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Contribution of Colombian Army in control environmental crimes and ecosystem restoration

Contribución del Ejército Nacional de Colombia en el control de delitos ambientales y la restauración de ecosistemas

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ABSTRACT

The prominent role of the Colombian National Army in ecological degradation and biodiversity loss has not been covered in depth, even less so in the context of climate and environmental security. The objective of the study was to analyze the Army's efforts to contribute to the control of deforestation, illegal wildlife trade, and other environmental crimes, as well as its support activities in ecosystem restoration. The qualitative methodology consisted of a non-experimental cross-sectional design, with a descriptive level and case studies. A semi-structured interview was conducted on a convenience sample of 30 individuals already belonging to strategic civilian and military sectors with influence in decision-making on environmental issues. The main finding was that the Army faces ongoing and crucial challenges with regard to the development of regulatory norms and doctrine for environmental protection. Likewise, limitations in technical capacity, planning, execution, sustainability, and monitoring were revealed in military exercises supporting ecosystem rehabilitation, which requires strengthening the documentation and technical-scientific evaluation of these processes. It was concluded that the Colombian National Army contributes significantly to climate resilience in the territories, further honoring its constitutional mission as guarantor of the security of the population and the sustainable development of the nation, all as a result of its operational and logistical efforts for the protection and conservation of ecosystems and biodiversity.

Palabras clave:
delitos ambientales, restauración de ecosistemas, biodiversidad, protección ambiental, Ejército Nacional de Colombia.

RESUMEN

No ha sido cubierta a profundidad la participación prominente del Ejército Nacional de Colombia en materia de degradación ecológica y la pérdida de biodiversidad, aún menos dentro del contexto de la seguridad climática y ambiental. El objetivo del estudio fue analizar los esfuerzos de contribución del Ejército, en el control de la deforestación, el comercio ilegal de vida silvestre y otros delitos ambientales, así como las actividades de apoyo en la restauración de ecosistemas. La metodología cualitativa consistió en un diseño no experimental transeccional, con nivel descriptivo y de estudio de casos. Se aplicó una entrevista semiestructurada sobre una muestra por conveniencia de 30 individuos,

	ya pertenecientes a sectores civiles y militares estratégicos con injerencia en toma de decisiones sobre temas ambientales. Como principal hallazgo, se identificó que el Ejército posee desafíos vigentes y cruciales, esto respecto al desarrollo de regulaciones normativas y doctrina para la protección ambiental. Asimismo, quedaron develadas las limitaciones de capacidad técnica, planeación, ejecución, sostenimiento y seguimiento; en los ejercicios militares de apoyo para la rehabilitación de ecosistemas, lo cual demanda un fortalecimiento de la documentación y evaluación técnico-científica de los mencionados procesos. Se concluye que el Ejército Nacional de Colombia aporta una significativa generación de resiliencia climática en los territorios, ya haciendo mayor honor a su misión constitucional, como garante de la seguridad de la población y el desarrollo sostenible de la nación, todo esto como resultado de sus esfuerzos operacionales y logísticos para la protección y conservación de los ecosistemas y la biodiversidad.

Introduction

Colombia currently faces enormous challenges to promote the protection and recovery of ecosystems and biodiversity, due to territorial dynamics associated with deforestation and the illegal exploitation of mining deposits, activities that in many cases are controlled by armed groups that generate territorial conflicts and weaken institutional capacity for environmental control (Suárez Perilla, 2021). In this context, pressure is intensifying on strategic ecosystems at the national and regional level, such as the Amazon and the Biogeographic Chocó, where illegal resource extraction dynamics have led to habitat fragmentation, displacement of species and loss of biodiversity (Mayorquín Tovar and Moreno Carvajal, 2022).

The protection of the natural base in the country has a robust regulatory framework, based on the ratification of the Convention on Biological Diversity (CBD) through Law 165 of 1994, which establishes a commitment to the conservation of biodiversity, its sustainable use and the fair and equitable participation in the benefits derived from its use (Congress of Colombia, 1994). In compliance with these commitments, the National Biodiversity Policy was formulated in 1995 and updated in 2012 as the National Policy for the Integrated Management of Biodiversity and its Ecosystem Services (PNGIBSE), integrating the considerations of the 2011-2020 action plan of the CBD and the Aichi Targets (Ministry of Environment and Sustainable Development [MADS], 2012). Other relevant public policies are the document CONPES 4050 of 2021 "Policy for the Consolidation of the National System of Protected Areas - SINAP" (National Planning Department [DNP], 2021), and the document CONPES 4021 of 2020 that defines the "National Policy for the Control of Deforestation and Sustainable Forest Management" (DNP, 2020). These policies are aimed at reducing biodiversity loss through sectoral and cross-sectoral strategies to promote the sustainable use of the natural heritage in areas where socio-environmental conflicts have predominated, such as High Deforestation Areas (HEC).

Under this scenario, deforestation in Colombia is one of the main threats to conservation, highlighting that between 2001 and 2021, about 3.2 million hectares of forests were deforested, of which 89% was produced by illegal activities, threatening about 24% of natural ecosystems (World Bank Group, 2023).

Another critical aspect to take into account is related to the affectation of environmental conservation zones such as protected areas and forest reserve zones established by Law 2 of 1959, identifying that by 2022, 10% of deforestation in the country (12,449 ha) was generated in protected areas and 27.2% (33,602 ha) in Forest Reserve Zones (Instituto de Hidrología, Instituto de Hidrología). Meteorology and Environmental Studies [IDEAM] and MADS, 2023).

The drivers of land use change due to deforestation are mainly associated with ~~land~~ grabbing and extensive cattle ranching, expansion of transportation infrastructure without proper planning, expansion of the agricultural frontier, illicit crops, illicit mineral extraction, and illegal ~~logging~~ (IDEAM and MADS, 2023). Likewise, land use conflicts are highlighted in 50% of the country's territory, due to the expansion of cattle ranching in soils with agricultural vocation, or the development of agriculture in conservation areas, which promotes the loss of biodiversity, ecosystem services, the increase of desertification processes and soil detriment in 16.5% of the territory (MADS, 2017).

