

SUSTAINABLE INFRASTRUCTURE IN THE AMAZON

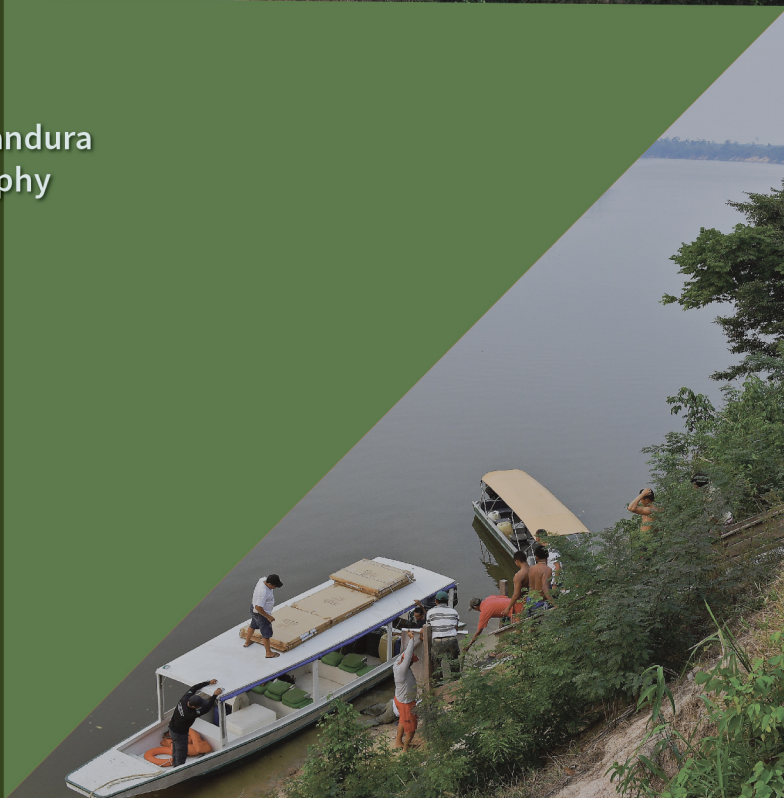
OCTOBER 2020

*Connecting Environmental Protection with
Governance, Security, and Economic Development*

Peru Country Case Study

AUTHORS

Romina Bandura
Owen Murphy



A REPORT OF THE CSIS
PROJECT ON PROSPERITY AND DEVELOPMENT

CSIS

CENTER FOR STRATEGIC &
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Acknowledgments

This report would not have been possible without the generous support of the Gordon and Betty Moore Foundation, with thanks in particular to Kristina McNeff. We are grateful that you have entrusted CSIS with such a significant undertaking. We would also like to thank Hareem Abdullah, Mary Margaret Burniston, and Fernanda Silveira for their excellent research assistance.

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Executive Summary

Peru is often referred to as an Andean country, yet 60 percent of its territory is in the Amazon rainforest. The Peruvian Amazon holds a wealth of resources: forest cover, waterways and biodiversity, minerals and agricultural products, and ecosystem services, among others. However, a host of governance, security, and infrastructure challenges have created strains on the forest, and sadly, since 1990, the Peruvian Amazon has been steadily deforested. The main culprits of deforestation in the Peruvian Amazon are agriculture, cattle ranching, coca cultivation, gold mining, infrastructure projects, and logging, with illicit forms of these activities also contributing significantly to deforestation. However, deforestation cannot be confined to an environmental lens, since it is also emblematic of broader vulnerabilities in Peru's rule of law, security, and governance. Introducing infrastructure development into this already complex picture also increases those risks.

The present case study analyzes infrastructure development in the Peruvian Amazon and its connection to deforestation, human security, and the rule of law. The case study draws from a wide range of literature as well as expert interviews. The aim of the case study is to offer a more comprehensive view of deforestation in the Peruvian Amazon and to explore whether environmental degradation is an indicator for broader vulnerabilities in human security and the rule of law. Finally, the case study examines the role infrastructure plays in exacerbating or alleviating these vulnerabilities.

Deforestation, Human Insecurity, and Governance in the Peruvian Amazon

The Peruvian Amazon faces socioeconomic challenges: more than 85 percent of the people in the region work in the informal economy, and citizens often lack economic opportunities and access to basic social services such as water and sanitation, healthcare, and education. This vulnerable socioeconomic situation is compounded by insecurity and weak governance, which impede the region's long-term development. Illegal gold mining, coca cultivation, and logging threaten both the inhabitants of the Peruvian Amazon and the environment in which they live. Approximately 28 percent of the gold mining in Peru is conducted illegally. Gold mining not only clears trees and undermines the rule of law when done illegally, but also has a less visible cost through the mercury contamination of water sources. Peru is also the second-largest cocaine producer in the world, behind only Colombia and ahead of Bolivia. Most drugs produced in Peru later find their way to Brazil, Europe, or Oceania.

Unfortunately, regional and local governments in Peru often lack the technical capacity, personnel, and budgetary resources to effectively address disputes regarding illegality, land governance, and public service provision. Moreover, corruption across sectors and levels of government wastes valuable public resources and creates a general sense of impunity for different actors to exploit. At the same time, inadequate land governance creates opportunities for settlers to invade property, leading to further deforestation.

Infrastructure Development in the Peruvian Amazon

Despite these challenges, the current approach to the economic development of the Peruvian Amazon has mainly used a resource-extraction framework that does not properly address weaknesses in governance, nor the social and security complexities in the region. Although infrastructure projects—such as the construction of hydroelectric dams and roads—have been developed to increase connectivity and foster economic growth in the region, these too have also contributed to further deforestation. Politicians have

used infrastructure, in particular road development, as a “winning strategy” for electoral victories, oftentimes disregarding the potential negative effects that these projects could create in a sensitive ecosystem such as the Amazon.

Infrastructure has primarily been pushed forward without a careful analysis of the best engineering designs and sustainable alternatives, an approach that has ignored the potential externalities and beneficiaries of these endeavors. Migration towards and urbanization of the Amazonian region has accelerated as a result of infrastructure projects, but local governments have been unable to provide adequate public services to meet increased demand.

Part of the challenge lies within infrastructure planning. There is little systematized information about the region in terms of proposed projects, how these projects relate to an economic vision of the Amazon, and which projects should be prioritized. Many of the proposals in the Amazon are promoted by public and private sponsors in a disjointed way, without an analysis of their interconnections and their collateral effects. Many of the infrastructure works proposed are road projects. Oftentimes an illegal or informal road has been built, and local governments decide to resurface or repave it, thereby “formalizing” its existence. A large road may improve trade logistics and enable greater transportation access to remote regions, but political motives that do not follow economic principles often drive the decision to construct these roads. Moreover, projects often do not account for environmental and social externalities. Many of these roads have brought in settlers, local smallholder farmers, and forest-dwelling communities, which has led to innumerable unplanned deforestation efforts. In many cases, road projects are executed without following the corresponding socio-environmental regulations. Accountability, transparency, and access to project information during the different phases of project cycles are still weak despite the presence of legal tools. There are also significant differences in terms of environmental and social standards applied by the different infrastructure project sponsors.

The Future of Infrastructure Development in the Peruvian Amazon

Although infrastructure investments are needed to support economic growth and social development in the Amazon, baseline conditions such as insecurity, weak territorial governance, and poor institutional capacity of regional governments need to be addressed. Otherwise, investments in infrastructure will be wasted, and economic growth will not be realized. The best way for infrastructure to serve the Amazon would be to first craft a sustainable development plan for the region and then to embed infrastructure projects into this plan. This plan should target economic activities that can provide meaningful alternatives to informal and illegal operations and should address the conditions needed to enable development, such as rule of law and effective governance. Infrastructure plans will need to be redesigned and embedded in this vision in order to avoid exacerbating existing challenges.

1. Devise a Sustainable Development Vision for the Amazon Basin

A new development paradigm of the Amazon Basin is needed, one that combines economic and social prosperity for its citizens, environmental preservation, and human security. Many of the regions that comprise the Peruvian Amazon have the highest population growth in the country, and people need jobs and social investments to support their wellbeing. Combatting illegal activities and protecting communities will require more than just heightened security forces on the ground: security also needs to be linked to economic plans.

The Peruvian Amazon will need to shift its production systems so that they are not as dependent on the fluctuations of international commodity prices. Suggestions include the transformation of commodities

into manufactured goods and services to increase their added value, as well as investments in technology-based industries that are independent of natural resources. Products such as rubber, Brazil nuts, and rare fruits such as camu camu, açai, and aguaje could make up a larger portion of the Peruvian Amazon's exports if infrastructure project planning processes improve and the correct incentives are established. For example, one could utilize Amazonian agriculture commodities as protein for fish farms, which lend themselves well to the warm ponds of the Amazon and require only a small surface area. Fish farming could benefit rural populations by creating a value-added production chain that boosts incomes and food security. Another recommendation includes investing in technology-based industries that are independent of natural resource extraction, such as cold storage and refrigeration during transit. Furthermore, Peru is the number one global exporter of organic coffee and cocoa—both of which are commodities that have seen increases in public demand for sustainable sourcing and transparent supply chains.

2. Address the Basic Enabling Conditions for Development

Basic enabling conditions for development need to be addressed such as increasing government transparency, devising innovative security models through technology and partnerships with communities on the ground, strengthening land governance, and improving fiscal decentralization to better match resources to spending needs.

In terms of security, successful programs such as the Monitoring of the Andean Amazon Project (MAAP) have demonstrated the power of digitalizing bureaucracy by leveraging GIS and drones to identify environmental crimes. Extensions of this technology include collaborating with indigenous communities to use drones to identify illegal incursions on their protected territories. On a broader scale, there is a fundamental need to expand information and communications technology to increase transparency between governments, indigenous communities, and donors.

The prosecution of environmental crimes could be improved by modelling successful initiatives such as Operation Mercury, developing operating bases for conservation crimes, implementing specialized environmental prosecutors, and increasing investigative capacity in Amazon-dense regions such as Madre de Dios and Loreto. More fundamentally, reforms at the personnel level should be a priority, including the expansion of staff training and budgets, as well as filling vacancies. Uncovering environmental crimes may also benefit from institutionalizing investigative tactics, including the use of confidential informants and undercover operations.

3. Strengthen Infrastructure Planning and Embed It into a Sustainable Development Vision

A sustainable pathway for the future of the Amazon must be accompanied by investments in infrastructure. Regional plans must be coordinated and integrated with the national infrastructure plan to avoid duplicating different initiatives and wasting much needed budgetary resources. In this regard, the decision-making process for selecting infrastructure projects needs to be technically sound and transparent. Social and environmental impacts need to be included early in the design phase—not only once the project has been approved—to ensure that all stakeholders are fully aware of impacts before any project breaks ground. Real community participation and an honest and informed discussion on the gaps and priorities of the region must be common practices going forward.

The default specific infrastructure project for the Peruvian Amazon tends to be in transport. However, there is little quality official information on the extent of the current road network, including informal or

illegal roads. Regional governments need to conduct a comprehensive inventory of secondary and tertiary roads in the Peruvian Amazon to diagnose the extent of the irregularities, and then remove those that are illegal. Furthermore, roads should not be regarded as the solution to all transportation problems in the region. Rivers in the Amazon Basin can be used to transport bulk commodities (such as grains, minerals, timber, and biofuels), while air transport could be subsidized for harder to reach communities. That said, when using rivers and other waterways as a form of transportation, there must be an acknowledgment of the environmental and health externalities that economic activities have on these water resources.

Air transit could also be expanded in the Peruvian Amazon to reduce the reliance on roads. While some flights to remote regions are already subsidized, the social impact of the new routes could outweigh the other costs. Moreover, if new road construction or road improvements are not economically, environmentally, and socially justifiable, then it is necessary to minimize this form of infrastructure. If roads are determined to need resurfacing or re-pavement, parallel efforts should be taken to improve agricultural productivity or incentivize economic alternatives, so that there is no increased deforestation and land grabbing as a result. At the same time, programs for reforestation and restoration of degraded areas need to be designed and strengthened.

In terms of energy provision, the construction of hydroelectric dams has stalled in the Peruvian Amazon, but alternatives that are more environmentally friendly—including solar and wind power—should also be considered. Furthermore, social infrastructure is lacking in the Amazon: higher investments in water and sanitation services in underserved areas are needed, and services in urban clusters need to be improved.

Introduction

Peru is often referred to as an Andean country, yet 60 percent of its territory is in the Amazon rainforest.¹ Of the nine Amazonian countries, Peru is second only to Brazil in terms of total Amazon rainforest territory.² The Peruvian Amazon is comprised of five main states or “regions” (Amazonas, Loreto, Madre De Dios, San Martin, and Ucayali—see Map 1) and holds a wealth of resources: forest cover, waterways and biodiversity, minerals and agricultural products, and ecosystem services, among others. However, a host of governance, security, and infrastructure challenges have caused strains on the forest, and sadly, since 1990, the Peruvian Amazon has been steadily deforested (Box 1). Government officials have recognized that “unless decisions are taken on the matter, forest loss could reach 300,000-400,000 hectares per year” (741,000-988,000 acres or roughly the size of Luxembourg).³

Approximately 2.7 million people live in the Peruvian Amazon Basin (representing 9.2 percent of Peru’s population).⁴ The Amazon is home to many indigenous groups, with approximately 330,000 indigenous Peruvians directly depending on the Amazon rainforest for their livelihoods.⁵ In fact, in Madre de Dios—one of the most culturally diverse regions in the Peruvian Amazon—there are 19 different ethnolinguistic groups present.⁶ But some of these Amazon Basin communities are tremendously remote, only accessible via boat or multiple days’ journey through dense jungle.

¹ Margarita Benavides, “Amazonía Peruana,” Infobosques, 2016, 6, http://infobosques.com/portal/wp-content/uploads/2016/12/Amazonia_Peruana.pdf; and “South America: Peru,” CIA World Factbook, n.d., <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/pe.html>.

² Julian Smith and Jill Schwartz, “Deforestation in Peru,” *World Wildlife Magazine*, Fall 2015, <https://www.worldwildlife.org/magazine/issues/fall-2015/articles/deforestation-in-peru>.

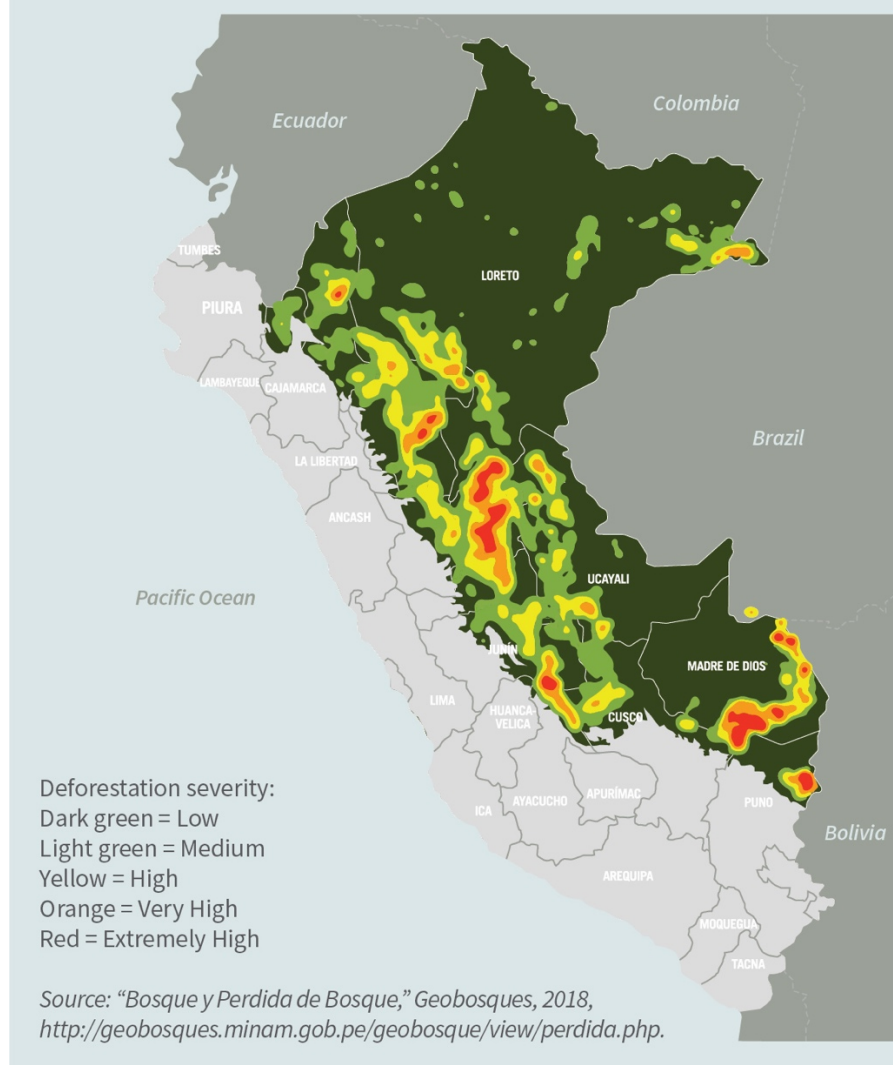
³ Roberto Cortijo, “Peruvian Amazon Undergoing Deforestation at Accelerating Pace: Official,” Phys.org, May 8, 2018, <https://phys.org/news/2018-05-peruvian-amazon-deforestation-pace.html>.

