Gender Dynamics and **Climate Change** in Rural **Bolivia**

November 2011

Maximillian Ashwill, Morten Blomqvist,
Silvia Salinas and Kira Ugaz-Simonsen

Banco Mundial

Public Disclosure Authorized

Gender Dynamics and **Climate Change** in Rural **Bolivia**

Maximillian Ashwill, Morten Blomqvist,
Silvia Salinas and Kira Ugaz-Simonsen

November 2011

World Bank

Gender Dynamics and Climate Change in Rural Bolivia

Maximillian Ashwill, Morten Blomqvist, Silvia Salinas, and Kira Ugaz-Simonsen

1818 H Street NW
Washington, DC 20433, USA
www.worldbank.org

Design and layout: SALINASANCHEZ • www.salinasanchez.com
Illustrations: Jorge Dávalos

This report should be cited as:
Ashwill, Maximillian and Morten Blomqvist, et al. (2011). "Gender Dynamics and Climate Change in Rural Bolivia", The World Bank, Washington D.C.

Table of Contents

ACKNOWLEDGEMENTS

This study was written and edited by Maximillian Ashwill (LCSSO) and Morten Blomqvist (Task Team Leader). Additional text and research was provided by Silvia Salinas and Kira Ugaz-Simonsen. Juan Carlos Parra and Maria del Socorro Peñaloza led the overall design, implementation and analysis of the quantitative survey, and provided important inputs to the report. Ely Silvia Linares Chumacero, Rayne María Calderón Camacho and Ricardo Jesús Casso Benitez led the field research in Chapare, the Highlands and the Chaco, respectively.

This document was improved by the important suggestions provided by peer reviewers, including: Marie-Laure Lajaunie, (Sr. Water Specialist, LCSEN), Maria Elena Soria (Disaster Risk Management Specialist, LCSUW/LCSEN - Bolivia Country Office), Michelle Rebosio Calderon (Social Development Specialist, AFTED and SDV), Sanne Agnete Tikjoeb (ET Consultant MNSEN) and Olaf Westermann (Natural Resource and Gender Specialist, DANIDA Bolivia). Additional comments were received from Faris Hadad-Zervos (Incoming Country Manager, Bolivia) and Mercedes Zevallos. The team is grateful to World Bank management for supporting and enabling this work. These individuals include: Oscar Avalle, Ousmane Dione, Maninder Gill, Susan Goldmark and Carlos Silva-Jauregui. We are also thankful for the administrative support provided by Ramon Anria, Monica Claros, Kelly Keirnan, Rosario Monroe, Fatima Soria and Joanna Mariscal.

The team would like to especially thank the case study communities for their great hospitality and openness as well as the different government agencies in Bolivia that provided inputs during the workshop in La Paz, held on September 8, 2011. Finally, the authors would like to express gratitude to the Gender Action Plan Trust Fund for providing the resources to develop this report and the overall study.

OVERVIEW

The purpose of this report is to inform practitioners on existing gender dynamics in Bolivia as they relate to natural resource management and climate change. The study aims to go beyond general assumptions and provide more detailed empirical knowledge on differentiated gender roles, relative access of women and men to resources, and gendered responses to climate change in rural Bolivia. The goal is to provide useful insights that support gender-mainstreaming efforts in rural development and climate change adaptation projects.

Based on the empirical findings, the report's overall conclusion is that there exists a strong linkage between gender roles in rural Bolivia and the differentiated climate vulnerabilities and adaptation strategies identified by women and men. This has led to a number of more specific conclusions and recommendations.

Overall gender roles are relatively well defined. Men tend to be responsible for community work (including community representation and decision-making), physical work in the agricultural sector, and high value economic activities (mining, timber, cattle, etc.). Women, on the other hand, are responsible for domestic tasks (cooking, cleaning), reproductive and caretaking activities, supporting the man in productive sectors, subsistence farming and other small-scale income generating activities. This division of labor indicates that women's work tends to be less valued in economic terms. It also suggests that women usually access community decision-making structures "through" men.

Gender roles are rapidly changing as women assume more traditional male responsibilities, though often only as the "replacement" for an absent man. The study shows a greater tendency for males to migrate and seek wage labor. In these cases, women tend to take over male responsibilities in the communities, which significantly increases female workloads but can also improve their access to community decision-making mechanisms. By contrast, it was not observed that men are becoming more involved in traditional female roles like domestic and reproductive tasks. These changes to gender roles are viewed by locals as more of a temporary arrangement than a permanent transition, since women are often viewed only as the man's "replacement" while he is otherwise unavailable (away, sick or deceased).

Climate change adaptation strategies employed by women and men differ significantly, and are shaped by existing divisions of labor and differential control over resources. Whereas men focus on large-scale community interventions (e.g. irrigation, river defenses), migration,

or seek employment as day laborers; women tend to focus more on practical and innovative improvements such as seeking alternative water supplies, protecting local assets, planting new crop varieties or supplementing traditional incomes through other local activities. Analyses of the types of adaptation actions that women and men have preferred shows that men tend to adapt to climate change by using more resources, while women adapt by using resources more efficiently.

Women's heavy workloads are key barriers to promoting female participation in climate change adaptation training and projects. The field investigation demonstrates that women are already overworked in rural Bolivia and this situation is worsening because of climate change, migration and natural disasters. This means that women simply do not have the time to participate in new development projects, climate change adaptation efforts, technical trainings and productive activities.

What should be done?

