

Well-being dynamics in a context of environmental change



Alison Macnaughton

PhD Candidate in Geography, University of Victoria

Supervisory Committee:

Anthony Charles, Saint Mary's University

Mark Flaherty, University of Victoria

Edward Allison, University of Washington

Aleck Ostry, University of Victoria

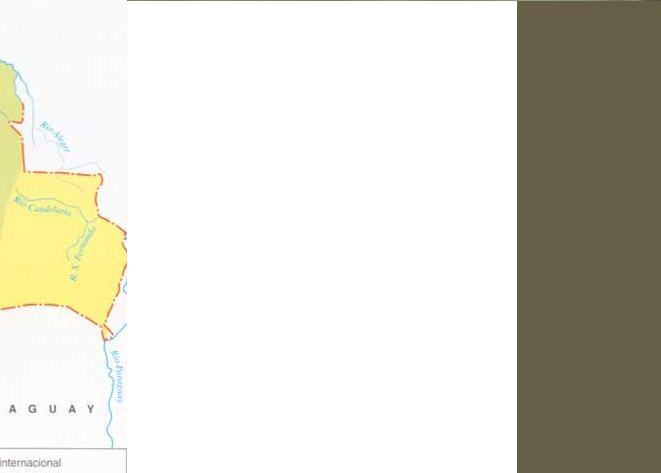
Key features of the Bolivian Amazon

- 66% of Bolivia land area
- Tropical flood-pulse river system, mostly brown/white water rivers, major tributaries of Madera
- Diversity of fishes: 800+ species (Carvajal-Vallejos et al. 2014)
- Resource-based economy, unequal distribution of benefits, poverty and vulnerability in rural areas
- Historically isolated from Andes region (transportation/politics)
- Small urban-based commercial fleet fishing catfish and other mostly river-based sp. Differential controls (local, departmental, etc.)
- 109g/p/day fish consumption in rural areas = 40kg/yr (Camburn 2011)



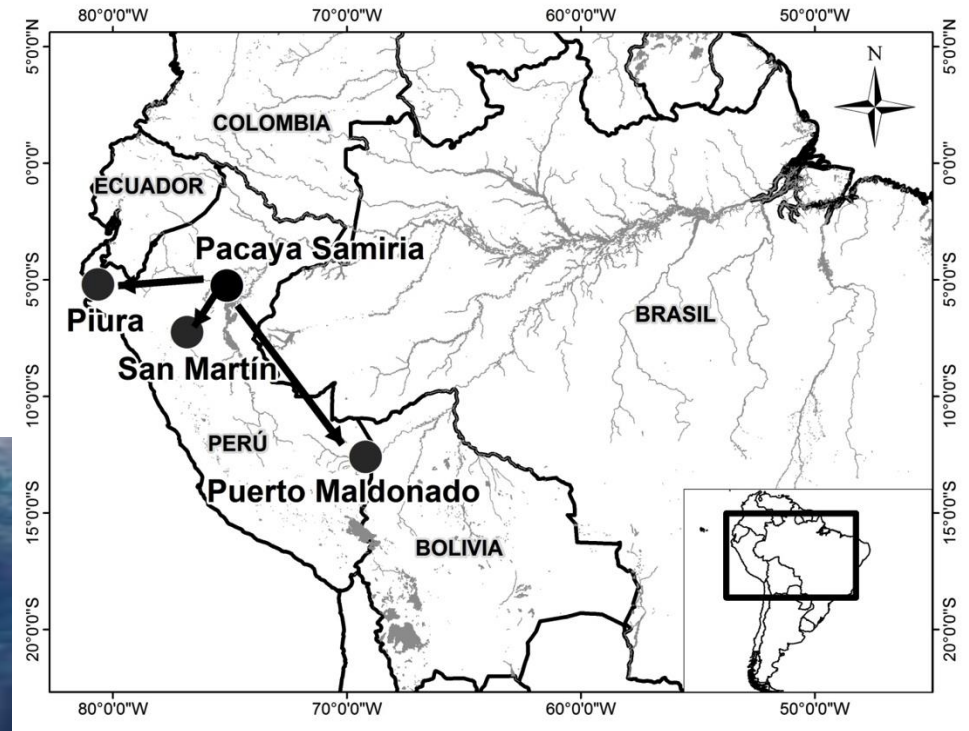
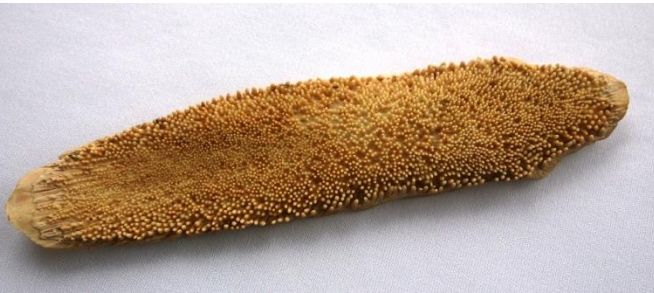
Changes at work