⁴ “Population and Housing,” INEI, n.d., <http://m.inei.gob.pe/estadisticas/indice-tematico/poblacion-y-vivienda/>.

⁵ CAAP, “Población Indígena de la Amazonía Peruana Supera los 330,000 Habitantes,” August 10, 2016, <https://www.caaap.org.pe/website/2016/08/10/poblacion-indigena-de-la-amazonia-peruana-supera-los-330000-habitantes/>.

⁶ Sam Goodman, “The Role of NGOs in Mitigating the Impact of the Inter-oceanic Highway,” American University, 2014, 71, <https://www.american.edu/sis/gep/upload/sam-goodman-srp-final-draft-4.pdf>.

DEFORESTATION HOTSPOTS OF THE PERUVIAN AMAZON



The regions that constitute the Amazon have an average poverty rate roughly double the national average.⁷ Social infrastructure development in the Amazon often lags behind that of other regions: citizens often lack economic opportunities and access to basic social services such as water and sanitation, health care, and education (Table 1).⁸ Moreover, more than 85 percent of the people in the Peruvian Amazon work in the informal economy.⁹ While the regional economies have a diverse economic basis, they are mainly driven by extractive industries and agriculture-related activities (Table 2).

⁷ "Pobreza y Gasto Social" INEI, n.d., <https://www.inei.gob.pe/estadisticas/indice-tematico/sociales/>.

⁸ "Peru Data and Statistics," Knoema, n.d., <https://knoema.com/atlas/Peru>.

⁹ "Más del 80% de trabajadores son informales en la Macro Región Oriente," Gestión, December 6, 2015, <https://gestion.pe/economia/80-trabajadores-son-informales-macro-region-orient-92194-noticia/>.

Table 1: Access to Basic Services (Most Recent Year Available)

REGION	ACCESS TO POTABLE WATER FROM A PUBLIC GRID (% , 2018)	ACCESS TO A PUBLIC SEWER NETWORK (% , 2018)	ACCESS TO ELECTRICITY (% , 2016)	UNEMPLOYMENT RATE (% , 2017)	GDP PER CAPITA (USD , 2018)
National	68.4	74.5	91.6	49.0	\$6,729.89
Amazonas	27.6	57.7	77.1	66.5	\$3,312.79
Loreto	45.7	42.1	76.6	57.4	\$10,172.00
Madre de Dios	61.1	54.9	91.8	37.2	\$6,693.73
San Martin	46.3	49.9	91.7	57.3	\$2,896.13
Ucayali	42.7	42.7	87.4	44.3	\$3,623.06

Source: Data collected by CSIS researchers from José García Zanabria et al., Peru Formas Acceso a Agua Para Consumo Humano, Lima: INEI, 2019, 68, https://www.inei.gob.pe/media/MenuRecursivo/boletines/boletin_agua_nov2019.pdf; INEI, “Servicios,” 24, https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1520/cap01.pdf; “Peru Indicadores Nacionales,” SINIA, <https://sinia.minam.gob.pe/modsinia/index.php?accion=verIndicador&idElementoInformacion=1605&idformula=160>; Francisco Costa Aponte et al., Peru: Indicadores de Empleo e Ingreso Por Departamento 2007-2017, Lima: INEI, July 2018, https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1537/libro.pdf; and INEI, Producto Bruto Interno Por Departamentos 2018, Lima: INEI, June 2019, 57, https://www.inei.gob.pe/media/MenuRecursivo/boletines/pbi_departamental2018.pdf.

Table 2: GDP Composition and Growth in the Peruvian Amazon, 2018

REGION	MAIN SECTORS (% OF REGIONAL GDP)	FASTEST GROWING SECTORS (% GROWTH)	MAIN AGRICULTURE PRODUCTS
Madre de Dios	-Extraction of petroleum, gas, and minerals (39.4%) -Other services (15%) -Trade (11.9%) -Construction (7.2%) -Agriculture, granary, hunting, and forestry (6.8%)	-Telecommunications and information services (11.2%) -Construction (8.3%) -Agriculture, granary, hunting, and forestry (5.1%)	- <i>Brachiaria</i> ¹⁰ -Papaya -Maize -Plantains
Ucayali	-Other services (22.5%) -Trade (17.4%) -Manufacturing (14%) -Agriculture, granary, hunting, and forestry (9.6%) -Construction (8.5%)	-Telecommunications and information services (12.3%) -Construction (8.4%) -Restaurants and accommodations (5.1%) -Trade (4.1%)	-Plantains -Palm oil -Yuca -Cacao -Rice -Papaya
Loreto	-Other services (24.8%) -Trade (18.4%) -Extraction of petroleum, gas, and minerals (13%) -Agriculture, granary, hunting, and forestry (9.3%)	-Telecommunications and information services (11.2%) -Construction (6.5%) -Restaurants and accommodations (5.4%) -Transportation, storage, and mail and courier (5.1%)	-Yuca -Plantains -Maize -Rice
Amazonas	-Agriculture, granary, hunting, and forestry (33.4%) -Construction (11.4%) -Trade (11.1%) -Manufacturing (5.1%)	-Telecommunications and information services (13.9%) -Fisheries and aquaculture (15.6%) -Construction (10.1%) -Electricity and water (6.6%)	-Rice -Coffee -Yuca -Plantains
San Martín	-Agriculture, granary, hunting, and forestry (27.2%) -Other services (22.8%) -Trade (11.4%) -Construction (9.7%) -Manufacturing (9.4%)	-Fisheries and aquaculture (24.9%) -Telecommunications and information services (12.5%) -Construction (10.1%)	-Rice -Coffee -Cacao -Palm oil -Plantains

Source: "Información Regional," Banco Central de Reserva del Perú, <https://www.bcrp.gob.pe/estadisticas/informacion-regional.html>.

A host of security and governance challenges compound this vulnerable socioeconomic situation, impeding the region's long-term development. Illegal gold mining, illegal logging, and coca cultivation threaten the inhabitants of the Peruvian Amazon as well as the environment in which they live. At the same time, inadequate land governance creates opportunities for settlers to invade property, leading to further deforestation. Local governments often lack the institutional capacity to deal with all these challenges, thereby compounding the environmental and human security difficulties in the region.

¹⁰ "Brachiaria Decumbens Fact Sheet," Tropical Forages, n.d., http://www.tropicalforages.info/key/forages/Media/Html/entities/brachiaria_decumbens.htm.

Thus far, economic development of the Peruvian Amazon has mainly been approached through a resource extraction lens, without properly addressing these governance weaknesses or the social and security complexities in the region. Although infrastructure projects—such as the construction of hydroelectric dams and roads—have been developed to increase connectivity and foster economic growth in the region, they have also contributed to deforestation. Politicians have used infrastructure, in particular road development, as a “winning strategy” for electoral victories, often disregarding the potential negative effects that these projects could create in a sensitive ecosystem such as the Amazon.

Infrastructure has primarily been pushed forward without a careful analysis of the best engineering designs and alternatives, ignoring the potential externalities and beneficiaries of these endeavors. Immigration and urbanization of the Amazonian region has accelerated as a result of infrastructure projects, but local governments have been unable to provide adequate public services to meet increased demand.¹¹ Between 2015 and 2017, the Monitoring of the Andean Amazon Project (MAAP) estimates that 2,200 kilometers of forest roads were constructed in the Peruvian Amazon, all of which are concentrated in southern Loreto, Ucayali, and northwestern Madre de Dios.¹² In addition, some of the infrastructure developed has unintentionally worsened security concerns by providing criminal groups with greater access to remote areas, which has led to heightened social conflicts with indigenous ethnic groups.¹³

The present case study analyzes infrastructure development in the Peruvian Amazon and its connection to deforestation, human security, and the rule of law. The case study draws from a wide range of literature as well as expert interviews conducted during March 2020. Overall, 15 organizations from Lima and Puerto Maldonado were consulted. The case study informs a larger CSIS report on Sustainable Infrastructure Development in the Amazon. The aim of the case study is to offer a more comprehensive view of deforestation in the Peruvian Amazon and to explore whether environmental degradation is an indicator for broader vulnerabilities in human security and the rule of law. Finally, the case study examines the role infrastructure plays in exacerbating or alleviating these vulnerabilities.

Deforestation is not just an environmental issue, it is also emblematic of broader vulnerabilities in Peru’s rule of law, security, and governance. Introducing infrastructure development into this already complex picture can increase the risks associated with those vulnerabilities. This study hopes to change the discourse on the Amazon’s future by presenting constructive and action-oriented ideas to further a vision of the Peruvian Amazon that is economically, environmentally, and socially sustainable.

Deforestation is not just an environmental issue, it is also emblematic of broader vulnerabilities in Peru’s rule of law, security, and governance.

¹¹ Marc Dourojeanni, Alberto Barandiaran, and Diego Dourojeanni, “Amazonia Peruana en 2021,” Lima: Sociedad Peruana de Derecho Ambiental, 2010, <https://sinia.minam.gob.pe/documentos/amazonia-peruana-2021-explotacion-recursos-naturales-infraestructuras>.

¹² Matt Finer and Nadia Mamani. “Deforestation in the Andean Amazon (Trends, Hotspots, Drivers),” MAAP, 2018, <https://maaproject.org/2018/synthesis3/>.

¹³ Clément Doleac, “Deforestation in Peru: Building a Dramatic Future in the Amazon and the Andean Region,” Council on Hemispheric Affairs, September 28, 2015, <http://www.coha.org/deforestation-in-peru-building-a-dramatic-future-in-the-amazon-and-the-andean-region/>.

Box 1: Deforestation in the Peruvian Amazon

Although half of the deforestation in the Amazon takes place in Brazil, deforestation in Andean Amazon countries, such as Peru, has increased in recent years.¹⁴ Peru has the highest annual deforestation rate of all Andean Amazon countries.¹⁵ Each year, 1,100 square miles (2,849 square kilometers) of the Peruvian Amazon are deforested, with much of the deforestation occurring as a result of illegal activities. Not only has this had a significant negative impact on Peru's incredible biodiversity, but it also accounts for half of the country's greenhouse gas emissions.¹⁶ According to the Monitoring of the Andean Amazon Project (MAAP), the main culprits of deforestation in the Peruvian Amazon are agriculture, cattle ranching, coca cultivation, gold mining, infrastructure projects, and logging.¹⁷ Illicit activities such as illegal gold mining and cultivation of coca are especially rampant in Madre de Dios and other areas throughout southern Peru.¹⁸ Deforestation due to illegal gold mining has risen in recent years and reached a record high in 2018.¹⁹

¹⁴ "Amazon Deforestation," WWF, n.d., https://wwf.panda.org/our_work/forests/deforestation_fronts2/deforestation_in_the_amazon/; and Matt Finan and Nadia Mamani, "Deforestation in the Andean Amazon."

¹⁵ Finan and Mamani, "Deforestation in the Andean Amazon."

¹⁶ Smith and Schwartz. "Deforestation in Peru"; and Ibid.

¹⁷ Matt Finan and Nadia Mamani, "Deforestation in the Andean Amazon."

¹⁸ Chris Arsenault, "Small Farmers Play Big Role in Felling Peru Rainforest: Satellite Maps," Reuters, February 22, 2017, <https://www.reuters.com/article/us-peru-environment-landrights/small-farmers-play-big-role-in-felling-peru-rainforest-satellite-maps-idUSKBN16128D>; and Ibid.

¹⁹ Matt Finan and Nadia Mamani, "MAAP #96: Minería Aurífera alcanza Máximo Histórico en la Amazonía Sur Peruana," MAAP, 2018, <https://maaproject.org/2019/peru-mineria-2018/>.

Map 2: Main Drivers of Deforestation in the Peruvian Amazon



Source: Matt Finer and Sidney Novoa, "MAAP Synthesis #2: Patterns and Drivers of Deforestation in the Peruvian Amazon," MAAP Synthesis 2, 2017, <https://maaproject.org/2017/maap-synthesis2/>.

1. Deforestation, Human Insecurity, and Governance in the Peruvian Amazon

Illegal activities in the Peruvian Amazon threaten both its inhabitants and the environment in which they live. Rampant illicit activities in this region are primarily comprised of unsanctioned coca cultivation, gold mining, and logging. Stemming largely from the Peruvian Amazon's lack of an orderly land titling system, opportunities are created for people to unlawfully claim land and conduct these activities. However, local governments often lack the institutional capacity and budgetary resources to respond to these challenges. Taken together, these activities not only instigate more deforestation, undermine the rule of law, and threaten human health, but also prevent the achievement of a viable long-term vision for the economic development of the Amazon region.

Illicit Activities Threaten Human Security and Create More Environmental Degradation

Illegal Gold Mining

Peru is one of the world's leading producers of minerals, with copper, gold, zinc, lead, iron, precious metals, and oil comprising more than 45 percent of its total exports.²⁰ Gold mining is the second-largest export in Peru, and yet a large portion of the gold mining industry is unlicensed or "informal," prompting further deforestation and greater health and human security challenges in the Peruvian Amazon.²¹ According to the Global Initiative Against Transitional Organized Crime, approximately 28 percent of gold mining in Peru is conducted illegally.²² Informal and illegal mining has been found in as many as 21 out of the country's 26 regions.²³

Gold mining not only clears trees and undermines the rule of law, it also has a less visible cost: the mercury contamination of water sources. To extract gold, high-pressure pumps and hoses fire at the sediment deposits of riverbanks; the mineral-rich mud is then cut with mercury so that small flecks of gold can be captured. Unfortunately, this mercury often ends up in Peru's waterways and contaminates ecosystems.²⁴ A 2012 study by the National Institutes of Health identified the mercury levels in the Madre de Dios population by measuring the total amount of mercury in human hair samples collected from mining zones.²⁵ A regression analysis revealed that fish consumption, gender, and location of residence

²⁰ "Peru Exports, Imports, and Trade Partners," The Observatory of Economic Complexity, n.d., <https://oec.world/en/profile/country/per/>.

²¹ Ibid.; Drew Kann, "Record Levels of Gold Mining Are Destroying One of the Most Biodiverse Places on Earth, Study Shows," CNN, February 8, 2019, <https://www.cnn.com/2019/02/08/world/gold-mining-deforestation-peru-record-levels-trnd/index.html>; and Yvette Sierra Praeli, "Record Levels of Deforestation in Peruvian Amazon as Gold Mines Spread,"

²² Livia Wagner, "Organized Crime and Illegally Mined Gold in Latin America," *Global Initiative Against Organized Crime*, March 30, 2016, <https://globalinitiative.net/organized-crime-and-illegally-mined-gold-in-latin-america/>.

²³ Ibid.

²⁴ Kann, "Record Levels of Gold Mining"; and Sarah E. Diringier et al., "Deforestation Due to Artisanal and Small-Scale Gold Mining Exacerbates Soil and Mercury Mobilization in Madre de Dios, Peru," *Environmental Science & Technology* 54, no. 1, January 7, 2020: 286–96, <https://pubs.acs.org/doi/abs/10.1021/acs.est.9b06620>.

