

Give a Person a Loan and Will She Be Fed a Lifetime? Microcredit, Aquaculture and
Capabilities in the Bolivian Amazon

by

Ahmed G. Eid Valdiviezo

Bachelor of Arts, Universidad Privada Boliviana, 2009

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF ARTS

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ABSTRACT

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The development interventions of the past thirty years have relied on microcredit and other microfinancial services as a way to include the poor in the dynamics of the free market, so they may have a better chance of benefiting from economic development. Nowadays, the microfinance industry in Bolivia is highly developed, and the country is usually mentioned next to Bangladesh and India as a success case of microcredit, as a myriad of microfinancial institutions operate combining credit, savings and insurance with education, women empowerment or production efforts. In this setting, the *Peces Para la Vida II* project, was started in Bolivia in early 2015, with the objective of improving food security in Bolivia thorough the promotion of small scale aquaculture and fisheries in the Bolivian Amazon. As a part of this promotion strategy, a microcredit component was included in the project with the intention of scaling up the benefits found in the first stage of the project via an individual microcredit component and a group microleasing operation. Using a qualitative application of an analytical framework that combines Amartya Sen's capability approach and the Department for International Development's sustainable livelihoods approach, this thesis will argue that unless certain conditions on access to markets that enable savings and wealth creation are met, individual microcredit alone may not be sufficient to lead its users towards capabilities that ultimately improve their access to better endowments of various types of capitals, and that the group leasing operation appears to be more promising in terms of allowing those involved as it tackles productivity and market issues simultaneously, but with an implementation plagued with problems and the short time the operation has been underway, it would be premature to be definitive about these results.

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for the broken egg on the floor/for the 5th of july/for the fish in the tank/for the old man in room 9/for the cat on the fence/for yourself/not for fame/not for money/you've got to keep chopping/as you get older/the glamour recedes/it's easier when you're young/anybody can rise to the/heights now and then/the buzzword is/consistency/anything that keep it/going/this life dancing in front of/Mrs. Death

Charles Bukowski

DEDICATION

To Julian and my parents.

Chapter 1

Introduction

1.1 Nature of the problem

As of 2015, Bolivia is ranked 119 out of 188 countries in UN's Human Development Report ([33]). During the past ten years, Bolivia has reduced its poverty headcount ratio at 1.90 USD PPP per day from from 20.4% to 6.8% ([21]), while Latin America has done so at a more moderate rate, as the portion of the population living under this poverty line fell from 12.9% to 5.4%. This accelerated reduction of monetary poverty in Bolivia was due to both remarkable reductions in income inequality - the Gini index fell from 58.5 to 48.4, and to economic growth, as gross national income per capita grew at a yearly rate of 3.2% during the past decade - Latin America only grew at a yearly rate of 2.1% ([21]). However, this encouraging trends in poverty were not equally distributed throughout the country: in 1999 rural poverty was 2.5 times higher that urban poverty, but that ratio increased to 3 in 2011 ([24]).

Despite being encouraging, Bolivia's performance on economic output and inequality only speak about the country's advances in monetary poverty, and the fact that despite being an outstanding performer in its region it remains in the worlds bottom half in development, is puzzling, and given that most of the improvements occurred in urban areas and through the informal labor market ([24]), show a need to direct more attention towards the performance and focus of development intervention in rural areas of the coun-

try. One of the latest trends in rural development around the world and in Bolivia, is the scaling up of past successful development interventions, which blend local with scientific knowledge, and adapt known development enablers, such as credit and insurance, to their environment and conditions ([22]). To scale up an intervention or innovation, means to disseminate it or to articulate it with other interventions, so its impacts reach scales larger than the community where it was first implemented ([22]). However, it means much more than mass physical replication: It must increase social inclusiveness and change traditional mindset of rural communities ([7]). Scaling up initiatives are developed after an initial trial, when the main success factors and mechanisms are clearly identified, but even after having singled out an effective intervention, and having distilled the essence of its success, it is hardly ever the case, that such programs attain a public policy status, reaching more regions and communities, and making its impacts visible at levels beyond local.

Another salient aspect of recent development interventions is the way they are evaluated. Decades of theoretical developments have established that poverty is a multidimensional problem, but not only in the sense that the poor are deprived in more than one dimension of development and not just income or consumption, but also in the sense that the perceptions of the poor on their situation must also be considered when assessing their situation. This has paved the way for approaches like the Capability Approach, that advocates that a just society is the one that gives their members the best chance for living the life they want to live, to judge the effectiveness of development interventions, and to approaches like the Sustainable Livelihoods Approach to assist in the inclusion of many aspects regarding the institutional and environmental context of an intervention, that were previously left out. Another benefit of devising development interventions around more complex concepts such as a livelihood - as opposed a more simplistic focus on income, anticipates the fact that the poor must pull themselves out of poverty through the market ([2]), given the current neoliberal context of most economies, should lead to more robust interventions whose positive results should continue to be observed once it reaches its end.

In this context of comprehensive development interventions, identification of success factors is as important as the discovery of certain critical constraints that may prevent positive effects from reaching broader populations, and if tackled with the right development tool, such constraints may no longer be binding. Such right tool, may be an adaptation of an existing solution, that better fits the needs of rural communities, as is the case of microcredit. Traditional credit is usually available to those who can provide a collateral for a loan: this means the user may have liquidity issues at a given time, but has assets which allow him to have access to credit. Microcredit started as a tool to promote production activities for the poor in Bangladesh with the Grameen Bank, specifically for self-employment in the nonagricultural sector, with a successful group lending model, replicated in over 40 countries ([32]). The poor in Bangladesh and in many other countries usually do not have assets valuable enough to warrant a traditional loan. The debate of the success of microcredit is still widely debated, as results of evaluations of several microcredit programs are mixed in terms of their effect of key outcomes (e.g. business revenue, consumption of durable goods or poverty) ([17]). Regarding the ability of microcredit to enhance the capabilities of its users and the effects it has on their livelihoods and vulnerability, the discussion still lacks evidence, since not many interventions have been evaluated from a multidimensional perspective.

1.1.1 The Peces Para la Vida II project

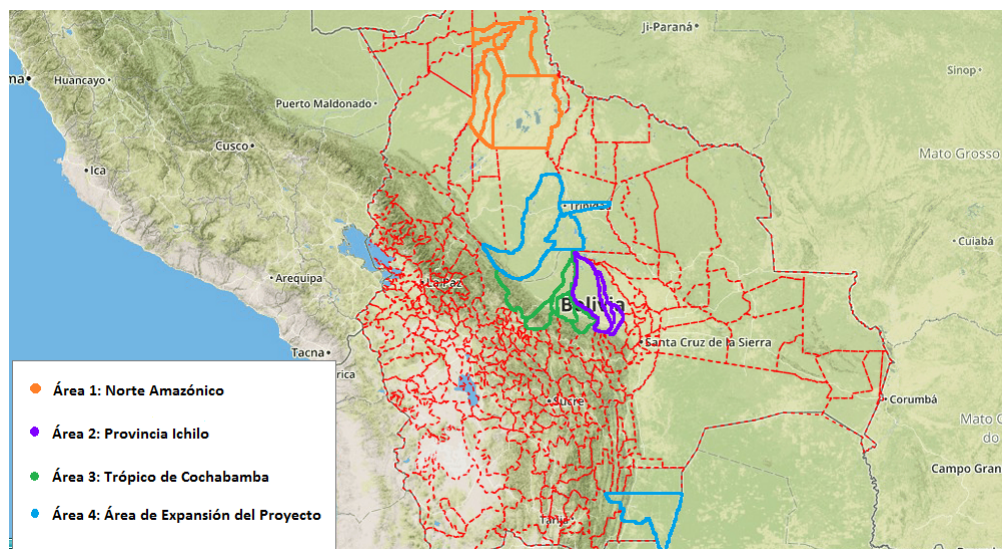
The Peces Para la Vida (PPV) II project is a food security intervention to promote fisheries and aquaculture in the Bolivian Amazon. It was funded by the International Development Research Center, an organization that is part of the Canadian Government that supports research in the developing world. The PPV II project operates in three distinct areas in Bolivia: The Ichilo province in Santa Cruz and the Chapare province in Cochabamba is where aquaculture is being developed in the central lowland region of Bolivia, and the Vaca Diez province in Beni, where fisheries operate in the Amazon basin in the north of Bolivia. Since the latest available information at the municipality level dates back to 2005, I will only provide a description of the local context based on CIDRE's clients' data.

There are currently two distinct types of ongoing credit operations:

1. Traditional individual microcredit operations, in which a single client is evaluated and granted a loan based on his/her past documented payment ability and character, as required by Bolivian financial regulation, and
2. A group leasing operation, in which a local producers association, the *Asociación de Productores Norte Integrado* (APNI), is leasing the necessary equipment to produce their own fingerling feed for their aquaculture operations. The novelty of this operation is that its approval was based on cash flow forecasts, and not payment history, and that there are several stakeholders involved: the local producers association, an NGO that provided the funding for the operation and CIDRE, that manages and oversees the operation. Other groundbreaking aspect of this operation is that it allows an association without any significant assets or recorded credit history, to lease equipment it would have hardly been able to buy with a traditional credit operation. To separate the feed plant from the association, APNI founded a limited liability corporation named ACUAPEZ that operates the feed plant.

These two types of credit are the microcredit component of PPV II, and are at the center of this study.

Figure 1.1: Bolivia: Municipalities where the Peces Para la Vida project operated



1.2 Research purpose

After an initial trial, which aimed at developing artisanal fisheries and small-scale aquaculture and boosting underused fish resources, Peces para la vida, a project funded by the International Development Research Fund from Canada, underwent its scale-up phase. During its past phase, access to credit was identified as a bottleneck for value chain development, as there are several financial needs when it comes to improve fish production, handling, processing and marketing. However, credit has the potential to impact poor people's lives in more than one way: since it has the potential to influence decisions on savings, consumption smoothing, intra-household resource allocation and alter existing power relations ([39], [29], [38], [12]). Credit may also change the way a business is conducted, and may directly influence its survival and profitability. In summary, credit may have an effect on the business venture itself, and in the household of those who engage in it.

Hence, the purpose of this study is to understand how microcredit affects the capabilities and freedom of those who take it up, paying particular attention to how it affects a person's livelihood strategy, which in this particular case is tied to fisheries or aquaculture.

1.2.1 Research objectives

The specific objectives of this thesis are to:

1. Investigate the ability of microcredit to increase wealth and affect business profitability, survival, and to improve a client's financial situation.
2. Describe how microcredit affects a client's wellbeing and ability to cope with negative shocks
3. Describe the role microcredit plays when designing livelihood strategies and income diversification.
4. Assess if credit is the optimal financial tool to create avenues towards enhanced capabilities for small scale fishermen and aquaculturists.

5. Explore the linkages between different types of microcredit, livelihoods and capabilities.

1.3 Structure of thesis

Section 2 will provide the necessary background information to understand the context of the study, with a brief description of the *Peces Para la Vida II* project, and the institutional conditions that affected it. Section 3 will describe the methods used to arrive at the findings, with a focus on the choice of the analytical framework used to arrive at the findings laid out in section 4, which will show the results of the study following the structure of the analytical framework. Finally, section 5 will present a discussion of the findings and section 6 will present the conclusions and final thoughts.

Chapter 2

Background

2.1 A brief description of Bolivia

The Plurinational State of Bolivia is a landlocked country in the heart of South America, with an extension of 1,098,591 square kilometers, and a total population that surpasses the 10.8 million mark according to the latest census estimation. Bolivia's gross domestic product in 2016 was of 33.8 billion USD, and poverty remained just shy of 39% since 2013, after enjoying sustained economic growth since 2006, mainly due to natural resources exports, with natural gas taking an stellar role in this regard ([1]).

Spanish conquerors started an aggressive colonization period in 1524, forcing into submission the most advanced indigenous culture of the Andes, the Inca empire, whose total defeat came in 1538. The founding of La Paz, Bolivia's current administrative capital, took place in 1549, and in 1561 Santa Cruz, Bolivia's current largest and most prosperous city, was founded. Potosi, a small mining town, was founded in 1545, turned out to have the largest concentration of silver in the new world, and when its population reached 150,000, it became the largest urban center in the western world. The coercive forms of labor imposed during this period, would create profound scars in the indigenous community, and in the late eighteenth century, the first attempts to break the Spanish ruling would start. Starting in 1809, Bolivia would gain independence from the Spanish crown in 1825 (LOC 2006).

Bolivia's history has been dominated by political instability, war and loss of territory. Bolivia lost territory to Brazil, Paraguay and Chile, and lost its access to the Pacific Ocean. Another trait of the country, shared by many other Latin American countries, is a long tradition of military dictatorships, with the last one ending in the late 1970s, and finally allowing democratic regimes into government. The dawn of the democratic was plagued by economic crisis, hyper-inflation¹ and foreign debt, which led to Bolivia's president at that time to start stabilization programs with the International Monetary Fund. In 1895, one of the most austere stabilization policies took place, in line with structural adjustment programs and an overall reduction of State participation in the economy (LOC 2006).

Neoliberal policies dominated the Bolivian economy during the 1980s and 1990s with economic results that did not create a noticeable reduction in poverty, as Bolivia was one of the most unequal countries in the world by the late 1990s. Also in this decade, the indigenous political and social movement, usually left out of traditional politics, began to rise and achieved a very important milestone in 2005: Evo Morales, a left-wing leaning indigenous leader from the coca production region became president, breaking with over a decade of neoliberal policies. The Morales administration enjoyed an encouraging economic cycle in which poverty and inequality levels fell to historic lows, with unusual political stability due to over 60% of voter support since 2006 (LOC 2006).

2.1.1 Bolivian land reform

One of the most relevant aspects of Bolivian history in the second half of the twentieth century is land ownership reform. The first Paz Estenssoro administration received massive popular support due to a set of historic changes he was set to implement, such as universal voting rights, the foundation of Bolivia's Worker Central², the nationalization

¹With rates as high as 24,000% per year.

²The *Central Obrera Bolivia* in spanish, is one of the most important social institutions in the country. It gathers worker unions accross industries with a strong participation of the mining industry, and it has

of Bolivia's mining industry and land reform.

These reforms were groundbreaking at a regional level, universal voting rights in which women, indigenous and illiterate people were allowed to vote were not implemented in other Latin American countries until 30 years later in some cases. Land reform was aimed at solving a severe land distribution problem, in which 8.1% of agricultural owners possessed 95% of agricultural land, and 69.4% of the remaining owners had to settle with 0.41% of the available land. Land distribution remains unequal today, after further attempts of reform in the 1990s and the 2000s, even under the Morales administration, with differences between the east and west of the country: The western region is home to 60% of land owners, despite having only 10% of Bolivia's agricultural land, and the eastern plain while accounting for 75% of productive lands, only houses 18% of landowners (REF: USAID 2011).

The modern history of Bolivian land ownership traces back to 1953, in the Law of Agrarian Reform. In 1996 a new law was passed, the Law of the National Agrarian Reform Bureau, which kept some of the content from the previous law, and introduced regulation regarding access, ownership, use and tenure of the land and its natural resources. The 1996 law was modified in April of 2000 and in November of 2006, and it remains valid after Bolivia's latest constitution was passed in 2009, which explicitly separates individual from community ownership and allows its coexistence, and states the two criteria used to separate one from the other: a set of conditions to maintain individual ownership and access to natural resources.

Regardless of the type of ownership, a *Social Function* must be fulfilled to maintain the right to own land, and the constitution states that it is the type of function that determines the legal type of ownership. Table 2.1 (taken from [15]) shows a summary of the features of rural land ownership:

been a part of the most significant social changes in Bolivia such as the election of Bolivia's first indigenous president, among other milestones.

Table 2.1: Features of agricultural property

Type	Ownership	Function	Access to NR
Agricultural Enterprise	Individual	Economic	Surface
Mid range property	Individual	Economic	Surface
Small property	Individual	Social	Exclusive access to renewables and preferential to non-renewables
Community property	Collective	Social	Exclusive access to renewables and preferential to non-renewables
Indigenous territory	Collective	Social	Exclusive access to renewables and preferential to non-renewables

Small, community and indigenous properties seek a social function, so they are reserved for peasants and indigenous people. On the other hand, mid range properties and enterprises seek an economic function and must benefit society and their owners, otherwise, their property rights may be contested by the State. ([15])

This study is concerned with the small property, since all the participants save for two, possess their land under this legal figure. A small property is defined as the minimum land endowment of a producer, that should allow him to rationally satisfy his basic needs, under the 1996 law. This final feature of being recognized as a bare vital minimum to subsist, makes this type of property an undivisible, nonseizable and tax exempt family heritage, which is explicitly stated in the Bolivian constitution. These protections are maintained even after the property is passed onto the owner's children ([15]).

The majority of these types of properties was distributed gratuitously in 1953, however, no proper registry of these properties was developed at the time, and that is a problem that persists even nowadays. After the first generation of beneficiaries passed away, people resorted to several types of dubious documents to prove their ownership of the land,

which led to its fragmentation, large proportion of male owners, and lengthy legal disputes over land property rights. ([15]). The State sought to remedy this situation, with a process of ownership clarification, which is ongoing for the past twenty-one years and its progress is slow due to complex ownership arrangements and the inherent difficulty of conducting work in rural Bolivia, where road access is in an overall precarious condition.

2.1.2 Coca leaf production

In 1961, Bolivia adhered to the UN Single Convention on Narcotic Drugs in Vienna, meaning that coca plantations would have to be destroyed, save for a limited production quota to satisfy the domestic traditional market. 12,000 hectares were allowed by the Bolivian N.1008 Anti-drug Law, which banned production outside of the Chapare region, where 200 hectares were allocated, and the Yungas region in the La Paz department where the remaining hectares would be permitted. This large difference in legal hectares between Chapare and Yungas comes from a traditional/non-traditional distinction: Over 1,000 years ago, Bolivia's first indigenous nations were already growing coca leaves in the Yungas region, whereas coca production in the Chapare is relatively new and does not follow the traditions from Yungas, as producers employ pesticides and fertilizers ([20]). This situation also led to conflict between coca producers and Bolivian armed forces in charge of the eradication of excess plantations, and the reputation of the Chapare peasant had a negative connotation, linked to drug production and trafficking ([20]).

The initial N. 1008 law allowed each family in the Chapare region to grow a *cato* of coca, an area of 40m \times 40m, that could provide a monthly income between 70 USD and 100 USD³ ([20]). Evo Morales increased the legal total area of coca production in 2006 to 20,000 total hectares, with 3,500 allocated to the Chapare region, and the *cato* would not be limited to one per family, but one per *member* of one of the six coca syndicates in the Chapare region, in exchange for the cooperation of coca producers against the fight against excess plantations ([20]).

³Between 2008 and 2010. This range was taken from Grisaffi 2010.

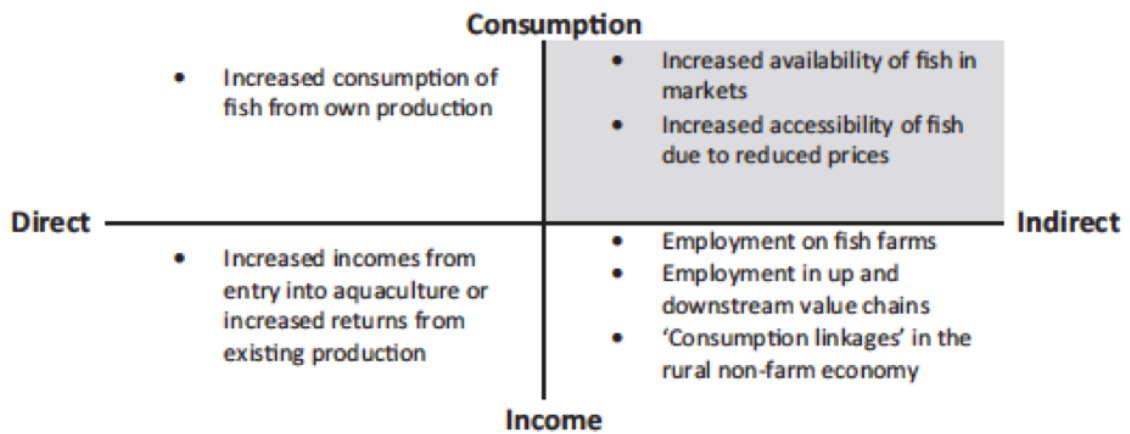
Some authors claim that a cooperative approach to coca growth reduction is more effective than forced eradication ([27]), and the one-*cato* policy seemed to drive the price of coca upwards ([20]), which is accordance to my findings. The interviews I had with branch managers in the Chapare region indicate that a family is able to obtain a yearly income of 32,000 BOB to 48,000 BOB [between 4,600 USD and 6,900 USD]. To provide perspective on this figures, please consider that a Bolivian minimum wage is 2,000 BOB [287 USD], which amounts to 3,450 USD per year. Income from coca leaf grants a Chapare family an income that is 33% to 100% higher to that of a domestic minimum wage. In terms of poverty, the highest poverty line for Bolivia in 2014 (the last available data point for poverty lines) was of 760 BOB⁴ per month [109 USD] or 1,310 USD per year, so income from coca leaf is at least 3.5 times higher than an urban poverty line

2.2 Aquaculture, fisheries and microcredit

The issue of whether aquaculture is a valid livelihood option for the poor has received attention in the development literature, and certain conditions have been established to determine when aquaculture would benefit the poor relatively more than the non-poor. [42] analyze how aquaculture may directly or indirectly benefit the poor in Bangladesh. These authors start by summarizing the effects of aquaculture on poverty they found on the related literature, as shown in figure 2.1:

⁴This was the poverty lines for urban areas. For rural areas, this value was of 553 BOB

Figure 2.1: Contribution of aquaculture to poverty reduction



The most important distinction these authors make is between direct and indirect effects of aquaculture to poverty reduction. A direct effect is one that affects poor people in a straight forward manner, e.g. if an intervention allows him to build a pond in his land, the benefit would be direct. An indirect effect is one that trickles down from an intervention that benefits somebody who is not poor, e.g. if a company gets a subvention to build 20 ponds and employs the local poor and they benefit from the employment generated by the intervention, the effect would be categorized as indirect, since the company is the target of the intervention.

[42] argue that it would be very difficult for the poor to benefit directly from aquaculture due to a severe lack of critical assets, such as land, so indirect benefits may be more realistically achieved. That is why they choose to focus on these type of effects and conclude that aquaculture is an activity that benefits the poor more than it benefits those out of poverty because the increased production of fish lowers its price, and since it is a staple of the poor's diet in Bangladesh, they benefit from the lower prices but in the food security aspect as well. However, in Bolivia and in PPV's particular context, land ownership is not an issue, since most of the project's beneficiaries own their land (individually or communally), and they could benefit from more direct effects, since an investment in land would not be necessary. In this setting, microcredit appears to be a viable option to access the operation capital needed to increase business volume, sparing

the aquaculturists the need to access emergency savings or more expensive informal credit mechanisms.

