A SUSTAINABLE LIVELIHOOD RESOURCE EVALUATION OF COMMUNITIES THAT PARTICIPATED IN A LIVESTOCK DEVELOPMENT PROJECT A DECADE AGO

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

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and hereby certify that, in their opinion, it is worthy of acceptance.

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LIST OF ABBREVIATIONS

DFID	Department for International Development
HPI	Heifer Project International
LC	livelihood capital
NGO	non-governmental organization
ODI	Overseas Development Institute
SLF	sustainable livelihood framework
SL	sustainable livelihood
EF	environmental factors
EEF	enabling environmental factors
DEF	disabling environmental factors

ABSTRACT

Livestock projects are a popular type of development activity to provide resources that farmers can use to positively change their livelihoods. Recently NGOs have been moving towards more holistic approaches of monitoring and evaluating their development projects. While this is creating a more complete picture of immediate impacts in the community, there are short-term constraints due to the time frame in which the monitoring and evaluation occurs. This research used the sustainable livelihoods framework's livelihood capitals to determine what the long term impact of a livestock development project was on several areas in the Altiplano Highlands of southern Peru. The Heifer Project International's Alpaca Biodiversity Project was active from 2004-2007. Through a simple categorical analysis, the results determined that the area with the most enabling environmental factors saw the greatest Long-run benefits. The livestock project's livelihood capital resources contributed to the area were able to have a moderate to strong positive impact and be maintained because of the existing environmental factors. In the other area's the project's livelihood capital resources had adverse impacts according to the farmers interviewed. Overall, the area in which the project exists needs to have environmental factors that provide for the primary needs of the community, thus allowing for the farmers to fully utilize their available livelihood capital resources and new livelihood capital resources introduced by the project.

Chapter 1. Introduction

Global agricultural development is moving away from economic and production driven goals to more holistic, community centered planning for improving the livelihoods of vulnerable communities. The two main focuses of agricultural development work are crops and livestock improvement projects. While both are tied closely together, livestock development projects offer more benefit to farmers in the short and long run. These benefits can be draft power, manure, women's empowerment, and fiber, and with the ability to multiply, the source of benefits can continue to grow. There are thousands of livestock development projects around the world, funded both by government and non-government organizations working diligently in communities to provide diverse ways to alleviate poverty. A livestock development project is any project that brings animals to a system then adapts or changes the current farming system to create opportunities for the family or community to alleviate poverty. This can include amending value chains, creating producer groups, education and skills trainings, women's empowerment groups, micro-credit schemes, and new technologies.

International livestock projects began in the 1940s, where NGOs like Heifer International coupled with USAID flew cattle to places like Puerto Rico and Costa Rica. At the time these animals were not adapted to tropical climates, diseases, or fodder and many of them died within a few years. However, there were benefits for the receiving families in terms of having extra animals, more milk and other things. Usually a calf or kid was given to another family in the community. These projects paved the way for using livestock as a tool for development.

The paradigm that existed for international development policy makers, governments, and NGOs during the 1940s-1960s was that economic growth from increased production was the way to alleviate poverty. This "west is best" ideal of economic growth found its way to livestock

development projects. There was no focus on what livestock meant culturally and religiously in rural farming communities, nor if the families had the necessary resources to care for more animals. Time burdens for women increased, who typically care for small livestock, and competition between food for the family and food for the animals was taking place. It was only in the 1980s that first world leaders started to realize that using livestock as a tool for development had other implications and consequences for the family and community involved. Today, most livestock projects, NGOs or governments are trying to consider all aspects of their involvement in the communities they work with.

Livestock development projects not only provide livestock but capital building tools for the community in the form of education, access to information, development of credit systems, market systems, and much more. Livestock itself plays a greater role in many aspects of life such as draft power, women's empowerment, access to liquid assets, income and consumption smoothing, cultural and religious uses, strong social networks through organizations, and increased food security. Livestock's ability to encompass different livelihood strategies has made it a tool for NGOs and government organizations alike to implement it in developing communities to begin to lift them out of poverty.

Livestock development projects are typically short lived with the presence of the NGO being five years or less. The vulnerable communities that are involved in the project often lack access to basic resources that would provide education, technology, and the ability to acquire new farm inputs. During the implementation portion of the project there were various education workshops, trainings, women's' empowerment classes, work on building animal or animal product associations, and sometimes even micro credit schemes. The jolt of new resources can build dependency on the NGO for solving all problems the community perceives exist. When the

project is over and the trainings and education workshops stop, the community must find a way to balance the new repertoire of resources. In the long run we do not know how the community used the resources provided and how the livestock project affected the community's resource profile and livelihood strategies.

This research project examines what resources the community continues using 10 years or more after a livestock development project finished and how the community adapted the resources provided by the project and how the project and community fare. I aim to show how the project's resources either strengthened, weakened, or did not change the sustainable livelihood resources in the community. The project I examine in this study focused on restoring natural colors of Alpacas and was located in the Puno Region of Peru. The NGO Heifer Project International (HPI) conducted trainings and education workshops and provided colored male Alpaca sires between 2005 and 2008. HPI added a women's empowerment project to coincide with the Alpaca project because they were not having the success they hoped without women participating. My project examines the long-term effects of the Heifer International livestock intervention on the communities

Every livestock project has their own unique goals for the community they are working in, which yields different combinations of capitals or livelihood resources that the project has available to the community. My research will provide information for future projects to have better collaboration with communities, to address the complex environmental factors that exist. I expect the interaction of resources and capitals determines the success and community adoption and longevity of the project as a whole. This relationship will give a window into why these specific projects have flourished and what we need to look for in the future as we continue towards more sustainable, inter-disciplinary methods of livestock projects for risk alleviation.

An important contribution of this project is a conceptual framework that examines the relationship between the livelihood resources available in a livestock intervention and the livelihood resources available in the community the project is working in. I argue that there are pre-existing combinations of livelihood resources that, in conjunction with livestock project resources, make a livestock project successful in the long run. In support of this claim I conducted an exploratory case study on a livestock project in the Altiplano Highlands of Peru to determine the long term impact of the livestock project on the livelihood resources in different communities.

Chapter 2. Literature Review

Since the post-colonial era the global North has deeply involved itself in the development of the third world. Policy, trade, and World Bank/IMF loans have strongly shaped how development projects are implemented. Gross Domestic Product was a universally accepted and minimally contested measure of a country's economic development, at least from the standards of the Western world. This was followed by the Human Development Index, which took into account education, gender equality, and health (foreignpolicy.com). Before NGOs entered the game, the success of development projects was typically measured on a national level by using indices, not at a community level. "Livestock development projects tended not to be targeted at poverty alleviation, but rather at the other national priorities such as production levels, export, promotion, or control of specific diseases" (Wanyoke, 2013). The problem with indices is they do not account for unequal income distribution, shadow economy and are used for macro-level analysis. These indices assume development is homogenous throughout a country They also neglect to show if poverty alleviation and development was occurring at the community level due to government based development initiatives because it focused on economic growth. When the World Bank redefined development as "Participation in the world market" (Theories of Development, p. 12-14, 2015)) development became a global privatized project, no longer a public nationally based initiative. There was a transition from public state agencies funding and doing development to private NGOs funded by donors and some governmental funding. This occurred because of structural adjustment policies and the removal of funding for extension services. NGOs took the reins away from the development state of third world countries in the 1980s as governments began to focus more on international trade and exporting raw product rather than investing in the development of their own nation because of pressure from the

Bretton Woods Institutes for loan prepayment. During this time NGO leaders were also included in World Bank networks. (Theories of Development, p. 241, 2017, Development and Social Change, p. 149-150, 2015). The shift changed the way we measure development by moving the focus of success from economic growth in the region or country to growth within communities. With new measurements and a new focus on community centered development, new methods of impact assessment were created.

The academic development literature produced during the 1990s was in response to the power shift between government and state agencies to NGOs. The power shift occurred within the realms of societal role of development organizations, public image, and the ability to garner huge amounts of funding (Haque, 2002). In the wake of NGOs gaining a significant hand in development, reliable and valid ways to measure impact were needed to show donors what their money was doing (ODI, 1996). The methods that NGOs were adopting to measure impacts were focusing on what the immediate results were rather than long term change (Chapmen and Mancini, 2008). In 1996, the Overseas Development Institute explained that NGOs have two main pillars they use to do assessments. First, was the initial goal of the project met, and if the goal was for the community to have access to clean water, do they now have access to clean water? Second, were the lives of the project participants enhanced? This second criteria depended on the values of the NGO, "The criteria chosen were typically based on the characteristics which NGOs highlight as important to their approach to development" (ODI, 1996, pg. 1).