- Climate change projects should specifically target women and their specific needs. Women in general tend to stay more permanently in their communities and, therefore, often become responsible for the day-to-day management of natural resources and related projects.
- Donors and project managers should consider that adaptation strategies proposed by women tend to be more individual, small-scale, low-cost and low-impact, whereas strategies proposed by men are often larger-scale, more capital intensive and more technically complex.
- Development and government agencies should promote activities and projects that aim to reduce the workload of women, rather than simply offering more trainings and project related tasks.
- Investing in women can improve climate change adaptation outcomes. Evidence shows that when women are provided with greater resources they tend to dedicate them to the tasks for which they are responsible (e.g. family health and nutrition). Given they are charged with much of the burden to adapt locally to climate change, investing in women can lead to beneficial and cost-effective outcomes.
- Women and men's response strategies to climate change differ and should both be supported. While women face many difficult challenges that men do not, it is important to note that men also face adversity, which can negatively impact them and their families.

Findings in this report are based on case studies from seven communities in three different agro-ecological regions of Bolivia. These regions were chosen based on their ecological and geographical differences, ethnic composition and the presence of diverse types of resources and climatic challenges. The field investigation methodology incorporated both qualitative and quantitative data collection tools, including household surveys, gender-sensitive group discussions, interviews with local leaders and testimonials.

INTRODUCTION

The purpose of this report is to inform practitioners on gender dynamics in Bolivia as they relate to natural resource management and climate change. This is done to provide new knowledge for mainstreaming gender into rural development projects. The aim is to go beyond general gender assumptions and provide more detailed empirical knowledge on differentiated gender roles and the relative access of women and men to resources.

> **Gender** is defined as the behaviors, tasks and responsibilities a society designates as "male" or "female." They are profoundly interlinked with the sustenance of all types of livelihood systems and with the management of natural resources in rural communities (see a list of relevant definitions in Annex 1).

Climate change in Bolivia is not gender neutral. The different roles, resources, opportunities and agency of women and men influence the ways in which climate change is felt and responded to locally. Therefore, to build local resilience to climate change, practitioners should work, in a context specific way, towards decreasing the relative vulnerabilities of men and women. In order to do this, it is crucial to understand how climate change impacts gender roles and, conversely, how these roles influence natural resource management and adaptation responses from women and men.

The report will demonstrate that women and men in rural Bolivia have many different roles and opportunities, which are not equally distributed. The paper will also show that these roles are changing as a result of both general development trends and climate change. Further, evidence demonstrates that women and men experience vulnerability and adapt to climate change differently. As a result, rural development and adaptation strategies should integrate the relative capacities of women and men and respond to their particular needs. This will help avoid counterproductive outcomes that widen gender gaps and allow for more sustainable, pro-poor rural development.

This report will begin by introducing the methodology and case study regions. It will then examine in detail the specific roles of women and men in rural Bolivia. Next it will look at the gendered access to and control over resources and how gender roles, access and control are changing as a result of climate change. The report will finish with some general conclusions and specific recommendations for development practitioners in rural Bolivia.

METHODOLOGY

The study's methodology incorporated both qualitative and quantitative data collection. The quantitative part of the study was undertaken through a comprehensive individual survey. The survey was taken by a minimum of 15% of the adult population in the selected communities. A total of 62 men and 68 women participated in the survey. Stratification and random sampling techniques were used to ensure the representativeness of the data. Only statistically significant information has been included in this report, unless otherwise stated.

The qualitative dimension involved individual interviews with local leaders and experts on the themes of gender and climate change. It also included group discussions with different social groups separated by age, gender and ethnicity. Beyond creating gender-specific spaces, the group discussions identified gender differences in terms of four themes; (1) roles, (2) access and control of resources, (3) climate change impacts and vulnerability, and (4) climate change adaptation and natural resource management strategies. Participant observation by investigators was an important part of this data collection and no individual who answered the survey also took part in the group discussions.

Additionally, individual testimonies were gathered in order to enrich and provide a human face to the information collected. In the end, a margin of flexibility was provided to investigators to adapt the methodology to on the ground realities. This was done in order to avoid methodological rigidities that could limit the ability to identify new or previously unidentified gender dynamics. Attaining community trust was a key prerequisite in undertaking the study locally; therefore investigators were selected who already had ample experience in the selected communities.

The use of case studies in the methodology allows the investigator to unfold the many layers of societal dynamics (see Burawoy 1998 and Lund 1994). Present day practices of men and women represent social dynamics that often contradict general norms and structures, and case studies provide the specifics and depth of analysis to show this. More aggregate, quantitative studies often do not reveal the vibrant interface between women and men in a particular social arena. For example, in rural Bolivian communities, many women have attained prominent roles in community decision-making structures because of many factors such as climate change or shifting migration patterns.[i] However, this runs

i This was observed in the Highlands where many women (mainly widows and those left alone by men who migrated) held community leadership positions. In Corquemaya, a new irrigation committee was established to reduce risk to rain-fed agriculture systems from more unpredictable weather patterns and shorter rainy seasons. The Secretary General of this association was a women.

contradictory to the general trend that men represent the family in these decisions. Without such local perspectives, we would rely too much on simplified gender models when designing projects. By contrast, it is also obvious that local results cannot simply be scaled up or generalized to represent large-scale trends. A dynamic understanding of gender is especially crucial in Bolivia given its high levels of social, cultural and geographic diversity.

