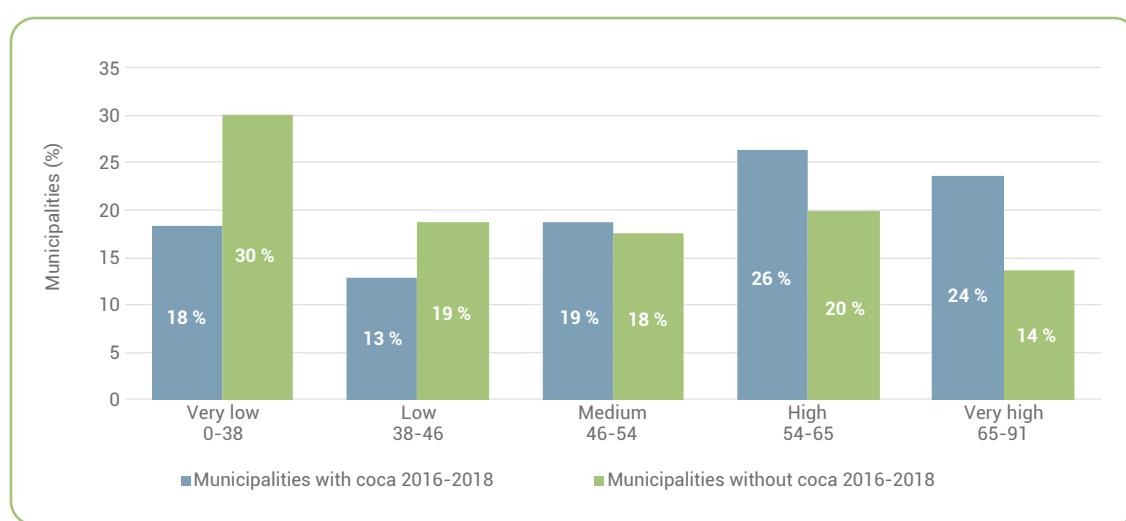
RRA was calculated for municipalities that, due to their biophysical conditions, are suitable for the establishment of coca crops (809 of 1,120 municipalities).

The main findings of the analysis are:

- Out of the 809 municipalities suitable for coca crops, 24.9% showed some degree of involvement due to the presence of coca crops in the 2016-2018 period.
- 49% of municipalities without coca are below the average RRA lag level, while municipalities with coca that are below the average level are only 31% (Figure 31). The average RRA of the municipalities with coca in the 2016-2018 period is 54%, while that of the municipalities without coca is 47%. Despite the existence of a difference, it is not significant<sup>87</sup>.

- 50% of the municipalities with coca are located in high and very high RRA lag levels. This means that the municipal agricultural production yield is less than half of what they could produce using appropriate technologies, so they face conditions of low competitiveness. In 24% of cases, the RRA lag varies between 65% -91%, which implies that they barely obtain a third of the production potential achievable with the proper use of technology.
- The situation of the RRA lag in the municipalities that are subject to intervention with the PNIS program is similar. The average lag of the intervened municipalities (PNIS) is 49%, and that of the PDET municipalities is 54%.

The previous data show the relevance of addressing the problem of agricultural production competitiveness throughout



**Figure 31. Agricultural Performance Lag (RRA) in municipalities with and without coca, 2016-2018**

Source: prepared by SIMCI based on EVA reports and the Bovine Census in Colombia by the Colombian Agricultural Institute (ICA), and the Ministry of Agriculture and Rural Development.

<sup>87</sup> When performing the T test for independent samples (municipalities with coca and without coca) with a level of significance of 5% and a 95% confidence interval that ranges between 0.044 and 0.098 points, the hypothesis that the means are equal is rejected. However, the degree of difference in means is not high (0.071), which implies that municipalities with coca have a greater, but slight RRA lag, compared to municipalities without coca.

the rural sector. The performance dynamic is closely related to the levels of productive investment, with the levels of technical knowledge, and with the availability and cost of agricultural inputs, among other factors. However, the decision of the producers will combine these elements with the perception on the dynamics of prices of the products in the market and their volatility, as well as with the transaction costs of the products. In this sense, the location of producers in relation to their proximity to market centers will be one of the determining factors of the success of productive investment initiatives.

Table 9 shows that the average distance of a grid with coca to a populated center<sup>88</sup> is 8.6 km. The distance to the nearest municipal capital<sup>89</sup> is 23 km on average, and 173 km to the nearest metropolitan market center<sup>90</sup>, where there is greater demand for agricultural production.

Table 10 shows that 64% of the grids with coca crops are close to the populated centers or to the municipal capitals. In these scenarios, it is possible to consider processes of ruralization and socio-economic integration that tend to establish efficient commercial relations, provided that the conditions of connectivity and security for the development of productive investments are improved.

The production units that are at a medium distance can still be the object of strategies to boost legal production and market integration, with a greater effort in strengthening connectivity and access to investment resources and technical assistance. In these cases, however, specific strategies should be designed in the case of special management areas, in particular the PNN and their buffer zones, as well as the forest reserve areas.

	Distance to the nearest town center (km)	Distance to the nearest municipal capital (km)	Distance to the nearest metropolitan market center (km)
Median	6.46	19.67	169.28
Average	8.60	23.09	173.46
Maximum distance	0.00	0.00	19.58
Maximum distance	69.72	311.36	664.42

Table 9. Analysis of the grids affected by coca crops in relation to their proximity to populated centers, municipal capitals and metropolitan market centers

<sup>88</sup> Populated center: defined as a concentration of at least twenty (20) adjacent, neighboring or semi-detached houses, located in the rural area of a municipality.

<sup>89</sup> Municipal Capital: geographical area defined by an urban perimeter that corresponds to the place where the administrative headquarters of a municipality is located.

<sup>90</sup> The populated centers that are considered as metropolitan market centers for having values equal to or greater than 7 in the SIMCI categorization are: Bogotá, Barranquilla, Manizales, Popayán, Pereira, Cali, Ibagué, Santa Marta, Medellín, Bucaramanga, Cartagena and Cúcuta. The categorization was carried out based on variables such as the extension of the populated center, road access, population and locative health facilities.

Proximity to the nearest centers (ranges) <sup>a</sup>			
	Grids with coca to the nearest populated center (%)	Grids with coca to the nearest municipal capital (%)	Grids with coca to the nearest metropolitan market center (%)
Near	64	64	42
Medium	30	33	51
Far	5	3	7

<sup>a</sup>Ranges (established based on the Jenks Natural Breaks method)

	Distance to the nearest town center (km)	Distance to the nearest municipal capital (km)	Distance to the nearest metropolitan market center (km)
Near	0-8.97	0-24.41	19.59-153.8
Medium	8.97-22.73	24.41-60.66	153.8-288.47
Far	22.73-69.73	60.66-311.37	288.47-664.43

Table 10. Grids with coca crops according to their proximity to populated centers, municipal capitals and metropolitan market centers (percentage)

A small fraction of grids constitutes a challenge for the design of substitutes other than those usually considered in alternative development processes, and even in the establishment of broader local development programs, in terms of distance to populated centers, municipal capitals and market centers, representing a difficult obstacle. In these cases, the alternatives of ranger families and other support modalities may be more functional than the incentive of productive initiatives that will not be able to access the markets efficiently.

However, only 49% of the grids with illicit crops are located less than 153 km from the metropolitan market centers. This means that more than half of agricultural production faces unfavorable conditions of competition, with respect to producers located in nearby areas, and more when considering the state of tertiary and secondary roads in areas of low population density, which is where illicit crops tend to be located.

## Production boosted by illegal armed actors and drug trafficking networks

The complex security situation that represents the dispute over the control of the territories and the profits of drug trafficking, has led the communities, in the rural areas where the production of coca crops is concentrated, to face a strong pressure from illegal armed actors and drug trafficking networks. This pressure is characterized by several elements: on the one hand, the uncertainty of the communities due to the lack of control of one or another illegal group over the region, which creates a doubt regarding the actor they must face or resist. An example of this tension is the threats, intimidation and selective killings performed by armed groups to exert control over the territory and impose coca production.

On the other hand, the economic resources generated by illicit production lead to the establishment of pressure

groups that can influence municipal dynamics in various ways:

- Consolidation of the presence of armed actors in the territory: the magnitude of illegal income increases the demand for private illegal security in the territory, both for protection against competitors, as well as to deal with control actions carried out by the State. This presence means a threat to national sovereignty, and constitutes a risk for the violation of the rights of the communities living in the territories.
- Impact on voters: drug trafficking agents can promote election processes in favor of candidates who put less pressure on illegal activities, through coercion or intimidation.
- Impact on the local political class: drug trafficking resources can be used to weaken the actions of local governments, in relation to supply control or the implementation of programs or actions that result in a reduction of its benefit.
- Systemic corruption: the use of drug trafficking resources for bribes can go beyond the local governments, accessing state supply control agents, so that it constitutes a favorable scenario for performing this economic activity with a lower level of risk to the trafficker and his private illegal security units.

All this is linked to the historical presence of coca crops in these territories, where communities recognize

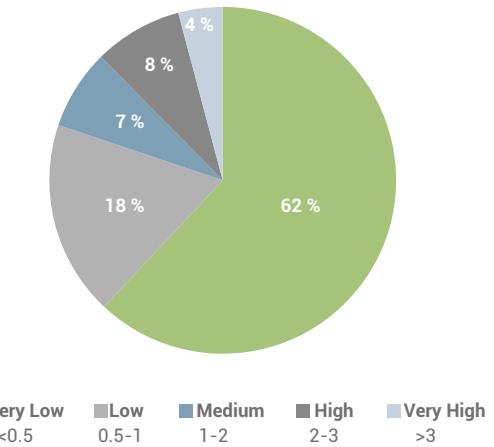
the characteristics of their territory, state abandonment, the low economic return of licit economies, and road isolation, among other factors, put them in a vulnerable situation for armed groups to urge them to return to this illegal practice<sup>91</sup>.