One of the problems with short term impact assessments from NGOs is that they are only selecting a few criteria to measure based on their own values. The evaluation results using these criteria tend to be very narrow because the assessment shows the project succeeded in meeting

their immediate goals (ODI, 1996). While the project opened the door for more holistic approaches to evaluation, the assessments tended to be limited. The question still not answered is, what happens after the project is over in the long run, ten or more years after completion? There is limited knowledge and minimal literature about what development project communities look like in the long run since most NGO evaluations focus on the immediate, five years or less, impact of the project.

Fast forward ten years to the mid-2000s, we find the MDG are in full swing, The Sustainable Livelihoods Framework is a viable, working model of development, NGOs are focusing more on capacity building and less on economic growth within the community, and impact assessments are geared heavily in qualitative methods with supplementary quantitative methods. While NGOs are using more holistic development approaches, many still are not conducting long-term project assessments.

In 1993 USAID and the International Bank for Reconstruction and Development held an informal meeting to discuss the global state of livestock development projects. The take-away lessons were that future livestock projects needed to include the farmers through local producer associations, to take into consideration the needs of the people the project is supposed to serve, address gender concerns, consider different parts of the production process and different input needs in each region, recognize that sustainable resource use comes from working with farmers directly, and focus on the income generation from livestock production (Blackburn & de Hann, 1992). Livestock has been shown to alleviate poverty, increase women empowerment, increase income, increase food and nutritional security in a household, promote biodiversity in an ecosystem, and strengthen community networks. NGOs and governments used this knowledge to create livestock development projects. The positive outcomes that are reported in livestock

development projects come from the projects being assessed within five years of completion and focus on increased income generation as measurement of poverty alleviation. Although the performance of livestock projects has greatly increased in recent years, the evaluations of the organizations doing these projects still shows significant weakness in monitoring and evaluations, especially in regards to the impact of the benefits and results are used in project management and field application (Ibrahim et al., 2014).

The Overseas Development Institute conducted research into *Developing Methodologies for Livelihood Impact Assessments* in 2000 written by Ashely and Hussein. They describe how the sustainable livelihood method can be used for the analysis of natural resource conservation projects across Africa and also how the SLF method can be used to evaluate projects that did not use livelihoods frameworks in the project. They found that the Sustainable Livelihoods Methodology can be adapted to evaluate NGO resources as well as communities, but the people doing the evaluations and analysis need to be taught how to adapt to sustainable livelihood thinking. It also takes interdisciplinary work, strong local partnerships, the ability to adapt on the fly, and strong analytical skills. The positive outcomes they discovered are that, "At a fundamental level: putting livelihoods as the focus, and enhancing livelihood impacts as a central aim in making recommendations (Sustainable Livelihoods as an 'Approach'); In the detail of analysis: exploring livelihood priorities of local people and how they are affected by the projects" (ODI, 2000, pg. 52). However, the research was done only two years after the projects, so long term effects are unknown. Ashley and Hussein state, "A third concern is that projects may produce impact over both the short and the long term. It is extremely difficult to make reliable projections of future impact and a danger may be that we attribute value to possible

future impacts that never occur. More work needs to be done to understand how long is required before livelihood impacts can really be assessed" (ODI, 2000 pg. 54-55).

There are a limited number of long term impact assessments of NGO development projects, especially for livestock development projects. This is problematic because it means most NGOs have no long run record of what is happening with livestock development projects in communities they are working in. What is available is multi-case studies on NGO development projects and country or region wide studies with little focus on individual projects. The problem is that these case studies happened less than 10 years after the project ended and do not cover long term effects.

The development projects that are currently evaluated as the most successful involve community participation in the design and implementation of the project. One type of community participation project design is using the sustainable livelihoods approach. This approach was first pulled together by Dr. Robert Chambers and Dr. Gordon Conway in the late 1980s (Kollmair, 2002). Since then it has been adapted and utilized many times to provide a toolbox for community analysis and evaluation. There are many organizations that are using the Sustainable Livelihood Framework for project evaluations. However, no one is using it to create a ranking system to see if the impact was positive, negative, indifferent or other. My conceptual framework does just that.

In conclusion, the gap in the literature is a lack of long term evaluations for livestock development projects, especially evaluations using the Sustainable Livelihoods Framework. My research fills this gaps by creating a categorical impact evaluation based on the livelihood resources in the Sustainable Livelihoods Framework, which is geared specifically towards long term resource availability in the community.

Chapter 3. Conceptual Framework

I use the Sustainable Livelihoods Framework (SLF) to evaluate the long-term effectiveness of a livestock development project. The SLF allows for a simple categorical analysis of the change in available sustainable livelihood capitals, during and after a livestock development project. The idea is that the change of the community's available resources over time shows how the NGO project attributed to the community. The motivation for the analysis framework comes from the lack of long-term impact assessments of development projects, especially ones rooted in holistic approaches that consider multiple livelihood capitals or resources. I believe that understanding the long-term impacts of NGO livestock development projects is critical to informing how we continue to do development. It will also be useful for stakeholders in development projects to further understand where their resources make the most impact over a long period of time. The information from long term assessments takes our thought process from the macro-level to the micro-level, per individual community. Valdivia et al. (2010, p. 821) says it this way, "Scientific knowledge focuses on relationships and phenomena that do not vary across time and space, whereas local knowledge is very context specific. Scientific knowledge is reductionist and looks at relationships among individual variables, whereas local knowledge is holistic and focuses on cases rather than on variables. Because the knowledge systems of agricultural practitioners and scientists have different foci, teaching farmers (rural vulnerable farmers) scientific principles will not lead to technological change. If agricultural research is to contribute to the well-being of agricultural producers and their communities, bridges must be created between these two knowledge systems. These bridges assure that scientific research is conducted in priority areas for producers and ensure that research results can be used to improve their livelihoods."

There are five livelihood resources in the SLF: Human Capital, Social Capital, Natural Resource Capital, Financial Capital, and Physical Capital. These resource capitals are interconnected. The linkages between capitals offer a view of cause and effect, and determine what resources are available for a family to utilize. Of the five capitals I use four in my conceptual framework. Natural resource capital is better suited to be part of enabling or disabling environment, and the project goals were not to change the natural resources of the areas.

I chose the Sustainable Rural Livelihoods Framework by Ian Scoones (1998) because it provides a means to evaluate many resource building activities in a community. As previously mentioned, livestock development projects are moving towards a more holistic approach. It makes sense to look at the long-term effects using a framework that encompasses different, people-centered, dynamic approaches that provides linkages between the macro and micro world (Kollmair, 2002). "The ability to pursue different livelihood strategies is dependent on the basic material and social, tangible and intangible assets that people have in their possession. Drawing on an economic metaphor, such livelihood resources may be seen as the 'capital' base from which different productive streams are derived from which livelihoods are constructed" (Scoones, 1998, p. 7). Using Chamber's and Conway's definition, a sustainable livelihood resource is "A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with an recover from stress and shock, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term" (IDS Discussion Paper, 1991, p. 296). One way to understand this it to think of a sustainable livelihood capital category as a lake, where the streams feeding in and out of the lake are components that add to or

subtract from the lake. Examples by Chamber and Conway of what I think of as streams, are stores, resources, claims and access required for a means of living.

With this metaphor in mind, I specifically look at what the project contributed to the community's resource "lakes, streams, and branches" and how much of that contribution was still present 10 years later. This viewpoint allows for categorical analysis of the data so I can categorize the quotes from participants into activities that affect components. The average of the activities and components make up the livelihood resource category.

I assume that the only cause of change to livelihood capitals is the NGO project or the community. I make this assumption to focus the framework on the direct effects of the project on the available livelihood capitals in the community. While I acknowledge there are other things that determine whether a livelihood capital (LC) resource is improved upon, adversely changed or has no change, for this research I am not looking for external causes.

I expected there would be little to no retention of the ideas and livelihood activities brought by the project in the communities because I focus on Alpaca farmers in Peru, I note that they live in such a vulnerable context that anything the project provides would most likely be used as a coping strategy for immediate needs. I expect the project will have strongly improved the human capital and social capital resources because of the nature of the design of the implementation. HPI focuses on participatory processes in their livestock projects which mean working with farmers to meet them in their local context. There were trainings given, Alpaca associations created, and women's groups formed, and if there is enough incentive these organizations should still be functioning (with the exception of more trainings). I do not expect financial capital to be greatly improved because of the vulnerability of the community, and excess income will be used for immediate needs, as well as using Alpacas for income smoothing.

Physical capital, in terms of more Alpaca, should increase. Natural Resource Capital could be perceived as enhancing native species of the Altiplano, for example, by bringing back the natural colors of Alpaca. An increase in the diversity of native Alpacas to the highlands could be a change in natural resource capital.