A few past experiences linking aquaculture and microfinance have been documented in [25], who summarize the results of six case studies in Africa, revolving around the demand and supply of financial services for the operation of fisheries and medium and small scale aquaculture. These authors first point at the almost unanimous recognition of the fact that aquaculture needs credit to grow at the pace it requires to increase its participation in the supply of fish, since fisheries resources should start to decline in coming years. They later discuss how traditional credit may lead to an exploitation situation for fishermen, as the high interest rates charged due to the lack of collateral, may force them into asymmetric commercial relationships, where fishermen and aquaculture producers would only dwell in subsistence. According to the authors, this applies to traditional banking and microcredit operations. These authors conclude that it is necessary to include some form of business development program into any financial service aimed at fisheries and aquaculture in developing countries, as these activities are perceived to have a high risk profile and large capital needs relative to their return. Additionally, the perception of the overall aquaculture industry is of being inefficient, since it is underdeveloped in the countries they study.

Lolita Villareal performed a case study of women in fishing communities in the Philippines (found in [41]). The author recognized that women are active participants in almost every aspect of the household fishing value chain, but they lack any real decision making power at the community or local level, and it was thought that through credit and repeated economic interaction with the village, they would be able to participate in decision making processes at larger scales. Specifically, this project set out to: i) increase incomes and improve skills in managing the microenterprises of at least 50 percent of the participants; ii) manifest positive changes in family planning, population education, maternal and child health (MCH) and related matters of at least 50 percent of project participants; and iii) develop and test a community-based/managed integrated system.

The project started operating in 1990 and lasted until 1994. It had formed 78 women's groups in 20 municipalities from two districts, Capiz and Pangasinan, had disbursed nearly 280,000 USD in total, and the repayment rate at the end of the project was around 83%. However, after the project ended, many groups had stopped meeting and some even dissolved, due to credit operations being terminated in Capiz in 1995. The results were more encouraging in Pangasinan, in which credit operations continued until 2002. Overall, participant women reported increased income and empowerment within their household, and the access to credit was found to be the essential component in keeping the women's groups running.

The project *Aquaculture Development in the Northern Uplands of Vietnam* (ADNUV) funded by the FAO and UNDP in 1999, in 50 communities in three provinces in northern Vietnam, aimed at reducing poverty and enhancing local food security. The project also included a productivity package, which had an aquaculture technology development package, the provision of aquaculture extension services, the improvement of availability of fish seed and the creation of a community managed credit and savings scheme.

According to Dien (also in [41]), by the end of ADNVU, 314,213 USD had been disbursed, doubling the amount that had originally been allocated in the project budget for credit disbursements, so the funds had actually revolved as farmers repaid their loans and the amounts repaid were then used for further loan disbursements. Altogether, 3 630 households in all six districts of the project were reached by the microcredit component of the project, received loans and deposited savings. Loan repayment fluctuated around 98% and 100%. At the end of the project, 68% of all loan recipients were poor households, and the rest to middle class households.

Once again, exceeding immediate client needs (business training) and a social component (women's groups) are crucial factors to increase the likelihood of success in a microcredit intervention. Aquaculture seems to be an activity that promotes women empowerment and gender equality. A business training component has the potential to play

a decisive role: credit introduces a strain in any business operation, as now the venture must generate enough cash to cover credit payments (in addition to the profits necessary for the household's support), so a training component aimed at developing a profitable, sustainable business would increase the likelihood of business survival in the long run, reducing a household's vulnerability to negative shocks, thus making a livelihood sustainable in a strict sense. If this livelihood would be aquaculture, the benefits in women empowerment could be sustained over longer periods of time.

Chapter 3

Methodology and methods

3.1 Theoretical framework: Neoliberalism and microcredit

Neoliberalism is defined in [19] as:

A worldview (or philosophy of life), a wide-ranging policy programme, and a set of concrete policy measures in which individual freedom is given priority...It can be disaggregated into a worldview (a body of normative goals and aspirations amounting to a philosophy of life, or something close to one), a political discourse (a set of values, norms, and ambitions professed by those who control, or realistically seek to control, the formal apparatuses of government), and a set of public policies (regulations and procedures that make both the worldview and the policy discourse flesh in some way). As a short-hand, we can think in terms of the ‘three ps’: philosophy, programme, and practice.

The set of public policies mentioned in the definition, were designed as a response to keynesian policies, which relied upon government intervention and expenditure in the economy to stimulate the aggregate demand, which would cause overall production and output to grow to satisfy this new demand. Neoliberal policies advocated for reductions in government spending, end its intervention in the economy and instead, create a free

market, where the poor would benefit from the dividends that would trickle down from the rich at the top. The development agenda was capital intensive, as it was thought that big investments in infrastructure would be necessary to create the conditions for private sector led industrialization, which would eventually lead to a convergence between rich and poor countries, as the latter were expected to grow at faster rate than developed economies ([26]). This orthodox view of poverty eradication, was pushed through the 1960s and early 1970s, with no positive results, as poverty and inequality continued to rise, even beyond what growth models predicted, with no visible signs of convergence. In this particular view, poverty eradication was a consequence of economic growth.

The 1973 oil crisis and price increase, created a considerable financial surplus for oil production countries, which deposited their funds in banks from developed countries. These banks loaned the money at very low interest to developing countries, but when those interest rates started to rise in 1980, the Latin America debt crisis started when many countries were not able to make their debt payments. To avoid a total economic collapse, these countries were forced to refinance their debt, by subscribing to a set of policies and conditions imposed by the World Bank, the International Monetary Fund and the Interamerican Development Bank. These conditions entailed the reduction of government expenditure and the imposition of *Structural Adjustment Programs* based on the Washington Consensus agenda ([11], [26]). These programs required the lending of more money to Latin American countries, in order to restructure their economies, trade and financial liberalization, and privatization of state enterprises. The fulfillment of these prescriptions would secure more loans at lower interest rates.

The results of the neoliberal development model were mixed. Some countries were able to attain high levels of economic growth and have made progress in poverty reduction, as in the cases of Chile and Argentina, but other countries still lag behind developed economies, in terms of economic output and overall welfare, after almost half a century later. These are the cases of Bangladesh and Bolivia, who after engaging in Structural Adjustment Programs were left in very precarious situations, to which microcredit seemed

to be a practical solution.

After gaining independence in 1971, Bangladesh was also subject to Structural Adjustment Programs and the agenda of the Washington Consensus. The neoliberal policies led to the dismantling of large public enterprises, garment manufacturing became the largest manufacturing segment, energy was privatized and its price rose, and public banking with rural branches was also terminated ([2]). Rural-urban migrations also increased along with self and underemployment, and the conditions for microcredit were set. In 1974 BRAC started its microcredit operations, in 1976 Muhammad Yunus formed what in 1983 would become the Grameen Bank. The poor were introduced into the economy as entrepreneurs, and this sounded attractive to the vast majority of the donors and development industry, and in the early 1990s, the World Bank would become a key stakeholder in the development of microfinance, and in 1995 funded its microfinance issues branch, the Consultative Group for Assistance of the Poor (CGAP) ([2]).

In the early 1980s, Bolivia suffered six consecutive years of negative economic growth, international tin prices fell dramatically, leaving almost a quarter of the workforce out of a job, and saw the highest inflation rate in peace times, 24,000%. This created a fast process of rural-urban migration, which led to levels of informality and selfemployment in the labor force, near the 60% mark ([3]). As part of the neoliberal process, public banking was terminated in 1991, despite having almost half of the national credit portfolio and operating in the rural areas, where private banks were reluctant to operate in at that time. This scenario, with a large percentage of the labor force unable to access traditional banking due to informality and in a dire overall economic situation, presented the optimal conditions for the birth of commercial microfinance. After the efforts of Accion International and IPC, American and German organizations advocating for microcredit, the first microfinance banks were born in Bolivia, taking advantage of the fact that people was more interested in accessing the capital than in its price, and with high interest rates not being an object, the commercial model was viable, leaving behind the traditional model of an externally funded NGO providing microcredit ([8], [3]).

3.2 Analytical approach: Combining Sustainable Livelihoods with Capabilities

Microcredit can be linked to various welfare and development frameworks, as it deals with a complex problem such as poverty, whose solutions while seemingly simple, rely on complex mechanisms, that try to affect several outcomes with a single tool. From this perspective, I believe it is more appropriate to state that microcredit has been used as a tool for development, a richer concept than monetary poverty, as it encompasses more than deprivation, and touches on issues such as health, education and empowerment and their interactions. One of the latest and most comprehensive frameworks to analyze development is Amartya Sen's Capability Approach (CA), that views development as the expansion of people's freedom, and their ability to accomplish and be more in their life ([37]).

As microcredit also relates directly with people's livelihoods, I believe it is also appropriate to analyze how microcredit affects people's livelihood strategies, particularly if it helps make a livelihood more resilient and reliable. Thus I believe microcredit should also be analyzed through the Sustainable Livelihoods Approach (SLA) ([16]), as it has the ability to affect economic and social capitals directly, and in the case of fisheries, the possible increased activity could also affect the physical capital. Additionally, since credit may affect a business' continuity, it also engages directly with its vulnerability and the vulnerability of a household. Both approaches have their strengths and weaknesses, and they were first combined in [28], and it is referred to as the Combined Capabilities and Livelihoods Approach (CLA). Though there is only one empirical application, I believe that this combined approach may provide the most useful when analyzing the effects of microcredit on people's livelihoods and wellbeing.

3.2.1 The Capability Approach (CA)

The origins of the CA can be found in Sen's Tanner lectures *Equality of What?* from 1979. It started as a critique to traditional welfare economics, that traditionally relate wellbeing to opulence (income, access to commodities or resources) or to satisfaction or utility. The criticism Sen makes, rests on the following ideas:

1. Poor people learn to be happy with less and adapt to their circumstances
2. Income and wealth are means to an end, and not an end itself
3. Different people need different resources to achieve wellbeing

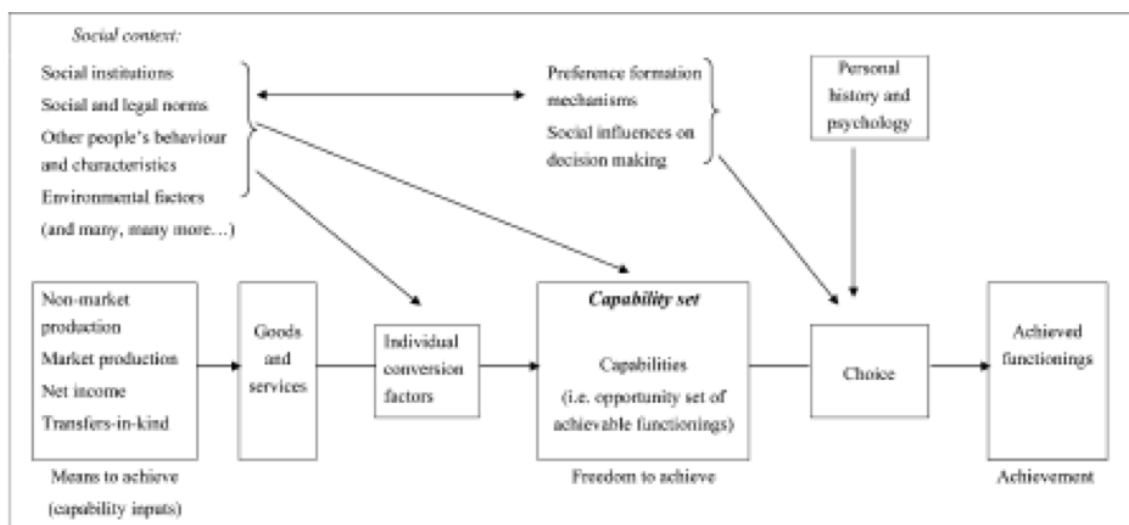
Sen states that a just society will be one that reinforces people's freedoms to achieve the life they choose, and that "an integrated and multifaceted approach is needed, with the object of making simultaneous progress on different fronts, including different institutions which reinforce each other" (Sen 1999, [13]). In other words, Sen argues that such approach must focus on human *functionings* and their *capabilities* to achieve valuable functionings. Let us consider the following definitions, taken from [13]:

- **Functioning:** 'A functioning is an achievement of a person: what she or he manages to do or be. It reflects, as it were, a part of the "state" of that person' (Sen, 1985, p.10). Achieving a functioning (e.g. being adequately nourished) with a given bundle of commodities (e.g. bread or rice) depends on a range of personal and social factors (e.g. metabolic rates, body size, age, gender, activity levels, health, access to medical services, nutritional knowledge and education, climatic conditions, etc). A functioning therefore refers to the use a person makes of the commodities at his or her command.
- **Capability:** A capability reflects a person's ability to achieve a given functioning ('doing' or 'being'). For example, a person may have the ability to avoid hunger, but may choose to fast or go on hunger strike instead. Sen (1999) categorizes capabilities into two broad groups: substantive and instrumental. Substantive capabilities are basic and complex functionings that enable people to be or to do things that

enhance their wellbeing. Instrumental capabilities relate to rights, opportunities, and entitlements that expand people’s wellbeing. Sen (1999) identifies five types of instrumental freedoms: political (e.g., civil rights); economic (e.g., consumption, production or exchange, availability and access to finance, and distribution of national wealth); social (e.g., education, and health care), transparency guarantees (e.g., trust and openness, lack of corruption); and protective security (e.g., presence of a social safety net with fixed institutional arrangements and ad hoc arrangements)

The focus of the CA can be broadened further to include ‘agency’, which recognizes that individuals often have values and goals (such as preserving the environment, purchasing free trade products or opposing injustice, tyranny and oppression) that transcend and sometimes even conflict with personal wellbeing ([35]).

Figure 3.1: The Capability Approach



However, Sen appears to have left a void in his approach, by not paying more attention to *how* goods or assets turn into functionings. According to Robeyns 2005, the relation between a good and the functionings to achieve certain beings and doings is influenced by three groups of conversion factors. First, personal conversion factors (e.g. metabolism, physical condition, sex, reading skills, intelligence) influence how a person can convert the characteristics of the commodity into a functioning. Second, social conversion factors (e.g.

public policies, social norms, discriminating practices, gender roles, societal hierarchies, power relations) and, third, environmental conversion factors (e.g. climate, geographical location) play a role in the conversion from characteristics of the good to the individual functioning.

[35] only provides an overview of the conversion factors, and leaves the researcher helpless when trying to address this issues in a practical manner. As [28] points out:

three problems emerge from not further clarifying the means/input side. First, infrastructure or facilities are not easily representable along Robeyns's categories: Are they commodities/goods or social context or conversion factors? The second problem emerges when environmental aspects are taken into account as conversion factors only. Water and food are not conversion factors but natural goods, whose availability is an important input for one's opportunity space. Third, her framework is both single directed and purely individualistic, whereas scarcity and fragility are normally effects stemming from aggregated individual actions. Creating opportunity spaces, i.e., through infrastructure, or realizing functionings, e.g., traveling, could generate negative feedback loops for the individuals, e.g., resource depletion. Hence, Robeyns's framework considers neither aggregated effects of individual activities nor their feedback loops on the social and natural enabling factors for capabilities

To solve these three difficulties, it is possible to turn to the SLA for analytical guidance.

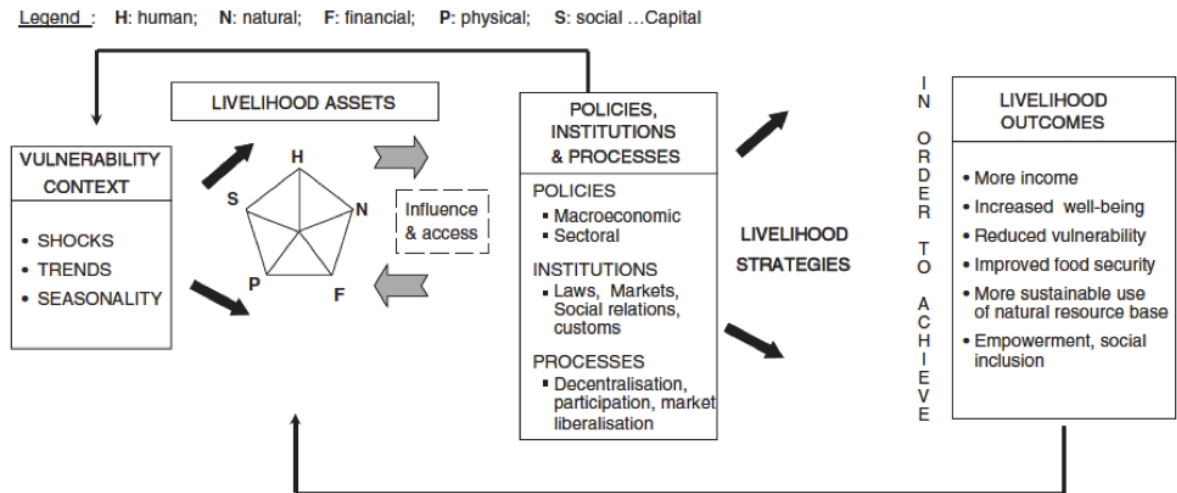
3.2.2 The Sustainable Livelihoods Approach (SLA)

Also stemming from the multidimensionality of poverty, the SLA provides a set of principles and an analytical framework to analyze such a complex phenomenon. SLA puts people's social and economic activities at the center of the analysis and it makes an effort to link effects at several scales, so the understanding of a given livelihood goes beyond the understanding of the livelihood effort itself, and it incorporates factors such as the vulnerability context and the level of social inclusion of those under study. SLA also takes

a broader view of sustainability, and explicitly incorporates the economic, institutional and social dimensions of sustainability, on top of the environmental dimension. It also recognizes that sustainability in dynamic terms, and views it instead as the capacity of elements of a livelihood system (people, institutions, environment and economy) to withstand shocks and adapt to change. The concept of resilience is similarly defined in recent writings on linked social–ecological systems ([16], [28], [7]).

Following ([16]) The SLA brings together assets and activities and illustrates the interactions between them (3.2). The social and economic unit considered is typically the household, conceived as the social group which resides in the same place, shares the same meals and makes joint or coordinated decisions over resource allocation and income pooling. The capital assets owned, controlled, claimed, or by some other means accessed by the household are grouped into five categories. These comprise physical capital (at household, community or citizen level); financial capital (savings, credit, insurance); natural capital (fish stocks, areas of seabed leased or accessed by license, land owned, crops cultivated etc.); human capital (people’s ‘capabilities’ in terms of their health, labor, education, knowledge, skills and health); and social capital (the kinship networks, associations, membership organizations and peer-group networks that people can use in difficulties or turn to in order to gain advantage). Access to both assets and activities is enabled or hindered by policies, institutions and processes (PIPs), including social relations, markets and organizations. PIPs include access and rights regimes and how they work or do not.

Figure 3.2: The Sustainable Livelihoods Approach (Source: [16])



Livelihood sustainability is also affected by external factors ([40]), referred to as the vulnerability context, comprising cycles (e.g. seasonality), trends and shocks that are beyond the household's control. At a household level, illness or death of a family member and the theft or loss of a livelihood productive asset are obvious shocks. Understanding how people succeed or fail in sustaining their livelihoods in the face of shocks, trends and seasonality can help to design policies and interventions to assist peoples' existing coping and adaptive strategies ([40]). Capital assets permit livelihood strategies to be constructed by individuals or households. Strategies can also relate to people's consumption choices (e.g. 'doing without' or the sale of assets). Short and long term measures to ensure survival are often distinguished as 'coping' and 'adapting', respectively. Finally, this framework points to outcomes. A livelihood is sustainable if people are able to maintain or improve their standard of living related to wellbeing and income or other human development goals, reduce their vulnerability to external shocks and trends, and ensure their activities are compatible with maintaining the natural resource base ([16]).

3.2.3 The Combined Capabilities and Livelihoods Approach (CLA)

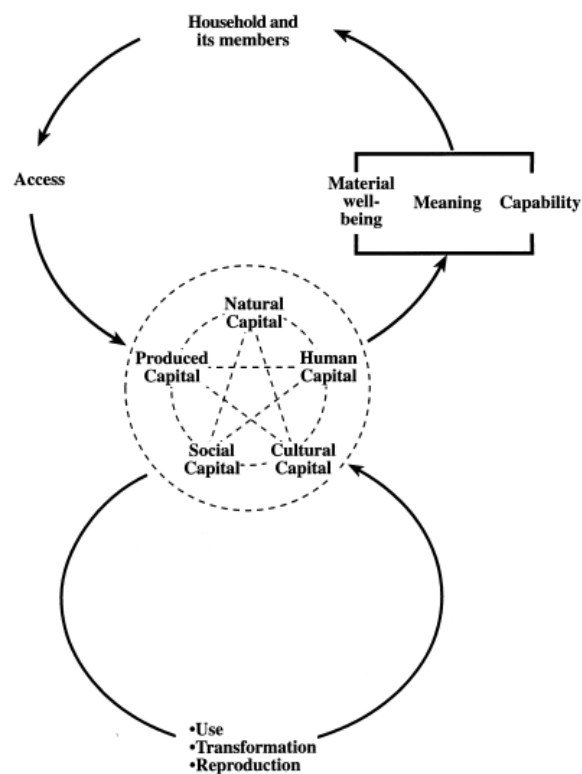
To the best of my knowledge, the first formal attempt at merging livelihoods and capabilities into an analytical framework is found in [6], to provide a broader understanding of the way rural livelihoods work. An important point of separation of this framework from

previous livelihoods literature is the acknowledgment that rural livelihoods are comprised of more than just agricultural activities, and that they encompass the use of a broader range of assets, income sources and institutions (e.g. the labor market), hence livelihoods are viewed in terms of access to the five types of capitals from the SLA.

The framework is further advanced by including the relationship between people's perceptions of wellbeing and their livelihood choices. This is accomplished by viewing assets not only as means or resources people use in building a livelihood, in contrast, people's assets give *meaning* to a person's world and give them the capability to be and to act, and ultimately give people the power to challenge the rules under which they access their assets and control the resources they use in their livelihoods ([6]).

