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Review Article

Geospatial information and the intervention of the Peruvian state in areas occupied by drug traffickers

ABSTRACT

This article describes and analyzes the Peruvian state's security and defense policy in relation to the expansion of the cultivation of coca, its exploitation and transportation abroad. Next, it presents quantitative budgeting data from the defense sector related to military and police operations and actions in the fight against drug trafficking and terrorism. It analyzes the work of the modern Peru SAT-1 Peruvian satellite, managed by a team of professionals from the Comisión Nacional de Investigación de Desarrollo Aeroespacial (CONIDA), which is part of the Peruvian defense sector. In relation to this commission, it presents quantitative budgeting data corresponding to the integrated and effective management of drug supply control in Peru and the improvement of military capabilities for defense and national development. The Peru SAT-1 satellite is the most modern satellite in the entire region, offering imaging services related to military operations and others of key importance to different public entities in Peru, one of which is related to the country's defense and security and the fight against illicit crops in the areas where coca plants are grown, such as the Valles de los ríos Apurímac, Ene y Mantaro (VRAEM).

Keywords: geospatial information; drug trafficking; budget.

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INTRODUCTION

The Peruvian state's security and defense policy in relation to narcoterrorism should be a priority on the government's agenda, since the expansion of coca crops, their sale and transportation abroad is carried out exponentially, as it often happens that bridges are built with illegal coca growers, as can be seen at present.

Unfortunately, in recent years, coca cultivation and cocaine production in Peru have been increasing steadily despite the efforts of the defense sector. In this context, the Peru SAT-1 Peruvian satellite provides images that are related to military operations, so the question is why it is so difficult to take action and fight narcoterrorism efficiently, since these images make it possible to accurately locate clandestine airstrips in the areas with the highest coca cultivation in the VRAEM region.

The study proposes triangulating the budgets assigned to the executing units described in the following paragraphs in order to find an answer to the question of why the fight against narcoterrorism is not so effective, despite the fact that Peru has the Peru SAT-1 satellite, the most modern and precise imaging satellite in the region, which is supposed to make the fight against narcoterrorism more efficient and effective.

The results will reveal whether the budgets allocated to the defense sector should be reduced on the grounds of lack of efficiency and effectiveness based on the work carried out by the Peru SAT-1 satellite.

PURPOSE OF THIS PAPER

The purpose of this paper is to present an analysis of the budget the state allocates to the defense sector through the Ministry of Economy and Finance (MEF by its Spanish initials), to the executing unit of the National Commission for Aerospace Research and Development (CONIDA, by its Spanish initials) in budget category 0074: Integrated and effective management of drug supply control in Peru. It also aims to present an analysis of executing unit 002-469, Joint Command of the Armed Forces, with budget categories 0031 and 0032, corresponding to the reduction of illicit drug trafficking and the fight against terrorism, respectively. Finally, it aims to present an analysis of executing unit 003-470, Peruvian Army, corresponding to budget category 0032: fight against terrorism. This will make it possible to analyze whether the budgets allocated to the defense sector are adequate or whether they should be reduced, since the images taken by the Peru SAT-1 satellite help in the effective management of the fight against narcoterrorism.

ARGUMENTATIVE REVIEW

Overview of drug trafficking in Peru

The development of the reform of the state's security and defense policy is related to the expansion of the cultivation of coca, its commercialization and transportation abroad. This productive chain has an impact on the national economy, since coca is cultivated in geographic areas where there is no presence of native communities. From 1980 to 2000, terrorism in Peru grew throughout the country, leading to the militarization of most of the highlands, as terrorist groups used those geographic conditions to seek refuge. Currently, there is a direct link between the areas with terrorist presence and the so-called illegal crop areas, such as the Valley of the Apurimac, Ene and Mantaro Rivers in the provinces of Ayacucho, Apurimac and Cusco (Bermudez-Tapia and Sierra-Zamora, 2021).

Figure 1 shows an overview of the area occupied by narcoterrorism within the VRAEM region (see Figure 1).