An example of components and activities of a livelihood capital category is depicted in Fig 1. For each resource, I examine the average of the activities in order to make a judgment of whether the component was strongly, moderately, or weakly impacted in a positive or negative way by the presence of the project. Thus, the average of the components will show if the entire livelihood resource category was effected.

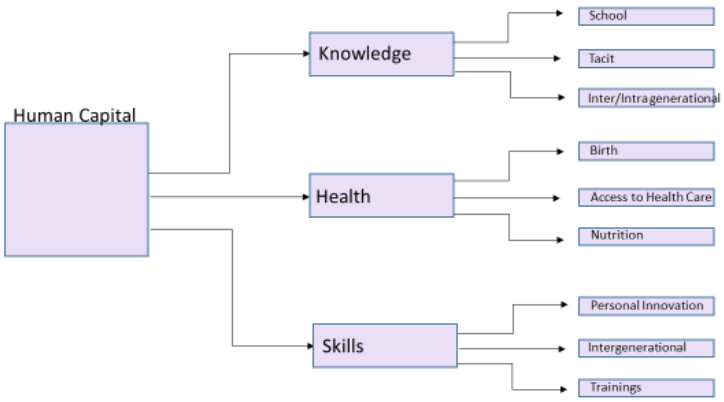


Figure 1. Break Down of a Livelihood Resource Capital

Human capital breaks down into three components: knowledge, skills, and health or ability to labor. The components come from the Department for International Development paper. I coded what activities constituted knowledge if the interviewee expressed they learned something new from the project. The activities were deduced after the study. For example,

controlling breeding for color, learning about genetics, and separating fiber colors are all activities of the component knowledge that project participants learned from trainings and mentioned in their interviews.

I distinguished between skills and knowledge by keeping in mind that skills are the act of doing something, while knowledge is understanding how and why the act occurs. Health or the ability to labor were independent of the project because nothing the project did enabled or disabled a participants' health or their ability to labor. Activities that were commonly found were sickness, off farm migration, and age.

Social capital's components were networks and connectedness, membership to formal organizations, and relationships/trust/reciprocity and exchanges. These components also came from the DFID paper.

Financial capital's components are financial literacy, access to loans, saving accounts, extra income. The components were adapted from DFID's explanation of Financial Capital, which says, "Financial Capital denotes the financial resources that people use to achieve their livelihood objectives" (DFID, 1999, p. 15). I took this definition and added it to the components listed above. I recognize the term financial literacy has an extensive meaning, and includes understanding processes associated with finance. I chose to simplify financial literacy because of the constraints of this research project to if the farmer knew about loans, banks, and savings accounts. Access to loans was chosen as a component because it is a strategy to achieve livelihood objectives. The component of having a monetary or living savings accounts in terms of cash or livestock shows there is enough supplementary income to meet unexpected needs. Having a monetary savings account also means there is some stability in the high risk life of the farming household, enough to have some spare money to put away. I chose extra income as a

component to see one if there is any excess income specifically from Heifer's project, two, if not where is it coming from, or three, there is no extra income.

Physical capital as defined by DFID (1999, p. 13) is "Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods." The components that make up physical capital are affordable transport, shelter and buildings, adequate water supply and sanitation, access to information, and, from my perspective, livestock. I chose to include livestock as a physical capital because the Alpacas are a tangible asset that provides the participant families with a means to support their livelihood.

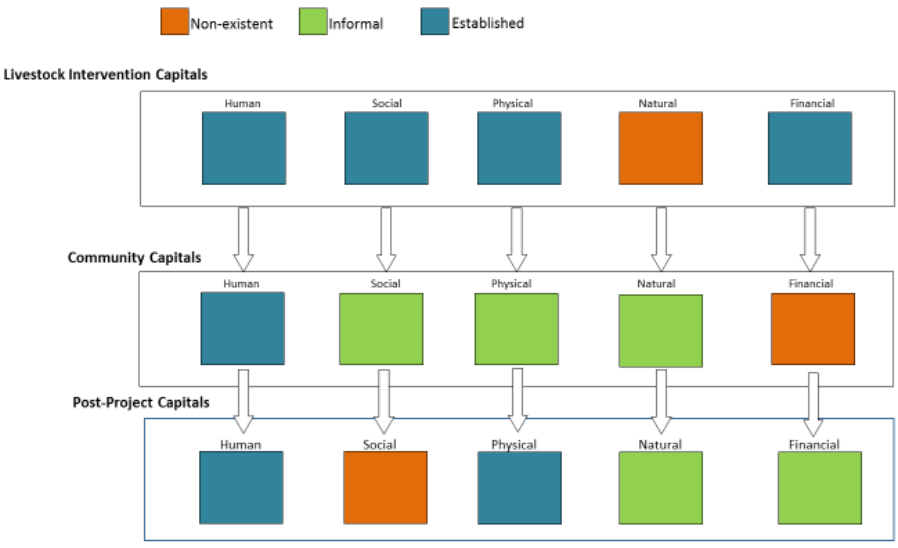


Figure 2: Displays changes in resources from the interaction of project resources and community resources

The second step in coding was determining if the activities were still prevalent. Sometimes activities were negative, such as having to lie to sell fiber. Figure 2 depicts an example of how I coded sustainable livelihood capitals to reflect change over time. After

considering each resource's components and activities, they are averaged to determine if they were improved, indifferent, or adversely effected. The indicated changes are illustrative only of what my framework will do.

For a resource to be categorized as strongly improved it must be lacking before the project, become established after the project and still be utilized by the community 10 years later. Moderately improved is defined as lacking before the project, established during the project, and is somewhat being utilized by the community, or at least is available. Another definition for moderately improved is a resource that existed in the community before the project, during the project it was strengthened, and after the project the resource retained the improvements in the long run. Weakly improved can be defined as lacking before the project established during the project and informal after, meaning that in very few cases the resource is still being utilized.

The strongly adverse category is defined as a resource existing before the project, but during the project it became informal or non-existent, while after the project it is no longer available to the community. Moderately adverse is defined as an established resource before the project, but during the project it became informal or only a few community members are utilizing it, then 10 years after the project it is still informal. The weakly adverse category is defined as a resource established before the project, but during the project there were some change that did not immediately affect the established resource, while 10 years later the resource has diminished to an informal or non-existent state.

Chapter 4. Background on the Alpaca Project (from Heifer Project International and Communities Visited: Cuchusuma, Riopampa, Rasiri, and Callacani)

The Altiplano plateau in southern Peru is home to the Aymara people who have lived there since before the Spanish conquistadors in the 1500s. When the Spaniards arrived in 1533 the Aymara people were subject to decades of oppression and exploitation (Encyclopedia Britannica, 2016.). The war of independence for Peru concluded in 1824, followed one year later by Alto-Peru separating and becoming the Republic of Bolivia, thus, separating the Aymara people into two countries. The culture has remained the same despite the separation.

The Peruvian Aymara people are pastoralists who live in small communities scattered throughout the highlands. These communities exist between 9,000 ft and 14,000 ft above sea level. The land they have has been passed down through their family for generations and women own land as well as livestock.

In these communities there is no access to the internet, a few people have phones, some have a motorbike, and many have no mode of transportation. However, there is usually someone that can be found to transport people to the market or elsewhere. The market is typically an hour or so away by vehicle depending on where people live. The city of Puno is over three hours away by car from all the areas I worked in. The climate is extremely harsh with high variability in temperature and weather events. The families subsists on many different varieties of potatoes, cañiua and huarizos (cross between llamas and Alpacas). The micro-climates limit what areas can grow crops.

One of the primary livestock species raised by these farmers is Alpaca. The Alpaca herds are kept to provide fiber to sell or make into handicrafts and some are used as food.

There are some government projects in the Altiplano, most projects are from NGOs, and NGOs partnering with other countries' governments. The NGO, Heifer Project International (HPI), began the Alpaca Biodiversity Project in several Altiplano communities in 2005. The goals of the project were to save natural Alpaca colors and provide families with a better economic endeavor by being able to breed colored Alpacas and sell colored fiber. Heifer implementers went around asking community members if they would like to participate. The entire Alpaca project goes far beyond the Altiplano into other parts of central to southern Peru. There was no requirement placed on the family other than the "will to work and learn" (J. Mamani, personal communication, Aug 7th, 2016). If a family did not want to participate they were not required. . Over a three-year period trainings in genetics, controlled breeding, and animal health were taught to participating community members. The NGO set up Alpaca Breeder Organizations in each community as well as gave one colored Alpaca sire to each participating family.

After a few months HPI staff noticed that very few women were investing in the Alpaca project. To remedy this HPI started a Women's Empowerment project in conjunction with the Natural Colored Alpaca Biodiversity project. The Women's Empowerment Project taught classes on gender equality and value added techniques for fiber.