Figure 3.3 shows the elements in the framework by [6]:

Figure 3.3: Assets, livelihoods and poverty



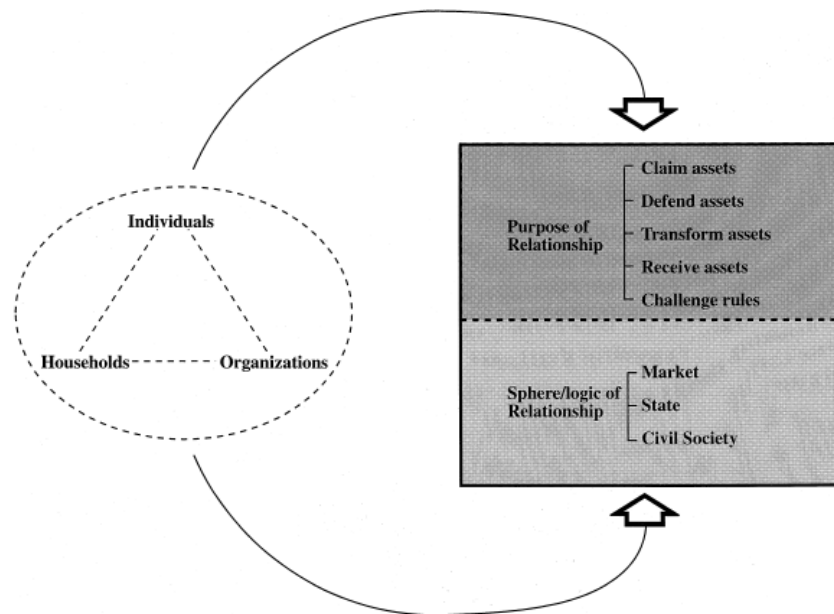
Quoting [6]:

...one part of a holistic framework (see figure 3.3) would conceive the livelihoods and the enhancement of human wellbeing in terms of different types of capital (natural, produced, human, social and cultural) that are at once the resources (or inputs) that make livelihoods strategies possible, the assets that give people capability, and the outputs that make livelihoods meaningful and viable¹ .

[6] argues that rural households that have been able to improve their livelihoods share some common traits, usually associated with their ability to (i) maintain or increase their access to different resources (e.g. credit, land or labor), (ii) enhance the way those resources contribute to their livelihoods (e.g. improving their terms of trade) and (iii) access social networks which include government, non-government organizations and market actors who play a role in securing their access to resources. Conversely, where rural people have not been able to protect their access to resources, livelihoods have not been improved, and [6] points out that social capital, is of paramount importance when maintaining and expanding access to resources, as development programs are usually deployed through organizations that operate at scales larger than the local level. Hence, a second part of the framework, the one that illustrates how households engage with other individuals and organizations, is shown in figure 3.4

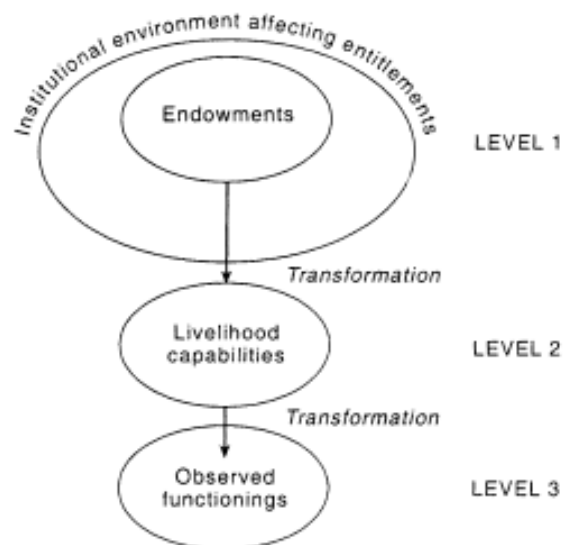
¹A *viable* livelihood would be one that could have been targeted by a development program on the basis of its future profitability. The rural development discussion in Latin American countries during the 1990's divided rural dwellers and their livelihoods between viables and non-viables, the latter would not receive aid in form of investment, but as some kind of social assistance that would steer them towards becoming salaried workers in other productive industries ([6], IDB XXXX)

Figure 3.4: Relationships of resource access, use and transformation



In 2003, [31] also used a combined framework of capabilities and livelihoods to analyze microenterprises in rural England, seen in figure 3.5:

Figure 3.5: Adaptation of Sen's framework in [31]



These authors consider that a household may have physical, financial, human and social endowments which the household draws from organizations and institutions outside the household, so the total household endowment may be more than the sum of indi-

vidual capital endowments. The authors identify two points of transformation: from endowments to livelihood capabilities and from capabilities to functionings, and the first level of transformation depends on the institutional context and level of endowment ([31]).

[6] and [31] took on the challenge of merging capabilities and livelihoods as a response to development interventions which did not seem to produce the results or impacts expected from them ([31]), due to a misidentification problem: Interventions had been designed on erroneous assumptions on how a livelihood was made or how a household behaved regarding its livelihood strategies, thus failing to identify the aspect of their livelihoods that would have benefited more from a development intervention.

[28] found motivation for the development of a combined SLA - CA analytical framework in a different issue: sustainability. Considering that poor people in developing countries tend to depend on natural/biological resources for their livelihoods, issues like depletion of overexploitation of said resources could be problematic in the long run. Hence, to analyze this issue, these authors bring together what they consider the best aspects of both frameworks. [28] chooses to incorporate the extended CA framework by [34] because environmental factors are considered as means towards development goals, but the analysis of sustainability issues could also benefit from an approach that makes input factors and the mechanisms in which they participate, more explicit ([28]). In this regard, the SLA provides this explicit guidance, and it also incorporates issues of intergenerational justice at the center of the sustainability analysis.

In summary, [28] argues that the CA provides the answer to the question *What aspect of human development should be evaluated*, and The SLA offers a well established approach for the instrumental input factors left open by the CA. i.e. answers the question *How are goods converted into functionings?*

Figure 3.6: A Combined Capabilities-Livelihoods Approach (Source: [28])

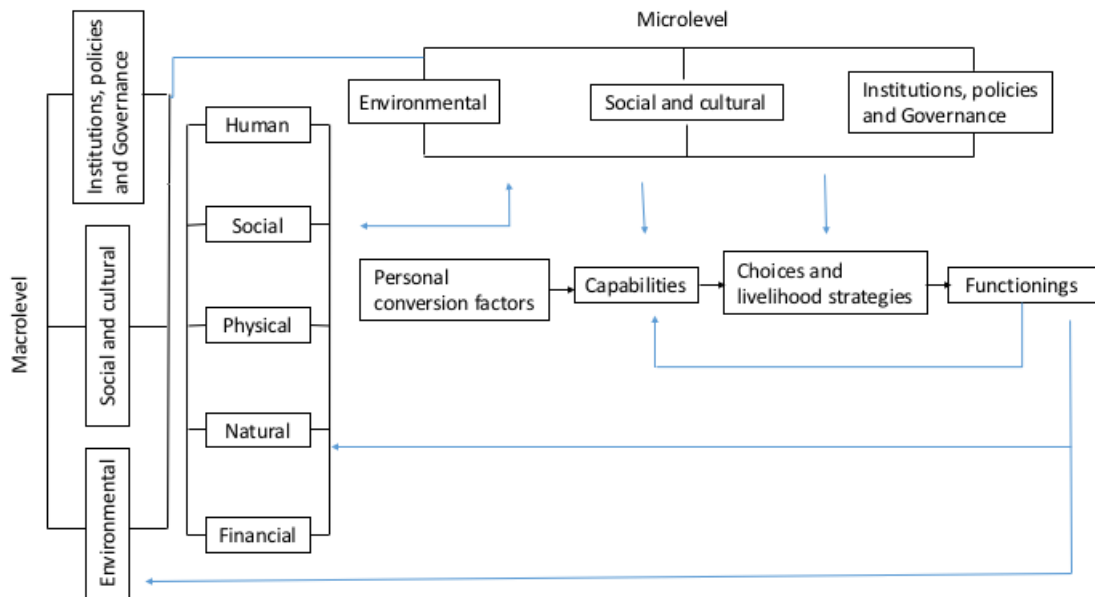


Figure 3.6 depicts the combined CA-SLA framework by [28], which I will use in this thesis. An individual is endowed with assets or livelihood resources, which are taken from the SLA. Capabilities at the individual level are the metric for wellbeing, and these are to be understood as a person's set of freedoms. Identical capital endowments may result in different capabilities for different individuals, due to *personal conversion factors* which depend on the individual's characteristics ([28]). As an agent, an individual makes choices ([28],[36]), such as a livelihood, that result in functioning the individual values. This is similar to the second transformation level in [31]. The framework also incorporates macro-level conditions, deemed crucial by both [6] and [31], which at first influence an individual's initial capital endowment, and could change after an individual designs a livelihood strategy whose outcomes may influence external conditions that result in greater capital endowments ([28]).

It is necessary to create an empirical understanding of capabilities for a practical application of the analytical framework. Since Sen does not provide a definitive list of capabilities in the original approach, there have been attempts at determining such list. One of the most widely used is Nussbaum's list of central capabilities:

- **Life:** Being able to live a normal length human life.
- **Bodily health:** Being able to have good health and nourishment
- **Bodily integrity:** Being able to move freely and be secure against violence and assault
- **Senses, imagination and thought:** Being able to use the senses, to think, to imagine and reason in a way cultivated by education.
- **Emotions:** To be able to have attachments to things and people outside ourselves
- **Practical reason:** To be able to form a conception of *good* and to be able to plan for one's life.
- **Affiliation:** Being able to engage in various forms of social interaction.
- **Other species:** Being able to live with concern for other plants, animals and the world of nature
- **Play:** Being able to enjoy recreational activities
- **Control over one's environment:** Being able to participate in political choices and to be able to have property rights in the same conditions as others.

But these may be viewed as categories of capabilities rather than a list of them ([28]). Another source of capabilities to be included in the analysis is the Bolivian Constitution (BCons), it lists explicitly some of Nussbaum's capabilities such as education and health, and it also includes capabilities the Bolivian people should have regarding access to financial services:

The State will regulate the financial system with equality of opportunity, solidarity, distribution and equitable redistribution criteria. (BCons Art. 330 I.)

and regarding the role the state should play in the promotion of financial services:

The State, through its financial policy, will prioritize the demand of financial services for micro and small enterprises, artisan craftsmanship, commerce, services, community organizations and production cooperatives (BCons Art. 330 II.)

3.3 Methodology: Directed content analysis

Qualitative information was analyzed using directed content analysis ([23], [9]), since the purpose of my study is to validate the linkages proposed in the analytical Capabilities-Livelihoods approach. This approach also guided the discussion of findings, thus extending and supporting previous theory. The analytical framework provided a way to categorize the codes from the interviews, and this guidance was very valuable in terms of orienting the analysis.

3.4 Methods

3.4.1 Semi-structured interviews

To collect data, I chose to conduct semi-structured interviews with participants, as it was more convenient for the participants to receive me at a place and time of their convenience, than to gather them for a workshop of focus group, as it would have been very costly for them to stop working for an entire day. Interviews also gave the participants significant freedom to expand on issues they felt were relevant. Although not many studies link aquaculture to capabilities and provide access to their instruments for data collection, [10] appended the questionnaires used in the interviews of her study, and those interviews served as a starting point for the questionnaires of this research.

3.4.2 Sampling and recruitment

Two main groups of participants were of particular interest: Individual microcredit clients and members of APNI who participated in the group leasing operation. In depth semi-

structured interviews were conducted with the 16 of CIDRE's individual credit clients and five interviews were carried out with APNI members. A secondary group of interest is formed by CIDRE's branch managers working in PPV II areas. Individual microcredit clients were sampled purposefully: For a client to be a member of my sample, his or her loan had to have been approved between 01/03/2015 and 09/31/2016, the loan should not have exceeded the 5,102 USD threshold, and the loan should have been destined to one of the following economic activities²:

- Lake fisheries (CEA³ 5001)
- River fisheries (CEA 5002)
- Aquaculture (CEA 5003)
- Fishing related activities (CEA 5004)
- Fish restaurants (CEA 55204)
- Fish processing (CEA 15120)

The reason behind this purposeful sampling is that the effects of microcredit are not immediate, and considering that there are semiannual and quarterly installments, there is a chance I might encounter someone who would be yet to make a payment if I interview a client whose loan is less than a year old.

At the time of my research proposal defense, I had stated my intentions to interview the sample of individual microcredit clients outlined in table 3.1:

Regarding the second group of participants, those involved in the group leasing operation, two interviews were conducted with regular members of the association, alongside another three members in positions of power within the producers' association or the feed factory. I was invited to observe an evaluation focus group conducted by PPV II's

²Economic activities in Bolivia are classified and coded defined by the regulator, in coordination with Bolivia's national statistics bureau.

³Code for economic activity (*DECAEDEC* in spanish)

Table 3.1: Client sample

Branch	Study participants	Female participants
Ivirgarzama	4	1
Entre Rios	3	-
Chimore	4	1
Yapacani	4	2
Riberalta	1	-
Total	16	4

evaluation team, and there I was able to establish the initial contact with APNI members.

In general, all interviews lasted between thirty and forty minutes, with an average duration of twenty-eight minutes. To conduct interviews, I reached the clients by phone to let them know my schedule and set up a meeting at their house. I visited each client at their house or lot of land if they told me they would be working and would like me to go meet them there. Once I arrived to their property at a time of a client's convenience, I read them the participant consent form approved by the University's Human Research Ethics Board and asked for their permission to record the interview and then I would start the interview after getting verbal consent.

Another set of participants was CIDRE's branch managers and loan officers. Of the five branches visited, four accepted to be interviewed and one rejected the invitation. Two local aquaculture experts were also interviewed. In total, twenty-seven interviews were carried out during three weeks of fieldwork. Since my mother tongue is Spanish, all interviews were conducted in such language.

Interviews for the first group were divided in four sections. I would start the interview by asking about the decision process to obtain a loan and the client's relationship with CIDRE. Then I would delve into the client's financial situation and livelihoods, and how they had changed with the loan. This section also included questions regarding the use of the loan and its effect on the client's aquaculture or fisheries venture, and any other

income generating activities the client may have had. The third section included questions about the participants' daily concerns and important dimensions of wellbeing, and they were asked to elaborate on how the loan had impacted these concerns. The final section addressed the issue of how microcredit affects a client's future perspectives and overall sense of control on his or her life. This layout is also present in the interviews for participants in the group leasing operation and branch managers. The complete interview questionnaires for each group may be found in appendix A.1

3.4.3 Ethical considerations

Given the nature of this study, it was necessary to obtain permission from the University's Human Research Ethics Board. This permission was granted in August of 2017, and the certificate of approval may be found in appendix A.3.

An informed consent script was read to the participants by the researcher, in order to get verbal consent to start the interview. Verbal consent was requested because it was a more natural way to start the interview. I believe that asking them to read a consent form and to provide a signature at the end of the consent form would have been problematic: Even if they were at least educated until the primary level, there was the possibility that they would have struggled when reading the consent form, not to mention that Spanish is a second tongue for some of them, as the native languages of *Quechua* and *Aymara* are mother tongues for a considerable proportion of the Bolivian population⁴, specially in rural areas. For the case of loan officers, once I explained the consent form to them, they requested not to be recorded and seemed uncomfortable with me taking a lot of notes, since they were disclosing some information and practices that while not illegal, could be frowned upon by some, not to mention, they are easily identifiable to their employers, who are potential readers of the entirety of this thesis.

To guarantee the anonymity of participants, initials that do not represent their names

⁴Knowledge of one of these languages is even a requirement to work in the public sector.

were used when citing quotes. Participants were informed of their right to withdraw at any time and of their right to decide if they could be recorded or not. I had no withdrawals, and save for one fish farmer, all participants in producer groups allowed me to use a recording device. Interview incentives were not considered, as I did not want the participants to feel they were induced to provide a positive review had the incentive been in cash. For the case of an in-kind incentive, it would have been very difficult to haul the incentives to some remote locations only accessible by motorcycle.

3.4.4 Interview locations and field research

Interviews were conducted in 3 Bolivian departments: Cochabamba, Santa Cruz and Beni. In Cochabamba, I conducted interviews in the rural cities of Ivirgarzama, Chimore and Entre Rios of the Chapare province, one of Bolivia's two coca leaf production hubs. In Santa Cruz, I met with clients from the Yapacani branch, one of CIDRE's newest 3 branches, and very close in distance to the Chapare province. Though it is not legal to plant coca in this region, a lot of drug dealing related activities take place here, making safety one of the main concerns of participants in this region. The final location for my interviews was Riberalta, in the Beni department. This location was home the the first six indigenous fishermen to obtain credit from CIDRE under the PPV II project.

I was unable to locate twenty-two clients I had initially planned to interview due to various reasons. Twenty of those clients had already repaid their loans, so contact with CIDRE had already been lost. When I tried to reestablish the relationship I learned that six of those twenty-two had sold their properties and left the country, one had entered prison, four had left the activity and did not wish to be interviewed, eight had gone fishing and it was impossible for me to know when they would be back.

In the case of the six Riberalta fishermen, I discovered through the loan officer that only one of them was actually engaged in the activity but was unable to obtain all the capital he needed, so he enlisted five of his relatives including his father and brother to sign up for loans, even though they were not going to invest the money in fisheries, so I

decided to only interview the main client.

For the group leasing component of the study, I had initially proposed to interview 15 members from APNI. In order to do this, I requested assistance from APNI's leadership to obtain contact information of possible participants, and one member present in the focus group agreed to take me to visit more members in a future day. Unfortunately, that person failed to honor her commitment and I was only able to interview in total five APNI members with knowledge of the leasing operation and what it entailed.

3.4.5 Recording and transcribing interviews

Participants and were mostly open to talking and did not have a problem with being recorded. People in the Chapare region were more reluctant to provide details of their activities and income, specially when asked about their coca leaf production and relationship with local coca unions. From the individual client pool, only 3 refused to be recorded. All of CIDRE's branch managers also requested the interview was not recorded. In these cases, I did not record the interview and only took notes of the answers I was provided.

Interviews were recorded on my phone and files were kept in my personal password protected personal computer. All interviews were transcribed by me, with the aid of the *TranscribeME* software, which is a transcription software that works online and offline and provides nothing more than a tight integration between a very basic word processor and an audio player, making it easier to do a transcription.

3.4.6 Coding interviews

Interviews were coded using R version 3.4.3, using its Qualitative Data Analysis (RQDA) package. I initially went through all the interviews to perform an open coding, keeping in mind the concepts of the capability approach and viewing the data through its lens. After having a set of codes, I started grouping them into categories. These code categories came from the Combined Livelihoods and Capabilities approach, with each category being

inspired in one of the boxes of diagram 3.6. The coding was performed separately for each group of participants, with the same coding categories for both of them, and a the majority of the codes were shared by all groups. An overview of the coding is provided in appendix A.2, alongside some summary statistics regarding its use on the data.

3.4.7 Additional data sources

In addition to data collected from interviews, three additional sources of quantitative data were used. The first supplementary data source was the loan application for each individual client in the sample. Individual loan applications contained very detailed data on a client's livelihood at the moment of the application: There was a complete depiction of income and expenditure streams for the aquaculture or fisheries activity of the client over an entire year, so issues regarding production planning and seasonality were properly described. Regarding other activities, this detailed account of production cycles and cash flow were not present, however, total yearly profits from this activities were recorded in the application, so it was possible to determine the relative importance of aquaculture income in a client's total yearly income.

Loan applications also contained detailed information on a client's assets, liabilities and net worth, i.e. assets minus debts, at the moment of the application. This allowed me to determine whether a client had previous debt, or was using the loan to consolidate other debts. Since land was the largest item in participants' assets, information on property size and value was also obtained from this source. Information on collaterals used was also present in the application, alongside general household demographic data. Loan applications were sent from the branches to CIDRE's main office in Cochabamba, where I scanned the original files to proceed with the analysis, before returning the documents to the branches. Unfortunately, all the information contained in loan applications is not poured into a digital dataset, so this process of scanning the original applications and extracting information from these scanned files was the only way to gain a significant understanding of a participant's background and overall financial situation prior to loan disbursement.

This leads to the second supplementary data source, CIDRE's administrative dataset on all its loan operations. This dataset gathers the most important aspects from loan applications, i.e. a client's total assets, debts, net worth, income and profit, among other variables, at an aggregate level, e.g. one would be able to know a client's yearly total income from this source, but one would not be able to know how this income is distributed among the several income generating activities a client may have. This means that it would be impossible to obtain a complete overview of a client's financial situation from this digital dataset alone, thus it became necessary to scan the original loan applications and analyze them to fully understand the data present in the administrative dataset. The administrative dataset also contained information regarding the loan, e.g. its interest rate, the collateral that was being used, the length of the operation, among other financial details. While I only requested and analyzed individual loan applications for those clients I interviewed, I was able to extract general information from the administrative dataset for the nearly 300 participants of PPV II, and allowed me to better understand the program's targeting and general trends. The version of CIDRE's administrative dataset I analyzed, was that of 12/31/2017.

A final source of information that I analyzed in depth, was information on the credit activity of all financial institutions operating in PPV II's influence area. I was able to access aggregate information from one of Bolivia's credit information bureaus, regarding the overall activity on loan disbursement, number of clients and delinquency of all the financial industry in the study sites. I used this information as a proxy for access to financial services in the areas of focus of this research. The latest available dataset I was able to access for this source was that of 11/30/2017.

3.4.8 Final remarks on methods

Evaluation of microcredit programs have traditionally been carried out quantitative methods ([4]), however, when a quantitative evaluation is pursued, it must be considered since

the design of the program and this was not the case for this study, the implementation microcredit component of *Peces Para la Vida* II did not allow any kind of simple experimental evaluation. After my coursework on qualitative methods, I became convinced that it was possible to generate knowledge with them, and that they were as suitable for the task as quantitative methods. Once I started my fieldwork and began conducting the first interviews, I felt a certain relief regarding my choice of methods, as I could not imagine how I could have captured all the depth that the interviews were allowing me to explore: To understand the complexity of the interactions of microcredit with the livelihood strategies of participants through the experiences and voices of those directly in charge of designing those strategies, in the level of detail they were kind enough to share with me, it was imperative to provide participants with as much freedom as possible, and the semi-structured interviews were an ideal tool to provide such liberties.

When conducting a qualitative study, rigor becomes a concern for those who advocate in favor and against qualitative methodologies ([5]). To address concerns for validity of the findings, I must emphasize that three sources of data were contrasted: 1) The original loan applications in all their detail for study participants, 2) CIDRE's administrative dataset to get an overview of all 294 PPV II microcredit clients and 3) Interview data for study participants. Interview participants were selected on the basis of their experience with the loans, so those with the longest experience were asked to share their data, increasing the credibility of the study. Regarding the selection of quotes, I have chosen to show those that provided the better context and depth for the points of analysis, and a summary of the codes used and their categorization is presented in appendix A.2.

Chapter 4

Research findings

The better navigate the findings this research was able to produce, I chose to follow the structure of the combined livelihoods and capability approach by [28]. This analytical framework starts with an analysis of the broadest relevant context, and ends with an analysis at the individual level, and this broad-to-specific approach was applied to this section.

The exposition of the findings starts with an overview of CIDRE's administrative data set in section 4.1: Given that the set of interviewed participants is a subset of the participants universe, this section is intended as a description of said universe, with the level of detailed allowed by CIDRE's administrative data. Then I enter the exposition of the results within the CLA framework, starting with an analysis of the most relevant macrolevel frame condition in section 4.2 to depict an immediately relevant context to further findings. Then, section 4.3 analyzes the access and endowments of capitals that participants typically have, drawing on data from loan applications and from aggregate credit bureau data. Section 4.4 analyzes the microlevel conditions, where the most relevant information regarding income from coca leaf production came from interviews with branch managers.