²⁵ Katy Ashe, "Elevated Mercury Concentrations in Humans of Madre de Dios, Peru," *PloS ONE* 7, no. 3, 2012: e33305, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0033305>.

were all significant indicators of mercury levels in an individual. In particular, high levels of mercury vapor (2 million ng/m³) were found around gold shops in Madre de Dios gold mining towns as recently as 2017.²⁶

Despite being forbidden inside the national reserves of Madre de Dios and the buffer zones between them, gold mining is most prevalent in the Madre de Dios region.²⁷ Many of the miners are under investigation for occupying protected lands, but due to weak government enforcement, the accused often skip their court proceedings and continue to operate illegally without consequences.²⁸

Illegal gold mining is associated with other human security issues such as child labor, forced labor, and prostitution.²⁹ Peru has the third-highest rate of forced labor in Latin America, after Mexico and Colombia.³⁰ Moreover, an increase in illegal gold mining after global prices spiked a decade ago has created a thriving sex industry in Peruvian rainforest towns.³¹ Dozens of brothels have sprung up around gold mines in the Madre de Dios region—especially in the mining areas of La Pampa and Delta 1.³² An NGO in Madre de Dios, Asociación Huarayo, estimates that 2,000 women and girls were employed as sex workers in 100 brothels in the Delta 1 area alone in 2010. The Global Initiative Against Transnational Organized Crime claims that almost all of the women and girls trafficked to Madre de Dios are abducted and forced to work or face severe punishments at the hands of their oppressors if they attempt to leave.³³ In 2017, 143 reports of human trafficking were recorded in Madre de Dios.³⁴

Additionally, a large number of sex trafficking victims come from indigenous farming and rural communities in the Andean highlands, located hundreds of miles away from the towns they are trafficked to.³⁵ Coming from impoverished backgrounds with little to no education, these victims are easy prey for traffickers, who lure women and girls through promises of well-paying jobs in restaurants and shops or as domestic helpers.³⁶

The government of Peru has responded to these issues through numerous military and police crackdowns. One example occurred in February 2019 when the Peruvian military launched Operation Mercury. The initiative involved the declaration of a state of emergency that lasted two months, the establishment of three military bases, the deployment of 1,500 police and military officers, and the allocation of 80 national prosecutors.³⁷ The state of emergency declaration allowed prosecutions for illegal mining to be expedited,

²⁶ Paula Dupraz-Dobias, “How One Country Is Grappling with Mercury Emissions from Artisanal Gold Shops,” *Chemical & Engineering News*, American Chemical Society, March 16, 2020. <https://cen.acs.org/environment/pollution/one-country-grappling-mercury-emissions/98/i10>.

²⁷ Leo Schwartz, “Gold Mining Leaves Heart of Peruvian Amazon a Wasteland,” PBS, September 21, 2019, <https://www.pbs.org/newshour/show/gold-mining-leaves-heart-of-peruvian-amazon-a-wasteland>.

²⁸ Praeli, “Record Levels of Deforestation.”

²⁹ Phoebe Cohen, “Sex Trafficking in Peru,” The Borgen Project, August 27, 2017, <https://borgenproject.org/sex-trafficking-peru/>.

³⁰ Ibid.

³¹ Anastasia Moloney, “Sex Trade Flourishes in Peru’s Amazon Despite Crackdown on Illegal Mining,” Reuters, January 16, 2020, <https://www.reuters.com/article/us-peru-trafficking-mining-idUSKBN1ZF0KE>.

³² Ibid; and Livia Wagner, “Organized Crime and Illegally Mined Gold in Latin America,” *Amazonia Socioambiental*, April 2016, https://www.amazoniasocioambiental.org/wp-content/uploads/2016/04/2016_04_20_Global-Initiative-Organized-Crime-and-Illegally-Mined-Gold-in-Latin-America-April-2016-web_PDF.pdf.

³³ Ibid.

³⁴ Francisco Costa Aponte. “Perú: Anuario Estadístico De La Criminalidad y Seguridad Ciudadana 2011-2017.” Perú Instituto Nacional de Estadística e Informática, July 2018, https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1534/libro.pdf.

³⁵ Moloney, “Sex Trade Flourishes in Peru’s Amazon.”

³⁶ Ibid.

³⁷ Reuters, “Peru Cracks Down on Illegal Gold Mining to Save Deforested Amazon Area,” NBC News, February 20, 2019, <https://www.nbcnews.com/news/latino/peru-cracks-down-illegal-gold-mining-save-deforested-amazon-area-n973551>; and Schwartz, “Gold Mining Leaves Heart of Peruvian Amazon a Wasteland.”

with trials occurring as quickly as within 48 hours and convictions occurring as soon as eight days later.³⁸ The program resulted in a 92 percent reduction in La Pampa's deforestation rate from 2018 to 2019 and rescued dozens of women and girls in the process, many of whom were underage (some as young as 11 years old).³⁹ Deforestation from gold mining has not been completely eliminated in La Pampa, with some activity occurring in isolated areas. Even so, the program was a success, and concerns that miners, having been displaced by Operation Mercury, would simply move to other regions and cause surges there, have not materialized.⁴⁰ Similarly, predictions of significant increases in illegal activity during the Covid-19 pandemic have not been validated, but the deforestation of 198 acres during quarantine orders (March-June 2020) has been reported.⁴¹

Cocaine Production

Beside illegal gold mining, other illicit industries thrive in the Peruvian Amazon. Peru is the second-largest cocaine producer in the world, behind only Colombia and ahead of Bolivia.⁴² Most drugs produced in Peru find their way to Brazil, Europe, or Oceania. In the past, Colombian and Mexican organizations trafficked cocaine through well-established trafficking routes to the United States. But the dynamics of drug trafficking in Peru have changed, and routes now head south toward Argentina, Brazil, and especially Bolivia—areas that are also focal points for regional connectivity initiatives.⁴³ Criminal groups use Bolivia as a bridge to transport drugs overseas, using small aircraft on illegally constructed runways, or to Brazilian markets, using road infrastructure.⁴⁴ Drug cartels often use a central region of Peru known as the Valley of the Apurímac, Ene, and Mantaro Rivers ("Valle de los Ríos Apurímac, Ene y Mantaro," or the VRAEM) to transport cocaine to Bolivia or Brazil.⁴⁵ The VRAEM is one of the poorest areas in the country and is considered the hub for coca plant and cocaine production, responsible for approximately 70 percent of Peru's cocaine production in 2016.⁴⁶

Peru's border areas are among the most densely forested areas of the country, containing thousands of trafficking routes. As officials attempt to identify and close such routes, new ones often spring up in their place.⁴⁷ Loreto, Peru's northernmost region, shares borders with Ecuador, Colombia, and Brazil. Its thick forest cover, large waterways, and relative isolation from authorities has also made it a transportation hub for cocaine.⁴⁸ Furthermore, small planes have been used to transport drugs to Peru's Pacific ports and to

³⁸ Schwartz, "Gold Mining Leaves Heart of Peruvian Amazon a Wasteland."

³⁹ L. Villa and M. Finer, "MAAP #104: Major Reduction in Illegal Gold Mining from Peru's Operation Mercury," MAAP, August 4, 2019, https://maaproject.org/2019/lapampa_opermercury/; and Moloney, "Sex Trade Flourishes in Peru's Amazon."

⁴⁰ Matt Finer and Nadia Mamani, "MAAP #115: Illegal Gold Mining in the Amazon, Part 1: Peru," January 17, 2020, https://maaproject.org/2020/mining_frontiers_peru/.

⁴¹ Matt Finer and Nadia Mamani, "MAAP #121: Reduction of Illegal Gold Mining in the Peruvian Amazon," June 26, 2020, <https://maaproject.org/2020/gold-mining/>.

⁴² "Analysis of Drug Markets: Opiates, Cocaine, Cannabis, Synthetic Drugs - World Drug Report 2018", United Nations Office on Drugs and Crime, June 2018, Vienna: United Nations, June 2018, https://www.unodc.org/wdr2018/prelaunch/WDR18_Booklet_3_DRUG_MARKETS.pdf.

⁴³ Anna Grace, "Peru Drug Trafficking Groups Expanding to New European Markets," InSight Crime, October 18, 2018, <https://www.insightcrime.org/news/brief/peru-drug-trafficking-expanding-european-markets/>.

⁴⁴ Ibid.

⁴⁵ Max Radwin, "Cocaine Production Is Spiking in Peru and Bolivia, and It Could Keep Going Up," World Politics Review, November 9, 2018, <https://www.worldpoliticsreview.com/insights/26707/cocaine-production-is-spiking-in-peru-and-bolivia-and-it-could-keep-going-up>.

⁴⁶ Saalar Aghili, "The Rise of Cocaine in Peru," *Berkeley Political Review*, May 16, 2016, <https://bpr.berkeley.edu/2016/05/16/the-rise-of-cocaine-in-peru/>; and Marco Aquino, "Peru to Start Uprooting Coca Plants in Top Drug-Trafficking Region," Reuters, September 12, 2019, <https://www.reuters.com/article/us-peru-drugtrafficking-idUSKCN1VX2I0>.

⁴⁷ Radwin, "Cocaine Production Is Spiking."

⁴⁸ Gardenia Mendoza, "Loreto, Zacatecas, De La Migración al Crimen Organizado," *La Opinión*, March 12, 2018, <https://laopinion.com/2018/03/12/loreto-zacatecas-de-la-migracion-al-crimen-organizado/>; and Sergio Saffon, "Illegal Gold Mining

other countries.⁴⁹ To combat this, the Peruvian government passed a law in January 2016 that instructs security forces to shoot down planes suspected of transporting drugs.⁵⁰ Security forces have worked to shut down numerous makeshift “narco runways,” which can span up to 600 meters.⁵¹ However, under President Vizcarra, Peru’s aerial interdiction laws have not changed, but it does not appear to be a priority of his administration’s anti-drug trafficking strategy.

DEVIDA (“Comisión Nacional para el Desarrollo y Vida sin Drogas”)—the agency responsible for creating Peru’s anti-drug strategy—has set a goal of eradicating 50 percent of the country’s illicit coca crops by 2021 by increasing eradication efforts and introducing a crop substitution program.⁵² USAID has played a role in this plan by working to provide technical assistance and funding to transition Peruvian coca farms to produce legal goods, including cacao, coffee, and bananas. In 2018, USAID transitioned 41,439 Peruvian farms to produce 75,620 hectares (186,861 acres or roughly the size of Singapore) of legal crops. The transition to cacao production has been particularly successful: in 2018, Peruvian cacao growers sold \$41 million worth of cacao. In areas where the transition to legal goods has followed eradication, coca cultivation decreased by 86 percent.⁵³ However, critics of crop substitution programs argue that not only do the programs disrupt communities that rely on the coca plants for their livelihoods, but they also increase the price of the remaining illicit crops, encouraging other farmers to continue planting.⁵⁴

Illegal Logging

Peru also has a rampant illegal logging industry, which makes the Amazon’s deforestation much more covert. Rather than chopping down all of the trees in their path, timber harvesters instead target the high-value species of trees, such as mahogany, teak, chestnut, walnut, rosewood, and ebony.⁵⁵ Because it relies on selective logging rather than clearcutting, tracking the full extent of deforestation is difficult. Yet satellite data from the Monitoring of the Andean Amazon Project (MAAP) suggests that as many as 3,300 km of logging roads were constructed from 2015 to 2018, primarily in Ucayali, Madre De Dios, and Loreto.⁵⁶ The rapid increase over such a short time span is partly due to leakage from Brazil; Brazilian loggers and ranchers make their way into Madre de Dios and other regions within Peru’s Amazon Basin where deforestation laws are not readily enforced.⁵⁷ Small-scale crop and cattle agriculture has been a major driver of deforestation in the central Amazon but is now becoming prevalent in southern Peru.⁵⁸ With rising global demand for beef and high prices for coca, palm oil, and gold, locals already residing near large-scale infrastructure projects, as well as settlers from other parts of Peru and Latin America, may choose to participate in deforestation and additional unlawful activities in order to improve their economic outcomes.

Operations Enter New Parts of Peru,” InSight Crime, October 11, 2019, <https://www.insightcrime.org/news/brief/illegal-gold-mining-new-parts-peru/>.

⁴⁹ “Peru Shoot-Down Law Turns Drug Smugglers to Boats, Backpackers,” Reuters, April 26, 2016, <https://www.reuters.com/article/us-peru-drugtrafficking-idUSKCN0XN2RY>.

⁵⁰ Ibid.

⁵¹ “Peru Destroys Forest Runways in Bid to Halt Cocaine Smuggling,” *Irish Times*, September 13, 2014, <https://www.irishtimes.com/news/world/peru-destroys-forest-runways-in-bid-to-halt-cocaine-smuggling-1.1928347>.

⁵² Radwin, “Cocaine Production Is Spiking.”

⁵³ “Alternative Development: Peru,” USAID, September 4, 2019, <https://www.usaid.gov/peru/our-work/alternative-development>.

⁵⁴ Radwin “Cocaine Production Is Spiking.”

⁵⁵ “The Rainforest Economy,” Discover Peru, n.d., <http://www.discover-peru.org/peru-geography-rainforest-economy/>; and Lucio Villa and Matt Finer, “MAAP #99: Detecting Illegal Logging in the Peruvian Amazon,” MAAP, April 13, 2019, https://maaproject.org/2019/detect_illegal_logging/.

⁵⁶ Lucio Villa and Matt Finer, “MAAP #99.”

⁵⁷ Lyndsie Bourgon, “Indigenous People Battle Squatters and Timber Poachers in Peru’s Amazon,” *National Geographic*, April 12, 2019, <https://www.nationalgeographic.com/environment/2019/04/indigenous-people-battle-squatters-timber-poachers-peruvian-amazon/>.

⁵⁸ Matt Finer, Nadia Mamani, “MAAP #122: Amazon Deforestation 2019,” MAAP, June 30, 2019, <https://maaproject.org/2020/2019-amazon/>.

Weak Land Governance and Institutional Capacity at the Subnational Level Magnify the Environmental and Human Security Challenges

These environmental and human security challenges are exacerbated by weaknesses in governance and rule of law at the regional and local levels. Although Peru is a unitary democratic republic, in the early-2000s, Peru embarked upon a process of political and fiscal decentralization to improve service delivery and to provide more accountability for government actions. Peru's government is split into regions, provinces, and districts, and all branches of government are considered autonomous state bodies.⁵⁹ The regional governments enjoy political, economic, and administrative autonomy, and they coordinate with municipalities. However, in contrast to federal systems such as Brazil or the United States, the independence of these regions is limited, and this autonomy is not matched by budgetary resources or by the capacity to execute their authorities. In many cases, corruption is also present.⁶⁰

Inadequate Land Governance

The Peruvian Amazon has a disorderly land titling framework and an opaque system for granting different types of economic concessions. This unclear land governance structure makes it easier for land-grabbers to come into the region and expand their activities. Moreover, regional governments lack the resources, capacity, and sometimes political will to devise a land governance framework that would provide a clearer demarcation of land rights and deter these illegal activities. Taken together, institutional and land governance challenges provide an avenue for environmental exploitation and enable illegal activities to flourish.

Land cadastres at the regional level suffer from inconsistencies, and the Peruvian government is uneven in its issuance and enforcement of land titles. This leads to overlapping rights and land grabbing, creating disputes between indigenous groups, mining companies, and settlers.⁶¹ The Consejo Interregional Amazonico, a special commission established by regional governments to develop a sustainable action plan for the Amazon region (for 2019 to 2021), has identified several challenges in this area.⁶² One key problem is the lack of official information on indigenous communities and their land titling. Obtaining the geographic scope of land titles and verifying such information is also difficult. The laws and regulations are complex and lead to overlapping rights among indigenous communities, mining and oil concessions, public lands, and protected areas. For example, a comprehensive study conducted in the Madre de Dios region found more than 600 overlapping rights (Table 3), leading to constant land conflicts.

