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Frontier Security: The Case of Brazil

by John A. Cope with Andrew Parks



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Cover: Brazilian army soldiers patrol the Oiapoque River, border between Brazil and French Guyana, as part of Operation *Agata 8* in Amapa State, May 15, 2014 (Pedro França/AFP/Getty Images)

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By John A. Cope with Andrew Parks

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Fonte: IBGE, Diretoria de Geociências, Coordenação de Cartografia.

Executive Summary

Over the past three decades Brazil has greatly improved its ability to monitor and control its long border. Achieving better management of the complex frontier security problem required a great deal of patience, trial and error, organizational adaptation, and good leadership. The Brazilian experience yields a number of important lessons for Brazil and for its neighbors in the Western Hemisphere. Improving performance required subordination of military priorities to civilian authorities; the repositioning of forces; better military-police cooperation; inter-agency and international cooperation; investment in technologies to give Brazil an advantage in the contest for best situational awareness; a long-term commitment; and guiding strategy documents supported by both civil and military authorities. Of overarching significance is the way the Brazilian military was able to reestablish the confidence of civilian leaders in the aftermath of decades of military rule. The result was a Brazilian military that is more professional, more respected, and better resourced than before. For the United States, the evolution of Brazilian frontier security is not only a developing good news story for hemispheric relations, but also a learning opportunity, since similar security problems have not always been so well managed in the United States.

Brazil faces a herculean challenge to defend national sovereignty and control access by land, river, air, and sea along the 10,000-mile land border it shares with 10 countries. The relatively developed and populous southern zone, roughly 4,000 miles, has traditionally been the priority defended by army mechanized and armored units. However, the majority of the frontier in the northern and western expanse of the Amazon rainforest has been sparsely populated and has had a minimal military presence. Interest in border security and regional development began to change in the 1970s as the pressure of environmental politics in Brazil and abroad increased.

Brazil's approach to frontier security has evolved steadily over the past 30 years from passive, defensive, little contact with neighbors, and small military detachments (mostly army) working the arc of the Amazon from French Guiana to Bolivia to an aggressive, all-services strategy covering the whole border in close cooperation with the federal police and with increased bilateral coordination. The country's evolving approach to the demanding tasks of guaranteeing the state's authority and protecting vulnerabilities and natural resources is instructive for other governments facing similar challenges. Brazil's relative success improving frontier security is notable because of its linkages to sustainable socio-economic development, inter-agency coordination, surveillance technology, and international cooperation.

Brazil's modern border policies began to take shape after the end of the 1964–1985 military dictatorship. The new civilian government supported a civilian and military border development initiative known as the *Calha Norte* program. This project stressed settlement and infrastructure construction and also introduced special border platoons along the northern frontier. The nascent program was fully supported in 2004 by an operational system for the surveillance of Amazonia (Sistema de Vigilância de Amazônia, or SIVAM). In 2008, the ministry of defense announced a National Strategy of Defense, championed by President Lula da Silva, which established regional priorities, directed the reorganization and repositioning of army, navy, and air force capabilities, and prescribed operational guidelines. Three years later, President Dilma Rousseff's government launched its Strategic Borders Plan, which instituted military–law enforcement security operations across the whole border against the full range of criminal activities. With this plan, the Brazilian congress granted the armed forces policing powers within 90 miles of the frontier.

In many ways, the National Strategy of Defense marked a clear turning point in frontier security. Of critical importance is that the strategy introduced what it calls the triple imperative of *monitor and control*, leading to requirements for *mobility* and ultimately *presence*. These three concepts govern the mid-term and long-range development of capabilities and force structure for each branch of the armed forces, and provide near-term guidance for the growing scope of roles that increasingly includes tasks in support of law enforcement. Implementing the Strategic Borders Plan over the last 5 years has resulted in gradually improved interdiction in the frontier zone against narcotics, weapons, and other illegal commodities. The way ahead intensifies integrated military and police operations, emphasizes the technical and procedural refinement of surveillance and communication capabilities, and strengthens security collaboration with neighboring countries.

While military and civilian agency progress in the border zone is real, it is hampered by the continued lack of an interagency legal framework, binding over time on all federal and state players, to promote sustainable development, regional integration, and national security. Forward movement still depends on presidential involvement and executive decrees. As often happens, interagency coordination is difficult and slow. Most recently, a harsh recession, currency devaluation, and a political crisis involving the president have led to budget constraints in many areas, including defense, in which there had been rising investment.

This analysis is the fourth publication from the Institute for National Strategic Studies on Brazil and its emerging world role.

Introduction

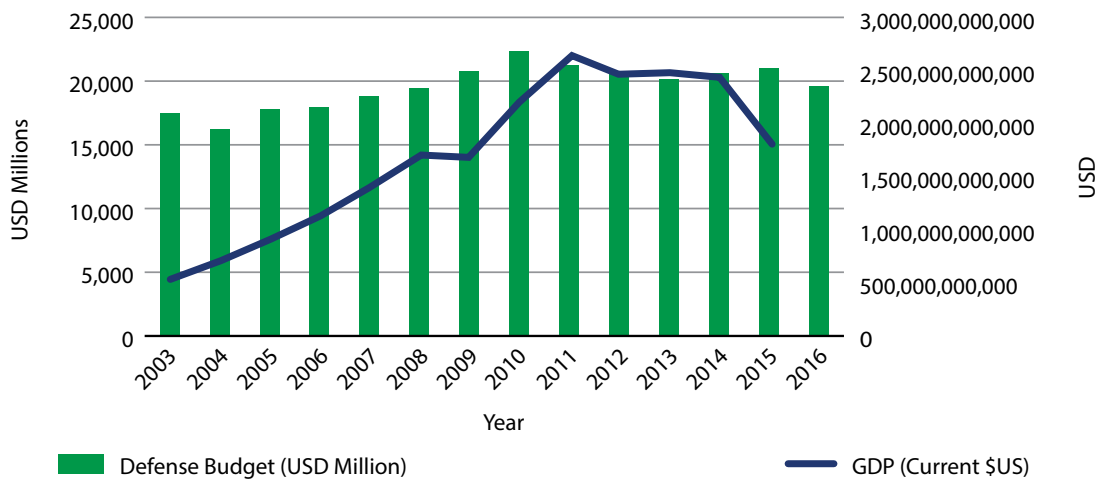
Terrorist incidents worldwide have underscored the demanding practical and political challenges governments face trying to manage porous frontiers to protect national sovereignty from the pressures created by refugees, migrants, an array of small-scale smugglers and larger organized criminal networks, and the spillovers of foreign conflicts.

In the Western Hemisphere, the problems associated with frontier security are most apparent, complex, and instructive in Brazil. Its land border, shared with 10 countries, is peaceful, marked by efforts to achieve bilateral cooperation rather than settle longstanding disputes. Nonetheless, the border remains at risk and difficult to manage in the country's distant, relatively underpopulated, and historically neglected frontier areas. Security concerns have increased as Brazil has emerged on the world stage. Pope Francis visited the country in 2013. Brazil then began hosting a series of major international sports events including the 2014 World Cup for soccer and the 2016 Summer Olympics and Paralympics, all of which provide tempting targets.

An underpopulated jungle frontier distant from major cities would present any country with a herculean test. In Brazil, the long Amazon section of the border, some 6,000 miles, was historically seen as bounding empty space. In the 1960s, this emptiness suddenly heightened military concerns about national security. Brazil's military government in the 1960s and 1970s encouraged domestic migration to occupy Amazon lands. Road building and financial incentives provided a pathway that led to land clearing for large cattle ranches and plantation agriculture. The random development stimulated concerns outside Brazil about massive deforestation, disrespect for indigenous rights, and degradation of the environment.

The lack of both a near-term plan to defend sovereignty and a longer-term resource strategy to strengthen military capabilities to do so came to a head in 1985. International pressure over the health of the Amazon was building as a civilian government returned to office after 21 years of military rule. President José Sarney upheld the three tenets of the military's Amazon policy—sovereignty, security, and development—and approved the *Calha Norte* program to create presence with a small number of special border platoons that were located at strategic points north of the Amazon and Solimões rivers. While the federal government also encouraged infrastructure development in this enormous threatened area, the armed forces began a slow, poorly funded process of shifting forces from all services into the Amazon region. The Amazon Military Command was created in 1991 to accommodate the growing geopolitical importance of the region. Over the next two decades the military would adapt aerial surveillance, communications technology, and many other capabilities to meet the region's security demands.

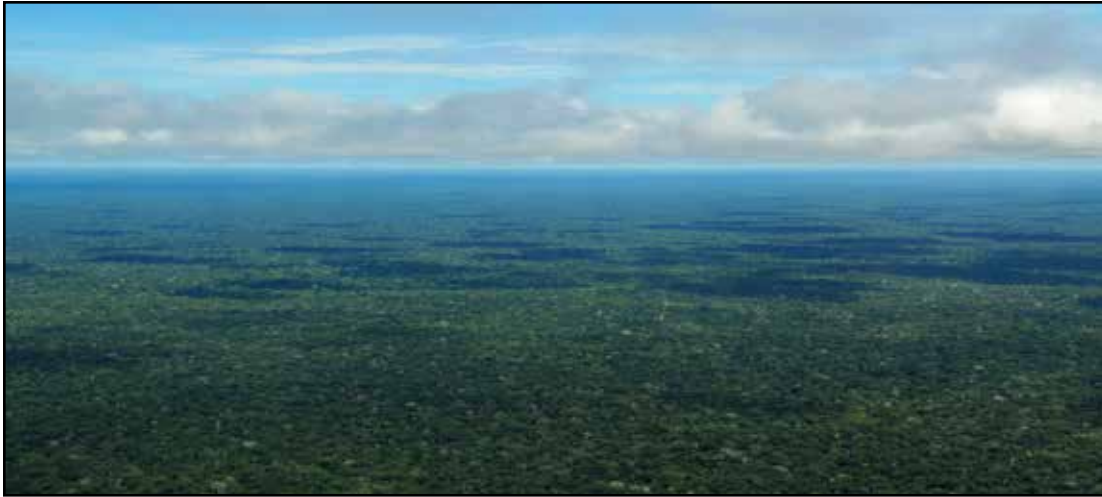
Figure 1. Brazil’s Defense Budget and GDP Growth



Source: IHS Jane’s Defence Budgets, “Brazil’s Defence Budget and Military Capabilities,” April 2016.

It was the 2008 National Strategy of Defense, however, that provided the missing strategic vision to protect Brazil’s territorial integrity, prioritized the Amazon region, and strengthened the military’s ability to support domestic and foreign policy in an increasingly unstable, unconventional security environment. This document marked the rehabilitation of the Brazilian armed forces from the long period of military rule (1964–1985) and the transformation of their mission from domestic order to national defense. Its guiding strategic doctrine of monitor and control, mobility, and presence continues to shape the efforts of the armed forces to reorganize, reposition, and strengthen their dissuasion capabilities. The National Strategy provided the defense sector with a rationale for funding wide-ranging modernization in a context of civil-military unity instead of friction. In fact, the defense budget as a share of government spending increased 28 percent from 2003 to 2010 (the Lula government) when the strategy was officially promulgated (see figure 1).