Finally, the individual level is analyzed in section 4.5. This section starts with an analysis of the personal conversion factors, followed by the findings on choices and livelihood strategies, and then on the achievement of functionings. Finally, a separate subsection

within section 4.5 is devoted to the case of the group leasing operation. This section relies on qualitative data from interviews with individual microcredit clients and from interviews with participants in the group leasing operation.

4.1 Analysis of participants' administrative data at CIDRE IFD

The following analysis is based on CIDRE's administrative dataset as of December 2017, which contains demographic and economic information about PPV clients. For a client to be considered part of the PPV II program, the following requirements, set by CIDRE, must be met:

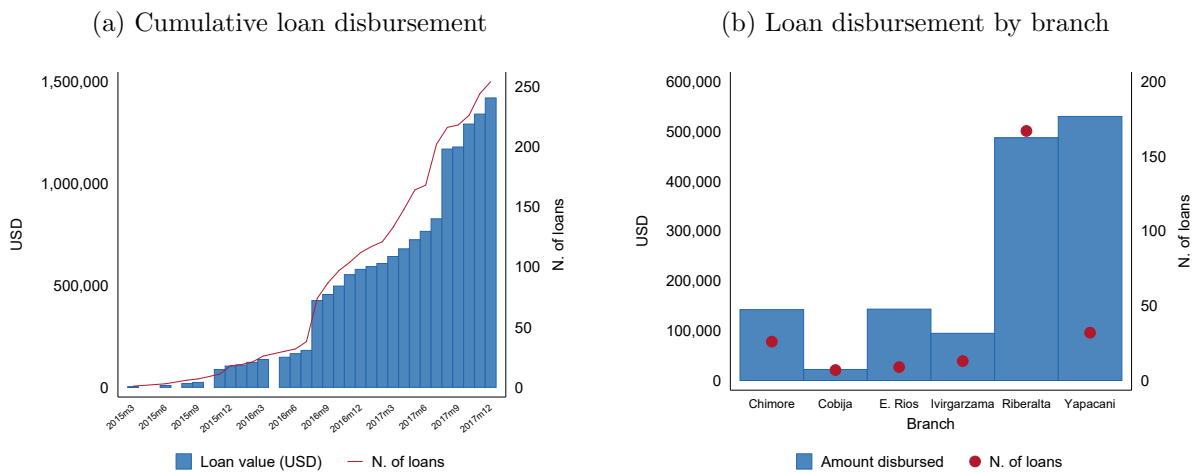
1. The loan must have been disbursed between 03/01/2015 and 12/31/2017.
2. The loan must have been disbursed within PPV II's influence area, i.e. by CIDRE's branches in Yapacani, Riberalta, Ivirgarzama, Chimore, Entre Rios or Cobija.
3. The loan had to be dedicated to one of the following economic activities:
 - Lake fisheries (CEA¹ 5001)
 - River fisheries (CEA 5002)
 - Aquaculture (CEA 5003)
 - Fishing related activities (CEA 5004)
 - Fish restaurants (CEA 55204)
 - Fish processing (CEA 15120)

Another definition relevant to the following analysis is related to loan size: A microcredit is defined as a loan that is equal or below 5,103 USD, which is equivalent 35,000 BOB, in Bolivian currency. This limit is also related to the executive level in charge of

¹Code for economic activity (DECAEDEC in spanish)

making approval decisions on loans: below said mark, it is up to the branch manager and the loan officer to disburse the loan, which makes processing times much faster and closer to 3 days from application to disbursement. Loans above the 35,000 BOB threshold will be referred to as *credits*, and these loans go through from one to four additional levels of analysis, depending on their size, and final decisions on their approval are made by regional or national level executives. Throughout the project, CIDRE disbursed over 1.4 million USD in over 240 loans, to 196 different clients. Figure 4.1 depicts the cumulative evolution of disbursed loans and how they were distributed geographically:

Figure 4.1: Evolution of loan disbursement and its geographical distribution



Loan disbursement happened slowly in the early stages of the project, with three months without any loans disbursed in the first 15 months. Generally, loans were disbursed at the same rate during the project, save for two months, August 2016 and September 2017, in which large disbursements of 171,000 USD and 331,000 USD respectively, were made (figure 4.0a).

Geographically, the Chapare region (Chimore, Ivirgarzama and Entre Rios) accounted for approximately 300,000 USD in loans, while Riberalta and Yapacani, had a loan take up of nearly one million USD, however, Yapacani, the branch with the largest amount disbursed, had 42 total operations, i.e. a few large loans with many smaller credits, while Riberalta disbursed almost half a million USD in nearly 160 loans (figure 4.0b).

There were two sources of funding for the loans in PPV II: funds from a government owned institution, BDP² and funds from CIDRE itself. Funds from BDP are set up in a trust fund, in which CIDRE manages said trust fund on BDP's behalf, and BDP pays CIDRE a fee for managing the fund. From a client's perspective, the main difference between these funds, is price: Since BDP is owned by the Bolivian Government, its interest rates are regulated and have a ceiling, with the highest ceiling being at 11.5%, almost half of CIDRE's standard 20.5% for an agricultural microloan. Other important differences between the two sources of funding are 1) processing times, which are much higher for BDP loans where processing times of up to one month are not uncommon, as opposed to CIDRE's 3 to 5 day processing times for microcredit and 2) collateral requirements: while for CIDRE it is not uncommon to accept somebody's endorsement as a collateral for a microcredit client, BDP funding usually relies on collaterals related to tangible assets, usually out of reach for microcredit clients. Table 4.3 shows relevant results regarding the financial component of the PPV II project:

²*Banco de Desarrollo Productivo*

Table 4.1: PPV II: Summary of disbursed loans in the PPV II project

Funding	Purpose	Size	Activity	Total Disb.	N. of loans	Avg. loan	Med. loan	Min. loan	Max. loan
BDP	Investment	Credit	Aquaculture	547,638	13	42,126	14,577	8,746	311,778
BDP	Investment	Credit	Rel. Act.	177,942	1	177,942	177,942	177,942	177,942
BDP	Investment	Microcredit	Aquaculture	9,184	2	4,592	4,592	4,082	5,102
BDP	Investment	Microcredit	Fisheries	19,446	7	2,778	2,915	1,662	3,644
BDP	Operation	Microcredit	Aquaculture	10,204	2	5,102	5,102	5,102	5,102
BDP	Operation	Microcredit	Fisheries	11,953	4	2,988	2,915	2,915	3,207
CIDRE	Investment	Credit	Aquaculture	102,041	5	20,408	10,204	10,204	35,714
CIDRE	Investment	Credit	Fisheries	18,950	2	9,475	9,475	8,746	10,204
CIDRE	Investment	Credit	Restaurants	35,204	2	17,602	17,602	10,204	25,000
CIDRE	Investment	Microcredit	Aquaculture	97,857	21	4,660	5,102	2,915	5,102
CIDRE	Investment	Microcredit	Fisheries	111,197	71	1,566	1,020	729	5,102
CIDRE	Investment	Microcredit	Restaurants	19,825	6	3,304	3,061	1,458	5,102
CIDRE	Operation	Credit	Aquaculture	30,408	3	10,136	10,204	10,000	10,204
CIDRE	Operation	Microcredit	Aquaculture	23,324	7	3,332	3,061	1,166	5,102
CIDRE	Operation	Microcredit	Fisheries	189,650	104	1,824	1,895	1,020	4,519
CIDRE	Operation	Microcredit	Restaurants	15,306	4	3,827	3,571	3,061	5,102
Totals									
			Fisheries	351,197	188	1,868	1,895	729	10,204
			Aquaculture	820,656	53	15,484	5,102	1,166	311,778
			Rel. Act.	177,942	1	177,942	177,942	177,942	177,942
			Restaurants	70,335	12	5,861	3,571	1,458	25,000
		Credit		912,184	26	35,084	10,204	8,746	311,778
		Microcredit		507,946	228	2,228	1,895	729	5,102
	Investment			1,139,285	130	8,764	2,442	729	311,778
	Operation			280,845	124	2,265	1,895	1,020	10,204
BDP				776,367	29	26,771	5,102	1,662	311,778
CIDRE				643,763	225	2,861	1,895	729	35,714
Total				1,420,130	254				

Source: CIDRE's administrative data as of Decembre 2017.

BDP funded 29 loans, a little over 10% of CIDRE's 225 loans, however, the value of those loans accounts for the majority of the total loan value: 776,367 USD, as opposed to CIDRE's 643,763 USD. BDP funded loans as large as 311,778 USD and as little as 1,662 USD, whereas CIDRE's largest loan in the program was just above 35,000 USD, with loans starting as low as 729 USD. This disparity in loan size also relates to the use of the loans: BDP loans were mostly -nearly 750,000 usd, used for investments, i.e. purchases of large equipment, land or conditioning of production facilities, and not for operation purposes, such as the purchase of production inputs or the purchase of small tools.

On the other hand, CIDRE's loans were used for both investment (approximately 380,000 USD) and operation (approximately 260,000 USD), with the vast majority of

loans funding the operation of fisheries, with 104 loans worth nearly 190,000 USD devoted to that purpose. In terms of loan size, microcredit accounted for nearly 35% of total loan value but nearly 90% of operation volume, and credit for the remaining 65% of loan value and 10% of operation volume.

In terms of the economic purpose of the loans, aquaculture was the activity that demanded the largest funding, occupying nearly 63% of total loan value in 21% of the operation volume. River Fisheries was the activity that took the largest portion of operation volume, 74%, with 25% of total loan value. This disparity in loan size by economic purpose, provides a simple overview of the credit component in PPV II: Overall, few larger loans funded by the BDP with an investment purpose, were granted for aquaculture, and a large number of microloans were disbursed for the operation of fisheries ventures.

Table 4.2 shows some demographic features, all which can be recovered from CIDRE's administrative data:³, of microcredit clients in the PPV project.

³Unfortunately, CIDRE does not store digital versions of loan applications, which contain detailed demographic and economic information of clients, only the characteristics displayed in table 4.2 are stored in CIDRE's digital records.

Table 4.2: **PPV II: Demographic indicators of individual microcredit clients**

Loan use	Branch	N. of loans	N. of clients	Female clients	Avg. age	Comp. primary school	Comp. high school	Avg. HH members
River fisheries	Chimore	4	3	2	27	1	2	3
River fisheries	Cobija	5	5	0	29	3	2	3
River fisheries	Riberalta	165	115	4	34	73	42	3
River fisheries	Yapacani	14	12	3	34	5	5	2
Aquaculture	Chimore	15	13	3	46	9	3	2
Aquaculture	E. Rios	8	8	0	40	4	2	2
Aquaculture	Ivirgarzama	12	12	4	43	8	3	2
Aquaculture	Yapacani	18	17	5	39	3	7	2
Fishing related activities	Riberalta	1	1	0	31	0	0	1
Fish restaurants	Chimore	7	6	1	42	5	0	2
Fish restaurants	Cobija	2	1	1	24	0	1	1
Fish restaurants	E. Rios	1	1	1	30	1	0	2
Fish restaurants	Ivirgarzama	1	1	1	54	1	0	2
Fish restaurants	Riberalta	1	1	1	45	0	1	1
	Total	254	196	26	37	113	68	2

Source: CIDRE's administrative data as of Decembre 2017.

Only 26 microcredits feature a female as the main debtor, and 12 of those clients obtained loans for aquaculture. More than half of CIDRE's clients have at a primary school degree, and approximately a third of them have completed high school. On average, a client has 2 household members who depend on him or her for income, meaning the average household size is 4. The average age for a credit client in the PPV II program is 37, but the aquaculture clients are approximately 4 to 5 years older than the clients in the fisheries industry.

Table 4.3 shows some essential features of the loans disbursed so far, by source of funding:

Table 4.3: PPV II: Descriptions of loan features by source of funding

Fund. type	Loan use	Branch	Avg. loan size	Med. loan size	Min. loan size	Max. loan size	N. of loans	Avg. Int. rate	Avg. loan term	Avg. N. of Inst.
BDP	Fisheries	Riberalta	2,854	2,915	1,662	3,644	11	9	2	28
BDP	Aquaculture	Chimore	8,309	7,289	4,082	14,577	4	9	3	11
BDP	Aquacultur	E. Rios	42,857	42,857	42,857	42,857	1	9	7	14
BDP	Aquaculture	Ivirgarzama	12,391	12,391	9,475	15,306	2	9	5	22
BDP	Aquacultur	Yapacani	46,615	12,391	5,102	311,778	10	9	7	13
BDP	Fish.Rel.Act	Riberalta	177,942	177,942	177,942	177,942	1	7	10	120
CIDRE	Fisheries	Chimore	5,867	5,102	3,061	10,204	4	22	3	39
CIDRE	Fisheries	Cobija	3,003	3,644	1,458	4,082	5	22	4	46
CIDRE	Fisheries	Riberalta	1,644	1,895	729	8,746	154	22	2	19
CIDRE	Fisheries	Yapacani	2,008	2,004	1,200	3,061	14	23	2	25
CIDRE	Aquacultur	Chimore	5,367	5,102	1,749	10,204	11	22	3	20
CIDRE	Aquaculture	E. Rios	14,140	5,102	3,061	35,714	7	22	5	18
CIDRE	Aquacultur	Ivirgarzama	5,975	5,102	2,915	10,204	10	23	4	14
CIDRE	Aquaculture	Yapacani	4,483	5,102	1,166	5,102	8	22	4	7
CIDRE	Restaurant	Chimore	3,790	3,061	3,061	5,102	7	25	3	27
CIDRE	Restaurants	Cobija	3,571	3,571	2,041	5,102	2	22	3	29
CIDRE	Restaurant	E. Rios	1,458	1,458	1,458	1,458	1	26	1	12
CIDRE	Restaurants	Ivirgarzama	10,204	10,204	10,204	10,204	1	20	5	60
CIDRE	Restaurant	Riberalta	25,000	25,000	25,000	25,000	1	21	5	60

Source: CIDRE's administrative data as of Decembre 2017.

The most relevant difference between BDP funded loans and CIDRE loans is seen in the average interest rate column: BDP loans have an average interest rate of 9% per year, while CIDRE funded loans have rates fluctuating between 20% and 30%. This fact is also related to loan size, where it is clear that BDP loans have a much larger average loan size, e.g. 46,000 USD in Yapacani for aquaculture, when compared to CIDRE's, whose average loan size does not surpass the 14,000 USD level. This fact is merely a confirmation that riskier, smaller loans are also accompanied by usually larger rates. Table 4.4 shows the same features in table 4.3, disaggregated by loan purpose:

Table 4.4: PPV II: Descriptions of loan features by loan purpose

Purpose	Loan use	Branch	Avg. loan size	Med. loan size	Min. loan size	Max. loan size	N. of loans	Avg. Int. rate	Avg. loan term	Avg. N. of Inst.
Investment	Fisheries	Chimore	6,803	5,102	5,102	10,204	3	22	4	44
Investment	Fisheries	Cobija	3,003	3,644	1,458	4,082	5	22	4	46
Investment	Fisheries	Riberalta	1,484	1,020	729	8,746	58	22	1	16
Investment	Fisheries	Yapacani	2,008	2,004	1,200	3,061	14	23	2	25
Investment	Aquacultur	Chimore	6,728	5,102	4,082	14,577	13	18	3	19
Investment	Aquaculture	E. Rios	19,825	10,204	4,082	42,857	7	19	6	18
Investment	Aquacultur	Ivirgarzam:	7,044	5,102	2,915	15,306	12	20	4	15
Investment	Aquaculture	Yapacani	39,696	10,204	5,102	311,778	12	13	7	13
Investment	Fish.Rel.A	Riberalta	177,942	177,942	177,942	177,942	1	7	10	120
Investment	Restaurants	Chimore	3,741	3,061	3,061	5,102	3	24	3	28
Investment	Restaurant	Cobija	3,571	3,571	2,041	5,102	2	22	3	29
Investment	Restaurants	E. Rios	1,458	1,458	1,458	1,458	1	26	1	12
Investment	Restaurant	Ivirgarzam:	10,204	10,204	10,204	10,204	1	20	5	60
Investment	Restaurants	Riberalta	25,000	25,000	25,000	25,000	1	21	5	60
Operation	Fisheries	Chimore	3,061	3,061	3,061	3,061	1	24	2	24
Operation	Fisheries	Riberalta	1,856	1,895	1,020	4,519	107	21	2	22
Operation	Aquacultur	Chimore	2,405	2,405	1,749	3,061	2	22	2	6
Operation	Aquaculture	E. Rios	3,061	3,061	3,061	3,061	1	25	3	10
Operation	Aquacultur	Yapacani	4,276	5,102	1,166	5,102	6	17	3	6
Operation	Restaurants	Chimore	3,827	3,571	3,061	5,102	4	25	3	27

Source: CIDRE's administrative data as of Decembre 2017.

Investment loans tend to have larger average size than operation loans, but interest rates usually do not vary when breaking up the analysis by loan purpose: overall interest rates vary around the 20% level, save for aquaculture investments in Yapacani and fisheries investments in Riberalta, which on average have an interest rate of 13% and 7% respectively. Loan terms for investments are also noticeably longer for investment loans, going as long as 10 years, whereas terms for operation purposes are never above 3 years.

Table 4.5: PPV II: Descriptions of loan features by loan size

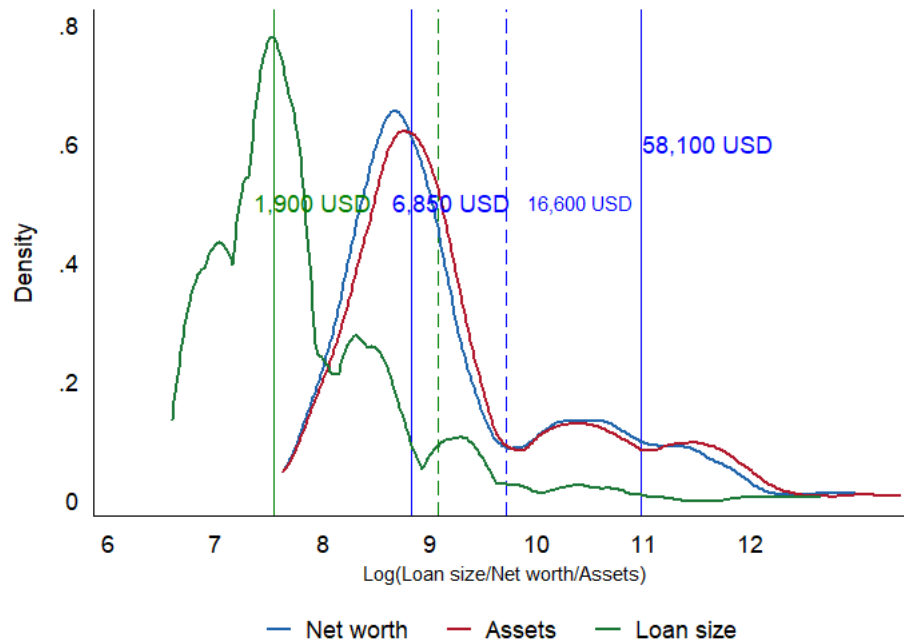
Size	Loan use	Branch	Avg. loan size	Med. loan size	Min. loan size	Max. loan size	N. of loans	Avg. Int. rate	Avg. loan term	Avg. N. of Inst.
Credit	Fisheries	Chimore	10,204	10,204	10,204	10,204	1	21	5	60
Credit	Fisheries	Riberalta	8,746	8,746	8,746	8,746	1	19	5	60
Credit	Aquacultur	Chimore	11,115	10,204	9,475	14,577	4	15	4	34
Credit	Aquaculture	E. Rios	31,122	35,714	10,204	42,857	4	16	7	22
Credit	Aquacultur	Ivirgarzama	11,038	10,204	9,475	15,306	5	17	5	21
Credit	Aquaculture	Yapacani	56,993	14,942	8,746	311,778	8	9	8	16
Credit	Fish.Rel.Ac	Riberalta	177,942	177,942	177,942	177,942	1	7	10	120
Credit	Restaurants	Ivirgarzama	10,204	10,204	10,204	10,204	1	20	5	60
Credit	Restaurant	Riberalta	25,000	25,000	25,000	25,000	1	21	5	60
Microcredit	Fisheries	Chimore	4,422	5,102	3,061	5,102	3	23	3	32
Microcredit	Fisheries	Cobija	3,003	3,644	1,458	4,082	5	22	4	46
Microcredit	Fisheries	Riberalta	1,682	1,895	729	4,519	164	21	2	20
Microcredit	Fisheries	Yapacani	2,008	2,004	1,200	3,061	14	23	2	25
Microcredit	Aquaculture	Chimore	4,347	4,956	1,749	5,102	11	20	3	12
Microcredit	Aquacultur	E. Rios	4,337	4,592	3,061	5,102	4	24	3	13
Microcredit	Aquaculture	Ivirgarzama	4,192	5,000	2,915	5,102	7	23	3	11
Microcredit	Aquacultur	Yapacani	4,606	5,102	1,166	5,102	10	19	3	7
Microcredit	Restaurants	Chimore	3,790	3,061	3,061	5,102	7	25	3	27
Microcredit	Restaurant	Cobija	3,571	3,571	2,041	5,102	2	22	3	29
Microcredit	Restaurants	E. Rios	1,458	1,458	1,458	1,458	1	26	1	12

Source: CIDRE's administrative data as of Decembre 2017.

Table 4.5 shows loan features broken down by loan size. Interest rate and loan term are the main features that vary across credit and microcredit, the latter being more expensive and with a shorter overall length.

Figure 4.2 shows the distribution of loan size, assets and net worth of PPV II's credit participants:

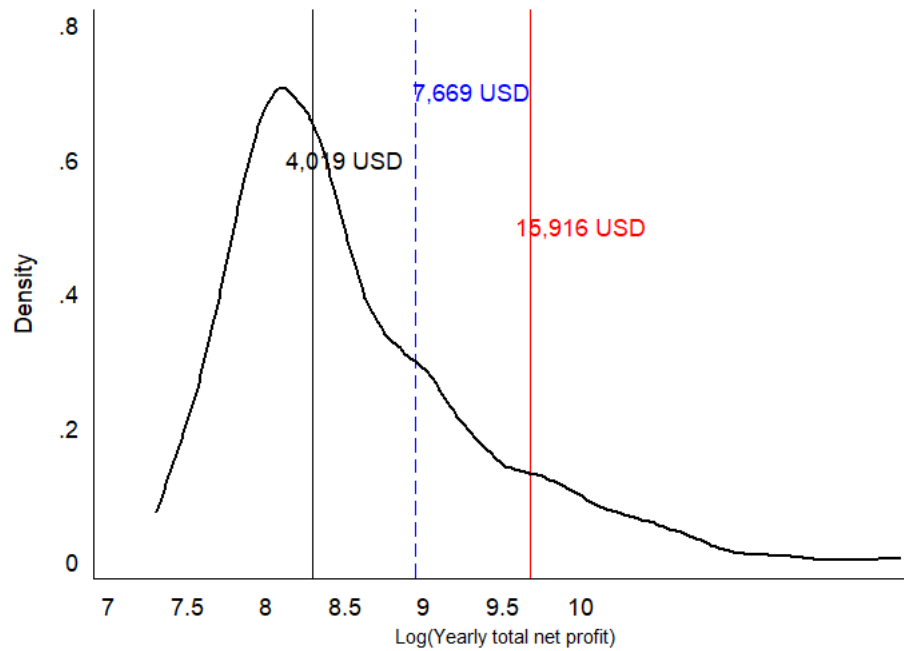
Figure 4.2: PPV II: Distribution of loan size, total assets and net worth



The green vertical lines show percentiles 50 and 90 of the loan size distribution, while the vertical blue lines show percentiles 50, 75 and 90 of the net worth distribution. All the distributions have long right tails, the median loan size is 1,900 USD, and the median net worth is 6,850 USD, and it is close to the 90th percentile of the loan distribution which is close to 8,700 USD. The distribution of net worth lies virtually over the assets distribution, meaning that most of the clients had no debts at the moment they applied for a loan in CIDRE.