Box 1

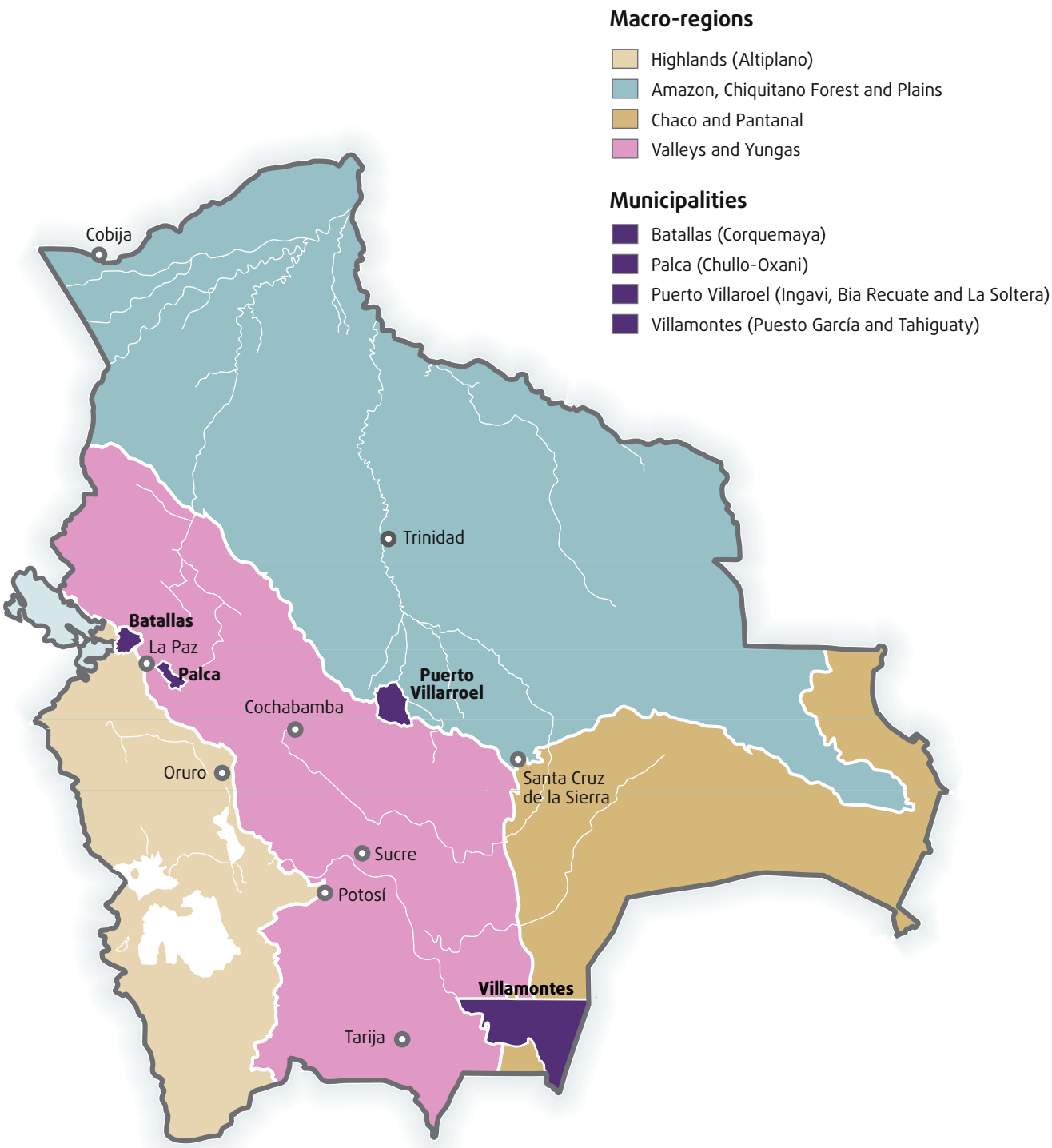
Linking this report to the 2012 WDR and Regional Gender Action Plan

In developing this report, the "2012 World Development Report: Gender and Development" (World Bank 2011) was closely consulted. The WDR analyzes factors related to gender equality that have fostered change and constraints that have slowed progress. Specifically, it examines gender differences in education and health, agency, and access to economic opportunities. This report supplements the WDR with more of a social analysis. Furthermore, we bring these questions surrounding gender differences and inequality down to the national and sub-national levels of Bolivia with the purpose of making our findings actionable for rural development practitioners.

As a response to the WDR's findings, the World Bank has developed an operationalization strategy (September 2011) that's seeks action in five areas: (1) inject gender issues into most aspects of policy dialogue at the country level, including capacity building; (2) use the analytical guidance in the WDR to deepen and expand country-level diagnostic work; (3) scale up lending in maternal and child health, girls' education, and women's access to jobs, credit, entrepreneurship opportunities, infrastructure, and voice; (4) help strengthen country systems for generating data and promoting access; and (5) strengthen partnerships.

Additionally, the Latin America and Caribbean Region of the World Bank has developed a regional gender action plan, known as "Gender Equity in Latin America and the Caribbean: A Roadmap for Action: FY12-FY14" (forthcoming). This plan is supported by three pillars, which include (1) mainstreaming gender into projects and Country Partnership Strategies, (2) addressing priority areas of gender inequality, and (3) gathering and sharing knowledge.

The purpose of this report, and the companion Field Guide, is to provide practitioners in Bolivia with the specifics to effectively implement these priorities that the Bank has mapped out.


Macro-regions
Highlands (Altiplano)
Amazon, Chiquitano Forest and Plains
Chaco and Pantanal
Valleys and Yungas
Municipalities
Batallas (Corquemaya)
Palca (Chullo-Oxani)
Puerto Villaroel (Ingavi, Bia Recuate and La Soltera)
Villamontes (Puesto García and Tahiguaty)
Cobija
Trinidad
Batallas
La Paz
Palca
Puerto Villarroel
Cochabamba
Oruro
Santa Cruz de la Sierra
Sucre
Potosí
Villamontes
Tarija

SELECTED CASE STUDY REGIONS

Bolivia is a country characterized by geographic and cultural diversity. Thirty-six distinct indigenous groups inhabit the country's varied landscapes, which include the Andean mountains, dry lands of the Chaco, the Amazonian rainforest and others. Field studies were conducted in seven rural communities in three different agro-ecological regions of Bolivia. These regions were chosen based on their ecological and geographical differences, ethnic composition, access to natural resources and different climatic challenges. Four indigenous groups (Aymara, Yuracare, Yuqui and Guarani), in addition to Quechua and Spanish speaking migrant groups, are represented in the communities. This diversity in site selection allowed for an understanding of different gender roles, which depends on regional and cultural contexts.