Figure 32 shows the quotient of the value of the potential production of basic cocaine paste, over the value of municipal income executed in 2017<sup>92</sup>. When this value approaches zero (0), a low incidence level of the illicit economy in the municipality can be presumed, at least in relation to the income derived from the commercialization of raw material and basic paste. As the value increases, a growth in the economic pressure capacity of drug trafficking agents at the municipal level can be presumed. The median of this value is 0.37, and the average is 0.76, with the maximum of 3.84 in the municipality of Puerto Caicedo, Putumayo.

The graph shows that in most of the municipalities affected by the presence of coca crops (62%) the ratio is less than 0.5, which indicates that the drug trafficking resources derived from the commercialization of the base paste in the territory is equal to or less than 50% of the municipal budget. In such cases, the incidence of drug trafficking agents on municipal dynamics can be equally low. In 18% of the municipalities the ratio varies between 0.5 and 1.0, indicating that traffickers manage a volume of resources greater than half, but less than the total municipal budget.

<sup>91</sup> Office of the Ombudsman, *Informe especial: economías ilegales, actores armados y nuevos escenarios de riesgo en el posacuerdo* (Bogotá, 2018).

<sup>92</sup> Although most of the agricultural producers sell fresh coca leaf, the basic paste is processed in the municipality of origin, constituting the product marketed by the trafficking organizations.



**Figure 32. Value of the potential production of basic cocaine paste over the value of municipal executed income**

Source: SIMCI, based on *Informe de ejecuciones presupuestales municipales 2017*, provided by the General Comptroller of the Republic.

In 19% of the municipalities, however, the ratio is greater than 1. In these cases, the potential for the incidence of pressure groups associated with drug trafficking is high, since the traffickers have resources equivalent to the total value of what the local government can invest in the territory. The municipalities, in which the ratio is greater than 1, concentrate 64% of the hectares of coca cultivated throughout the country.

### Changes in power structures associated with the production of coca crops

#### Dynamics of illegal armed actors

Parallel to the demobilization of the Farc-EP guerrillas, the struggle for territorial control and revenues from illicit economies continues to exacerbate the armed conflict. Optimism for a

peace scenario after the signing of the agreements has not materialized and, on the contrary, it has strengthened the armed actions of other illegal structures. The scenario has changed, and the dynamics of the confrontations have moved from the national to the regional level, where social control practices have been resumed<sup>93</sup>, with new forms of action, focused on intimidation, threats, selective assassinations and isolated armed actions, leaving aside the massacres and violent takeovers of previous years, in order to maintain a discrete control of the territory and avoid the operations of the public force.

In 2018, the process of rearrangement and reorganization of illegal armed groups in the territory continued, a process which began with the demobilization of the Farc-EP. In 2019, particular control zones for each of the groups begin to be

<sup>93</sup> Oquendo, C. 2019. "Hay cinco conflictos armados hoy en Colombia". *El País*, July 21st, [https://elpais.com/internacional/2019/07/20/colombia/1563649226\\_997490.html](https://elpais.com/internacional/2019/07/20/colombia/1563649226_997490.html).

established. Armed tension in certain regions remains, a situation that has increased violent actions, making some communities subject to the provisions of illegality. Although establishing territorial control zones is the main interest of illegal structures, drug trafficking continues to be their means of financing. This is why criminal organizations encourage peasant producers to venture into this practice, despite the implementation of the programs provided in the peace agreements.

Without the presence of the Farc-EP, organized criminal groups have taken advantage of their absence. According to the defense and security policy of the national Government, under the category of Organized Armed Groups (GAO, for its acronym in Spanish)<sup>94</sup>, in strategic territories of the national geography, there is presence of the ELN guerrilla, the Gaitanista Self-Defense Forces of Colombia (AUC, for its acronym in Spanish) or Gulf Clan (Clan del Golfo), Los Pelusos, Los Puntilleros, and the residual GAOs of different demobilized groups, plus 232 Organized Crime Groups<sup>95</sup>. Taking into account the number of men, the impact of military operations and the threat to the territories, the ELN, the Gulf Clan and the Farc-EP dissidents are the three most important illegal organizations.

- ELN: This armed group has continued its operations in the national territory,

with a growth of about 1,000 men in the last year, for a total of 4,000 men in arms, according to official sources<sup>96</sup>. On the other hand, unofficial sources indicate that the operations of this group still affect Cauca and southern Bolívar, with a growing presence in the center of Chocó, near the Gulf of Urabá. However, the expansion has not been as intense as expected after the demobilization of the Farc-EP. According to the available information, the ELN went from occupying 96 municipalities in 2016 to 112 in 2018, which corresponds to a territorial expansion of 16% in terms of the number of municipalities.

This may be due to armed confrontations with other illegal structures interested in the same areas. This guerrilla has strengthened its economic returns based on drug trafficking, promoting this practice in the departments of Chocó, Arauca, Nariño, Cauca, Norte de Santander, Catatumbo and Antioquia. Armed actions against the public force and public goods have been maintained –although the public statements of this organization expressly intend to reestablish negotiations with the Government of Colombia– as well as the control of the territories of its interest, aiming at positioning once again its legitimacy in the communities<sup>97</sup>.

<sup>94</sup> Groups whose level of organization and hostility gives them the ability to threaten national security and seriously affect the rights of the population in different regions of the country (Government of Colombia, *Política de defensa y seguridad PDS. Para la legalidad, el emprendimiento y la equidad*, 2019, [https://www.mindefensa.gov.co/irj/go/km/docs/Mindefensa/ Documentos/descargas/Prensa/Documentos/politica\\_defensa\\_degaridad2019.pdf](https://www.mindefensa.gov.co/irj/go/km/docs/Mindefensa/ Documentos/descargas/Prensa/Documentos/politica_defensa_degaridad2019.pdf)).

<sup>95</sup> Ibid.

<sup>96</sup> Ibid.

<sup>97</sup> Peace and Reconciliation Foundation. 2018. "¿En qué municipios tiene presencia el ELN?", December 27th, <https://pares.com.co/2018/12/27/en-que-municipios-tiene-presencia-el-eln/>.

- Gulf Clan: AGC or Gulf Clan continue to be one of the groups with the greatest territorial impact in the country. It has 1,600 men in arms according to official sources<sup>98</sup>, although the organization has weakened thanks to public force operations. The implementation of operations Agamemnon I in 2015 and Agamemnon II in 2017 provided a heavy military blow that debilitated the structure and reduced its illegal operations, as well as its magnitude<sup>99</sup>.
- Farc-EP Dissidents: according to unofficial sources<sup>100</sup>, in the last year there was a strengthening of these groups, particularly the so-called Front 1, which maintains its operations in its former control area in Guaviare, Vaupés and Meta. It is made up of 400 men, and its operations center is located in the municipality of Miraflor (Guaviare). According to the same source, drug trafficking has become one of their main sources of financing, including the establishment of a traffic route from the department of Meta, through Vichada and Guainía to Venezuela. Another route operates from Caquetá, crossing the department of Amazonas to Brazil. In recent months they have been expanding their area of influence towards Putumayo and Nariño, to control drug trafficking in this region.

### ***Characteristics of the security problem in the territories affected by coca crops***

In order to assess the security conditions in the territory affected by coca crops, five main variables were examined: presence of coca crops, murdered social leaders, internal forced displacement, involvement of the public force (murders or injured), and terrorist acts (terrorist act/attacks/ fighting/harassment) at the municipal level. Table 11 presents the calculation of Spearman correlation coefficients<sup>101</sup> for the presence of coca crops and the other variables indicated, without considering the magnitude of the presence of these crops at the municipal level. It was found that there is a positive correlation between the presence of crops and forced displacement (0.5090), the occurrence of terrorist acts (0.4799), the murder of social leaders (0.3955), homicides within the framework of armed conflict (0.5066) and, to a lesser extent, with the impact on the public force (0.2177) (Table 11). Based on this, it can be inferred that the presence of coca crops constitutes a risk factor for the security of the communities in these territories.

It should also be noted that the problem of internal forced displacement shows the closest relationship with the occurrence

<sup>98</sup> Government of Colombia, *Defense and Security Policy*.

<sup>99</sup> Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC), *Documento de lineamientos para el debilitamiento de la cadena de valor del narcotráfico. Documento interno* (2019).

<sup>100</sup> Insight Crime. 2019. "Disidencia del Frente Primero", July 13th, <https://es.insightcrime.org/colombia-crimen-organizado/disidencia-frente-primer/>.

<sup>101</sup> The ordinal correlation coefficient or Spearman's rank correlation coefficient allows the linear association between two ranges to be measured. Because it is a correlation coefficient, its resulting value varies between -1 and 1, where values close to -1 reflect a negative relationship between the variables. Values equal to zero (0) imply that there is no linear association between the variables, and values close to 1 imply a positive correlation between the variables. For the present analysis, the correlations were made under a significance level of 5% [Sarabia, José María and Marta Pascual, *Curso básico de estadística para economía y administración de empresas* [Santander: University of Cantabria, 2005]].

	Presence of coca crops (not considering magnitude)	Social leaders killed	Internal forced displacement	Public force affectation	Terrorist acts
Presence of coca crops	1				
Social leaders killed	0.3955*	1			
Internal forced displacement	0.5090*	0.4987*	1		
Public force affectation	0.2177*	0.3509*	0.4589*	1	
Terrorist acts	0.4799*	0.4705*	0.6251*	0.4009*	1

**Table 11. Correlation of the presence of coca crops and variables related to security aspects in the territories, 2016-2018**  
(Universe: 1,120 municipalities)

of terrorist acts, but responds equally positively to the other variables considered.