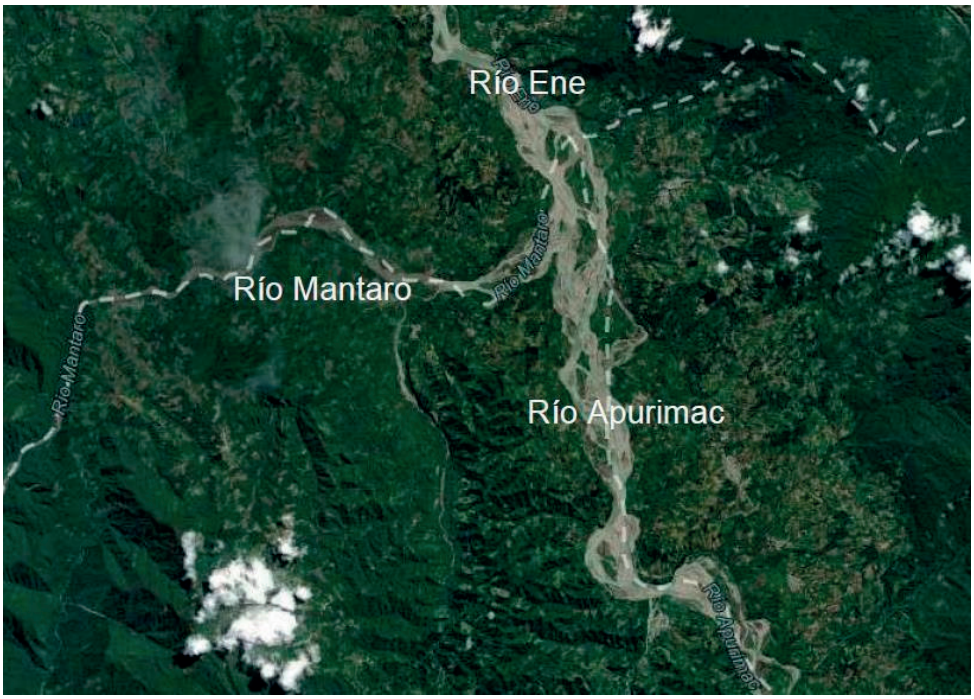
Narcotics control

According to a report by the International Narcotics Control Board (INCB), the total area planted with illicit coca leaf crops in Peru was 49,000 ha in 2017, rising to 53,134 ha in 2018, to 54,644 ha in 2019, and to 61,777 ha in 2020, the latter representing a 13% increase compared to the previous year. The board advised Peru to resume surveillance studies of the area affected by illicit crops, certified by the United Nations Office on Drugs and Crime (UNODC for the Andean Region 2022).

In this regard, the Comisión Nacional para el Desarrollo y Vida sin drogas (DEVIDA) reports that coca growers hand over their coca to drug traffickers under the argument that they

Figure 1

VRAEM region



Note. Figure 1 highlights the geographic extension of the VRAEM, Ministry of Economy and Finance (MEF) 2022a.

will eradicate it themselves and reduce the coca-growing area, but, on the contrary, instead of decreasing, it increases in accordance with their interests. This is due to the fact that farmers are pragmatic and thrive thanks to the demand for coca leaves, thus they do not give importance to other types of crops, which have turned out to be an absolute failure, despite the fact that the price of cocaine hydrochloride has fallen due to the lockdown caused by the pandemic (DEVIDA, 2022).

The government in office often insists ad nauseam on the articulation, integration and efficiency of associated sectoral public policies, but each administration works in its own way and, frequently, disconnected from the other sectors, as do regional and local governments, so they spend the allocated budget as well as they can, and no one takes responsibility for anything (DEVIDA 2020).

Work by Peruvian state's defense sector

The analysis developed with respect to the work carried out by the Ministry of la Comisión Nacional de Investigación y Desarrollo Aeroespacial (CONIDA) for 2020, 2021 and 2022 in budget category 0074, "Integrated and effective management of drug supply control in Peru," is only performed in the department of Lima. The same applies to budget category 0135, "Improvement of military capabilities for defense and national development," which is performed only in the departments of Lima and Moquegua, in the latter only in 2022 (see Table 1).