While these families live in extremely volatile conditions it is well documented that communities in Latin America possess the ability garner and control resources, and translate information into action (Valdivia et al., 2010)

Chapter 5. Methods and Procedures

The Beginning

To acquire projects, I made a list of NGOs that specifically work in livestock development projects. Then I searched that list for projects that were completed ten years ago or longer. Very few project evaluations occur within the five to ten year span post completion, it is necessary to consider a ten-year horizon to see how projects impact the community in the long run. After vetting the list a second time I contacted each NGO inquiring about the opportunity to work with them. Of the ten NGOs I reached out to one was interested in working with me. The NGO that responded was Heifer Project International, which is based in the USA but has offices in the countries they work in. In this case, HPI has offices in Lima and Cusco, Peru. I organized email and skype meetings with the director of the Cusco office to discuss the details of my visit to the project location, access to necessary documents, and the opportunity to discuss my findings with some of the project participants, project implementers, and the director of HIP projects for Peru.

To see the best picture of what the project has done, it was imperative that I had access to project documents from before, during and after the implementation. The written information leading up to the project provided an idea of what the goals of the NGO were, how they wanted to implement them, and what the values of the NGO are. Once I had access to the documents from the NGO, I coded them to categorize what livelihood capital components the project was bringing to the community. For example, I coded educational trainings as human and social capital, human capital because it was providing education and skills to the farmers, and social capital because the community members were coming together to learn. The trainings provided

an opportunity to transfer information from one person to another, which otherwise might not have occurred.

The goals of the project were written as "The project will seek to recover and conserve biodiversity loss of colored Alpacas, which will benefit 131 families from seven communities in the province of Collao and Juli by delivery of 121 male Alpacas, 15 females and from the third year will share with 170 new families……Training of women promoters and men in agricultural and artisanal production. This will help improve income." (Heifer Peru, Pg 1, 2010)

I chose not to include the various proposed budget changes for the project because they did not appear to have a direct effect on the community. For example, just because the project was provided with more money did not mean there was an increase in any livelihood capital on the ground or an extension of the project in terms of time.

Some other information pertinent to how I made informed conclusions that does not show up in the data are interviews that I did not include, informal conversations I was a part of but was not able to take notes of, as well as my personal experience in Peru.

Two interviews were with Heifer employees to talk about setting up the project, challenges and their thoughts on it as a whole. From these interviews, I gained valuable background information about the communities, the cultural atmosphere during the project in regards to gender equality, and unintended consequences that came from the project. These interviews were not coded or accounted for in the data, but were just as valuable. I chose not to include them because these persons did not receive an Alpaca and did not live in the communities we did interviews in.

There were two other interviews I chose not to include that were with farmer participants. One was because the interview was rushed, and I felt the participant was coerced into talking

with us, while the second one was because the participant was chosen by Heifer to be a community promotor. The promotors interview was completely opposite of the rest, but provided a glimpse into what the end of the project should have been like. For example, he spoke about his job, which is to provide medication for sick animals. when asked everyone else said there is no medicine available. These interviews also provided information that helped inform my conclusions but was not accounted for in coding or data.

In several informal conversations, women opened up about the Machismo culture that exists in the house hold, how the Men felt in the communities when the Women were being taught their empowerment classes, how folks feel about the government, HPI, and others who come to their communities. I gained a tremendous amount of insight and knowledge during these conversations that provided substantial background information for the conclusions of this research.

Interviewing in the Altiplano

To get the most out of conversations with project participants I chose a semi-structured interview approach. It was important for the interviews to be structured more as a conversation to allow for thoughts and ideas from the participant to be openly shared. The smallholder families were recruited by a former implementer/trainer from Heifer. The recruiter went into the communities and asked if they wanted to participate in my research several months before I arrived. When I travelled to the Puno Region, I visited six communities and conducted nine interviews for the project. In the district of Sopara we visited Cuchusuma and Riopampa. In the district of Juli we visited Pasiri and Callacani, and finally we went to the market in Conduriri.

In the field, a research assistant from the University of Missouri and I used an iPhone to record the interviews. Unfortunately, the original recording devices were lost before we reached Puno. We took field notes during the interviews and wrote reflections afterwards. The notes and reflections were particularly important to document the observations of the herd of Alpaca, and available natural resources and environments, as well as how the farmers were interacting with us.

In all occasions, I chose to build rapport with the participants by sharing my farming experiences. I did this by inserting myself in the space that the interviewer is in, rather than allowing the conversation to flow with me outside. I chose to do this because one of the early female participants appeared nervous to talk to us, so I made the decision to tell her I am a farmer too. This created a similarity between us that I believe made it more comfortable for her to share her thoughts with me.

On a typical day we would leave Puno around 0800, travelling two to three hours to the communities for our interviews, and we did this for six days. We were accompanied by the participant recruiter, who also served as our field guide, and by a translator from Aymara to Spanish. We had a second translator with us to translate from Spanish to English that Heifer recruited. We brought with us coca leaves, CAFNR hats, and food as gifts for the participants. We would share the coca leaves before the interview as is the custom in the highlands. The gifts of hats and food were only distributed after the interview to thank them for their time.

During the meeting with project participants our English to Spanish translator would read the consent form and our Aymara to Spanish translator would share it with the family before the interview began. Any and all questions from interviewees were answered previously to

beginning. The interviews typically lasted between thirty minutes to an hour. Most of the interviews were conducted in the fields surround by the Alpacas.

Coding

I coded data into categories of strongly, moderately, or weakly, improved or harmful, which provided a simple means for analysis of how the project impacted the community in the long run. Then I coded the interviews by activity, component, and category, which allowed for a picture of the fluctuations of the livelihood resource category over time. The cause of the changes in resource activities is hypothesized to be from the interaction between the project's livelihood capital (LC) resources brought to the community and the LC resources that already existed in the community. For example, if a social capital resource activity is strongly improved it means it did not exist before the project, the project brought that resource building activity and it sustained itself to date. This logic does not take in to account if it was actually a strong improvement in the total social capital of their life, just relative to the project. I did not have time to include if they had other associations they were part of or look at their social networks, which would have changed their social capital. I then assigned arbitrary values to the categories to allow the results to be placed on a chart.

Figure 3 is an example of how I coded the transcripts. Yellow designates before the project, blue for during the project, and green is after the project.

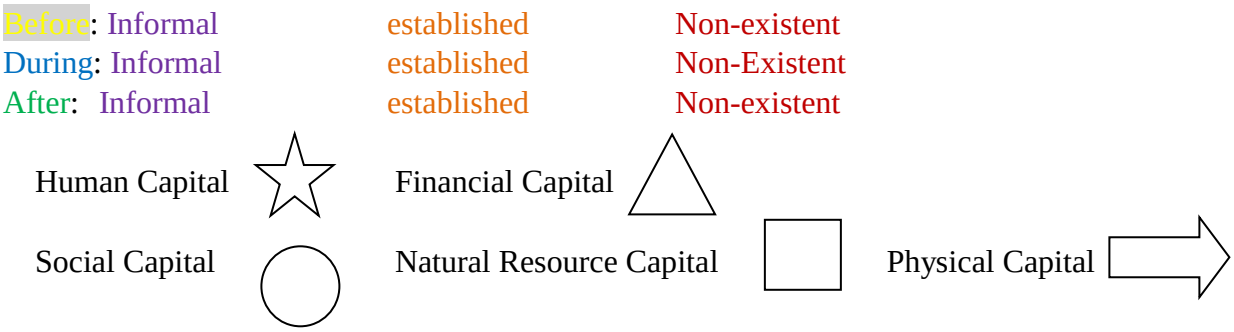


Figure 3. Example of coding Physical Capital -Strongly Improved

In the paragraph (see below for an example) I would highlight sentences regarding before, during or after the project with the appropriate color. The next step was determining if the activity was informal, established or non-existent within the time frame given. I used the shapes to remind me what capital category the information belonged in to prevent overlapping between LC categories as follows:

> "Before, we had grey and discolored Alpacas, but the project has changed that. With this project that has changed. Before, the wool didn't cost [have value] anything. But now that we have gotten the Alpacas we have improved. The wool has risen [in price], we shear a higher volume of it."
> Before: fiber low price, low volume, Informal: genetic quality of the herd
> During: acquired colored Alpaca sire, Established: provided a colored Alpaca sire, with good genetics
> After: fiber up in price and up in volume, Established: herd has improved
> Strongly Improved because of the nature of the improvement, the livelihood of the farmers is selling Alpaca fiber, the price and quality over time has improved.