Table 12 presents the correlation between the amount of coca crops and the variables listed for the 2016-2018 period. As in the previous case, the correlation coefficients are positive and statistically significant (by 5%), which indicates that the magnitude of coca crops is correlated with the aforementioned affectations. According to the previous data, the increase in the amount of coca has been accompanied by increases in internal forced displacement, homicides

in the context of the armed conflict, the occurrence of terrorist acts, the murder of social leaders, and the occurrence of effects on the public force.

For 2018, both 80% of the homicides and the displacements that occurred in the context of the armed conflict were took place in municipalities with the presence of coca crops, according to the analysis made from the crop information and data of the Unit for Comprehensive Attention and Reparation for Victims (UARIV). This is closely associated with the correlation analyzes discussed above.

Security aspects	Coca area (coca quantity)
Internal forced displacement	0.5293*
Terrorist acts	0.4496*
Social leaders killed	0.3658*
Public force affectation	0.2656*

**Table 12. Correlation of coca crops area and variables related to safety aspects in the affected municipalities, 2016-2018** (Universe: 200 municipalities affected by coca presence during the period)

Source: prepared from the Ministry of Defense, INDEPAZ and the National Information Network of the UARIV<sup>102</sup>.

Note: coefficients calculated through the Spearman correlation coefficient, with a significance level of 5% and normalized variables.

<sup>102</sup> See: "Índice", <https://www.unidadvictimas.gov.co/es/registro-unico-de-victimas-ruv/37394> (accessed on July 19th, 2019).

## Crimes against life in the context of armed conflict in areas affected by illicit crops

According to UARIV, during 2018 1,537 homicides were registered within the framework of the armed conflict. 80% of the victims lived in municipalities that were affected by the presence of coca crops during that year, and 76% lived in the municipalities in which the design of the PDET has been advancing. In the municipalities where the actions of the PNIS are being implemented (56), 35.7% of the homicides have been registered during 2018 (Table 13). The situation is similar when considering the 2016-2018 period, during which 4,507 people lost their lives in the context of the conflict, and 72% of them lived in the municipalities affected by coca crops during that period.

In the field operations carried out by UNODC, communities have repeatedly expressed enormous concern about the

threats and murders of social leaders. With the purpose of articulating, guiding and coordinating the different protection programs and resources of the different State entities, responsible for the prevention and individual and collective protection of the rights to life, freedom, integrity and security of defenders of human rights, community social leaders and journalists, the national government designed the Plan de Acción Oportuna (Timely Action Plan), coordinated by the Ministry of Interior, with the participation of the Ministry of Justice and Law.

This plan encompasses a series of articulated and rapid actions with a territorial approach, to respond to the situation of violence against these groups of people, while aiming to generate conditions that contribute to the guarantee of their fundamental rights and promote social dialogue. These actions are grouped into the following axes: strengthening of the inter-

	Municipalities with coca in 2018 with homicides (%)	Homicides in the framework of the armed conflict in 2018 in these municipalities (%)	Municipalities with coca 2016-2018 with homicides (%)	Homicides in the framework of the armed conflict 2016-2018 in these municipalities (%)
Municipalities with coca in 2018 (188)	64.9	80.1	47.2	69.9
Municipalities with coca 2016-2018 (200)	67.2	76.3	48.6	72.0
Municipalities PDET (170)	61.9	76.3	42.9	67.3
Municipalities PNIS (56)	26.1	35.7	17.4	28.6

Tabla 13. Participación del homicidio en el marco del conflicto armado en los municipios afectados por cultivos de coca

Fuente: SIMCI, a partir de información de la Red Nacional de Información de la UARIV<sup>103</sup>.

<sup>103</sup> See: "Víctimas por tipo de hecho victimizante", <https://cifras.unidadvictimas.gov.co/Home/Victimizaciones> (accessed on July 19th, 2019).

institutional response, strategic action in the territory and design of a strategy for non-stigmatization<sup>104</sup>. An example of the actions that can be promoted is to establish an official source of information on this subject, since social leadership is defined in different ways, according to the scope of institutional action<sup>105</sup>.

The Defensoría del Pueblo (Office of the Ombudsman) has made progress in the process of registering these cases. In a report from the Ministry of the Interior)<sup>106</sup>, the information on homicides of social leaders and human rights defenders is presented at the departmental level for the period January 2016-August 2018. However, these sources are not yet

systematic and do not have the level of disaggregation necessary for the analysis performed in this document.

When integrating coca information, it is observed that the probability of occurrence of murder in the context of the armed conflict is higher in the municipalities with coca in any of the two periods considered. For 2018, the probability that a person in the context of the conflict is killed in a municipality with coca during the same year is 4.3 times higher than in the other municipalities. For the 2016-2018 period, this probability is 5 times higher than in the other municipalities (5% level of significance) (Map 9)<sup>107</sup>.

<sup>104</sup> In development of the Plan de Atención Oportuna (Timely Attention Plan), the national Government has been present in the most affected territories, attending early warnings, working in the formulation of public policy for guaranteeing human rights, and promoting the importance of social leadership.

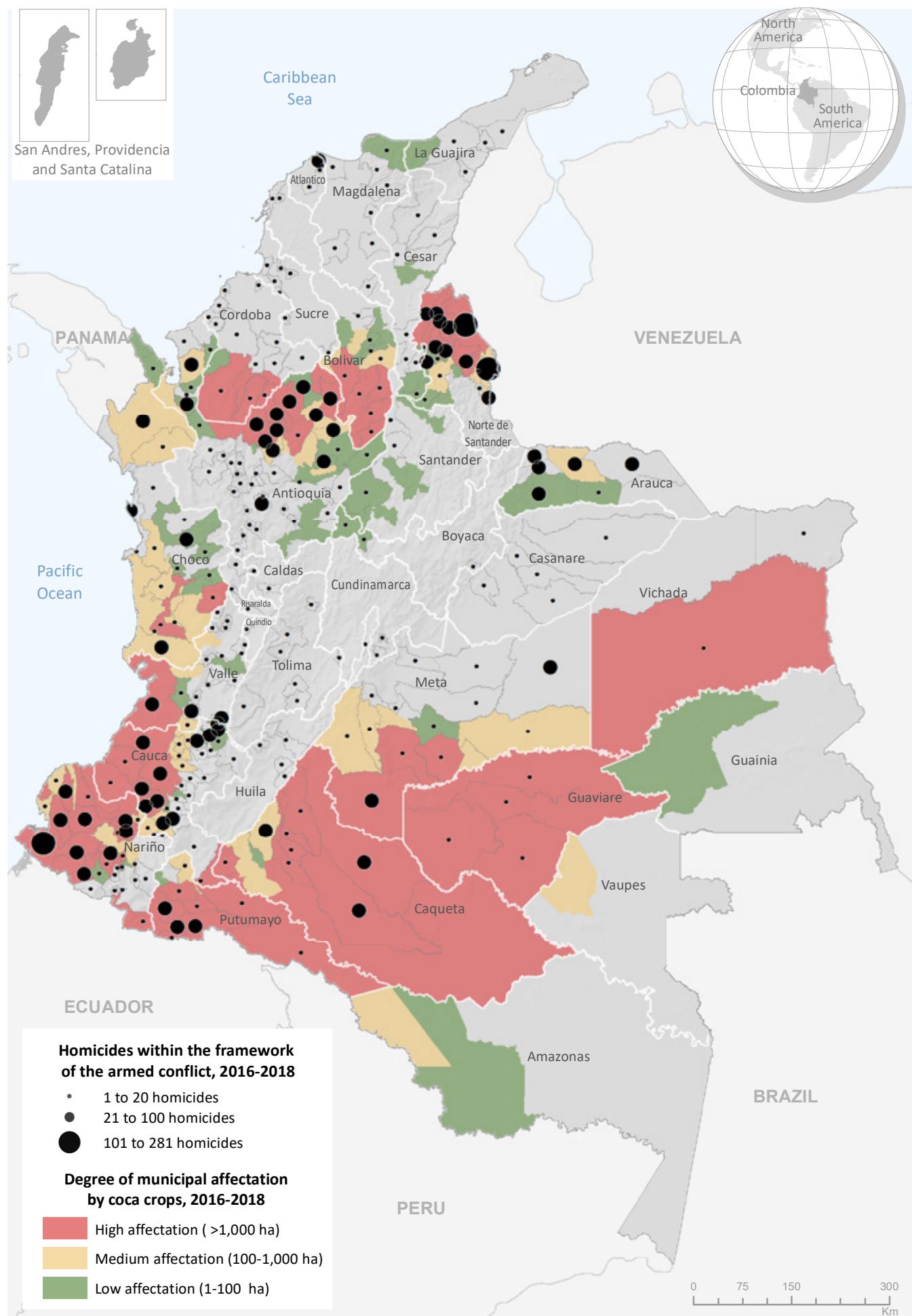
Under this context, the Ministry of Justice and Law, within the framework of its legal competencies, seeks to ensure the articulation between the Fiscalía General de la Nación (Attorney General's Office) and the Consejo Superior de la Judicatura (Superior Council of the Judiciary), in order to contribute to its actions in the territories. Also, recognizing the incidence of drug trafficking as a determining factor in the consolidation of violence and the affectation of human rights, the Ministry seeks to improve access to justice through the strengthening of the institutional capacity to design, implement and monitor the Departmental drug action plans, through the Consejos Seccionales de Estupefacientes (Narcotics Sectional Councils).

