SCENARIOS OF THE FIGHT AGAINST DRUG TRAFFICKING COLOMBIA 2042: THE ROLE OF NEW TECHNOLOGIES

Omar Leonardo Valladares Icedo[1]
Diego Felipe Murillo Peñuela[2]
Jorge Del Río-Cortina[3]

Abstract

For the prospective school, the future is built from the present; this implies that, only if the key elements of the present are analysed, will it be possible to think of a better future, especially regarding illicit drugs in Colombia. Although the fight has been going on for some time, the present requires the adoption of new technologies and the use of robotics to effectively combat this issue. Hence, the objective of this prospective study is to construct future scenarios in which the role of new technologies is explored as a key element to end drug trafficking in Colombia. In this way, four future scenarios with a high probability of occurrence are proposed, three of which are tendential and one of which is disruptive, wherein state-of-the-art technology is a fundamental tool in the fight against drug trafficking. This will make it possible to begin building a future and thus put an end to illicit crops in the territory.

Keywords: Prospective Scenarios, Drug Trafficking, Technology.

Introduction

In recent years, understanding the needs of the future has become a very significant issue because it allows for reducing uncertainty and thus using this knowledge to predict possible opportunities or threats that may arise in this context (Del Rio Cortina et al., 2019). This is how the prospective school becomes a tool that can provide some certainty about future scenarios (Mojica, 2006), especially in a transnational problem as important today as drug trafficking, which has the true source of funding for criminal activities. This strengthening is due to the lack of control of countries over their economic power (Potón, 2013).

Historically, drug trafficking has produced social consequences, such as new illicit activities around criminal groups. Montes Sarmiento & Perea Garcés (2005) argue that drug trafficking is understood as productive and commercial processes of illicit substances, which, however illegal they may be, should be analysed as a form of commercial accumulation and not as a simple criminal behaviour. In fact, even if it is a product of organized crime, the drug economy is still subject to the inherent value of money from trade. This is a production process in which the advance of capital and labour is used to produce goods to be sold in the market and make profits (Aschner & Montero, 2020).

1 Magister en Administración. Docente de la Universidad Autónoma de Baja California. E-mail: mbaomar@uabc.edu.mx. ORCID: https://orcid.org/0000-0002-4114-4807
2 Magister en Seguridad y Defensa Nacional. Ministerio de Defensa Nacional. E-mail: D0104772@unimilitar.gov.co. ORCID: https://orcid.org/0000-0003-3949-9518
3 Ph.D en administración. Universidad tecnológica de Bolívar. E-mail: jdelrio@utb.edu.co. ORCID: https://orcid.org/0000-0001-6127-8450

Throughout time, traditional efforts have been made to combat drug trafficking, beginning with the eradication of illicit crops and up to reaching marketing channels. In this sense, the incorporation of new technologies aimed at supporting efforts in the fight against drug trafficking at the level of all links in the chain is highlighted (Murillo Peñuela & Vargas Moreno, 2020). These new technologies include the use of digital photographs through satellites for the identification of illicit crops, fumigation using new ingredients other than glyphosate and with minimal effects on human, plant and animal life, as well as the use of drones to distribute such new fumigants and finally the inclusion of advanced scanners to identify shipments of drugs abroad through "human mail".

Taking the above into account, it is necessary to determine how the incorporation of new technologies in the fight against drug trafficking in Colombia could affect the future. Therefore, this article aims to propose scenarios for the future, with a view to evaluating various frameworks by 2042, in a way that allows the Colombian National Army to have the means to achieve this objective and face such future scenarios through technological innovation.

It is, in this way, that theoretical references are proposed, outlining the prospective approach as a tool that allows for the introduction of future scenarios in the fight against drug trafficking as well as the role of new technologies in said scenarios. Subsequently, the methodological section is proposed, followed by the results presenting the identification of strategic variables as well as the most relevant local and foreign actors that affect this context and, from this perspective, submit the probable scenarios that enable a commitment to new technologies in the fight against drug trafficking.

Theoretical references

New Technologies in the fight against Drug Trafficking

Drug trafficking is the first level of transnational crime in which different actors intervene to cooperate and collaborate to solve this problem. Efforts have been made to combat drug trafficking along the production chain, and actions have been taken to eradicate illicit crops until their marketing is controlled through final trafficking; the intrusion of technologies aimed at supporting the fight against drug trafficking is also restricted to all links in the production chain (Murillo Peñuela & Vargas Moreno, 2020). This section reviews the use of robotics and similar technologies in the war on drug trafficking at the national level.

Specifically, in Colombia, to combat this problem, tactics such as monitoring areas with illicit crops by the Landsat 8 satellite (LDCM), have been employed. In 2017, 302 images were obtained that were downloaded and processed along with 128 Sentinel images - 2 and 14 Worldview II images to be analysed and thus obtain the census number of crops along with their discrimination by regions (Murillo Peñuela & Vargas Moreno, 2020).

The country is studying another technology that does not use glyphosate to stop the production of coca leaves, including the modification of plant DNA, with an investment of more than US $12 billion. By using genetic technology that hinders productivity, that is, through a series of molecules (not harmful to health), it is possible to inhibit alkaloids, so it does not acquire anaesthetic extracts, rendering these crops infertile and, therefore, decreasing interest from cartels.

The development of these molecules can take a year, and when ready, they can be used in any application without affecting other crops (Arboleda, 2019).

From this perspective, the use of drones for the fumigation of illicit crops has become very important, and these planes can replace glyphosate in response to the recent increase in cocaine production, which is approximately eight hectares of coca per day, transporting approximately 10 litres of herbicide (Indigo, 2018).

El Dorado International Airport has made efforts to control air traffic. As a means of airport search and control, it uses scanners and drug detection equipment (such as copies for dogs and readers) to integrate control measures, which are applied to travellers as well as cargo and air terminal warehouses. Among the devices used are Body Scan and Smiths Detection eqo (Patiño Uribe, 2013).

Prospective approach, creation of scenarios and Fight against drug trafficking

For Barms et al. (2016), the construction and analysis of scenarios are two aspects of the same situation insofar as the construction of scenarios approximates the possible results of the related causal variables in terms of expected and unexpected combinations, which in turn allows for the generation of multiple future scenarios, some of which are surprising or amazing, but all of them are possible (Jordan, 2016).