Caveats

First, my poor Spanish was a significant limitation to the study because it kept me from understanding many conversations in real time. This prevented me from asking probing questions during the interviews. Instead, the field guide and translator asked probing questions they thought of as well as answered some of their own questions they had for the participant. When the translations and transcriptions were returned to me, I realized this occurred and that I would have asked different questions. I had questions pre-determined by my framework that ended up not being asked as well as questions made up by the translator being asked to the participants. The results contain significant amounts of information that cannot be included in the results because of this. I believe this occurred because of the machismo culture found in Peru, lack of clear communication between myself and the field guide and translator and to be frank my lack of knowledge of the Spanish language.

Second, I discovered there was a women's empowerment project happening at the same time as the Alpaca project. When asking questions about the Heifer project, one respondent's answers were about the empowerment project. I chose to include answers dealing with the empowerment project to the data set because it happened during the same time, both were done by Heifer Project International and both ended around the same time.

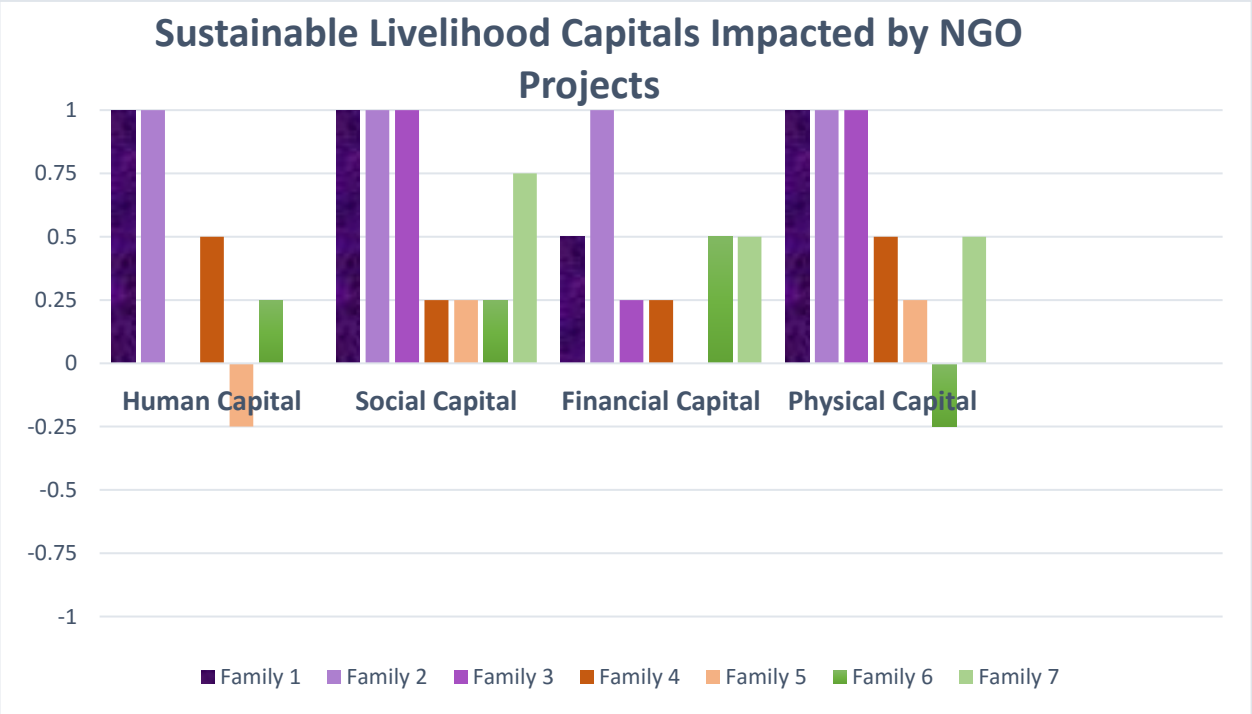
Finally, during my analysis I realized that environmental factors are the key to a successful project in the context of these communities. I coded the interviews a second time for positive and negative environmental factors. A positive environmental factor allowed the family to participate in the project, improve or add livelihood capital resources and build adaptive capacity. Negative environmental factors were factors that barred participants from doing the above.

Chapter 6. Results

There were three areas that we interviewed project participants in and the summary of the data from those three areas is below in charts and tables. Much of this chapter is contrasting and comparing the three areas worked in. I refer to different places as Area One, Area Two and Area Three.

In Area One, all three families were strongly improved by the project in human capital, physical capital, and social capital. In financial capital, the three families spread across strongly, moderately and weakly improved. In Area Two there was a sharp decline in strongly improved livelihood capitals, with both families being weakly improved in social and financial capital, only one family moderately improved in physical capital. One family did not talk about any human capital building activities in relation to the project.

Chart 1



Area One is Purple Area Two is Orange Area Three is Green

Chart 1 is a glimpse of the overall sustainable livelihood capitals found in each of the areas. The chart was compiled by the coding data from the interviews after it was categorized.

Area Two was the least improved of all three areas. The project had a weakly adverse effect on the fourth family in terms of human capital, and only weakly improved effect in social and physical capital, with nothing to report in financial activities. Family five was moderately improved in human and physical capital and weakly improved in financial and social capital. The determining factor for the lack of improvement in Area Two is the environmental context the families exist in, which will be discussed later.

Area Three was found to be in the middle of the other two areas in terms of impact. Family six was weakly improved in human and social capital, moderately improved in financial and weakly adversely impacted in physical capital. Family seven was strongly improved in social capital, moderately improved in physical and financial capital and did not report about any human capital activities.

Environmental Factors

Here are tables that describe the environmental factors per family in each area.

Area One/ Family 1 Table 1

Positive	**Negative**
30min walking distance from Community Center where trainings are held	Climate shock events
Have Eucalyptus trees they use to make tools for harvesting crops, and building houses	
Utilize knowledge/skills from gender equality trainings	Age of community members
Sells hats, sweaters and vests at local market	
Direct sale at local market	
Share sires	
Kids go to school	

Area 1/ Family 2 Table 2

Positive	**Negative**
Less than an hour walking distance from Community Center where trainings are held	Climate shock events
Weaves sweaters and hats	l
Saves seeds, purchases new when necessary	Age of community members
Takes animals to regional fairs	
Functioning Alpaca Association	
Direct sales at local market	
Kids go to school	
Have several crops	

Area One/ Family 3 Table 3

Positive	**Negative**
Knew about breeding colored Alpacas before project	Climate shock events
Leads some workshops for community members	Age of community members
Trade sires if it's not too difficult	
Invests own money in projects	
Has other crops for consumption	
Knowledgeable about market trends	
Has water springs on property	

Area Two/ Family 4 Table 4

Positive	**Negative**
Eat Alpacas every month for food	Climate shock events
Borrow money to buy properties in the city	Alpacas and sheep are very sick
Sell entire animals once in a while	Have to deceive people to sell fiber
	No crop production at all
	Used to have a greenhouse
	Snow is blinding the animals
	Distance between community members is vast
	Cannot go to meetings
	Sell to intermediaries who "trick" them, both fiber and meat
	Poor market prices
	Age of community members
	Migrators keep getting younger, now leave as kids
	Not enough land to continue with breeding project
	Sell young Alpacas for meat
	Eat Alpacas every month for food
	Many Kids and grandparents are getting sick often
	Loss of customs, people not participating in giving rites to Pachamama anymore

Area Two/ Family 5 Table 5

Positive	**Negative**
Enough human labor to put up some fencing	Children are not there to help
Plans to plant oats and pasture grass	70 years old, Arthritis, weak, sight going bad
Neighbor helps put her animals into pens	Extremely limited pasture, no pasture
Can get a car ride to the market an hour away	Lacking food
Wire fencing is helping her a lot with keeping animals	No more projects after Heifer
	Leaders of the Alpaca association are gone
	No lending male Alpacas anymore
	Climate shock events
	Cannot eat when there are strong storms

Area Three/Family 6 Table 6

Positive	**Negative**
Direct sale in several places	Best herd so neighbors cannot lend him sires
Monetary savings account in home	No other good sires in area
Variety of livestock	Spouse passed away
Has water well at house	Age
Own 10 hectares of land	No crops
	Too much frost
	Organizations pressuring to breed for white fiber

Area Three/Family 7 Table 7

Positive	**Negative**
Alpaca and Handicraft Association	Age
Savings in livestock	Migration to cities
Barter system for provisions	Lots of lightning, many Alpacas die
	Save with livestock only
	Indirect sale to intermediaries
	No water, humans and animals drink from same place
	Distance to good Alpacas is extremely far

Enabling Environmental Factors and Vulnerability Context

Enabling or disabling environmental factors allow households to utilize their livelihood resources. In the context of the project several environmental factors were important during analysis. Shock events in the form of changing weather patterns, market trends in regards to natural colored Alpaca fiber, ease of market accesses, direct or indirect sales, living saving

accounts in livestock, available natural resources and distance between other Alpaca farmers. It was found that Area One had more enabling factors than areas two or three.