<sup>105</sup> SIMCI, Report of the Workshop on socialization and scope of the multidimensional monitoring system, March 12th, 2019.

<sup>106</sup> Ministry of Interior, *Plan de acción oportuna de prevención y protección para los defensores de derechos humanos, líderes sociales, comunales y periodistas*, [https://www.mininterior.gov.co/sites/default/files/plan\\_de\\_accion\\_oportuna\\_de\\_prevencion\\_y\\_proteccion\\_0.pdf](https://www.mininterior.gov.co/sites/default/files/plan_de_accion_oportuna_de_prevencion_y_proteccion_0.pdf): 11.

<sup>107</sup> The probabilities come from the marginal effects of the Logit model coefficients.

**Map 9. Homicides in the context of the armed conflict and degree of municipal impact caused by coca crops, 2016-2018**



Source: Colombian Government - UNODC Supported monitoring system.

Boundaries, names and titles used herein do not concur acknowledgement or acceptance by the United Nations.

# MAIN CHALLENGES FOR COCA-AFFECTED AREAS

The problematic situation described here poses several challenges for overcoming the drug problem in Colombia, and in particular for regions that produce illicit coca crops. The most important are mentioned below.

## Implementation of the agreement for the end of the conflict

In 2018, two of the fifteen years planned for the implementation of the peace agreement implementation process established between the national Government and the Farc-EP guerrillas were completed. The Kroc Institute, one of the entities responsible for monitoring and supervising the implementation of the agreement, describes the progress as significant. Of the six agreed points, 23% have been fully implemented; 12% intermediate; 33% at the minimum of implementation, and 32% have not started execution.

Among the points of greatest progress are the mechanisms for implementation, verification and endorsement of the agreement, with a 54% execution, which reflects the joint effort made by the Government, the guarantor countries, and the UN peace mission to accompany the process. Second, there is the agreement associated with the end of the conflict, which materialized with

the concentration and disarmament of guerrilla structures<sup>108</sup>.

Although at the negotiating table in Havana the importance of taking urgent and priority measures in the implementation of the agreements to address the problems of rural territories, a comprehensive rural reform (RRI), and the solution to the problem of Illicit drugs are delayed, since only 2% of the implementation of these two components has been fully advanced. This situation adds to the rise in armed actions of illegal groups, which are currently in search of drug trafficking consolidation in rural territories as a means of financing<sup>109</sup> (Figure 33).

According to the most recent report of the Kroc Institute, the delay in implementation is due, among other reasons, to the lack of approval of the political-electoral reforms and the required legislative acts, as well as the execution of actions that are found linked to compliance with other previous measures for particular cases. There is a strong commitment on the part of the current National Government to continue with the implementation, as reflected by the incorporation of measures to address this responsibility of the State within the current National Development Plan 2018-2022. However, the conditions

<sup>108</sup> Kroc Institute for International Peace Studies, *Estado efectivo de implementación del Acuerdo de Paz de Colombia 2 años de implementación* (Bogotá, 2019).

<sup>109</sup> *Ibid.*

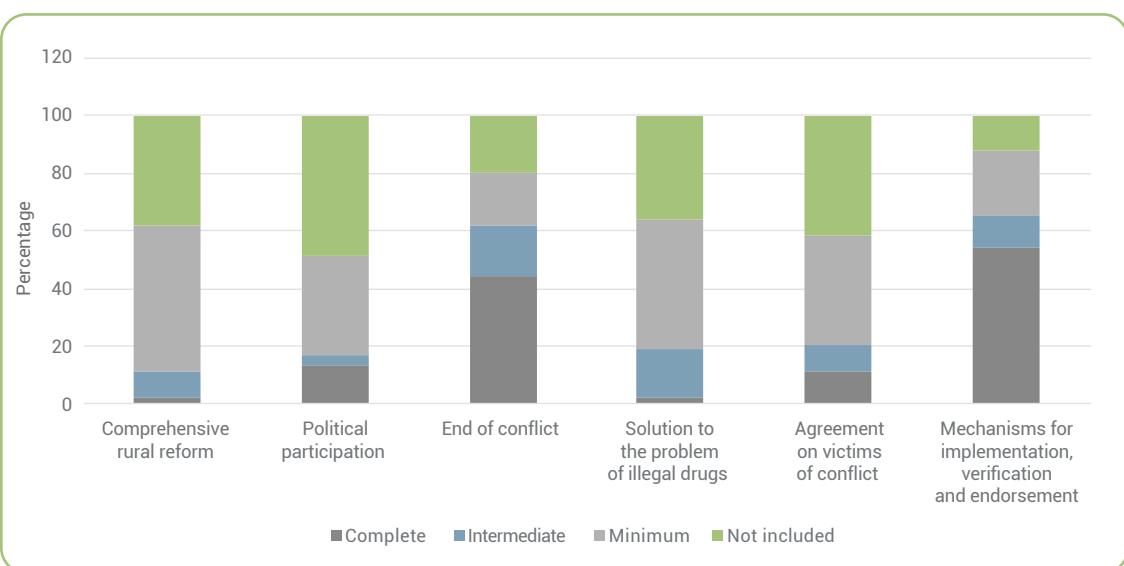


Figure 33. Percentage of the agreement to end of the armed conflict execution<sup>110</sup>

of territorial vulnerability persist and facilitate the proliferation of coca crops in the territory.

In addition to regulatory reforms, the conditions of insecurity are added as a means of pressure to curb these projects, maintain the institutional vacuum in the territories and impose cocaine production.

### Implementation of PDET and PNIS in the territories

The PDETs form a sub-regional program of integral transformation of the rural areas with a ten-year projection, through which the RRI instruments are launched more quickly in the territories most affected by the armed conflict, poverty, illicit economies and institutional weakness. On the

other hand, the PNIS was designed as a program aimed at providing a solution to the problem of illicit crops in the country. This program is contained in point 4 of the peace agreement signed between the national Government and the Farc-EP. Like the PDET, the PNIS is implemented within the framework of the RRI, which seeks to promote the reduction of poverty conditions among communities with illicit crops; generate policies and productive opportunities for growers, through the promotion of solidarity associations and economy; contribute to the closure of the agricultural frontier, the recovery of ecosystems and sustainable development, and promote the voluntary substitution of illicit crops through the promotion of integral municipal and community replacement and alternative development plans (PISDA)<sup>111</sup>.

<sup>110</sup> Ibid.

<sup>111</sup> High Commissioner for Peace, *Acuerdo final para la terminación del conflicto y la reconstrucción de una paz estable y duradera* (2016), <http://www.altocomisionadoparalapaz.gov.co/procesos-y-conversaciones/Documentos%20compartidos/24-11-2016NuevoAcuerdoFinal.pdf>: 104.

The delay in the implementation of the RRI has caused further delays in the implementation of the PDET. Although only 2% progress has been made in the implementation, progress in the formulation of the Community Pacts for Regional Transformation in the 170 PDET municipalities, which correspond to 100% of the planned coverage, should be highlighted. Also the 170 municipal pacts and the 16 Planes de Acción para la Transformación Regional (Action Plans for Regional Transformation, PATR)<sup>112</sup>. According to the Agencia de Renovación del Territorio (Territory Renewal Agency), the pacts were built in 16 sub-regions prioritized in the peace agreement, with the participation of 156,482 people who allowed the formulation of 16 community pacts, 10 ethnic pacts, and 170 municipal pacts. This program has a total execution budget of COP \$32.9 trillion for the 16 sub-regions.

In addition, CONPES 3932<sup>113</sup> was published, which designs the route for the inclusion of PDETs in the next four Planes Nacionales de Desarrollo (National Development Plans), having as a first experience the Plan Nacional de Desarrollo 2018-2022. The main difficulties that have limited the implementation of the PDETs is related to the weakness in their articulation with other territorial attention plans, doubts about the financial sustainability of the program, and particularly the public

order problems in the implementation areas. Likewise, a pending issue pointed out by the Kroc Institute is the promotion of citizen oversight and the creation of communication channels between citizen oversight and the institutions in charge of this process<sup>114</sup>.

The United Nations Office on Drugs and Crime (UNODC), through the project for monitoring and verifying commitments to replace illicit crops, reported on December 31, 2018 the subscription of 99,097 families benefiting from the PNIS, consisting of 67,420 coca-growing families (68%); 14,829 non-cultivating families living in areas affected by illicit production (15%); and 16,848 coca leaf collectors (17%). These families live in 56 municipalities located in 14 departments of the national territory, where 66% of the country's illicit crops are concentrated.

57.79% of the total families enrolled belong to the Putumayo-Caquetá region (33.59%), followed by the Pacific sub-region (24.20%). These two regions have the highest share of coca leaf production nationwide. In fact, the municipality of San Andrés de Tumaco (Nariño), the main coca leaf producing municipality nationwide, accounts for 16.71% of the total beneficiaries enrolled in the PNIS program.

The enrollment of families to the PNIS includes a conditioned economic transfer component with monthly cash

<sup>112</sup> Kroc Institute for International Peace Studies, *Estado efectivo de implementación*: 28.

<sup>113</sup> National Planning Department - National Council for Economic and Social Policy (CONPES), Documento CONPES 3932 de 2018. *Lineamientos para la articulación del plan marco de implementación del acuerdo final con los instrumentos de planeación, programación y seguimiento a políticas públicas del orden nacional y territorial*, <https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/3932.pdf>.

<sup>114</sup> *Ibid.*

payments of COP \$1,000,000 for 12 months, for the economic support of the beneficiary families in the program. It is worth clarifying that the transfer is made by the program on a bi-monthly basis, so the total payment of the component is made in 6 payment cycles of COP \$2,000,000 each.