Khan & Weiner (1967) define prospective scenarios as attempts to describe, in some detail, a hypothetical sequence of events that can lead to a plausible future situation. Godet & Durance (2009) complement this statement by claiming that these scenarios are a grouping formed by a description of the future situation and a series of events that allow us to move from the original situation to the future situation.

The construction of such scenarios is not intended to predict the future but rather to learn from alternative futures (Bernstein, Lebow, Gross Stein & Weber, 2000: 56). This is how the future should be viewed as a projection of the present, with linear and incremental changes. The multiple and alternative futures help us to become aware of possible disruptions, of the causal relationships between the variables that shape the scenarios of the impact and relevance of the change processes in general and of how these can affect a particular organization or state (Neumann & Overland, 2004).

A prospective study conducted by the Organization of American States (2013) presented 4 future scenarios proposing trends that guide the problem of drug trafficking by 2025 in the region. Although these scenarios have different approaches, they all have a common element: the existence of a sustained demand for psychoactive substances, including alcohol, pharmaceuticals and illicitly produced drugs. Although 3 of the scenarios are biased and follow the events with some substantial changes, in which the production and distribution of illicit drugs is maintained with few changes, the fourth scenario called “disruption” makes a different approach to the problem of drug trafficking demand instead of supply.

In Colombia, Jaramillo (2012) proposes a prospective study on how security and conflict will develop in the country by 2022, where drug trafficking occupies a relevant place in the study.

A scenario with an average probability of occurrence suggests that many ex-combatants did not achieve their reintegration and that this made them, along with those who never thought of laying down their arms, become powerful drug traffickers and that, in the future, this would increase the production and distribution of illicit drugs aggravating the problem to a greater extent.

Taking previous research into account, future scenarios in the fight against drug trafficking do not show encouraging results in the region, so new technologies are incorporated as a possible differential in the war on drug trafficking.

Methodology

The methodological approach of the article is exploratory and corresponds to a qualitative paradigm in which possible future scenarios were established for the inclusion of robotics as a tool to fight drug trafficking in Colombia by 2042. In this methodology, key variables were identified that would allow us to define possible scenarios based on the actions and strategic plans of the actors involved in the model.

The study was developed in three stages. The first stage was a diagnosis in which the main technological and robotic tools that have been developed to combat drug trafficking worldwide were addressed, presenting organizational, social, political, cultural, economic and technological trends. Subsequently, field work was conducted that began with the training of experts, with socialization talks -with personnel with high knowledge and experience on the subject- on the results derived from the diagnostic stage; and then proceeded to the identification of internal and external factors that affect the fight against drug trafficking through an expert workshop. Through the analysis of the MIC MAC method, the factors that stimulate the system and become key variables for the model were determined. Subsequently, hypotheses are proposed for the different scenarios according to the collective construction of the experts.

Results

A structural analysis was proposed from the PESTAL tool with the objective of analysing the current state of the fight against illicit drugs in Colombia and the future impacts of the implementation of robotics as a support to combat this problem.

Variables of the MIC MAC method

The MIC-MAC method was used with the advantage of allowing for a qualitative study of the system from subjective points of view by each of the members of the group of experts. In Table 1, we proceeded to consider all the factors (28) that characterize the studied system.

Table 1. MIC-MAC coded factors.

No.	Long name	Abbr.
1	Use of Technology for the development of operations	TECDESOP
2	Research, development and innovation of technologies to combat drug trafficking	INVDESINN
3	Support from the National Government to confront drug trafficking.	APOGOBNA
4	Competencies of personnel for the use of new technologies	COMPERTEC
5	Technological Knowledge of the Army	CONTECEJC
6	Military budget to counter drug trafficking	PREMILCN
7	Inter-institutional agreements to confront drug trafficking	COVINTCN
8	National political environment	AMBPOLN
9	Behaviour of illicit crops	COMCULNA
10	Taking advantage of the technological developments of the National Army.	APODESTEC
11	Crime rates supporting structures at the service of drug trafficking	INDCRIMNC
12	Logistical efficiencies for operations	EFICLOGOP
13	Availability of resources for the fulfilment of the mission	DISPLOGOP
14	Innovation to counter drug trafficking	INNCTNAR
15	Use of environmentally clean technologies	TECLIMPMA
16	Use of digital tools for business relationships of organizations	HERDIGCOM
17	Regulatory and legal framework	MARNORLEG
18	Availability of personnel	DISPNEFEC
19	Synchronization of the structure of the National Army to combat drug trafficking	SINCESTEJC
20	Competencies of personnel to counter drug trafficking	COMPPERCN
21	Planting of illicit crops by peasant communities	SIEMCULILC
22	Use of renewable energies	ENERGRENO
23	Environmental waste management in operations	GESTAMBOP
24	Doctrine to confront drug trafficking	DOCLUCCN
25	Perception of the civilian population against the crime of drug trafficking	PERCPPOBC
26	Irregular migration	MIGRIRREG
27	Protection of the knowledge of the National Army	PROTECCON
28	Generational change	CAMBGENER

Source: Murillo Peñuela & Vargas Moreno (2020)

As a result of the tool used, six strategic variables were identified. The selected variables coincided in the plane of direct influence and in the plane of indirect influence. It is necessary to note that, for their choice, the criteria of the participants were their knowledge and perceptions compared to what they considered highly relevant. Therefore, the factors that were positioned in the plane of influences/dependencies in the upper right margin were included as strategic variables.

