

AMAZON FISH FOR FOOD

TRANSFORMING AN UNDERUSED RESOURCE INTO PROFITABLE INDUSTRIES THAT ALLEVIATE POVERTY AND IMPROVE FOOD SECURITY

WHAT CANADIAN BOLIVIAN COLLABORATORS DISCOVERED:

- ✓ Improved *paiche* fisheries management and standards that increased fish quality and income for fishers and sellers
- ✓ A proven business model to increase aquaculture income with sustainable pacú production
- ✓ Introduction of a parallel value chain (fish leather), and diverse food dishes
- ✓ Public-private consensus building platforms
- ✓ Innovative financial services and supportive legal frameworks

BY THE NUMBERS

- Incomes for family-based fish farmers increased to USD\$19,079/year (2018) from USD\$7,705/year (2015);
- Production increased 6-fold, to 4,805 t/year from 811 t/year in the five targeted municipalities
- 1,757 families involved in fish production, compared to 937 in 2015 in target and neighbouring municipalities; 84% satisfied or very satisfied with fish farming as part of their livelihoods
- 742 tonnes(t)/year of the introduced *paiche* fish being exploited by 772 fishers (379 indigenous) and 66 sellers or retailers, up from 304 and 520 t/year in 2011 and 2014 respectively
- Higher incomes for both indigenous and commercial fishers:
 - 379 indigenous fishers increased their income by 47.5% (sales of *paiche* meat)
 - 32 indigenous fishers improved income by 23% (sale of skin)
 - 393 commercial fishers improved income by 35.5% (sales of *paiche* meat)
 - 5 commercial fishers improved income by 23% (sale of skin)
 - 56 vendors (retailers) improved income by 28% (sales of *paiche* meat)
- 1.2 t of *paiche* skins now used in the leather value chain per month (projected to reach 100 t/year in 2018); by the end of 2017, 8400 ft² of *paiche* leather had been produced, representing 56 tonnes of fish caught by 30 commercial and indigenous fishers.
- 254 loans totaling US \$1,420,130 were disbursed to 196 clients in fisheries and fish farming (17% female-only clients; 72% women co-signing loans with their husbands)
- Fish farming families increased fish consumption by 12 kg/family/year; nationally, *paiche* consumption increased by 20.8% and pacú consumption by 37.9% from 2015 to 2017;
- *Paiche* and pacú consumers are increasing by 9,000 new people/year in project regions

THE IMPACT:

A multi-sector partnership has shown that indigenous and urban fisheries and small privately-owned fish farms are more equitable and sustainable with the right technical assistance (e.g., better resource management and hygiene and handling practices), financial services, and legal environments. The main beneficiaries have been small-scale enterprises,



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particularly those owned by women and indigenous families. This proven model can be replicated in other municipalities to increase the production and consumption of fish, and sale skins for leather. Recipes have been developed to encourage vulnerable populations to use the highly nutritious heads, abdominal meat and skeletons that would normally be discarded in processing, and to debone fish to ease consumption for children.

THE CHALLENGE:

More than 50% of households in the flood-prone northern Bolivian Amazon are food insecure. Fish is a valuable source of protein, healthy fatty acids and micronutrients but its consumption in Bolivia is one of the lowest in the world. There is also national and international demand for *paiche* products – meat, leather, and scales – but the species is listed as endangered internationally though it is abundant in Bolivia as an invasive species. Phase 1 of this project identified several promising solutions to grow commercial *paiche* fisheries in the northern Amazon. The project also focused on growing and strengthening family-run fish farms in the lower Amazon that produce a native species (pacu). Women represent a significant number of fish farmers in the core regions where the project has its roots, Yapaquí (48%), San Carlos (60%), and is approaching 30% in newer target areas (Chimoré, Shinahota, Puerto Villarroel and Entre Ríos).

TRANSLATING RESEARCH INTO ACTION

Building local and national capacity to support fishers and fish farmers

“The (multistakeholder) platform is there to improve fish production, and is very necessary for marketing... We need (that) participation from producers, funders, technical experts, and government at the municipal, departmental and national level. It has to be integrated.”

Edmundo Mamani, District III, Municipality of Puerto Villarroel

- Built supportive legislation (e.g., a new Sustainable Fisheries and Aquaculture Law), sectoral policies, governance systems, fisheries management plans and 3 regulations specific to fisheries, including indigenous
- A new Bolivian regulation, informed by the project’s research, was a first step towards legalizing and managing *paiche* fishing and improving market opportunities
- The project has informed advocacy and administrative resolutions in the Pando department which will open *paiche* fishing in protected areas, further increasing production
- 14 fishing associations and 12 fish farming associations were legalized, women on fish farming association boards increased by 28%
- The Inter-Institutional Northern Amazon Committee for Control of Fisheries and Commercialization (CONACO) was created between the increasingly strengthened fishing federation and government. This represents a first step towards a co-management platform
- The creation of multi-stakeholder roundtable “platforms” has improved the sector’s capacity for leadership, management and communication, and created a model for municipal investment in fish farming infrastructure (two municipalities projected investment of CAD\$ 5,095,293)
- A new fish leather value chain was made possible through an agreement between the fisheries federation and the tanning industry
- The Curupaú tanning company was only able to process 10% of total skins produced, at a price of \$3.42 CAD/kg. This changed in February 2018 when one Trinidad’s largest tanneries offered to purchase the other 90% skins available on the market from the FEUPECOPINAB, at a price of \$7.6 CAD/kg (a 3-fold increase).
- Developed new standards for fish handling and hygiene with the national Food Safety Authority SENASAG; 63 fish sellers practicing good hygiene and handling