As of December 31st, 2018, of the 99,097 enrolled families, 17,186 families (57.71%) have received at least one payment from the PNIS. In the Putumayo-Caquetá region, the first payment of the conditional transfer was made to all the beneficiaries. However, the beneficiaries in the municipalities of Jambaló (Cauca), Rosas (Cauca), Ituango (Antioquia), Tierra Alta (Córdoba), San Pablo (Bolívar), Sardinata (Norte de Santander), and Puerto Rico (Meta) did not report Conditional transfer payment at the cutoff date.

One of the aspects of implementation that is worth highlighting is targeting: 71% of the PDET municipalities and 95% of the PNIS intervened municipalities

were affected by coca crops in the 2016-2018 period (Table 14).

The correlation analysis between the intensity of affectation by coca crops (sum of the hectares cultivated by municipality during the period 2016-2018) and the intensity of intervention of the PNIS in 2018 (number of beneficiaries), presents a positive association (0,6386) and 5% statistically significant at the municipal level. Therefore, it is inferred that the magnitude of the investments provided by the PNIS is proportionate to the intensity of the effects of coca crops, ensuring that the resources will go largely to the municipalities where the problem of illicit crops is stronger.

### Coca concentration in conservation and special management areas

Special management areas cannot be intervened in the same way as areas that do not have restrictions. Given that the participation of these areas in the area cultivated with coca at the national level is 47%, the identification of intervention

Degree of involvement 2016-2018 <sup>a</sup>	Total of municipalities	No intervention		Intervenidos PNIS 2018	
		Total	Percentage	Total	Percentage
High (greater than 1.000 ha)	76	34	3,19	42	75,00
Medium (between 100 and 1.000 ha)	55	47	4,40	8	14,29
Low (between 1 and 100 ha)	69	66	6,19	3	5,36
No involvement (0) <sup>b</sup>	922	920	86,22	3	5,36
General total	1.122	1.067	100	56	100

Table 14. Distribution of municipalities with and without PNIS intervention 2018 by degree of involvement with coca crops

Source: UNODC.

Notes:

- a Involvement valued by the accumulated cultivated hectares during the 2016-2018 period.
- b Municipalities without involvement that have been intervened: Inírida (Guainía), Jambaló (Cauca), and El Dovio (Valle del Cauca). The lots in Inírida correspond to reporting families in San José del Guaviare, whose farms for productive projects are located in Guainía. In Jambaló and El Dovio, intervention was based on the declaration of families that reported coca crops in the territory, even if they had not been located by means of remote detection.

alternatives is one of the most important challenges for the next period.

In the case of collective territories (indigenous reserves and lands of black communities), Colombian regulations have tools to advance prior consultation processes that could activate the participation of these communities in the program. In relation to the PNN and the areas of Law 2, alternatives for the management of intervention processes are being defined within the framework defined by the regulations.

Faced with this challenge, there are cases in which the peculiarities of the territories have affected the abandonment of illicit crop production. In the indigenous territories, for example, the case of the Inga community of Aponte, located in the department of Nariño, stands out, where the sustained abandonment of planting poppy crops in mid-2005 responded to a combination of factors associated with institutional intervention, with the implementation of alternative development

programs, and the eradication of crops. To this was added the collective will of the community to abandon this practice, to recover their territory, to strengthen as indigenous people, and to defend their cultural traditions<sup>115</sup>.

On the other hand, in the PNN a reduction of the production associated with the implementation of institutional programs and promotion of the local capacities, taking advantage of the peculiarities of the territory, has also been observed. In the case of the Sierra de la Macarena Park, in the department of Meta, there has been a reduction in the production of coca crops of 35% between 2017 and 2018. When approaching the territory, it has been observed that the community organization built locally is one of the elements that has influenced the transformation of the park, based on the promotion of licit economies such as ecotourism, which seek to take advantage of the surrounding cultural and environmental wealth, while embracing sustainability principles.

<sup>115</sup> Ministry of Justice and Law and the United Nations Office on Drugs and Crime (UNODC), *Caracterización agro cultural del cultivo de amapola y de los territorios afectados-Síntesis de resultados de investigación* (Bogotá, 2019).

## ANNEXES

### 1. COCA CROPS IN NATURAL NATIONAL PARKS OF COLOMBIA (HA), 2016-2018<sup>116</sup>

Natural National Park	2016	2017	2018
Alto Fragua Indi Wasi	20	37	44
Catatumbo Barí	699	778	872
Cordillera de los Picachos	0	5	0
El Tuparro	8	15	2
La Paya	701	474	484
Los Farallones de Cali	269	527	563
Munchique	325	533	626
Nukak	1,738	1,118	1,375
Paramillo	1,278	1,557	1,786
Plantas Medicinales Orito Ingi Ande	2	2	2
Puinawai	6	0	0
Sanquianga	45	51	51
Serranía de Chiribiquete	38	12	17
Serranía de los Churumbelos	11	13	17
Serranía de los Yariguíes	5	6	6
Sierra de la Macarena	2,548	2,832	1,840
Sierra Nevada de Santa Marta	12	2	4
Tinigua	276	326	155
<b>Total</b>	<b>7,981</b>	<b>8,288</b>	<b>7,844</b>

<sup>116</sup> The historical series of coca crops in PNN was adjusted according to the latest geographical delimitation provided by Parques Nacionales Naturales de Colombia (Natural National Parks of Colombia). The data were obtained by using the 1 km<sup>2</sup> grids on PNN. For border grids, the adjustment was made based on their percentage in the park. Also, the Future Route Policy prioritizes indigenous reservations over other special management areas. Some territories overlap, such as indigenous reservations and PNN. When the Future Route Policy refers to PNN, these overlapping territories are excluded.

## 2. COCA CROPS IN INDIGENOUS RESERVATIONS (HA), 2016-2018<sup>117</sup>

Indigenous reservations	2016	2017	2018
Agua Blanca	40.07	44.28	49.39
Agua Negra	135.15	169.97	183.78
Aguas Negras	0.36	0.00	0.00
Albania	1.58	11.13	3.93
Almorzadero, San Isidro y La Nueva Unión	14.92	17.68	33.00
Alto Lorenzo	90.80	114.34	83.82
Alto Orito	38.55	47.41	50.69
Alto San Jorge	5.76	13.97	11.92
Alto Sinú, Esmeralda Cruz Grande e Iwagado	322.47	311.52	352.49
Alto Unuma	67.11	54.77	89.23
Altos del Tigre	1.08	1.32	1.31
Arara, Bacatí, Caruru y Miraflores	79.51	98.02	52.39
Awá Ñambl Piedra Verde	92.64	163.97	92.65
Bajo Grande	3.00	1.63	1.79
Banderas del Recaibo		0.30	7.72
Barranco Colorado	8.43	1.92	0.42
Barranquillita	25.82	24.94	18.59
Bella Vista	14.24	29.12	29.95
Bellavista-Unión Pitalito	18.97	31.40	19.70
Bocanas de Luzon	34.35	42.14	51.10
Buenavista	179.95	214.38	227.33
Caicedonia	52.40	87.23	97.79
Calarcá	83.91	63.08	46.60
Calenturas	12.45	15.13	11.35
Cali-Barranquilla	2.50	0.00	4.35
Calle Santa Rosa Río Saija	170.92	272.51	289.10
Campo Alegre del Afilador	38.53	61.80	60.32
Cañaveral	95.53	108.44	137.95
Caño Jabón	0.00	0.17	0.00
Caño Ovejas (Betania Corocito)	0.00	1.47	0.00
Cañón del Río Sanquinini	3.85	10.77	12.18
Carpintero Palomas	5.04	0.00	0.00
Cecilia Cocha	0.38	0.31	1.11
Chagpien Tordo	23.04	46.37	37.87
Chagui Chimbuba Vegas y Otros	68.81	109.95	100.63
Chaluayaco	5.27	5.12	7.99
Charco Caimán	5.51	6.90	4.88

<sup>117</sup> The historical series of coca crops in indigenous reservations was adjusted according to the latest geographical delimitation provided by the National Land Agency (ANT).

Indigenous reservations	2016	2017	2018
Chidima Tolo	0.09	0.00	0.00
Chimborazo	15.96	52.77	45,49
Chinguirito Mira	338.55	216.36	158.80
Chonara Huena	0.99	0.97	0.65
Chontadural Cañero	0.07	4.11	4.05
Concordia	2.70	0.00	0.00
Consara-Mecaya	9.28	4.75	5.43
Cope del Río Ingara	0.00	1.88	2.63
Corinto López Adentro	4.38	0.00	0.64
Corocoro	1.09	0.00	0.00
Coropoya	5.90	0.00	0.00
Cuaiquer Integrado La Milagrosa	125.34	192.85	193.12
Cuasbil-La Faldada	12.66	19.69	23.90
Cuascuabi-Paldubi	0.92	0.95	0.80
Cuayquer del Alto Albi	444.85	483.12	385.31
Cuchilla-Palmar	5.51	16.63	21.88
Cuenca Media y Alta del Río Inírida	15.79	24.64	39.23
Cusumbe-Agua Blanca	0.00	0.00	0.74
Damasco Vides	123.79	136.99	166.77
Dominico, Londoño y Apartadó	0.62	0.00	0.00
El Cedrito	7.48	3.46	3.57
El Cedro, Las Peñas, La Brava, Pilví y La Pintada	773.25	787.73	772.05
El Descanso	0.93	0.77	2.06
El Espingo	105.53	97.00	105.38
El Gran Sabalo	610.33	733.90	509.65
El Guayabal	2.97	3.23	1.71
El Hacha	88.94	86.31	75.61
El Itilla	1.62	0.27	0.00
El Portal	1.86	4.35	3.42
El Porvenir-La Barrialosa	1.76	2,60	0.20
El Quince	1.33	0.00	0.00
El Sande	445.81	666.65	674.62
El Tablero	9.47	4.40	3.74
El Triunfo	4.37	5.05	7.31
Eperara Siapidara del Río Naya	9.61	14.55	13.89
Eyakera Dogibi	0.00	1.08	0.00
Flores Sombrero	0.52	0.00	0.93
Gabarra-Catalaura	41.18	29.66	26.86
Getuchá	0.75	0.99	1.01
Gran Rosario	1,302.84	1,420.42	1,322.35
Guaco Bajo y Guaco Alto	1.94	0.00	0.00
Guadual, Cumbas, Magüi, Invina y Arrayán	2.54	2.78	6.86
Gualcalá	65.76	76.33	119.92
Guelnambi-Caraño	12.97	21.73	10.25

