

Stories of change

© Jose Ledezma



Family fish farming improves quality of life in the Bolivian Amazon

By Tiffanie Rainville, Widen Abastoflor, Alison Macnaughton, Paul Van Damme, Joachim Carolsfeld and Álvaro Céspedes

Key messages

- Family-based fish farming has become an alternative livelihood in the Yapacani municipality of Bolivia.
- Families in Yapacani have incorporated technological innovations in water management and polyculture which have increased their income by five times.
- Family diets have improved through the inclusion of fish, an affordable source of high quality protein.
- Women are leaders in the fish farming process, which empowers them in their homes and in the community.
- Family fish farming has begun to be replicated in other regions throughout the country.

recently recognized the potential contributions that fish can make for food security and has created a national program for fisheries and aquaculture development.

In the Municipality of Yapacani (a subtropical region in Bolivia) there are approximately 4,000 rural families living in poverty, mainly due to their extreme dependence on single crop rice farming, which is highly vulnerable to changes in the weather and market conditions. In 2008, the producers in this area, through the Asociación de Piscicultores del Norte Integrado en Yapacaní (Yapacani Northern Integrated Pisciculture Association - APNI), in partnership with the Centro para la Promoción Agropecuaria Campesina (Centre for Rural Agricultural Promotion - CEPAC) chose to diversify their livelihoods through fish farming.

Context

Bolivia is a landlocked South American country with one of the lowest levels of per capita fish consumption in the world, despite a great freshwater fish diversity. The government has

Based on a study carried out by experts from Canada, Brazil and Bolivia, the Fish for Life project (Peces Para la Vida - PPV, 2011-2014) built on the successful example of APNI and CEPAC and formed an alliance to strengthen capacity, provide new technology and undertake participatory research with fish farmers. The PPV project set



out to increase family fish farming profitability, sustainability and gender-sensitivity through testing pilot models for sustainable development, and through enhancing producers' technical expertise and partnerships between various stakeholders involved in fish production.

Emerging outcomes

Better quality of life for family fish farmers

Before the PPV project, fish farming in Yapacani was carried out by 40 vulnerable rural families. There are now 130 families engaged in fish farming, each with three fish ponds. This has increased the supply of fish from 50 to 400 tons per year, of which 70% is consumed locally and the remaining 30% consumed in other regions throughout the country.

Market availability of fish in Yapacani has grown dramatically, contributing to an increase in per capita fish consumption, from 3.8 kg per year (2008) to 5.6 kg per year (2014). Families who practice fish farming, previously among the most vulnerable, now consume more fish: nearly 42 kg per year.

Fish sales generate additional income of US\$15,000 a year per rural family, compared to US\$3,000 per year generated on average. For this

reason, a growing number of families are now making fish farming their main source of income.

“ Raising small fish is like a bank. Whenever I need to, I sell my fish and it gives me a little money, both for food for my fish as well as food for us. With the sale of my fish, I was also able to make another fish pond and buy more fish fry to continue producing more fish.

Victoria Zelaya, Cascabel, Yapacani

Adoption of new technologies - polyculture

In Yapacani, families working with APNI had previously raised only the pacu species (*Colossoma macropomum*) for single fish production (monoculture). The PPV project introduced technology for polyculture (integrated, multi-species fish farming) by adding another species of smaller size, the sabalo or black prochilodus (*Prochilodus nigricans*). This species is also native to the region.

Polyculture shows greater yields than monoculture and improves the quality of pond water (IDRC, 1993; Baldisserotto & Carvalho Gomes, 2005; Garcia et al., 2011). The sabalo feed on algae and decaying material, including uneaten feed used for the other fish that would otherwise decompose on the bottom (Baldisserotto &

Carvalho Gomes, 2005). This polyculture offers higher yields since pacu production remains the same, the sabalo are produced with no additional feed costs, and pond conditions are improved.

The project initiated a polyculture pilot trial by providing eight families with sabalo and pacu fry and training, in a

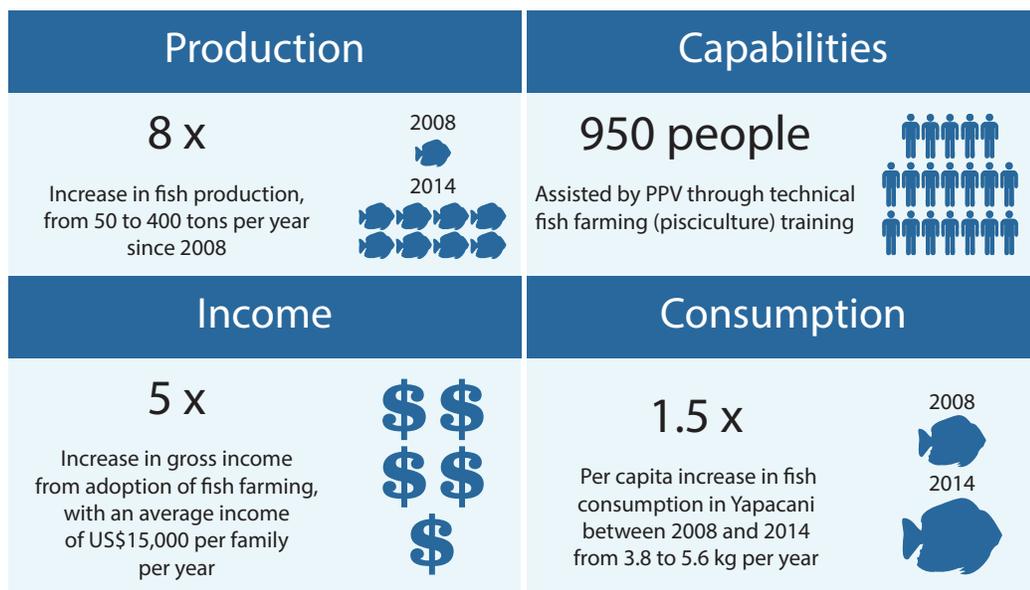


Figure 1: Positive impacts resulting from the PPV project

participative research context. Based on the success of this innovative pilot trial, 44 fish farmers in the region replicated polyculture technology at their own expense in the same year. The participants in the pilot now have the ability to provide technical support to their neighbors.