Countries tend to lack sufficient law enforcement manpower and deterrent capabilities to manage borders effectively. Homeland security police are widely scattered, so manmade barriers—fences and walls, supplemented by technological devices—have sometimes been used to minimize the absence of human presence and provide a deterrent. Brazil is no exception, but its complex geography precludes extensive physical barriers. The country has found that law



Aerial view of Amazon Rainforest, near Manaus, the capital of Brazilian state of Amazonas (Wikipedia/Neil Palmer)

enforcement and the armed forces must work together along the frontier, and where police presence is thin or nonexistent, the military needs policing powers. Both must find ways to exploit the advances of modern technology to support their efforts.

Much can be learned from the dynamics of Brazil's response to controlling and regulating who and what passes across or flies over such a long and vulnerable land frontier. This study identifies the strategic vision and policies that guide the country's efforts to guarantee its authority and protect natural resources in Amazonia and elsewhere. It describes the roles the armed forces play improving territorial security in the *faixa de fronteira* (the approximately 90-mile-deep frontier zone), which is still developing and remains environmentally sensitive. The armed services have had relative success adapting to challenges of sovereign control, employing modern technology, close collaboration with law enforcement, and bilateral cooperation with neighboring countries. Brazil's experience suggests lessons that would be of interest to other governments.

A Complex Security Challenge

Brazil's land boundaries are almost two times the combined length of the U.S. border with both Mexico and Canada without Alaska. Brazil's frontier with Bolivia alone (2,176 miles) is longer than the U.S.-Mexico border (1,933 miles). The Brazilian Atlantic coastline stretches for an additional 4,600 miles, with some of the country's largest ports and major cities. The country's land borders combine easily recognized terrain features and a few negotiated segments that

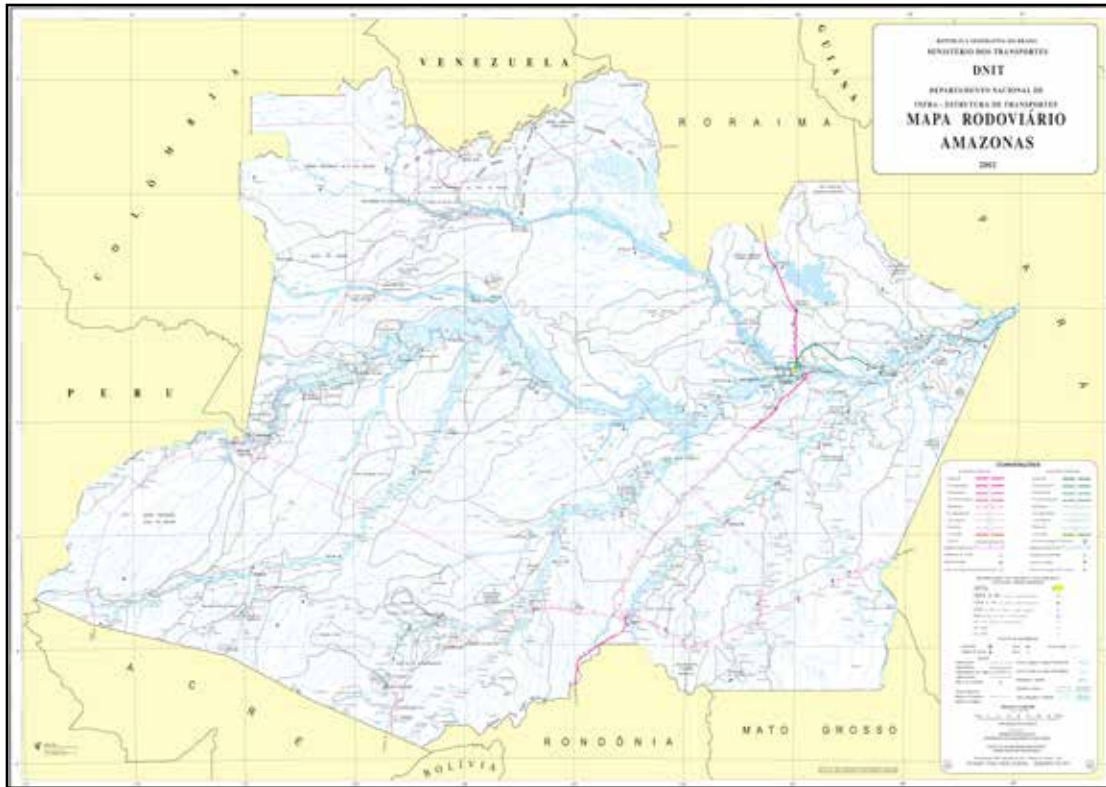
cross a variety of terrain and rely on boundary markers, which in some cases are missing. The most common geographic features, particularly in the west and south, are river courses, many of which are navigable for hundreds of miles. In the north, the boundary follows the mountainous terrain of the Guiana Highlands, which forms the divide between the Amazon Basin's watershed to the south and the Orinoco River Valley and other rivers that flow north (see map). Much of the northern and western segments of the frontier are in tropical rainforests that had never been explored when the relevant bilateral treaty was signed and would not be surveyed until the 1960s. Today, largely inaccessible border areas in sparsely inhabited rainforests have been designated national parks, indigenous Indian reserves, and sometimes both.

The peaceful nature of Brazil's land borders with 10 immediate neighbors is generally credited to the Baron of Rio Branco, José Maria da Silva Paranhos Júnior, Brazil's minister of foreign affairs from 1902 to 1912. He negotiated treaties with all adjoining countries, leading to the diplomatic resolution of boundary controversies, principally over remote and poorly mapped regions of the Amazon Basin. His success formalized Brazil's sovereignty from the Atlantic Ocean to the foot of the Andes Mountains.¹ Over half of the territory was gained using the legal doctrine of *uti possidetis de facto*—possession takes precedence over legal title. The presence of some Brazilian settlers, particularly in western areas, was invaluable.

The arc of the Amazon border from French Guiana to Bolivia defines Brazil's Amazonia, which covers 45 percent of national territory and is home to over 7 percent of the population. Other Amazonian countries include Peru, Ecuador (not a neighbor), Colombia, Venezuela, Guyana, and Suriname. Between Brazil and its neighbors, trans-boundary communication and transportation infrastructure, primarily bridges, is sparse in the north and west and most prevalent in the south and southeast regions, where 43 percent of Brazil's population and a large percentage of the country's industry are located.

Brazil has a total of nine official border crossing points with Uruguay and Argentina and six with Paraguay and Bolivia. Trans-boundary movement in the Amazon Basin is physically more challenging with only three customs areas with Peru, three with Colombia (one shared with Venezuela), and one each with Venezuela, Guyana, and French Guiana.

Most travel takes advantage of extensive navigable river systems ranging from the huge Amazon River, on which oceangoing freighters can travel 2,300 miles as far as Iquitos, Peru, to smaller tributaries such as the Javari River on the border with Peru, which is navigable by motorized canoe for over 800 miles. The city of Manaus on the Rio Negro, founded in 1693 and with 2 million inhabitants in 2014, is the main transport hub for the entire upper Amazon River—900 miles upriver from the Atlantic. Its busy and expanding free trade zone supports



The Amazonas state has an extensive river system. The central west-east flowing river is the Amazon. Rio Negro flows north and merges with the Amazon south of Manaus. The three major tributaries flowing south to north are Rio Juruá (west), Rio Purus, and Rio Maderia (east).

electronics, chemical, distilling, ship construction, and natural gas and petroleum refining industries. Between 2005 and 2015, container volume soared sevenfold, from 78,000 20-foot-equivalent units to 492,000. River transportation in the Amazon includes barges, small ships, and ferries. The growth of river traffic has led to the rise of piracy, particularly in the states of Amazonas, Pará, and Rondônia.² In good weather, local transportation also relies on the use of light aviation and helicopters. Few paved roads link the capital, Brasilia, with cities in northern and western states or connect the few neighboring border cities in the Amazon. Most roads that exist, including many sections of the 2,400-mile Trans-Amazonian Highway, are unpaved and difficult to maintain in an environment with frequent heavy rains.

Brazil does not face a conventional military threat to its sovereignty. The Atlantic Ocean, the Amazon rainforest, and the Andes create formidable natural barriers to the north, east, and west. To the south, the historic rivalry with Argentina has evolved into active cooperation best

characterized by the agreement in 2011 to hold a biannual brigade-level combined military exercise, Guarani, to improve interoperability. So long as its military planning was focused on Argentina, Brasilia paid minimal attention to the western and northern land frontiers. During the period of military government, however, the armed forces realized that they lacked the ability to defend Brazil's sovereignty in this vast and rich but lightly populated region relatively far from the centers of Brazilian power. They feared neighboring countries might use the doctrine of *uti possidetis de facto* to seize unoccupied territory. In the 1970s, the armed forces launched a colonization program along the nation's western frontier called the Super-Brazil da Amazonia. The government encouraged citizens, particularly those in the drought-stricken northeast, to move toward the frontier and help develop the territory. The armed forces established a few posts in Amazonia and initiated transportation infrastructure projects to help the national government integrate the western sector into the national economy and strengthen national security.

In the 1980s and 1990s, growing international concern about the depletion of natural resources in the vast Amazon Basin and foreign activism about endangered indigenous populations energized Brazilian nationalism and came to be seen as threatening Brazil's sovereignty. Domestic controversies over land speculation, concerns about protecting Indian and rural workers' rights, and huge, often uncontrolled Amazonian fires grabbed and sustained front-page media attention worldwide. External criticism of Brazilian environmental practices by the United States, European countries, and some United Nations agencies turned caring for the rainforest and defending sovereignty in the Amazon into contentious public policy issues. Rural ranchers and large agricultural landholders confronted domestic and international conservationists. The turmoil ultimately led to many political and structural changes at the federal and state levels. Of particular importance was the creation of the Brazilian Environment and Renewable Resource Institute to coordinate environmental policy and oversee authorized extractive enterprises. Diplomatically, Brazil proposed that Amazonian neighbors collaborate and present a common front in response to international challenges to their collective sovereignty over the Amazon.³ By the early 1990s, Amazonia had also become an important "rallying symbol" for a concerned Brazilian military.⁴

Environmental attention to the Amazon Basin increased at a time when narcotics smuggling across Brazil's largely uncontrolled frontiers was also growing. The illicit exploitation of the Amazon's natural wealth (gold, rare minerals, lumber, and many other commodities) was also expanding. The worrisome presence of Peruvian and Colombian narco-guerrilla units near, and sometimes in, Brazilian territory exacerbated the security challenge. Domestic criminal



Deforestation and illegal logging discovered in SIVAM satellite imagery (System for the Vigilance of the Amazon)

activities in Amazonia were deeply rooted locally and had a history reaching back to the smuggling of rubber out of South America from the late 19th century until World War II. Law enforcement along the border consisted of small and widely separated detachments of the federal police department and the Brazilian army. While generally viewed as competent, both police and military always lacked intelligence, manpower, material capacity, and funds needed to counter effectively the various forms of transnational organized crime active in the region.

