



SUPPORTING PIRARUCU FISHING BUSINESSES IN THE AMAZON

BUSINESS ON THE FRONTLINES

In 2018, the Fundação Amazonas Sustentável and the University of Notre Dame through its Business on the Frontlines program worked together to support a vibrant fisheries business to serve the traditional communities of the Amazon.



MENDOZA COLLEGE OF BUSINESS





The Amazon river basin is one of the most biodiverse places on earth, home to the largest rainforest and critical to global climate change. Yet the basin continues to be threatened by illegal logging, poaching, natural resource extraction and pollution.

Over the last 10 years, Fundação Amazonas Sustentável (FAS), or the Sustainable Amazonas Foundation, has led conservation efforts in the Amazon, focusing on sustainable economic development of the area's abundant resources and traditional river communities. In groundbreaking initiatives, FAS has sought to balance the economic needs of the communities inhabiting the rainforest with the need for ecological conservation.

In 2018, the University of Notre Dame MBA course Business on the Frontlines partnered with FAS to develop business solutions to impact livelihoods for the better in this critical geographic area.



Photo by John Dunbar

ABOUT

FUNDAÇÃO AMAZONAS SUSTENTÁVEL (FAS)

As a Brazilian nongovernmental organization, FAS was launched in 2007 by means of a partnership between the government of the state of Amazonas and Bradesco Bank. The foundation gained the support of multinational corporations such as Coca-Cola Company Brazil (2009) and Samsung (2010), among other partnerships for its programs and projects.

The mission of FAS is to promote sustainable development, environmental conservation and improvement of the quality of life of the river communities of the state of Amazonas. The main initiatives are implemented by the Bolsa Floresta Program (PBF), Education and Saude Program (PES) and Innovative Solutions Program (PSI).



Photos by John Dunbar

ABOUT

BUSINESS ON THE FRONTLINES

At the University of Notre Dame, the Business on the Frontlines (BOTFL) program examines the impact of business in societies suffering deep poverty and conflict. Graduate students and faculty from the Mendoza College of Business work directly on business- and poverty-related projects with partners in the field, primarily international humanitarian organizations.

Many BOTFL projects focus on agriculture, infrastructure and mining. Others have extended to microfinance, youth unemployment, post-civil

war reconciliation, business incubators, health and nutrition, human trafficking, child prostitution and disaster preparedness. Since 2008, BOTFL teams have worked on more than 40 projects in 25 countries with 15 partners.

By one estimate, thousands of individuals now have improved jobs and livelihoods due to the opportunities provided by BOTFL's projects in the field.

THE PROBLEM



At the center of the joint FAS-BOTFL efforts is the pirarucu — a prehistoric-looking, air-breathing fish that can grow up to 9 feet long and weigh 400 pounds. It inhabits lakes in the deepest parts of the Amazonian rainforest. Communities rely heavily on fishing for pirarucu, with half of their yearly income coming from just a few weeks of fishing. Twenty years ago, the giant fish was nearly extinct due to overfishing. However, as FAS taught communities to manage their commercial fishing operations, the pirarucu populations have rebounded dramatically.

The resurgence of the prized pirarucu was expected to bring significant improvements to the livelihoods of traditional communities. But sadly, it did not. The communities face an all-too-familiar situation: They do not capture a significant portion of the economic

value of their fish. Instead, middlemen and fish processors claim the majority of the profits. With few alternatives, communities are forced to accept low prices. If prices remain low, many communities will likely turn to illegal logging, mining and poaching in order to make ends meet.

Yet these communities call themselves “children of the forest.” Acting in a capacity similar to U.S. park rangers, these communities are often the last line of defense against the pillaging of the Amazonian rainforest. Building their economic livelihoods becomes incredibly important to protecting the Amazon. As a consequence, FAS asked the Notre Dame BOTFL team to advise on building and supporting a vibrant and sustainable fishery business around the pirarucu.