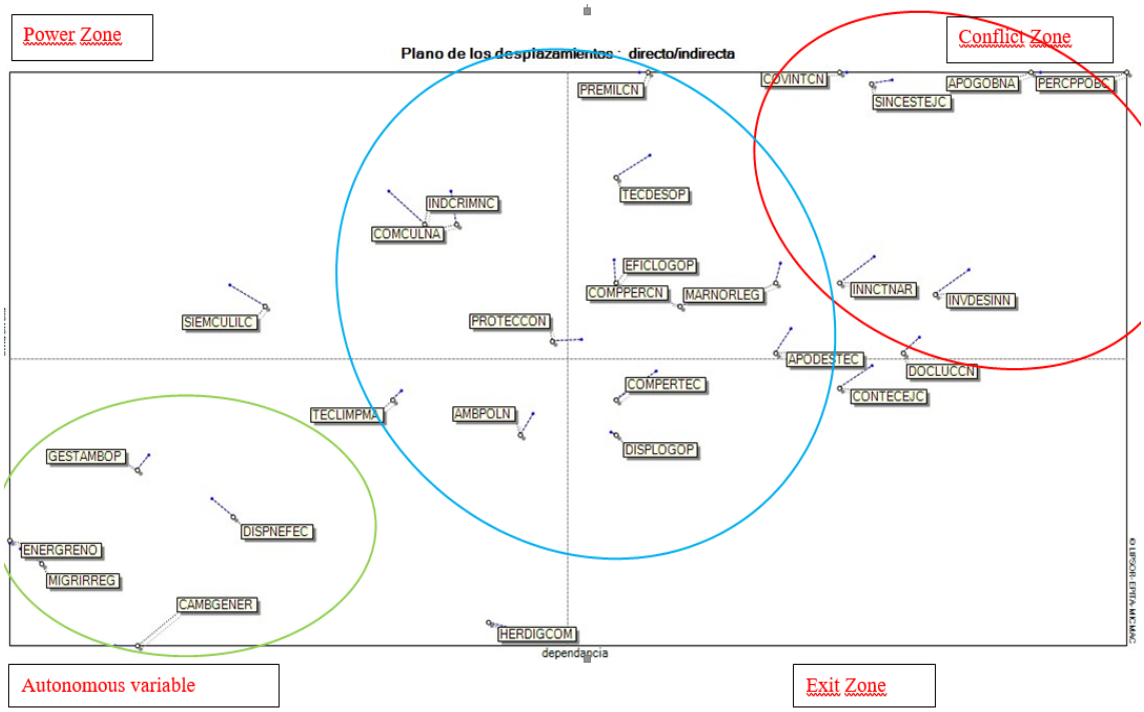

Fig 1. Mac Mic Matrix

To identify these variables, each of the conflict variables was projected in the plane of indirect influences on a bisector located from the upper right corner to the lower left corner (see Figure 1). Based on the above, the following variables were selected: “Perception of the civilian population against the crime of drug trafficking”, “National government support to confront drug trafficking”, “Innovation to counteract drug trafficking”, “Interinstitutional agreements to combat drug trafficking”, “Synchronization of the structure of the National Army to confront drug trafficking”, and “Research, development and innovation of technologies to confront drug trafficking”.

This plane is divided into four zones, which allow for the grouping of variables with similar characteristics, as shown below:

Power zone: The variables located in this area are “Protection of the knowledge of the National Army”, “Crime Indexes supporting structures at the service of drug trafficking”, “Behaviour of illicit crops”, and “Planting of illicit crops by peasant communities”.

Conflict zone: The variables located in this area are “Perception of the civilian population against the crime of drug trafficking”, “Support from the National Government to confront drug trafficking”, “Interinstitutional agreements to combat drug trafficking”, “Synchronization of structure of the National Army to combat drug trafficking”, “Normative and legal framework”, “Research, development and innovation of technologies to confront drug trafficking”, “Doctrine to counter drug trafficking”, “Use of technological developments of the National Army”, “Innovation to counteract drug trafficking”, “Logistical efficiencies for operations”, “Military budget to confront drug trafficking”, “Use of Technology for the development of operations”, and “Competencies of personnel to combat drug trafficking”.

Exit zone: The variables located in this area are “Availability of resources for the fulfilment of the mission”, “Competencies of personnel for the use of new technologies”, and “Technological Knowledge of the Army”.

Zone of autonomous problems: The variables located in this area are “National political environment”, “Use of environmentally clean technologies”, “Use of digital tools for the commercial relations of organizations”, “Cash availability”, “Environmental waste management in operations”, “Use of renewable energies”, “Irregular migration”, and “Generational change”.

Once the key variables that allow for the dynamization of the analyzed system have been determined, it is relevant to develop an analysis of actors through the MACTOR technique, in order to know the position of actors regarding the strategic objectives (i.e., key variables) in order to determine actors for or against the development of the territory. Likewise, the strength of actors in the system is to be known, which will define those with the greatest and least power thereof.

MACTOR analysis

The MACTOR analysis aims at determining the interrelation of actors in the achievement of the future scenario through the strategic objectives established. In doing this, the actors with the greatest influence in the system and their level of convergence and divergence with respect to the key variables defined in the MIC-MAC analysis are set. (Godet, M., Monti, R., Meunier, F., & Roubelat, F., 2000).

Identification of actors

In this phase, the actors that exert great influence and control over the current and future conditions of the phenomena studied were determined. It should be noted that the detailed description of the actors is submitted through a matrix, taking the objectives, strengths and weaknesses of each actor into account, as listed below:

National government

Objectives: Determine the resources for the operation of the national armed forces. Strengths: Financial resources. Weaknesses: decrease in resources raised.

Ministry of national defense

Objectives: Allocate resources to strengthen the capabilities of the force.

Define strategies aimed at reducing illicit coca, poppy and marijuana crops: Strengths: Capacities of the Army to face Drug Trafficking, Special Brigade Against Drug Trafficking specialized in combating this crime. Weaknesses: low budget growth for the defense sector; environmental limitations for the implementation of crop eradication by spray.

Ministry of justice

Objectives: Coordinate and enforce public policy in matters of legal order, defense and legal security, access to formal and alternative justice, fighting crime, transitional judicial

mechanisms, crime prevention and control. Strengths: Inter-institutional cooperation with the Ministry of Foreign Affairs. Weaknesses: Low budget allocation

National army

Objectives: Ensure the security and defence of the nation, carry out work on an interoperable basis to accomplish the mission and institutional goals. Support other forces with effective means towards the proper development of military operations. Strengths: Infrastructure, machinery, capacities and equipment available for management, Strategic planning, documents and directives, Budget assigned by the Ministry of National Defence. Weaknesses: Lack of communication and internal coordination (between actors and specialties). Human factor, logistical and budget restrictions.

Organized illegal armed group known as ELN

Objectives: Generate income through illegal activities, Evade the actions of the Government Armed Forces. Strengths: Increase of illicit crops, smuggling, drug trafficking, illegal activities, among others. Armed Component with great subversive experience. Weaknesses: pressure and persecution by National Security Services.