Highlands

Two of the communities selected for the case study - Corquemaya and Chullo-Oxani - are located near mountaintop glaciers. Both are traditional Aymara communities that partially depend on glacial water for irrigation and water supplies for dairy cattle, but to a large extent still rely on rain-fed subsistence farming and livestock breeding. These communities are sensitive to the disappearance of mountaintop glaciers, unseasonal frosts and the rapid changes in inter-annual precipitation patterns. Both communities are located near the major cities of La Paz and El Alto. Corquemaya is in the Highlands (*Altiplano*) at 3,850 meters above sea level and Chullo-Oxani is 300-500 meters lower in the High Andean Valleys (*Valles Alto Andino*). The ethnic and geographic similarities between these communities allowed for the investigation of highly specific differences in gender roles and vulnerabilities.

Chapare

Three of the case study communities – Ingavi, Bia Recuate and La Soltera – are located in the Chapare valleys of Cochabamba. This is a region with navigable rivers, tropical forest and one of the highest annual precipitation rates in the world. The region has historically been vulnerable to flooding, though climate change has exacerbated the frequency of these events and made their occurrence and severity less predictable.The unpredictable weather patterns have also led to extended dry seasons, which lower river water levels. This decreases the navigability of these rivers and reduces the mobility of locals.

All three communities represent distinct ethnic groups. The community Ingavi is primarily composed of Quechua speaking migrants (they define themselves as intercultural people or "*interculturales*") who immigrated to the region in the 1970s from higher elevations. Ingavi mainly produces coca leaves and bananas for export.

Bia Recuate is a Yuqui community. The Yuquis are a semi-nomadic indigenous group that is highly vulnerable to climate change due to their poverty and reliance on the natural ecosystem for livelihoods. Hunting, fishing and gathering are traditional activities in this community though newer livelihoods like timber harvesting, agriculture and participation in the informal (and often illicit) urban labor market in nearby cities have become more common. La Soltera is a geographically isolated Yuracaré community that depends on agriculture, fishing, hunting and commercial timber harvesting for livelihoods. The selection of these three communities and their distinct ethnic groups allowed for an analysis of gender roles, livelihood strategies and climate vulnerabilities across cultures, but within an eco-region with similar climate change and disaster impacts.

Box 2
Stocktaking Investigation

This study was initially guided by an investigation that took stock of the existing information in Bolivia related to gender and climate change. The purpose was to identify what types of information is available on these themes, and more importantly, what knowledge gaps are present. The main conclusions from the stock taking include the following:

- There are favorable policies in Bolivia related to gender equality and sustainable development, however, these have not been effective in reaching the grassroots level;
- A number of gender studies, assessments and project manuals exist, but few are publically available, and fewer are actually linked to policy formulation;
- Gender focuses tends to be stronger during the conceptual and planning phase of projects, but much weaker during implementation, monitoring and evaluation;
- The lack of disaggregated data on gender dynamics in Bolivia is a challenge for mainstreaming these issues into sustainable development projects and monitoring long-term quantitative impacts; and
- There is a tendency to use "the community" as a homogenous unit of analysis in rural development, which makes it difficult to assess and monitor the gender inequalities that exist at an intra-community or household level.

Chaco

In the dry Chaco-region of southeastern Bolivia, two communities – Puesto García and Tahiguaty – were selected. Rainfall is scarce in this region making it highly vulnerable to droughts and climate variability. This region is also exposed to increasingly common heat waves. Puesto García and Tahiguaty are composed of different groups, including indigenous Guaraní people, traditional livestock breeders and *mestizo* immigrants. The Guaraní population generally depends on traditional rain-fed subsistence farming, honey production and day labor while the other two social groups depend more on livestock breeding and irrigated cash-crop farming for livelihoods. The selection of these two communities allowed for an investigation of differentiated, intra-community gender roles and inequalities amongst women and men of different ethnic groups or socio-economic classes who live within the same community boundaries.

GENDER ROLES IN RURAL COMMUNITIES

Gender roles are defined as the behaviors, tasks and responsibilities a society defines as "male" or "female." These roles are established by cultures and societies because of certain belief systems on the one hand, and certain necessities on the other. They are profoundly linked with the sustenance of all types of livelihood systems.

Female dominated responsibilities are undervalued in economic terms in comparison to traditional male work. Reeves and Baden (2000) elaborate further,

> "roles typically designated as female are almost invariably less valued than those designated as male. Women are generally expected to fulfil the reproductive role of bearing and raising children, caring for other family members, and household management tasks, as well as home based production. Men tend to be more associated with productive roles, particularly paid work, and market production. In the labour market, although women's overall participation rates are rising, they tend to be confined to a relatively narrow range of occupations or concentrated in lower grades than men, usually earning less. Historically, women's productive roles have been ignored or under-valued, particularly in the informal sector and subsistence agriculture."

The case studies show this as well, with rural men responsible for activities in the productive,[ii] cash-generating sphere like cash-crop farming, natural resource extraction (timber and mineral), transportation services and migrant or wage labor. Conversely, women are shown to dominate activities that do not produce much income. These include domestic duties (childcare, food security and preparation, and cleaning), subsistence activities like tending crops and small animals for food, supportive roles in productive activities like agriculture and other small cash-income activities like artisanal craft production and bee keeping. For example, among the Yuracaré, commerce is essentially a

ii Although there are many ways to be "productive" including from within the home, we define productive roles as those that deal with earnings and economic empowerment.