In the 1980s and 1990s, federal and state governments were poorly prepared to confront surging illegal criminal activities as they expanded in Brazil's eight Amazon border states. Prominent among them were thousands of Brazilian and neighboring illegal gold prospectors, or *garimpeiros*. Estimates vary between 30,000 and 100,000, many of whom were armed and intent on exploring land designated as belonging to the Yanomami Indians.⁵ Brazil's National Department of Mineral Production estimates that between 1977 and 1986, 1,569 tons of gold were lost due to illegal exploitation of natural resources and smuggling operations in Amazonia compared to the 167 tons recovered using legitimate methods. Illegal gold prospecting took, and continues to take, a heavy toll on the rainforest and its indigenous people. The Indians often retaliated, and there has been a loss of life on both sides. To this day, gold rushes occur

(such as in Mato Grosso state in late 2015), and garimpeiro wildcat gold panning impacts the region's water, riverbeds, and fish. Neighboring farms are adversely affected by large-scale mining operations that use dredges and highly toxic mercury, which is required for gold extraction.

Another predatory clandestine industry, the illegal logging of mahogany and other high-value hardwood species, has expanded significantly, driven by foreign demand for precious lumber, again frequently with violence on Indian land. Not only does illegal logging degrade the Amazon rainforest and its ecosystems, but corruption in the legal timber trade means that very little of the profit reaches the communities where the trees were found.⁶

Units of the Fuerzas Armadas Revolucionarias de Colombia (FARC) have been attracted to Brazil to purchase logistical support and by the profit potential of illicit gold mining, drug trafficking, and related activities.⁷ The 1991 Traira River incident was a shock to Brazilian public opinion and an affront to the country's sovereignty. A 40-man FARC unit attacked an army detachment of 17 in Brazil near two gold fields, killing three and wounding nine. The event highlighted Brazil's alarming vulnerability. Despite an unprecedented cooperative Brazilian-Colombian military operation into Colombian territory by Brazilian special forces that eliminated the FARC unit and retrieved stolen equipment, incursions continue to occur, as has bilateral military cooperation and combined operations along sensitive parts of the border zone.⁸

Drug smuggling traverses Peruvian and Bolivian borders into the states of Acre, Mato Grosso, Mato Grosso do Sul, and Rondônia. Colombian and Peruvian cocaine also follows clandestine routes into Brazil from Paraguay. Extensive use of aircraft to transport drugs has diminished since Brazil passed a shoot-down law in 1998, but large quantities of narcotics are still moved by river. Today, cocaine paste often travels by boats aided by global positioning systems to labs in the Peruvian, Colombian, and Brazilian rainforest. The finished cocaine moves by fishing craft and scheduled passenger services to ports and then by oceangoing vessels to locations around the country. Consumption has risen steadily and significantly, making Brazil the second-largest consumer of cocaine in the Western Hemisphere after the United States. Brazil also serves as a transit country for illicit drugs from neighboring Andean countries destined primarily for Europe. By the mid-2000s, Brazil's civilian and military leaders realized that drug trafficking and the organized crime networks involved posed a serious security problem, requiring the reluctant armed forces to become directly involved in the frontier zone supporting the federal and state police departments. Given the scale of the narcotics problem and the vast size of the borders, any progress in reducing drug trafficking is likely to be modest and incremental.⁹

Although the ubiquity of drug-related activities along all sections of Brazil's frontier attracts the most police and military attention, there are other cross-border security concerns.

Beyond checkpoints, the frontier is wide open. Brazilian and foreign criminal groups have created routes to smuggle into Brazil refugees from Haiti and other countries as well as controlled substances such as mercury and contraband commodities from weapons and cigarettes to software and used cars. Commodities transported illegally from Brazil include precious and semi-precious gems, uncertified commercial lumber, and fauna and flora.¹⁰ Contraband represents in 2015 an estimated annual loss of around 100 billion real (equivalent to U.S. \$288 million) to the economy, damage to local industry, and loss in tax receipts.¹¹

Prioritize the Amazon!

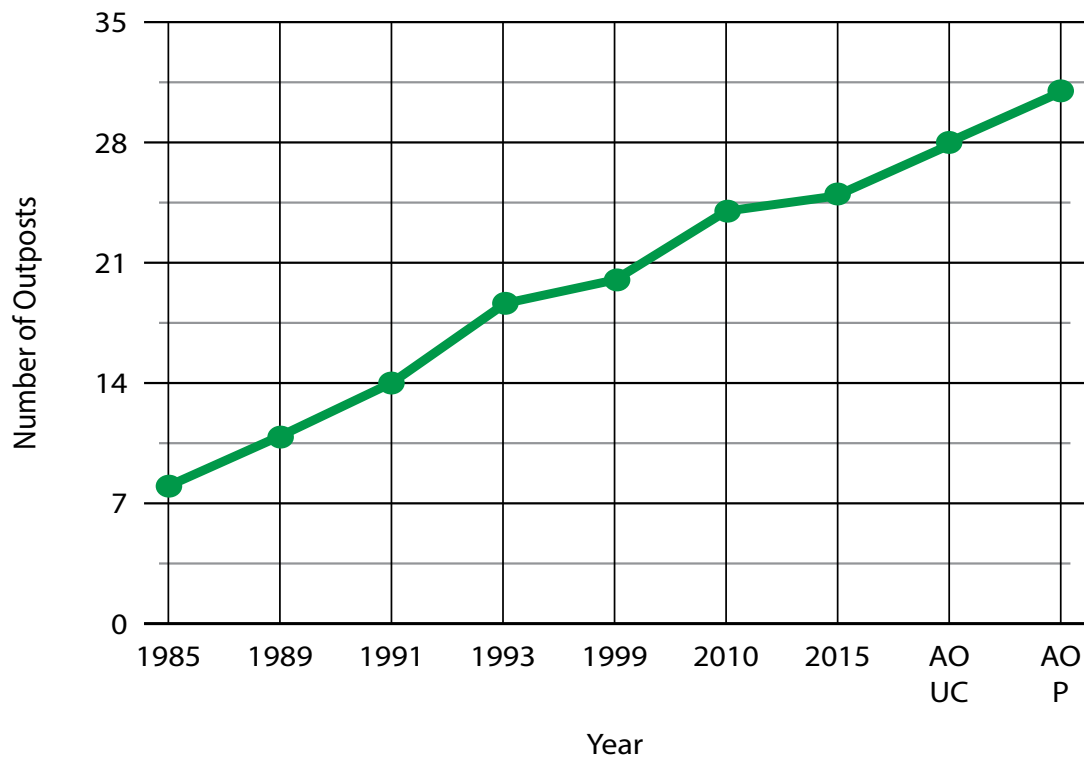
Traditional military missions along the frontier were to monitor the border and provide other agencies with intelligence, logistical support, and training when needed. The armed forces' approach to these roles changed radically over the last 30 years. Four major initiatives influenced the evolution of Brazil's frontier security efforts. The first commenced in 1985 with a military and civilian border area development plan, the Calha Norte program, which began by deploying eight special border platoons from jungle infantry battalions to create posts along the border. From these locations and working with detachments from federal ministries, the army would develop local infrastructure. In 1992 Brazil launched the second initiative, the System for the Surveillance of Amazonia (Sistema de Vigilância de Amazônia, or SIVAM) with its integrated air traffic control, environmental, and surveillance information technologies. The system did not become fully operational until 2004. Led by Nelson Jobim, the ministry of defense in 2008 announced a National Strategy of Defense, the third initiative, that established regional priorities and prescribed operational, stationing, and capability development guidelines. It took effect in 2010. Finally, in 2011, President Dilma Rousseff's government launched its Strategic Borders Plan by decree, which formalized and expanded joint military-law enforcement security operations across the whole land frontier against the full range of criminal activities.

The Calha Norte Program

Brazil's armed forces, fearing foreign encroachment north of the Amazon and Solimões rivers, collaborated with an inter-ministerial work team to propose an ambitious plan, *Programa Calha Norte* (Northern Corridor), which President Sarney approved in December 1985. Initially classified in an effort to hide the precarious nature of the Brazilian presence along the frontier, the initiative was designed to establish a small, permanent military presence at selected sites able to watch and control rivers and other strategic locations, such as important Indian communities, and with other federal agencies encourage economic and social development.¹²

The ambitious initiative’s objective was to increase the presence of the federal government in an important part of the Amazon region, contributing to national defense by providing assistance to local settlements and securing the border. Calha Norte encompassed a crooked corridor of land approximately 150 miles wide and 3,900 miles long, for a total land area of 720,000 square miles. The targeted populations were in the states of Amapá, Acre, Amazonas, Rondônia, Roraima, and municipalities in the Northern Corridor of the Amazon River in Pará state and the island Marajó. As originally conceived, the promotion of security and development involved four priority action areas: augmenting military and government presence in the zone, creating clearly demarcated international borders through surveying and physical markers, increasing bilateral relations (in terms of commerce and technical and infrastructural cooperation), and defining an appropriate policy for indigenous groups in the corridor, particularly the large community of Yanomami Indians. The rationale gradually expanded to include interdicting drug trafficking and preserving the environment. Regrettably, no federal ministry was tasked to coordinate the

Figure 2. Growth of Special Border Platoons, 1985–2015 and Projected



Key: AOUC = additional outposts under construction; AOP = additional outposts planned.

Source: *Jane’s Sentinel Security Assessment—South America*, “Brazil’s Army Annual Reports,” 2015.