Government Level E: National Government Sector 26: Defense

Sheet 026: Ministry of Defense

Executing Unit 006-1122: National Commission for Aerospace Research and Development

The Apurimac River Valley is the area most heavily controlled by drug traffickers along the Ene River. This is the reason why this area is less controlled, allowing traffickers to move around the area carrying out activities such as coca processing and sale, with operators reaching the clandestine airstrips where the drugs are transported. These are commonly known as armed narco-organizations, which ambush

Table 1
Spending execution by executing unit 006-1122: National Commission for Aerospace Research and Development

Budget category	Spending execution						
	Goal	Department	Year	Updated Intitutional Plan (PIA)	Modified Institutional Budget (PIM)	Transferred Execution	Progress %
0068: Vulnerability reduction and disaster emergency response	15	Lima	2020	753,875	788,116	788,115	100.0
	15	Lima	2021	802,300	857,375	841,138	98.1
	15	Lima	2022	659,222	659,222	355,484	53.9
0074: Integrated and effective management of drug supply control in Peru	15	Lima	2020	0	825,000	819,987	99.4
	15	Lima	2021	0	1,000,000	780,653	78.1
	15	Lima	2022	0	205,784	205,783	100.0
0135: Improvement of military capabilities for national defense and development	15	Lima	2020	3,837,569	4,246,267	4,233,631	99.7
	15	Lima	2021	13,555,200	14,150,039	13,544,097	95.7
	15	Lima	2022	15,985,355	14,671,159	848,010	5.9
	18	Moquegua	2022	0	1,379,246	276,210	20.4
0137: Development of science, technology and technological innovation	15	Lima	2020	2,496,755	2,512,296	2,500,831	99.5
	15	Lima	2021	740,111	958,668	944,434	98.5
	15	Lima	2022	1,069,419	1,069,419	511,471	46.5
	18	Moquegua	2022	0	310,000	0	0
9001: Central actions	15	Lima	2020	3,283,402	3,210,221	3,158,828	98.4
	15	Lima	2021	3,165,198	2,859,925	2,828,372	98.9
	15	Lima	2022	4,589,109	4,650,211	1,564,696	33.9
9002: Budget allocations not resulting in products	15	Lima	2020	0	29,400	29,100	99.0
	15	Lima	2021	0	2,520	2,520	100.0
	18	Moquegua	2021	0	904,477	0	0
	-	-	2022	-	-	-	-

Note: MEF, 2022b

police and military personnel, carrying out selective assassinations and massacres. The military anti-subversive strategy is considered to be bound to fail, since Sendero Luminoso has supported drug trafficking in the last fifteen years of fighting, as is the case in the department of Loreto, and they have extensive experience in warfare (Silverstein, 2021).

The analysis of work conducted by the Ministry of Defense through executing unit 002-469 (Joint Command of the Armed Forces) in action 0031 (Reduction of illicit drug trafficking) and action 0032 (Fight against terrorism) shows that these interventions are effective only in the departments of Madre de Dios and Cusco, areas that belong to the VRAEM (see Table 2).

Government Level E: National Government Sector 26: Defense

Sheet 026: Ministry of Defense

Executing Unit 002-469: Joint Command of the Armed Forces

In addition, there is the work by the Ministry of Defense through executing unit 003-470 (Peruvian Army) in action 0032 (Fight against terrorism), whose interventions are effective in the following departments of Peru: in 2020, in the departments of Ayacucho and Cusco; in 2021, in the departments of Ayacucho, Cusco and Lima; and in 2022, in the department of Ayacucho. The departments of Ayacucho and Cusco are located in the VRAEM region (see Table 3).

Government Level E: National Government Sector 26: Defense

Sheet 026: Ministry of Defense

Executing Unit 003-470: Peruvian Army

Spending execution by executing unit 003-470: Peruvian Army

Table 2
Spending execution by executing unit 002-469: Joint Command of the Armed Forces

Budget category	Spending execution						
	Goal	Department	Year	PIA	PIM	Transferred Execution	Progress %
0031: Reduction of illicit drug trafficking	17	Madre de Dios	2020	3,600,000	0	0	0.0
			2021	-	-	-	-
			2022	-	-	-	-
0032: Fight against terrorism	08	Cusco	2020	102,727,927	16,157,354	15,377,062	95.2
	08	Cusco	2021	129,756,908	16,029,034	15,548,657	97.0
	08	Cusco	2022	116,644,009	32,997,74	4,156,111	12.6

Note: MEF, 2022b

Table 3
Spending by executing unit 003-470: Peruvian Army

Budget category	Spending execution						
	Goal	Department	Year	PIA	PIM	Transferred Execution	Progress %
0032: Fight against terrorism	05	Ayacucho	2020	4,552,251	4,600,735	3,211,984	69.8
	08	Cusco	2020	75,415,053	100,155,035	90,360,488	90.3
	05	Ayacucho	2021	29,533,860	83,475,854	76,948,484	92.9
	08	Cusco	2021	0	6,000,402	5,706,520	95.2
	15	Lima	2021	1,385,428	2,219,576	285,200	12.8
	05	Ayacucho	2022	28,218,320	79,062,571	16,186,889	20.8