Another factor that dynamize~~s~~ these negative processes for ecosystems is the lack of State presence in areas that are difficult to access or remote from major cities, allowing the presence of armed groups in the territory and the development of illegal activities, becoming situations that generate serious socio-environmental conflicts (Lozano, 2015), evidencing that the weak State presence in rural areas facilitates the expansion of illegal economies, generating significant environmental impacts, perpetuating dynamics of violence (Morales Muñoz et al., 2025; Ayala and Pérez, 2025). Other problems can be identified, such as wildlife trafficking, in

whose dynamics local communities, financed by criminal agents, interact. However, in Colombia this phenomenon has not been prioritized for attention, because efforts are concentrated on combating criminal activities such as illicit crops and illegal mining, despite the fact that the country is part of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (InSight Crime & IGARAPÉ Institute, 2021).

On the other hand, the environmental consequences of the Peace Agreement in Colombia stand out, such as increased deforestation, illegal dynamics associated with illicit crops, illegal exploitation of mining deposits, extensive cattle ranching, land grabbing, among others, ~~the~~ areas that were liberated by the extinct Revolutionary Armed Forces of Colombia (FARC) have a low capacity for state regulation and weak environmental governance, being occupied by new illegal actors, which intensify pre-existing socio-environmental conflicts (Garzón et al., 2020). Likewise, the illegal exploitation of minerals has affected indigenous populations, in National Natural Parks and forest reserves, generating serious damage on public health due to the use and dumping of harmful inputs such as mercury (Guio Rodríguez, 2018).

Following this context, the National Development Plan 2022-2026 "Colombia Potencia de la Vida", indicates that it is necessary to implement strategies to reduce deforestation and promote the restoration of degraded ecosystems, in order to minimize the impacts on protected areas, promoting solutions based on nature and the resilience of the territories in the face of the climate crisis, pointing out the low results to curb the loss of biodiversity due to deforestation and the development of regeneration processes (DNP, 2023).

Due to obstacles related to low political will, insufficient legislation and public policies, lack of financing, weaknesses in technical capacity and limited investment in research and monitoring (Solano and Torres, 2022), it is identified that the restoration processes developed at the national level do not contribute efficiently to national biodiversity conservation objectives.

In this sense, the National Army of Colombia, has positioned itself as an important actor to contribute to the preservation and defense of the environment and natural resources, in accordance with the provisions of Article 103 of Law 99 of 1993, which states that the Armed Forces shall ensure the protection and defense of the environment and natural resources, as a primary element of national sovereignty (Ministry of National Defense, 2017).

The Army also promotes its role of supporting the control and surveillance activities established in Articles 64 and 65 of Law 99 of 1993, in relation to the mobilization, processing, use, exploitation and commercialization of renewable natural resources, which are developed by the territorial entities and the territorial environmental authorities. On the other hand, the Ministry of National Defense, established environmental protection through support to environmental authorities, territorial entities and the community, as a mission area of contribution of the defense sector (Ministry of National Defense, 2017). The triangulation of these actors has allowed the joint alignment of their respective action strategies, in order to confront environmental crimes and cooperate, permanently, in the management of climate change within the framework of "Guarantees for Life and Peace 2022-2026".

It should also be noted that the doctrinal development of the National Army has included the response to threats or anthropic events as part of its land power capabilities. This action is framed within the Defense Support to Civil Authority (ADAC) operations, which correspond to non-lethal missions and other support activities, in response to the requirements of civil authorities, within the framework of the law, through the use of available capabilities and means (National Army, 2017).

Similarly, the National Army issues Environmental Management guidelines and directives to mitigate the impacts on the environment due to the development of the Force's

mission, through the Department of Military Engineers, which is part of the Chief of Staff of Plans and Policies (National Army, 2023a). It also coordinates the implementation of environmental guidelines through the Engineers Command with the Environmental Management Section, with environmental advisors and managers in the divisions, brigades and battalions (National Army, 2023b). Cooperatively, the National Army supports the protection and defense of the environment, through the planning and conduct of military operations, to combat environmental crimes, through the Brigade against the illegal exploitation of mining deposits, a unit that operates throughout the national territory, in a joint, coordinated and interagency manner (Ministry of National Defense, 2017).

In the above context, it should be noted that the nation has an Army that contributes to peace building, not only from the territorial security approach, but also from the perspective of its contributions to sustainable development. However, this participation has not been analyzed in depth, in terms of its strategic importance for achieving national climate resilience and biodiversity conservation objectives.

In view of the above, the purpose of this article is to analyze the contribution efforts made by the Colombian National Army in the control of environmental crimes such as deforestation and the illegal exploitation of mining deposits, as well as the activities to support the restoration of degraded ecosystems, as partial results of an investigation carried out in 2024. The study highlights the support functions of the National Army, in accordance with its mission and capabilities, within a context of environmental conflicts due to climate change, biodiversity loss and armed conflict.

Method

Design

According to the degree of structuring of the data, the research presents a qualitative type, with a non-experimental field design, descriptive scope and cross-sectional (Hernández Sampieri et al., 2014). With the purpose of describing in depth the observed phenomenon, a qualitative method based on case studies was applied, from different areas and sectors of the Colombian armed institution linked to the environment, in an attempt to explore complex dimensions in their real context of realization (Atlas.ti, 2025). In the approach to the object of study, a combination of several techniques was applied for the collection of information, specifically, self-developed semi-structured interviews, direct observation and documentary analysis, seeking an appropriate fit with the aforementioned approach of case studies (Jiménez Chaves and Comet Weiler, 2016).

Categories

The categories that guided the collection of secondary and empirical information, as well as the categories of codification and analysis correspond, in the first instance, to the contribution of the development of control and surveillance operations and actions, in which the perceptions and opinions of the population sample are analyzed, on the effectiveness of operations oriented to the control of environmental crimes and the collaboration with other entities. Secondly, the environmental restoration support activities are presented, analyzing the projects developed by the Force, community participation and their results, as described in Table 1. The categories were analyzed descriptively without interdependent relationships between them, according to the scope of this research.

Table 1

Operationalization table of categories.