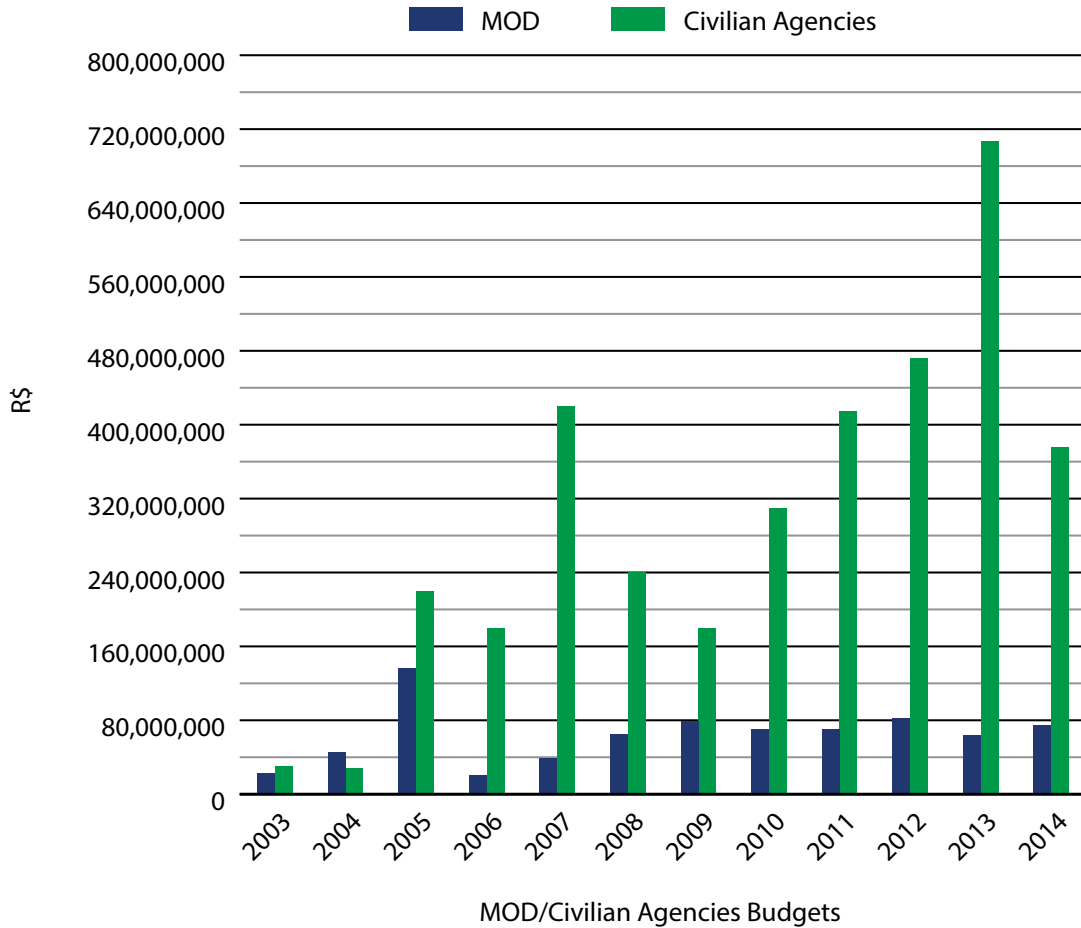
program and manage its implementation. When the congress reduced funding after 1988, civilian ministries lost interest and failed to sustain their commitments.

By default, Calha Norte became a military-led development program to build bases, roads, and other infrastructure. The linchpin for the program was the placement of a small number of army special border platoons at strategic locations close to indigenous and other settlements along the northern border. In concept, the military post would be augmented by civilian expertise from government agencies to introduce a school, a medical clinic, a community center, a federal police agency, a bank, a system of communication, and perhaps an airfield built and maintained by the air force. The original eight posts would serve as community embryos and provide the foundation for future growth. In addition, Calha Norte funds would help the armed forces start to build bases, airfields, and other infrastructure in relatively close proximity to support units along the border. The army repositioned a helicopter force from southern Brazil to Manaus in 1991. The navy had a lesser role that emphasized securing rivers and bringing medical treatment to the riverine population, where possible, using two new hospital ships. Even though the army was able to increase the number of special border platoons over the course of the 1990s (see figure 2), overall implementation of the project proceeded slowly. The armed forces' lack of funds was matched by insufficient civilian interest.¹³

Calha Norte suffered financially during the 1990s, receiving 3.5 percent of the estimated annual budget,¹⁴ as a result of its identification with the past military dictatorship at a time of increasing aversion to the armed forces. The military (mainly the army) continued to fund the program and kept it alive. With zones of instability near the borders with neighboring countries, the Amazon reemerged in the late 1990s as a region of paramount concern for Brazilian security, although without increases in funding. When President Fernando Henrique Cardoso created the country's first ministry of defense in June 1999, he gave a strong voice to the defense of the Amazon and finally established a home for the management of the federal Calha Norte program in the ministry.

Then in 2004, President Lula revitalized Calha Norte as his administration brought renewed interest in and increased funding for Amazonian development and control of the frontier. During Lula's two terms (2002–2010) and that of President Rousseff, there was greater funding as Brazil's economy took off, but it fluctuated markedly in response to the price of commodities as well as domestic and international politics. From 2003 to 2014, the federal government allocated over R\$3.8 billion on Calha Norte. Approximately 80 percent went to the civil development side in Amazonian municipalities ranging from paved roads and new schools to nurseries and soccer fields.¹⁵ With the overall growth in funding for Calha Norte, which after

Figure 3. Annual Budgets for the Calha Norte Project, 2003–2014



Sources: Calha Norte Annual Budget Reports.

the 2008 National Defense Strategy remained constant for the ministry at approximately R\$72 million allocated, the armed forces were able to establish more bases for special border platoons and parent jungle infantry battalions as well as build airfields and naval facilities, expanding the military presence in the northern Amazon (see figure 3).

As Calha Norte celebrated its 30th anniversary in 2015, it had supported settlements in 194 municipalities in 6 northern states. Only half were located within the faixa de fronteira, 90 miles from the border and contributed to the surveillance and monitoring of that strategically relevant area.¹⁶ The remaining municipalities were further inland, showing how a bold

and multidisciplinary government initiative can be of social significance to Brazilians.¹⁷ In 2015, President Rousseff officially expanded the scope of the program to encompass the entire Amazon region.

The special border platoons at the heart of the Calha Norte project are an innovation that have proved their value over time. The members of these volunteer units, who are graduates of the Jungle Warfare Training Center, live with families in austere outposts, usually for a year. Many soldiers are from indigenous communities. The locations along the frontier usually are on an important river near a local or indigenous community. One strategic site along the frontier with Peru is adjacent to a Portuguese fortification from the 17th century. Beginning with 8 special platoons, the number has grown over the last 30 years to 25, with 3 more in development and another 3 being planned (see figure 2). Each platoon has at least one officer, 50 to 70 soldiers, a generator, and wireless communication. The platoon's mission is captured by four words: life, work, vigilance, and combat. They perform a broad range of activities, most beyond traditional defense and military functions, such as growing crops, hunting/fishing, caring for livestock, building and repairing community infrastructure, providing education, first aid, and community protection, exercising police powers in their area, and maintaining the trust of the community. In other words, local governance and development, early warning, and limited law enforcement are in the hands of army personnel.¹⁸

After the Cardozo government created the ministry of defense, one of its first actions was to broaden the mission of the armed forces in the Amazon region from the traditional defense of national sovereignty to include combating narcotics trafficking and other forms of smuggling. The military's new role was defined in two landmark federal laws. The 1998 *Lei do Abate* authorized the military to shoot down hostile aircraft, including those purported to be carrying drugs or other contraband, although several years passed before the installation of radars was complete and the law was enacted.¹⁹ A related federal law passed in 1999 gave the armed forces authority to search for contraband and make crime scene arrests in the border zone, which is understood to be the area within 90 miles of the border. The law emphasized that the military can

*act through preventive and repressive actions in the border zone, at sea and in inland waters—regardless of the ownership, property, purpose or any encumbrance upon them—against transnational and environmental crimes, alone or in coordination with other agencies of the Executive Branch, conducting, among others, the following actions: I—patrolling, II—inspecting/searching people, land vehicles, ships and aircraft, III—on-scene arrests.*²⁰

In practice, members of the armed forces try to involve representatives of law enforcement, if possible, when an arrest must be made.

The System for the Surveillance of Amazonia

SIVAM, announced by the Brazilian air force in 1992, started initial operations with 50 percent of the architecture in place in 2002 and became fully operational 2 years later. The project, in which Raytheon had a major role, continues to be refined as radar and other information technology becomes more capable. The system, overseen by the ministry of defense (Air Force Command), is a complex network of 25 fixed radars and airborne radars aboard sophisticated Air Force Embraer R-99A early warning aircraft, environmental sensors, satellite imagery terminals, wireless communication networks, computerized data collection, and ground-based air traffic monitoring centers designed for surveillance and coordination. State-of-the-art SIVAM architecture, which covers 61 percent of Brazil's land mass, generates and disseminates information on border control and criminal activity. Of equal importance, the system enhances Brazil's understanding of the Amazon's ecology, as well as scientific, economic, and social development issues. SIVAM provides results in six areas:

- environmental surveillance (maps, climate, and environmental data)
- processing of meteorological information (maps, observations and patterns, early warning systems)
- land and air surveillance (law enforcement, discovery of illegal air strips, tracking deforestation and illegal mining, drug cultivation and production areas)
- monitoring and processing regional communications (official records of regional air-wave communications)
- air traffic control (flight security, radar-controlled airways, flight planning)
- planning and control of regional operations (plans of action, operational support, emergency search and rescue).

The information gained through SIVAM is shared with the overarching System for the Protection of Amazonia (Sistema de Proteção da Amazônia, or SIPAM), which provides support,

coordination, and oversight for sustainable development initiatives that are carried out by multiple public agencies working in the Amazon.²¹ The ministry of defense also is interested in having neighboring countries associate with SIVAM. Information is shared with Colombia and Peru.

National Strategy of Defense

From 2002 through 2007, the armed forces conducted a series of training maneuvers and law enforcement operations in remote areas across the country to assess the military's ability to defend Brazil against a variety of potential threats. The objectives included information collection on the Amazonian region; testing unit readiness and deployment capabilities to the borders with all neighboring countries; learning from combined exercises in southern states and southeastern coastal areas; testing responses to simulated invasion scenarios; and exploring how to conduct law enforcement operations with federal and state police forces and other government agencies in different border zones. Military discussions with Minister of Defense Nelson Jobim (2007–2011) and knowledgeable government civilians led to the development of the ministry's landmark 2008 *National Strategy of Defense: Peace and Security for Brazil*. Under the Brazilian Complementary Law that promulgated the strategy in August 2010, congress and the defense ministry became jointly responsible for the defense strategy. The law also required an unclassified white paper to inform the country. It is to be updated every four years, explaining how the armed forces are implementing the strategy.