There is also a lack of transparency in the process of granting mining concessions in the Amazon. Mining concessions are granted administratively and in a decentralized manner. The central government processes and grants mining concessions for medium- and large-scale mining operations, while subnational governments process and grant mining concessions for artisanal and small-scale mining

⁵⁹ "Peru's Constitution of 1993 with Amendments through 2009," Constitute Project, 2009, https://www.constituteproject.org/constitution/Peru_2009.pdf?lang=en; and SNGWOFI, "2019 Report World Observatory on Subnational Government Finance and Investment – Country Profiles", OECD, Paris: 2019, http://www.sngwofi.org/publications/SNGWOFI_2019_report_country_profiles.pdf.

⁶⁰ Kyra Gurney, "Meet Peru's New 'Narco-Governors,'" InSight Crime, December 19, 2014, <https://www.insightcrime.org/news/analysis/meet-peru-s-new-narco-governors/>.

⁶¹ "Country Profile Peru," Timber Trade Portal, November 28, 2018, <https://www.timbertradeportal.com/countries/peru/>.

⁶² Secretaría de Descentralización de la Presidencia del Consejo de Ministros, Comisión Multisectorial e Intergubernamental para el Establecimiento de Acciones Públicas Prioritarias para la Promoción del Desarrollo Sostenible de los Territorios de la Amazonía: informe final, 2019-2021, Lima: August 2019, <http://www.descentralizacion.gob.pe/wp-content/uploads/2019/09/GIZ-PCM-PRODUCTO-FINAL-ok.pdf>.

within their territorial jurisdictions.⁶³ Approved lands for concession are then posted on an online database and in newspapers, but these forms of media do not reach indigenous communities in the Amazon. Many communities barely have reliable electricity, let alone internet access, which prevents indigenous communities from asserting their right to opposition. Many times, indigenous communities will hear of a concession only after it has already been granted. The Environmental Impact Assessments for mining projects are over 31,000 pages long and difficult for non-technical readers, reinforcing the perception that transparency is lacking between governments and communities.⁶⁴

Table 3: Quantity of Overlapping Land Rights in Madre de Dios, Peru

TYPE OF OVERLAP	NUMBER OF COMMUNITIES AFFECTED	QUANTITY
CONCESSIONS		
Mining	14	572
Hydrocarbon	10	10
Logging	4	9
Forest of Permanent Production	3	3
AREAS OF CONSERVATION		
Natural protected areas	5	5
Regional areas of conservation	1	1
Buffer zones	14	14
INVASIONS		
Agriculture invasions	2	2
Property invasions	5	5
INFRASTRUCTURE PROJECTS		
Roads	3	3
Dams	0	0
AMONG INDIGENOUS COMMUNITIES		
Overlap with another indigenous community	3	3

Source: Enrique Basurto Carvo, “Estudio de Línea de Base de Conflictos Socio-ambientales en Paisajes Específicos de la Amazonía Peruana, Madre De Dios,” Lima, Peru: Sociedad Peruana de Derecho Ambiental, 2012.

These overlapping rights among different communities require a more systematic and official process of land titling and conflict resolution among communities and other actors. Part of the challenge is that 90 percent of land titling and land dispute resolution is the responsibility of regional governments, but they do not possess the administrative capacity (human resources, salaries, and technical training) or budgetary and financial tools to carry out titling and concession activities. Coupled with a lack of capacity, there is often little coordination among sectoral ministries and the different levels of government on this issue (Table 4).

According to the Inter-American Development Bank (IDB), 90 percent of land owned by landowners in the Peruvian Amazon lacks a formal title.⁶⁵ Farmers in the region do not feel compelled to invest in their lands because there is a risk that they will not reap the fruits of their labor if the land becomes titled to someone

⁶³ Rosana Madrid, “Corruption Risks in the Mining Sector: Peru Report,” Lima: PROETICA National Council for Public Ethics, 2019, <https://www.proetica.org.pe/wp-content/uploads/2019/02/estudio-mineria-ingles-proetica.pdf>.

⁶⁴ Ibid.

⁶⁵ “Peru to Improve Rural Land Registration and Titling with an IDB Loan,” IDB, December 4, 2014, <https://www.iadb.org/en/news/peru-improve-rural-land-registration-and-titling-idb-loan>.

else. The IDB has sought to help Peru improve its land tenure regulation system since 1996, when it first provided two loans amounting to \$41 million.⁶⁶ More recently, in 2014, the IDB awarded a \$40 million loan to Peru's Ministry of Agriculture to assist in the design of a land titling project, which aimed to grant titles to 220,000 small farmers and 380 indigenous communities.⁶⁷ Studies have indicated that projects that seek to improve land tenure such as those initiated by the IDB have positive effects on income generation, with average increases of 15 percent.⁶⁸ Land tenure reform has been found to increase agricultural productivity by 40 percent and promote women's inclusion in economic decisionmaking by 17 percent.⁶⁹ Increases in income, agricultural productivity, and women's economic empowerment are linked to increases in food security as well.

Despite the positive effects of projects that seek to improve land tenure, many have criticized such projects for paying little to no attention to the impact they will have on indigenous or rural communities. The Interethnic Association for the Development of the Peruvian Rainforest argues that such initiatives intensify conflicts over deforestation and land rights.⁷⁰ One report found that Peru's indigenous communities must go through over 25 bureaucratic hurdles to obtain legal recognition and formal land titles, which can be a costly and lengthy process. The same study found, in contrast, that logging or mining concessionaires only face between three and seven bureaucratic steps, with the process concluding as quickly as within a few months.⁷¹

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Jeremy Hance, "Turning Point for Peru's Forests? Norway And Germany Put Muscle and Money behind Ambitious Agreement," Mongabay, September 24, 2014, <https://news.mongabay.com/2014/09/turning-point-for-perus-forests-norway-and-germany-put-muscle-and-money-behind-ambitious-agreement/>.

⁶⁹ Ibid.

⁷⁰ "IDB Land Titling Project in Peruvian Amazon Must Be Redesigned to Avoid Violating Indigenous Rights and Increasing Deforestation," Forest Peoples Programme, news release, February 24, 2015, <https://www.forestpeoples.org/en/region/peru/news/2015/02/idb-land-titling-project-peruvian-amazon-must-be-redesigned-avoid-violating>.

⁷¹ "Getting a Land Title in Peru Almost Impossible for Indigenous Communities - Protecting the Rainforest," Rainforest Foundation US, December 2, 2015, <https://rainforestfoundation.org/landtitlesperu/>.

Table 4: Land Governance Challenges and Proposed Actions

PRIORITY	BOTTLENECK	STEP
Management of Information	There is no official standardized information about the titling of native communities available.	Identify the gap in updating the geo-reference of titled communities.
Conflict Resolution	There is a superposition of land rights.	Develop guidelines to correct the superposition of rights.
Normative Instruments	Legal instruments are cumbersome and unclear.	Simplify, unify, and modify normative instruments.
Administrative Capacities	Human capital and equipment in regional governments are not available to process legal processes and cessation of use.	Offer technical assistance and equip and incorporate new technologies in regional governments.
Financing and Alignment of Funds	Regional governments have low budgets.	Develop diagnostics to define the budget needed.
International Coordination	Coordination with diverse international organizations in the Amazon is weak.	Coordinate with international organizations on joint activities.
Domestic Coordination and Articulation	Coordination among government actors is weak.	Promote working groups or commissions between regional governments and sectors.

Source: Edgardo Cruzado. “Comisión Multisectorial e Intergubernamental para el establecimiento de Acciones Públicas Prioritarias para la Promoción del Desarrollo Sostenible de los Territorios de la Amazonía.” Secretaría de Descentralización y Secretaría de Descentralización de la Presidencia del Consejo de Ministros, August 2019, <http://www.descentralizacion.gob.pe/wp-content/uploads/2019/09/GIZ-PCM-PRODUCTO-FINAL-ok.pdf>.

In addition to the land tenure weaknesses, a process of “territorial planning” in Peru was intended to streamline and integrate the planning process; nonetheless, after almost 20 years, the territorial planning of the country has not been fully realized. Where plans exist, they are not integrated or aligned at the local, provincial, or regional levels.⁷² Innumerable socioenvironmental conflicts have occurred because of a lack of territorial planning, changes in land use and property rights, and the overexploitation of non-renewable natural resources.⁷³ Third parties often exploit disputes between the government and indigenous communities to establish operations in areas originally occupied by native communities.⁷⁴

Weak Institutional Capacity and Corruption

Regional and local governments in the Peruvian Amazon often lack the technical capacity, personnel, and budgetary resources to effectively address the problems of illegality, land governance, and public service provision. Moreover, corruption across sectors and levels of government wastes valuable public resources and creates a general sense of impunity for different actors to exploit.

The first institutional challenge relates to inadequate fiscal space for regional governments to perform their duties. In other words, Peru’s spending responsibilities are not matched with corresponding income sources. The 2004 Fiscal Decentralization Law defined a plan for transferring expenditure responsibilities

⁷² “An Assessment of Territorial Planning in the Amazon,” Nature Conservancy, October 2018, <https://www.nature.org/en-us/about-us/where-we-work/latin-america/stories-in-latin-america/an-assessment-of-territorial-planning/>.

⁷³ Hernando Núñez del Prado. “The Territorial Planning in Peru,” *Revista Científica Monfragüe Resiliente* 11, no. 2, October 2017, 16, <https://www.eweb.unex.es/eweb/monfragueresiliente/numero18/Ar5.pdf>.

⁷⁴ Jack Lo Lau, “Amazonía Peruana: Tierra de Todos y de Nadie,” Mongabay, September 9, 2017, <https://es.mongabay.com/2017/09/amazonia-peruana-tierra-todos-nadie/>.

to municipal and regional governments. The plan aimed to consolidate 26 regional governments into 12 macro-regions, allowing these macro-regions to serve as intermediaries between local governments and the national government. However, this fiscal decentralization process stalled after Peruvians voted down the creation of macro-regions in a referendum. A proposal for a revenue-sharing mechanism for income tax and value-added tax (VAT) had been tied to the establishment of macro-regions, so when the referendum failed, the new mechanism was unable to be implemented. The progress of decentralization remains stunted because stalled implementation has prevented the various governments from obtaining adequate tax and other revenue sources to fund their new responsibilities. Under these new responsibilities, regional governments are responsible for providing or coordinating the delivery of public goods and services across local jurisdictions, coordinating policy priorities and service delivery between the local and national authorities, and preparing the formal development program for their region. However, regional governments lack a transparent and stable revenue-sharing mechanism with the central government, not to mention that they have limited autonomy to allocate the transfers they receive or adjust public services to suit the local context, which underscores the critical gaps in coordination between the national and regional governments.⁷⁵

Even within the federal government itself, lack of coordination creates discontinuity between development goals. For example, the President of the Council of Ministers is responsible for coordinating whole-of-government cooperation, yet the function is itself decentralized, with specialized commissions and secretariats focusing on separate development strategies. The OECD identifies only 7 of these commissions and secretariats as exercising “whole-of-government coordination functions” and an additional 12 units possessing mandates unrelated to whole-of-government coordination.⁷⁶

A lack of coordination between regional and local governments has also culminated in social conflict and protests. Regional and local governance tensions have resulted in roughly 50 conflicts each year since 2004, and they account for the second-largest source of social conflict in Peru. Such conflicts have often been motivated by protests against ordinances, a lack of transparency, and corruption allegations, which serve as indirect indicators of citizens’ perceptions of the legitimacy of governance. Weaknesses in the legal system often result in regional and local governance conflicts without resolution: in 2011, only 2 of 32 municipal conflicts reached resolutions. Legal weaknesses that contribute to this issue include a lack of established procedures to address situations that cause social conflicts, a lack of definition of the conflict under the law, and overlapping responsibilities among levels of government—all resulting in inaction.⁷⁷

Another institutional challenge relates to the civil service. There tends to be a higher number of authority positions left vacant in subnational governments, with close to 39 percent of positions vacated due to corruption scandals.⁷⁸ Other concerns include a “revolving door” phenomenon among senior public and private officials, particularly in the mining sector: senior government officials who leave their posts for jobs in the private sector often return to the public sector again, sometimes repeatedly, leading to conflicts of interest and overly pro-business policies. There is also a high level of turnover in government positions

⁷⁵ Fernando Blanco, Jorge Martinez-Vazquez, and Janet Porras Mendoza, “Peru: Building a More Efficient and Equitable Fiscal Decentralization System,” Washington, DC: World Bank Group, March 2017, <http://documents.worldbank.org/curated/en/106651568318660229/pdf/Peru-Building-a-More-Efficient-and-Equitable-Fiscal-Decentralization-System.pdf>.

⁷⁶ “Public Governance Reform: Peru Highlights,” OECD, Paris: OECD, 2016, <https://www.oecd.org/gov/public-governance-review-peru-highlights-en.pdf>.

⁷⁷ Gary Bland and Luis A. Chirinos, “Democratization Through Contention? Regional and Local Governance Conflict in Peru,” *Latin American Politics and Society* 56, no. 1 (2014): 73–97, <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1548-2456.2014.00223.x>.

⁷⁸ Paula Muñoz Chirinos, “Gobernabilidad y Desarrollo Subnacional: Problemas de Baja Calidad de La Democracia,” *Agenda 2014* Propuestas para mejorar la descentralización, 2014, <http://agenda2014.pe/publicaciones/agenda2014-gobernabilidad-desarrollo-subnacional-1.pdf>.

because there is no official system of civil service, which results in hiring temporary civil servants and causes mid-level officials to not achieve specialization in the work they perform.⁷⁹

A fourth challenge has to do with overall transparency in government. A 2017 report by Defensoria Del Pueblo, a constitutional organization of the Peruvian government, estimated the country lost \$3.4 billion annually due to corruption.⁸⁰ A recent poll shows that citizen perceptions of corruption remain high: 65 percent of those surveyed named corruption as the principal problem in the country.⁸¹ In general, distrust of government institutions among Peruvians has been increasing over the past few years, with less than 10 percent of Peruvians indicating that they trust the government, courts, and police.⁸²

Three of the five regions in the Amazon had below-average incidences of corruption, while Loreto and Ucayali had above-average incidences of corruption in 2018.⁸³ Loreto and Ucayali were also among the regions with the highest increases in incidences of corruption from 2016 to 2018: Loreto had the fourth-highest increase, and Ucayali had the sixth-highest.⁸⁴

Environmental crimes in the Peruvian Amazon, such as illegal mining and oil extraction, often go unpunished due to police corruption, which remains widespread in Peru.⁸⁵ The region has the highest number of complaints of environmental crimes in the entire country. In 2016 alone, almost 1,000 complaints were filed against police officers, and 1,218 officers were accused of crimes in 2015.⁸⁶ In recent years, the police has been accused of working for the interests of private companies operating in Peru.⁸⁷ However, in February 2020, Peru passed legislation establishing a Specialized Prosecutor's Office in Environmental Matters (Fiscalía Especializada en Materia Ambiental, or FEMA) with a broad mandate, including powers to "investigate and prevent environmental crimes" and "promote the defense of the environment and natural resources."⁸⁸ The legislation also established the Satellite Georeference Monitoring Units for Environmental Crimes (Unidades de Monitoreo Georeferencial Satelital de Delitos Ambientales, or UMGSDA) to help identify environmental crimes.⁸⁹ While it is perhaps too early to assess the program's effectiveness, its emphasis on utilizing technology, sharing expertise, and strengthening the investigative process represents an important step in better prosecuting environmental crimes.

⁷⁹ Madrid, "Corruption Risks in the Mining Sector."

⁸⁰ Fabrizio Tealdo Zazzali, "Reporte La Corrupción En El Perú." Defensoría del Pueblo, 2017. <https://www.defensoria.gob.pe/wp-content/uploads/2018/08/Reporte-de-corrupcion-DP-2017-01.pdf>.

⁸¹ "Perú: Percepción Ciudadana Sobre Gobernabilidad, Democracia Y Confianza En Las Instituciones, Julio - Diciembre 2018," INEI, 2019, <https://www.inei.gob.pe/media/MenuRecursivo/boletines/boletin-percepcion-gobernabilidad-enero-2019-4ta-version.pdf>.