The strongest enabling factors appeared to be lower elevation, easy access to the market, the ability/time to make handicrafts, direct sale to other handicraft makers and consumers, and shorter distances between families, which allows for swapping male Alpacas. In Area One there is a breeder who is known to have the best Alpaca stock around, with sires in several different colors. This enables them to continue working towards the goals set by HPI during the project. In the other two areas it was reported that they cannot easily get new sires because they are too far away and it is too expensive to purchase and transport them. The process also takes up too much time and energy on the farmers' part to try and facilitate acquiring a new sire.

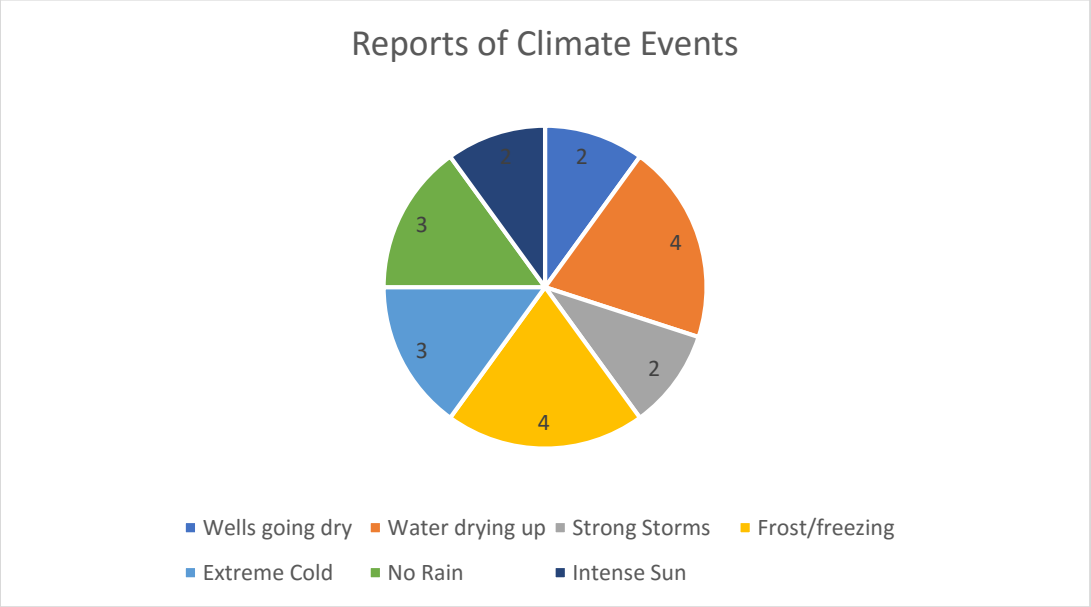
Natural Resource capital also provides an enabling or disabling environment for the farmer—Area One is an example, which is able to grow crops while the other two areas cannot. Natural resource capital is also how much land the farmer owns and what resources are there. Family seven said their well at the house was dry and they drink from the same spring the Alpacas do. In areas one and three there were reports of wells going dry. In Area Two the farms were in bofedales or wetlands, and there is water for the humans and animals.

The combinations of disabling and enabling environmental factors make up much of the vulnerability context of the community. For the most part, these environmental factors cannot be easily changed or amended, forcing the families that exist in them to adapt to their specific geographic and climatic location. For example, elevation plays an important role in whether or not a family can have a diverse farming operation because the farm's elevation determines if crops can grow or not.

Climate

All the families reported that they believe the climate has changed in the last 10 years. Weather events that families mentioned were hail storms, frost/freezes and lack of available water, extreme cold, no rain, and intense sun. In some cases, the farmer mentioned lighting striking and killing several Alpaca at once. In Chart 2 is an account of what climate events were seen in all three areas and how many times they were mentioned overall.

Chart 2



Climate change perception of these areas is interesting because only in Area Two and three was more frost/freezing and extreme cold mentioned, further showing that Area One is in a slightly different climate. Area One was the only area that reported “water is drying up”, and all three farmers in Area One mentioned it. In the context of the interviews farmers were talking about water on their physical land. “No rain” was reported in all three areas. “wells going dry”

and “intense sun” was reported in areas one and three. The Table 8 breaks up the climate events by area to show the difference between areas.

Climate Events by Area Table 8

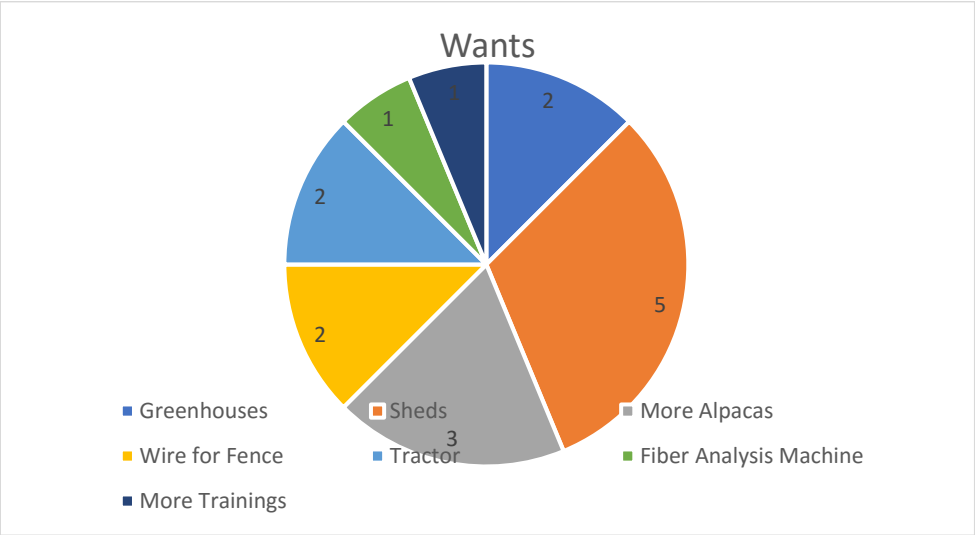
	Area 1	Area 2	Area 3
Wells Going Dry			
Water Drying Up			
Strong Storms			
Frost/Freezing			
Extreme Cold			
No Rain			
Intense Sun			

Wants of the Farmers

Most wants of the community members are physical assets, which translate into economic capital, or economic potential. Sheds were wanted across the board, which match the fact that climate events are affecting every area. Area One reported the most wants, which is probably because we spoke with three families, as opposed to two in the other areas. I felt it was important to ask the question, “If you could have anything on your farm that would help you what would it be?” because it tells us what is the most pressing thing the farmer perceives they need.

Chart 3 organizes the wants that the participants had and the instances the items were mentioned.

Chart 3



In Table 9 the items wanted were broken up by area to show the differences between places.

Summary of wants according to area Table 9

	Area 1	Area 2	Area 3
Greenhouse	x	x	
Shed	x	x	x
Wire for Fence		x	
More Alpacas	x		x
Tractor	x		
More Trainings	x		
Fiber Analysis Machine	x		

Age

Age is a factor for adopting new technologies, like breeding colored Alpacas. The physical and mental work involved in learning and doing a new skill is a barrier to older farmers

(HD3I2, 2016). In several cases interviewees mentioned that older farmers do not want to adopt new technology. Older interviewees shared that when younger people leave it is very hard for them to take care of the entire farm on their own. This is life cycle issue in the Altiplanos where the children leave to seek work and education and leave the burden of the farm to the older generation. The table is the average age of community members as reported by the families. On the other hand several families reported their children going to school which is an investment in the human and financial capital of the family. In Table 10 the average age that the interviewees gave is organized by area and age given.

Reported Average Age by Area Table 10

	45 years old	50 years old	>50 years old
Area 1	X	X	
Area 2	Na	Na	X
Area 3	X X		

Market for Fiber

The market paralleled the improvement of the Alpaca herd genetics. The market demand for white fiber shifted 3-4 years after the project first started. The gestation of Alpacas is 11 months, so it took several generations to have good quality colored fiber to sell. As the fiber from participating farmers became finer and more colorful, the market demand increased for both handicrafts and raw fiber. Though we are not sure if the market demand changed because of the new increased availability of quality colored fiber or for some other reason. What is known is the handicraft market now had access to the supply of quality fiber, so artisans could sell their

value added product for a higher price. Producers were now able to get higher price for raw fiber, by selling it to the artisans rather than middle men. Though some producers that participated in the project still are selling to middle men.

What the change in the market meant for the producers who are price takers, is that the new market price provide an increase in income. I do not know what kind of effects this had on farmers who chose to not participate in the project, and kept breeding their Alpacas for white fiber.