Jobim's consolidation of a new consensus on the legitimacy of Brazil's defense needs reflected a major contrast in the attitudes of both the defense establishment and Brazil's civil society. The strategy engages the Brazilian people to explain the aim of modernizing the national defense structure.²² The Brazilian Amazon has a prominent place. The northern and western sections of the national frontier are considered the most vulnerable parts of the country and regions where Brazil must be watchful and make an unconditional reaffirmation of its sovereignty. The document's approach to territorial control reflects the well-established military belief that security requires sustainable development and preservation projects as well as measures taken by the uniformed forces. The latter continues the repositioning of forces from all services in Amazonia and the restructuring of some conventional capabilities to facilitate presence and operations there. Since 2008, the armed forces have improved communication capabilities and undertaken a number of joint security operations intended to increase the military's presence in the faixa de fronteira. Funding from both the Calha Norte project and the ministry of defense made this possible. During Lula's tenure, Brazilian defense budgets grew almost 28 percent as the entire federal government benefited from the country's economic boom (see figure 1). As an



Admiral Mike Mullen, then Chairman of the Joint Chiefs of Staff, right, and Brazilian Minister of Defense Nelson Jobim, center, walk past Brazilian ship in Amazon River in Ipiranga, Brazil, March, 2009 (DOD/Adam M. Stump)

indicator of progress, the Brazilian navy has had to establish nine regional commands of differing size in the vast Amazonia. The air force has seven, while the army has eight.²³

The *National Strategy of Defense* assigns critical importance to the triple imperative of *monitor and control*, *mobility*, and *presence*. These three concepts govern the mid-term and long-range development of capabilities and force structure for each branch of the armed forces, as well as shaping their near-term operational doctrine. The first imperative emphasizes the ability to monitor and then control national airspace, territory, and jurisdictional waters. The scope of the concept stresses surveillance for early warning and identification, pattern analysis, and the acquisition of advanced means to strengthen these capabilities. In or over border areas and jurisdictional waters, Brazilian “front line” units from all services remain vigilant, perform surveillance tasks, and contribute information to an integrated monitoring system that benefits

from satellite imagery. The second imperative of utmost importance is mobility, the ability of relatively nearby and strategic reserves to reach an operational area quickly and have the tactical capability to move within it. Mobility allows Brazil to overcome the limiting effects of the vastness of the nation's land and sea frontiers in order to defend sovereignty. The final concept is military presence along the frontier and in forward reserve locations. The strategy makes clear that "given the continental dimensions of the national territory, presence may not mean omnipresence. A presence gains effectiveness thanks to its relation to monitoring and control and mobility."²⁴

The document also is a directive to "reposition the personnel of the armed forces." The guidance validates the efforts of the armed forces over the last two decades, albeit with limited funds, to restructure and reposition forces from bases in southeast and south Brazil to a more challenging theater in the north and northwest. The military's initial emphasis was on developing essential infrastructure needed to relocate forces. Adaptation to the Amazon operational theater presented huge challenges. The army, for example, had to create the Jungle Warfare Training Center in Manaus to teach servicemembers how to use the rainforest to their advantage. The service's doctrine for small unit operations had to be modified for unconventional warfare. The demanding environment forced changes in communication capabilities and procedures, mobility (more aviation assets and river boats), logistics, and engineer construction on the saturated soil. Initially, the army created a small special operations capability, similar to U.S. Army Special Operations Forces, as a centrally located strategic reserve and direct action force for the border. For a better jungle infantry structure, the army gradually established jungle infantry brigades. They now are composed of one to four jungle infantry battalions. Selected battalions may have two to seven special border platoons, depending on the importance of their sector of the frontier. As required, the other jungle infantry battalions are mobile and operate in the rainforest around the platoon posts. Today, there are five jungle infantry brigades and one being formed, all within the north arc of the Amazon region. The units are 100 percent volunteer, and members receive 10 percent extra pay. The Amazon Military Command was positioned in Manaus to provide command and control of the jungle infantry forces. The army recently created a new, smaller Northern Military Command farther east in Belem.

The south Atlantic Ocean is becoming Brazil's new Amazon. As in Amazonia, visions of riches—in this case oil and minerals in the continental shelf—have increased defense concerns. The Brazilian navy's repositioning has increased attention to south Atlantic territorial waters. Navy doctrine emphasizes sea denial and deterrence in the "Blue Amazon." Consistent with doctrine, Brazil purchased an aircraft carrier and submarines from France, which constitute a

powerful deterrent force for the region and substantial protection for the country's 4,600-mile coastline and its offshore and onshore resources. The aircraft carrier purchased from France in 2000 is operational, and the navy has launched a program to build four conventional French Scorpene submarines and one nuclear-powered submarine. The shipyard that will build them was inaugurated in 2013. All submarines are expected to be operational by 2025. In addition, the navy is developing a Blue Amazon Management System (Sistema de Gerenciamento do Amazonia Azul, or SisGAAZ), known as SIVAM at Sea.²⁵

The navy's role in border security and waterway control in the terrestrial or "Green Amazon" and the Paraguay-Paraná River Basin in the south has led to another modernization program. The navy will increase its presence using more patrol craft and transport ships capable of navigating inland waterways.²⁶ Since 2008, the navy has provided *Pedro Teixeira*- and *Roraima*-class patrol vessels and several transport ships with helicopters and adapted them to work with marine units in order to ensure the control of river banks during riverine operations.²⁷ New marine riverine brigades with riverside operations battalions have been formed. In the Amazon, the headquarters for the 2nd Fleet and a marine division have been established in Belem.

The air force fulfills important surveillance and monitoring functions in Amazonia with early warning and remote-sensing aircraft forward deployed to a limited number of all-weather airfields. Since 2015, a few non-weaponized unmanned aerial vehicles (UAVs or drones) also perform these missions. Small transport aircraft provide in-region mobility for logistical support and medical evacuations. Super Tucano fighters often are scrambled to interdict clandestine aircraft crossing Brazilian air space. Air force construction engineers play an essential role building basic landing strips in difficult locations close to major Indian communities and, if possible, near special border platoons.²⁸ It took 10 months in 2007, for example, to construct a 700-meter-long strip of dirt and crushed rock to support an influential Indian community in a remote border area near Venezuela and Guyana. Heavy construction equipment had to be carried in piecemeal by helicopter and reassembled on the ground. Now there is at least one flight per month by the National Air Mail Service to deliver supplies, medicines, and occasionally healthcare personnel, all of which convey a sense of government interest.²⁹

Border Security Operations

Early in her first administration (2011–2015), President Rousseff vowed to toughen border controls. The result was a law entitled Plano Estratégico de Fronteiras, the Strategic Borders Plan, unveiled in June 2011. Among other key elements, congress formally reaffirmed granting policing powers to the armed forces within 90 miles of the frontier to augment the efforts of the



Patients receive dental care onboard ship *Lieutenant Maximiano* during Operation *Agatha 6*, October 2012 (Ministry of Defense/Felipe Barra)

federal police to suppress illicit trafficking of narcotics and the smuggling of contraband and people. The Strategic Borders Plan called for the revitalization of Operation *Sentinel* (Sentinela da Pátria), which had begun in 2010. These operations are overseen by the ministry of justice and the federal police department with support from the armed forces. The law also created a new program to fight crimes on the frontiers, Operation *Ágata*, which is led by the ministry of defense and the armed forces with support from the federal police and other law enforcement agencies.³⁰ In May 2013, President Rousseff decided to make combined military and police border operations a “constant” rather than a series of short-term in-and-out actions with specific objectives in different geographical locations.³¹ The Strategic Borders Plan has helped eliminate confusion of roles and missions between law enforcement agencies and the armed forces. The minister of defense has taken an unprecedented step to improve effectiveness by creating a joint military-police command center for border issues inside the ministry of defense. This has worked well. Brazil’s vice president has used the center to chair regular cross-agency meetings that bring together environmental, trade, and other officials.³²

Under the 2011 Strategic Borders Plan, the ministries of justice and defense expanded their collaboration on security operations to reassert control of border areas and disrupt smuggling and illegal activities. The *Ágata* series began in 2011; the ninth and tenth operations occurred in 2015. The duration of each operation is typically 30 days; each takes place along different sections of the frontier; and the size of the force varies. The largest operation to date, *Ágata 7*, which occurred from May to June 2013, was timed to precede the Confederations Cup soccer tournament and the visit of Pope Francis. *Ágata 7* spanned Brazil's entire frontier and involved 33,500 military personnel (all services) and an array of military equipment, as well as 1,100 public servants from the federal police, federal highway police, and other state police agencies. Nineteen tons of narcotics were confiscated.³³ During these operations, in addition to fighting crime, the military promotes civic-social actions with the aim of bringing medical and dental care to indigenous communities and poor local residents. It would not be uncommon to see a Brazilian air force field hospital on barges pushed by tugboats visiting communities along the Rio Negro and other navigable rivers. The first six *Ágata* operations resulted in 59,717 medical and dental procedures and 9,000 vaccinations.³⁴

In addition to the *Ágata* series, the Brazilian army, navy, air force, and joint staff organize their own joint security exercises and operations throughout the Amazon region. These are done on a smaller scale but are still in collaboration with the federal police and civilian representatives from various government institutions and nongovernmental organizations. The army, for example, conducted Operation *Curaretinga V* in November 2014 with a series of combined security patrols along nearly 1,800 miles of the Brazil-Bolivia border. Almost a year later, in September 2015, the army and the police launched Operation *Curare VI*, a series of operations dedicated to the state of Roraima. The units operated in the inhospitable terrain along the 1,153-mile border shared with Venezuela and Guyana. Satellite images provided by SIPAM/SIVAM allowed the forces to locate and raid areas of the rainforest where illegal mining and logging were taking place as well as pinpoint and destroy clandestine landing strips.³⁵ Positive outgrowths of contemporary border security operations have been improvements in the interoperability within the armed forces and the ease of collaboration between military units and the federal and state police. At least one border state, Mato Grosso, created a small, elite Special Group on Border Security (Grupo Especial de Fronteira, or Gefron) in 2002 to support federal agencies responsible for security of the frontier between Brazil and Bolivia. The police unit specializes in the prevention and repression of drug trafficking and smuggling, and the theft of property and assets. Gefron recently was recognized for outstanding performance at the border in 2015, having seized a record 1,770 kilograms of drugs.

The frequency of the confiscations, the quantities, and the variety of items seized have increased since 2011 with the advent of operations *Ágata* and *Sentinel* as well as army and navy collaborations with law enforcement agencies. The federal government finally instituted a regional database of items seized during these operations. In the first 6 months of 2011, military-police operations along the borders with Argentina, Paraguay, Uruguay, Colombia, Bolivia, and Peru seized over 115 tons of drugs, 65,000 bottles of alcohol, 650 kilograms of explosives, 200 vehicles, 4.2 million packs of cigarettes, and over 500 weapons.³⁶ Two years later, during *Ágata 7*, which covered the entire land border, 184,000 vehicles and over 12,000 river craft were inspected, leading to the confiscation of 25 tons of marijuana, 657 kilograms of cocaine, crack, and hashish, 4.9 tons of explosives, and 4.5 cubic meters of timber.³⁷ In May 2014, *Ágata 8*, with over 30,000 military personnel operating along all borders, seized 40 tons of narcotics, which demonstrated that the lessons learned during *Ágata 7* had been incorporated. The expansion of military and law enforcement cooperation has had an increasingly positive impact on smuggling activities and environmental degradation. Still, no matter how large and frequent the border security operations, the territorial extension of the frontier, and the Amazon itself, is so vast and the dexterity of criminal organization so skillful that any progress controlling the *faixa de fronteira* is likely to be modest and incremental.

The introduction of a few police and air force reconnaissance drones in 2015 has strengthened operations in border zones and provides a confidence-building way to assist a neighbor (if requested by Bolivia or another country). A drone's ability to sustain monitoring of suspicious activities as well as provide surveillance in remote parts of the frontier sharpens the ability of the military and police to react.