Figure 4.3 depicts of how large are the total profits of CIDRE's clients, and how they're distributed. Unfortunately, CIDRE's administrative dataset does not provide information on how many different activities a client is undertaking, or the individual profits of each activity, however, it still allows us to get a limited picture of a clients overall income situation.

Figure 4.3: PPV II: Distribution of total annual profit



The median total annual profit is 4,019 USD, and the 90th percentile of the profit distribution is at 15,916 USD, while the maximum profit in CIDRE's records is 167,096 USD. The median profit is a little over Bolivia's full time minimum wage of 3,500 USD per year. With a median profit, a 5 person household would live with 1.94 USD per day, that become 0.87 USD PPP per day, which puts them below the 1.90 USD PPP extreme poverty line. It is important to emphasize that total profits for clients in the Chapare region do not contain profits from coca leaf plantation, which may reach nearly 7,000 USD per year. Income from this source alone is likely to move an average 4 member family above the rural poverty line by itself, and an average family will most definitely be above the poverty line when income from other agricultural sources is accounted for.

4.1.1 Profile of a PPV II microcredit client and his aquaculture business

CIDRE's administrative data does not record all the information a loan officer captures when interviewing a potential client. Typically, a client does not fill his own loan application at CIDRE, the loan officer is the one responsible for collecting a client's business data and formatting it according to CIDRE's standards. This process is first done manually at the client's property, and only when all required data has been captured, it is poured into an electronic file which is used for approval purposes.

After scanning the manual records for the 38 clients in the initial sample and analyzing them, I learned that all of them were small property owners, and in some cases they owned more than one property. Land was by far the highest value asset they owned, usually accounting for over 80% of their total assets, while the remaining percentage was kept in some form of produce stock and some farm animals, and the smallest fraction was kept in cash or savings. At the time of the loan disbursement, most clients did not report other debts in the formal financial system, and some of them used CIDRE's loan to consolidate debts from other institutions and obtain additional capital.

From a business perspective, CIDRE is only required to evaluate the economic performance of the activity that will repay the loan. This means that in an effort to disburse the loan as quickly as possible, loan officers neglect the information regarding other activities the client may have, and additional activities only become important if a client is unable to pay his aquaculture debt using only aquaculture income. When an activity is evaluated, loan officers get a very detailed picture of its expenditure, income and profits for an entire year, considering any seasonality that may be involved. If requested, information on supplementary activities is only recorded at an aggregate level, without any monthly or seasonal details. Almost every client had recordings of at least one additional income generating activity, and in 3 cases, income from 3 additional activities was recorded.

With this preamble, aquaculture is a seasonal activity, in which the farmer has one harvest usually every ten to twelve months. To start fish farming, a person must dig a pond, usually 25m \times 50m or 100m \times 25m, and the digging may cost up to 2,000 USD. To fill the ponds with water, some wait until the rain season so rainwater fills the pond, but some use water pumps and fill their ponds with water from a nearby river. Then, water undergoes some preparation regarding its acidity levels and sanitary conditions, so it is suitable for fingerlings to be put in it, and then the most expensive part of the process starts, feeding, which is done in three phases throughout the 9-12 month growth period. Fish are fed two to three times per day depending on the stage, which makes food the largest expense in the aquaculture business: of the 14 aquaculture loans in the sample, 12 were destined to start or expand an aquaculture venture and two only to cover operational costs, and on average food makes up 61% of total operational expenses. Food is usually bought weekly, as it cannot be stored for long periods of time, and producers prefer to use the freshest food possible to feed their fish.

Under normal circumstances, the price for a kilogram of fish is between 3.6 USD and 4.0 USD, and it costs approximately 3.0 USD to produce a kilogram of fish, making aquaculture's return on investment close to 33%, but more than one client reported profits close to 54%. Regarding total income composition, aquaculture accounts for 1 to 2 thirds of total household income, however, income from coca leaf is not reported in CIDRE's records due to regulatory requirements, and including this profitable source of income would drive the relative importance of aquaculture income to levels close to 25%-60%, assuming a conservative income of 4,500 USD per year from coca leaf production.

4.2 Analysis of relevant macrolevel frame conditions

4.2.1 Institutional frame conditions

At the largest scale, the most important institutional frame condition is the current legislation on land ownership. The fact that small properties are non-seizable, impact directly

on a microcredit client's ability to obtain loans. Since small properties cannot be mortgaged, financial institutions will not accept them as collateral in credit operations, this leaves a small land owner in a precarious situation, since he may only use alternative collateral that are usually more expensive: in CIDRE's case, a loan that does not involve the mortgage of a lot of land or a house as a collateral may cost up to 3 percentage points more.

Another consequence of a person's inability to mortgage a small property relates to loan size. Financial institutions in Bolivia are free to decide how large of a loan to disburse without a physical asset as collateral, but most of them set a limit between 10,000 USD and 20,000 USD, which may not always work to a producer's favor, and may lead him to acquire multiple small loans from different institutions and not enjoy from a consolidated debt.

A suggestion given to small property owners is that they should try to invest in a house or property that may be mortgaged, but his solution is not always possible. A producer sometimes lives in his small property, and most of the time invests in it, making infrastructure improvements such as building roads or digging aquaculture ponds, increasing its commercial value if they decided to sell their property, but despite having a more valuable property and being able to access a larger loan, the producer is left with the same collateral constraints which translate into higher financial costs and multiple small debts. Since a small property owner cannot leverage more funding with a growing net worth, he may have more difficulties accessing credit in more convenient conditions.

4.3 Analysis of the five capitals

4.3.1 Natural and physical capital

After analyzing the individual loan applications, I found that all participants in the study were land owners of at least one small rural property, which had great variability in ex-

tension and value. According to loan applications, the average size of a lot of land for participants in non-indigenous areas was 13.8 ha., with the smallest size being 1.4 ha and a maximum size of 21.0 ha. The average value of these properties at the time the loan were granted, between March 2015 and September 2016, was of 133,594 BOB or 19,194 USD, with some properties being valued as high 54,210 USD but never below 11,828 USD. When analyzing land value by hectare, we encounter some cases in which the price by area unit could be as high as 8,354 USD or as low as 1,426 USD. These prices depend on factors such as proximity to the main highway (the lot worth over 8,000 USD/ha is located right on the highway connecting Santa Cruz and Cochabamba) and availability of utilities in the area. In addition to owning a small property, some of the participants owned a second piece of land.

In indigenous regions, land may be owned both individually and communally. In the fishermen village near Yapacani where a subset of my interviews took place, land ownership was individual but the sizes of those properties was much smaller than the those properties located in non-indigenous areas. According to loan applications, the average lot size for study participants was 902 m², with very little variance among them. The same can be said about the value of their land, whose average was of 3,807 USD.

As a remark I would like to state that the value of these properties are determined by CIDRE's loan officers by following a set of valuation guidelines set by CIDRE, corroborated with an informal investigation on the value of nearby properties. The data of one of the clients pointed to the existence of a previous loan which listed the same property among the client's assets, and this property's value increased from 7,543 USD to 11,828 USD in just 14 months. An explanation for this 56% increase in value was not provided in the loan application, and while many reasons are possible for this increase, the valuation of these properties is usually not a formal process due to lack of a proper registry on land ownership and transactions, and variations may be introduced by humans valuing these properties.

4.3.2 Financial capital

To determine whether a participant of PPV II would be able to increase its financial capital through credit, I decided to analyze data on the overall level of financial activity in their regions. After analyzing data from INFOCRED, one of Bolivia's credit information bureau, on the activity of the entire financial industry in the towns where CIDRE's branches are located, I found that the activity of financial institutions in these areas for the activities that PPV II focuses on, has been growing consistently for the past five years.

It is possible for participants in the study area to access financial capital with their endowments of land and assets, mostly in the form of microcredit. The number of present financial institutions in the study sites varies between 1 and 24, with Riberalta being the municipality with the highest coverage, followed by Yapacani with 14 financial institutions operating in the area. In the Chapare region, the number of financial institutions varies between 3 and 5⁴. In terms of the attention drawn by the activities funded by the PPV project, it must be said that the aquaculture and fisheries sector has grown considerably in the past 5 years. Figure 4.4 shows the evolution of the credit portfolio, i.e. the outstanding amount of loans disbursed by financial institutions, at the national and study site level:

⁴Data from Bolivia's regulator, *ASFI*

Figure 4.4: Total credit portfolio evolution of aquaculture and related activities in Bolivia and in the study area

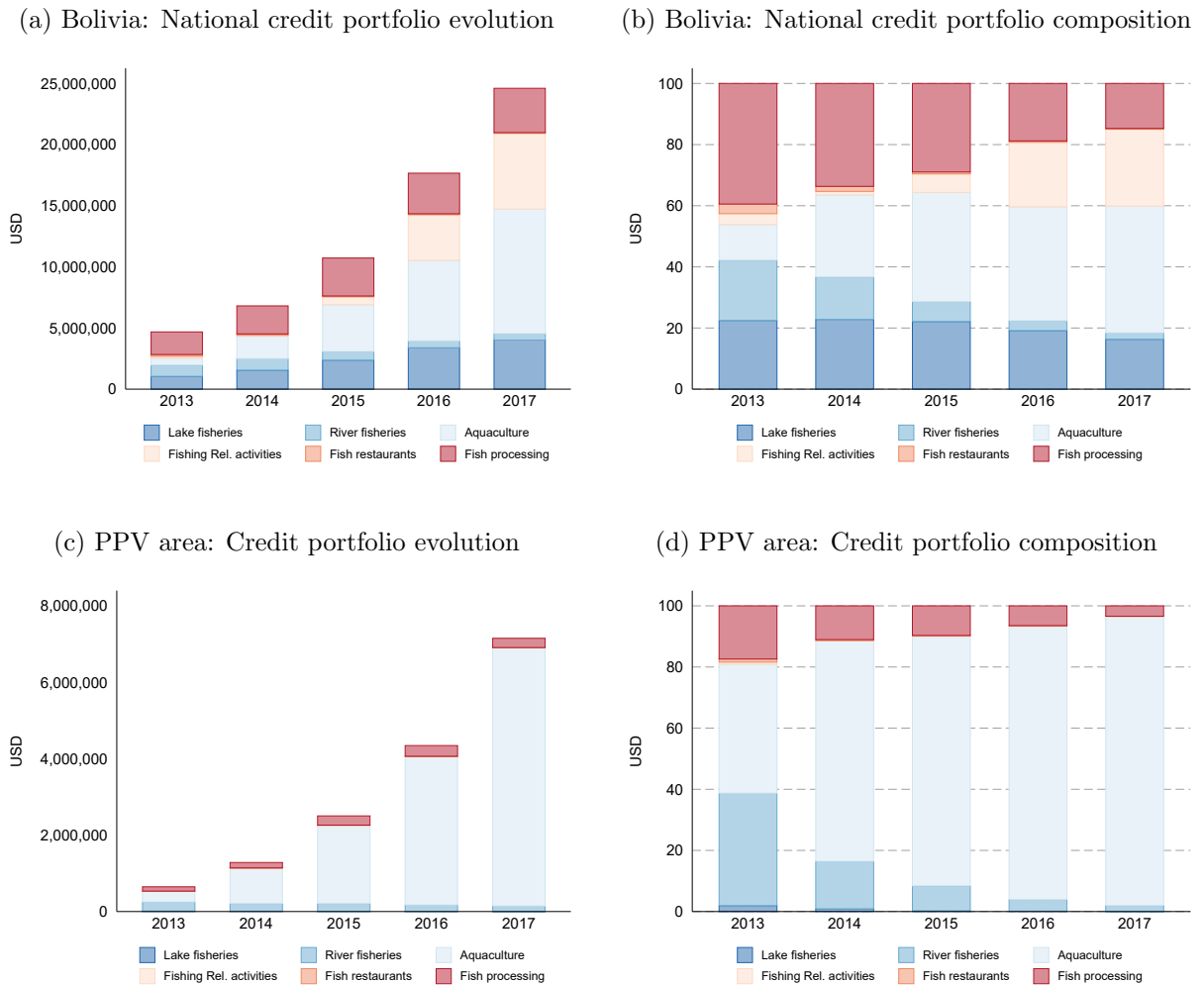
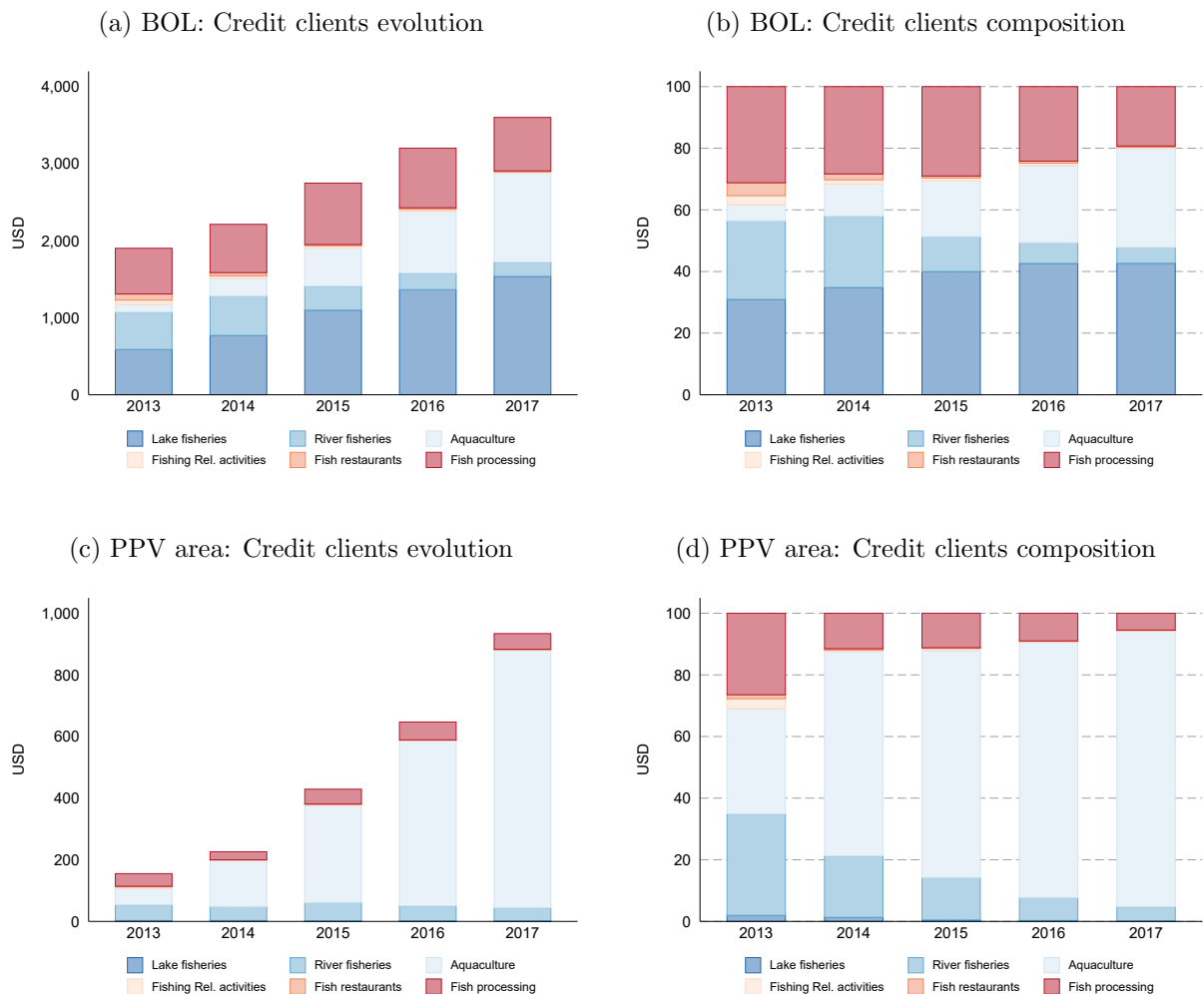


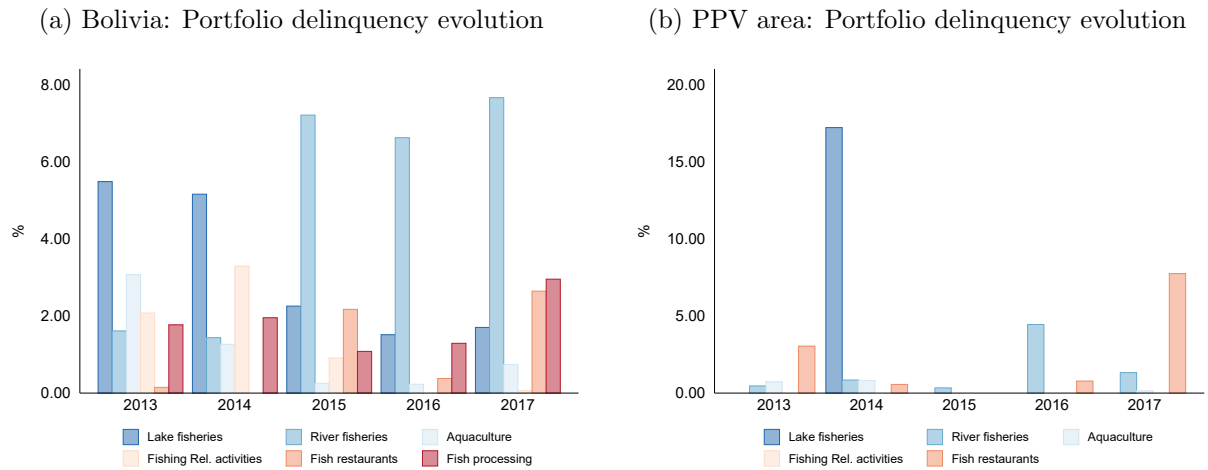
Figure 4.3a shows that the total credit portfolio in the activities funded by the project grew nearly five times since 2013, with aquaculture being the sector driving such growth, followed by other fishing related activities. In relative terms, aquaculture in 2017, occupied over 40% of this total portfolio (Fig. 4.3b). When narrowing the focus in the study area, aquaculture grew almost 4 times in the last five years, while the growth of the other sectors is almost negligible (Fig. 4.3c). Figure 4.5 shows the evolution of the number of people accessing credit for the activities included in the project focus:

Figure 4.5: Number of aquaculture and related activities in Bolivia and in the study area



In Bolivia, the number of people with credits for aquaculture and related activities in the formal financial system has grown from almost two thousand to nearly three thousand and five hundred in the past five years, and this growth has also been driven by the aquaculture sector. It is also noticeable that the number of people who obtained loans for river fisheries has been reduced in the last five years (Fig. 4.4a). In the study area, almost the entirety of credit clients in the six economic activities targeted by the project have decided to invest in aquaculture (Fig. 4.4d). This fast paced growth of credit portfolio and clients, was not translated in increased arrears as seen on figure 4.6:

Figure 4.6: Delinquency evolution of aquaculture and related activities in Bolivia and in the study area



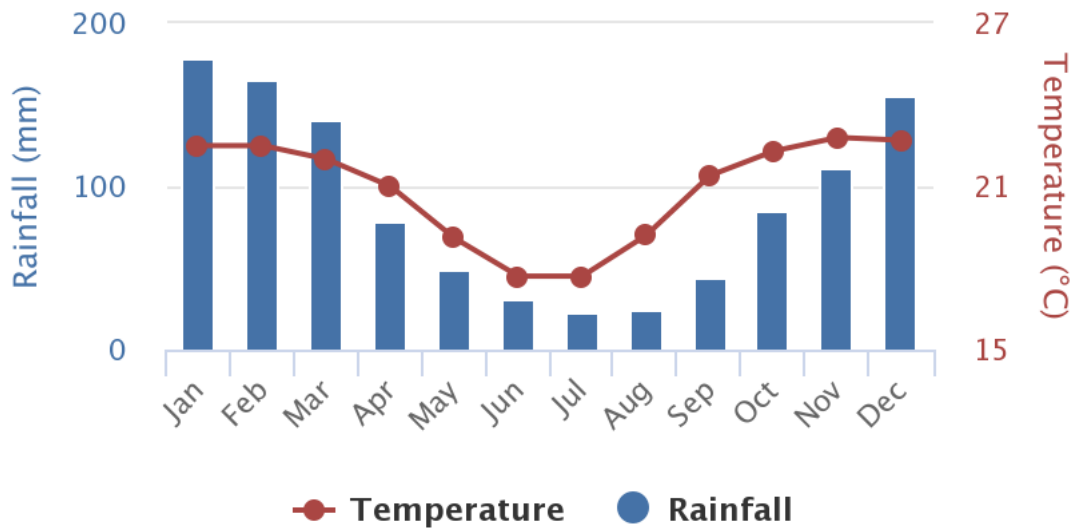
Considering CIDRE's institutional delinquency is 2.89%, arrears in aquaculture are below that level and that may be considered as a positive sign when assessing the sector's overall risk level, however, given the high level of diversification in income sources for clients in the PPV area, it is not possible to be certain about the origin of the resources used to make credit payments, as they may come from other activities or coca leaf.

4.4 Analysis of microlevel frame conditions

4.4.1 Environmental conditions

Figure 4.7 shows the yearly pattern for rain and temperature for Bolivia:

Figure 4.7: Bolivia: Average monthly temperature and rainfall (1901-2015. Source: World Bank)



This pattern is also exhibited in the influence area of PPV II, that is also prone to flooding during the high precipitation months. Ponds are usually dug during the winter time, in a period that coincides with the lowest amount of rain as well. The ponds are then prepared to be filled with rainwater during the month of September, so early harvesting may start around early April, which is one of the months with higher fish consumption since it coincides with the Good Friday catholic holiday. In Bolivia, the catholic population chooses not to eat red meat during this date, so there is a noticeable spike in the demand for fish, and fish farmers and fishers devote a lot of effort to seize this opportunity.