Category	Conceptual Definition	Operational Definition	Dimensions	Indicators
Contribution from the development of control and surveillance operations and actions	National Army efforts to control deforestation and other environmental crimes.	Extent to which the Army contributes to the control of environmental crimes.	Development of control and surveillance operations and actions.	Perception of the effectiveness of operations and control and surveillance actions.
			Support to other entities.	Opinions on collaboration with other entities.
Environmental restoration support activities.	Activities carried out by the National Army for the remediation of negatively impacted ecosystems.	Degree of participation in ecosystem restoration projects.	Restoration Projects.	Perception of the effectiveness of reforestation and restoration projects.
			Results and Project Evaluation.	Feedback on the results and evaluation of restoration projects.

Participants

The population sample, made up of 30 individuals, 53% (16) of whom were women and 47% men (14), was derived from a non-probabilistic sampling among the sectors of national planning, defense, environment, cooperants and/or international allies (Table 2). Most of the participants belong to the 30 to 40 years age group, representing 53% of the sample (16), followed by the over 50 years age group with 23% (7), the 40 to 50 years age group with 13% (4) and finally the 20 to 30 years age group with 10% (3). The individuals were selected according to their relationship and influence in decision-making regarding the planning and/or execution of environmental protection guidelines, biodiversity and the control of environmental crimes. A semi-structured interview was administered to these study units, in which they were asked about their contribution to the control of environmental crimes and the support of ecosystem restoration processes. 19 interviews were conducted virtually and 11 in person, according to each interviewee's availability and location

Other sociodemographic data about the sample are omitted for ethical and confidentiality reasons.

Table 2

Distribution of interviewees by entity

Sector	Institution	Number of interviewees	Role
National Planning	National Planning Department	1	Articulates medium- and long-term planning
Defense	Ministry of National Defense	2	Defines safety policies including environmental protection
	General Command of the Military Forces	3	Strategically directs the Military Forces in environmental protection
	Colombian National Army	12	Supports environmental crime control and environmental protection.
Environment	Ministry of Environment and Sustainable Development	1	Formulates environmental policies and coordinates intersectoral actions.
	National Natural Parks	2	Administers and manages the National Natural Parks System.
	Corporation for the Sustainable Development of the Southern Amazon (Corpoamazonía)	1	Executes environmental policies and plans in the

Sector	Institution	Number of interviewees	Role
	Corporation for the Sustainable Development of the Northern and Eastern Amazon (CDA)	1	territory as the highest authority.
	Amazon Vision Program	2	Articulates deforestation planning and control efforts between government, international cooperation and communities.
International cooperating partners and/or allies	United Nations Office on Drugs and Crime (UNODC)	2	Supports institutional strengthening in the control of environmental crimes
	GiZ - German Cooperation Colombia	1	Provides support for institutional strengthening and capacity building for conservation and environmental control.
	United States Agency for International Development (USAID)	1	It finances and accompanies conservation, environmental governance and crime control projects.
	Center for Management and Operation of the Amazon Protection System (CENSIPAM)	1	Regional cooperation for the control of cross-border crime.

Instrument

Data collection was carried out by means of a semi-structured interview as a flexible instrument which, according to Díaz Bravo et al. (2013), allows adjustments in the application of concepts or questions in order to reduce ambiguities. The interview included questions such as: What actions do you consider important to implement for the adequate management of climate change and the protection of biodiversity, especially in the Colombian Amazon; What weaknesses and strengths do you identify in the contribution activities developed to support the control of deforestation and other environmental crimes, especially in the Colombian Amazon; Do you know of actions or initiatives of the National Army for the restoration of degraded ecosystems; and What weaknesses and strengths do you identify in these restoration practices?

The instrument was validated by expert judgment, yielding a content validity coefficient of 0.96, which corresponds to excellent inter-judge agreement (Hernández-Nieto, 2011).

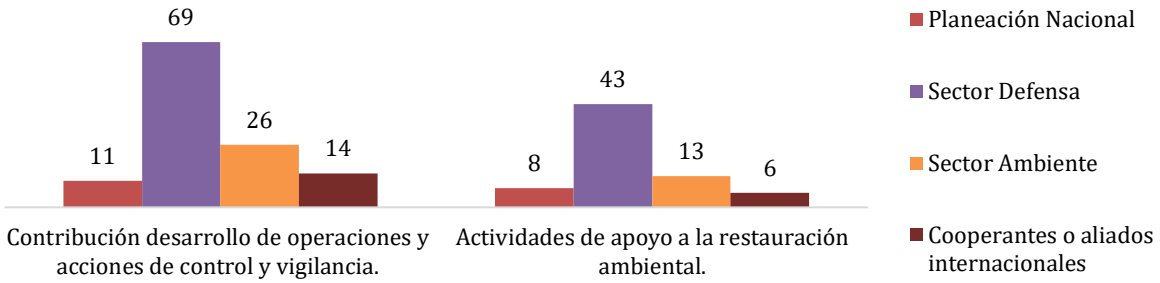
Data Analysis

The qualitative data analysis phase was supported by the *ATLAS.ti* version 25 software, which facilitates the process of storing, processing and interpreting large amounts of qualitative data, through an iterative process of hybrid coding, based on the research categories proposed and the generation of second-level or emerging categories. Similarly, descriptive statistical techniques were used to analyze the frequency of occurrence of quotations related to the categories and the distribution of these categories in the different sectors to which the interviewees belong.

Results

The coding process based on the research categories yielded 120 citations associated with the category of contribution to the development of operations and control and surveillance actions, and 70 citations from the category of support activities for environmental restoration, and Figure 1 shows their distribution in the different sectors of the interviewees. The results also show that quotations were present in 27 of the interviews, which corresponds to 90% of the sample.

Figure 1
Distribution of citations between interviewees' sectors and research categories



In the coding process, emerging or second level categories were identified, related to challenges and opportunities for the National Army in the control of environmental crimes and support for ecosystem restoration, which are presented in Table 3.

Table 3
Emerging or second level categories

Description	Categories
Challenges or threats	Technical and logistical challenges. Institutional Barriers. Conflict and Security. Public policy guidelines and legislation
Opportunities	Technological innovation, logistics and operations. International Collaboration. Training and Capacity Building. Resilience and Adaptation to Climate Change.