© Jose Ledezma

The sale of fish generates additional income of US\$15,000 a year per family

Assistance from expert missions from Bolivia, Brazil and Canada improved the skills of 435 people (145 women and 290 men, including producers, technicians, students and business people) in appropriate water management, efficient feeding and polyculture technologies. CEPAC technicians compiled this new knowledge and developed an interactive manual for local fish farmers that is being distributed throughout the area. 56% of fish farmers now report having solved their problems with their own knowledge, without the external technical support that they previously required.

The PPV project has additionally created opportunities for dialogue between various stakeholders, including government officials, producers, development institutions and business people. Twenty six representatives from these

sectors led the development of a document outlining strategic policy guidelines for tropical fish farming in Bolivia.

Women leaders in aquaculture

Fish farming in Yapacani has become a female-led activity. Before fish farming, women were generally not recognized in economic organizations in the region. Now they are formal partners and co-owners of APNI productive assets, with the same rights and obligations as men. Of the 50 current members of APNI, five are men and 45 are women. The female APNI members benefit from credit for purchasing fish feed and have access to the same technical assistance as men.

There is an emphasis on leadership by women, who have tripled their families' incomes. Women increasingly occupy executive positions in their communities and are taken into account at events at the municipal level. A PPV study shows that they have greater financial responsibilities in the family, with 31 women now controlling family finances. Previously, their productive role was not recognized.

Family unity has improved through increasing support from husbands. Initially, 70% of husbands had doubts about this productive activity and in some cases they did not respect female entrepreneurs. This situation has completely changed: 100% of the 50 APNI member families



© Jose Ledezma

The production and availability of fish has increased significantly

have seen the males diversify their own agricultural livelihoods to support their wives in family-based fish farming.

Conclusion

The project has effectively contributed to the development of fish farming as an alternative means for rural families to improve their quality of life. Its focus on strengthening local stakeholders as well as key alliances has allowed the enhancement of technical skills and the creation of opportunities for collaboration between those involved. Fish farming has opened up a greater role for women and has improved family diets with the addition of an affordable, high quality protein source.

These early successes are being increasingly replicated in other regions of Bolivia, mainly because the model centers on family-based productive business units and promotes multi-stakeholder partnerships, which in turn contributes significantly to the development of the national fishery sector.

References

- Baldisserotto, B. and Carvalho Gomes, L. (2005). *Espécies Nativas Para a Piscicultura no Brasil*. Universidade Federal de Santa Maria, Brasil.
- CEPAC Project Website: www.cepac.org.bo.
- FAO. (1978). *Esquema de un Programa de Investigación Aplicada y Desarrollo Experimental para el Centro Regional Latinoamericano de Acuicultura*. Food and Agriculture Organization of the United Nations, Rome, Italy. <http://bit.ly/1uqMcQu>.
- García, J.J., Celis, L.M., Villalba, E.L., Mendoza, L.C., Brú, S.B., Atencio, V.J., and Pardo, S.C. (2011). *Evaluación del Policultivo de Bocachico*



© Jose Ledezma

Fish consumption in Yapacani families has increased from 3.8 to 5.6 kg per year

Prochilodus magdalenae y *Tilapia Oreochromis niloticus* Utilizando Superficies Fijadoras de Perifiton. *Revista de la Facultad de Medicina Veterinaria y de Zootecnia*, 58: 71-83.

- IDRC. *Food Security, Fish-farming, and Aquaculture in the Bolivian Amazon*. <http://bit.ly/1xWPWHe>.
- IDRC. (1993). *El Policultivo: La Mejor Alternativa de Producción*. Red Regional de Acuicultura, Bogotá, Colombia. <http://bit.ly/1twulEW>.
- Peces Para la Vida Project Website: www.pecesvida.org.
- Peces Para la Vida. (2014). *Informe Final: Aportes e Intervenciones Realizadas en Acuicultura Tropical 2012-2014 en el Marco del Proyecto PPV*. Peces Para la Vida, Bolivia.

Contacts

Widen Abastoflor: widen@cepac.org.bo

Tiffanie Rainville: tiffanie@worldfish.org

Paul Van Damme: faunagua@yahoo.com



Foreign Affairs, Trade and
Development Canada

Affaires étrangères, Commerce
et Développement Canada



IDRC | CRDI

International Development Research Centre
Centre de recherches pour le développement international

Canada

This outcome story is one in a series that reports on research supported by the Canadian International Food Security Research Fund (CIFSRF), a program of Canada's International Development Research Centre (IDRC), undertaken with financial support from the Government of Canada, provided through Foreign Affairs, Trade and Development Canada (DFATD). Produced by WRENmedia in November 2014.