Chapter 7. Discussion

Environmental factors (EF) were the key to whether or not a family's livelihood capitals were improved or adversely effected by the development project. Enabling EF many times were the existing livelihood capitals in the community. Initially, I had trouble realizing that LCs and EEFs were often the same thing. The lack of EEF (Enabling Environmental Factors) was a twofold problem. First, there were not many opportunities for the communities' livelihood capital activities to be built upon, because they just did not exist. Second, disabling environmental factors (DEF) served as barriers, constraints, preventing families from the ability to fully utilize HPI's livelihood capital activities that could have improved their own livelihood capitals.

It makes sense that Area One had the best overall improvement to their livelihood capitals because they had the most and strongest EEF of the three areas. When EEF exists, there is a level of stability in the community as life burdens and risk are mitigated by these EEFs. For example, in Area One the families are able to grow several different crops. A small part of the crops is for sale, while the majority of the crop is for consumption. This adds to food security, a small income increase and takes away some of the worry about having enough food for the present, and future. When a family has enough food it smoothes some of the burdens of being poor and living in an extreme place. In Area One's case there was enough existing LCs in conjunction with EEF to gain some significant long term benefit from the project.

Evaluating the environmental factors in the areas revealed several themes: climate change and shock events, distance between key places, age, access to direct sales vs intermediaries, and having enough land. If the community had these examples as positive, enabling environmental factors, they were able to diversity their farm operation, have time to make and sell handicrafts to

direct buyers, were able to continue sharing sires, attend training meetings, and keep a functioning Alpaca association. The only theme that affected everyone was the extreme weather events.

Weather is by far a strong disabling factor across all three areas, even though Area One has the ability to grow crops they still have to contend with weather shock events. Over the last thirty years there have been significant changes in the climate of the Altiplano (Valdivia et al., 2010). Valdivia et al. (2010, p. 819) reports, "In this region, climate change is expected to increase temperatures and the frequency of extreme events." This is exactly what was reported in all areas. While the Valdivia et al. work was in the Altiplano in Bolivia, the elevations are similar to the communities I worked in. In the Bolivian Altiplano, the same kinds of adverse weather events were reported. Hail impacting crop and livestock, drought, frost, and the perception that the climate is changing.

Distance is a disabling environmental factor (DEF) for the families in Area Two and Three, in comparison to it being an EEF in Area One. The family five from Area Two used to walk to the market, which was tedious when the children had to be carried. Now, it takes about an hour by car. The market is too far away for family four to go, which is one of a few reasons they are forced to use an intermediary for selling goods. The other is that there is no one to watch the herd for them while they would go to trainings and they care for several other family's animals along with their own.

In every case, off-farm migration is placing the work and time burden of the project onto the older family members. Family four reported that people used to leave the community around 20 years old and now they leave as children to go to the city and often do not return. In Area One there were children around helping their parents, while in Area Two and three, we did not see

any kids that were old enough to help on the farm. The kids in Area One go to school when they can, but enjoy the farm and the oldest wants to be an Alpaca farmer.

Age is not necessarily an environmental factor but it is a human capital. One of our participants was 70 years old, ailing from time, arthritis, and not having the children around. When sharing about how the weather has changed the participant responded, “The weather has changed a lot. I hope to die soon. I don’t want to see these kinds of things.” At 70 years old the respondent could no longer herd the animals, fix the house, and reported only being able to walk because of the medicine they were taking. Also a sense of hopelessness with old age as the respondent can no longer do what they once could. In Area Three family seven reported that sometimes people will come back once they are finished at school, and family 6 wished more young people would come back because that would spur competition among Alpaca breeders and help the economy.

Enabling environmental factors that allow Area One to be better off on average in all livelihood capitals are factors like being close to the community center where trainings were held, which cuts down on the time burden traveling to the training location. A second factor is the ability to have direct market sales of value added goods and bulk colored fiber. It is well known that middle men cheat and steal from poor families, placing the risk of selling their good on the producer, while Area One families can sell directly to a buyer. The direct sale allows for prices to be negotiated and money or traded goods in hand immediately. Reducing the economic burden of waiting around for money or goods that may or may not be received. The fact that there was a functioning Alpaca Association a decade later shows that there is enough benefit from the association to provide an incentive for the community to keep it going. While the specific benefits according to the community were never uncovered, it’s safe to assume that

social capital is also renewed over time because of association gatherings. This also means that many farmers from Area One can physically go to meetings to participate.

Area One was substantially better off than the other two areas that participated in the project. This was initially evident by their continued investment into their colored Alpaca herd, a functioning Alpaca Association, and from what they desired to have on their farm. Digging deeper, enabling environmental factors were discovered in Area One that allowed their continued participation and utilization of resources over the past 10 years. The physical environment of Area One was able to produce crops in conjunction with other livestock endeavors. In the weather data there was no report in Area One of frost events, or hail. There is a possibility of a micro-climate in that area that is keeping them safe from extreme weather events. It was reported by all participants that there is not much rain, and things are drying up. However, they are still able to produce a variety of crops for consumption and for market sale. In one instance a family also had planted a few hundred Eucalyptus trees and are now using them to build and reinforce their homes as well building tools to harvest crops with.

Area One enabling environmental factors discussed above provided the families with the ability to have a diverse livelihood system. Spreading risk around to many different economical endeavors bolstered by the relatively safer climate of the area has allowed these families to fully participate in Heifer's project, as well as continuing to diversify farm operations, send children to school and plan for the future. In Area One families reported being able to make handicrafts, and the distance to the training facility being a short walk of about 30 minutes. This tells me they had enough available time to make handicrafts and attend trainings.

In Area Two there is a huge change in environmental factors compared to Area One, that the families must contend with. Having more DEF such as long distances between community

members, not enough pasture, no extra human labor because of migration, and indirect sale to intermediaries, has prevented these families from using of the livelihood resource activities that Heifer brought. When the project was over both families reported stopping all activities with the Heifer project and, one family sold the better Alpacas from the first generation of the Heifer project sire. On one hand this shows that significant dependency on Heifer was created because there were not enough enabling environmental factors for the family to support the activities provided. On the other hand there could have been good reason to sell all the animals and have a lump sum of cash, available for whatever needs the family had.

Speaking about fiber and the market the farmer said, “Very bad, always, very cheap. In spite of working with the project (Heifer) and other projects too, they have always tricked us, people like (name) or whoever. The intermediates have always tricked us. We will continue being tricked-I don’t know until when. For example, it seems as though our wool is as refined as we can get it. Maybe it is not to the 100 percent, but it is always bad (worth)” (HD2I1, 2016). Their genetics are not close to 100% refined because they sold the Alpacas the project gave to them shortly after receiving them. It seems like they were so over burdened with the rest of their lives that they could only attempt the colored breeding project a little bit, but perceive the work they put in during the attempts as worthy of a much higher return then they have now probably because of their opportunity cost associated with the effort involved being a project participant. They said they had trouble with controlled breeding and the only color they had breeding with white Alpacas anyway. The negative experiences trying to sell their fiber has led them to take fiber from the legs of animals that is no longer allowed to be sold, and they mix it in with the fiber from the body, just to add a little more weight, trying to get a better price. They would like to sell in a group again as they did when the project was there, but without Heifer coordinating it,

they do not have the time and resources to form one again. It was also reported by one female head of household that she has no time to make handicrafts or attend trainings because she is the only one watching the Alpacas (HD2I1, 2016).

Livelihood Capitals

Financial capital: Farmers are currently getting more money for their fiber but we do not know where it goes. Only one interviewee responded by saying all the extra money goes to send her children to school. It was not a primary goal of Heifer to set up loans, or saving accounts in this project, though Heifer is known to use that method in other projects. Financial capital came in all different varieties. Livestock was cited as a savings account by one farmer and is well known as a tool for income and consumption smoothing. Other financial capital came from handicrafts, most participants knew that being able to knit or weave would bring a higher price at the market, even if they currently were not making items. Another financial stock are the children who are getting an education. That can take care of their parents in old age or start their own business.

Everyone reported some level of increased income when the market shifted and paid more for colored fiber. In Area Two that increased income was short lived as they were not able to continue breeding colored Alpacas. That market trend has continued, anyone who sells colored fiber to the local market or craftswoman receives double what the white fiber is selling for. Area One had the ability to have diversified income strategies, with crops, Alpaca fiber, and handicrafts, while in Area Two they only had Alpaca and sheep, and Area Three just Alpaca and llamas.