Organized illegal armed group known as clan del golfo

Objectives: Generate income with illegal activities, Evade the actions of the National Security Services. Strengths: Increase of illicit crops, smuggling, drug trafficking, illegal activities, among others. Weaknesses: pressure and persecution by the National Security Services.

Residual organized illegal armed group

Objectives: Generate income with illegal activities, Evade the actions of the National Security Services. Strengths: Increase of illicit crops, smuggling, drug trafficking, illegal activities, among others. Weaknesses: pressure and persecution by National Security Services.

Organized crime gangs

Objectives: Generate income with illegal activities, Evade the actions of the National Security Services. Strengths: Increase of illicit crops, smuggling, drug trafficking, illegal activities, among others. Weaknesses: pressure and persecution by National Security Services.

Technology supply academy

Objectives: Develop breakthroughs and contributions to the scientific literature related to robotics and drug trafficking, Research centres that provide technological developments in robotics and the war on drug trafficking, Contributions to national security at different geographical levels. Strengths: Budget assigned by the Government, Economic contributions from private companies. Weaknesses: Inaccessibility to updated information, Low budget allocated to research.

Other national security forces such as the thomas greg and sons business group

Objectives: Contribute to national security at different geographical levels.

Effectively coordinate the work, Support the strategies of the National Government with air, maritime, river and land interdiction capabilities in terms of inputs, chemical substances and precursor components used in the production of drugs of natural and synthetic origin. Strengths: Infrastructure, machinery and equipment available for management, Strategic planning, documents and directives, Budget assigned by private entities. Weaknesses: Lack of commitment from the military high command for cooperation-, Short- and medium-term planning, Lack of human, physical and / or logistical resources for the development of activities.

Agencies and institutions with great breakthroughs in the fight against drug trafficking as established by the national development plan

Objectives: Develop crop replacement programs, Eradicate the commercialization of Drugs. Strengths: Contracts and commitments between various parties, Experience and recognition in the sector, Contacts and public relations. Weaknesses: Budgetary limitations, personnel security limitations for the development of activities.

Countries and organizations on the international stage for personnel training and specialization

Objectives: Provide advice and convey knowledge to educate and train personnel to confront drug trafficking. Strengths: experience and specialization on the subject, Cooperation agreements, Financial resources. Weaknesses: Lack of commitment of some States to support initiatives against drug trafficking.

Setting of Objectives

In this section, the challenges or objectives to be tackled for each previously established strategic variable are identified. Such objectives address the vision established in the future for each specific objective, considering the influence of actors within the system, as laid out below:

Table 2. Strategic Variables and Related Objectives

No.	STRATEGIC VARIABLES	OBJECTIVES (CHALLENGES)	SHORT TITLE
1	Perception of civilian population against the crime of drug trafficking	Improve the perception of the National Army's institutional image among Colombian people by surpassing 85% of the best score ever achieved.	PERCPOBL
2	Support from the National Government to fight drug trafficking	Guarantee a 20% increase in budget allocation for the activities that support the war on drug trafficking and, in turn, ensure 100% of the personnel, equipment, machinery and logistics assigned by the National Government to fight drug trafficking	APGOBNAL
3	Synchronization of National Army structures to combat drug trafficking	Improve, by 85%, the effectiveness of all operations developed against drug trafficking	SINCROEJC

4	Inter-institutional agreements to combat drug trafficking	Develop 80% of operations against Drug Trafficking with the cooperation of institutions and agencies such as the Organization of American States (OAS), the Joint Interagency Task Force South (JIATF), the Federal Antinarcotics Agency of the United States. (DEA), US Department of State, American Embassy	CONVINTERI
5	Research, development, and technological innovation to confront drug trafficking	Increase, by 20%, the budget allocation allowing for the upgrade of current technologies, in addition to implementing new technologies and training staff in the use of new technologies. Achieve the approval of 2% of patents associated with efforts against drug trafficking and the implementation of robotics in operations to combat drug trafficking and the Publication of articles in research journals that contribute regarding the actions against drug trafficking and the implementation of robotics as a means of support	INVDESINNO
6	Innovation to counter drug trafficking	Develop 100% of operations Against Drug Trafficking, supported by new technologies such as hygrobots, assault robots, autonomous robots, miniature robots, cyberinsects, robofish, artificial intelligence robots and bioherbicides in operations against drug trafficking to increase effectiveness in the results achieved and, in turn, include 30% of the above in the use of clean and low environmental impact technologies in activities against drug trafficking	INOVACNAR

Source: Authors' own sources

Once the strategic objectives have been defined, the MACTOR analysis will be carried out. To do this, with the identified actors, each actor will be coded in terms of the use of the software, as shown in Table 3:

Table 3. Actor coding for MACTOR

No.	LONG TITLE	SHORT TITLE
1	National government	GobNal
2	Ministry of National Defence	MinDefen
3	Ministry of Justice	MinJustic
4	National Army	EjercNal
5	ELN Organized Armed Group	GaoELN
6	Clan del Golfo Organized Armed Group	GaoGolfo
7	Residual Organized Armed Group	GaoResd
8	Organized Criminal Groups	GDO
9	Technology Supply Academy	AcadproTecn
10	Other National Security Forces such as the Thomas Greg and Sons Business Group	OtrasFuerz
11	Agencies and Institutions with Huge Breakthroughs in the Fight against Drug Trafficking as Established in the National Development Plan	AgInstLCN
12	Countries and Organizations on the international stage for personnel training and specialization	PyOCapPer

Source: Authors' own sources

At this stage, each of the actors is ranked with respect to the level of dependency or influence being exerted over them, through a weighting factor. For the evaluation of the

influence and dependence over the actors, the following weighting system was used as it was processed through the software:

- 4: Actor Ai may question the existence of actor Aj
- 3: Actor Ai may question the missions of actor Aj
- 2: Actor Ai may question the projects of actor Aj
- 1: Actor Ai may question, in a limited manner (for some time or in a specific case) the operations of actor Aj.
- 0: Actor Ai has no influence on actor Aj.