- Legislative reform and decentralization
- Recognition of indigenous rights
- Focus and dynamics of the regional economy: Rubber/wood / mining /Brazil nuts/ ranching/ soy/ and fish?
- Rapidly growing regional urban centers
- New infrastructure and connectivity: roads and cell phones
- Increase in frequency / intensity of floods, drought events
- Hydroelectric dams and gas exploration
- INTRODUCED SPECIES



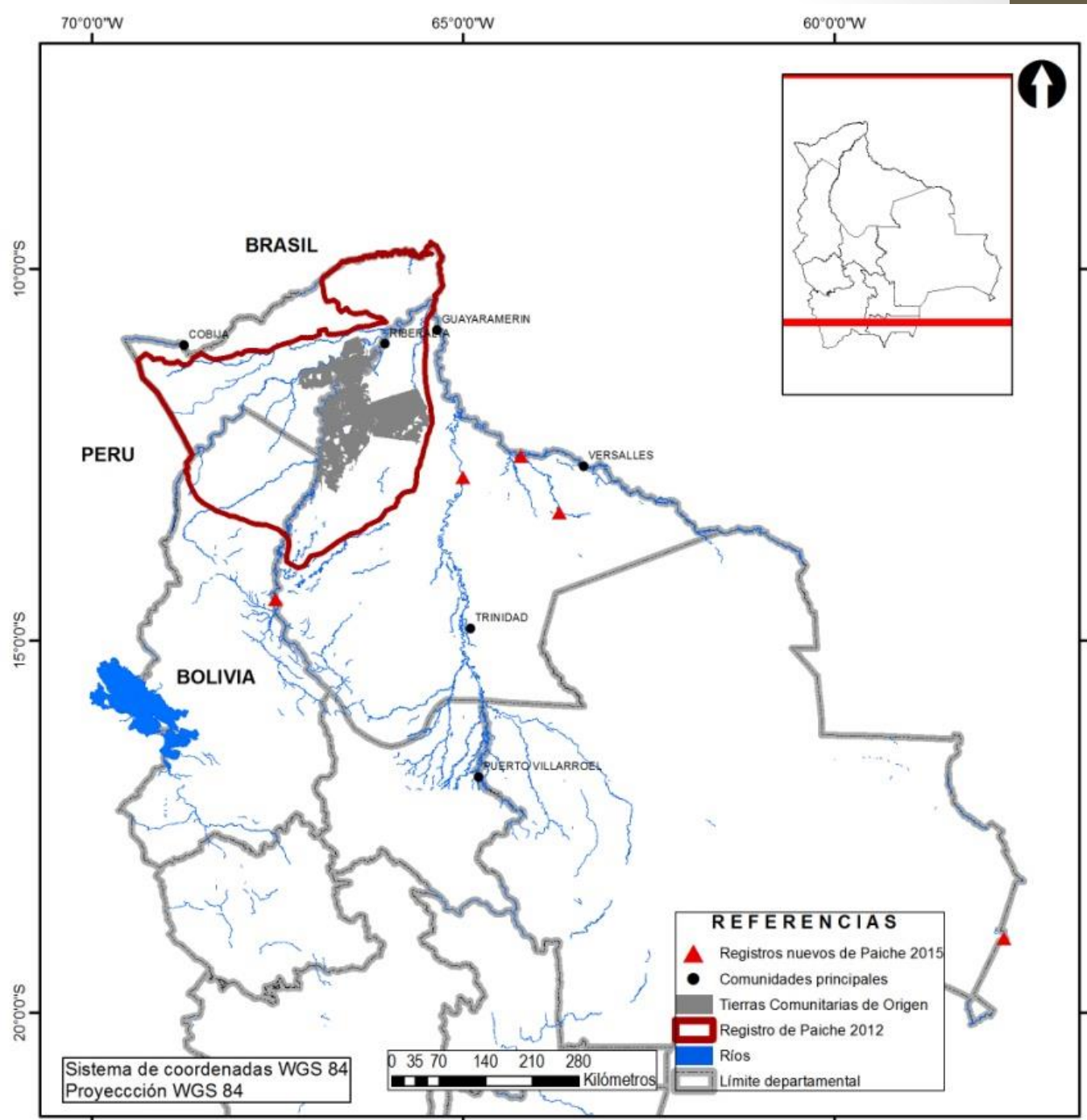
Paiche in Bolivia

- *Arapaima gigas*, Schinz, 1822
(pirarucú or paiche)



Current range of Paiche expansion in Bolivia.

(Van Damme et al 2015)



Is paiche a blessing or a curse?

- Abundant, easy to catch?
- +90% of the catch for urban-based fishermen (approximately 3,000 t / year)
- Still deregulated, possible access conflicts
- It is not part of the traditional diet
- A threat to native fish resources?
- MSY vs. maximum social benefit ...
- Manage for biodiversity objectives, economic performance, or social welfare? What are the commitments and 'trade-offs' between these objectives?



Public policy response

National government

- 2016 bi-ministerial resolution on invasive species: paiche
- 2017 National Fisheries and Aquaculture Law
- 2017 National Fisheries Baseline (professional registry, production estimates)
- 2017 National and International research on paiche expansion and potential for sustainable use.



Regional indigenous government

- Develop economic opportunity fisheries?
- Norms/specific regulations for resource extraction still not developed
- Include paiche in Resource Management Plans?



Development questions, from a fisheries perspective:

How to support biodiversity conservation, economic development and social improvement objectives in managing fishery resources?

Development as modernization AND improvements in the welfare of people and communities, which of these can/do fisheries development strategies really address?

→ Over-reliance on strategies of modernization/production, assumption that these will also contribute to improved welfare.

→ Lack of adequate strategies/tools to consider and address the uncertainty and changes that are impacting development.

Socio-economic aspects of small-scale fisheries

- Data on the fleet (# and size of vessels, equipment)
- Production, income and employment data
- Basic demographics
- Data disaggregated by gender
- Analysis of economic multipliers
- Data on subsistence fishing
- Food security data (regional, national contributions)

What's still missing?