While seizures of narcotics and weapons make headlines, less attention is paid to the trafficking of wild animals and other natural commodities, which has become a business worth over R\$2.5 billion in Brazil.³⁸ According to the World Wildlife Fund, as Brazilian authorities have increased pressure on transnational criminal networks, some traffickers have switched to smuggling exotic animals—a job with less risk of inspection and with a good profit.³⁹ Perfume, chia seeds, and geodes also have been confiscated by customs authorities in the last year, usually along the Brazil-Paraguay border. Illegal logging and gold mining remain a problem along the northern frontier. In May 2013, the federal police launched Operation *Ibira* just to dismantle illegal logging activities in the state of Pará. More recently, the army's Operation *Curare* in the adjoining state of Roraima destroyed 12 barges and 4 clandestine landing strips that organized criminal groups had been using to support large-scale illegal mining. Army personnel also

seized about 1,200 cubic meters of illegal timber, the vehicles to transport it, fuel, and an assortment of equipment to harvest the timber.⁴⁰

Weaknesses in Brazil's Approach

All border areas in the *faixa de fronteira* have received greater attention for national security and sustained development since President Lula's administration. The armed forces and law enforcement departments work hard to combat an array of domestic smugglers and transnational organized criminal networks and meet the humanitarian needs of Brazilians along the vast land border in 11 rural states. But in such an enormous region, real progress must be modest and uneven at best. Federal auditors from the Brazilian Federal Court of Accounts (Tribunal de Contas da União, or TCU) recently released a critical study of the government's approach to border security. The TCU pointed to the lack of a legal framework and a master plan, binding over time on all federal and state players, to promote sustainable development, regional integration, and national security. Instead, forward movement depends on presidential involvement and executive decrees. As often happens, a second weakness is a lack of understanding within the federal government of the complexity of the challenges along the frontier and the subsequent difficult and slow interagency coordination process. A final weakness is the impact of a harsh recession, currency devaluation, and a political crisis involving the president. Brazilian defense spending has declined steadily from a peak in 2010. The 2016 defense budget, for example, suffered a real decrease of 6.2 percent. The future of the Integrated Border Monitoring System (Sistema Integrado de Monitoramento de Fronteiras, or SISFRON), in which there was rising investment, has been slowed. Analysts forecast that the severity of cuts will gradually lessen after 2019.⁴¹

The Midwest and South

The midwest and south constitute 40 percent of Brazil's frontier. Most of the "twin cities" along Brazil's borders are in this area. The challenge to national sovereignty and for control of the border zone from the state of Mato Grosso southeast to the state of Rio Grande do Sul and the Atlantic coast is no less intense but is different in several ways than in the Amazon region. The terrain continues to feature extensive river systems (the Paraguay, Paraná, and Uruguay rivers), generally flowing south rather than east and passing through land that is rolling savanna rather than rainforest. A unique feature is the Pantanal, a natural region encompassing the world's largest tropical wetland area (54,000 to 75,000 square miles, depending on the season). It is located mostly in Brazil's state of Mato Grosso do Sul but extends into portions of Paraguay and Bolivia.



Brazilian navy patrol vessel with helicopter landing pad navigates Paraguay River along frontier zone with Paraguay (Military Operations Portal of the Ministry of Defense)

The main security concerns in the midwest and south are drug trafficking, including marijuana, and smuggling. The range of contraband items is different, emphasizing firearms, explosives, cigarettes, pharmaceuticals, and vehicles. With the relocation of many Brazilian army units to the Amazon, there is less military presence on land. There are no special border platoons at strategic locations. Security is mainly in the hands of law enforcement. The challenge the police face in this region, from a Brazilian perspective, is exacerbated by semi-lawless areas in Paraguay, the under-policing of Uruguayan and Argentine frontiers, and the growing role of Brazilian organized crime gangs such as the First Capital Command (Primeiro Comando da Capital, or PCC) as the drug traffickers in neighboring countries.

The tri-border area encompassing the cities of Ciudad del Este, Paraguay, Foz de Iguacu, Brazil, and Puerto Iguacu, Argentina, is renowned for its legacy of smuggling and for reputedly being the largest black market in the Western Hemisphere. Contributing to this reputation is money laundering and the financing of Middle Eastern terrorism. Brazil, Paraguay, and Argentina cooperate to track and interdict the flow of money and contraband commodities. In 1996, the three governments created a Tripartite Command, which still functions to coordinate intelligence analysis and police operations against the many forms of organized crime in this area.⁴²

Paraguayan plantations near the border with Brazil produce high-quality marijuana (approximately 5,900 tons annually). Moreover, the country is a conduit for cocaine from the Andean region (an estimated 40 tons annually). Brazilian crime groups have taken root in Paraguay. The PCC now plays a major role in trafficking narcotics to Brazil's market and to international ship-

ping points and moving most of the other smuggled commodities. The federal police, the federal highway police, and state law enforcement agencies face the brunt of the security challenges supported by some army and air force capabilities and the Brazilian navy's presence on navigable rivers. Looking ahead, the federal police has announced plans to establish 11 new bases along the frontier with Paraguay and purchase additional helicopters, riverine boats, and weapons.⁴³

The border with Paraguay is a focal point for frontier security operations. A cooperative relationship began in 1988 when the Paraguayan ministry of justice and the Brazilian federal police signed a bilateral counternarcotics accord to assist Paraguay's National Anti-Drug Secretariat in the eradication of marijuana grown close to their shared border. The two governments extended the scope of the agreement in 2011. The federal police share intelligence and work closely with their counterpart to improve technical and tactical capabilities. Operation *New Alliance IV* (2013), a recurring joint marijuana eradication initiative, is an example of successful collaboration.⁴⁴ On the military side, each service in the Brazilian armed forces provides extensive military training and professional education to strengthen the ability of their Paraguayan counterparts to defend their country and control national territory. Since the adoption of the Strategic Border Plan, the ministry of justice has conducted numerous police operations with military support in the *Sentinel* series in the midwest and south. The ministry of defense has focused five of nine *Ágata* operations in this region either on a specific target area, such as the Paraguayan border, or as part of an all-borders security operation.

Modernization and International Cooperation

Brazil's federal government has not been complacent in moving forward with the approach to frontier security spelled out in the *National Strategy of Defense* and its companion Strategic Border Plan. Implementing the strategy and plan has institutionalized security operations across the entire frontier zone, strengthened collaboration among the services and between the military and police, and improved their relations with other national and state agencies. There are weaknesses, however, that need to be addressed. Two particularly important weaknesses are information technology for surveillance to improve early warning of border violations and criminal activity and expanded bilateral action with neighboring countries to address shared security concerns.

Improved Surveillance

The *National Strategy of Defense* reminds the defense sector that technology cannot substitute for combat or men on the ground, but given the austere environment along most of the



SIVAM-related satellite receivers for use at sites throughout Amazonia (System for the Vigilance of the Amazon)

frontier, Brazil's armed forces have had to rely on technical processes to reinforce their presence and physical capabilities.⁴⁵ The military commands responsible for security along the northern and western frontiers in the Amazon rely heavily on the information from the comprehensive regional monitoring system, SIPAM, and its key component, the Amazon Surveillance System. Its meteorological data, satellite imagery, and radar images and remote sensor activations help manage air traffic and assist in pinpointing ongoing illegal activities. As a general matter, however, the government's readiness to react anywhere along the entire border remains slow and often inadequate. The principal problem is early warning. Control centers are able to see illegal activities taking place, but this does not provide sufficient warning to activate a timely response.

Challenged by the emphasis on surveillance in the *National Strategy of Defense* but encouraged by SIVAM's technological advancements, the army in 2010 began working with Atech, a Brazilian company with extensive experience in integrating systems and networks. The objective has been to design the SISFRON, for which the government intends to spend an estimated

R\$12 billion throughout its planned 10 years of implementation. The system is best described as an electronic fence for real-time identification of threats and communication with command centers capable of activating operational units against any breach of security. SISFRON will integrate sensors along the entirety of the border, imaging radars, modern communications, decision-making support, towers for observation and the transmission of signals, optical and thermal cameras, satellite imaging, drones, special riverine vessels, and four operating centers. (At least 75 percent of its equipment will be manufactured by Brazilian companies.) The positioning of SISFRON will be based in part on the presence of special border platoons in the north and west, which will gradually increase in number from the current 25 to 48, and on army battalions and their brigade headquarters stationed at strategic locations in the midwest and south. An important challenge will be to mesh with SIVAM, the navy's SisGAAz, and other major surveillance systems within the Brazilian armed forces.

The Army launched a SISFRON pilot project in November 2014 at the headquarters of the 4th Mechanized Cavalry Brigade in Dourados, Mato Grosso do Sul. Most of the brigade's units are stationed along the border with Paraguay, covering almost 360 miles. The test of the pilot project is to provide early warning and sustained surveillance across the entire length. Military authorities expect the pilot project will end in 2016. If successful and if funding permits, the project will be expanded north and south in the next phase. To the north, SISFRON will be used by the 13th Motorized Infantry Brigade in Mato Grosso to cover a 470-mile border with Bolivia and by the 17th Jungle Infantry Brigade in Rondônia and Acre to cover an 805-mile border with Bolivia and an 858-mile border with Peru. To the south, SISFRON will be established in an area under the responsibility of the 15th Mechanized Infantry Brigade in Paraná, a state that borders Paraguay (125 miles) and Argentina (176 miles). The armed forces anticipate the SISFRON project, integrated with SIVAM, could be fully operational by 2022 and ultimately cover Brazil's entire land frontier.⁴⁶ The country's ongoing financial difficulties, however, have had a serious impact on the defense budget and slowed the progress of the SISFRON program. This has raised concern that by the time the program is completed much of the technology will have to be modernized.

Cooperation with Neighbors

Brazil's defense of its sovereignty and control of a 10,000-mile border rely in part on its ability to cooperate and collaborate with neighbors. The Brazilian government traditionally prefers bilateral engagement on security issues instead of working within larger regional organizations in which consensus decisionmaking often proves difficult and actionable agreements are

elusive. There are exceptions, however. Under growing international environmental pressure in 1978, Brazil encouraged Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela to join the Amazon Cooperation Treaty (often referred to as the Amazon Pact) to secure the entire Amazon against any external intervention. In 1995, pact signatories established the Amazon Cooperation Treaty Organization (ACTO) to promote wide-ranging cooperation. In 2002, they created a permanent secretariat in Brasilia; meetings are held every 2 years. The original issues discussed at ACTO emphasized sustainable development, environmental protection, and indigenous rights—nothing related directly to security.