Another important issue regarding environmental conditions is the difference between quality of agricultural land in Yapacani and the Chapare region. Participants described Yapacani as a "low" land: Given it is prone to flooding, it is only suitable for the production of rice, so aquaculture was a more relevant livelihood option there. In the Chapare region, agriculture was more diverse, so participants would usually have other crops such as citric fruits, flowers and some tubers in addition to their aquaculture venture.

4.4.2 Institutional conditions

Perhaps the most relevant microlevel frame condition is the situation regarding coca leaf growth in the Chapare province in Cochabamba. Coca leaf has a strong cultural value among Bolivian western indigenous nations, as it is viewed as a divine gift to stave off hunger and fatigue, both mental and physical, and it was crucial for their survival when Spanish colonists would make them work silver mines in the most precarious conditions. Coca leaf is nowadays known as the main raw material for cocaine, and this has sparked a series of profound and historical changes in Bolivia for the past 30 years.

When asked about income from coca leaf, participants would become a bit uneasy and responded cryptically which led me to drop that line of questioning altogether. However, branch managers were able to provide me with those numbers and even acknowledged that they would incorporate this income source when assessing a potential client's credit worthiness. This analysis was done informally, in a spirit of supporting the case of a potential loan disbursement, as Bolivian regulation does not allow the provision of credit for coca production and it prohibits the use of coca income when calculating a client's payment ability. which had to be fully supported by activity that would ultimately benefit from the loan. Nevertheless, given coca's seasonality (there are 4 yearly harvests for the most productive producers) and the certainty of its sales (branch managers claim all production is sold, without exception in all harvests) it is impossible to ignore the effect it has on risk taking behavior and livelihood strategies

4.5 Microcredit and the individual livelihood level

4.5.1 Personal conversion factors

The commitment to repay a loan, regardless of its magnitude, is the most important factor a financial institution considers when making decisions regarding the approval or loan applications. In more developed economies with highly sophisticated credit bureaus

capable of tracking an individual's payment behavior over time, this factor is analyzed through credit scores which play a major role in a person's ability to obtain credit. In developing economies, such as Bolivia, this technology is not yet in place, and financial institutions must conduct their own assessment of a person's credit worthiness, which usually relies on a series of contacts with an applicant's business partners and community members.

Under the analytical framework of this study, the willingness to repay a debt becomes can be thought of as a personal conversion factor, a characteristic present in some individuals that will allow them preserve or enhance their ability to obtain credit in the future. Participants in the study provided several reasons for not incurring in delinquencies, ranging from preferring to avoid late payment fees, living up to values transmitted by a parent, or viewing the ability to pay on time as an evidence of good business management. LP, a 26 year old from Entre Rios spoke of this as follows:

Well, I believe you have to pay in the date you've been told to, we have honored that, a little sooner, we didn't wait for it [payment due date]...we've always...my dad taught us to pay on it's due date or better if it's much sooner, so we can be responsible people, so we don't have regrets because I've heard that when you miss the [payment] date, the rate is higher, it is like that, right? It's always going up and that is not okay, and one has to be ready to pay on its due date.

AA, a savvier business man managing a larger aquaculture operation, took pride in his ability to meet his payments without any problems:

...ever since I started working with banks I did not like falling behind with my payments, my first duty was to pay, earlier, maybe a week or four days. Now with this business I manage 4,000 BOB [570 USD] weekly, selling 200 Kg. [of fish] because fish production is good, it is profitable for those who can manage it, but for those who are doing this [aquaculture] for the first

time or are amateurs, it's not going to be enough [the money] because they're amateurs or they're not dedicated enough.

This positive attitude towards the repayment of a debt may be seen simply as an expression of other more complex conversion factors, such as the ability to plan for the future and respect such plan, and the recognition that credit in the future may be needed and hence it is in the producer's benefit to maintain his ability to access it. RO spoke about this in his interview, saying:

...and always to my capacity [to repay the loan], I've never entered delinquency, I've always paid on time, and my wife is always...two weeks before the due date she separates that money and doesn't let go of it, and then one is not concerned about it, because that may affect me, being concerned about that [being able to pay the installment], and for my sake and my family's sake, because I could become delinquent and that can be very difficult by what I hear, right? because other people cannot get a loan and they'll tell me *they don't want to give it to me, how did you get it?*[a loan] and I ask them *were you ever late on a payment?* and they'll reply that yes, maybe 3 or 4 days one time, and that becomes a precedent, and I tell them they can't do it like that.

While incurring in a single episode of 3 or 4 day delinquency is not a basis for the denial of credit, since delinquencies under 5 days, while reported to the credit bureau, do not harm a person's credit worthiness according to the regulation⁵, the previous quote shows how the willingness of a client is directly connected to his ability to make proper financial planning, to learn from the experiences of others, and his acknowledgment that his and his family's wellbeing becomes affected by the credit operation. This personal conversion factors play a determinant role in allowing microcredit to serve as an input for the creation of new capabilities

⁵If a person incurs in no more than two episodes of delinquency below 5 days in five years, is still considered a *CPOP* (*Cliente de pleno y oportuno pago*) client (a client who pays a full installment on time) and may be eligible to receive better credit conditions than others.

4.5.2 Choices and livelihood strategies

Given the environmental conditions at the microlevel, people living in PPV's influence area place a very high value on diversifying their income sources, and future plans of investment in more land or in scaling up one of the activities in their portfolio, are usually tied to investments in the rest of their activities as well. The usual role of microcredit in this setting is to enable the operation of an activity, allowing the producer to purchase production inputs. Nevertheless, microcredit may be used for investments in aquaculture: the cost of digging an additional pond or two, or the acquisition of a water pump, may be covered with a sub 5,000 USD loan.

MP, a 40 year old wife of a fisherman, presents an interesting case of positive spillovers from the credit in her livelihood diversification strategy. She obtained a 1,500 USD loan to purchase a larger fishing boat for her husband: she was able to purchase a larger engine and was able to pay for the inclusion of a roof on their new boat. This was considered an investment loan, and it was aimed at the improvement of the profitability of their fishing business, but after ending up with a more comfortable and faster boat, they started offering a tourism service compatible with their fishing activity: Her husband would fish on weekdays, and on the weekend he would offer boat rides for tourist. In her own words:

I wouldn't know about other people, but I really liked it [the microcredit] because I really needed it. And I did very well in this loan, like I was telling you, the engine we bought, the boat we had made, are being very useful. Because this is a touristic area, we host tourists from Cochabamba, Santa Cruz [nearby Bolivian departments], even from foreign countries, they ask for rides on our boat and we charge them 400, 500 BOB [57.5, 71.8 USD] for two days, and once that money comes in it helps me, my children, my husband, even for our installment payments, that comes every month, so I did very well in this credit and I liked it.

RG, a 55 year old female, used a 3,500 USD from her 5,000 USD loan to dig two additional ponds in her lot of land. She was scheduled to pay her loan in 4 years, but she

managed to repay her debt in 13 months. Her aggregate yearly profits before the loan were 8,711 USD, which included profits from her rice crops, farm animals, and one pond for aquaculture. While tripling her aquaculture production played a key role in how fast she was able to pay her debt, she placed a very high value in diversifying her sources of income and being able to allocate some of her production in self consumption:

We are also in agriculture, at least to eat...we are not buying rice anymore, we are buying animals, one is able to get what one wants and eats, right? We don't have that expenditure...I have chickens, cows, that's what I've got.

and she also observed positive spillovers from the digging of her additional ponds:

...To take care of what is good for one, and if there is no pond, we are not that careful anymore, right? When I dug my other 2 additional ponds, then I thought it was important to be there all the time. I took all my animals there, and while one is there, one takes care of the pond, of the animals, that are for one's personal benefit..

Increased attention to all the activities in their production portfolio was also observed in other candidates, and it also related to a deeper sense of responsibility, as in the case of LP:

Now that I have more responsibility, things are more serious, I have to pay attention to aquaculture, cattling, coca leaf production, besides, I have to make payments to the bank, it's a lot of causes for concern...and I also have the feed shop, I need to keep paying attention to that too...

MA, a 50 year old male from Entre Rios, also spoke about diversification for self consumption:

...always *yuca*⁶ in small quantities, I don't know if I got one [a loan] for *yuca*, sometimes it's 20 BOB [approx. 3 USD], 22 BOB for a *quintal*⁷, and this year

⁶A tuber similar to potato

⁷A traditional weight measure equivalent to 100 kg.

I sold it at 80 BOB but I didn't have much, I got 8,900 BOB [1,271 USD] for it...after that, coca leaf, rice is only for eating, I sow that only to eat it, and whenever you want you peel what you're going to eat. Those are the *hard selling* products, fish, rice, *yuca*, I sow corn only to feed my chickens, for consumption only, there are no more income sources.

Others have adopted a diversification strategy aimed at increasing the value of their fish farming production. MS taught his son this business strategy:

...because he is only dedicated to aquaculture, but now he's renting a place to use as a restaurant so he may sell his fish there, because one makes more money when selling cooked fish instead of raw fish, one can make twice as much [...] so that's what I've taught my son, not to sell it raw, to sell it cooked whenever possible, and he told me *looking at numbers dad, one makes good money* and that what it's about in the end, it's about making money...

In the Chapare areas, the most popular and nearly universal alternative source of income is coca leaf, which provides a comfortable financial cushion for producers, who turn to their coca leaf income whenever they are not able to make a payment with income from the activity in which they invested the loan they obtained. Even though the law prohibits financial institutions from counting coca leaf income towards a client's payment ability, I perceived that it was something always present in a loan officer or branch manager's mind when assessing somebody's credit worthiness, and participants were not shy about disclosing the past use of coca leaf income to meet their payments in time.

In some cases, the sense of financial security from coca leaf income, translated into a higher risk appetite for clients who felt confident with more investments, however, these additional investments lead to a more diversified portfolio of activities, as in the case of HZ:

...we're building a chicken farm, the roof is ready, the fences are ready, all that's missing are the water dispensers and the chickens, and we're just waiting for sanitation registry to be ready

When asked about why they decided to invest in a chicken farm, HZ replied that her cousins in Cochabamba only worked with chickens and that it was profitable according to them. I followed up with questions regarding her assets and she replied that her family had 2 small properties, each of them with a *cato*⁸ of coca leaf. While having the security of the equivalent of up to 4 monthly minimum wages may have influenced HZ's decision to invest in a chicken farm based on the recommendation of her cousins, it is worth pointing out that such investment was made with diversification in mind.

When participants were asked about the reasons for not specializing in one activity, they pointed out to lack of land as one of the main reasons for this. LP stated that:

That [specializing in one activity] depends on me having an adequate space for it, I'd have to think about the land and invest in a good lot, suitable for it [aquaculture]. You also need space for cattle, right? even a small bit [of land], but if I had a larger property, it would be good, right? So I could dig more ponds and invest in it, the larger your lot, yo can dig 5, 6 or 8 ponds and then have some [space] left for cattling

All of the former examples and points of view on diversification as the ultimate livelihood strategy in the study area, indicate that microcredit enables its users to manage a diversified portfolio of activities, to account for income seasonality, smooth household consumption and to meet their financial obligations in a timely fashion. Perhaps this quote from DV, the current president of APNI, summarizes the local overview about income and activity diversification:

I tell you this because we have nothing else to hang on to, a lot of my colleagues they...they don't have anything else besides fish [from aquaculture], they're *caught* in it, for instance DS, she is a nurse and she has her fish [from aquaculture] and she has nothing else, where else is going to get money from? there is no other source [of income], whereas I support myself a little bit better, right? I have my harvester, I have a tractor, I have my own *caterpillar*, I

⁸A *cato* of coca is a traditional measure of land extension, equivalent to 1,600 square meters.

make my own...I am a little bit more *fulfilled* [realized, perhaps?] than her, as a person.

The person she is referring to, DS, owns 12 ponds and pioneered the aquaculture movement in Yapacani and is also one of the founding members of APNI and its first president. DV did not say this in an arrogant manner nor was she being dismissive of DS's accomplishments (they are very close friends actually and hold each other in very high regard), but this statement makes clear that a sense of fulfillment in the study area is closely tied to being invulnerable to negative shocks, and that is achieved mainly through income diversification.

4.5.3 Achieving functionings from an expanded capability set: The role of microcredit in wealth creation and business profitability

From the perspective of economics, wealth is considered to be the assets an individual has accumulated, after all liabilities have been deducted, and some authors prefer to make explicit that the assets to be considered for the estimation of somebody's wealth must generate a stream of income in the future. As described in CIDRE's services strategy, a loan may be destined for investment or operation, and each type of loan may contribute to profitability and wealth creation in different ways.

In aquaculture, a loan directed towards an investment likely means the individual will dig more ponds, or he will acquire an asset of considerable value such as a water pump, or he will pave a road that connects his ponds to the main road. In the first two cases it is clear how a stream of income might be generated, and in the case of a road, the improved access to the ponds will increase the likelihood a potential buyer will acquire the individual's fish production.

The evidently direct role between microcredit and wealth creation is when the credit operation is destined towards an investment: If a client successfully repays his loan in one

of the aforementioned cases, his net worth will be increased at least in the amount of the original loan, since the investment or asset will remain with the client and the liability created by the debt will have disappeared from the client's balance sheet. MS, a 50 year old male, makes this very clear in one of his statements:

Maybe in the tools I have now, I will not buy them again, so there I have money, I have a motorcycle, I have to large water pumps that help me solve my problem with fish mortality, and now I have the possibility to start making my own feed...

This quote also touches upon another direct mechanism on how an aquaculture investment influences wealth creation: through improvements in aquaculture productivity. Aquaculture is an activity in which the physical space of a pond sets a limit on how much fish one is able to farm. Under these circumstances, the loss of fish occurs through:

1. predators such as small alligators or birds that feed from a pond,
2. Fish disease, and
3. Changes in pond conditions (water temperature, oxygen or PH levels)

Investments in certain assets, may reduce the probabilities of a catastrophic loss in production by allowing the aquaculturist to create optimal pond conditions for fish growth, thus allowing the producer to receive the income he expected at the beginning of the aquaculture campaign.

After investing in the operation or expansion of an aquaculture endeavor, the producer must be able to sell his fish in the market, and being visible to fish sellers is more difficult for some producers. Being able to opportunely access the fish market and sell a harvest, is tied to income certainty that is crucial for adequate financial planning for businesses at any scale, and more so at the subsistence or family level: if an expected stream of income does not occur or its timing is off by lapses of over 30 days, producers resort to the sale of assets or production from other activities:

But sometimes it's good to have them, right? the animals...like that time I wasn't able to sell my fish when I wanted to...then i had my cows and I sold them, and at the last minute, one day before my payment date somebody told me he wanted to buy my fish, so with that I could come up with the money, it's important to have cows, you can't sell the fish on time? then you have your cows, those are easy to sell anytime

This quote by RG summarizes the main problem stemming from restricted market access: a producer is forced to convert assets into cash to make his payments, destroying part of his wealth by doing so. This was the singular most important concern for RG, who later stated that if not for her lack of buyers when she needed them, "aquaculture is very profitable".

Ease of access to markets appears to play a heavy role in larger investment plans as well. AA was the only participant heavily invested in aquaculture and the only one seeking to become specialized in it, and his intentions were rooted in the type of contract he was able to secure from various buyers in the city of Cochabamba:

I have a weekly production of 200 kg, that is what I must provide for the restaurants I have under contract, I work with 5 restaurants in Cochabamba, so I make deliveries every Saturday morning no matter what.

Being under contract for such a high amount of fish, drove him to start planning for the purchase of an additional lot of land close to the Ichilo river, in which he would attempt to dig 10 ponds in addition to the 8 he already had functioning. However, this is an isolated case of a very successful fish farmer. LP spoke about other difficulties regarding market access for a small scale producer:

With a wholesale buyer it would be much better, because when your fish is ready to be sold, you get your profit all at once. Had we been more experienced...because in past years we sold to retail buyers, and we just sold a little bit, we gathered 200 kg and sold that, then you have a little bit of money

that you invest in feed...and you lose track of that money, but when you sell all your production at once, you know how much you've got. We've realized this, but people doesn't have a market that buys like this [in large quantities], there are people in the cities that buy like this, 500 kg, but people don't buy that amount here.

Wealth creation and conservation is not only tied to a producers ability to generate income, it relates to his ability to make proper financial plans which cannot be done with incomplete information, i.e. not knowing with a high degree of certainty when and how much income he will perceive, and it relates to his ability to avoid situation in which his existing wealth is destroyed, as was RG's case of having to sell cows in order to not fall behind in the payments of her credit.

After a producer is able to solve his problems related to market access and is able to sell his production in convenient terms, the plans he has in store for his income have to be constructed in a way that allows him to build his wealth steadily. This type of detailed planning was not present in any of the interviews. Participants were able to plan for future payments, future microloans, but I did not perceive a specific investment strategy, save for AA and MS, the most experienced businessmen, whose operations were already large at scale and required the type of long term planning that was absent from the rest of the microloan operations.

The ability to save was important among participants, but at different levels for each participant. Some of them save for emergencies and unexpected negative shocks, as MP explains:

Yes, it is important for me to save, because you know, here you cannot sow, this is a floodplain, so there are no other sources of income, so I say *I have to save this, because I might need it for something*, sometimes my children get sick, or I do, and you need savings for that.

MP has a small grocery store and restaurant in her front yard, and like other diversified

small producers, she makes several monthly or weekly small transactions, as she tells:

Thank God I did not have a big emergency recently, when I need money it's only 200, 300 BOB [approx. 30-40 USD], but I am able to come up with that, sometimes from my savings, or I spend from some other profit [restaurant, grocery store, tourism] and then I put everything back in its place, that's how I've always worked.

To build an amount of savings that covers for the operation of several businesses and other emergencies would take considerable discipline and management skills when keeping track of how much each business makes, spends and contributes to the savings fund, and while most participants operate in this fashion, it is not the easiest way to run a business. Additionally, not all of them have bank accounts or use them actively, making the transaction record a manual process that is rarely carried out, as most of it is done by memory.

RG spoke about the temptation of spending when having money readily available:

...and if I still have time, one can buy an animal, right? a cow maybe, because there money isn't wasted...because if we keep that money in our hands, temptations are always there, right? you can see something and buy it, but in time of need then you're broke...One always has to be careful because what's gone will not come back, right? because spending irresponsibly with no sense you won't have money when it comes to covering important expenses, you have to learn to save.

The duties of managing several transactions for several sources of income for various expenditures related to business and family make saving and planning difficult for small scale producers. They need to resort to buying animals as a mean to preserve their purchasing power, and fall into some sort of trap, that allows them to cover regular day to day expenses, but does not allow them to plan properly for future investments.

4.5.4 A productivity approach towards enhanced capabilities: Leasing and the case of the Asociacion de Productores Norte Integrado

A local producer's association based in Yapacani, APNI (*Asociacion de Productores Norte Integrado*), used the available credit services in PPV II in a different way and proposed a leasing operation to acquire the equipment necessary to produce their own feed. APNI representatives expressed concern about the quality of the feed available in the market at the time and had secured partial funding from an NGO (Oxfam) to buy some equipment to produce feed, and with this conditions, CIDRE agreed to proceed with the untraditional leasing operation, which led to the creation of ACUAPEZ, a limited liability company that would operate the plant, whose capital comes from contributions of 22 APNI members, who through this contribution become owners of ACUAPEZ.

While securing the funds to lease the equipment was possible without significant trouble, the purchasing of the equipment did pose significant challenges to APNI, which made technical mistakes that became costly down the road. To install the plant, APNI needed two critical and expensive pieces of equipment: an extruder and a dryer, and the simplest version of their technical difficulties lies in the output capacity of their equipment, as the extruder is able to process 500 kg/h of feed, and the dryer processes 60kg/h, severely limiting the entire factory's production capacity.

G, an aquaculturist member of APNI's board of directors gave me this recount of how this situation came to be:

It was actually a chia seed dryer, and the price difference was huge. The dryer we had asked for would cost 70,000 USD, more expensive than the extruder, and this dryer cost only 9,000 USD. Its manufacturer made a series of modifications, its heater was changed, its structure was modified and we ran some tests before buying it, right? We ran tests with some feed, we measured its humidity before going through the dryer and it was above 25%, and after

going through the dryer it was 10% which was great, that's why we decided to buy it...but we had run the test with only 50 kg of feed, but when we loaded it with 350 kg or 450 kg of feed, matching the capacity of the extruder, humidity only fell 4%

Limited access to funding was the reason ACUAPEZ decided to cut corners when deciding to make the purchase for the dryer, and this should not come as a surprise for the reader, since Bolivian banking regulation lists a minimum of 2 years of experience in the business to obtain credit for it, and given that ACUAPEZ was just starting as a company, its access to funds was limited to whatever it could obtain from its funding partners or other NGOs.

With constrained access to capital, ACUAPEZ had to settle for modifications on an existing piece of equipment. These modifications were made by a local *metalmecanico*, a craftsman who works with metallic equipment. C, the production manager at ACUAPEZ, had the following opinion on this matter:

Feed production is new around here, the only company that has a good dryer is Nutrifish, a private company that doesn't allow access to its plant, and all the other dryers are Bolivian made...they're national extruders made here or invented here by *metalmecanicos*, and they're machines that may be doing...there are things that are being done without measurement...look, for fish feed you use a lot of nutrients and the drying process may ruin them or brake it down [the protein content]...there are things that must be measured, if they did it with that dryer, that they said it worked in the beginning, but I believe they ignored temperature measurements.

C does not hold a degree in engineering or a related field, he learned about this sort of equipment by working closely with the previous industrial engineer in charge of the plant. The impossibility to obtain proper technical guidance or to seek the advice of local experts, coupled with ACUAPEZ's financial struggles, led to this situation of starting

production with severely diminished capacity.

Since ACUAPEZ's members were determined with continuing production, they tried to find alternatives to the dryer problem, and what they found to be the best solution was to run the feed through the drying cycle more than once, while the rest of the humid feed was being sundried. As G pointed out in his interview:

...when you put in the dryer 350 kg, 400 kg, it dries...the extruder outputs that with 20% humidity, and what we want is for the feed to have 6% to 8% humidity, maybe ever 12%, but the dryer outputs that [the 400 kg] with 13% to 14% humidity, and with a second cycle it gets closer to what we want...as I was telling you, the other day they [the plant staff] did 6 cycles...sometimes the extruder works and we lay it to the sun to dry, but that means we depend on weather conditions.

Typically, rain season in Yapacani starts in late November and ends by mid April, rendering this solution ineffective in the long run. Additionally, the production disparity between the extruder and the dryer forces ACUAPEZ to only let the extruder operate 2 days per week, so inefficiencies begin to accumulate in the entire production process.

Despite the turbulent start of the company, sales have been very good since starting in May 2017 according to DS:

It sells! we have people buying it in advance, for instance one of ACUAPEZ's members buys 100 bags every two weeks, and because of the price people try to buy 50 bags because then the price is 100 BOB [approx. 15 USD] and not 105 BOB...but sales are great, but the weather isn't helping this time, we don't have any product right now, yesterday people was fighting over the feed, I sent a video of this to the WhatsApp group, see? sales are fine, it's just about the weather now...