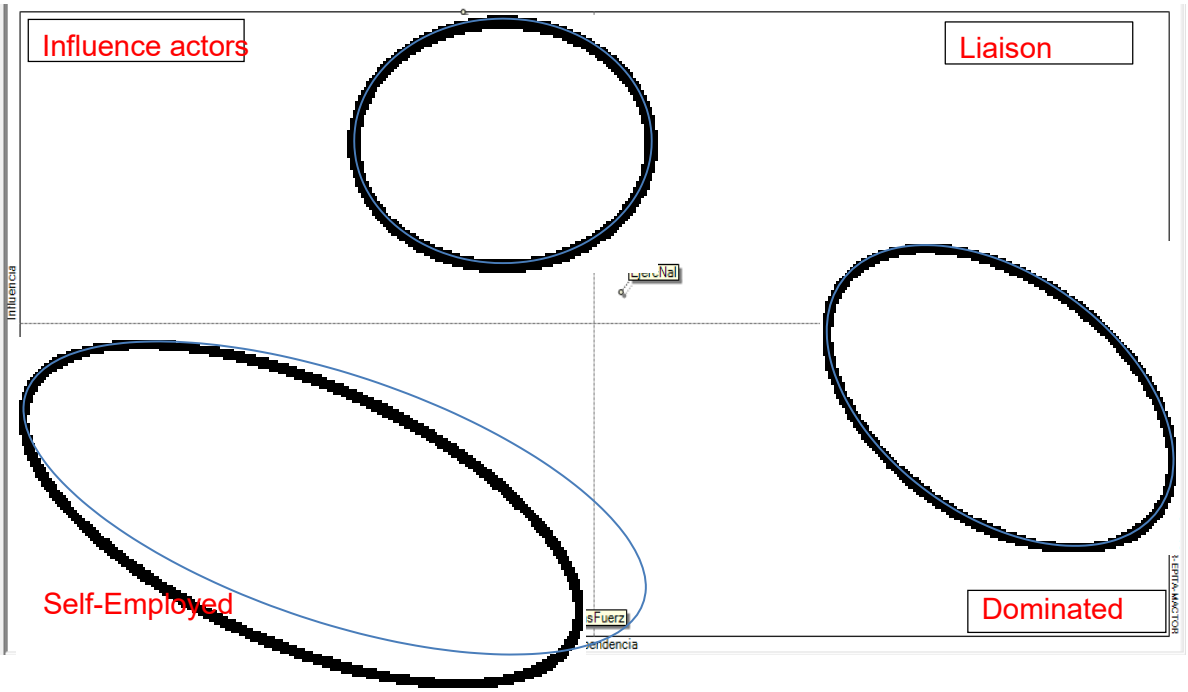

Figure 2. Plane of influences and dependencies of Actors
Source: Authors' own sources based on Mactor

On the plane of influences-dependencies between actors (see Figure 2), actors were located according to the evaluation carried out by the experts. As follows, they are classified by quadrant:

- Liaison actors: National Army.
- Influence actors: National Government, Ministry of National Defence and Ministry of Justice.
- Dominated actors: Organized Illegal Armed Groups, ELN, Clan del Golfo, Residual Organized Illegal Armed Groups, Organized Crime Gangs.
- • Self-employed actors: Technology Supply Academy, Other National Security Forces such as the Thomas Greg and Sons Business Group, Agencies and Institutions with huge breakthroughs in combatting drug trafficking as established in the National Development Plan and Countries and Organizations on the international stage for personnel training and specialization.

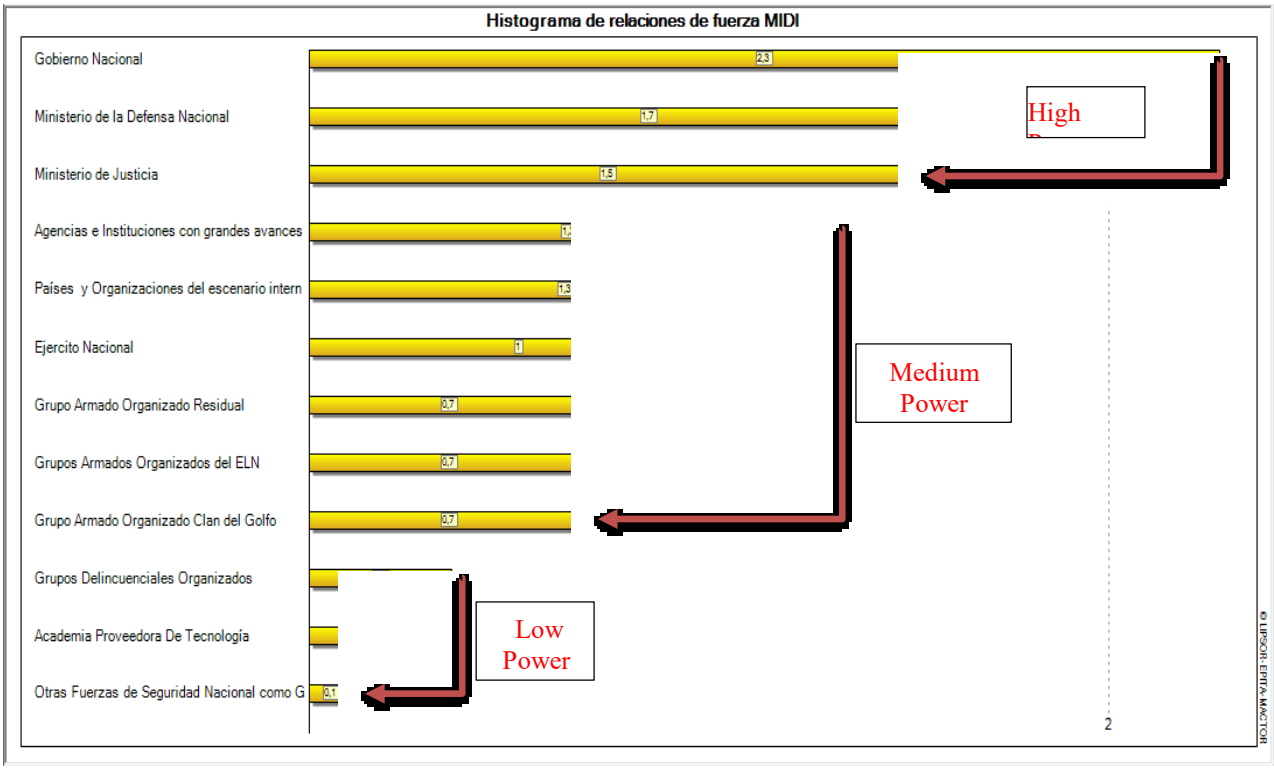

Figure 3. Histogram of MDI force relationships
Source: Authors' own sources based on Mactor.