- Data on **distribution of costs and benefits** at different levels/scales (temporally, between the links of the productive chain, and between individual producers): e.g. investment of time, opportunity cost, autonomy
- Data that consider/disaggregate different **levels of effort and styles of participation** in fishing - fishing as an integral, occasional, temporary, secondary, active/passive
- Consideration of **risks**: risks of entry cost (equipment, etc), exit cost, environmental risks, occupational health, individual and community health
- Consideration of **relationships with other activities** in the region.

The livelihoods concept

Livelihoods - a combination of **activities** and **capabilities** that support and sustain rural families.

Productive activities + context in which they happen + benefits derived from them. In other words, livelihoods are not only comprised of income-generating activities (income considered in both the form of cash and cash equivalents, or products that substitute the need to purchase), but also are characterized by situation of social institutions and services, physical infrastructure and related public services (for example roads, energy, water), gender relations, resource access and use rights and property ownership (Ellis 1998).

Technical Basis for the Integrated Use of Paiche (*Arapaima gigas*) in the North of Beni Department: Oct - Nov 2015 (INIAF Study)



Key questions of the INIAF study

- Where are the paiche? What is their current abundance and potential fishery productivity?
- What drives the expansion of paiche and associated fisheries?
- Who is fishing? What for? How much?
- How do paiche and/or other fisheries, contribute to food security/sustainable livelihoods?
- What are the opportunities/constraints to improving this contribution?



A photograph of a wooden boat on a river, with a dense forest on the bank in the background. The boat's wooden deck and a rope are visible in the foreground. The text is overlaid on the image.

Los medios de vida en comunidades indígenas en la región amazónica norte de Bolivia: cuál es el actual y potencial rol de la pesca?

Alison Elisabeth Macnaughton¹, Roxana Salas², Selva Montanello²,
Fernando Carvajal-Vallejos²

¹World Fisheries Trust 434 Russell St. Victoria B.C. Canada, V8A 3X3 alisen@worldfish.org 1-250-380-7585

²Asociación FAUNAGUA (Instituto de Investigaciones Aplicadas de Recursos del Agua), final Av. Máx Fernández s/n, zona Arocagua Norte, Cochabamba, Estado Plurinacional de Bolivia.