Selling production in advance also helps ACUAPEZ to deal with working capital requirements, and also according to DS, they are late on salary, utilities and input payments,

but she is confident they will be able to pay those debts without the need for additional credit and only with their profits.

The reason for people to be lining up for ACUAPEZ's feed and to be willing to essentially fund their operation with their own money, which is equivalent to buying its product in advance, is because ACUAPEZ's main focus is on feed quality. JC, a member of ACUAPEZ and APNI, spoke about her past problems related to feed quality when buying from other brands:

Now I'm in schedule to harvest in 8 months, like I always did in the past. I was really disappointed some time ago, after waiting a year and a half to harvest, and I told him [the salesman for the other feed brand], *look, I'm only working for you* [this is a way of saying she was working just so the salesman can make his profit]

JC claims she decided to make her own tests and saw for herself that ACUAPEZ's feed would allow her to harvest her fish more quickly. G's opinion on the evolution of the fish food market showed the motivation behind the decision of starting ACUAPEZ:

...and with the arrival of the Brazilians [two Brazilian experts brought by an NGO to train local fish farmers], one of them made us understand that water and feed quality have a lot to do with fish growth and with the longevity of the ponds...despite the decision [to create ACUAPEZ] was already made, it changed our perspective regarding the purchase of better equipment...but basically it was that at a certain point there is a shortage of feed and its quality...when this [aquaculture] began in 2008, 2009, the feed that was on the market was relatively inexpensive and had good quality, but as input prices began to rise, its quality began to fall, so most of the feed you find now are bad, that's what motivated us to start ACUAPEZ.

So, with feed quality, i.e. protein content and nutrient composition, being of utmost importance, ACUAPEZ began producing and C takes a lot of pride in working for ACUAPEZ because of their commitment to quality and not to profits:

...because looking at local feed companies, they do put everything [all nutrients and protein content] they are supposed to, but I fear they might forget to put everything in once they have the clients, whereas we have a detailed registry of what the outputs and inputs are for each ton of product, which helps us guarantee our product to the producer, and other companies only think about their profits, right? they do not have an interest in improving quality for the producers

While, this perception is not to be understood as a negative critique⁹, it is a claim that buyers from ACUAPEZ may be willing to pay in advance as the quality of the product they are receiving would be guaranteed to be one of the highest in the market. Paying in advance for the most expensive production input is a luxury that most producers would not be able to afford. As C points out, only a few ACUAPEZ members are able to obtain the feed:

...only members, imagine that only 3 or 4 people buy our product in large quantities, that covers out weekly production.

Why only 3 or 4 members? What about the others?

They buy every once in a while, or they call and we're out [of feed]. Those 3 members are the ones that pay in advance, they already know our product.

I imagine those 3 or 4 have a lot of ponds

Well, you know that there are producers who do not have the money at hand, and with all the sales being in cash and we don't have enough feed, when they have money they have to buy it elsewhere, what could they do? We've also had producers who came asking for a certain amount and we don't have it, and in those cases they don't want to come back again.

Despite the multiple issues affecting ACUAPEZ, APNI members have a positive outlook on this initiative. When asked about this situation, DV replied:

⁹C is only taking pride in the rigorous control quality of ACUAPEZ, and claims that process might be absent in other companies, but he is sure other comply with nutrient requirements. As I went over this translation several times, this is the closest I could get to the original quote, and I must stress that C did not mean to criticize others with a negative spirit.

...there's not enough feed even for all of us [APNI members]...they leave money in advance and they take it, when we go to the plant there's no feed, that upsets me a little bit...gee, [and I think] the product is good, let's hire more workers, let's buy a dryer, that's what we're fighting for, that way there's going to be more feed to sell and well...for everybody

DV acknowledges that production problems in ACUAPEZ and its inability to supply its feed to at least all of APNI's members is problematic, but her hopes of future success appear to outweigh present time struggles. The impressions of the rest of my interviewees regarding ACUAPEZ were also overall positive, but G's claim was the one that struck a chord regarding my analytical framework:

Maybe being a member of ACUAPEZ generates an additional income for me [through ACUAPEZ's profits], not now at least, in the future maybe, but as I was telling you, that is not my main interest...I'm interested in being a part of this company because I can have control on feed quality, that is my main interest.

The unprompted phrase G used, *sense of control* is what ultimately the capability approach regards as the goal of development. According to G's statement, despite the myriad of problems ACUAPEZ faces, ACUAPEZ and APNI members are better off with an intervention of this kind, in which their sense of control over a crucial component of their livelihood is enhanced. Any conclusion regarding this leasing operation would be premature, as the company is yet to make its first payment of the leasing agreement¹⁰ and other operational costs still represent a considerable strain on the finances of the company, but an intervention that allows its beneficiaries to control a critical productivity component of their livelihood, while also adding certainty to expected income, has the potential to affect institutional microlevel conditions, i.e. the local feed market, to benefit not only APNI members but all aquaculture producers by inducing other feed companies to increase the quality of their product to compete against ACUAPEZ.

¹⁰CIDRE benefited ACUAPEZ with a 12 month grace period since the disbursement on December 2016.

Summary

A set of findings was described for each component of the microcredit intervention in PPV II. For individual clients, it was found that they were not operating within a vulnerable region above the poverty line, in which they possess their land and with the aid of microcredit, they are able to operate a set of income generating activities to smooth their consumption throughout the year. These producers placed a high value on diversification, which increases the number of day-to-day transactions they must control, and takes focus away from a long term plan to increase their wealth and assets through the profits they obtain from their portfolio of activities.

The findings for the group leasing operation tell the story of an implementation plagued by issues that severely crippled the production ability of APNI's feed plant. The high quality product of their plant is only accessible for the handful of producers without cash constraints who are able to purchase the feed in advance, defeating the original purpose of the plant that was to provide members of APNI with a high quality feed, that increases their productivity and makes income streams from aquaculture more predictable. The implications of both these sets of findings will be discussed in the following section.

Chapter 5

Discussion

The main objective of my research was to understand how microcredit affects the capabilities of those who use it to start or operate an existing small scale aquaculture endeavor in the Bolivian amazon. I would seek this understanding through the lens of a combined livelihoods and capability approach, in an effort to obtain a broader perspective on the road and obstacles a development intervention must address to enhance the wellbeing of their target population.

The main idea behind the capability approach is that development is increased when the set of personal freedoms of an individual is enhanced, so a person has more options when making choices regarding her wellbeing. Under the combined livelihoods and capability approach, the set of capabilities a person is able to access is determined by the endowments of capitals -human, social, financial, physical and natural, she has, and are converted into capabilities through personal conversion factors. The first result of this process is a livelihood strategy, that if successful, will allow the person to obtain more functionings, the capabilities she actually chooses and exercises.

The participants of PPV II who became CIDRE's clients by obtaining a microcredit from this institution to start, operate or improve their aquaculture business that I was able to interview were satisfied with the service they received, and they all referred to microcredit as an important support for their business. However, this result must be

considered very carefully, as those who end up struggling with their credits, becoming delinquents and possibly having a negative overall experience, are very difficult to track down and thus their opinions are hard to capture. I believe this was not the case in my particular research, as no loan from my sample had to be written off or incurred in a deep arrear, and the attrition problem I experienced came due to reasons unrelated to negative experiences, and due to clients moving out of town, changing their address after paying ahead their loan fully, or in one particular case, a client entered prison and I was unable to set up a meeting with him.

The people I spoke to were typical microcredit clients in their respective areas: educated at least until the primary level, owners of their small rural property, and very concerned with having multiple sources of income, which led to a risk management strategy of carrying out different agricultural and non-farm activities to support themselves and their families. In this setting, what is microcredit actually enabling its users to achieve? what capabilities related to consumption smoothing and reducing income risk is microcredit fostering when destined towards aquaculture?

Let us consider microcredit as an increase in a person's financial capital, which is possible due to an increased interest from the local banking industry in investing in these types of loans, in conditions that locals can meet: they are unable to mortgage their land to obtain a regular loan with a government capped rate, and thus must resort to a microcredit at an interest rate that doubles the capped rate, using an unconventional collateral, i.e. they must leave documents (that prove they own their land and that they would need if they wanted to sell their lot) in the CIDRE's custody, or they must use their financial capital and ask another person to vouch for them with CIDRE.

Now, with a loan in his hands, a client must spend the credit the way CIDRE expects him to do it, and assuming the client is not in an emergency situation, perhaps the first personal conversion factor comes into play: the funds must be spent responsibly in its intended purpose. If this is the case, the client is able to work, a valuable capability for

participants in the study. Furthermore, the client is able to start a profitable aquaculture business, or to start a new campaign in it, improving the diversification of his activity portfolio and increasing his number of income sources. It is at this point in which I believe microcredit is moving out of its traditional scope of action: Microcredit was used as an economic development tool to move people out of poverty ([44]). This assumes that its user are poor and that it is possible for them to engage in an activity profitable enough to let them cross a poverty line, but I believe my findings show aspects that are beyond this linear process towards development.

Participants in this study were more concerned with diversifying their income sources to account for the seasonality of their agricultural activities and to mitigate climate and theft risks, hence most of them used microcredit more as an operation fund, as opposed to an initial investment. This use of microcredit is pointing out to a preference to consolidate a portfolio of activities, and even if one activity is more profitable than the rest, there is more effort directed towards becoming less vulnerable to negative shocks than it is to maximize income (maybe by investing heavily in the most profitable activity) and making a leap to distance themselves more from poverty. Evidently, participants will only take credit for profitable activities, but their wellbeing was not tied to income alone in a single point in time, my findings point that it was tied to a *way* of having more income, and that is more income from more sources is preferable to more income from a single source.

Another aspect of this diversification scheme is control over the multiple activities. Participants prefer to employ labor in harvest seasons only, and not have a year round staff, and specialization in a single activity would eventually force the use of employees beyond the family. Having a set of activities in a relatively small plot of land requires only the participation of family members, in their spare time in the case of school aged children, to run successfully.

However, this preference to make progress slowly but steadily comes at a cost. Be-

yond the high relative cost of microcredit, plans always seemed to be made for shorter periods of time, from one season or year to the next, from one microloan to the next, and long term plans such as the construction of a house, seemed to be postponed indefinitely. Savings were destined for emergencies or small assets such as motorcycles or animals, if they were not diluted in daily transactions¹. Aquaculture has the potential to become an activity that enables this form of "big chunk" savings: income from it is yearly, and if the producer is able to find a buyer and sell the entirety of his production in one occasion, and has no other cost to cover other than the microcredit, it would be possible for him to start a savings fund towards a purpose other than emergencies. Unfortunately, I did not see this for of planning in any of the participants, nor did CIDRE encourage this practice.

Judging from my findings, microcredit does provide its users the ability to work, diversify their sources of income and to keep their activities operating normally, so it is a proper fit for a diversification scheme as the majority of participants reported, and the benefits of using it seem to outweigh the costs it causes. However, the lack of an explicit connection towards a long term investment plan makes me question its validity as a development tool that can provide people with more choices and significant freedom that would allow its users to influence their micro or macro level conditions in order to increase their endowment of capitals. To observe a significant change in capital endowments would require more time and a study based on panel-like observations, and careful, detailed recordings of multiple microcredit operations and business transactions. Setting poverty reduction goals in PPV like interventions may be possible and reaching those goals may be even feasible, but identifying the effect of microcredit would be a very difficult task and if the intervention does not lay a long term credit plan, it is not certain that a significant development result will be achieved. My findings lead me to believe that microcredit leaves its users in a sort of poverty trap: they will turn to microloans because they need capital to operate or make small investments, and the savings generated by the the businesses supported by a microloan do not appear to be large enough to secure larger, less expensive loans in the future, and the fact that small properties cannot

¹This issue was explored in more depth in [14].

be used as a collateral may also be considered a constraint to access credit in better terms.

PPV II also had a group leasing component, in which a group of fish farmers formed a company to produce their own fingerling feed. This transaction may be viewed as an increase in financial capital immediately translated in physical capital at a community level. This financial service was essentially an experiment, Bolivian MFIs do not offer leasing services because of regulatory requirements, and CIDRE had to involve a third NGO to proceed with the operation. Given that in Bolivia it is legally impossible to provide credit for a business in its initial stages, such as the case of ACUAPEZ, this experiment may be considered groundbreaking.

From the beginning, critical flaws in the allocation of very limited financial resources resulted in a severely hindered production capacity, as a huge bottleneck was created when the output of one of two important pieces of equipment was 9 times larger than what the other important equipment could process. This reduced production led to feed being accessible to only the least cash constrained producers, those who are able to make payments in advance, defeating the purpose of the initiative to provide high quality feed initially to all members of a local producer's association, and afterwards to the rest of fish farmers in the region.

While the individual microcredit component appears to be the least likely to allow its beneficiaries to increase its capability set and to achieve functionings that would help them improve their frame conditions to gain access to larger capital endowments, the leasing initiative may provide a more direct avenue towards enhanced functionings and capabilities. Taking this experiment at face value, it provides a technical solution to an existing problem: high quality feed in the market became scarce as more companies started to produce and offer feed to fish farmers, competing with only price in mind. Then, ACUAPEZ utilizes a different strategy by focusing on quality and not price, and users of its feed would observe better results in their production by enjoying shorter and predictable harvest times, which translated in a steady income stream from aquaculture.

Nevertheless, I believe the potential of the leasing component has more to offer within the context of the livelihoods and capabilities approach: it is a more straightforward path towards a positive change in microlevel institutional conditions, in which the aquaculturist is not under the control of the local feed market. By becoming an actor in the supply side of the feed market, ACUAPEZ has the potential to induce a competition on the basis of quality among feed producers, which could benefit fish farmers beyond the owners of ACUAPEZ of the members of APNI.

The path towards better microlevel frame conditions with the individual microcredit component starts with the injection of additional financial capital and depends on the alignment and success of the many choices made by the producer to result in an improvement of context conditions, the leasing component simplifies this path: it grants the individual a choice he did not have before, he may choose the quality level of the feed he will use for his fish. If he then decides to follow through with his decision and uses this high quality feed, he should see an improvement in his productivity and benefit individually, while also helping ACUAPEZ generate its own profits, and if ACUAPEZ becomes successful enough, it could cause other feed suppliers to follow its lead, benefiting the entire aquaculture community. In summary, the microcredit component gives the producer more choices to make, which will not always lead to improved functionings, the leasing component only provides control over a small number of additional variables but if successful, an improvement in context conditions could be feasible

The broader microfinance evaluation literature is based on findings obtained through randomized control trials, and focuses on the impact of microcredit on outcomes such as income, consumption or savings. After two decades of evaluation literature, there is still no clear consensus on the effects of microcredit. In the latest and most comprehensive review I was able to study (Banerjee 2013), no definitive effect was measured or identified, and most results point to no effect in consumption and no long run increases in profits. Most effects seem to be tied to the moment of disbursement, as some increase in assets

of hours worked is present in the months close to that milestone.

The literature related to the effects of microcredit on capabilities is limited. [10], [43] and [18] are perhaps the most comprehensive and exhaustive approaches to this matter². In these studies, the effects of microcredit are explored in a broad set of capabilities, ranging from education to more complex outcomes such as empowerment or choice and control, in the context of three microfinance programs in Australia, unfortunately none of them comparable to the microcredit component of PPV II, as the programs of the other studies had a distinct focus (on women for example) or comprised savings circles. The main findings of those studies point to that the social interactions and knowledge sharing played a role as a variety of participants' capabilities were enhanced, and that the provision of additional services such as savings are also relevant to the expansion of capabilities.

The majority of microcredit programs seem to follow some of all of the aspects of the original Grameen bank model: a very small amount of money is loaned to a group of very poor borrowers, with some variations in certain occasions when a focus on female clients is introduced. The microcredit component in PPV does not follow this model, as loan sizes are relatively large, clients are usually not poor in the most strict sense of the word, and there are no group dynamics, however, PPV clients face constraints when trying to access capital, and live in highly vulnerable conditions, despite the safety net that seem to provide.

I believe my main contribution will not bring any more clarity to effects of microcredit on the wellbeing of its users, and will only cast further doubts. The differences in the setting of my study relative to the programs that have been evaluated in the literature, are too large to ignore and still lead me to believe that I conducted a study in a very particular context, but that still holds a fundamental connection to the others, as financial capital is still flowing towards those who are in dire need of it. While individual microcredit certainly enables its users to work, and gives them a chance at running a profitable

²[30] presents a more succinct quantitative approach.

business, does not entirely meet their expectations regarding what is more important for them: diversification. Small scale aquaculturists, while feeling supported with a loan for one of the activities in their portfolio, require a suite of financial services, like insurance, savings and long term planning to be able to make a difference in their context and have access to all five capitals ins better terms. The leasing component in PPV II showed great potential and enjoys massive support from the members of ACUAPEZ and APNI, but its initial difficulties have posed a threat to its survival, and have made a struggle of the entire endeavor. However, as far as I can tell, this seemingly flawed initiative, gives its beneficiaries a better chance at expanding their capabilities.

Chapter 6

Conclusions

This study used a qualitative methods guided by the combined livelihoods and capabilities approach by [28], to investigate the effects of microcredit on its users capabilities and livelihoods, who lived in the Bolivian Amazon and had a small scale aquaculture or fisheries activity that was the main target of the credit. I conducted twenty-four semi-structured interviews with microcredit users and local branch managers of CIDRE, a Bolivian microfinance institution. This microcredit initiative was part of the *Peces Para la Vida II* project, a food security intervention funded by the International Development and Research Fund, an institution that is part of the Canadian Government.

The research showed that individual microcredit, despite being contractually tied to an activity, in this case aquaculture, fisheries or a related field, usually fits into an activity portfolio created by the producer with income diversification in mind. This risk management strategy was employed to manage the risks inherent to agricultural activities and to account for income seasonality and allow the producer to smooth his consumption throughout the year. In this setting, microcredit supports the operation of this portfolio of activities, and in some cases, small investments may be made and microcredit facilitates the expansion of the portfolio by allowing the producer to start a new activity. My findings suggest that microcredit stabilizes a person's financial situation, not necessarily improving it. However, it is my interpretation of the producer's view is that the achievement of this stability with a diversified portfolio seems to be the microloan's *rai-*

son d'être, with improvements on the financial situation being secondary to diversification.

Regarding microcredit's ability to induce wealth creation and savings, the findings suggest that while it allows for the existence of future profits, they tend to become diluted in daily transactions and are hardly saved, accumulated and translated into wealth. Under favorable circumstances regarding access to fish markets, aquaculture has the potential to become an activity that could allow producers to save more effectively: If a producer would be able to sell the yearly fish production on a single occasion to a single buyer, it would become easier for him to plan the future production cycle and he would be able to save a large amount of his profits, or he would be able to invest those profits and become less reliant on microcredit, thus saving on interest payments. However, the opportunity of selling a year's worth of production is rare, and fish farmers are more likely to sell smaller amounts of fish on repeated occasion, and then use those cash flows towards supporting their other activities, day to day transactions or emergencies. Not many producers have or use bank accounts, and the fact that transactions in all of rural Bolivia are done almost exclusively in cash, forces them to maintain cash in their homes, does not make savings matters easier for them.

Individual fish farmers certainly keep microcredit in mind when planning production cycles and deciding which activities to pursue with business intentions and which to keep at a self-consumption scale. Overall financial activity has been growing in the region of the study and fish farmers know they are able to access credit and the participants I was able to interview certainly worked hard to maintain positive payment records to facilitate access to future loans. Producers know that they can use microcredit to invest in a new activity if the cost of starting it could be covered with a loan that would not require an asset as a collateral, and aquaculture certainly falls into this category of low-cost start up activity. The microcredit clients I was able to interview usually maintained a responsible approach towards the use of debt, and were aware of the limitations of their businesses and their ability to generate cash to make timely payments, and would use it mainly to cover operational expenses, so the amount of credit they may access more easily, usually

sets a limit to the scale of their activity portfolio operation, and would prevent them from extending the scale of their activities beyond their means, or the number of activities they could maintain in a given year.

The findings of the study point to the fact that individual microcredit supports its users' abilities to work in a diversified portfolio of income generating activities, which builds a sense of security and of reduced vulnerability that is preferred to the security a single very profitable activity may confer. This preference for diversification leads to a situation in which wealth is accumulated more slowly, as managing the transactions of a portfolio of several activities and debts makes saving more difficult. Given the current Bolivian legislation in which small rural properties may not be used as a collateral in credit operation, saving a large amount of money to invest in a property that may be mortgaged seems to not be feasible for most producers, and without it, their access to larger amounts of financial capital will remain the same as it currently is. This means that while producers using microcredit may continue to work their land, generate income and live above a poverty line and support a family, I do not see a clear path towards improved access to financial or any other form of capital, i.e. microcredit would not be contributing towards the creation of functionings that derive in better context conditions or capital endowments.

Regarding the group leasing operation and its ability to influence in the members of APNI and their capabilities, the findings point towards a positive effect of the operation on overall member capabilities and functionings. APNI members claimed they enjoyed an improved sense of control over the quality of their feed, which translated on an overall sense of control over their aquaculture business: a higher quality feed allowed them to be certain about the production cycle, and thus about their income from aquaculture. However, the fact that the plant is currently able to supply feed to producers with the largest cash flows, who are able to purchase feed in advance, severely limits the benefits for the majority of APNI members. However, if a time comes when the feed plant is able to supply a large number of producers with a high quality feed fairly priced, benefits on

local feed market conditions could be on the horizon, as other feed producers could be induced to focus on quality instead of price, and thus benefiting the entire aquaculture community. Nevertheless, there is no evidence that this chain of benefits would occur, as the ACUAPEZ plant is only operating seven months, so the benefits I envision are only a possibility and not a certainty, but the leasing solution at least provides a path towards improved local market conditions accompanied with a better sense of control over production for aquaculturist, whereas the individual microcredit solution as implemented in PPV II, does not.

The findings shed light on an aspect of microcredit that has not been extensively researched, as is diversification. In the past, diversification was found to be a result of microcredit, but I argue that in the setting of the study, it is its purpose. A study of microcredit that does not make an explicit link with livelihood strategies would probably reveal an incomplete picture, and the connection that occurs between strategies, capabilities and frame conditions was useful to determine the extent of the effects of individual microcredit, which failed to make an effect in frame conditions, or the group leasing operation, which has the potential to influence frame conditions. Considering the broader implications of development interventions should aid in future designs of development programs and should allow researchers to extract more sensible lessons learned. The inclusion of the poor into market dynamics to allow them to escape poverty and become self-reliant or less dependent on Government of foreign aid, will probably dominate development practices for years to come, but there is danger in creating gray areas such as the one this study identified: PPV II's microcredit users are not poor and they may generate income with the aid of microcredit, but they see themselves as vulnerable and choose to focus on diversification without a long term plan, which could be detrimental if they aspire to access credit in better terms. If the poor are not assisted in the navigation of these gray areas so they can ultimately exit them and become less vulnerable and self-reliant, then market solutions to poverty are, in my opinion, incomplete.