THE COLLABORATION

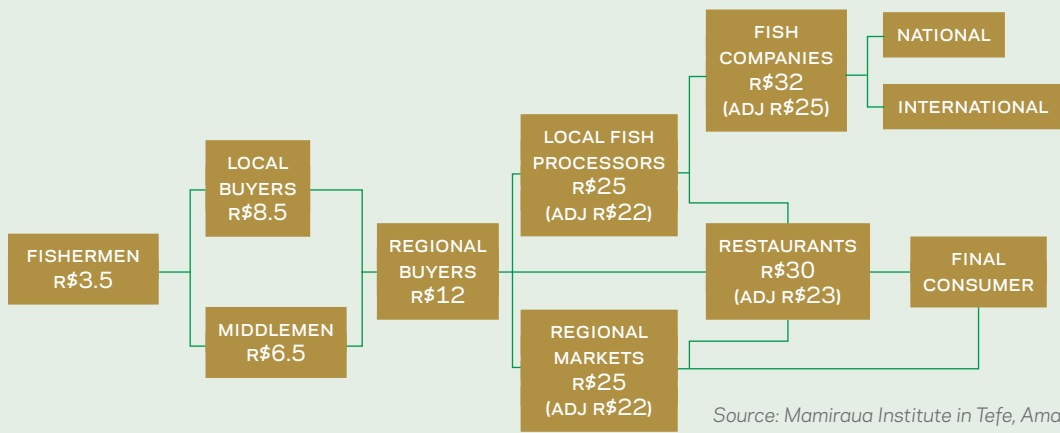
In November 2017, the BOTFL team began researching the pirarucu — its market, habitat and current supply chain. Leveraging Notre Dame’s contacts among other universities and businesses, the team consulted those with scientific expertise, as well as pirarucu importers for Whole Foods and other industry experts.

The research also included a detailed analysis of every step of the value chain, from the communities catching the pirarucu, to the middlemen who pick up the fish from the fishermen and transport it hundreds of miles down the river to the frigoríficos (“fridges”) in Manaus that process the pirarucu and sell it to end customers.

From January to the beginning of March, the joint FAS-BOTFL team members spoke every week via video chats to develop their research plan and to discuss their emerging findings. By the time the Notre Dame team departed for Brazil in March, the students had a thorough understanding of the pirarucu supply chain, market dynamics and competition.

Once in Brazil, the team traveled extensively along the Amazon to witness firsthand the challenges of transporting a perishable good hundreds of miles by boat from remote lakes to its end customers. The team spent more than 80 hours traveling on boats, kayaks, canoes, speedboats and ships, eventually arriving deep in the jungle.

MERCADO DO PIRARUCU: MAMIRAUA *(reais/kilogram of pirarucu)*



Source: Mamiraua Institute in Tefe, Amazonas, Business on the Frontlines team analysis



Photo by John Dunbar

Students interviewed dozens of community leaders and residents across the two environmental reserves of Mamiraua and Uacari, which are responsible for much of the pirarucu production. They also visited the fish markets and processors in Manaus to better understand pirarucu customers. The resulting research enabled the team to develop a complete supply chain.

From these visits, several issues became clear: The residents of the communities felt they had little power; they were very proud of their role in protecting the Amazon; and they were eager to explore ways to bring more profit to their communities through their prized pirarucu.

“The hospitality extended towards us by the Amazon communities was as captivating as the breathtaking beauty of the Amazon forest itself. One could only surrender to the charm of nature and the kindness of mankind. My humble gratitude and admiration to FAS for not just being a strong collaborator, but also for upholding the torch light for the Amazon communities to walk ahead in life.”