⁸² "Corruption – 96% of Peruvians See Government Corruption as a Serious Problem," *Andean Air Mail and Peruvian Times*, September 25, 2019, <https://www.peruviantimes.com/25/corruption-96-of-peruvians-see-government-corruption-as-a-serious-problem/31806/>; Coralie Pring and Jon Vrush, *Opiniones y Experiencias de Los Ciudadanos En Materia de Corrupción*, Berlin: Transparency International, 2019, https://www.proetica.org.pe/wp-content/uploads/2019/09/GCB_LAC_Report_ES-WEB.pdf.

⁸³ Adjuntia de Lucha contra la Corrupción, Transparencia y Eficiencia del Estado, "Casos de Corrupción de Funcionarios En Trámite Por Departamento En El 2016 y 2018," Presentation, 2019, <https://www.defensoria.gob.pe/wp-content/uploads/2019/05/Mapas-de-la-Corrupci%C3%B3n-Nro.-1-Mayo-actualizado-FINAL.pdf>.

⁸⁴ Ibid.

"Criminalización de la Protesta y la Situación de los Defensores y Defensoras de los Derechos Humanos," ⁸⁵ Coordinadora Nacional de Derechos Humanos Lima: 2016, <http://derechoshumanos.pe/informe2015-16/Criminalizacion-de-la-protesta.pdf>.

⁸⁶ Luis Fernando Alonso, "Nearly 1,000 Complaints against Peru Police This Year," *InSight Crime*, October 14, 2016, <https://www.insightcrime.org/news/brief/nearly-1-000-complaints-against-peru-police-this-year/>.

⁸⁷ Grupo de Trabajo sobre Pueblos Indígenas de la Coordinadora Nacional de Derechos Humanos, "Informe Alternativo 2018 Cumplimiento de Las Obligaciones Del Estado Peruano Del Convenio 169 de La OIT" Lima: Coordinadora Nacional de Derechos Humanos, October 2018, https://www.business-humanrights.org/sites/default/files/documents/Informe-Alternativo-2018-0_0.pdf.

⁸⁸ "Aprueban Reglamento de Fiscalías Especializadas En Materia Ambiental," *SPDA Actualidad Ambiental*, February 25, 2020, <https://www.actualidadambiental.pe/documento-pdf-aprueban-reglamento-de-fiscalias-especializadas-en-materia-ambiental/>.

⁸⁹ "Aprueban Nuevo Reglamento de la Fema que Favorece al Sistema para Combatir Delitos Ambientales," *ACCA*, 2020, <http://www.acca.org.pe/nueva-norma-fortalece-al-sistema-para-combatir-delitos-ambientales/>.

Another welcome development has been the first specialized court on environmental issues, set up in the Madre de Dios region.⁹⁰ Of the approximately 20,000 environmental crimes committed in all of Peru in 2018, 3,000 were committed in Madre de Dios alone.⁹¹ However, according to public prosecutor Julio César Guzmán Mendoza, who specializes in environmental crimes, “although the new environmental court is a step forward, the problem of the justice system in Peru will not be solved by appointing a new judge or opening a new court.”⁹² Attorneys and prosecutors are often overburdened, which leads to deficiencies in the investigations. Until cases are properly investigated, they cannot be admitted to the judiciary; therefore, very few crimes are prosecuted.⁹³

⁹⁰ Yvette Sierra Praeli, “Special Judiciary on Environmental Crimes Established in Peru,” Mongabay, April 2, 2018, <https://news.mongabay.com/2018/04/special-judiciary-on-environmental-crimes-established-in-peru/>.

⁹¹ Ibid.

⁹² Ibid.

⁹³ Ibid.

2. Infrastructure Development in the Peruvian Amazon

The difficulties arising from illegal economic activities, a disorderly land titling and concessions process, weak governance, and human insecurity in the Amazon region are compounded by a deficient process of overall development planning—and, in particular, by how infrastructure projects fit into those plans. Infrastructure has sometimes been viewed as a magic wand for bringing economic development to the region, with little understanding of how projects would meet their development objectives within the Amazonian context. Infrastructure projects require strong territorial governance, state capacity to provide essential services, an enabling environment for job generation, and the ability to provide security; otherwise, they can potentially lead to more intense social conflicts, increased deforestation, and an environment primed for illegal activities to flourish and new actors to invade precious lands. A more constructive approach and discussion about development in the Amazon is needed—one that primarily addresses governance, insecurity, and illegality challenges and then analyzes the role infrastructure can play in enabling or hampering such a sustainable path.

Infrastructure has sometimes been viewed as a magic wand for bringing economic development to the region, with little understanding of how projects would meet their development objectives within the Amazonian context.

Weaknesses in Infrastructure Planning Result in the Prioritization of the Wrong Projects

Peru recently started strengthening its infrastructure planning process through the adoption of the 2016–2025 National Infrastructure Plan (Plan Nacional de Infraestructura para la Competitividad, or PNIC), devised by the Ministry of Finance. The PNIC represents the first effort of the Peruvian government to define a vision and objectives to bridge the infrastructure gaps that impede the development of the country.⁹⁴ Announced in July 2019, the plan was developed in cooperation with the British government, the IDB, and the Swiss Agency for Development and Cooperation. It includes 52 key infrastructure projects in the transportation, communication, energy, sanitation, and agriculture sectors, approximately half of which were already underway by the time the PNIC was put into action.⁹⁵ However, the PNIC does not

⁹⁴ Ministerio de Economía y Finanzas, “Plan Nacional de Infraestructura Para La Competitividad,” Lima: 2019, https://www.mef.gob.pe/contenidos/inv_privada/planes/PNIC_2019.pdf.

⁹⁵ “MEF Reconoce que Plan de Infraestructura no Incluye Proyectos Sociales,” *Gestión*, December 5, 2019, <https://gestion.pe/economia/mef-reconoce-que-plan-de-infraestructura-no-incluye-proyectos-sociales-noticia/>.

include social infrastructure, nor did it account for environmental and social indicators during its elaboration.⁹⁶

The PNIC is not a forward-leaning planning document with a solid pipeline of quality infrastructure projects. It functions more like an inventory of “megaprojects” that have already been approved and budgeted, as an effort to streamline and prioritize investments. Criticisms have been levied against the PNIC for a lack of sectoral coordination; for example, mining plans are not connected to transport, health, or other sectors. The OECD describes Peru’s development plans as “neither linked together, nor integrated with budgetary instruments” and further criticizes the non-binding nature of the plans.⁹⁷ Moreover, the subnational governments have their own development plans that sometimes are at odds or do not include all the projects in the PNIC. In addition, the PNIC is called upon to work as a complement to the Regional Development Plans (Planes de Desarrollo Concertado Regional), all while defining its own vision.

In Peru’s Amazonian regions, the PNIC contains projects related to water infrastructure, telecommunications, roads, airports, and energy.⁹⁸ There are also development plans prepared by the local governments for projects that do not rise to the level of the PNIC. However, some infrastructure projects at the regional level still remain unaccounted for.

Planned projects in the Peruvian Amazon include a \$20.3 million wastewater treatment plant for Puerto Maldonado in Madre de Dios, a \$27.1 million wastewater treatment plant for the city of Tarapoto in San Martín, and a \$200 million natural gas distribution pipeline in Ucayali and other regions.⁹⁹ Other commitments include a telecommunications project that aims to increase internet access in Alto Amazonas, Loreto, Maynas, and Putumayo through the installation of 1,255 kilometers of fiber-optic cable, which will benefit 268 locations in the Amazon.¹⁰⁰ Furthermore, Peru’s PNIC sets aside a total investment of \$100.6 million for the Hidrovía Amazónica (Amazon waterway), which theoretically demonstrates the country’s commitment toward improving and maintaining the navigability of the Amazon region. In January 2020, however, the government announced that the project was indefinitely paused (see Annex 2).¹⁰¹

Many of the infrastructure works proposed are road projects. Oftentimes this consists of local governments deciding to resurface or repave an illegal road or informal road that has already been built, thereby “formalizing” its existence. Over 5,989 kilometers of national roads exist within the Peruvian Amazon, in addition to the 3,328 kilometers of regional roads in the Amazonian regions (Map 3).¹⁰² According to the Ministry of Transport and Communications (MTC), 28 of the regional roads and 5 of the national roads in the Amazon are scheduled for expansion.¹⁰³

⁹⁶ Ibid.; and Jorge Morel, “El Plan Nacional de Infraestructura Para La Competitividad: Innovación de La Gestión y Oportunidad,” Instituto de Estudios Peruanos, September 11, 2019, <https://iep.org.pe/noticias/el-plan-nacional-de-infraestructura-para-la-competitividad-innovacion-de-la-gestion-y-oportunidad-por-jorge-morel/>.

⁹⁷ “Public Governance Reform: Peru Highlights,” OECD, Paris, 2016, <https://www.oecd.org/gov/public-governance-review-peru-highlights-en.pdf>.

⁹⁸ Ministerio de Economía y Finanzas, “Plan Nacional de Infraestructura Para La Competitividad.”

⁹⁹ “2019-2022 Projects,” ProInversion, 2019, https://www.proinversion.gob.pe/RepositorioAPS/1/2/JER/PROJECT_PRESENTATION/2019/Portafolio%20ENG_20_11.pdf.

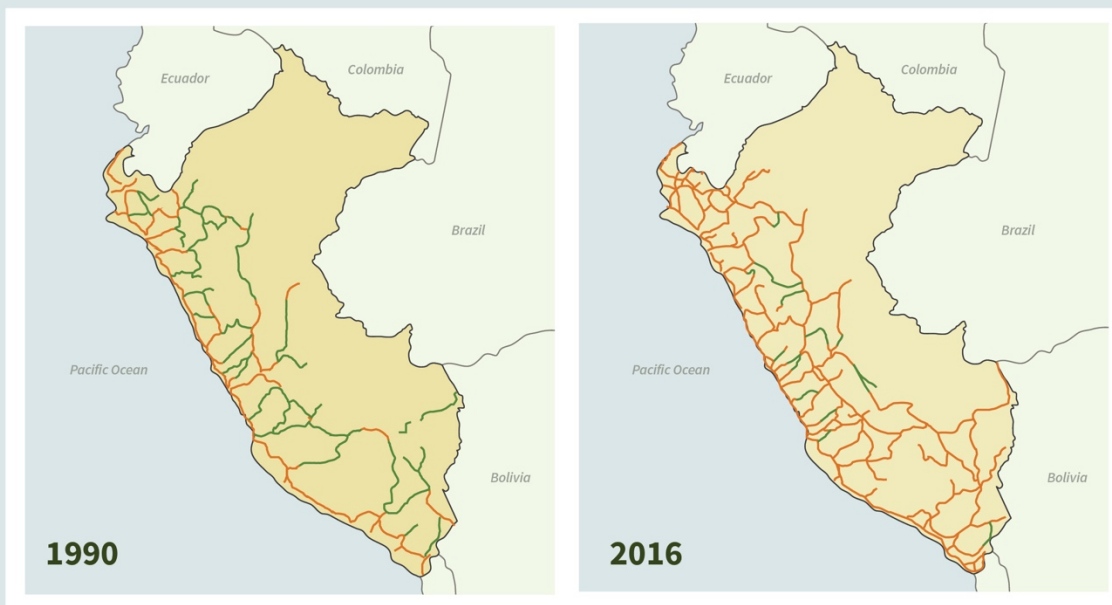
¹⁰⁰ Ministerio de Economía y Finanzas, “Plan Nacional de Infraestructura Para La Competitividad.”

¹⁰¹ Ibid.

¹⁰² “Mapa del Sistema Nacional de Carreteras del Perú,” SINIA, September 2015, <https://sinia.minam.gob.pe/mapas/mapa-sistema-nacional-carreteras-peru>; and “Renac,” Ministerio de Transportes y Comunicaciones, n.d., <https://portal.mtc.gob.pe/transportes/caminos/renac.html>.

¹⁰³ Ibid.

EVOLUTION OF THE ROAD NETWORK IN PERU



Note: Green lines = unpaved roads; Orange lines = paved roads

Source: "Cuánto Avanzó el Perú en Carreteras Desde 1990 al 2016?," RPP, July 14, 2016, <https://rpp.pe/peru/actualidad/cuanto-avanzo-el-peru-en-carreteras-desde-1990-al-2016-noticia-979260>.

In part, challenges with infrastructure planning arise because there is little systematized information of the region in terms of what the proposed projects are, which projects should be prioritized, and how these projects contribute to a positive economic vision of the Amazon. Many of the infrastructure proposals in the Amazon are promoted by public and private sponsors in a disjointed way, without an analysis of their interconnections and their collateral effects. As Dourojeanni et al. (2010) contends:

New roads are proposed without planning correlative rural development projects, migration is brought about without considering proportional improvements in education and health, ecotourism development is encouraged and in the same location illegal mining is tolerated and, to mention the most awkward cases, barely finished roads are built where a dam's great artificial lake is also to be created.¹⁰⁴

Furthermore, most of these projects lack clear economic, environmental, or social justifications; many of the feasibility studies of public infrastructure projects show that they are not economically viable and do not account for the environmental or social impacts.¹⁰⁵

Weak Infrastructure Planning Is Compounded by Deficiencies in Project Execution

It is important to recognize the potential negative impacts of new infrastructure projects in the Amazon. A large road may improve trade logistics and enable greater transportation access to remote regions, but political motives that do not follow economic principles often drive the decision to construct these roads.

¹⁰⁴ M. Dourojeanni, A. Barandiaran, and D. Dourojeanni, "Amazonia Peruana en 2021."

¹⁰⁵ Ibid.

Moreover, projects do not typically account for environmental and social externalities. Many of these roads have brought in settlers, local smallholder farmers, and other migrants, leading to countless unplanned deforestation efforts. In fact, 75 percent of the deforestation in Peru occurs on plots of land that are less than half of a hectare in size (less than 1.25 acres), and 95 percent of deforestation takes place less than six kilometers from a road.¹⁰⁶

As main roads attract people to settle in the surrounding area, economic activities expand with them, leading to greater deforestation. Invasive settlers arrive from other regions of Peru as well as from neighboring countries; they clear trees near the regional access roads for their economic activities, which include small-scale agriculture and mining, timber harvesting, cattle ranching, and others.¹⁰⁷ The Transoceanic Highway (also known as the Interoceanic Highway) is the perfect example of this issue. The Transoceanic Highway runs from the Pacific ports of San Juan de Marcona, Matarani, and Ilo in Peru to the Atlantic ports of Rio De Janeiro and Santos in Brazil, spanning a total of 2,603 kilometers (see Annex 2). Initially, residents of Madre de Dios welcomed the project, since they hoped the road would improve their standard of living by promoting ecotourism and trade with Brazil, and by extension the creation of more employment opportunities and increased access to health services and infrastructure.¹⁰⁸ With the new highway, it was projected that Peru's GDP would grow by 1.5 percent annually.¹⁰⁹ Today, the highway is rarely used for trade, but it has contributed to massive deforestation and land degradation in the region, and continues to threaten the livelihoods and security of communities along the route.¹¹⁰ In particular, the illegal gold mining industry has grown in the Amazon region because of the increased access enabled by the Transoceanic Highway.

In many cases, road projects are executed without following the relevant regulations. There is a fine line between characterizing a road as legal or illegal, since regional governments are often the ones that begin the construction of roads and choose not to follow the national requirements or environmental impact analyses. Many regional governments claim unfamiliarity with the national regulations and how different regulations interact with one another. If the technical feasibility studies are approved, then the construction of the road begins—the environmental certification and licensing process frequently becomes an afterthought.