The perception and opinions of those interviewed suggest that the National Army's contribution to the control of environmental crimes is framed within the framework of the operations of Support to the Defense of the Civil Authority (ADAC), developing mainly logistical and security support to other state entities whose main mission is the administration and control of the use of natural resources. One of the strengths of these exercises is the use of military intelligence for operational planning and as an input to guide judicial investigation processes. Likewise, the environmental and defense sectors highlight the presence of the Army throughout the national territory, which allows the development of actions in areas where environmental authorities and other entities do not have the capacity to enter, highlighting the air mobility capacity. Additionally, 36 % of the sample highlights the development of the inter-institutional articulation strategy in the Amazon called “Environmental Bubble” as of 2016, as a positive exercise to dynamize the coordination and development of operations and actions, mainly to control the increase in deforestation and attack other crimes such as the illegal exploitation of mining deposits.

In view of the above, emerging strategies of the National Army have been identified, such as the aforementioned Environmental Bubbles, the Artemisa Plan, the Amazonia Plan and the activation of specialized units such as the Brigade against the Illegal Exploitation of Mining Deposits (BRCMI), to confront criminal dynamics associated with organized armed groups, which ~~affect~~ natural resources, promote the invasion of protected areas, impacting the conservation and protection of biodiversity. However, the perception of the interviewees, especially the environmental sector, suggests a weakness in relation to the questioning of the effectiveness of the operations developed for the control of deforestation, due to the fact that

the agents of deforestation have not been impacted, only the lowest links in the criminal chain, which shows weaknesses in the institutional synergy.

Figures 2 and 3 present the challenges and opportunities for the National Army to contribute to the control of deforestation and other environmental crimes, through the development of operations and activities for the control and surveillance of natural resources.

Figure 2

Challenges of the National Army to contribute to the control of environmental crimes.

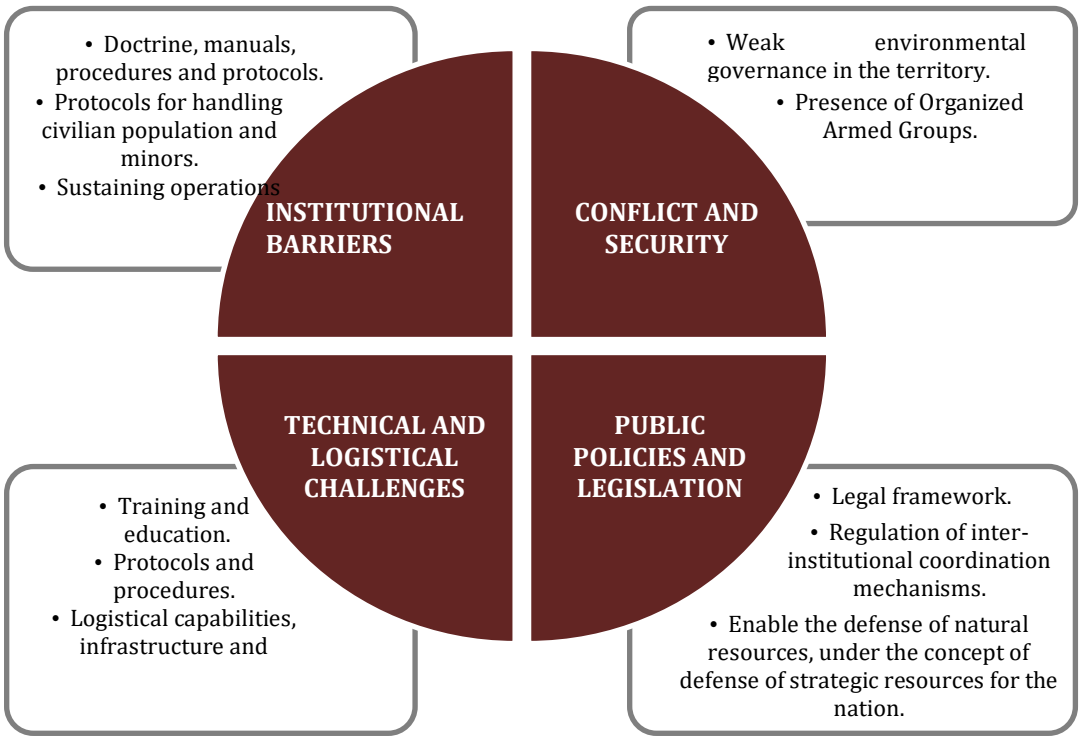
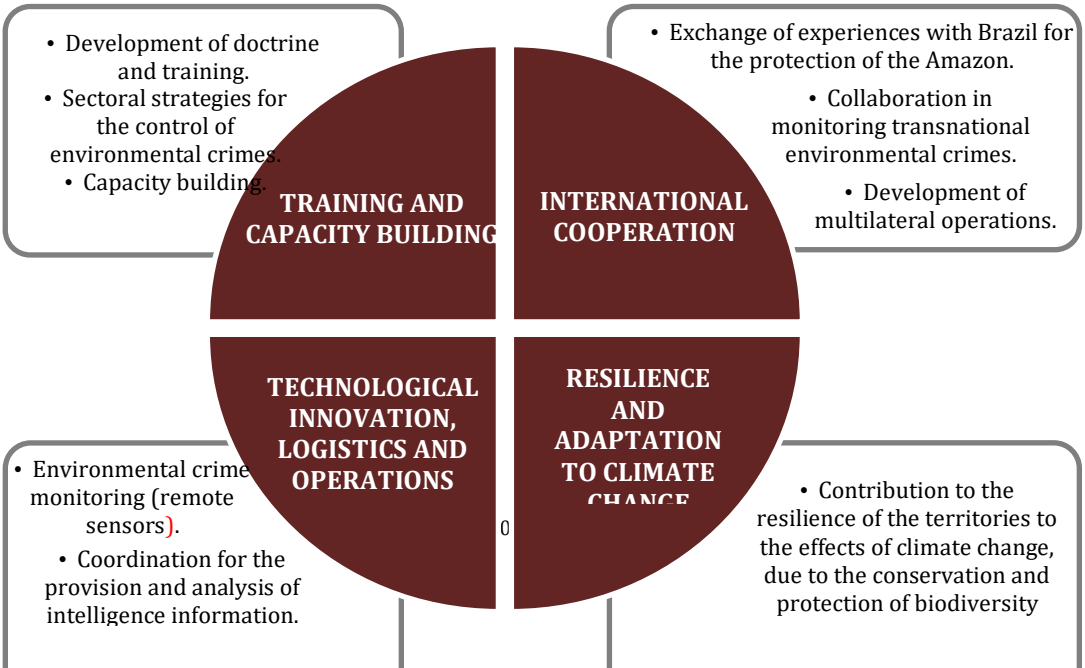


Figure 3

Opportunities for the National Army to contribute to the control of environmental crimes.