Brazil's armed forces initiated bilateral regional military exchange meetings in the 1980s with Colombia, Venezuela, and Uruguay. They have continued on an annual or biannual basis. The initiative was expanded to include Paraguay, Peru, Guyana, Bolivia, and most recently Argentina. The first operational collaboration began in the 1990s as information-sharing between the Brazilian air force and its Peruvian and Colombian counterparts. Over the years, the countries have passed radar tracks, shared other information about unauthorized flights by drug traffickers, and discussed the control of airspace. There have been periodic air interdiction and pursuit training exercises with the Venezuelan air force, which led in 2005 to a Mutual Cooperation Agreement to Combat Aircraft Traffic Involved in Transnational Illicit Activities. While the two air forces continue to exercise together, the effectiveness of SIVAM in providing early warning of airspace violations and identifying illegal air strips for destruction reduced the urgency to ratify the agreement. Ten years later, it still has not been finalized. Efforts to revitalize the fight against drug trafficking along sections of the frontier brought Brazilian and Colombian law enforcement together in 2000 with the ongoing Operation *Cobra*. In 2003, Brazil launched similar actions with Peru (Operation *Pebra*) and Venezuela (Operation *Vebra*)—the first letters of each country's name providing the name of the operation. The Brazilian army began maneuvers in remote areas that border Colombia in 2002. Today, the countries work together to fight organized crime along the frontier, including environmental offenses like illegal mining. Army units conducted parallel operations on both sides of the border in 2015 and 2016.⁴⁷

The potential for regional defense cooperation seemed excellent with the announcement of the *National Strategy of Defense* in 2008. Brazil took this opportunity to convince neighbors to join a South American organization that, for Brazil, would be the linchpin of its continental strategy. The result was a Union of South American States (União de Nações Sul-Americanas, or UNASUR) founded in 2008, with a South American Defense Council organized in 2009. UNASUR and the defense council improved confidence-building among neighboring countries and facilitated routine meetings of defense, justice, and interior ministers. The members

did not address the main security issue, cooperation against transnational criminal networks, until 2012. To date, UNASUR has shown little interest in having the nascent South American Defense Council tackle this complex and politically sensitive issue, which is beyond its current mandate.⁴⁸

President Rousseff's 2011 Strategic Borders Plan reenergized Brazil's efforts to enlist neighbors in joint efforts to target cross-border trafficking of narcotics, arms, and people and promote bilateral cooperation on matters of defense through the exchange of information, military training, and professionalization. The primary recipients of an increase in military and police training projects, managed by the Brazilian Cooperation Agency, have been the least-developed countries of Suriname, Guyana, and Paraguay. A neighbor of considerable interest concerning drug trafficking is Bolivia, particularly after the Evo Morales government expelled representatives of the U.S. Drug Enforcement Administration in 2008 to demonstrate independence from the United States. Brazil and Bolivia began almost immediately to share intelligence and satellite imagery. The United States, working behind the scenes, provided some of the information as part of a trilateral project that expired in 2013. The federal police agreed to support their Bolivian counterparts in 2011 by flying reconnaissance drones in Bolivian airspace near the border to report on the production of coca plants and the trafficking of cocaine. In 2012, Brazil donated four helicopters to aid interdiction efforts. Bilateral collaboration on anti-drug efforts began to wane in late 2013, the result of unrelated diplomatic disagreements, and Bolivia turned to other international partners. Peru has played an active role sharing intelligence, and France recently sold Bolivia 13 mobile radars that can be positioned at important sites. In 2015, Brazil reengaged Bolivia concerning international crime networks.⁴⁹

Brazil's relationship with Peru is warmer and less problematic. An agreement was concluded with Peruvian law enforcement in 2010 to conduct joint anti-drug operations along their border. Both governments share intelligence and operational information and agreed to improve coordination by establishing bilateral police liaison posts in several Amazonian cities in both countries.

Brazil continues its close association with Colombia. In 2011, Bogotá was the first government to discuss opportunities for collaboration after President Rousseff announced the Strategic Borders Plan. Within 7 months, the two countries' defense, foreign affairs, and justice ministries created and formalized the operation of a Bilateral Border Commission to share intelligence and coordinate joint mechanisms for operations to fight organized crime. The agreement quickly led to improved trade relations in the industrial security sector. More recently, the Bilateral Border Commission was expanded for a tripartite relationship that includes Peru. The

navies of the three countries have already joined forces to combat transnational criminal activities in the Amazon region. Looking to the future, Brazilian officials are hopeful that success with SISFRON will provide a foundation for the development and implementation of a modern cooperative security framework with Colombia and other neighboring countries.⁵⁰

In the future, Brazil's cooperation with neighbors will be intensified and further challenged by the integration of regional transportation infrastructure in South America. In particular, the transcontinental highway spanning Brazil and Peru is nearing completion. This highway will speed transcontinental shipments from the coast and interior of Brazil to ports in Peru for onward shipment to China and other Asian countries. Once in use, this new land corridor will be a magnet not only for commercial traffic but also for illicit traffic, which will require new control procedures and technologies. The transcontinental highway moved forward despite strong opposition from environmental advocacy groups in both countries, and the same is true for other regional transportation proposals such as the development of multimodal axes to the Amazon Waterway by Peru and Ecuador. Peru's project will connect the Pacific port of Paita with the Huallaga River port of Yurimaguas. Ecuador's project envisions a Manta to Manaus corridor. Feasibility studies also have started on a transcontinental railroad megaproject involving China, Brazil, and Peru.

Lessons from Brazil's Experience

It is difficult to grasp the enormous magnitude of Brazil's frontier environment or to comprehend the scope and scale of the challenges faced by civil and military authorities trying to defend national sovereignty and control a border zone that traverses 10,000 miles of not only dense tropical rainforest, inhospitable terrain, and ubiquitous river systems of great width, length, and power, but also huge tropical wetlands, extensive farm land, and large urban settlements. In addition, the frontier is dynamic and constantly changing. Authorized deforestation, for example, has resulted in newly arable land that can sustain communities, large soybean plantations with international markets, and a wide range of jobs. Development over the last 30 years also has attracted criminal organizations that are active in drug trafficking as well as illegal mining and logging, which have become lucrative alternative sources of income for many of these crime groups. These wildcat operations have led to the destruction of forest reserves and the habitat of many indigenous Indians. Securing the long border and protecting natural resources means providing security for Brazilians living not only within the 90-mile border zone but also well beyond it—over 20 million of them. While Brazil's defense and law enforcement challenge is unique and



Helicopters fly over Purus River in Paricatuba during Operation *Amazon*, September 2012 (Ministry of Defense/ Tereza Sobreira)

demanding, there are seven interesting lessons from the country's experience that may be useful to other countries.

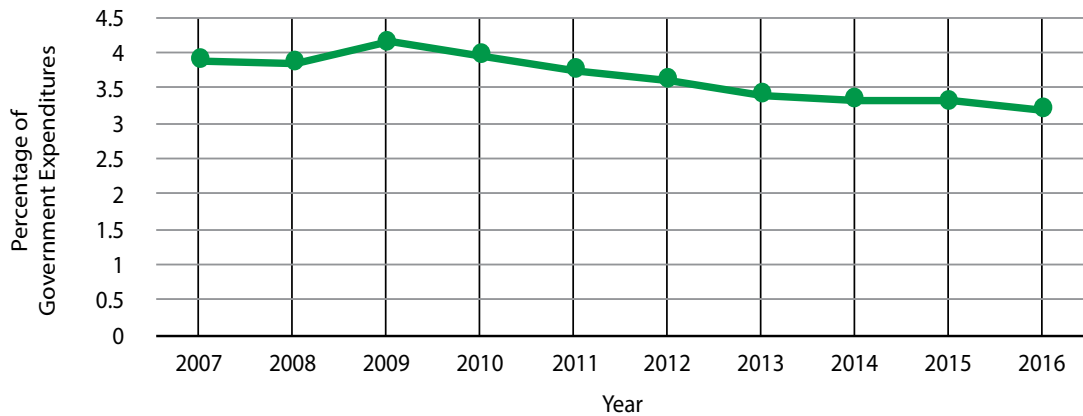
First, progress with frontier security requires civil-military harmony, presidential leadership, the political will to allocate the resources to support development, guarantee national authority, and protect strategic vulnerabilities such as the Amazon, and a comprehensive national defense strategy to guide capacity-building and day-to-day operations. During the period of military rule from 1964 to 1985, Brazil lacked political legitimacy for efforts to control the northern border. The most the armed forces could accomplish was to begin to establish military presence with some reaction capability and to develop community infrastructure. Slow and limited progress began with the return to civilian rule and increased after the presidential election of Lula da Silva. During his two terms, stewardship of the Amazon became a highly emotional international issue under pressure from Europe and North America. Lula was a staunch defender of the country's approach to caring for Amazonia and an advocate for protecting the frontier and fighting cross-border organized crime. With his involvement, the budgets for both

the civil agency and defense sides of the Calha Norte project began to increase, with a particular emphasis on development. President Lula's successor, Dilma Rousseff, sustained his interest in responsibly developing Amazonia and strengthened frontier security. Her administration's approach, embodied in her 2011 Strategic Borders Plan, pursued aggressively integrated military and police operations throughout the frontier zone. Though slowed by recent financial difficulties, many border security operations have supported preparations for major international events taking place in Brazil.

A turning point in Brazil's approach to frontier security was the 2008 *National Defense Strategy*, a decree signed by President Lula. The strategy consolidated and clarified goals, prioritized regions (the north, west, and the south Atlantic), and discussed how the armed forces should be organized to defend sovereignty and provided guidelines for the performance of their roles and assignments in both peace and war. Of particular importance is the strategic approach embodied in the triple imperative—monitor and control, mobility, and presence. The scope of these three concepts is quite broad, ranging from where forces in each service would be stationed to a doctrine of joint operations. Defense of the frontier, particularly the Amazon, and having dissuasive capabilities to protect the country's natural resources are priority missions, but the strategy also addresses important defensive sectors such as cybernetics, space, and nuclear power. The process of developing, coordinating, and promulgating the *National Defense Strategy* coincided with an increased share of funds for defense in the federal government's expenditures (see figure 4, which also shows the growing impact of the economic recession after 2011).⁵¹

The triple imperative is now the foundation of Brazilian strategic thinking. As applied to the defense of the frontier zone (and the maritime equivalent), the military presence is desirable and difficult to realize and therefore must be approached flexibly. The national strategy stresses during peacetime "the versatility with which presence . . . is replaced with the capacity to be present (mobility) under the light of information (monitoring and control)."⁵² The mobility component is of utmost importance. The ministry of defense defines strategic mobility as the ability to quickly reach the theater of operations; tactical mobility is the skill to move rapidly in the theater. Mobility compensates for the vastness of the space to be defended and the shortfalls in resources to do it. Creating a mobile military supported by a mobile logistics apparatus is a sensible approach to guaranteeing a state's authority and protecting its strategic vulnerabilities and material patrimony. Today, Brazil's army is in the process of acquiring long-range transport aviation and increasing the number of medium-range helicopters to be able to deploy more quickly into less accessible regions. The army also is testing river patrol boats to improve its ability to counter smuggling activity.

Figure 4. Defense as Percentage of Government Expenditures



Source: Andrew MacDonald, IHS Jane’s Defence Budgets.