The agency in charge of conducting the environmental licensing of projects is Servicio Nacional de Certificación Ambiental para las Inversiones Sostenibles (SENACE), which falls under the Ministry of the Environment (MINAM). In practice, there is little coordination of licensing with local governments' projects. In the case of transport projects, the Ministry of Transport and Communications (MTC) is the agency that carries out the environmental impact assessments. Moreover, the MTC carries out the evaluation and enforcement of environmental issues that arise during road construction. While the OEFA

¹⁰⁶ Mary Menton, Jazmín Gonzales, and Laura F Kowler, "REDD+ in Peru: The National Context," in REDD+ on the Ground: A Case Book of Subnational Initiatives Across the Globe; Erin O. Sills et al., eds. Bogor, Indonesia: Center for International Forestry Research, 2014, <https://www2.cifor.org/redd-case-book/case-reports/peru/>; and Dan Collyns, "Peru Passes Law Allowing Roads through Pristine Amazon Rainforest," *Guardian*, January 22, 2018, <https://www.theguardian.com/world/2018/jan/22/peru-passes-law-allowing-roads-through-pristine-amazon-rainforest>.

¹⁰⁷ "Peru: Foreign Investment Program," Climate Investment Funds, February 2014, https://www.climateinvestmentfunds.org/sites/cif_enc/files/meeting-documents/peru_fip_fact_sheet_01-28-14_0.pdf; and Smith and Schwartz, "Deforestation in Peru."

¹⁰⁸ Lulu García Navarro, "The Amazon Road: Paving Paradise for Progress?," NPR, September 14, 2009, <https://www.npr.org/2009/09/14/112535943/the-amazon-road-paving-paradise-for-progress>; and Amy R. Riley-Powell et al., "The Impact of Road Construction on Subjective Well-Being in Communities in Madre de Dios, Peru," *International Journal of Environmental Research and Public Health* 15, no. 6, June 2018, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6024980/>.

¹⁰⁹ Goodman, "The Role of NGOs in Mitigating the Impact of the Interoceanic Highway."

¹¹⁰ Ibid; and Chris Fagan, "Peru's Interoceanic: The Most Corrupt Highway in the World," Upper Amazon Conservancy, July 2018, <https://upperamazon.org/perus-interoceanic-the-most-corrupt-highway-in-the-world/>.

(Organismo de Evaluación y Fiscalización Ambiental), under MINAM, is in charge of evaluating and enforcing environmental matters, it has no authority in the case of road projects. This lack of independence of functions creates a conflict of interest that underplays environmental and social risk factors.

In order to correct this, environmental enforcement should be transferred to the OEFA. Furthermore, SENACE should become more involved with regional governments in terms of conducting impact studies of infrastructure projects. If these institutions remain unlinked, Peru's rate of deforestation has little chance of slowing down. The construction of one of the sections of the Yurimaguas-Jeberos road project depicts the complexity of these issues. In this case, neither the construction company nor the bidding authority prepared the environmental impact study that corresponds to the environmental certification process of the project, so the construction began in breach of this environmental obligation.¹¹¹

Civil society organizations such as the Sociedad Peruana de Derecho Ambiental (SPDA) work with local governments to carry out environmental assessments, organize community consultations, and help implement other facets of project requirements. Accountability, transparency, and access to project information during the different phases of the project cycle are still weak, despite the presence of legal tools—including the National Transparency Law and a public prosecutor to defend citizens' rights, even on environmental matters (Ley de Defensoría del Pueblo).¹¹² In 2018, Peru signed an international treaty—the Escazú Agreement—which seeks to augment access to information and environmental justice processes for the most vulnerable populations of Latin America once ratified (Box 2).

Box 2: The Escazú Agreement

The Escazú Agreement (Acuerdo de Escazú) represents the first environmental treaty of Latin America and the Caribbean, as well as the first treaty in the world to combine an environmental legal framework with a human rights treaty. Administered by the United Nations, the treaty focuses on ambitious goals of expanding environmental protection, combating inequality and discrimination, and protecting vulnerable persons. In terms of environmental protection, the treaty mentions a variety of focus areas, including biodiversity conservation, combatting land degradation, and disaster risk management. The treaty includes broader commitments aiming to boost accountability and transparency through key provisions and regulations for access rights to information and public participation.¹¹³ The treaty aims to leverage global and national frameworks to create regional standards, increase capacity building, bolster institutional architecture, and provide tools for improved policy- and decisionmaking.¹¹⁴ In 2018, Peru signed onto the Escazú Agreement, but it has not yet ratified it.¹¹⁵ The agreement currently has 8 ratifications from member countries; the treaty will go into effect when it has 11 ratifications.

¹¹¹ "Afectación ambiental de carretera Yurimaguas-Jeberos ascendería a unos 2 millones de soles," *Actualidad Ambiental*, October 29, 2019, <https://www.actualidadambiental.pe/serfor-afectacion-ambiental-ocasionada-por-carretera-yurimaguas-jeberos-ascenderia-a-cerca-de-2-millones-de-soles/>.

¹¹² "Ley de Transparencia y Acceso a la Información Pública," Gobierno del Perú, https://www.peru.gob.pe/normas/docs/LEY_27806.pdf; "Nuestra Institución," Defensoría del Pueblo – Perú, <https://www.defensoria.gob.pe/quienes-somos/>; and "Un Ambiente Sin Contaminación," Defensoría del Pueblo – Perú, https://www.defensoria.gob.pe/areas_tematicas/un-ambiente-sin-contaminacion/.

¹¹³ "Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean," UN - ECLAC, Santiago: March 2018, https://repositorio.cepal.org/bitstream/handle/11362/43583/1/S1800428_en.pdf.

¹¹⁴ *Ibid.*

¹¹⁵ "Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean," *United Nations Treaty Collection*, March 4, 2018,

https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-18&chapter=27&clang=_en.

Regarding access to information and consultation with indigenous communities, Law 29.785 (Ley de Consulta Previa) points out that for mining and extractive industry projects, communities need to be consulted before a contract is signed and whenever there is a change in the concession area.¹¹⁶ The law, however, provides no clear delineation of the phases when communities need to be consulted for transport and energy projects. For example, in many cases, roads and transmission lines are considered “public services” and therefore do not require prior consultation.¹¹⁷ In the case of the Iquitos–Saramiriza Highway (see Annex 3), there is work underway to conduct such a process of consultation.

There are also significant differences in terms of the environmental and social standards applied by the different infrastructure project sponsors. More established organizations, such as the International Finance Corporation (IFC) and the IDB, have developed “quality infrastructure” standards they have cultivated over decades of development finance experience. The IDB’s Principles of Sustainable Infrastructure, the World Bank’s Global Infrastructure Facility, and other major infrastructure implementers concur that infrastructure is sustainable when it is built with greater consideration of environmental, social, and economic externalities while also promoting community engagement and social benefits (Box 5). These organizations require host country governments to abide by those standards—no matter the country context—and often reward countries for meeting benchmarks.¹¹⁸ For example, from 2000 to 2015, the expertise of the Development Bank of Latin America (CAF) and the International Bank for Reconstruction and Development was utilized for seven DFI-financed infrastructure projects in the Peruvian Amazon.¹¹⁹ Through its projects in Peru, CAF assisted in strengthening the capacities of the Peruvian government by establishing oversight bodies for infrastructure projects.¹²⁰ CAF also assisted Peru in strengthening risk mitigation in the project planning phase and addressing gaps in regulatory oversight.¹²¹

Adopting Quality Infrastructure Standards

With new investors planning projects in Peru, particularly those originating from China, it is imperative that these new players also follow “quality infrastructure” standards (Box 3). Chinese financial institutions such as the China Development Bank and Export-Import Bank of China typically operate on the standards used by their borrowing countries, which tend to be inferior to those developed by the World Bank Group, IDB, and others.¹²² Additionally, these new institutions do not require competitive bidding for contractors, nor do they condition loans on borrowing countries’ ability to meet these standards. Since 2015, seven additional projects have been financed or slated to be financed in the Peruvian Amazon, with three of these seven projects set to receive financing from China.¹²³ Further, with more than 170 Chinese

¹¹⁶ “Ley del Derecho a la Consulta Previa a los Pueblos Indígenas u Originarios, Reconocido en el Convenio 169 de la Organización Internacional del Trabajo,” Gobierno del Perú, n.d., <http://consultaprevia.cultura.gob.pe/wp-content/uploads/2014/11/Ley-N---29785-Ley-del-derecho-a-la-consulta-previa-a-los-pueblos-ind--genas-originarios-reconocido-en-el-Convenio-169-de-la-Organizacion-Internacional-del-Trabajo-OIT.pdf>.

¹¹⁷ Francisco Rivasplata, “Los Estudios de Impacto Ambiental en Infraestructura de Transportes deben ser Consultados,” *Derecho, Ambiente y Recursos Naturales*, February 8, 2018, https://www.dar.org.pe/noticias/daropina_cphidrovia/.

¹¹⁸ Rebecca Ray, Kevin P. Gallagher, and Cynthia Sanborn, “Standardizing Sustainable Development? Development Banks in the Andean Amazon,” Boston: Boston University Global Development Policy Center, 2018, <https://www.bu.edu/gdp/files/2018/04/Development-Banks-in-the-Andean-Amazon.pdf>.

¹¹⁹ *Ibid.*, 14.

¹²⁰ *Ibid.*, 31.

¹²¹ *Ibid.*, 34.

¹²² *Ibid.*

¹²³ *Ibid.*

companies operating in Peru, investments have focused particularly on mining.¹²⁴ Recent mining investments underscore the challenge of implementing strong social and environmental standards.

Box 3: Quality Infrastructure and Sustainable Infrastructure Standards

Over the years, sustainable infrastructure development has gained acclaim as a concept and process. In its basic form, building sustainable infrastructure involves greater consideration of environmental, social, and economic externalities while also promoting community engagement and social benefits. Through the United Nations, World Bank, and others, the international community has developed a series of principles to guide investments in infrastructure projects. Among the earliest of such efforts, the UN Principles for Responsible Investment (2006) created a set of voluntary principles that recognized the need for sustainability in development. The UN principles sought to reinforce the importance of environmental, social, and governance considerations before undertaking any investment into development projects.¹²⁵

Other examples include the OECD, which developed a comprehensive framework for infrastructure governance that encompasses 10 key challenges: (1) Develop a strategic vision for infrastructure; (2) Manage the integrity and corruption threats throughout the project; (3) Choose how to deliver the infrastructure; (4) Ensure good regulatory design; (5) Integrate a consultation process; (6) Coordinate infrastructure policy across levels of government; (7) Guard affordability and value for money; (8) Generate, analyze and disclose useful data; (9) Make sure the asset performs throughout its life; and (10) Ensure that public infrastructure be resilient.¹²⁶

Similarly, the World Bank established the Global Infrastructure Facility in 2015 as a global and open platform to facilitate the preparation and implementation of infrastructure projects.¹²⁷ The G7 developed comprehensive standards under the Ise-Shima Principles for Quality Infrastructure in 2016, which the G20 then aimed to operationalize through the creation of the Osaka Principles for Quality Infrastructure Investment in 2019.¹²⁸ Also in 2019, the United States, Japan, and Australia launched the Blue Dot Network as a multi-stakeholder initiative aiming to certify infrastructure projects around the world that meet high standards of transparency, sustainability, and developmental impact.¹²⁹

¹²⁴ Jimena Galindo, “Peru to Join China’s Belt and Road Initiative,” Global Americans, January 2019, <https://theglobalamericans.org/2019/05/just-the-facts-peru-to-join-chinas-belt-and-road-initiative/>.

¹²⁵ “PRI Home,” PRI, n.d., <https://www.unpri.org>.

¹²⁶ “Getting Infrastructure Right: The Ten Key Governance Challenges and Policy Options,” OECD, 2016, <https://www.oecd.org/gov/the-oecd-framework-for-the-governance-of-infrastructure.htm>.

¹²⁷ “Home,” Global Infrastructure Facility, n.d., <https://www.globalinfrafacility.org/>.

¹²⁸ “G20 Principles for Quality Infrastructure Investment,” Ministry of Finance Japan, n.d., https://www.mof.go.jp/english/international_policy/convention/g20/annex6_1.pdf; and “G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment,” Ministry of Finance Japan, n.d., <https://www.mofa.go.jp/mofaj/gaiko/oda/files/000160272.pdf>.

¹²⁹ “Blue Dot Network,” U.S. Department of State, n.d., <https://www.state.gov/blue-dot-network/>.

3. The Future of Infrastructure Development in the Peruvian Amazon

In April 2019, Peru launched its “Vision for 2050,” a roadmap that will guide policies and plans for Peru post-2021, with the aim of achieving inclusive and sustainable development for all Peruvians.¹³⁰ The 2050 vision makes specific reference to sustainable economic development, calling for all actors in the country to “ensure a harmonious social and economic development, free of contamination and healthy for everyone in time, in the context of climate change.”¹³¹ As Peru embarks on the next phase of its development planning process, the country’s leaders should approach the Amazon Basin as a strategic region in terms of its economic potential, environmental endowment, and security for its communities.

Although infrastructure investments are needed to support economic growth and social development in the Amazon, baseline conditions such as insecurity, weak territorial governance, and poor institutional capacity of regional governments need to be addressed. Otherwise, investments in infrastructure will be wasted, and economic growth will not be realized. The best way for infrastructure to serve the Amazon would be to first craft a sustainable development plan for the region and then to embed infrastructure projects into this plan. This plan should target economic activities that can provide meaningful alternatives to informal and illegal operations and should address the conditions needed to enable development, such as rule of law and effective governance. Infrastructure plans will need to be redesigned and embedded in this vision in order to avoid exacerbating existing challenges.

As Peru embarks on the next phase of its development planning process, the country’s leaders should approach the Amazon Basin as a strategic region in terms of its economic potential, environmental endowment, and security for its communities.

Devise a Sustainable Development Vision for the Amazon Basin

A new development paradigm for the Amazon Basin is needed, one that combines economic and social prosperity for its citizens, environmental preservation, and security.¹³² Many of the regions that comprise the Peruvian Amazon have the highest population growth in the country, and people need jobs and social

¹³⁰ “Visión del Perú al 2050,” CEPLAN, n.d., <https://www.ceplan.gob.pe/visionperu2050/>.

¹³¹ Ibid.

¹³² Timothy J. Killeen, “A Perfect Storm in the Amazon Wilderness: Development and Conservation in the Context of the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA),” Arlington, VA: Center for Applied Biodiversity Science, Conservation International, 2007, http://faculty.washington.edu/timbillo/Readings%20and%20documents/interoceanic%20Highway/Peru_from_Darby/Peru_transoceanic/Killeen2007.pdf.

investments to support their wellbeing.¹³³ As already discussed, the Peruvian Amazon suffers from a host of security challenges, including rampant illegal activities, land grabbing, and environmental degradation. Many people are involved in informal or even illicit activities because there are few economic alternatives. According to some estimates, more than 85 percent of the people in the Peruvian Amazon work in the informal economy.¹³⁴ Combatting illegal activities and protecting communities will require more than heightened security forces on the ground: security also needs to be tied to economic plans.

Designing a vision of the rainforest of the future that is desirable is the task of all Peruvians and, especially, of the peoples who live in the rainforest.

-Dourojeanni et al.¹³⁵

In this regard, the Amazon will need to shift its production systems so that they are not as dependent on the fluctuations of international commodity prices. Potential avenues include transforming commodities into manufactured goods and services to increase their added value and investing in technology-based industries that are independent of natural resources.¹³⁶ Investments need to ensure the conservation of protected areas and efficient management of natural resources.

One issue with exports from the Peruvian Amazon is the current reliance on commodities linked to deforestation—such as palm oil, biofuels, and soy—combined with an “extractive mentality” that emphasizes extracting as much of a resource as possible when profits are high, often to the point of exhausting the resource entirely.¹³⁷ The result is an export market vulnerable to global fluctuations in international commodity markets. Some experts believe that improved *hidrovia* (waterway) systems will increase the global competitiveness of traditional Peruvian exports, such as biofuels, grains, and timber.¹³⁸ Products such as rubber, brazil nuts, and rare fruits including camu camu, açai, and aguaje could make up a larger portion of the Peruvian Amazon’s exports if infrastructure project planning processes improve and the correct incentives are established.

A new development paradigm for the Amazon Basin is needed, one that combines economic and social prosperity for its citizens, environmental preservation, and security.

¹³³ Population Growth: Average for Peru in 2007–2017: 0.7 percent. Madre De Dios 2.6 percent, Ucayali 1.4 percent, San Martin 1.1 percent, while Amazonas 0.1 percent and Loreto -0.1 percent. “Magnitud y Crecimiento Poblacional,” INEI, <http://m.inei.gob.pe/estadisticas/indice-tematico/growth-and-size-of-population/>.