With respect to the findings in the category of environmental restoration support activities, the latter are associated with the development of reforestation campaigns inside and outside military units and the production of plant material through the establishment of nurseries, emphasizing the experience of propagating frailejon in units located in high mountain ecosystems. The perception of the sample with respect to these exercises, especially the national planning sector and some environmental authorities, indicates that they have positive effects for the image of the institution, by showing-activities other than coercive actions carried out in the framework of military operations, which can promote a positive approach with the communities.

In contrast to this result, there are other opinions within the defense sector, part of the environmental sector and international cooperants or allies, who question the relevance of developing this type of activities that do not correspond to the mission of the National Army. In this regard, weaknesses in the technical capacity that may limit compliance with regulatory standards in the production of plant material, inadequacies in the planning, monitoring and maintenance of sowings or plantations, as well as a lack of scientific documentation on the military exercises carried out.

Following up on the above, Figures 4 and 5 present the challenges and opportunities for the National Army to continue the development of these initiatives, so that it cooperates more effectively with ecosystem restoration and, consequently, with biodiversity conservation.

Figure 4

Challenges of the Army in the development of environmental restoration support activities

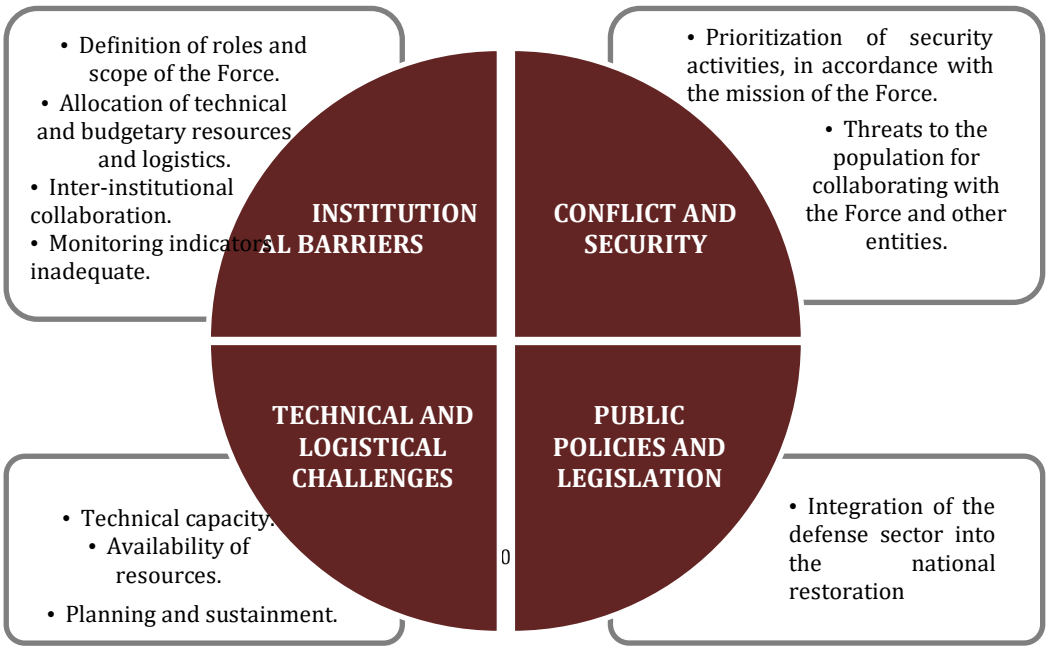
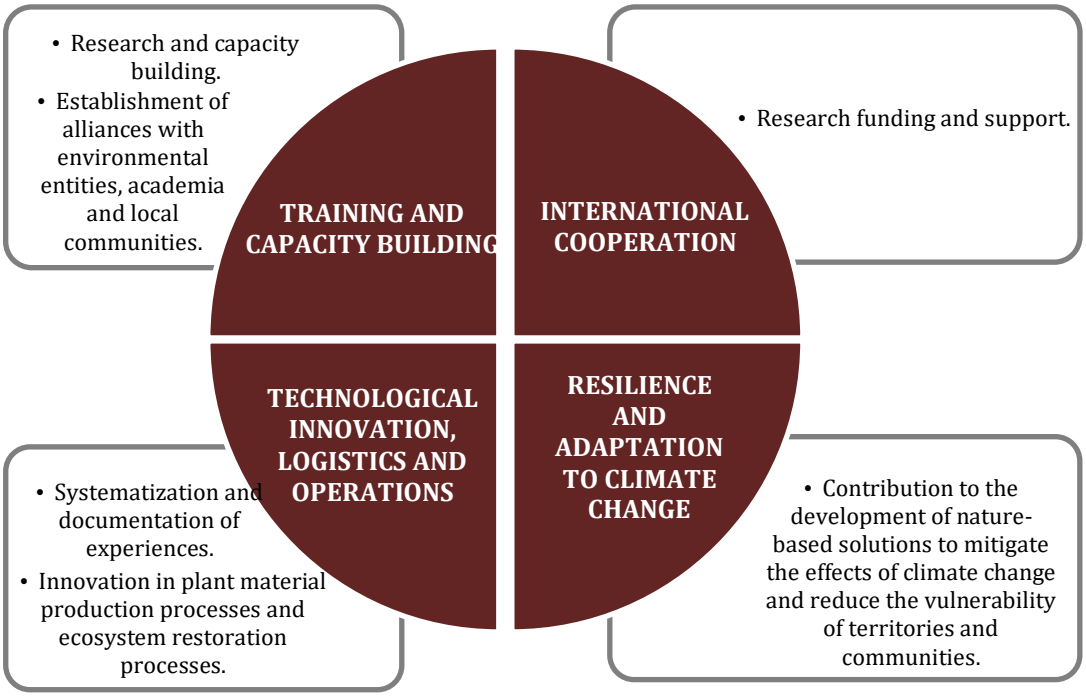


Figure 5

Opportunities for the National Army to develop activities in support of environmental restoration



Discussion and Conclusions

It stands out as an opportunity for the National Army, in accordance with the opinion of the interviewees, to include as a complementary measure of adaptation to climate change, the protection approach to biodiversity protection, in the midst of the Army's contributing role to the undertaking of operations and control and surveillance actions, in accordance with the doctrine related to the Defense Support to Civil Authority (ADAC) operations (National Army, 2017).