Key findings

- High paiche abundance/potential productivity
- Multi-modal extractive livelihoods
- **High rates of income poverty and high cost to maintain connectivity with urban region**
- Rate of extreme poverty @ 2x the national average (30% vs. 15%)
- **Strong evidence of poverty beyond income-based measures**
- **Food insecurity = chronic and seasonal, among all income groups**
- **Native fish = key source of daily nutrition.**
- **Limited, variable participation in commercial fishing**
- **Lack of self-identification as fishers**
- Some local interest in using paiche
- No access to existing national programs for low-income families, or food security programming.
- Limited access to school, rate of primary school completion is 30% compared to national average of 93%
- Very limited access to healthcare
- Very limited access to improved water (compared to 83% nationally)

View/download the full book at:

<http://www.faanagua.org/publicaciones/libros>



BASES TÉCNICAS PARA EL MANEJO Y APROVECHAMIENTO DEL PAICHE (*Arapaima gigas*) EN LA CUENCA AMAZÓNICA BOLIVIANA



INIAF
Instituto Nacional de Innovación
Agropecuaria y Forestal

www.iniaf.com.bo

Social well-being

“A state of being with others where one can act meaningfully to pursue one’s goals, and where one enjoys a satisfactory quality of life”

(WeD, 2008)

In other words, to enjoy a certain level of material life, to have good relationships with people, institutions and the natural world, and to feel good about how we are doing in life, our achievements.

Social Well-Being in Small-scale Fisheries (Weeratunge et al., 2014)

- Three interrelated dimensions (material, relational, subjective)



Some drivers and outcomes associated with social well-being:

- **Agency**
- **Access**
- **Equity**

Building on some of:

- Pain & Levine (2012) - Addressing different dimensions of agency, specifically fostering security of agency
- Charles (2011) – Governance aspects of access issues in small-scale fisheries
- Daw et al. (2011) - Multiple dimensions and associated ‘opportunity context’ of access
- Maru & et al (2017) - Reducing vulnerability and improving resilience in a context of rural extractive livelihoods
- Mcdermott, Mahanty, & Schreckenber (2013) - Multi-dimensional approaches to equity



Keys to improving security of agency

(Wood 2007, in Pain and Levine, 2012):

- a) Reducing future discount rates (ability to forgo present consumption to manage future risk);
- b) Enhancing capacity to prep for hazards;
- c) Improving quality of informal rights;
- d) Reducing dependency on patrons (clientelism);
- e) Enlarging choice and risk pool;
- f) Strengthening collective institutions;
- g) Improving quality/predictability of institutional performance.

Approach

- Examine associations between perceived trends in fishing and wellbeing processes (at household, community and regional levels and for different groups);
- Explore the role of agency in wellbeing improvement trends;
- Analyze multi-dimensional considerations of access and equity associated with wellbeing and wellbeing change.



A dynamic social wellbeing framework

- Starts with 3D wellbeing key elements (from WeD)
 - Material
 - Relational
 - Subjective
- Includes consideration of multiple scales and cross-scale interactions
 - Spatial (household, community, region)
 - Organizational/institutional - sectoral (single activity/sector, integrated)
 - Temporal
- Adds select structural elements that enable/constrain choices/changes for a particular context, for example:
 - Institutions
 - Culture (values + actions – not necessarily aligned)
 - Access (social, political, legal, economic, technological)
 - Social protection
 - Connectivity/multi-locality?
- Includes process-oriented elements
 - Power + Agency
 - Capabilities

Emerging themes

- Resource access rights unevenly enforced, problems with equity, distribution of benefits, transparency, informal arrangements, conflicts between indigenous communities, and with urban-based fishers;
- Shifting focus of paiche fishery regionally, this is affecting urban-based fishers negatively
- Castaña – fishing connections: interdependent livelihoods at local and regional economy levels
- Indigenous communities experience high levels of food insecurity, high environmental and social risks, significant constraints on choices/agency, e.g. to plan for future
- Strong focus among all actors on investing in children's education, 'getting out' of fishing.

Thank you!

alisonma@uvic.ca

www.pecesvida.org

www.communityconservation.net