Second, timely and accurate information is crucial for defense and law enforcement operations in a faixa de fronteira. In the early 1990s, Brazil’s federal government realized that it lacked adequate surveillance capabilities and had limited, often out-of-date intelligence about criminal activities along its difficult border. In addition, in the case of the northern and western zones, Brasilia realized it was poorly prepared for air traffic control and knew little about Amazonian ecosystems. SIVAM, which became fully operational early in the 21st century, was the first step toward correcting the deficiencies in knowledge. The system with radar and satellite surveillance and wireless communication technology succeeded. The ministry of defense continues to invest heavily in refining information technologies to create better ways to integrate monitoring capabilities on land and sea and in the air. Unfortunately, Brazil’s current financial difficulties have led to delays in the enhancement of border surveillance capabilities, although the ministry and the army are determined to fulfill the requirements.

SISFRON, with its integrated use of modern radars, drones, sophisticated sensors, and night vision, is a relatively new domestic project to integrate with and move beyond SIVAM in protecting Brazil’s borders against smuggling and arms trafficking. If a country lacks the resources to invest in information technology and associated infrastructure, it can integrate existing radars and communications capabilities, as Brazil had done previously. This step can support information-sharing among the armed forces, law enforcement, and other national and state agencies tasked with protecting a border region.

Mexico has begun to adopt aspects of the Brazilian model. Mexico’s Aerial Surveillance System (Sistema Integral de Vigilancia Aérea, or SIVA) became operational at the end of 2013.⁵³

This system of long- and short-range radars, UAVs, and sensors focuses primarily on Mexico's southeast border region and its off-shore exclusive economic zone. This region shares many characteristics with the Brazilian Amazon, such as difficult terrain, limited state presence, and high levels of illicit activity. Mexico based SIVA on the Brazilian model of using surveillance technology to support its border protection activities.

Third, effective control of Brazil's 10,000-mile border zone and interdiction of wide-ranging smuggling operations require unprecedented collaboration between Brazil and its neighbors. Strengthening security partnerships with countries that share the dangers posed by international criminal organizations is a basic tenet of the 2008 National Strategy and the 2011 Strategic Borders Plan. Efforts to collaborate are not new. The armed forces hold regional military exchange meetings annually or biannually with all neighbors except Suriname and French Guiana. Discussions with Colombia, Venezuela, and Uruguay began in the 1980s. There also are recurring combined military operations along both sides of a common border with a few countries. Brazil's armed forces and federal police share intelligence, provide information about upcoming operations, and discuss cooperation with land, river, and air operations. Efforts to work together sometimes are stymied by unrelated diplomatic obstacles. In addition to the regular regional military exchange meetings, Brazil's experience suggests three initiatives that have produced positive results. They include the Brazilian military or federal police providing technical and tactical training that enhances the recipient's capabilities for border defense and moves toward interoperable forces speaking Portuguese and using Brazil's radio communication protocols. A second initiative offers the external deployment of Brazilian drones for reconnaissance over frontier areas of interest to a neighbor's government. The third, exemplified by a recent agreement between Brazil, Colombia, and Peru, aims at the joint development of defense products, in this case a commonly developed patrol boat designed to interdict the Amazon's river systems.⁵⁴

Fourth, collaboration within the Brazilian government contributes to operational success in the field. The integrated organization of the *Ágata* (Defense) and *Sentinel* (Justice) series of law enforcement activities mandated in the Strategic Borders Plan has produced positive results. Granting policing powers to the armed forces within the frontier zone also has been beneficial when the number of police agents is small and their rotations are frequent. While border crime and wildcat activities persist, improvements in surveillance have made their conduct more precarious and vulnerable to disruption. *Ágata* and *Sentinel* not only fostered collaboration among army, navy, and air force commands but also caused the military to work with police and civilian representatives from various government agencies. Closer collaboration is

the goal. As mentioned previously, *Ágata 7* in 2013 is an example of the massive integration of 35,500 personnel from the army, navy, and air force as well as 1,100 public servants (federal police, federal highway police, state police, and officials from other federal and state agencies) for an operation that spanned the entire frontier. This integrative approach, which also can be seen in operations to regain control of Rio's *favelas* (slums), has become the national norm, but not without some tension among players. More recently, the federal government took action to coordinate security operations along the frontier, which did not occur during the early Calha Norte years. The minister of defense established a joint military-police command center for border issues within the ministry. This mechanism has facilitated operational planning and encouraged coordination across many interested federal and state agencies. In addition, the armed forces and federal police department share information about upcoming operations with counterparts in neighboring countries that would be most affected. This helps minimize surprise, eliminates potential problems, and often denies criminals the ability to cross a river into another country or flee into another rainforest.

Fifth, the Brazilian armed forces realize that long-term commitment is critical. Sustainable border security requires the federal government to control territory, bring essential infrastructure and whole-of-government services to the local population, and demonstrate that officials, most often military, are there to stay and can be trusted. For decades, the army's special border platoons have been the federal presence in a small number of strategic locations in the frontier zone. They have provided rudimentary governance, played a role in local development, as well as performed a security surveillance mission. Having the trust of local populations makes it difficult for criminals to operate. As an indicator of their importance, the 24 platoons along northern and western sections of the border are expected to increase gradually and ultimately almost double when SISFRON is fully operational. The creation of more border platoons is one of the measures planned to improve law enforcement actions. Their effectiveness has led the Colombian army to replicate the Brazilian model. Bolivia and Peru also are considering it.

Economic and social development on a larger scale, often by a public-private partnership, is inextricably linked to national security. An Amazon Regional Connection Program, for example, is under way. It will provide 4,680 miles of fiber optic cable run underwater along the banks of the Negro, Madeira, Solimões, Purus, and Juruá rivers in Amazonas state. The cable will improve digital communications infrastructure and connect 52 municipalities. The refurbishment of decaying roads, construction of bridges and short airfields, and the general expansion of transportation networks help federal and state agencies reach remote areas, introduce governance, and disrupt criminal planning of illegal activities. Many of the armed

forces' social-civic actions that are part of border security operations provide rural societies with much-needed medical and dental attention and access to fresh water and electricity as well as offering the opportunity for educational advancement. Brazil's social-civil programs provide examples of how the federal government can increase its presence and win the trust of isolated local communities. The ministry of national integration has been working with Brazil's border states on a plan for the regional and sustainable development of the frontier strip with the aim of promoting socio-economic development and trade integration in the country and with South American neighbors.⁵⁵

Sixth, during the first two decades of the Calha Norte project, the armed forces (and after 1999, the ministry of defense) lacked political support in the congress and consequently did not receive adequate resources, but they did what they could until support materialized during Lula's presidency. While efforts to understand and react to the array of frontier security challenges in a largely unfamiliar environment were a slow process, the armed forces adopted a deliberate approach to test and evaluate different operational situations and responses. This effective procedure contributed to two landmark documents, the well-conceived *National Strategy of Defense* and the Strategic Borders Plan. The same approach was used in the creation of SIVAM. The Brazilian defense industry's development of SISFRON also is being built on the experience with SIVAM, addressing its shortcomings, and based on the results of the pilot phase of implementation along a section of Brazil's border with Paraguay.

Finally, the United States should approach cooperation with Brazil with caution on issues concerning frontier security and the Amazon's environment. The country's longstanding fear of foreign intervention on matters pertaining to rainforest conservation or indigenous Indian communities persists. Some segments of the country's defense and security leadership are alarmed by discussion of the Amazon's role as a global asset in climate change and other environmental protection issues, to include intense advocacy by prominent U.S. politicians. These groups continue to see the United States as the major threat to Brazil's sovereignty over the Amazon despite respected in-country U.S. environmental programs. In the late 1990s, Brazil considered U.S. deployments of military radars to Colombia for anti-drug trafficking support and humanitarian exercises in other neighboring countries potentially threatening and demanded prior notification of such activities. In some circles, such suspicion persists. The *National Strategy of Defense* underscores that the armed forces must have dissuasive capabilities to defend sovereignty. The document directed the army to develop doctrine and capabilities to conduct nonconventional operations against an unnamed larger adversary focusing specifically on jungle warfare and border surveillance. While extensive consultations and dialogue have

strengthened the generally friendly relationship over the past 20 years, little attention beyond counternarcotics technical assistance has been given to Brazil's frontier security. Perhaps the best approach for the United States is to learn from Brazil's experience. The United States has enduring difficulties with the concept of military-police cooperative operations, and certainly in conducting complex, multiagency, multinational security operations, so learning from Brazil's experience would be beneficial.

Conclusion

The Brazilian approach to frontier security over the last 30 years has been a success on multiple levels. At the foundational level of civil-military relations, the Brazilian military demonstrated initiative, patience, and adaptability in recommending a new approach to frontier security and then serving as the junior partner of diverse civilian agencies during the 1980s and 1990s when funding was slim and civilian partnering erratic. But the military proved reliable and dedicated to the Calha Norte program over time, which increased civilian trust that the military could be relied upon to play in a limited but professional manner.

On a technical and operational level, the military successfully adapted to the new mission focus with special border platoons and tailored aerial surveillance and communication technologies, successes that encouraged civilian authorities to eventually respond with more resources. The bulk of SIVAM capabilities were in place by 2002—that is, *before* the Brazilian gross domestic product and federal budget skyrocketed—demonstrating the military had won the confidence of civilian authorities for important mission areas such as air traffic control over the Amazon and the frontier surveillance mission (see figure 1). Similarly, when Brazilian military budgets increased as a share of government expenditures, civilian authorities wanted reassurance that the funds would be spent in accordance with a strategy that made sense for the nation as a whole. With the leadership of the minister of defense in coordination with the minister-in-chief of the secretariat of strategic affairs, the ministry of defense responded with the well-received 2008 *National Strategy of Defense*.

The 2008 *National Strategy of Defense* provided true strategic direction and cemented civil-military partnership in formulating national security strategy. In many ways, it was a landmark event signaling the formal rehabilitation of the Brazilian armed forces after their two-decade foray into domestic politics; their transformation from guardians of domestic order to a new posture for national defense; and their subordination to a national plan of defense to guide resource allocation that was supported by both civil and military authorities. Befitting a national plan rather than a military one, the document builds on Brazil's progress managing border secu-

rity as a multi-agency, multinational cooperative venture. The same is true for the 2011 Strategic Borders Plan. With the military's relocation and reorganization still taking place, the ministry of defense and the armed forces nonetheless took the initiative to work in close cooperation with the federal police department, other federal authorities, and state agencies. The results have been undeniably positive. A passive and dispersed military presence has been transformed into comprehensive civil-military cooperation and significantly improved interdiction efforts in the frontier zone.

The impact of Brazil's economic recession that began in 2011 and the recent political crisis in response to widespread corruption have resulted in fewer resources for the military and the government as a whole. However, with a successful foundation of good civil-military relations in place, strong guiding strategy documents, and a proven track record of interagency and international cooperation, Brazil's military should be able to weather the resource drought even better than it managed resource scarcity for Calha Norte in the 1980s and 1990s. In that respect, the Brazilian military is an example to its contiguous neighbors but also to the United States, which also by most accounts is entering a period of relative resource scarcity and demands for better interagency and multinational approaches to complex security issues.

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