Indigenous reservations	2016	2017	2018
Hericha	23.61	21.25	21.90
Honda Río Guiza	19.77	29.75	23.99
Huellas	0.66	0.00	0.00
Inda Guacaray	325.73	334.32	289.29
Inda Zabaleta	2,520.08	2,185.09	2,052.20
Infi	118.82	98.29	71.10
Inga de San Miguel	28.53	29.41	31.10
Inkal Awa	8.80	9.07	5.14
Integrado El Charco	168.62	250.17	254.37
Ishu Awa	6.79	7.22	9.97
Isla del Mono	6.51	9.28	5.49
Jacome	5.37	5.49	8.33
Jaidezaví	13.72	21.14	15.35
Jai-Dukama	3.52	1.49	2.64
Jericó-Consaya	0.00	0.00	4.38
Jerusalén-San Luis Alto Picudito	71.68	106.03	129.85
Kawáneruba	0.00	2.61	2.53
Kogui-Malayo Arhuaco	22.94	4.41	7.58
La Aguadita	58.11	64.14	74.87
La Argelia	10.61	7.48	6.62
La Asunción	3.70	1.24	0.00
La Cristalina	0.79	3.93	11.03
La Esperanza	0.00	4.38	6.51
La Floresta, Santa Rosa y San Francisco	660.86	770.00	768.48
La Florida	1.73	0.73	1.93
La Fuga	1.29	12.10	4.36
La Iguana	77.29	40.98	18.72
La Italia	40.29	34.27	42.88
La Paya	10.55	6.80	3.32
La Perecera	2.96	4.49	1.80
La Siberia	0.00	0.66	0.00
La Teófila	0.59	0.00	0.00
La Turbia	1,051.45	1,075.45	892.47
La Unión Chocó-San Cristobal	1.11	0.00	0.00
La Yuquera	134.91	116.89	106.19
Lagos del Dorado, Lagos del Paso y El Remanso	275.15	200.76	137.21
Laguna Araguato y Barranco Ceiba	23.47	14.63	8.12
Llanos Del Yarí-Yaguará II	0.85	3.85	3.86
Los Almendros	0.23	0.46	0.49
Los Guaduales	18.41	20.39	29.02
Los Piñao	1.26	1.08	1.06
Macuare	10.44	9.41	5.85
Maiz Blanco	0.71	0.00	0.00
Maticurú	13.48	18.13	20.33

Indigenous reservations	2016	2017	2018
Morichal Viejo, Santa Rosa, Cerro Cucuy, Santa Cruz, Caño Danta-Otros	188.87	160.35	232.12
Morrito	0.00	3.45	4.62
Motilón-Barí	167.78	189.28	243.29
Nasa Chamb	0.00	0.00	1.17
Nasa Uh	5.11	6.99	3.07
Nasa We Sx Kiwe La Gaitana	0.00	2.49	0.00
Niñeras	29.16	29.19	42.42
Nukak-Maku	826.28	659.63	670.29
Nunalbí Alto Ulbí	14.79	32.82	21.08
Pablo Muera	0.00	5.82	11.77
Páez del Líbano	4.68	3.85	4.61
Palmar Imbi	14.59	20.76	28.88
Pescadito	0.00	0.46	0.00
Pialapi-Pueblo Viejo-San Miguel-Yare	0.59	5.41	5.85
Piedra Sagrada La Gran Familia de los Pastos	0.00	0.88	0.85
Piedra Sellada-Quebrada Tronqueria	2.10	1.44	0.37
Piguambi Palangala	101.06	82.19	49.31
Pipalta-Palbi-Yaguapi	36.29	52.44	50.52
Planadas Telembí	155.51	220.27	201.54
Playa Bendita	17.56	12.58	7.97
Playa Larga	33.10	37.61	41.03
Playita San Francisco	1.99	3.04	4.60
Polines	0.55	0.00	0.00
Predio Putumayo	188.30	205.41	138.63
Puadó, La Lerma, Mataré y Terdo	12.73	19.08	20.55
Pueblo Nuevo-Laguna Colorada	2.28	0.00	0.00
Puerto Limón	0.00	1.36	0.00
Puerto Naranjo, Peñas Rojas, Cuerazo y El Diamante	9.48	9.46	9.71
Puerto Nare	49.88	39.78	29.27
Puerto Sabalo	0.30	2.10	1.47
Puerto Viejo y Puerto Esperanza	5.16	14.16	7.61
Pulgande Campoalegre	230.71	231.81	220.51
Quebrada Cañaveral	0.83	0.42	0.38
Quebrada Grande	13.06	16.89	15.11
Quebrada Quera	1.29	0.00	0.00
Ramos-Mongon-Manchuria	24.13	36.26	39.71
Río Garrapatas	30.31	30.14	33.03
Río Guangüí	225.28	241.64	272.43
Río Purricha	0.94	0.18	0.00
Río Satinga	39.18	80.45	88.65
Río Siare	0.26	0.00	0.00
Río Taparal	0.22	0.00	0.00
Ríos Catru-Dubasa y Ancoso	1.63	1.23	0.00
Ríos Muco y Guarrojo	5.65	0.99	0.00

Indigenous reservations	2016	2017	2018
Ríos Tomo y Weberi	0.98	0.00	0.58
Rumiyaco	6.11	10.95	3.21
San Andrés-Las Vegas-Villa Unión	174.41	231.86	258.59
San Antonio del Fragua	13.99	20.05	11.76
San Luis	18.22	21.07	16.11
San Miguel	2.02	2.53	0.96
San Miguel de La Castellana	2.31	8.20	10.22
Sanandocito	6.04	13.98	11.14
Sanquianquita	10.41	10.84	6.46
Santa Cecilia de la Quebrada Oro Chocó	0.00	3.49	2.85
Santa Cruz de Piñuña Blanco	1.23	2.39	1.71
Santa María de Pangala	0.22	1.42	0.88
Santa Rosa del Guamuéz	13.12	13.61	11.69
Santa Rosa Sucumbíos El Diviso	40.76	37.60	39.90
Santa Rosita	78.36	75.58	53.93
Santa Teresita del Tuparro	42.05	49.62	76.99
Saracure-Cadá	48.59	39.57	47.70
Saunde Guiguay	292.53	393.23	297.50
Selva de Matavén	3.34	16.32	9.36
Selva Verde	62.00	80.32	53.00
Simorna	10.41	21.95	30.07
Sirena Berrecuy	0.00	1.46	2.59
Sta Rosa-Juanambú-Campo Alegre-Alpes Orientales	69.89	91.81	106.99
Tagual-La Po	0.00	0.00	2.46
Tortugaña, Telembí, Punde, Pitadero, Bravo, Tronquería y Zabaleta	193.46	299.63	265.67
Tronquería, Pulgande-Palito	89.72	174.04	143.67
Tucán de Caño Giriza y Puerto La Palma	30.43	28.01	18.87
Tukunare	1.07	1.01	0.70
Uradá Jiguamiandó	1.45	2.48	3.16
Valdivia	6.05	3.78	2.59
Vegas de Santana	9.86	15.45	8.27
Vegas de Segovia	0.00	0.63	0.97
Villa Catalina-de Puerto Rosario	161.94	199.52	173.17
Vuelta del Alivio	37.47	22.82	16.29
Wasipanga	12.49	10.52	13.34
Wasipungo	1.45	8.79	5.55
Witack Kiwe	4.64	11.02	9.21
Witora o Huitora	1.08	0.00	0.00
Yaberaradó	3.84	5.73	2.09
Yarinal (San Marcelino)	237.13	282.44	295.53
Yavilla II	110.48	108.35	92.68
Yu Yic Kwe	1.27	1.44	1.61
Yurayaco	2.80	4.35	5.36
Zit-Set del Quecal	2.85	7.44	6.36
<b>Total</b>	<b>16,338.64</b>	<b>17,627.31</b>	<b>16,588.64</b>

### 3. COCA CROPS IN AFRO-COLOMBIAN COMMUNITY AREAS (HA), 2016-2018<sup>118</sup>

Afro-Colombian community areas	2016	2017	2018
Acadesán	869.57	1,414.05	1,116.33
Acapa	255.71	447.97	521.36
Agricultores del Patía Grande	312.36	314.44	329.44
Alejandro Rincón del Río Ñambí	60.89	88.80	55.50
Alto Anchicaya	0.00	0.15	0.00
Alto Guapi	65.99	84.31	44.41
Alto Mira y Frontera	7,211.93	4,245.59	3,396.93
Alto Río Sequihonda	484.93	691.68	704.20
Bahía Málaga-La Plata	12.20	11.20	6.71
Bajo Mira y Frontera	48.47	106.55	95.45
Bellavista Dubaza	4.22	0.00	0.00
Bocas de Caná	14.02	26.89	33.27
C.C. Brisas del Alto Telemby	114.15	139.54	126.43
Catangueros	512.91	488.44	544.39
Chanzará	5.59	3.23	3.24
Chaparrosa	1.51	1.86	0.77
Citronela Río Dagua	0.00	6.31	0.00
Consejo comunitario Integral de Lloro	0.00	0.95	0.00
Consejo Organización Popular Campesina del Alto Atrato (Cocomopoca)	0.00	0.43	0.00
Córdoba y San Cipriano	4.00	3.90	0.00
Cortina Verde Mandela	40.95	47.13	45.40
Dos Bocas	2.52	2.51	6.00
El Aguacate	9.32	18.94	20.38
El Bien del Futuro	103.98	176.57	120.31
El Cuerval	5.47	13.36	20.01
El Playón del Río Siguí	21.31	39.77	17.36
El Progreso	133.31	138.96	133.02
El Progreso del Campo	2.66	11.42	15.76
El Progreso del Río Nerete	49.30	71.49	69.13
El Recuerdo de Nuestros Ancestros del Río Mejicano	485.62	495.18	465.98
Gualmar	35.18	54.36	59.40
Guapí Abajo	69.84	109.45	139.85
Imbilpí del Carmen	29.43	31.62	34.99
Integración de Telemby	521.67	465.91	531.57
Integración del Río Chuare	20.18	23.38	19.13

<sup>118</sup> The historical series on Afro-Colombian communities was adjusted according to the latest geographical delimitation provided by the National Land Agency (ANT).