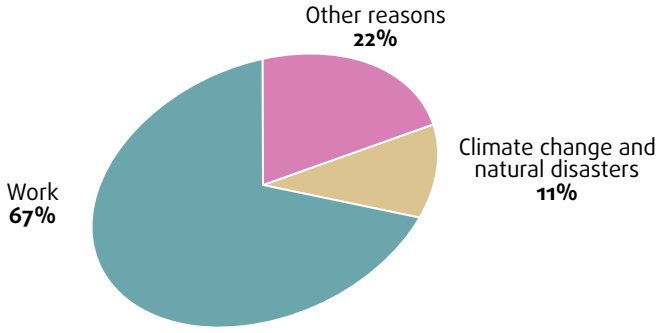
male activity. The local fishermen's association and timber related activities are comprised exclusively of men. Yuracaré women are mainly relegated to domestic duties or limited cash-income activities.[1]

Women often support their husbands in productive and labor-intensive activities. For example, when Guaraní men work as day laborers,[2] women often help them without pay. As a young Guarani women commented, "When my husband leaves for (day labor) work, I help so we can finish sooner and earn money more quickly."[3] In general, the group discussions and women's testimonials from all three regions show that the role of women in productive activities is "to help" the man or temporarily take over responsibilities in his absence. This shows that men are the primary representatives of the family in the economy but also that women serve a very important function that is easily overlooked and undervalued in economic terms. One 50-year-old Chaco woman said, "We live more off of what my husband earns. The work I do and the things I sell are only to help."[4] By contrast, evidence shows that men rarely engage in household or other traditional female activities.

Migration is a strategy used by men to respond to a variety of factors both positive and negative. Migration patterns are often hard to measure from surveys, since those who have migrated are not present to participate. Still, secondary literature (see Morales 2010, Bohrt 2009) and the case studies show that migration is dominated my males.

Figure 1

Reasons that men migrate from case study communities



Community surveys show men were frequently mobile for a number of reasons, which include finding work and alternate sources of income (i.e. seeking opportunities) and recovering from losses associated with climate events such as drought, flooding and generally less predictable weather patterns (i.e. minimizing costs) (See Figure 1). While migration enhances certain benefits like greater access to external resources and knowledge, it also entails hard work and increased vulnerability for men. Individuals that migrate usually do so as a coping strategy because of heavy losses in agricultural production or other livelihoods (Morales 2010). There is also pressure on men to migrate during crises, which can be a very heavy burden for them as well. Especially when one considers that labor migrants in the cities and mines have their own set of challenges and vulnerabilities, including the risk of illness or death. It should be noted that men in the survey generally perceive migration as positive.

By contrast, adult **women rarely migrate** (not a single adult women from the survey said she has recently traveled outside the community). As the community surveys show, 31% of women live alone in the communities compared to 15% of men (21 women, 10 men). In the rare cases where women are forced to migrate, they tend to take their children with them. This is the case among Yuqui women who

temporarily migrate to neighboring towns when faced with restricted access to food because of climatic factors. Also, in all three regions, young women tend to migrate as much as men when families send the youth to study or generally seek better opportunities. This could impact future migration patterns and the gendered population composition in rural communities.

When men emigrate they leave women behind as the de facto head of the household with all of the responsibilities and tasks normally performed by men, in addition to their previous workloads. The absence of the man increases the workload for the woman who tends to stay behind in their communities taking care of domestic tasks and productive responsibilities as the new local breadwinner.[5] In the highlands, for example, many of the men have migrated to work in the mines, leaving women in charge of productive assets in the community like livestock and cultivable land. It is not uncommon for these men to die or be seriously injured in the mines,[6] leaving a relatively high proportion of widows. One of the participating communities in the study estimates that 15 out of 70 families are headed by widows (21% of the households).[7] Locals commonly view widows as being the most vulnerable in times of crisis.[8]

9

Box 3

Women Heads of Households: Challenges and Opportunities

The number of female-headed households is increasing in many parts of rural Bolivia. In some ways, these women have better opportunities than other women, including greater access to decision-making structures and control over family-owned resources. However, the survey and qualitative interviews from all three regions indicate that women generally perceive "being alone" as negative because they are left with greater workloads, they lack traditional male knowledge and support and they suffer a social stigma associated with their status. Many testimonials have described these dynamics.

> *Life has worsened, particularly the discrimination that comes with being abandoned by my husband. I am alone with the work, and there is nobody left to help me."*
> Felipa Amaru, 56 years old, Chullo-Oxani, Highlands.

> *Single women cannot do much – only with help from their family or adult children - because the work in the field is hard and there are basically no ways forward."*
> Fidel Padilla, 65 years old, Chaco.

> *Women have to assume more work both in agriculture, stock breeding and domestic work because of (male) migration."*
> Bertha Poma, 37 years old, Corquemaya Highlands.

> *Sometimes I feel that the responsibility of being part of the association is a burden. It's a great responsibility because I have to be present at all of the meetings (…) and fulfill my other community tasks. Even though people know that I am alone, they expect me to complete all of this additional work."*
> Nicolasa Zapata, 50 years old, widow in Ingavi, Chapare.

Gender roles are dynamic and rapidly changing in many communities. Gender roles tend to be more dynamic within populations and regions influenced by temporary or permanent migration. This is true for the Quechua speaking migrants in the Chaco and Chapare regions and for the Aymara communities where men migrate to work in the mines. The opposite is true for some indigenous groups, like the Yuquis, Guaraniés and Yuracarés, where gender roles and the divisions of labor tend to change less. These examples underlie the important point that gender roles represent general tendencies but are not immovable rules. Many other factors influence gender roles, like culture, socio-economic or marital status, age or educational levels.

Changes in gender roles appear to be determined more by earning potential than by tradition, with men responsible for the most lucrative activities. For example, in the *Altiplano,* women are increasingly becoming responsible for the sale of agricultural products and livestock, but this only happens because men are working predominantly in mining, which is much more lucrative.