Developing sustainable businesses

“The greatest satisfaction is that we have found economic stability through rearing and selling fish. With this income our quality of life has definitely improved...My husband and I make decisions together, as a couple; we discuss our options together before deciding.”

Ana Aguilera, Yapacaní Fish Farmer, Restaurateur

- Upgraded the *paiche* value chain through gender equality, environmental sustainability and higher quality fish
- Peer-to-peer training exchanges and field schools at 11 demonstration farms and field schools involved 972 producers (44.3% women)
- 7 training workshops were delivered in 5 municipalities to 146 fish vendors, producers, and municipal staff (101 women); 126 reported improving their fish hygiene and handling practices
- 77 trained extension agents from 14 different municipalities (45% were women and girls)
- 3 multi-day gastronomic events in urban centres of Cochabamba and Santa Cruz and fish fairs in rural communities focused on novel fish dishes, nutritional benefits and marketing of *paiche* through promotional events, education, television and social media
- Fish leather production created an incentive for better fish handling and reduced the environmental impact of decaying skins along the shorelines of lagoons
- Commercial launch of 15 new *paiche* dishes and artisanal products using leather and scales

Improving access to financing and business planning

“The training with the association’s board of directors helped me a lot, because I didn’t know how to do an expense report. Now the members are more motivated to contribute their monthly dues, because I can explain to them how much money comes in, how it was spent, and they can see it all like a bank history report. I knew nothing of that before and now I know how to do it.”

Janneth Uzieda, Treasurer, Association of Fish Farmers Integrated North (APNI), Yapacaní

- Introduced new financial instruments (e.g. loan guarantees, leasing, credit contracts, insurance), especially for women and indigenous groups
- Specialized training for entrepreneurs, mostly women, in business planning, management and marketing as well as access to financial products
- Trained 12 first-level and 2 higher level organizations in organizational capacity and financial literacy

WHAT’S NEXT?

Both production and access to fish has improved. In fisheries, following a decision, informed by the project to allow *paiche* fishing in the Pando department (forecast increase to 1000 t/year), and a government plan to buy 500 kg of fish per month for distribution to supermarkets in the northern Amazon, these numbers will continue to rise. Fish farming continues to expand alongside demand. Further work is needed to: support a new collaboration between the fishing federation (FEUPECOPINAB) and the national fisheries regulator (SEDAG) to improve fisheries management and control; build business management capacity; and ensure a reliable supply of fish from small-scale fisheries. Further government investment is also required to promote the value of gender-responsive fisheries regulations to fishing organizations; further gender-transformative work in fisheries and aquaculture is necessary

LEARN MORE ABOUT THIS PROJECT:

Project abstract: <https://www.idrc.ca/en/project/amazon-fish-food-cifsrphase-2>

Project website: <http://www.pecesvida.org/en>

KEY OUTPUTS

BOOKS

Amazon fish for food: improving food security in Bolivia. Peces para la Vida (2018) <https://idl-bnc-idrc.dspacedirect.org/handle/10625/56959>

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ACADEMIC PAPERS

Paiche reigns! species introduction and indigenous fisheries in the Bolivian Amazon. Macnaughton, A.E., Carvajal-Vallejos, F.M., Argote, A. et al. *Maritime Studies* (2015) 14: 11. <https://doi.org/10.1186/s40152-015-0030-0>

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The expansion of Arapaima cf. gigas (Osteoglossiformes: Arapaimidae) in the Bolivian Amazon as informed by citizen and formal science. Paul A. Van Damme, Claudia Coca Méndez, Milton Zapata, Fernando M. Carvajal-Vallejos, Joachim Carolsfeld and Julian D. Olden. *Management of Biological Invasions* (2015) Volume 6, Issue 4: 375–383 doi: <http://dx.doi.org/10.3391/mbi.2015.6.4.06>

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Van Damme, Paul André. Journal of applied ichthyology (2018-11). <https://idl-bnc-idrc.dspacedirect.org/handle/10625/57302>

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View all related project outputs in the IDRC Digital Library.

<https://idl-bnc-idrc.dspacedirect.org/browse?type=project&value=107985>

QUICK FACTS

Project location(s): Bolivia

Institutions: World Fisheries Trust, University of Victoria (Canada); Asociación FAUNAGUA, Centro de Promoción Agropecuaria Campesina, Centro de Investigación y Desarrollo Regional, Ingeniería Marketing y Gestión (Bolivia)

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