Afro-Colombian community areas	2016	2017	2018
Istmina y parte del Medio San Juan	26.90	25.40	17.97
La Amistad	35.57	66.23	43.27
La Brea	0.99	8.70	5.77
La Cordillera Occidental de Nariño Copdiconc	1,469.00	1,846.51	2,205.97
La Costa-Concosta	74.83	34.75	27.15
La Cuenca del Río Acandí Seco. El Cedro y Juancho	0.00	2.20	0.82
La Cuenca del Río Iscuandé	173.77	208.51	228.11
La Cuenca del Río Salaquí	0.00	22.43	15.97
La Cuenca del Río San Bernardo Patía Norte	130.77	134.39	122.31
La Esperanza	0.00	0.47	0.46
La Esperanza del Río La Tola	28.39	62.83	57.77
La Gran Minga de los Ríos Inguambí y Albí	136.85	198.02	170.56
La Gran Unión del Río Telpí	66.19	116.48	107.55
La Mamuncia. parte media del Río Micay	243.16	186.05	118.18
La Nueva Esperanza	180.28	255.86	126.82
La Nueva Reserva Acanure	133.09	211.39	135.26
La Nupa del Río Caunapí	2.46	2.41	2.68
La Voz de Los Negros	258.99	334.66	417.76
Liberacion y Futuro	0.22	0.00	0.00
Llano Bajo	2.27	2.93	1.92
Los Andes	59.59	68.05	81.18
Los Ríos La Larga y Tumaradó	4.12	18.29	19.87
Manglares del Río Micay	51.55	68.52	62.21
Manos Amigas del Patía Grande	356.34	521.72	563.59
Manos Unidas del Socorro	156.78	224.06	158.50
Mayor de la cuenca media y alta del Río Dagua	0.67	2.90	3.21
Mayor de Nóvita	324.60	462.57	441.69
Mayor de Unión Panamericana	0.31	0.00	0.00
Mayor del Alto San Juan "Asocasan"	8.33	16.13	8.44
Mayor del Cantón San Pablo "Acisanp"	1.62	0.43	0.32
Mayor del Medio Atrato Acia	3.75	7.16	3.52
Mayor del municipio de Condoto e Iró	11.36	43.47	30.29
Mayor del Río Anchicaya	0.47	2.16	2.46
Mayorquín y Papayal	0.00	7.59	6.24
Negros en Acción	37.56	37.71	37.12
Negros Unidos	4.56	7.79	11.36
Nueva Alianza	107.52	137.24	104.00
Nueva Esperanza	0.00	4.15	15.39
Nuevo Renacer	89.50	112.98	44.53
Odemap Mosquera Sur	1.79	12.45	12.87
Parte alta sur del Río Sajá	218.05	270.73	251.64
Parte baja del Río Sajá	221.16	353.19	386.18
Pedeguita y Mancilla	9.26	60.87	44.79
Por el Desarrollo Integral	0.00	0.63	0.00

Afro-Colombian community areas	2016	2017	2018
Porce Medio	38.20	51.50	64.91
Pro Defensa del Río Tapaje	2,342.08	3,425.15	3,788.30
Puerto Echeverry	0.79	0.60	0.00
Renacer Negro	246.70	307.10	311.24
Renacer Telembi	100.42	145.98	133.99
Rescate Las Varas	33.06	35.19	82.17
Río Baudó Acaba	168.13	111.06	60.93
Río Cajambre	0.00	4.54	0.94
Río Calima	150.34	260.34	194.10
Río Curvaradó	28.14	41.93	32.33
Río Domingodó	5.23	14.23	20.95
Río Guajúí	259.67	335.76	385.05
Río Gualajo	73.47	62.00	66.16
Río Jiguamiandó	71.54	78.05	86.67
Río Napi	135.25	170.89	106.57
Río Naya	578.74	1,023.03	1,039.63
Río Pepe	4.16	3.54	5.63
Río Pilizá	3.00	0.00	0.00
Río Raposo	0.00	3.33	4.67
Río San Francisco	37.91	38.62	29.40
Río Satinga	1,122.47	1,545.74	1,624.45
Río Yurumanguí	0.80	4.19	6.45
San Andrés de Usaragá	2.99	0.00	0.00
San Joc parte alta del Río Micay	100.53	113.49	85.78
Sanquianga	664.27	860.48	875.12
Tablón Dulce	2.74	0.77	7.28
Tablón Salado	7.32	6.90	16.62
Unicosta	76.87	106.88	127.39
Unión Bajo Río Guelmambí	123.00	180.77	119.51
Unión de Cuencas de Isagualpi	1,128.94	1,361.04	1,428.50
Unión del Río Chagüí	326.85	328.94	394.46
Unión Patía Viejo	318.97	402.63	554.16
Unión Río Caunapi	179.72	203.02	188.39
Union Rio Rosario	379.09	410.82	343.91
Veredas Unidas	19.10	16.06	18.15
Vigía de Curvaradó y Santa Rosa de Limón	3.12	10.16	8.41
<b>Total</b>	<b>24,875.42</b>	<b>27,602.08</b>	<b>26,984.64</b>

## 4. MUNICIPAL THREAT INDEX DUE TO THE PRESENCE OF COCA CROPS, 2018

The threat index is a statistical summary of the historical conditions associated to the number of hectares with coca crops, their impact on the territory and their level of permanence. The index makes it possible to compare the degrees of threat between different municipalities in Colombia and their temporary level.

The threat index registers simultaneously those municipalities with the highest number of crops, with the strongest expansionary tendency, and with the greatest permanence of the phenomenon in the territory. The index assessment has a normalized scale between 0 to 1, where values close to zero (0) indicate less threat and those close to one (1) indicate greater threat. For qualitative purposes, the index has been grouped into five types of threat: very high, high, medium, low and very low. The threat index ( $I$ ) was calculated based on the following formula:

Where  $\hat{\beta}_{1,2}$  are the relative weights of both components<sup>119</sup>. As for the variables, they indicate:

$A_{mt} P_{mt}$ : Affected Area and Permanence factor.

$E_{mt}$ : territorial expansion of the phenomenon.

$C_{mt}$ : area with coca crops.

$T_{mt}$ : expansive or contractive tendency of crops.

$m$ : corresponds to  $m$ -th municipality threatened by the existence of illicit coca crops.

In general terms, it was found that by 2018 the threat of coca crops was concentrated in 280 of the 1,122 Colombian municipalities in 24 departments. Of these, a very high threat level was found in two municipalities, which corresponds to 0.7%. 6 municipalities (2.1%) were found to have a high threat. 19 municipalities (6.8%) had a medium threat. 33 municipalities

$$\underbrace{I_{mt}}_{\text{Threat index}} = \underbrace{\hat{\beta}_1 A_{mt} P_{mt} (1 + E_{mt})}_{\text{Territorial and Permanence component}} + \underbrace{\hat{\beta}_2 C_{mt} (1 + T_{mt})}_{\text{Crops component}}$$

<sup>119</sup> The weights are obtained through the evaluation of the combinations with the best simultaneous adjustment with the number of hectares of coca detected, as well as the territorial affectation and the permanence of the phenomenon through optimization exercises through linear regressions and panel data. This exercise estimated an optimal weighting of  $\hat{\beta}_1 = 0.5$ , and  $\hat{\beta}_2 = 0.5$ .

(11.8%) had a low threat and 220 municipalities (78.6%) had a very low threat. Table 15 shows a comparison between changes in threat intensity for the results obtained in the 2018 index (columns) against that of 2017 (rows).

It can be seen that threat levels tend to be very stable compared to the previous year, except for the situation in eleven municipalities where the intensity of the threat worsened, in comparison to that reported in 2017. Table 15 highlights the change of category of the Sardinata (Norte de Santander), El Tambo (Cauca) and Puerto Guzmán (Putumayo) municipalities, which went from medium to high threat levels, mainly because of the increasing trend in the area or the expansion territorial phenomenon.

The ranking of the ten municipalities with the highest threat levels in 2018 is as follows: Tibú (Norte de Santander), Tumaco

(Nariño), Puerto Asís (Putumayo), Barbacoas (Nariño), Sardinata (Norte de Santander), Puerto Guzmán (Putumayo), El Tambo (Cauca), San José del Guaviare (Guaviare), Orito (Putumayo) and Tierralta (Córdoba). It is worth mentioning that for the first time in over 8 years the municipality of Tumaco did not hold the first position in the country, as Tibú did. Another notable feature was the entry of the municipalities of Tierralta and Sardinata to the ranking, removing the municipalities of Miraflores (Guaviare) and Vichada (Cumaribo) from the list.