Human Capital: This is knowledge that was provided by the project is still being used today. One issue however, is that the families have been given enough knowledge to understand what inbreeding is and what it will do to their herd. Families in Area Two and Three are faced with the issue of continuing to breed genetically poor animals or figure out a way to purchase a new sire. The Alpaca project involved teaching the skill of controlled breeding, but an unintended consequence of this was the loss of traditional breeding. Teaching controlled breeding farmers bring their animals to a pen to mate and are taught to keep sires away from dams to prevent accidental breeding. Because of this, farmers are struggling to know when their animals are pregnant. Pregnant females act extremely hostile towards male Alpacas while open (non-pregnant) females do not.

Age is a factor for human capital gain and retention in this project. Older community members tended not to continue to participate, and one younger community member said, "If it [the community] were mostly younger people it would be a lot better. If young people lived here-young people dedicate themselves more. Older people not so much. They live for what they can." Age in a community could be a determining factor for whether or not a development organizations project can be successful there, or maybe the way they go about implementing the project needs to be adapted for their target age group.

Social Capital: There was a spike in social capital during the project because of an increased amount of gatherings due to the trainings and education seminars. The communities typically gather once a week at the market to discuss community issues before the project. The gender equality project increased the amount of women participating in local government, and the Alpaca project brought together farmers who usually do not participate in local government. When Heifer set up Alpaca associations it provided an institution for the participants to continue

gathering and networking. The associations only took off after the inclusion of project gender and younger leadership training. (C. Inkakutipa, Personal Communication, 7th August , 2016)

The first community still had an association they participated in, the second and third communities had ones falling apart. The reported reasons for the buckling of the other two area's associations was farmers just wanted assistance without putting in work for it, and the leaders of the organization were corrupt.

Another interesting observation was that family two said phrases like: "With us it concluded in 2009, 2010." "After those years there still were, but later on they abandoned us" "Well, since Heifer just stopped, we did too. The market easily chews up people like us" (HD2I1, 2016). Their perception was that the project abandoned them and thus provided no hope for the future since they are constantly being tricked by everyone. In Poor Economics, the authors talk about the psychology of being poor which entails depression and lack of hope because of the risky environment poor people live in.

The ability for vulnerable families to make plans for the future shows that there is some kind of stability in the household or community environment. In Poor Economics the authors found that most impoverished families suffer psychologically from time inconsistency, which is the inability to make future plans because the present, day to day is consuming high amounts of personal resources like time and energy. We see this in Area Two and Three where the negative environmental factors keep heavy livelihood burdens on the family at all times. When the respondents in Area Two were asked what they wanted for their farm, they asked for wire fencing to help immediately with their herd, and relieving some of the time burden of watching and moving the animals all day long.

While in Area One the respondents asked for more sires to continue breeding colored Alpacas, a tractor (because of the ability to grow crops there), and a fiber analysis machine. Area One had the largest amount of "Wants" because they have more stability and diversity of livelihood system within the community. The ability to purchase these wants, aside from the fiber analysis machine, shows that the farmers there have other wants or needs satisfied. As livelihood resources increase, the complexity of physical resources farmers want or perceive they need for their farm increases, in comparison to Area Two and Three where wants focused on continuing their current operation, and the health of their families. Showing more vulnerability in their livelihood context.

The Alpaca project participants had to stick it out with colored fiber breeding even when the market was not responding in hopes that their herd and the market would eventually change. Once the market shifted, we have no idea whether or not there was a negative impact on the farmers who did not participate in the Heifer project and continued breeding white fiber Alpacas. The farmers that stuck it out for the few years the market was still favoring white fiber had a diverse farming operation in order to weather the lack of return on resource investment (time, labor, cost). The families in Area 1had the diversity on-farm and enabling environmental factors to work through a few hard years until the market demand favored colored fiber.

Upfront the families needed to be stable enough to handle a few years of poor prices and low market demand, as well as consistent traveling to breeding ground and training locations. They also needed to have the 100 sols fee to pay for the use of someone else's sire (J. C. Mamani, Personal Communication, 7th August, 2017) The families did not anticipate the initial investment needing to last for several years before seeing a return. The results provided show clearly the families who had the capacity to do so and those who did not. It is interesting because

even the families who saw significant benefits from the project did not know how long it would take to reach that point. Strengthen the results that environmental factors are the gatekeepers to the community being able to successful use the livelihood capital resources.

One family reported a loss of tradition because of off-farm migration and purchasing small plots in the city. Traditional knowledge and practices fade with modernization (Valdivia et al., 2004). We can see this is exacerbated when families live in extreme poverty and do not have other means to continue traditional livelihood strategies. When asked how they feel about young people leaving the community their response was, "Through this too, it seems the animals accompany us. Because several houses have been abandoned, suddenly they don't carry the same custom. It is a custom from before our grandfathers, it was always there. I grew up always doing these customs, with the grandparents doing them, the rites for Pachamama" (HD2I1, 2016).

The families that participated in the Alpaca project mostly utilize the animals to sell raw fiber or make handicrafts. Some were using the Alpacas for food, and some were selling whole animals. Having options to use the animal allows the family to move livestock into different categories in their livelihood system to fill different needs. Whether the family continues doing what the project set out to do or not, theoretically, there should be less of a loss of resources if they need to use the animals for something other than what the project intended because of livestock's liquidity.

Chapter 8. Conclusion

The main conclusion from this research is that the existing environmental factors are the limiting reagent for the project to contribute to the adaptive capacity of the community. If the community lacks access to the market or other community members, for example, it becomes a disadvantage to them in the long run as the project tries to develop herds of colored Alpacas. The nature of the project and Heifer Project International is to share the offspring and sires with other families, in the last two areas the distance to new sires was too great and the distance to other community members was too. This was a fundamental clash between local environment and project ideology. We saw in the last two days of interviews the families were farther away from one another, they did not participate in as many handicraft trainings, and they no longer participated in their Alpaca Association nor did they share their sires. The constraints of the environment limited the ability of participants to fully utilize the knowledge, skills, and Alpacas the project provided.

I believe it is the responsibility of the group doing the development project to evaluate environmental factors and livelihood resources that exist before they start the project. It might be that the NGO or government chose a different strategy to help mitigate risk or amend a negative environmental factor like distance by ensuring that trainings are being held in more than one location and that they continue to provide necessary resources to the community over a longer period of time than the initial project. This could be something like holding education and skills trainings at the same time every year for one week. Continuing the ability for the community to have new information and technology when they do not otherwise have a way of accruing new information. Age specific activities in development projects would be important so the NGO does not waste resources on people who are not going to use them. Instead they can target older

populations with specialized activities that will alleviate some of the burden that comes with farmers at an old age. For example, our 70 year old respondent, if an NGO would help put up some fencing and corrals, what little participation required to be a part of that project would have a much higher utility than trying to be part of an Alpaca genetic breeding project, if they would even decide to try. Additionally, the outcome in the long run would be for the extent of the 70 year old's life, it would be much easier to care for the animals, and perhaps open up more time for another activity.

Once the market shifted we have no idea whether or not there was a negative impact on the farmers who did not participate in the Heifer project and continued breeding white fiber Alpacas. The farmers that stuck it out for the few years the market was still favoring white fiber had a diverse farming operation in order to weather the lack of return on resource investment (time, labor, cost). The families in Area One had the diversity on farm and enabling environmental factors to work through a few hard years until the market demand favored colored fiber.

Upfront the families needed to be stable enough to handle a few years of poor prices and low market demand, as well as consistent traveling to breeding ground and training locations. They also needed to have the 100 sols fee to pay for the use of someone else's sire. The families did not anticipate the initial investment needing to last for several years before seeing a return. The evidence provided shows clearly the families who had the capacity to do so and those who did not.

The environmental factors are the barriers to successful long term participation in the Heifer project. All families initially invested and participated but in the long term only the ones

that had enabling environmental factors were able to continue investing and profiting from their colored Alpaca herd over time.

Further research opportunities are investigating what the enabling environmental factors are in other areas, and if the factors are the same or different to the ones found in this research. As previously mentioned, a positive and negative impact of using the SLF is the plethora of information that is available. It would be interesting to apply the conceptual framework from this research to other NGO projects to compare and contrast the available livelihood capital resources that different types of NGO projects use. Also, researching which components of the local environment in different places around the world are the most limiting for development and how can we, as community minded development people, provide activities or programs that lead to a more stable environment.

Limitations

All of the definitions I used in coding what constituted an improved or adversely effected LC assumes that I know what is beneficial or harmful to the community. My lens is coming from the position of a first world, middle class, educated, white woman. As much as I want to stay away from "west is best", I found it to be ingrained in the way I think. During the interviews this changed as my questions asked the community members what was beneficial or not. I developed the definitions based on my own ideas of what constitutes strong, moderate, or weak. There was no basis to actually measure change. My definitions also negated a lot of good information from being included in the framework original framework.

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