In the histogram of power relations between actors (see Figure 3), the National Government and the Ministry of National Defence and the Ministry of Justice are seen as high-power actors; this is due to the fact that they have the strength and availability for funding the organization, stimulating research projects, as well as regulating and applying them.

On the other hand, actors with an average level of power are, in order of importance, the following: Agencies and Institutions with huge breakthroughs in the fight against drug trafficking as established in the National Development Plan, and Countries and Organizations on the international stage for personnel training and specialization, National Army, Residual Organized Armed Groups, Organized Armed Group known as ELN, Organized Armed Group known as Clan del Golfo.

Finally, there are the weakest actors in the chain, namely, Organized Criminal Groups, Technology Supply Academy, and other National Security Forces such as the Thomas Greg and Son Business Groups.

Degree of Convergence and Divergence between Actors

Faced with the points of convergence between actors, it can be observed that there are important points of convergences in terms of objectives between the National Government and the Ministry of National Defence and Agencies and Institutions huge breakthroughs in the fight

against drug trafficking as established in the National Development Plan, mainly due to the budget issue and the support of such institutions to the war on drug trafficking with the aim of achieving great strides to curb the growth of illegal crops and the export of illicit drugs, thus envisioning an optimistic horizon in the fight against this scourge.

Finally, there is a convergence relationship between the various organized armed groups and organized criminal gangs, mainly because the development of technology to confront drug trafficking does not suit them, since it becomes a direct threat to the survival of these non-state actors. (see Figure 4).

On the other hand, in the relations of divergence between actors, it can be observed that the most important actors are non-state ones, between the Organized Armed Groups and the Organized criminal gangs, whereas neither is keen on the development of technological and technical capacity by the Special Brigade Against Drug Trafficking to improve the results of the war on drug trafficking. (see Figure 5).

The above is true due to the fact that there is no interest, regarding the defined objectives, in achieving the implementation of robotics to counteract drug trafficking, given that these non-state actors widely affect the National Army in the accomplishment of goals established to confront drug trafficking, since the main sources of funding for such structures are illicit economies such as drug trafficking.

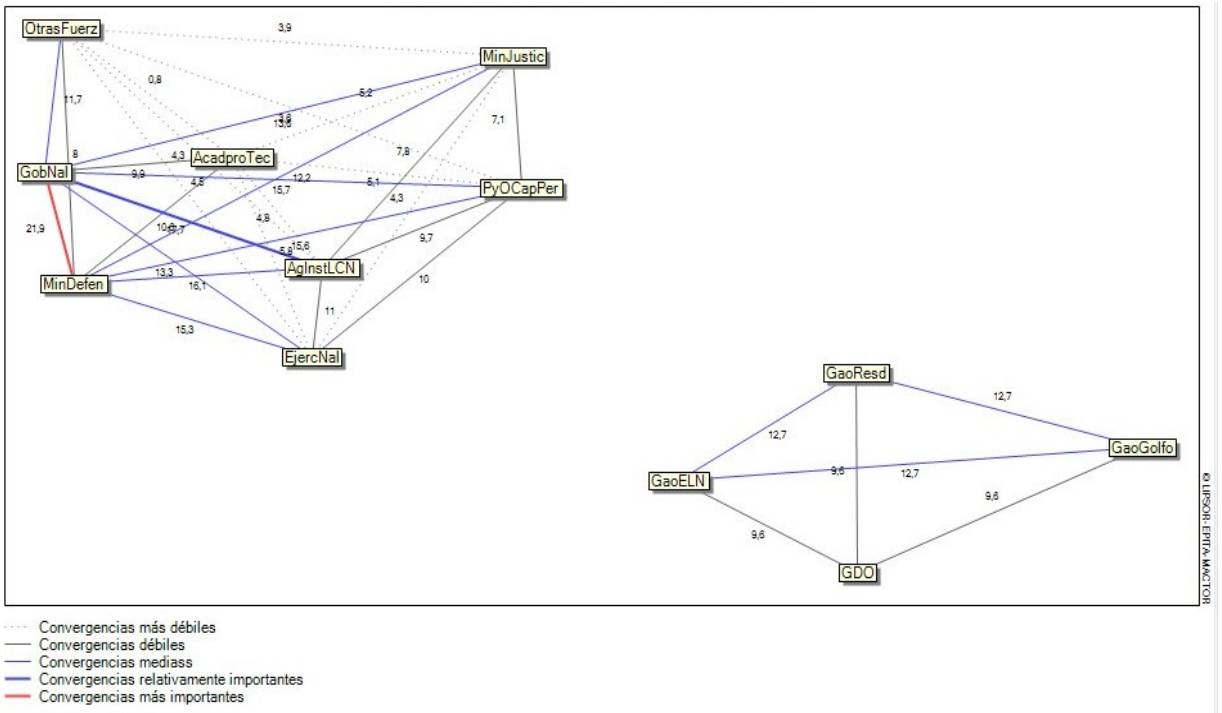

Figure 4. Degree of Convergence between Actors.
Source: Authors' own sources based on Mactor.