NAVYA P. RADHAKRISHNAN (MBA '18)

BOTFL teammate

THE SOLUTION



Photo by John Dunbar

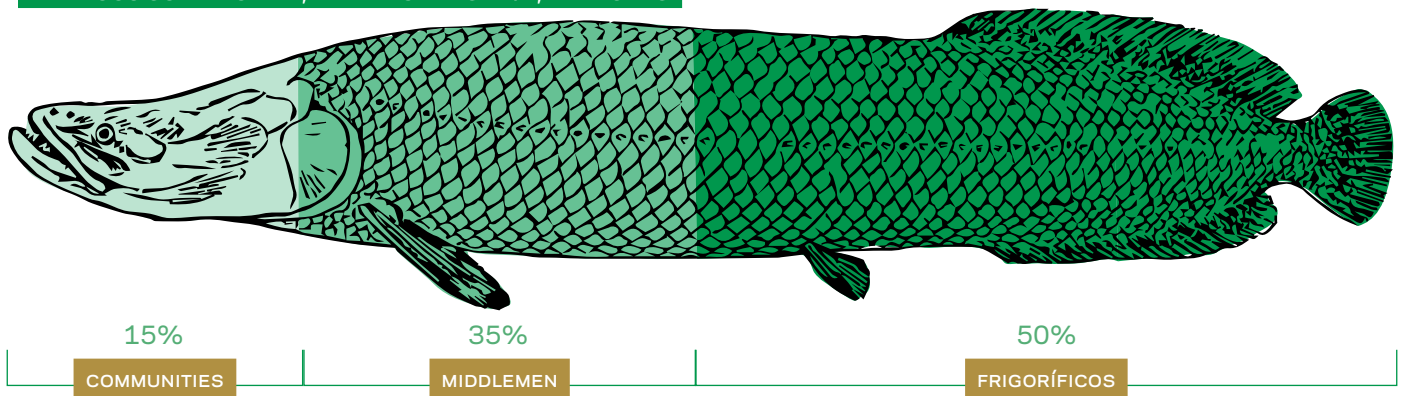
In many BOTFL projects, the team focuses its efforts in detailing the supply chain of various products, thereby uncovering potential opportunities. Graduate students bring their training in problem solving, research and analysis to the problem at hand.

However, on the first morning of the BOTFL team's first full day in Brazil, the FAS partner's colleagues presented a complete price and cost analysis for the entire pirarucu supply chain. Suddenly, the project became much more difficult. Students thought they were going to provide insights through identifying the central issues for the Amazon fishing industry, but it seemed that everyone already knew what those issues were. Furthermore, it seemed different organizations were already working on these issues.

PIRARUCU SUPPLY CHAIN, MAMIRAUÁ RESERVE, AMAZONAS

The team would have to push itself much harder to prove useful to FAS.

FAS and its leader, Dr. Virgílio Viana, are truly extraordinary in their dedication to environmental stewardship in the Amazon. Recognizing these capabilities in FAS, the BOTFL team challenged itself to think big. Really big. This allowed the students to move beyond simpler, quick wins to put their efforts toward how FAS could build a pirarucu fishing enterprise. FAS already had the most difficult strategic asset to acquire — namely, privileged access to more than half of the entire supply of legally caught wild pirarucu.



"It was a privilege to provide BOTFL's strong business analytics, substantial value chain experience and compassion to a respected organization such as FAS working to empower the people to solve their problems.

The FAS programs implemented over the past 10 years have done much to sustain the pirarucu, and now the focus is to do the same for the people living in the Amazonas region supporting their important role as the "keepers of the forest."

JOHN DUNBAR

Adjunct Professor of Finance, University of Notre Dame, BOTFL team faculty advisor

With a heavy dose of community organization and moderate investments into three physical assets — boats to transport fish to the market in Manaus, cold storage/ice-making equipment and, ultimately, a fish processing facility — FAS could build a business that earned millions of Brazilian reais per year. More importantly, much of the increased profit from the pirarucu would flow back to the fishermen.

Investment in market infrastructure, transportation and relationships with end-customers would significantly change the existing Amazon fish supply chain. In particular, with FAS assistance, the fishermen would be empowered to contract and sell their

pirarucu much more directly to consumers without the use of middlemen. These investments are estimated to increase significantly the average fishing household's annual income.