Note: MEF, 2022b

With the acquisition of the Peru SAT-1 satellite, which has been orbiting the earth at an altitude of 700 km since December 2016, the digital records of photographic shots of Peru are downloaded to Earth and decoded at the Centro de Operaciones de Imágenes Satelitales (CNOIS) in Pucusana in order to be used by different public institutions such as the Instituto Geológico, Minero y Metalúrgico (INGEMMET), the Ministerio de Energía y Minas (MINAM), as well as regional, province and district governments through a catalog of over 41,000 images of the Peruvian territory and 171 images from around the world, since Peru SAT-1 is a fundamental tool that can be applied in disaster risk management, in the study of the behavior of volcanoes and rivers, in agriculture, and in the prosecution of illicit activities such as illegal mining and logging, as well as narcoterrorism. The Peru SAT-1 satellite has been in service for approximately 10 to 12 years (Puerta *et al.*, 2021).

Peru SAT-1 is not the only Peruvian satellite orbiting the Earth. The country has four other satellites, which fall into the category of nanosatellites and femtosatellites. There are five Peruvian satellites in space: three of them belong to private universities and one to a public university. They are: PUCP SAT-1 launched in 2013, Pocket PUCP, UAPSAT 1 launched in 2014, Chasqui 1 belonging to UNI, which is a nanosatellite that was launched in 2014, and the Peru SAT-1 satellite owned by the State. According to CONIDA, the Peru SAT-1 satellite provides the state with 7,241 images per year (CONIDA, 2018).

Military operations

The acquisition of the Peru SAT-1 satellite, and the delivery of images should have allowed significant savings, in addition to showing efficiency in the fight against narcoterrorism in the detection of clandestine airstrips and in recognizing the areas with the largest coca

bush plantations, given that the region's most modern satellite has been at Peru's service for more than five years. These images are available within three hours to a day, depending on the position of the satellite, which is why the first Peruvian satellite also has a national defense and security purpose (Puerta *et al.*, 2021).

CONCLUSIONS

The research conducted leads to the following conclusions:

- There is an adequate distribution of the budget allocated by the state to the defense sector through the Ministerio de Economía y Finanzas, with respect to the National Commission for Aerospace Research and Development (CONIDA), the Comando Conjunto de la Fuerzas Armadas, and the Peruvian Army.
- There is a large amount of satellite images taken by the Peruvian satellite Peru SAT-1 that are requested by different public entities.
- Satellite images taken by the Peru SAT-1 satellite help to manage the fight against narcoterrorism in the Valley of the Apurimac, Ene and Mantaro Rivers (VRAEM), but there is no effective use of the catalog.
- Regarding the work of the Ministerio de Defensa in CONIDA, it refers to the integrated and effective management of drug supply control in Peru, this only takes place in the area of the department of Lima and there is no direct intervention in the VRAEM areas.
- Regarding the work of the Ministerio de Defensa in relation to the Comando Conjunto de las Fuerzas Armadas in the reduction of illicit drug trafficking and the fight against terrorism, there are interventions in the departments of Madre de Dios and Cusco, areas that pertain to the VRAEM.
- Furthermore, the work performed by the Ministry of Defense in relation to the Peruvian Army in the fight against terrorism is carried out through interventions that, at present, are only effective in the department of Ayacucho, in the area corresponding to the VRAEM.
- Therefore, it can be stated that the state budget should also include other regions in the areas corresponding to the Valley of the Apurimac, Ene and Mantaro Rivers (VRAEM) for the fight against narcoterrorism, as the satellite images taken by the Peruvian satellite Peru SAT-1 are effective and help considerably in this fight.

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Competing interests

The authors declare that there is no conflict of interest.

Authors' Contribution

Jose Antonio Villacorta Huapalla (lead author): Research, methodology, conceptualization, validation, writing (original draft, review and editing), supervision.

Kennedy Narciso Gómez (coauthor): Research, formal analysis, writing (original draft).

Aydee Peña Zerrillo (coauthor): Collection and achievement of results.