Appendix A

Additional Information

A.1 Interview questionnaires

A.1.1 Individual producer interview

Interview N° _____

Aquaculture Producing Farmer and Individual Loan Client

Consent: Interviewer signs to confirm the receipt of consent from participant

Survey Location

Village

Province

District

Interviewer: _____

Date: _____

Time: _____

1. Tell me how you went about making the decision to apply for a loan

- Was there a discussion? If yes, with who?
- how did your family respond to the *decision to apply for a loan*?
- How did you hear about CIDRE?
- Did you consider other lenders? Why or why not?
- Why a loan for aquaculture?
- How did you receive the money?
- How do you make your payments? Does a loan officer visit you?

2. What does having a loan mean to you?

- Personally
- For your family
- For your community (Do they want to get a loan too? Do you interact more with them (Buy from them/share with them/employ them/help them)? Has your “community” expanded?)
- Did you make any big efforts/sacrifices/tradeoffs to get the loan/make payments?

3. Tell me about your relationship with CIDRE

- Positive moments
- Negative moments
- What do you like about it?
- What don't you like about it?
- Would you stay with them in the future?

4. Tell me about the opportunities you have now that you have a loan, as opposed to the opportunities you had before the loan

- What type of choices/opportunities do you have now?
- What type of choices/opportunities did you not have before?
- For your family

5. Tell me about any changes in your financial situation after getting the loan

- Do you work more hours?
- Does your family work more hours?
- Do you make more money in aquaculture?

- What contributed to making aquaculture more/less profitable?
 - Have you acquired more loans after getting the loan from CIDRE?
6. **How do you go about managing your money?**
- Who controls the money?
 - Do you have a monthly/weekly budget?
 - Who makes the budget?
 - How has the budget changed after getting the loan?
 - Do you feel more in control of your financial planning?
7. **Do you save regularly?**
- How important is saving for you?
 - For your family
 - Did you save more before the loan?
 - Do you have a savings account?
 - Do you participate in a savings group?
 - What do you save for? Durable goods or non-durables? Parties?
 - Are your savings growing now that you must repay a loan?
8. **Do you engage in livelihood activities other than aquaculture?**
- Why a loan for aquaculture and not a loan for any of your other activities?
 - Do you still work on them after the loan?
 - What role did the loan play in deciding to stop working/work less on them?
 - How has your wellbeing been affected by not having to work on/work less on the other activities?
 - How about your family's wellbeing?
9. **What difference does the loan make in conducting your business?**
- In terms of planning?
 - In terms of time and effort?
 - For your family?
-
10. **What were your main concerns/sources of stress before getting the loan?**
- Regarding your family (health, education, nutrition, future)
 - Regarding your business (steady suppliers, steady markets, terms of trade with suppliers/buyers, having to work on activities you didn't like?)
 - Financial insecurity/uncertainty
11. **What are your main concerns now that you have a loan?**

- Losing the collateral (deteriorating the relationship with the co-signer)
- Neglecting other livelihood activities
- Not being able to make a payment
- Increased children engagement in work activities instead of education?
- Having to work harder than usual
- Strains on your health or your family's
- Neglecting family/leisure time

12. Describe the ways you coped with difficult financial times before getting the loan

- Who do you turn to in times of financial need?
- How would you have liked to get financial assistance?
- What financial services did you lack?

13. Who would you turn for financial assistance now that you have a loan? Would you consider CIDRE as a source of financial assistance?

14. How did getting a loan affect your outlook on life?

- Outlook before
- Outlook now
- What specific part of the loan changes the outlook?
- What caused the change?

15. Do you feel more or less in control of your life now that you have a loan?

- Financially
- What changed from not having a loan?
- About life in general
- What would help you feel more in control of your life?
- What caused the change?

16. Do you feel you can achieve more in your life after getting the loan?

- Personally
- For your family

17. How has the loan affected your overall wellbeing? Would you like to add something we have not discussed?

A.1.2 Leasing participant interview

Interview N° _____

Group Leasing Participant

Consent: Interviewer signs to confirm the receipt of consent from participant

Survey Location

Village

District

Province

Interviewer: _____

Date: _____

Time: _____

- 1. Tell me how you made the decision to participate in the leasing operation (LO)**
 - Was there a discussion? If yes, with who?
 - how did your family respond to the *decision to apply for a loan*?
 - How did you hear about CIDRE and the initiative?
 - Why lease that particular equipment and buy it directly?

- 2. What does participating in the LO mean to you?**
 - Personally
 - For your family
 - For your community (Do they want to participate too? Do you interact more with them (Buy from them/share with them/employ them/help them)? Has your “community” expanded?)
 - Did you make any big efforts/sacrifices/tradeoffs to make payments?

- 3. Tell me about your relationship with CIDRE**
 - Positive moments
 - Negative moments
 - What do you like about it?
 - What don't you like about it?
 - Would you stay with them in the future in operations such as this one? For an individual loan?

- 4. Tell me about the opportunities you have now that you are a part of the LO, as opposed to the opportunities you had before the LO.**
 - What type of choices/opportunities do you have now?
 - What type of choices/opportunities did you not have before?
 - For your family

- 5. Tell me about any changes in your financial situation after participating in the LO**
 - Do you work more hours?
 - Does your family work more hours?
 - Do you make more money in aquaculture?
 - What contributed to making aquaculture more/less profitable?
 - Have you acquired other loans after participating in the LO?

- 6. How do you go about managing your money?**
 - Who controls the money?
 - Do you have a monthly/weekly budget?
 - Who makes the budget?
 - How has the budget changed after getting the loan?
 - Do you feel more in control of your financial planning?

7. Do you save regularly?

- How important is saving for you?
- For your family
- Did you save more before participating in the LO?
- Do you have a savings account?
- Do you participate in a savings group?
- What do you save for? Durable goods or non-durables? Parties?

8. Do you engage in livelihood activities other than aquaculture?

- Why participate in the LO for aquaculture and not invest in any of your other activities?
- Do you still work on them while participating in the LO?
- What role did the loan play in deciding to stop working/work less on them?
- How has your wellbeing been affected by not having to work on/work less on the other activities?
- How about your family's wellbeing?

9. What difference does the LO make in conducting your business?

- In terms of planning?
 - In terms of time and effort?
 - For your family?
-

10. What were your main concerns/sources of stress before participating in the LO?

- Regarding your family (health, education, nutrition, future)
- Regarding your business (steady suppliers, steady markets, terms of trade with suppliers/buyers, having to work on activities you didn't like?)
- Financial insecurity/uncertainty

11. What are your main concerns now that you participate in the LO?

- Neglecting other livelihood activities
- Not being able to make a payment
- Increased children engagement in work activities instead of education?
- Having to work harder than usual
- Strains on your health or your family's
- Neglecting family/leisure time

12. Describe the ways you coped with difficult financial times before participating in the LO

- Who do you turn to in times of financial need?
- How would you have liked to get financial assistance?
- What financial services did you lack?

13. Who would you turn for FINANCIAL assistance now that you have a loan? Would you consider CIDRE as a source of financial assistance?

14. How did participating in the LO affect your outlook on life?

- Outlook before
- Outlook now
- What specific part of the loan change the outlook?
- What caused the change?

15. Do you feel more or less in control of your life now that you are a part of the leasing operation?

- Financially
- What changed from not participating in the LO?
- About life in general
- What would help you feel more in control of your life?
- What caused the change?

16. Do you feel you can achieve more in your life after the LO?

- Personally
- For your family

17. How has the LO affected your overall wellbeing? Would you like to add something we have not discussed?

A.1.3 Branch manager interview

Interview N° _____

Key Informant Interview (Bank Managers)

Consent: Interviewer signs to confirm the receipt of consent from participant

Survey Location

Village

District

Province

Interviewer: _____

Date: _____

Time: _____

1. What does having a loan mean to the clients?

- Personally
- For their family
- For their community (Do they want to get a loan too? Do the clients interact more with them (Buy from them/share with them/employ them/help them)? Have their “community” expanded?)
- Do they make any big efforts/sacrifices/tradeoffs to get the loan/make payments?

2. How do their families go about deciding to apply for a loan?

- Do they have a discussion?
- Is the decision process difficult?
- Has your relationship with the client changed after getting the loan? How?

3. Tell me about the client’s relationship with CIDRE.

- Positive moments
- Negative moments
- What do they like about it?
- What don’t they like about it?
- What do you think makes clients stay with CIDRE?
- What do you think makes them look for an alternative bank/MFI?

4. How does a client’s financial situation change after getting the loan?

- do they work more hours?
- do their family work more hours?
- do they start making more money? How soon after getting the loan?
- do they acquire more loans after getting their first loan from CIDRE?

5. What changes occur in a client’s budget?

- Stress on budget
- Are clients used to making a budget?
- How should their budget change after getting the loan?
- Should clients feel more in control of their financial planning once they have gotten the loan?

6. Do you know if clients save regularly?

- How important is saving for them?
- For their family
- Did they save more before the loan?
- Do they have savings accounts? MAKE IT LESS PERSONAL

- Do they participate in a savings group?
- What do they save for? Durable goods or non-durables? Parties?

7. **Do they engage in livelihood activities other than aquaculture?**

- Why a loan for aquaculture and not a loan for any of your other activities?
- Do they still work on them after the loan?
- How has your wellbeing been affected by not having to work on/work less on the other activities?
- How about their family's wellbeing?

8. **What difference does the loan make in the management of their business?**

- In terms of planning?
 - In terms of time and effort?
 - For their family?
-

9. **What are their main concerns/sources of stress before getting the loan?**

- Regarding their family (health, education, nutrition, future)
- Regarding their business (steady suppliers, steady markets, terms of trade with suppliers/buyers, having to work on activities they don't like?)
- Financial insecurity/uncertainty

10. **What are their main concerns now that they have a loan?**

- Losing the collateral (deteriorating the relationship with the co-signer)
- Neglecting other livelihood activities
- Not being able to make a payment
- Increased children engagement in work activities instead of education?
- Having to work harder than usual
- Strains on their health or their family's
- Neglecting family/leisure time

11. **What are the ways they cope with difficult financial times before getting the loan?**

- Where did they get assistance?
- How would they have liked to get help?
- What services did they lack?

12. **Would a client turn to CIDRE for financial assistance now?**

- How can CIDRE assist them?
 - Is this a common practice for CIDRE?
-

13. How does getting a loan affect a client's outlook on life?

- Outlook before
- Outlook now
- What specific part of the loan should change the outlook?
- What should cause the change?

14. How has the loan affected their overall wellbeing? Would you like to add something we have not discussed?

A.2 Coding structure and summary statistics

A.2.1 Summary for leasing operation data

Number of codings for each code.

abilityToAccessACUFeed	7	abilityToCreateSavings	8
abilityToGenerateIncome	7	ACUAbilityToRetainClients	2
ACUaccessToFinancialResources	31	ACUHumanResourceIssues	15
aquacultureProductivity	4	communityRelations	19
contextBolivianTechnology	18	contextFeedMarketConditions	6
contextWeatherConditions	12	dryer	20
feedPricingACU	6	feedPricingOthers	4
feedQualityACU	18	feedQualityOthers	12
futurePlans	7	lackOfFinancialPlanning	1
livelihoodDiversification	5	marketAccessForACUFeed	4
marketAccessToSellFish	5	NGOSupport	17
physicalSafety	4	positiveOutlook	5
producerAccessToFinancialResources	3	producerCreditForOperationCapital	1
producerTransportationConstraints	1	productionPotential	3
productionWeaknesses	9	savings	2
senseOfControl	15	wellBeing	11

Average number of characters associated with each code.

abilityToAccessACUFeed	157.7143	abilityToCreateSavings	372.8750
abilityToGenerateIncome	376.8571	ACUAbilityToRetainClients	126.5000
ACUaccessToFinancialResources	434.2581	ACUHumanResourceIssues	459.4000
aquacultureProductivity	290.5000	communityRelations	340.4737
contextBolivianTechnology	362.1667	contextFeedMarketConditions	264.6667
contextWeatherConditions	269.9167	dryer	254.4000
feedPricingACU	112.3333	feedPricingOthers	54.2500
feedQualityACU	237.3333	feedQualityOthers	198.7500
futurePlans	285.7143	lackOfFinancialPlanning	344.0000
livelihoodDiversification	350.4000	marketAccessForACUFeed	209.5000
marketAccessToSellFish	343.0000	NGOSupport	617.1176
physicalSafety	113.2500	positiveOutlook	151.6000
producerAccessToFinancialResources	91.0000	producerCreditForOperationCapital	90.0000
producerTransportationConstraints		productionPotential	

241.0000	272.6667
productionWeaknesses	savings
304.1111	162.0000
senseOfControl	wellBeing
193.2667	227.7273

Number of files associated with each code.

abilityToAccessACUFeed	4	abilityToCreateSavings	2
abilityToGenerateIncome	3	ACUabilityToRetainClients	2
ACUaccessToFinancialResources	5	ACUHumanResourceIssues	3
aquacultureProductivity	2	communityRelations	4
contextBolivianTechnology	3	contextFeedMarketConditions	4
contextWeatherConditions	4	dryer	5
feedPricingACU	2	feedPricingOthers	3
feedQualityACU	5	feedQualityOthers	5
futurePlans	2	lackOfFinancialPlanning	1
livelihoodDiversification	2	marketAccessForACUFeed	2
marketAccessToSellFish	3	NGOSupport	5
physicalSafety	1	positiveOutlook	3
producerAccessToFinancialResources	2	producerCreditForOperationCapital	1
producerTransportationConstraints	1	productionPotential	3
productionWeaknesses	4	savings	1
senseOfControl	5	wellBeing	3

A.2.2 Summary for individual client data

Number of codings for each code.

abilityToCreateWealth	2	abilityToGenerateIncome	12
abilityToSave	21	abilityToWork	3
accessToPhysicalCapital	1	aquacultureCosts	2
aquacultureEaseOfWork	2	aquacultureFeedIssues	1
aquacultureGrowthAsSector	5	aquacultureProductionLoss	9
aquacultureProductivity	20	aquacultureProfitability	12
aquacultureSalesInSyncWithProduction	7	aquacultureScale	5
aquacultureSelfConsumption	5	aquacultureTrainingOrExperience	20
assetSaleToCoverCreditCosts	6	businessSupervisionIssues	7
cocaLeaf	13	collateralAsCreditConstraint	3
collateralLoss	1	communityRelations	20
concernedWithMoneyIssues	5	constraintLandForAquaculture	4
contextLandConditions	2	contextWeatherConditions	17
creditAsAwayToProgress	3	creditAsBurden	3
creditAsNecessaryEvil	2	creditAsResponsibility	9
creditAsSupport	21	creditDrainingProfits	2
creditForAquacultureInvestment	16	creditForAquacultureOperation	15
creditHistory	19	creditLimit	5
creditPositiveChangesInduced	5	creditPositiveExperience	14
creditPositiveSpillovers	3	creditProperPaymentsSchedule	4
creditSuccess	3	creditTooBureaucratic	3
familyCatastrophicEvent	9	familyMoneyManagement	3
familyParticipationInAquaculture	1	familyWellbeing	8
feedQuality	2	femaleMoneyManagement	4
financialPlanning	22	fishPrice	9
furtherCredits	14	futurePlans	18
governmentSubsidyInAquaculture	1	growingAquacultureBusiness	6
incomeStability	3	interestRateHigh	14
interestRateProper	5	investmentAsSaving	7
leavePlace	1	livelihoodDiversification	57
marketAccessToSellFish	12	moreTimeSpentOnAquaculture	4

needForFinancialCapital	1	noSavingsAccountInBank	3
ownWellbeing	14	physicalSafety	6
positiveAttitudeTowardsPayment	18	positiveRelationshipCIDRE	1
quittingAquacultureOrFisheries	5	reinvestmentOfAquacultureProfits	2
roadAccess	7	savingsAccountInBank	5
savingsForEmergencies	2	savingsForFutureInvestments	5
savingsGrowth	1	selfConsumptionOtherActivities	2
senseOfControl	6	workDivision	3

Average number of characters associated with each code.

abilityToCreateWealth	340.50000	abilityToGenerateIncome	482.08333
abilityToSave	276.14286	abilityToWork	112.66667
accessToPhysicalCapital	88.00000	aquacultureCosts	61.50000
aquacultureEaseOfWork	374.00000	aquacultureFeedIssues	187.00000
aquacultureGrowthAsSector	118.60000	aquacultureProductionLoss	317.22222
aquacultureProductivity	285.85000	aquacultureProfitability	249.75000
aquacultureSalesInSyncWithProduction	151.85714	aquacultureScale	335.00000
aquacultureSelfConsumption	115.20000	aquacultureTrainingOrExperience	488.55000
assetSaleToCoverCreditCosts	214.66667	businessSupervisionIssues	220.28571
cocaLeaf	112.69231	collateralAsCreditConstraint	139.66667
collateralLoss	380.00000	communityRelations	247.05000
concernedWithMoneyIssues	320.80000	constraintLandForAquaculture	236.50000
contextLandConditions	139.00000	contextWeatherConditions	241.29412
creditAsAWayToProgress	536.00000	creditAsBurden	115.66667
creditAsNecessaryEvil	104.50000	creditAsResponsibility	661.44444
creditAsSupport	380.57143	creditDrainingProfits	148.50000
creditForAquacultureInvestment	340.62500	creditForAquacultureOperation	226.46667
creditHistory	264.94737	creditLimit	281.40000
creditPositiveChangesInduced	468.20000	creditPositiveExperience	368.42857
creditPositiveSpillovers	276.33333	creditProperPaymentsSchedule	416.25000
creditSuccess	62.00000	creditTooBureaucratic	208.33333
familyCatastrophicEvent	485.11111	familyMoneyManagement	77.66667
familyParticipationInAquaculture		familyWellbeing	

133.00000	247.12500
feedQuality	femaleMoneyManagement
453.00000	21.00000
financialPlanning	fishPrice
430.09091	80.00000
furtherCredits	futurePlans
228.57143	396.16667
governmentSubsidyInAquaculture	growingAquacultureBusiness
405.00000	216.83333
incomeStability	interestRateHigh
360.33333	190.71429
interestRateProper	investmentAssaving
207.60000	189.85714
leavePlace	livelihoodDiversification
320.00000	300.56140
marketAccessToSellFish	moreTimeSpentOnAquaculture
552.00000	193.75000
needForFinancialCapital	noSavingsAccountInBank
148.00000	75.66667
ownWellbeing	physicalSafety
278.92857	321.00000
positiveAttitudeTowardsPayment	positiveRelationshipCIDRE
178.55556	92.00000
quittingAquacultureOrFisheries	reinvestmentOfAquacultureProfits
355.40000	505.50000
roadAccess	savingsAccountInBank
156.00000	40.20000
savingsForEmergencies	savingsForFutureInvestments
102.50000	270.60000
savingsGrowth	selfConsumptionOtherActivities
20.00000	103.50000
senseOfControl	workDivision
350.83333	247.33333

Number of files associated with each code.

abilityToCreatewealth	abilityToGenerateIncome
2	6
abilityToSave	abilityToWork
6	3
accessToPhysicalCapital	aquacultureCosts
1	2
aquacultureEaseOfWork	aquacultureFeedIssues
2	1
aquacultureGrowthAsSector	aquacultureProductionLoss
4	7
aquacultureProductivity	aquacultureProfitability
9	9
aquacultureSalesInSyncWithProduction	aquacultureScale
2	3
aquacultureSelfConsumption	aquacultureTrainingOrExperience
4	8
assetSaleToCoverCreditCosts	businessSupervisionIssues
6	5
cocaLeaf	collateralAsCreditConstraint
7	1
collateralLoss	communityRelations
1	7
concernedWithMoneyIssues	constraintLandForAquaculture
3	3
contextLandConditions	contextweatherConditions
2	8
creditAsAwayToProgress	creditAsBurden
2	2


creditAsNecessaryEvil	1	creditAsResponsibility	5
creditAsSupport	2	creditDrainingProfits	5
creditForAquacultureInvestment	9	creditForAquacultureOperation	2
creditHistory	8	creditLimit	8
creditPositiveChangesInduced	12	creditPositiveExperience	3
creditPositiveSpillovers	2	creditProperPaymentSchedule	4
creditSuccess	3	creditTooBureaucratic	2
familyCatastrophicEvent	3	familyMoneyManagement	2
familyParticipationInAquaculture	3	familywellbeing	3
feedQuality	1	femaleMoneyManagement	6
financialPlanning	2	fishPrice	3
furtherCredits	8	futurePlans	7
governmentSubsidyInAquaculture	9	growingAquacultureBusiness	11
incomeStability	1	interestRateHigh	4
interestRateProper	2	investmentAsSaving	6
leavePlace	3	livelihoodDiversification	3
marketAccessToSellFish	1	moreTimeSpentOnAquaculture	13
needForFinancialCapital	7	noSavingsAccountInBank	4
ownWellbeing	1	physicalSafety	3
positiveAttitudeTowardsPayment	6	positiveRelationshipCIDRE	3
quittingAquacultureOrFisheries	11	reinvestmentOfAquacultureProfits	1
roadAccess	3	savingsAccountInBank	2
savingsForEmergencies	3	savingsForFutureInvestments	5
savingsGrowth	2	selfConsumptionOtherActivities	3
senseOfControl	1	workDivision	2
	4		2

A.3 Certificate of ethics approval



Office of Research Services | Human Research Ethics Board
 Administrative Services Building Rm B202 PO Box 1700 STN CSC Victoria BC V8W 2Y2 Canada
 T 250-472-4545 | F 250-721-8960 | uvic.ca/research | ethics@uvic.ca

Certificate of Approval

PRINCIPAL INVESTIGATOR: Ahmed Guillermo Eid Valdiviezo	ETHICS PROTOCOL NUMBER: 17-375 Minimal Risk Review - Delegated
UVic STATUS: Master's Student	ORIGINAL APPROVAL DATE: 07-Nov-17
UVic DEPARTMENT: GEOG	APPROVED ON: 07-Nov-17
SUPERVISOR: Dr. Mark Flaherty	APPROVAL EXPIRY DATE: 06-Nov-18
<p>PROJECT TITLE: Investigating the Effects of Microfinancial Services on Capabilites and Livelihoods of Small-scale Bolivian Fishermen and Aquaculturists</p> <p>RESEARCH TEAM MEMBER Co-principal Investigator: Mark Flaherty</p> <p>DEFINED PROJECT FUNDING: International Development Research Centre (IDRC) and Global Affairs Canada (GAC)</p>	
CONDITIONS OF APPROVAL	
<p>This Certificate of Approval is valid for the above term provided there is no change in the protocol.</p> <p>Modifications To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.</p> <p>Renewals Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.</p> <p>Project Closures When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.</p>	
Certification	
<p>This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.</p> <p style="text-align: center;"> _____ Dr. Rachael Scarth Associate Vice-President Research Operations</p>	

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Certificate Issued On: 07-Nov-17

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