Women's double duty in both domestic and productive activities increases their workload more than men in rural Bolivia. The survey shows that women dedicate on average four hours a day to agricultural activities and seven hours per day to domestic tasks, which adds up to 11 hours. Alternatively, men dedicate 5.4 hours a day to agriculture but only 1.4 additional hours a day to domestic tasks, a total of 6.8 hours. A woman from Ingavi (Chapare) describes her typical day, "In the home, women do all of the work. We get up at four in the morning to cook, later we send the children to school. At seven, we leave to work in the field for the entire day and at night we return to cook again and maybe wash some clothes or do some other domestic work…and then we sleep. There is no time for anything except work."

ACCESS AND CONTROL

Access is defined as "the ability, right, or permission to approach, enter, speak with, or utilize community resources or assets." However, by saying that access is a "right" to utilize resources would also signify control over said resources. Obviously, this is not always the case, especially when differentiating access based on gender, since both men and women often have "access" to a given asset, but who "controls" it often depends on the asset in question and other community characteristics.

Sikor and Lund (2009) argue that it is useful to think in terms of the concepts of access and property on the one hand and power and authority on the other because the process of seeking authorizations for property claims take place where power and authority exist. This is particularly true in rural Bolivia where case study evidence indicates that women often access resources and community decision-making structures "through" men. However, gendered community relations do not simply reflect male dominance and female subordination, but are spun into a much more complex and dynamic web of gender relations (Cleaver 2000). Still, according to Reeves and Baden (2000), "Gender analysis has revealed some evidence of bias against female members of households in the allocation of resources such as income, food, nutrition, health care and education. These patterns are not universal, however, and are also mediated by other factors such as age, and birth order."

Access to resources is determined in part by gender roles. Although survey respondents often said that women and men have joint access to resources, in practice access is highly influenced by gender. For example, women's roles in the domestic sphere mean that they have greater access to domestic resources. These include, for example, food for sustenance, resources for children's education and small animals. Men's roles in the productive realm mean that they have greater access to resources like cash crops, money and productive equipment. While access tends to be a practical outcome of gender roles, i.e. those responsible for activities in a certain sector will consequently have access to the resources of that sector, control is more of a social construct. There is very little practical justification for men controlling resources and decision-making structures; in fact, Westermann et al. (2005) demonstrate that community organizations and collective action where women are present tend to be more self-sustaining and apt to resolve conflicts.

In order to understand the gendered access to resources, we structure the subsequent analysis by following the Community Capitals Framework[iii] (Flora and Flora 2008), which has defined seven types

iii The Community Capitals Framework is similar to DFID's sustainable livelihoods framework, but includes the additional political and cultural capitals.

of community resources. These include *natural, built, cultural, human, social, political* and *financial* assets. These assets can be used, invested, or exchanged to create new resources. This section will include a description of the relative access and control by women and men over each of these seven resources.

Natural and Built

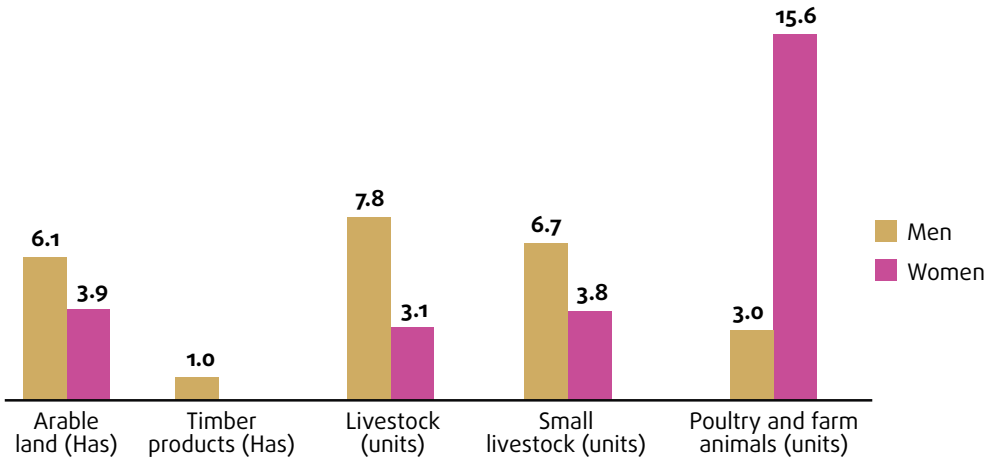
Natural resources refer to assets that exist in the natural environment such as water, agricultural land, forests, etc. *Built* resources refer to infrastructure assets such as roads, schools or houses. Together they represent the resources that can be owned by a given individual. In Bolivia, these types of assets are generally owned communally, by the family or by men, though women are increasingly gaining more rights.

Ownership patterns for women and men are not equal and generally depend on the type of resource in question. In the case of cultivable land, the survey shows individual male ownership is two-and-a-half times higher than individual female ownership, though family ownership is the most common type. For example, the gender gap in relation to land titles is evident among the "Intercultural" group in the Chapare region, with women owning only 12% of the land and men owning 38%. Women's plots also tend to be smaller, on average 3.9 hectares for women and 6.1 hectares for men. This is consistent with national surveys (Nina 2009) that show 19% of land titles issued in 2007 were for women, while 47% were for men. The remaining 34% represents co-ownership. Forest resources are typically communally owned; through men dominate productive activities related to timber.

Women or the family generally own the household's small farm animals, which are usually used for subsistence. Men typically own small livestock or cattle; the productive animals. According to the survey, the average number of cattle (cows) owned by men is 7.8 animals compared to only 3.1 animals in the case of women. When discussing small livestock (sheep, goats, llamas, etc.), on average, men owned 6.7 animals and women owned 3.8 animals, respectively. By contrast, 15.6% of women own farm animals (poultry, pigs, guinea pigs, rabbits, etc.) compared to only 3% of men. General patterns of individual ownership can be seen in Figure 2.