¹³⁴ “Más del 80% de trabajadores son informales en la Macro Región Oriente,” *Gestión*, December 6, 2015, <https://gestion.pe/economia/80-trabajadores-son-informales-macro-region-oriente-92194-noticia/>.

¹³⁵ “Dourojeanni et al., *Amazonia Peruana en 2021*, 135.

¹³⁶ Killeen, “A Perfect Storm in the Amazon Wilderness.”

¹³⁷ Mike Gaworecki, “New Report Examines Drivers of Rising Amazon Deforestation on Country-by-Country Basis,” Mongabay, May 23, 2019, <https://news.mongabay.com/2019/05/new-report-examines-drivers-of-rising-amazon-deforestation-on-country-by-country-basis/>; and Killeen, “A Perfect Storm in the Amazon Wilderness.”

¹³⁸ Killeen, “A Perfect Storm in the Amazon Wilderness.”

To develop viable exports from the Peruvian Amazon, some experts recommend transforming commodities into manufactured goods or services. For example, one could utilize Amazonian agriculture commodities as protein for fish farms, which lend themselves well to the warm ponds of the Amazon and require only a small surface area.¹³⁹ Fish farming could benefit rural populations by creating a value-added production chain that boosts incomes and food security. Another recommendation includes investing in technology-based industries that are independent of natural resources, such as cold storage and refrigeration during transit. Thirdly, Peru is the top global exporter of organic coffee and cocoa.¹⁴⁰ Groups such as the Rainforest Alliance are working with Peruvian farmers to advance sustainable coffee bean production as part of a larger effort to enhance the sustainability of pre-existing exports.

Moreover, Peru is one of 46 developing countries participating in the Forest Carbon Partnership Facility (FCPF), which brings together the public sector, private sector, and indigenous communities to foster activities that reduce emissions from deforestation and forest degradation (REDD).¹⁴¹ REDD activities relate, broadly, to forest conservation efforts, while REDD+ activities also include forest management reforms.¹⁴² Such reforms can include reducing carbon emissions from deforestation or degradation and promoting sustainable forest management, among others.

As a part of the FCPF's Readiness Fund, Peru receives technical assistance and consultations in establishing national REDD+ management arrangements, which include designing environmental and social safeguards.¹⁴³ And in 2017, the World Bank's Climate Investment Funds (CIF) awarded Peru a \$26.8 million grant and a \$23.2 million loan to address land titling issues related to forest conservation efforts.¹⁴⁴

The UN-REDD Programme also supports Peru's REDD activities.¹⁴⁵ From 2013 to 2015, UN-backed REDD+ projects in Peru generated nearly \$34 million for Peru, spanning a variety of areas of focus.¹⁴⁶ In one project, Peru developed Salvaguardas de Cancun, which are environmental and social safeguards that define guidelines for transparency, rights for indigenous people, and forest conservation.¹⁴⁷ With an emphasis on collaboration across regions and with indigenous communities, one REDD+ program established four Community Monitoring and Surveillance Committees (CMVCs). CMVCs equip communities with computers, drones, GPS, and technical assistance in order to better monitor forests, illegal logging, and other illicit activities.¹⁴⁸ Another program in the Madre de Dios region focuses on decreasing deforestation due to agriculture and cattle ranching and the mitigation of environmental impacts from the nearby Transoceanic Highway. The program assists with the management of 98,932 hectares of rainforest in the region (244,466 acres or roughly the size of the entire Rocky Mountain

¹³⁹ Ibid.

¹⁴⁰ "The Rainforest Alliance's Work in Peru," Rainforest Alliance, February 13, 2020, <https://www.rainforest-alliance.org/articles/the-rainforest-alliances-work-in-peru>.

¹⁴¹ "What Is REDD+?," Forest Carbon Partnership Facility, n.d., <https://www.forestcarbonpartnership.org/what-redd>.

¹⁴² "REDD Y REDD+: Iniciativas para Reducir las Emisiones de Carbono," Ministerio del Ambiente Peru, n.d., <http://www.minam.gob.pe/prensa/dialogos-ambientales/redd-y-redd-iniciativas-para-reducir-las-emisiones-de-carbono/>.

¹⁴³ "About the FCPF," Forest Carbon Partnership Facility, n.d., <https://www.forestcarbonpartnership.org/about>.

¹⁴⁴ "Forest Investment Program Peru," Climate Investment Funds, 2018, <https://www.climateinvestmentfunds.org/projects/forest-investment-program-peru>.

¹⁴⁵ "Peru," UN-REDD Programme, n.d., <https://www.unredd.net/regions-and-countries/latin-america-and-the-caribbean/peru.html>.

¹⁴⁶ Dan Collyns, "Peru's REDD+ Conservation Efforts Paying Off," Mongabay, October 6, 2016, <https://news.mongabay.com/2016/10/perus-redd-conservation-efforts-paying-off/>.

¹⁴⁷ "Salvaguardas REDD+," Ministerio del Ambiente Peru, n.d., <http://www.minam.gob.pe/cambioclimatico/salvaguardas-redd/>.

¹⁴⁸ Isabel Gonzales and Maricarmen Ruiz, "The Indigenous Approach to National Forest Monitoring in Peru," UN-REDD Programme, February 13, 2020, <https://www.un-redd.org/post/the-indigenous-approach-to-national-forest-monitoring-in-peru>.

National Park in the United States) by providing forest monitoring skills training to locals and supporting the development of sustainable cocoa farms as an alternative to logging.¹⁴⁹

Address the Basic Enabling Conditions for Development

Basic enabling conditions for development need to be addressed such as increasing government transparency, devising innovative security models by using technology and partnering with communities on the ground, strengthening land governance, and improving fiscal decentralization to better match resources to spending needs.

Technology can be used to increase government transparency and detect criminal activity. Successful programs such as the MAAP have demonstrated the power of digitalizing bureaucracy by leveraging GIS and drone technology to identify environmental crimes. Extensions of this technology include collaborating with indigenous communities to use drone technology to identify illegal incursions on their protected territories. Other initiatives, such as a Rainforest USA project, aim to increase civilian reports of environmental crimes by providing citizens with cellphones. Such programs can be complemented by other small-scale energy projects, such as harnessing solar and wind power in Amazon communities to power cell phone charging stations. On a broader scale, these recommendations relate to a more fundamental need to expand information and communications technology to increase transparency.

Following the model of successful initiatives such as Operation Mercury, the prosecution phase of environmental crimes could be improved by developing operating bases for conservation crimes, implementing specialized environmental prosecutors, and increasing investigative capacity in Amazon-dense regions such as Madre de Dios and Loreto. More fundamentally, reforms at the personnel level should be a priority, including expanding staff training and budgets and filling vacancies. An increase in uncovering environmental crimes may also follow from institutionalizing investigative tactics, including the use of confidential informants and undercover operations.

Recognizing the limitations of their budgets, operations should coordinate with High Crimes Investigative Units to focus on disrupting the illicit financial flows of larger criminal enterprises rather than using large amounts of resources on small-scale violators. In the long term, solutions to budget issues should be explored through examining revenue streams and special taxes for the government.

Persistent throughout these issues is the underlying problem of government decentralization without adequate coordination. Peru has, however, made strides in addressing this problem in relation to environmental crimes, particularly in the illegal logging sector. In 2019, Peru established an executive board of forestry, involving all regional forestry authorities collaborating to address issues and recognize opportunities for reform. In recognizing the value of such a model, Peru will hopefully continue to focus on implementing sustainable, collaborative solutions rather than piecemeal ones. In this regard, a recent World Bank report identifies several policy reforms to address issues related to fiscal decentralization in Peru:

- Institutional frameworks governing the relationship between levels of government;
- Clear expenditure responsibilities for each level of government;
- Commensurate redefinition of the tax authority to boost subnational source revenue capacity and enhance collection efficiency; and,

¹⁴⁹ “Madre de Dios,” Sustainable Carbon, n.d., <https://www.sustainablecarbon.com/projetos/madre-de-dios/>.

- Proposals to increase the transparency, stability, and equalizing impact of the intergovernmental transfer system.¹⁵⁰

In terms of land governance, the insecurity created by the land tenure system drives deforestation and social conflict. Changes are needed in the legal framework, such as establishing one main national cadastre to resolve existing zoning problems and prevent future ones. At the same time, current land titling disputes that affect indigenous communities will need resolution, and economic activities such as mining and agriculture will need to undergo a more serious formalization process.

Strengthen Infrastructure Planning and Embed It into a Sustainable Development Vision

If governance and security issues go unchecked, infrastructure investments will not provide an easy fix to economic growth. Infrastructure investments must be accompanied by a sustainable pathway for the future of the Amazon. Yet infrastructure development cannot simply be the outcome of an incoherent list of isolated sectoral projects. Given that sectoral and regional plans are not currently integrated, the PNIC is not a strong planning tool to help guide these investments. What has been seen so far instead is that default infrastructure projects end up prioritizing transportation connectivity, primarily in the form of road construction.

Regional plans must be coordinated and integrated with the national infrastructure plan to avoid duplicating different initiatives and wasting much-needed budgetary resources. In this regard, the decisionmaking process for selecting infrastructure projects needs to be technically sound and transparent. Many infrastructure projects are susceptible to external influences, whereby the largest beneficiaries are the ones sponsoring the projects. Oftentimes, an economic analysis of projects indicates that projects are not economically viable even without accounting for environmental and social costs.

Social and environmental impacts are often regarded as no more than a “formality” or a checklist item. The same applies to citizen participation. These aspects need to be included early in the design phase rather than only once the project has been approved; this way, all stakeholders will be fully aware of impacts before projects break ground. Real community participation and an honest and informed discussion on the gaps and priorities of the region must be a common practice going forward.

Environmental and social aspects must be incorporated into the whole cycle of the project, starting from the early stages, all the way to execution and evaluation. Stronger environmental and social standards need to be implemented, especially ones that go beyond those required by the national norms. The technical aspects of environmental and social impact studies need to be strengthened by following international standards—such as those developed by the OECD and development finance institutions such as the IFC and IDB. These studies should also incorporate community requirements. Assessments should take into account the secondary impacts of projects and the cumulative impacts of multiple projects in the region. If communities will be impacted, compensation plans for affected parties need to be properly estimated and managed.

¹⁵⁰ Fernando Andres Blanco Cossio, Jorge Martinez-Vazquez, Linda Janet Porras Mendoza, Maryam Ali Lothrop, and Sean Craig Lothrop, “Peru: Building a More Efficient and Equitable Fiscal Decentralization System,” The World Bank, May 5, 2017, <http://documents.worldbank.org/curated/en/106651568318660229/Peru-Building-a-More-Efficient-and-Equitable-Fiscal-Decentralization-System>.

A major challenge is for different stakeholders to be able to understand complex project information. Many communities cannot access information, or when they do, it is not user-friendly. Peru should continue to implement its development of digital government—as outlined in Peru’s 2018 Digital Government Plan—through publishing publicly accessible digital governance tools as a means of increasing transparency and citizen engagement.¹⁵¹ Improving the transparency of the project process can ensure that true dialogue with citizens occurs, that demands are considered, and that the project yields better outcomes. The role of civil society is crucial in intermediating this information among government, sponsors, and communities.

In terms of specific infrastructure, the default for the Peruvian Amazon tends to be in transport projects. However, there is limited quality official information on the extent of the current road network, including informal or illegal roads. Regional governments need to conduct a comprehensive inventory of secondary and tertiary roads in the Peruvian Amazon to diagnose the extent of the irregularities and remove those that are illegal. Furthermore, roads should not be regarded as the solution to all transportation problems. Rivers in the Amazon Basin can be used to transport bulk commodities (such as grains, minerals, timber, and biofuels), while air transport could be subsidized for harder-to-reach communities.¹⁵² When using rivers and waterways as a form of transportation, there must be an acknowledgment of the environmental and health effects that economic activities have on these water resources.

Air transit could also be expanded in the Peruvian Amazon to reduce reliance on roads. For example, the IDB and Peru’s Ministry of Transport and Communications constructed 14 air routes into various parts of the Peruvian Amazon in 2016.¹⁵³ While some of these flights to remote regions are subsidized to the extent of \$2.1 million per year, José Gallardo, the Minister of Transport and Communications, claims the social impact of the new routes far outweigh their costs.¹⁵⁴ If new road construction or road improvements do not make economic, environmental, and social sense, then it is reasonable to minimize this form of infrastructure. Otherwise, if roads are determined to be resurfaced or repaved, parallel efforts need to be taken to improve agricultural productivity or incentivize economic alternatives so that there is no increased deforestation and land grabbing as a result. At the same time, programs of reforestation and restoration of degraded areas need to be designed and strengthened.

In terms of energy provision, the construction of hydroelectric dams is stalled in the Peruvian Amazon, but alternatives that are more environmentally friendly—including solar and wind power—should also be considered. In Loreto, “Luz en Casa Amazonia” (Light in Amazon Houses) offered an alternative to energy grids, which require high investment and have negative environmental impacts.¹⁵⁵ After a successful pilot project of the program saw household savings and sustainable energy production, the program expanded to provide more than 400 families with access to electricity.¹⁵⁶ Further expansions of the program aim to reach more than 5,000 people in 30 locations, as well as commitments to undertake education efforts and technical training on the installation process.¹⁵⁷ The project emphasizes

¹⁵¹ “Lineamientos Para La Formulación Del Plan de Gobierno Digital – PGD,” Presidencia del Consejo de Ministros, 2018, https://www.peru.gob.pe/normas/docs/Anexo_I_Lineamientos_PGD.pdf; OECD, “Public Governance Reform: Peru Highlights.”

¹⁵² Killeen, “A Perfect Storm in the Amazon Wilderness.”

¹⁵³ “La Selva Ya Está Conectada al 100% Por Vía Aérea, Cuánto Puede Costar Un Pasaje,” *Gestión*, July 14, 2016, <https://gestion.pe/economia/selva-conectada-100-via-aerea-costar-pasaje-146841-noticia/>.

¹⁵⁴ *Ibid.*

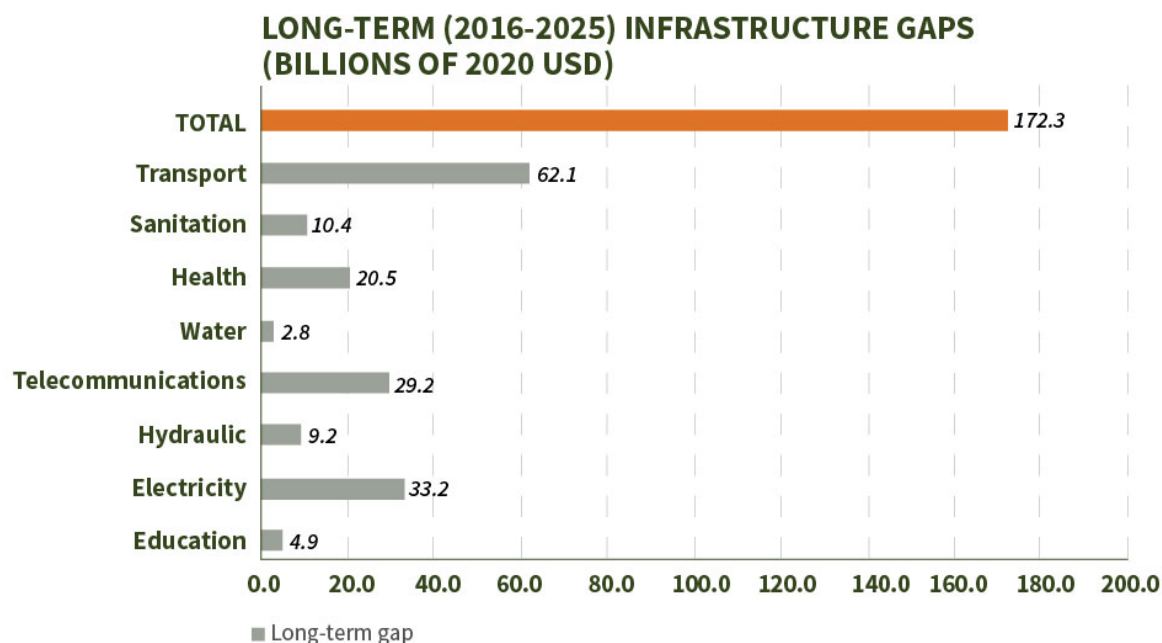
¹⁵⁵ “Luz En Casa Amazonia Programme,” Acciona, n.d., <https://www.acciona.org/peru/luz-en-casa-amazonia>.