To illustrate, households currently receive about 4,000 reais from La Bolsa program, and earn about 2,300 reais from other economic activities such as fishing for pirarucu. Should the average household be able to earn 7 reais per kilogram of pirarucu, rather than the current 3.5 reais per kilogram, the average non-La Bolsa income would double from 2,300 to 4,600 reais. At 13 reais per kilo, the average household could earn 8,500 reais, thereby significantly improving their livelihoods.

Creating the Team

MAY 2017

Benjamin Sicsu

Bernardo Sicsu



Benjamin Sicsu, a distinguished Brazilian businessman and chair of the FAS Board of Directors, and son Bernardo Sicsu (ND MBA '17) met with BOTFL to discuss how the program could serve FAS.

Dr. Virgilio Viana

Dr. Viva Bartkus



FAS founder Virgilio Viana and BOTFL founder Viva Bartkus focused on the pirarucu value chain.

SEPTEMBER-OCTOBER 2017

MBA

students



Five MBA students were chosen from a large pool of applicants to the BOTFL program, along with two experienced faculty advisors. Two spoke Portuguese; all were deeply committed to serving in Brazil.

THE RESULTS



Photo by John Dunbar

With the 2018 pirarucu fishing season, FAS has invested in the team's recommendations, which included adding a cold storage facility in Fonte Boa, a fish transportation boat for Uacari and eight boats for eight Mamiraua districts. The plans at present would be to deliver the pirarucu from the protected reserves to markets and customers in Manaus. Over time, such a pirarucu transportation and processing business could provide a steady source of income for the fishing communities deep in the Amazon. Further, such an enterprise would support the frontline conservation efforts of the Amazon communities and FAS.

Thanks to the thorough analysis and recommendations of the BOTFL team, FAS is in the process of investing in building a vibrant fisheries business in Amazonas, Brazil.

Continuing Partnership

As with many successful initial collaborations, the pirarucu supply chain project created other opportunities for FAS and Notre Dame to work together:

- 1 A collaboration on a major economic research initiative to assess the impact on the lives of those living in river fishing communities from FAS investments in the necessary components of a vibrant fisheries business. This research protocol has already been launched with the new pirarucu fishing season that began September 2018.
- 2 A new BOTFL project to define the initiatives underpinning a future diversified "bio-economy" of the state of Amazonas, including farina, acai and vegetable oils.
- 3 Potential future projects that involve training opportunities and hosting joint conferences on environmental sustainability, with FAS colleagues visiting Notre Dame for in-depth discussions in September 2018.
- 4 The next BOTFL team visit to the Amazon planned for March 2019.

WHAT WE LEARNED FROM EACH OTHER

“In all my service to international humanitarian and development nongovernmental organizations, rarely have I encountered one with as high degree of professionalism or predisposition to act as FAS. Without doubt, many thousands of people in the protected reserves of the Amazon live far better lives because of the good work and dedication of FAS' extraordinary staff. From all of us at the University of Notre Dame and its Business on the Frontlines program, we look forward to many more years of collaboration with FAS. Obrigada!”

VIVA BARTKUS

*Associate Professor of Management,
University of Notre Dame, BOTFL Founder*

“Our partnership with the University of Notre Dame MBA was extremely successful. The project resulted in a detailed analysis of the economic aspects of the entire pirarucu production chain, from fishing to the final consumer, and identified the main challenges and alternative solutions. Our work benefited from the Business on the Frontlines team's insights and the fact that the effort represented an independent, professional analysis. This has inspired all of the partners to renew the multi-institutional work agenda aimed at increasing the payment of fishermen while maintaining biological sustainability of production on the other.”

DR. VIRGILIO VIANA

Fundação Amazonas Sustentável Founder

Learn more



www.fas-amazonas.org
comunicacao@fas-amazonas.org

Business on the Frontlines

Viva Bartkus
Associate Professor of Management
vbartkus@nd.edu
botfl.nd.edu

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