Figure 2

General ownership patterns in the seven investigated communities



***Built* resources are owned communally, publicly or privately, depending on the specific resource.** Communally- and publicly-owned resources include roads, schools, irrigation systems, river defenses and community-constructed eco-systems (such as high altitude peatlands). Though both women and men have access and relatively equal user rights to these resources, they tend to be controlled by men since they represent the family in community organizations and have greater access to municipal or public officials. Women and men within the household usually negotiate control over private individual- or family-owned *built* resources such as housing, water harvesting and storage infrastructure, and wells.

Cultural

Cultural resources refer to assets related to the way people view the world. These include such things as local languages, food and traditions. It goes without saying that these resources are equally accessible to men and women alike. However, **it is often women who act as the caretakers and transmitters of this knowledge.** In group discussions from all three regions, both women and men emphasized that it is mostly women who transmit culture and traditions. The survey suggests that this happens through their day-to-day raising and caring for children.

Women's cultural resources can help build other assets as well. Among the Yuqui, the production and selling of crafts is the only activity that women do alone[10] and therefore is an important forum for them to exchange knowledge and experiences with each other (build human capital). At the same time, the little bit of income generated from this activity goes to the women themselves (creates financial capital). This makes it an important way for increasing their independence and position within society (strengthens political capital).[11]

Human

Human resources refer to "people" assets such as the education, knowledge, skills and training possessed by people of the community. **In general, women's access to human resources is limited by their roles.** Key barriers to this access include the need for women in reproductive and domestic tasks, the absence of women in community decision-making, the heavy workload of women[12] and male suspicion (see Box 4).

[13]

Box 4
Male Suspicion

Case study evidence shows that men are often concerned about women traveling to the city for training, education or other activities because, as one man suggested, "the women will be tempted to do bad things." Yuracaré men say they fear women will have affairs and be influenced to question traditional gender roles. Of course, what is good for the goose is good for the gander; Yuqui women are also suspicious and are known to secretly follow men when they leave the community. To overcome this suspicion in the male or female group discussions from the case studies, it was important to keep the other gender group informed. In one instance, it was necessary to allow a male representative to participate (without voice and vote) in a women's group discussion in order to demystify the proceedings.

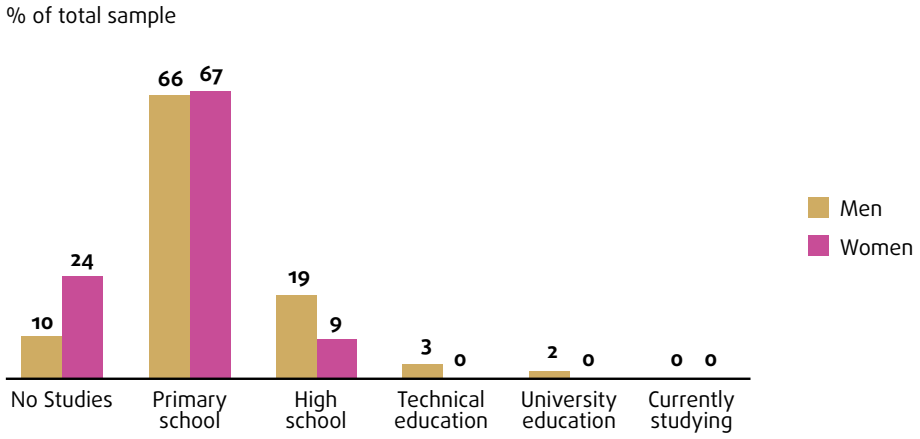
The heavy workload of women limits their mobility and opportunities for human development. In fact, the fieldwork shows that it is often the women themselves who "delegate" men to participate in technical trainings and other activities. The survey shows that 38% of women had individual access to training, compared to 53% of men. 46% of women claim to have had what is called "family access" to training. Family access can mean one of three things, (i) that the entire family has access, (ii) that men and women alternate access, or (iii) that men represent the family in trainings.

Women in the rural areas of Bolivia have lower levels of education than men. While a high percentage of the general rural population is illiterate, the majority are women. In all three regions, on average 24% of women reported having no educational background at all. Only 10% of men could say the same. This is relatively consistent with national statistical information, which estimates that 30% of rural women are illiterate compared to only 10% of men. This educational disparity is reduced among children with only 5% fewer rural girls accessing schooling than rural boys (INE 2010). While no differences were evident in the percentages of men and women with a primary education, there are twice as many men with a secondary education. Furthermore, while secondary education is the highest level of education attained by female respondents, 3% of the male population reported receiving some sort of technical education with an additional 3% attending a university (refer to Figure 3). These trends run contrary to global patterns. According to the 2012 WDR (World Bank 2011: xx):

> "Gender gaps in primary education have closed in almost all countries. In secondary education these gaps are closing rapidly and have reversed in many countries, especially in Latin America, the Caribbean, and East Asia – but it is now boys and young men who are disadvantaged. Among developing countries, girls now outnumber boys in secondary schools in 45 countries and there are more young women than men in universities in 60 countries."

Figure 3

Education levels of women and men in the seven investigated communities



Less education inhibits women's ability to build capacity in technical trainings at the community or extra-community level. Women are often illiterate and less qualified than men in terms of the skills needed to thrive in a typical training workshop, which often requires the ability to read, write and comprehend technical presentations.[14] The survey found that a higher proportion of older women than young were illiterate. This creates a paradox, as it is typically the older women who would participate in human capacity building and training, while younger women are too busy attending to domestic tasks.

Women's educational disadvantages reinforce a cycle of poverty; poor people are unable to pay for education and as a consequence lack the skills to attain a job, which would allow them to overcome poverty. According to the 2012 World Development Report on gender (World Bank 2011: 106):

> "Investments in education determine women's ability to earn higher wages and to own and operate productive farms and firms. On average, differences in education explain a significant fraction of the variation in wages and incomes among adults. In both high- and low-income countries, gender differences in education have contributed significantly to the productivity and wage gap between men and women."