¹⁵⁶ Camille Chouan, “Empowering Communities: Pay-As-You-Go Solar Energy in the Peruvian Amazon,” Medium, June 13, 2017, <https://medium.com/i-dev-insights/lighting-the-way-how-to-make-payg-solar-work-in-the-peruvian-amazon-b71dee3a9b03>; and “Luz En Casa Amazonia Programme,” Acciona.

¹⁵⁷ “Grupo Acciona amplía su proyecto ‘Luz en Casa Amazonia,’” La Republica, September 6, 2019, <https://larepublica.pe/nota-de-prensa/2019/09/06/grupo-acciona-amplia-su-proyecto-luz-en-casa-amazonia/>.

the central importance of building strong relationships with locals, especially with community leaders. Moreover, as the next phase of the project shows, it will be important to educate and empower the population.¹⁵⁸

Furthermore, social infrastructure is lacking in the Amazon; higher investments in water and sanitation services in underserved areas are needed, and services in urban clusters need to be improved. The most recent PNIC states that Peru has a long-term infrastructure gap of \$172.3 billion.¹⁵⁹ Of the lowest earners in Peru, only 26.3 percent have access to sanitation services.¹⁶⁰ Water, sanitation, and health infrastructure account for 19.6 percent of Peru's infrastructure gap, totaling approximately \$33.7 billion (Figure 1).



Source: José L. Bonifaz et al., "Un Plan Para Salir de la Pobreza: Plan Nacional de Infraestructura 2016-2025," (Lima: Asociación para el Fomento de la Infraestructura Nacional, 2015), https://www.proyectosapp.pe/RepositorioAPS/0/2/JER/SF_HUANCAYO_HUANCAVELICA/plan_nacional_infraestructura_2016_2025_2.pdf. Note: the data from the above source has been updated with 2020 USD. Exchange rate: 1.00 USD in 2015 = 1.08 USD in 2020.

¹⁵⁸ Ibid.

¹⁵⁹ José L. Bonifaz et al., *Un Plan Para Salir de la Pobreza: Plan Nacional de Infraestructura 2016-2025* (Lima: Asociación para el Fomento de la Infraestructura Nacional, 2015), https://www.proyectosapp.pe/RepositorioAPS/0/2/JER/SF_HUANCAYO_HUANCAVELICA/plan_nacional_infraestructura_2016_2025_2.pdf.

¹⁶⁰ Ibid.

Annex 1: The Transoceanic (or Interoceanic) Highway



In December 2004, Presidents Alejandro Toledo of Peru and Luiz Inácio Lula da Silva of Brazil agreed to construct the 1,600-mile (2,600-kilometer) Transoceanic (or Interoceanic) Highway that would connect Brazil's Atlantic coast to Peru's Pacific ports.¹⁶¹ The highway is one of the largest infrastructure projects in Peru's history, crossing directly through the Peruvian Amazon region of Madre de Dios, which is one of the most biodiverse places in the world and home to Manu National Park and Tambopata National Reserve.¹⁶² The main purpose of the highway was to combine Brazil's economic strength with Lima and other strategic ports that lie along the Pacific coast of Peru, such as Ilo, Matarani, and San Juan de Marcona.¹⁶³ From its inception in 2006 to its completion in July 2011, the cost of the project nearly tripled, from \$658 million to almost \$2 billion, much of which was financed by the Brazilian Development Bank (BNDES), the CAF, and the Peruvian government.¹⁶⁴

¹⁶¹ Ker Than, "Bugs Help Measure Impact of New Transoceanic Highway on Amazon," National Geographic, May 18, 2012, <https://www.nationalgeographic.com/news/2012/5/120518-leaf-packs-transoceanic-highway-amazon-water-quality/#close>.

¹⁶² Riley-Powell et al., "The Impact of Road Construction"; and Goodman, "The Role of NGOs in Mitigating the Impact of the Interoceanic Highway."

¹⁶³ Rhett Butler, "Transoceanic Highway Will Link Amazon to the Pacific," Mongabay, January 9, 2006, http://rainforests.mongabay.com/amazon/amazon/Transoceanic_Highway.html; and "Southern Interoceanic Highway (Peru-Brazil)," Bank Information Center, n.d., <https://web.archive.org/web/20110905054540/http://www.bicusa.org/en/Project.10312.aspx>.

¹⁶⁴ Bart Crezee, "Interoceanic Highway Incites Deforestation in Peru, Threatens More to Come," Mongabay, November 1, 2017, <https://news.mongabay.com/2017/11/interoceanic-highway-incites-deforestation-in-peru-threatens-more-to-come/>; and "Interoceanic Highway," Road Traffic Technology, n.d., <https://www.roadtraffic-technology.com/projects/interoceanichighway/>.

Prior to the construction of the highway, many areas of the Peruvian Amazon were only traversable by river.¹⁶⁵ Upon construction, it became much easier to access these areas and illegally exploit the forest's natural resources, including animal skins, Brazil nuts, fine wood, gold, and rubber.¹⁶⁶ Farmers, ranchers, and loggers began to clear land for raising cattle, acquiring timber, and setting up extensive soy plantations on the road arteries that branch out from the highway. At the same time, an influx of impoverished Peruvians migrated from the Andean highlands and began to settle in the fertile lowlands.¹⁶⁷ An estimated 200 migrants from the Andean regions of Apurimac, Cusco, and Puno arrived each day by way of the highway.¹⁶⁸ Most migrants have cited greater access to land and work opportunities as the main reasons for relocating.¹⁶⁹ The migrants cut down trees and cleared land for farming, which led to unchecked deforestation in the region.¹⁷⁰ Between 2013 and 2015, a total of 1,830 hectares (4,522 acres or roughly a quarter of the size of Manhattan) of low-lying tropical rainforests were lost in the bordering town of Iberia alone.¹⁷¹

The highway made illegal gold mining easier, which also drew hundreds of Peruvians into the lowlands.¹⁷² The flood of migrants made indigenous communities highly vulnerable to the threat of outsiders—not only because of outright violence, but also because isolated immune systems are often ill-adapted to respond to diseases such as the common cold, flu, or measles, some of which could wipe out entire indigenous ethnic groups.¹⁷³ There has also been a reported increase in crime associated with the arrival of migrants.¹⁷⁴ The majority of non-migrants, 58.7 percent, believe that the presence of migrants has made their communities worse since the construction of the highway.¹⁷⁵

The highway has created other challenges for communities as well. Deforestation and land degradation associated with the highway has limited rural livelihood options.¹⁷⁶ In recent years, access to natural resources such as fishing, wildlife, wood, and other forest products has significantly declined since the construction of the highway.¹⁷⁷ Local fish populations have been decimated by mercury from gold mining, which is showing up at dangerous levels in Puerto Maldonado and remote indigenous communities.¹⁷⁸ In a 2018 study, approximately 70 percent of survey respondents confirmed that hunting had become much more difficult. This has led to tremendous changes in the traditional diets of indigenous communities, which have, for the most part, transitioned to processed, calorie-dense “Western” diets. Out of fear of contamination, communities have also had to boil water or collect rainwater for consumption. The same study found that people living in communities surrounding the highway have seen an increase in cases of dengue fever and road traffic accidents: 6.7 percent of households reported that they experienced dengue

¹⁶⁵ “The Interoceanic Highway: Pros and Cons For Peru’s Southern Rainforest,” Aracari Travel, July 10, 2013, <https://www.aracari.com/blog/stories/interoceanic-highway-peru-rainforest/>.

¹⁶⁶ Ibid.

¹⁶⁷ Navarro, “The Amazon Road.”

¹⁶⁸ Dan Collyns and Tom Phillips, “Pacific-Atlantic Route Drives Up Fears of Crime and Destruction,” *Guardian*, July 14, 2011, <https://www.theguardian.com/environment/2011/jul/14/pacific-atlantic-route-brazil-peru>.

¹⁶⁹ Kelly E Jensen et al., “Small Scale Migration along the Interoceanic Highway in Madre De Dios, Peru: An Exploration of Community Perceptions and Dynamics Due to Migration,” *BMC International Health and Human Rights* 18, no. 1, February 12, 2018: 12, <https://bmcinthealthhumrights.biomedcentral.com/articles/10.1186/s12914-018-0152-8#citeas>.

¹⁷⁰ Navarro, “The Amazon Road.”

¹⁷¹ Crezee, “Interoceanic Highway Incites Deforestation.”

¹⁷² Navarro, “The Amazon Road.”

¹⁷³ Riley-Powell et al., “The Impact of Road Construction”; and Nadia Drake, “Isolated Tribes and Forests Threatened by Peru’s New Amazon Road,” *National Geographic*, March 2018, <https://www.nationalgeographic.com/news/2018/03/peruvian-amazon-road-forests-uncontacted-tribes-indigenous-rights/>.

¹⁷⁴ Jensen et al., “Small Scale Migration.”

¹⁷⁵ Ibid.

¹⁷⁶ Riley-Powell et al., “The Impact of Road Construction.”

¹⁷⁷ Ibid.

¹⁷⁸ Ibid.

fever, and 21 percent of households reported that they experienced road traffic accidents in the past year. Among threats to health, the concern of infectious diseases was most often raised. Communities are also exposed to various other diseases—some of them potentially life-threatening—including diarrhea, fungal infections, leishmaniosis, and tuberculosis.¹⁷⁹

¹⁷⁹ Ibid.

Annex 2: Hidrovía Amazónica

In January 2020, Peru announced it was pausing construction of the Amazon Waterway (Hidrovía Amazónica), an infrastructure project that aimed to improve navigation and integrate transportation on the Amazon, Ucayali, Huallaga, and Marañón rivers. The project intended to create integrated Atlantic-to-Pacific river transport, which would use Pacific ports to improve the shipment of goods from inland areas to Asia. Estimates placed the project value at \$70 million, financed by a public-private partnership between the Peruvian government and Cohidro, a Chinese-Peruvian concession holder.¹⁸⁰

However, the project was controversial, due to its proposal to dredge four Amazonian rivers to allow for year-round transport for large cargo vessels using questionable economic and technical assumptions. The intended dredging would result in 56-meter-wide and 1.8-meter-deep lanes in the rivers.¹⁸¹ SENACE, the government agency responsible for conducting environmental impact assessments, produced a largely inconclusive report, stating that the study “couldn’t fully gauge the environmental impacts of dredging riverbed sediments.”¹⁸² Opponents of the project argued that such dredging would result in changing river conditions upstream and downstream, as well as increased incidences of shallow areas in different places along the stream. In that case, dredging as originally proposed would not yield the navigability benefits originally envisioned. Critiques of the study point out that it did not consider the total amount of toxins contained in dredged sediment, did not address the presence of several heavy metals, and did not consider the possibility that such toxins could accumulate in fish and other aquatic organisms. Furthermore, given the lack of Peruvian environmental quality standards for sediments, the report utilized Canadian standards, which may not be suitable for tropical rivers.¹⁸³

The portions of the river in question cross the territory of 424 native communities of 14 different ethnicities.¹⁸⁴ Indigenous people protested the plan, citing potential harm to indigenous fisheries, healing practices, and other rituals. Those in support of the project argued that dredging would occur at only 13 locations, accounting for approximately three percent of the waterway, and that the waterway would improve safety conditions, lower costs of travel, and have a positive economic impact.¹⁸⁵

¹⁸⁰ “Amazon-region Dredging Plan Put on Hold in Peru,” Ecoamericas, January 2020, <https://www.ecoamericas.com/issues/article/2020/1/589C3B33-6FC0-4DA3-B79D-F235D600BCB4>.

¹⁸¹ Neil Giardino, “Peru’s Natives Say Amazon Waterway Project Threatens Food Sources,” Al Jazeera, October 23, 2018, <https://www.aljazeera.com/indepth/features/peru-natives-amazon-waterway-project-threatens-food-sources-181022164802018.html>.

¹⁸² Ecoamericas, “Amazon-region Dredging Plan Put on Hold in Peru.”

¹⁸³ Ibid.

¹⁸⁴ “Qué es y por qué las Comunidades Nativas Rechazan su Construcción?,” RPP, July 6, 2019, <https://rpp.pe/peru/actualidad/hidrovía-amazónica-que-es-y-por-qué-las-comunidades-nativas-rechazan-su-construcción-noticia-1207288>.

¹⁸⁵ Giardino, “Peru’s Natives Say Amazon Waterway Project Threatens Food Sources”; and “Amazon-region Dredging Plan Put on Hold in Peru,” Ecoamericas.

Annex 3: Iquitos-Saramiriza Highway

On October 4, 2017, the Peruvian government passed Law 30.670, which declared the construction of the Iquitos-Saramiriza highway, connecting the region of Loreto with Peru's northern coast.¹⁸⁶ Before the highway was announced, the main route from Iquitos, Loreto's capital, to Saramiriza, Loreto's entry point to the Amazon River, required a nine-day upstream boat ride up the Marañón River.¹⁸⁷ Cassava, açai, camu camu, meat, and fish could not be exported from the Amazon, and the time-consuming journey from Peru's western coast made vegetables such as lettuce, tomato, and cucumber costly imports.

Support for the highway from the local population is mixed. Socially, there will be negative impacts on current inhabitants' commercial activity: they will have to move to the road, and some are skeptical the road can even be maintained in a jungle with constantly shifting waterways.¹⁸⁸ The president of the Regional Organization of the Eastern Indigenous People (ORPIO) has underscored that the Iquitos-Saramiriza highway will result in an increasing influx of people who will exploit the virgin forest and potentially cause security and land trafficking concerns.¹⁸⁹ In addition, concerns have been raised regarding the excessive costs of upgrading roads in the Amazon, which can easily exceed US\$1 million per kilometer.¹⁹⁰ As of February 2020, the project remains in the planning phase and continues to seek input from local people in the area.

¹⁸⁶ "[Video] Carretera Iquitos-Saramiriza: Viabilidad del Proyecto e Impactos en la Amazonía," SPDA Actualidad Ambiental, October 12, 2017, <https://www.actualidadambiental.pe/video-carretera-iquitos-saramiriza-viabilidad-del-proyecto-e-impactos-en-la-amazonia/>.

¹⁸⁷ Jurriaan van Eerten, "Connecting Iquitos: Building a Road through the Amazon," Al Jazeera, May 15, 2017, <https://www.aljazeera.com/indepth/features/2017/05/connecting-largest-city-unreachable-road-170508081433163.html>.

¹⁸⁸ Ibid.

¹⁸⁹ "Unas 19 Comunidades Aledañas a Lo Que Sería La Futura Carretera Iquitos-Saramiriza, Sí Quieren Que Ésta Se Construya," Periódico de Loreto, May 16, 2019, <http://www.periodicoluzverdeloreto.com/%EF%BB%BFunas-19-comunidades-aledanas-a-lo-que-seria-la-futura-carretera-iquitos-saramiriza-si-quieren-que-esta-se-construya/>; and "Iquitos - Saramiriza, Una Carretera Inviabile," Pro & Contra, October 15, 2019, <https://proycontra.com.pe/iquitos-saramiriza-una-carretera-inviabile/>.

¹⁹⁰ Vilela, Thais, Alfonso Malky Harb, Aaron Bruner, Vera Laísa da Silva Arruda, Vivian Ribeiro, Ane Auxiliadora Costa Alencar, Annie Julissa Escobedo Grandez, Adriana Rojas, Alejandra Laina, and Rodrigo Botero. "A Better Amazon Road Network for People and the Environment." *Proceedings of the National Academy of Sciences* 117, no. 13 (March 31, 2020): 7095. <https://doi.org/10.1073/pnas.1910853117>.

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