According to the results, the National Army's contribution to the control of environmental crimes is based on the use of its operational, intelligence and logistical capabilities to support other authorities in the fulfillment of their mission. In this regard, Garzón et al. (2020) indicates that the experience of the Military Forces in operational planning, intelligence deployment, and their mobility capabilities, constitute the main advantages in environmental protection processes.

Similarly, the Army's differential capabilities, including deployment to strategic areas of the national territory, contribute to the effective control of illegal dynamics associated with organized armed groups that use the exploitation of natural resources for their financing (Ayala Sánchez, 2023).

On the other hand, the experiences of inter-institutional articulation led by the National Army arise as a response to the increase in deforestation and other environmental crimes in the Amazon, articulating state entities responsible for the regulation and surveillance of natural resources and protected areas (Murillo and Ceballos, 2021). Likewise, operations aimed at reducing deforestation have been executed in order to comply with Directive 10 of 2018 corresponding to the orders to comply with judgment 4360-2018 of April 5, 2018, related to the control of deforestation in the Amazon (Piñeros et al., 2020). To improve the efficiency of these actions, it is necessary to activate specialized units such as the BRCMI to carry out environmental protection tasks.

Although the benefits of the participation of the National Army in the control of environmental crimes are evident, there are questions regarding the efficiency of the results in relation to the limitation of resources, use of capacities, excessive use of force and relations with local communities involved in the criminal chain (Garzón et al., 2020). In view of these considerations, the Major Operation Artemisa promoted in the 2019-2022 government period, to combat deforestation, is based on respect for human rights and international humanitarian law (IHL), favoring the formation of Sustainable Forest Nuclei (Ayala Sanchez, 2023).

The National Army's challenges are centered on the lack of doctrine, procedures and protocols for the control of environmental crimes, despite new regulations that empower the National Army to take preventive punitive measures and destroy heavy machinery, in accordance with Law 2387 of 2024. However, there are no specific implementation procedures and protocols. In addition, Giraldo et al. (2024) points to the need to establish a robust legal and conceptual framework that allows for inter-institutional coordination and effective ~~integration of the~~ human rights approach, especially in territories with weak environmental governance and socio-environmental conflicts such as the Amazon.

With respect to the above, the need to regulate the technical and operational coordination of spaces such as the National Council to Combat Deforestation and other associated crimes (CONALDEF) and other spaces of inter-institutional articulation is evident, to promote the effective introduction of capacities against environmental crimes and other illegal activities that degrade natural resources (Garzón et al., 2020), underlining the importance of recognizing natural resources as strategic assets of the nation, which require prioritization in the objectives of national defense protection.

On the other hand, there are shortcomings in the allocation of resources, a situation that translates into a lack of logistical, infrastructure and equipment capabilities to guarantee the sustainability of operations. The scarcity of these resources fosters conditions for the permanence of illegal actors in territories that are difficult to access, highlighting the dynamics in the border rivers and forests of the Amazon, where control mechanisms of the environmental authorities and the National Army are not sufficient to control illegal cross-border activities *(Environmental Investigation Agency* [EIA], 2019).

Despite the challenges exposed, Cabrera and Macías (2020) establish that the Military Forces have a substantial role in front of environmental protection, despite the fact that this type of activities corresponds to non-traditional missions, being necessary to strengthen the actions of the Army against environmental crimes to describe in the doctrine tasks of environmental protection, control and monitoring (Morales, 2017).

On the other hand, innovation in the monitoring of environmental crimes and environmental degradation dynamics, at local and multilateral levels, is noted as a potential opportunity, as described by Miranda (2022) in his study on the potential environmental protection tasks of the Peruvian Armed Forces, which highlights the use of remote sensors, unmanned aircraft and satellite images for these purposes.

Regarding the development of ecosystem restoration support activities, oriented to reforestation processes and production of plant material by military units, these can contribute to the recovery of territories affected by the armed conflict, through the restoration of ecosystem services (Jiménez and Vega, 2020).

Despite the positive experiences, weaknesses are still identified with respect to technical capabilities, sustainability and evaluation of the effectiveness of this type of activities developed by the National Army, so it is necessary to have adequate monitoring mechanisms and specialized experts, given the complexity of the processes and ecosystems (Mola et al., 2022).

On the other hand, the main challenges identified are the lack of a clear definition of the Army's responsibilities in environmental restoration activities, which would enable the allocation of resources, in order to integrate the Force into national restoration strategies. For this reason, implementation will depend to a large extent on inter-institutional collaboration, especially through the signing of agreements with environmental authorities (Gordón, 2022).

In addition, the development of ecological restoration processes in the territory is interrupted due to the persistence of the armed conflict, as it challenges the Army's priority attention in maintaining security and the constraint of illegal armed actors among the communities. This scenario deteriorates the link between state institutions and the communities, who are afraid to participate in the aforementioned restoration of the territory due to the constant threats from these organized armed groups (Garzón et al., 2020).

As opportunities for the processes of support to restoration developed by the Army, the development of research and capabilities, fostering innovation and systematization of experiences, through alliances with academia, environmental authorities and civil society, which also make it possible to attract international cooperation resources, stand out. In this regard, the Scientific Working Group for the United Nations Decade on Ecosystem Restoration (2022), positions the importance of generating long-term inter-institutional alliances, since restoration processes are prolonged, and this is an opportunity for the generation of knowledge and innovation that produces multiple benefits for environmental sustainability.

