



Fisheries, aquaculture and living well in Bolivia: contributions to food security

Fish are an important source of proteins, micronutrients, and fatty acids, and have great potential to improve food security and rural livelihoods. Bolivia, a country without access to the sea, has one of the lowest rates of fish consumption in the world (FAO, 2014). Despite the high potential for fisheries and fish culture (aquaculture) in the Amazon, the current consumption of fish is only 1.8 kg/person/yr (Bombin et al., 2009). Recently, the Plurinational State of Bolivia has recognized the potential contribution that fish could make to food security, creating a National Program for Fisheries and Aquaculture that proposes, among other objectives, to increase fish consumption in the country to 5.6 kg per person, per year.

Between 2011 and 2014, the PECES PARA LA VIDA (PPV) alliance evaluated the potential contribution of fisheries and aquaculture to food security, developed recommended best practices, implemented pilot projects, and proposed development strategies for fisheries and aquaculture. The PPV is an alliance of Bolivian and Canadian universities, non-governmental organizations, and public actors, supported by the International Development Research Centre (IDRC, Canada) and the Department of Foreign

Did you know?

- Fish are one of the healthiest foods, and throughout the world, contribute to support of livelihoods of people living in poverty.
- Bolivia has vast flood plains and more than 200 species of fish that are used by people living by these rivers.
- The consumption of fish in Bolivia, 1.8 kg/person/yr, is one of the lowest in the world.
- The new plan for Fisheries and Aquaculture in Bolivia proposes a 300% increase in fish consumption by 2018, based on an increased fisheries and aquaculture production.
- Based on the experience of the PPV alliance, sustainable development of the sector can be envisioned through strengthening links of the value chains and productive complexes, as well as through the development of social capital and cooperative networks.

Affairs, Trade and Development (DFATD) through the Canadian International Food Security Research Fund (CIFS RF).

The PPV found that there is an extraordinary degree of difference in fish consumption across different locations: there are communities that consume no fish at all, and others, especially indigenous communities in the floodplains,

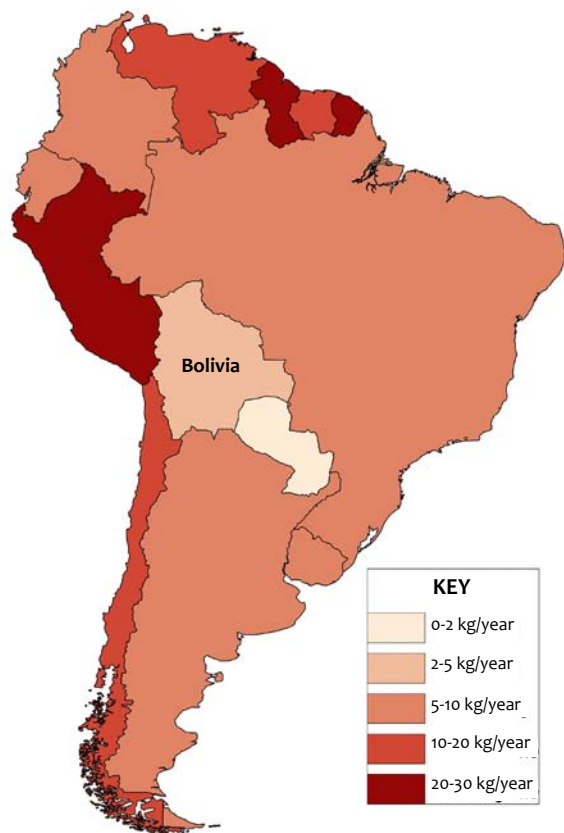


Figure 1: Per capita fish consumption by country (kg/person/yr). Source: FAO (2014). State of World Fisheries and Aquaculture <http://bit.ly/1sLsLw1>

that depend heavily on fish, which constitutes their main source of protein and a source of monetary income. A study conducted by PPV found that there are high rates of food insecurity in indigenous communities and that fishing is an essential activity both for subsistence and for income generation.

In response to demand from the sector and to make better use of the potential of fisheries and aquaculture, in 2013 the Bolivian government created the National Program for Fisheries and Aquaculture. As part of its food security-with-sovereignty strategy, it proposed to increase fish consumption from 1.8 to 5.2 kg/person/year by 2018 (Agricultural Sector Plan 2014-2018), which represents a 62% increase in production, through fisheries, aquaculture and/or imports, to reach 57,725 tonnes by 2018.

The aim of this document is to help ensure that the approved policy is effective, efficient and sustainable.

Recommendations

The fisheries and aquaculture sectors should take geographic, climatic and social factors into account in planning for sustainable development

The country has various ecological and climatic zones, some of which are favourable for fishing and/or aquaculture, while others are not. Both sectors are also influenced by human activities that have a negative impact (e.g. hydroelectric dams). It is important to understand social and economic aspects in order to choose an appropriate approach, type and scale of fisheries and/or fish farms that best meet the needs of local populations.

PPV Recommendations:

- Develop a map of aquaculture potential, which takes into account the socio-environmental characteristics of each zone;
- Design strategies for mitigation and local adaptation of the aquaculture sector to extreme weather events (e.g. floods and cold fronts);
- Introduce legislation to regulate water access by fish farmers and fishers, especially in zones where this resource is scarce;
- Mitigate the external threats that affect cross-border migratory fish stocks, particularly hydroelectric dams built or planned by neighbouring countries;
- Prepare a socio-economic assessment protocol to be applied in each region, as well as a map indicating the potential of 'Integrated Production Complexes' (IPCs).