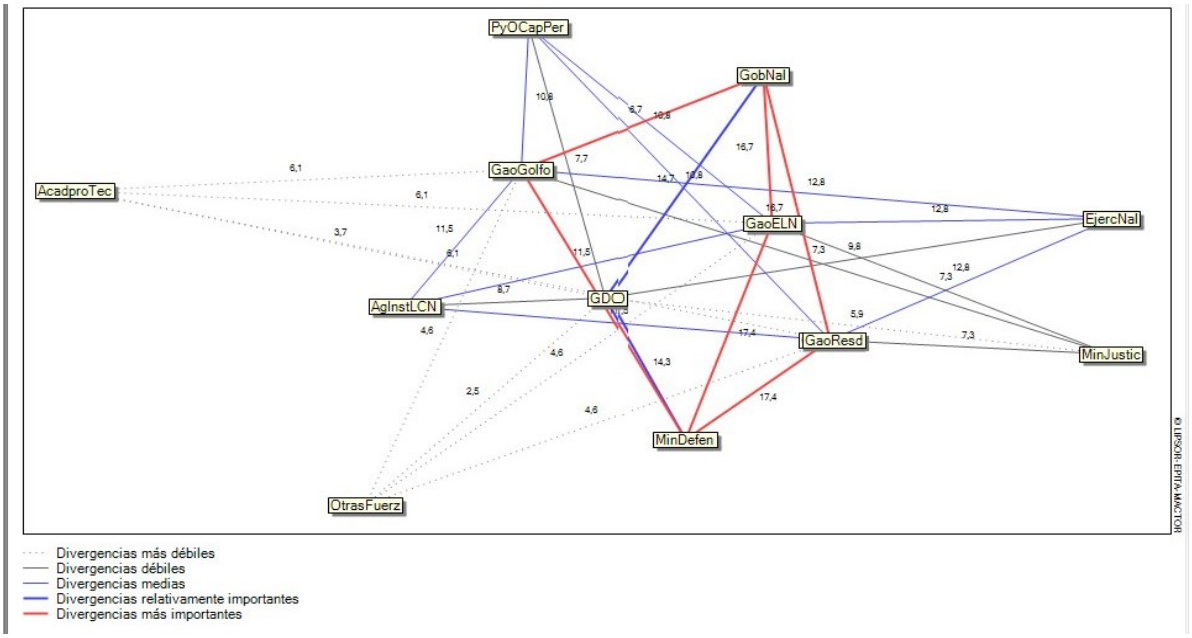

Figure 5. Degree of Divergence between Actors.
Source: Authors' own sources based on Mactor.

From the definition of the key variables that will make the analysed system more dynamic, it is important to be able to define prospective scenarios where the future of these is evidenced through strategic objectives that include viewing the key variables over time, which, in this case, are scenarios of the fight against drug trafficking in Colombia by 2042. Next, the definition of the scenarios is determined.

Definition of scenarios

The construction of the scenarios was performed by using the "morphological analysis" tool, which allows us to systematically define possible futures taking the key variables produced by the MIC-MAC analysis into account. Through different combinations of occurrences between the variables, the route of the possible scenarios is traced. It begins with the definition of a morphological space that is understood as a set of components (key variables) and their configurations (what can happen with them); each component and configuration can be combined between them, forming the morphological space. From this, a reduction is made with the possible and probable combinations according to the subject of study. After this, the identified scenarios are selected and narrated (Godet, Monti, Meunier & Roubelat, 2000). Each scenario is presented below:

Scenario Narration

"Us vs. Drug Trafficking" scenario

After 2042, Colombia continues to face drug trafficking problems, which increase the number of social actions that affect the governance of institutions. Colombian drug traffickers are more prosperous than ever, production and commercialization have reached a record level, and

new international markets are being explored. Large-scale drug traffickers are becoming more reserved, and it is almost impossible for them to be identified. Regarding commercialization, the number of scales and the number of people who are linked to distribution have been reduced, thus increasing their effectiveness, making the business more profitable, and continuing to infiltrate political elites.

Eighty percent of the civilian population has a negative perception of the National Army. The budget for anti-drug activities has been reduced by 20%, the TOE of personnel is 60%, and there is not enough equipment, machinery or logistics to properly execute anti-drug operations. The effectiveness of the security forces is very low, with only 55% effectiveness, interinstitutional agreements have been reduced by 20%, and only 50% of operations to combat drug trafficking are carried out in cooperation with agencies.

There is no adequate technology to face transnational threats; only 10% of its business is carried out using a certain technology, and budgetary allocations for research, development, and innovation to combat drug trafficking have been reduced by 10%, which has expanded cocaine production as a main factor. There has also been progress in the planting, care and harvesting of plants, which has allowed for an increase in the yield of alkaloids grown per hectare; that is, drug trafficking organizations have invested in research, development, and innovation. Improve the process of drug trafficking export chains has been improved and the progress, efficiency, and effectiveness of law enforcement in the fight against this crime have been weakened.

"What do we do now?" scenario

In 2042, technological development advanced, knowledge society was consolidated, and considerable progress was made. New inventions and discoveries have increased exponentially. The security forces maintained their strategy and used technological breakthroughs to strengthen operations against drug trafficking with the objective of eradicating illicit crops and carrying out interception activities. They achieved the first advances in the upgrade of current technology by increasing budget allocations up to 10%. This allows agencies to approve 1% of patents related to the fight against drug trafficking, and there is an approach towards implementing robotics in the war on drugs. Although the publication of articles in research journals is still emerging, efforts are still being carried out, including breakthroughs in robotics as a means of support, despite things such as hydrobots, assault robots, autonomous robots, miniature robots, cyber insects, robot fish, robots with artificial intelligence or bioherbicides; therefore, their effectiveness is maintained at 55% throughout all actions implemented in response to drug trafficking.

Unfortunately, in terms of strengthening the strategy to combat illicit drugs, government support is not efficient and cannot ensure the continuity, increase, effectiveness and success of drug control in the current new situation (budget allocated). The activities to fight drug trafficking have been reduced by 20%, the TOE of personnel is 60%, and machinery and logistics are insufficient to adequately execute the operations of combating drug trafficking.

The interinstitutional agreement has been reduced by 40%. Only 40% of operations carried out in response to drug trafficking are carried out in cooperation with agencies, whereas 60% of the civilian population has a negative perception of the National Army; few people doubt that it is

a reliable integrated entity. There is no comprehensive strategy to eradicate illicit crops, nor have comprehensive blockades of seas, rivers, air and land been strengthened to achieve greater blockades, and there is no way to dismantle the interpersonal networks and their leaders, who support drug trafficking. The coordinated criminal investigation has not yet yielded real results, and it is impossible to stop the new emerging market for psychoactive substances in the country, which shows that there is no clear policy to combat drug trafficking, legality or peace building.