Based on the discussion, it is concluded that the cooperation efforts of the National Army in the control of environmental crimes are mainly oriented towards the control of illegal activities that affect the environment and serve as a source of financing for illegal armed groups. In this way, the need to strengthen normative and doctrinal regulations is highlighted, evaluating the need to create specialized units. For this reason, it is recommended that comparative studies be carried out with Armed Forces in the region, in order to evaluate experiences and strategies that can be replicated for the protection of natural resources and the control of environmental crimes.

Regarding ecosystem restoration activities, seen as a support or contribution effort, they already show considerable technical limitations, which translate into errors in planning, sustainability and evaluation, despite the fact that they identify potential benefits in terms of improving the institutional image and generating alliances with other institutions. In this regard, it is pertinent to suggest studies that technically and scientifically evaluate the methods used by the Army in reforestation processes and propagation of plant material, in relation to its mission and the effectiveness of these logistical exercises.

The main limitation of the study was the restricted access to key participants, which was mitigated by involving relevant stakeholders from the design of the research, ensuring the anonymity of the results, through the implementation of information management protocols that were communicated in a transparent manner, which allowed the generation of trust and active participation.

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References

Atlas.ti. (2025). Guía fundamental de la investigación cualitativa – Parte 1: Conceptos básicos. https://atlasti.com/es/guias/guia-investigacion-cualitativa-parte-1/metodos-de-investigacion-cualitativa

Ayala García, E. T., & Pérez García, Y. (2025). Impacto del Conflicto Armado en el Bienestar Territorial y la Calidad de Vida en Zonas de Conflicto. *Cuadernos De Vivienda Y Urbanismo*, 18. https://doi.org/10.11144/Javeriana.cvu18.icab

Ayala Sánchez, F. (2023). Las Fuerzas Militares y su lucha contra el agotamiento de recursos naturales como activos en Colombia. In E. A. Salamanca Rodríguez & J. A. Serpa Hernández (Eds), *Seguridad humana y construcción de patria en defensa de la vida* (pp. 455-485). Sello Editorial ESDEG. https://doi.org/10.25062/9786287602595.17

Cabrera Ortiz, F. y Macías Tolosa, A. (2020). Rol de las Fuerzas Militares de Colombia en la protección de la Amazonia. In E. Pastrana Buelvas and N. Stopfer (Eds). *Gobernanza Multinivel de la Amazonia.* (pp. 357-386). Fundación Konrad Adenaue. https://www.kas.de/documents/273477/11482518/Gobernanza+Multinivel+de+la+Amazonia.pdf/58d120e4-07da-211a-d1dc-17da75caf79f?version=1.0&t=1611931583522

Congreso de Colombia. (1994). Ley 165 de 1994: Por medio de la cual se aprueba el Convenio sobre la Diversidad Biológica. Diario Oficial No. 41.522.

Departamento Nacional de Planeación. (2020). *Documento CONPES 4021: Política Nacional para el Control de la Deforestación y la Gestión Sostenible de los Bosques.* DNP. https://colaboracion.dnp.gov.co/CDT/Conpes/Econ%C3%B3micos/4021.pdf

Departamento Nacional de Planeación. (2021). *Documento CONPES 4050: Política para la Consolidación del Sistema Nacional de Áreas Protegidas - SINAP*. DNP. https://colaboracion.dnp.gov.co/CDT/Ambiente/CONPES_4050%20Politica_Sinap.pdfDepartamento Nacional de Planeación (2023). *Plan Nacional de Desarrollo 2022-2026*. DNP. https://www.dnp.gov.co/plan-nacional-desarrollo/pnd-2022-2026

Díaz Bravo, L., Torruco García, U., Martínez Hernández, M., & Varela Ruiz, M. (2013). La entrevista, recurso flexible y dinámico. *Investigación en Educación Médica, 2 (7), 162-167.* https://www.redalyc.org/pdf/3497/349733228009.pdf

Ejército Nacional (2017). *Manual Fundamental Del Ejército MFE 1-0 El Ejército*. Centro de Doctrina del Ejército. https://www.cedoe.mil.co/

Ejército Nacional (2023a). *Departamento de Ingenieros Militares.* Ejército Nacional. https://www.Ejército.mil.co/departamento-de-ingenieros-militares/

Ejército Nacional (2023b). *Gestión Ambiental y Ecosistemas*. Ejército Nacional. https://www.Ejército.mil.co/gestion-ambiental-y-ecosistemas-602753

Enviromental Investigation Agency (EIA). (2019). *Condenando el bosque. Ilegalidad y falta de gobernanza en la Amazonia Colombiana*. Agencia de Investigación Ambiental. https://www.condenandoelbosque.org/

Garzón, J. C., Riveros Gómez, C., & Tobo, P. (2020). *Fuerzas militares y la protección del ambiente.* Fundación Ideas Para la Paz. https://ideaspaz.org/publicaciones/investigaciones-

analisis/2020-09/fuerzas-militares-y-la-proteccion-del-ambiente-roles-riesgos-y-oportunidades

Giraldo, K., Cardona, D., Escobar, N. K. y Santacoloma, L. J. (2024). *Ganadería, deforestación e institucionalidad: CONALDEF, el control y los derechos humanos.* Dejusticia. https://www.dejusticia.org/wp-content/uploads/2024/04/CONALDEF-deforestacion-y-ganaderia-Resumen-Ejecutivo-.pdf

Gordón Albarracín, K. Y. (2022). *Construcción de viveros al interior de Unidades Militares del Ejército Nacional de Colombia, ubicados en ecosistemas estratégicos del país.* [Undergraduate thesis] Universidad de Bogotá Jorge Tadeo Lozano, Bogotá. https://expeditiorepositorio.utadeo.edu.co/handle/20.500.12010/27616?show=full

Grupo Banco Mundial. (2023). *Informe sobre clima y desarrollo del país*. World Bank Publications. https://documents1.worldbank.org/curated/en/099072023124015474/pdf/P1781040f920a400809a2c09e70149f435b.pdf

Grupo de Trabajo Científico para el Decenio de las Naciones Unidas sobre la Restauración de los Ecosistemas (2022). *Restauración de los ecosistemas basada en la ciencia para la década de 2020 y más allá.* UICN. https://portals.iucn.org/library/sites/library/files/documents/2021-032-Es.pdf

Guio Rodríguez, C. (2018). *El posconflicto y los impactos de la minería en la amazonía oriental colombiana*. Corporación Grupo Semillas. https://semillas.org.co/es/revista/el-posconflicto-y-los-impactos-de-la-minera-en-la-amazona-oriental-colombiana

Hernández Sampieri, R., Fernández Collado, C., y Baptista Lucio, P. (2014). *Metodología de la Investigación* (6th edition). McGraw Hill.