The sustainable development of aquaculture should be planned with an Integrated Production Complex (IPC) approach, which includes family enterprises as one of its essential components

An IPC consists of:

- A functional and territorial agglomeration of different enterprises and stakeholders in a given market;

- Vertical and horizontal integration at the level of the sector and of the value chain, connected to the market;
- Synergy and collaboration: public-public; public-private-community;
- A favourable national and regional support system and environment.

Based on experiences with the aquaculture production complex in Yapacaní-Santa Cruz (see box), PPV makes the following recommendations:

- The government should define its leading role as IPC facilitator, regulator and developer for the fisheries and aquaculture sectors and plan their development;
- Prioritize the consolidation of emerging aquaculture IPCs (e.g. Yapacaní-Chore-Santa Cruz);
- Develop protocols for the species best adapted to each eco-region/IPC in a participatory manner with practitioners;
- Promote aquaculture in family production units, integrated with larger enterprises and incorporated into the regional IPCs, facilitating their association in order to address their main limitations;
- Prioritize a system of public-private micro-credits for family-based producers.

Promote policies and actions aimed at improving access to supplies, especially ice, fry and feed

There are significant bottlenecks in fish-producing IPCs. For aquaculture, the most restrictive are the limited availability of quality fry and the lack of specific feed for farmed species. In the case of fisheries, the main bottlenecks are the supply of ice, difficulties in accessing financial credits and inequality between the different links of the production chain.

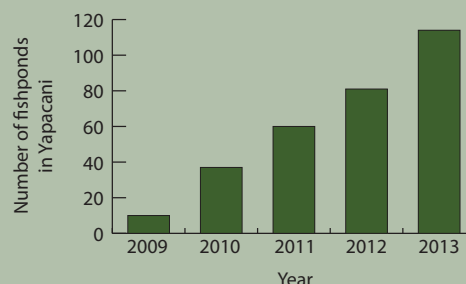
PPV Recommendations :

- It is important that the State provides support to producers by developing strategies and actions for the regular supply of suitable, quality supplies for the sector;
- In collaboration with public and private stakeholders, develop mechanisms for

Family-based Aquaculture in Bolivia

Tropical aquaculture in Bolivia, which began through promotion and development by NGOs and a few government programs, has been developed mainly with community groups and producers’ associations and was no longer sustainable once external financial support was withdrawn.

In the municipality of Yapacaní, a model of medium-scale family production units was created, very different from the “communal” experience. This new family-based aquaculture model, supported by PPV, has grown without major subsidies (see figure). The families reinvested their profits in new fish ponds, fry (young fish) and prepared feed. Four years ago, these families began with one pond (2,000 fish) and have expanded with their own investment to as many as eight ponds (in some cases).



Growth of family aquaculture in the Yapacaní region (supported by CEPAC 2009-2012 and PPV 2012-2013)

processing and marketing of the introduced species *Arapaima gigas* (paiche) in the Amazon region of northern Bolivia, with the supply of ice and equitable consolidation of value chains:boosting fisheries production, especially in indigenous communities.

Promote policies and actions geared towards strengthening extension services, research and training in aquaculture and fishing

Fishers and small-scale fish farmers still lack sufficient skills to manage and increase their production sustainably. PPV has identified the lack of extension and technical training in fisheries and aquaculture as one of the biggest problems in the sector.

PPV Recommendations :

- The different levels of government should invest in a training and extension program at the regional level, using teams of trained specialists with practical experience and successful fish farmers who can provide the long-term technical support necessary for the sustainable development of aquaculture and fisheries;
- Public and indigenous universities must play a key role in training and extension services.

Promote policies and actions to preserve aquatic ecosystems and create a favourable environment to enhance social benefits to the various areas of the fisheries sector

There is potential for fisheries in the Amazon region (Van Damme et al., 2011), but it is not recommended to plan an intensification of fisheries. Alternative strategies that can be prioritized include the reduction of fish losses, the improvement of markets and taking advantage of introduced species, thus protecting the native fish fauna.

PPV Recommendations:

- Increase transparency among stakeholders on the production chain, offering new tools to contribute to the fairer distribution of benefits, emphasizing social capital among stakeholders, the connections between the different levels and the participation of women;

- Coordinate fisheries operations with an emphasis on sustainable use, and the regulation of transportation, sale and markets;
- Promote fishing of the introduced species *Arapaima gigas* (paiche) with a view to its sustainable use as well as the protection of native fish species;
- Develop a system of micro-credits for the links in the fish production chain as a mechanism to strengthen family enterprises.

References

- Bombin, L., Mena, A., Salas, R., Salinas, F., Lino, F., Van Damme, P. and Bravo, N. (2009). Diagnóstico de Pesca Continental y Acuicultura en Bolivia. Anexo 1. In: *Proyecto Mejoramiento de la Legislación Para la Pesca y Acuicultura*. Tribunal Constitucional Plurinacional, Bolivia.
- FAO. (2014). *The State of World Fisheries and Aquaculture*. Food and Agriculture Organization of the United Nations, Rome, Italy. <http://bit.ly/1sLslw1>.
- IDRC. *Food Security, Fish-Farming, and Aquaculture in the Bolivian Amazon*. <http://bit.ly/1sJE14q>.
- Van Damme, P.A., Carvajal-Vallejos, F.M., and Molina Carpio, J. (2011). *Los Peces y Delfines de la Amazonía Boliviana: Hábitats, Potencialidades y Amenazas*. Editorial INIA, Cochabamba, Bolivia. <http://bit.ly/1vKEArB>.

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