Another characteristic feature of threat at the municipal level is that it has had a strong tendency towards concentration. The Gini index<sup>120</sup> for the value of threat at the municipal level in 2018 was 0.84, which despite reducing by 2% since 2017, indicates high levels of concentration. In fact, the first five municipalities together represented more than a fifth of the total threat share nationwide.

Threat index (2017)	Threat index (2018)							
	Scale	Without registration	Very low	Low	Medium	High	Very high	Total
Without registration			3					3
Very low			217	2				219
Low				31	6			37
Medium					13	3		16
High						3		3
Very high							2	2
<b>Total</b>		<b>0</b>	<b>220</b>	<b>33</b>	<b>19</b>	<b>6</b>	<b>2</b>	<b>280</b>

Table 15. Changes in threat index intensity by coca crops presence, 2017-2018

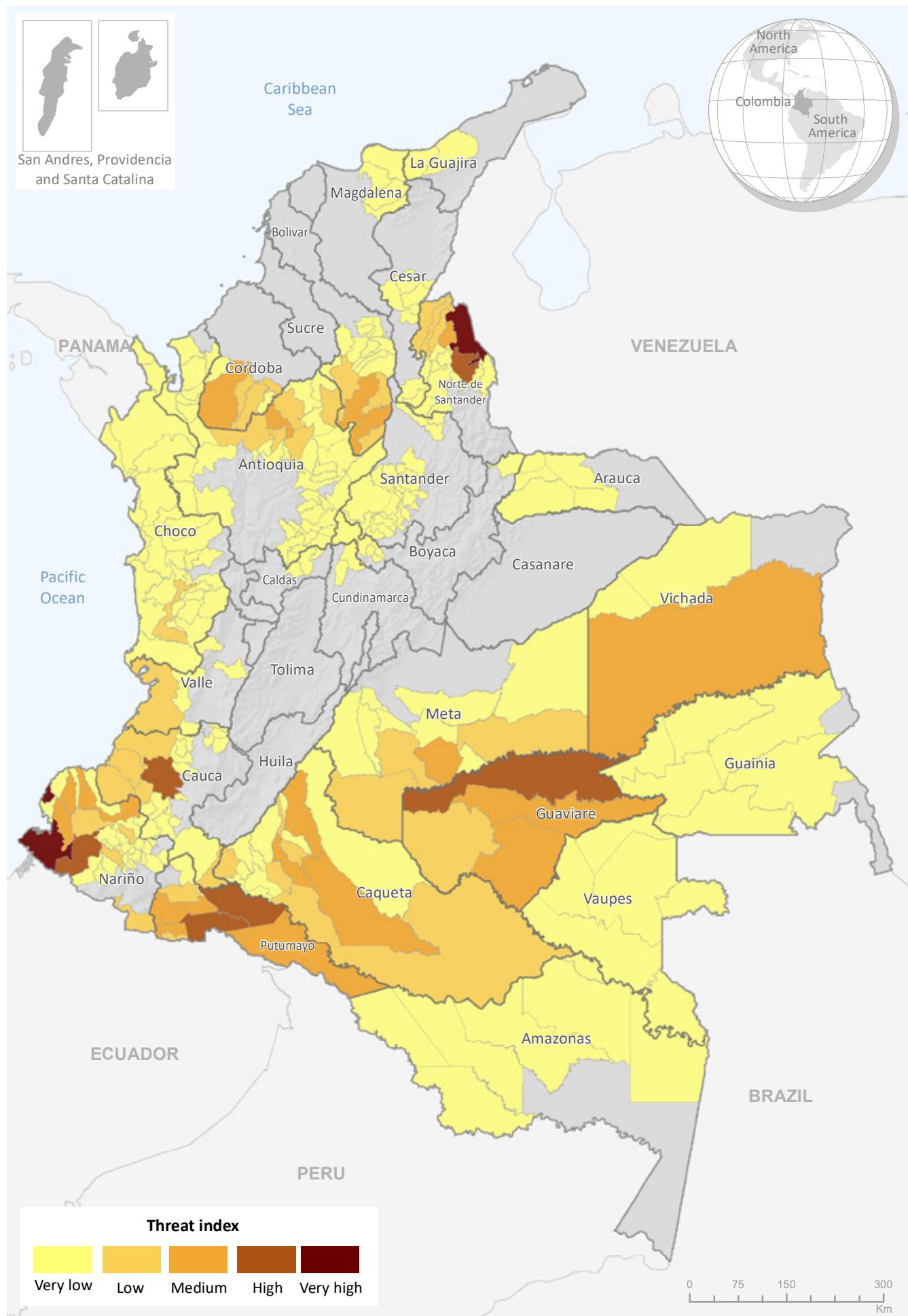
Note: The municipalities whose threat level worsened are shown in the matrix's upper diagonal (gray) section. Contrarily, the lower diagonal section (green zone) shows municipalities where said levels improved.

<sup>120</sup> The Gini coefficient measures the relative distribution of a variable, in this case, the threat of illicit coca cultivation in Colombia. The measure is between zero (0) and one (1), where 0 corresponds to perfect equality and 1 corresponds to perfect inequality; that is, it indicates a maximum concentration of the threat by these crops.

At the spatial level, the threat was concentrated in delimited space clusters (Map 10). The most important is located in the southwest of the territory, specifically in the border of Nariño with Ecuador, delimited by the municipalities of Tumaco and Barbacoas, and to a lesser extent, by Roberto Payán, Olaya Herrera,

El Charco and Magüí, on the Colombian Pacific coast. However, the cluster with higher growth in the threat level is located in Catatumbo, which is composed by the municipalities of Tibú and Sardinata (Norte de Santander), next to Teorama and El Tarra, mainly attributed to the growth in coca crops in the last few years.

**Map 10. Municipal threat level due to the presence of coca crops, 2018**



## 5. STRATEGIC COMPREHENSIVE INTERVENTION AREAS: COCA CROPS AND POTENTIAL PRODUCTION<sup>121</sup>

SACI	No. SACI	Area with coca crops as of December 31 (ha)	Productive area during the year		Fresh coca leaf production		Potential production of cocaine base		Potential production of pure cocaine hydrochloride <sup>a</sup> mt
			ha	Total ha (%)	mt	mt	Total mt (%)		
Arauca	No. 1 La Esmeralda, La Paz, Aguachica, Santa Ana	3	3	0.0	12	0.0	0.00	0	
	No. 2 Pueblo Nuevo, Filipinas, Panamá de Arauca	1	64	0.04	262	0.2	0.02	0	
	Total	3	67	0.04	274	0.2	0.02	0	
Bajo Cauca	No. 1 Área Minera	1,708	1,525	0.9	6,555	8	0.6	7	
	No. 2 Área de Refugardia Estratégica	255	264	0.2	1,135	1	0.1	1	
	No. 3 PNN Paramillo	3,360	3,354	2.0	14,424	19	1.4	15	
	No. 4 Corredor Troncal del Caribe	6,732	6,340	3.7	27,265	34	2.4	27	
Cataatumbo	Total	12,055	11,483	6.7	49,379	62	4.5	50	
	No. 1 Gabarra-Frontera	6,062	5,901	3.5	31,867	41	2.9	33	
	No. 2 La Gran Alianza	5,014	4,992	2.9	26,960	36	2.6	28	
	No. 3 PNN Catatumbo Barí	2,095	2,030	1.2	10,966	14	1.0	11	
	No. 4 Convención, Teorama, San Calixto, Hacarí	2,127	2,042	1.2	11,026	14	1.0	12	
	Total	15,298	14,965	8.7	80,819	105	7.5	84	

<sup>121</sup> The data were calculated based on 1 km<sup>2</sup> grids. Within the framework of the UNODC-Government of Colombia International Cooperation Agreement, an annual survey of coca crops was established. To meet this objective, a methodology that uses spatial resolution satellite images was designed for data to be obtained at national and departmental levels, with significant levels of confidence. However, at the municipal level, data confidence is reduced and, if the scale increases –for example, sub-regional analyzes such as sidewalks or characterizations directly in the field– the data loses confidence.

SACI	No. SACI	Productive area during the year			Fresh coca leaf production		Potential production of cocaine base		Potential production of pure cocaine hydrochloride <sup>a</sup>	
		Area with coca crops as of December 31 (ha)	ha	Total ha (%)	mt	mt	Total mt (%)	mt	mt	mt
No 2 PNN Serranía del Chiribiquete-Calamar	134	217	0.1		1,605	2	0.1			
No. 3 PNN Sierra de La Macarena Sur Oriente	1,372	1,672	1.0		12,374	17	1.2			
No. 4 PNN Sierra de La Macarena Sur-Norte	658	1,023	0.6		7,568	11	0.8			
Total	2,164	2,912	1.7		21,547	30	2.1			
No. 1 Triángulo del Telemón	2,708	2,380	1.4		13,332	20	1.4			
No. 2 Llorette y Guacamaya	13,275	13,470	7.9		75,436	112	8.0			
No. 3 Olaya, La Tola, El Charco	3,286	3,177	1.9		17,791	25	1.8			
Total	19,269	19,027	11.1		106,559	157	11.2			
Outside SACIs N. A.	120,230	122,588	71.8		718,336	1,046	74.7			
Total SACIs	48,789	48,453	28.2		258,578	354	25.3			
National Total	169,019	171,041	100.0		976,914	1,400	100.0			
								283		
									1,120	

Note:

a Based on the productive area during the year, according to level.

## NOTES

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