Instituto de Hidrología. Meteorología y Estudios Ambientales (IDEAM) y Ministerio de Ambiente y Desarrollo Sostenible (MADS) (2023). *Actualización de cifras de monitoreo de la superficie de bosque - Año 2022. IDEAM – MADS*

InSight Crime & Instituto IGARAPÉ (2021). *Las raíces de los delitos ambientales en la Amazonía colombiana.* InSight Crime. https://insightcrime.org/es/investigaciones/raices-delitos-ambientales-amazonia-colombiana/

Jiménez Chaves, V. and Comet Weiler, C. (2016). Los estudios de casos como enfoque metodológico. *Revista de Investigación en Ciencias Sociales y Humanidades, 3* (2). https://dialnet.unirioja.es/descarga/articulo/5757749.pdf

Jiménez Velandia, J. y Vega Delgado, L.A. (2020). La restauración ambiental de ecosistemas deforestados por cultivos ilícitos, el nuevo desafío del Ejército Nacional. *Revista Agunkuyâa, 10* (1), 75-89. https://doi.org/10.33132/27114260.1797

Lozano, J. B. (2015). Cambio climático: desafío para la seguridad nacional. *Revista CREES, (1),* 73-80.

Mayorquín Tovar, A. R. y Moreno Carvajal, M. A. (2022). *Deforestación y minería ilegal: Una mirada a los mecanismos dirigidos a la protección del medio ambiente en Colombia.* [Undergraduate thesis] Universidad La Gran Colombia. https://repository.ugc.edu.co/server/api/core /bitstreams/cf968abf-3075-4218-a539-2085dbfb8143/content

Ministerio de Ambiente y Desarrollo Sostenible (2012). *Política Nacional para la Gestión Integral de la Biodiversidad y sus Servicios Ecosistémicos (PNGIBSE).* MADS. https://www.minambiente.gov.co/wp-content/uploads/2021/10/Poli%CC%81tica-Nacional-de-Gestio%CC%81n-Integral-de-la-Biodiver.pdf

Ministerio de Ambiente y Desarrollo Sostenible (2017). *Plan de acción de biodiversidad para la implementación de la Política Nacional para la Gestión Integral de la Biodiversidad y sus Servicios Ecosistémicos 2016-2030.* MADS.

https://archivo.minambiente.gov.co/images/BosquesBiodiversidadyServiciosEcosistemicos/pdf/Plan-de-Accion/PLan_de_Accion_de_Biodiversidad_2016_2030.pdf

Ministerio de Defensa Nacional (2017). Directiva Permanente Ministerial 004 del 2017. Instrucciones de Coordinación Conjunta e Interinstitucional para la lucha contra la explotación ilícita de yacimiento Minero y Delitos conexos en Colombia. MDN.

Miranda, V. (2022). Cambio Climático: ventana de oportunidad para las Fuerzas Armadas en las estrategias de adaptación y mitigación En A. Castro y M. I. Merino-Gómez (Eds.), *Desafíos y perspectivas de la situación ambiental en el Perú*. *En el marco de la conmemoración de los 200 años de vida republicana.* (374-397). INTE-PUCP. https://repositorio.pucp.edu.pe/index/handle/123456789/184481

Morales, L. (2017). *La paz y la protección ambiental en Colombia: propuestas para un desarrollo rural sostenible.* The Dialogue. https://thedialogue.org/analysis/la-paz-y-la-proteccion-ambiental-en-colombia-propuestas-para-un-desarrollo-rural-sostenible/?lang=es

Mola, I., Sopeña, A. and de Torre, R. (2018). *Guía Práctica de Restauración Ecológica.* Fundación Biodiversidad del Ministerio para la Transición Ecológica. https://ieeb.fundacion-biodiversidad.es/sites/default/files/guia_practica_re_0.pdf

Morales Muñoz, H., Schmelzer, N., Viehoff, A., Pohl, B., & Vélez, J. (2025). *Construcción de paz ambiental en Colombia: Sinergias entre las políticas de medio ambiente, clima, paz y seguridad*. adelphi research gemeinnützige GmbH. https://weatheringrisk.org/sites/default/files/document/Construcci%C3%B3n_de_Paz_Ambiental_en_Colombia_ES.pdf

Murillo, A. A. y Ceballos Bedoya, E. O. (2021). *El rol del Ejército Nacional en la protección de los ecosistemas amazónicos*. Grupo Editorial Ibáñez.

Piñeros Vera, D., Prieto Ararat, P. and Garzón Amórtegui, D. (2020). Los delitos contra el medio ambiente y las prácticas de control territorial de los Estados amazónicos: entre la seguridad militar, humana y ambiental. In E. Pastrana Buelvas and N. Stopfer (Eds). *Gobernanza Multinivel de la Amazonia.* (pp. 157-204). Fundación Konrad Adenauer y Escuela Superior de Administración Pública (ESAP). https://tinyurl.com/ycxac8x6

Solano, C. and Torres Romero, F. (2022). Retos y oportunidades de Colombia en el decenio para la restauración de los ecosistemas 2021- 2030. In M. Rodriguez Becerra and M.F. Valdés Valencia (Eds). *Colombia país de bosques* (pp. 335). Fundación Natura. https://www.researchgate.net/publication/361861435_Retos_y_oportunidades_de_Colombia_en_el_decenio_para_la_restauracion_de_los_ecosistemas_2021-_2030

Suárez Perilla, L. V. (2021). *Las consecuencias de la minería ilegal en Colombia a través del análisis de datos: Caso departamento de Chocó.* [Undergraduate thesis] Universidad Militar Nueva Granada. https://repository.umng.edu.co/bitstream/handle/10654/39362/SuarezPerillaLauraVanessa2021.pdf?sequence=1