"Step by Step Against Drug Trafficking" scenario

After 2042, the comprehensive policy to combat drug trafficking is still very strong, but the objective of "eliminating or greatly reducing" the supply, demand and consumption of illicit drugs is far from being achieved. Opium, coca and cannabis plantations increase year after year.

Colombia has a clear vision of how to face the problem of illegal drugs, but the policies of allied and neighbouring countries that regulate the consumption of these hallucinogens (such as cannabis) will dwindle and affect the effectiveness of Colombia in the resistance against drug. In addition, there is a 15% increase in the budget allocated by the national government for activities and the TOE of personnel reached 90% with regards to combating drug trafficking, with equipment, machinery, and logistics to carry out the aforementioned activities, but in all anti-drug operations only 60% are effective. Seventy percent of the actions carried out to combat drug trafficking are carried out in cooperation with agencies and institutions, and the difficulty lies in the lack of clear supervision of the market, which has led some countries to try new options on their own and break consensus, in addition to adopting a unilateral repressive policy instead of increasing their effectiveness with the support of all countries.

The homicide rate in Latin America is the highest on the planet, in part due to violence related to drug trafficking. Faced with this vicious cycle, many countries have adopted public health methods and prevention programmes, which are far from eradicating the drug trafficking cancer. In summary, each country has adopted different internal policies; some countries have chosen to supervise more emancipation measures, while others have opted for large-scale measures. Likewise, research, development and innovation by the armed forces have also stagnated, budget allocations have been reduced by 10% and only 10% of anti-drug activities have been carried out with breakthroughs in technology. On the other hand, knowledge society has progressed enormously. However, public forces have not used technological advances to improve and reduce drug trafficking and the use of illicit drugs more effectively, thereby wasting the ability to obtain operational results through their use and application. Knowledge society has currently developed and applied technology.

"We Can Together" scenario

In 2042, Colombia has a clear policy to confront drug trafficking and has made significant progress in consolidating transnational threats, especially in the fight against drug trafficking. One of the main advances is the development of applied technology and high-level research. Developing and innovating capacities to face this threat is very useful in the fight against drug trafficking throughout the country, and has achieved results in the following indicators: 90% of operations against drug trafficking are developed with the cooperation of institutions and agencies,

the budget allocation of the institution increased by 25% for the upgrade of current technologies, achieving the approval of 5% of patents associated with combating drug trafficking, 100% of the operations against drug trafficking are carried out, supported by New technologies such as hydrobots, assault robots, autonomous robots, miniature robots, cyber insects, robot fish, robots with artificial intelligence and bioherbicides in operations against drug trafficking to increase the effectiveness of the results obtained. Likewise, the favourability of the institutional image increased, reaching the historical level of 90% in terms of positive image in the eyes of the civilian population.

On the other hand, the efforts of the country's defence sector are geared towards combating transnational threats, which provide actions and resources necessary to fight the scourge of drug trafficking, thus ensuring that part of the budget is increased by 25% for government activities in the war on drug trafficking, and this has ensured that 100% of the personnel, equipment, machinery and logistical activities being assigned by the National Government to combat drug trafficking, which shows that 75% of the illicit cultivation of crops has been reduced throughout the country, with what has been produced in that territory actually destroyed and confiscated in secret. Operations against drug trafficking have increased their effectiveness by 80%, thus becoming an international benchmark against drug trafficking.

Regarding the identification of scenarios, it is crucial to promote the "We Can Together" scenario, which will allow the relationship, not only of the key variables, but also of the actors that promote contributions to the scope of such scenario. From this, the definitions of strategic actions to achieve this scenario become necessary; however, due to the scope of this research, they will not be considered. It is important, then, that future research generates the route that Colombia must take to reach the defined scenario.

Conclusions and Discussions

Based on the content of the prospective and strategic research on the use of robotics to combat drug trafficking in order to achieve the most appropriate scenario in 2042 throughout the entire document, it is designed to ensure that the Nation, by means of the National Army, face up to the challenges of technological innovation, which can come from the expected perspectives. The application of the model developed by Michel Godet allows for the methodology to establish a retrospective and updated state of anti-drug initiatives.

Similarly, the analysis of the relationship between the present and the future allows us to determine the representative influence of the 28 changing factors in the present and the future before 2042, apply robotic technology to combat drug trafficking and understand the information obtained from the latest technology, as well as perform triangulation, matrix, trend matrix, consult with different experts on the subject and use methods such as MIC - MAC to obtain strategic variables that directly affect the future.

From the morphological analysis and the definition of the future hypotheses (trends, transitions and ruptures) of the six strategic variables, the possible as well as the most likely scenarios were determined, thus designing scenarios as a wager on the fight against drug trafficking. In the vision of the National Army, this is expected in 2042. In this sense, four possible

scenarios were defined: “We vs. drug trafficking”, “Now what do we do?”, “Step by Step Against Drug Trafficking” and “We Can Together”.

It is important to project the institution in a regional benchmark in terms of technology research to take advantage of the opportunities that such technologies pose and determine the future of people’s lives in this world. In this view, Zuleta (2019) mentions that the war on drugs through prohibition as the main instrument in the fight against drug trafficking was left behind in the past. It is necessary, based on the established Havana agreements, for various elements to arise that go far beyond prohibition by using state-of-the-art technologies for monitoring and controlling illegal activity.

Technological advancement requires great investment by the State to be leaders in military technology, but we cannot be oblivious to this reality; we know of the emergence of new threats based on their severity or the perception of them through public opinion, which may detract from the actions of the National Army in the security and defence of the interests of the State and its population. That is where the Army usually provides itself with a self-review of the potential it has to counter those threats and, if not favourable, efforts arise in the field of research, development and innovation in order to close that gap, finding solutions to solve the threat at hand.

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Highlights

The following have been determined as key variables that will allow for system dynamization in the fight against drug trafficking: Perception of the civil population against the crime of drug trafficking, Support of the National Government to confront drug trafficking, Synchronization of the National Army structure in the war on drugs, Inter-institutional agreements to combat drug trafficking, Research, development and innovation of technologies to confront drug trafficking, Innovation to counter drug trafficking

The “We can Together” scenario is viewed as the one that will lead Colombia to become successful in the fight against drug trafficking, wherein it is not only necessary to promote key variables, but also the interrelation of all actors to achieve such dynamization.

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