Social

Social resources refer to networking assets. These resources include people's relationships, bonds or loose ties with organizations or other individuals in positions that can provide support in terms of capacity building or other themes, or during times of crisis. These networks can be both formal and informal.

Men in rural Bolivia possess greater formal social capital than women. Both the survey and group discussions clearly indicate that men participate more actively in community organizations, community work and communal natural resource management. They are the ones negotiating with the municipalities, solving potential conflicts in the community or with other communities, and migrating. Each of these activities brings men into contact, and builds relationships, with institutions external to the community. This allows men to seek support in issues that concern them and, as Borht (2009) notes, return the externally acquired knowledge and capacity to the community.

Women, by contrast, travel much less and do not often participate in technical trainings. This limits their ability to access local decision-makers, attain technical knowledge and establish bonds outside of the community. Unlike men, women's social capital tends to be concentrated in informal institutions and within the realm of domestic activities. It was observed in several communities that these institutions are relatively flexible in their dealings and have been used to adjust to newer challenges like climate change and male migration.

Political

Political resources represent power and control and the connections to people who have power and control. An example of this resource is the ability to make decisions regarding the use of other resources.

Women and men identify the family as a key decision-making forum. Both female and male respondents in the survey emphasize that most decisions are made as a couple/family. 56% of men said that decisions were made as a family, while 45% of the women respondents said the same. Despite this slight difference, the importance of the family as a social arena for decision-making is clear. This fact was summed up nicely by a 43-year-old women from the Chaco when she said, "There are certain tasks performed only by men and others only by women, but we are always sure to ask one another to know what to do."[15] In the highlands, the complementarity of gender roles and decision-making follows the concept of *Chachawarmi* ("duality" in the Aymaran language), or the harmony between man and woman. This concept is correctly recognized as a strength by many, but should not be romanticized to the point where it causes people to overlook real inequalities (Nina 2009).

"Male bias"[iv] **occurs in Bolivia** when men unwittingly control formal decision-making structures and women feel constrained from participating or voicing their opinions. Although both women and men said that many decisions are made as a household, in the end, it is the man who represents the family and has the greatest influence on community decisions. For example, in Corquemaya (Highlands), men consult their wives for their opinions and inputs "depending on the topic."[16] This demonstrates a power dynamic in which women's voices are heard "through men," but men are the ones who control what issues "merit" female consultation. The survey shows that 31% of men have held a community leadership position compared to only 15% of women. For example, amongst the Guarani, women are increasingly participating in community meetings, yet are rarely permitted to lead them.

This unequal power dynamic between women and men in decision-making persists even when women are present. For example, in the Highland communities, women would often remain silent during meetings, or when they did speak, their opinions were not valued as much as a man's. A key informant from the Highlands commented that, "Both men and women participate at the meetings, but women are not heard nor taken seriously. When women are alone amongst other women, they speak up more."[17]

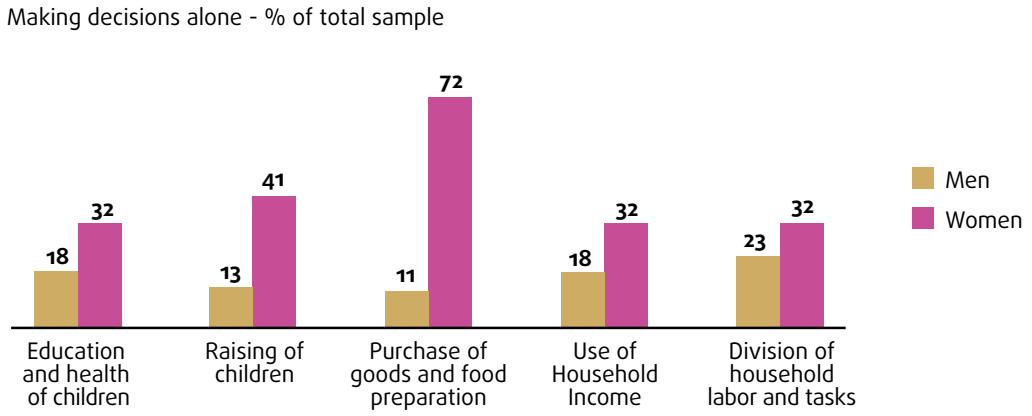
There is a disadvantage for women in making their views heard and having their needs prioritized in community planning. In the highlands, women are described as "shy." During group discussions, women themselves reported feeling uncomfortable in large events and cited their lack of education and experience in the public realm as the main reason for this. As a consequence, community organizations, municipal participatory planning and budget allocations usually reflect a male view of reality. One result of this in the Chaco region is that women tend to receive limited municipal resources as community demands are mainly prioritized and presented by men.[18]

Despite these disadvantages, women act as primary decision-makers in domestic issues. According to Cleaver (2000) women have a lot of influence when negotiating domestic matters within the household. Survey results show that these issues include child raising, children's education and health, the purchase and preparation of food, and household finances and savings (see Figure 4).

iv For more information on "male bias" refer to Elson (1995).

Figure 4

Individual decision-making regarding domestic issues is dominated by women



Financial

Financial resources refer to money and access to funding such as credit, savings or grants. **Men are typically in charge of the most lucrative productive activities and therefore dominate access and control of these resources.** The survey revealed that agriculture and livestock are seen as the main sources of family income. Both are activities that include female and male participation, though men tend to own the land and the cattle and, hence, control the wealth.

Men earn higher wages than women in rural areas. For example, in the highlands (Chullo-Oxani), a high percentage of men migrate to the mines where they receive monthly payments that fluctuate between 3000 and 6000 Bolivianos (US$450 and US$850). This is a source of income that women cannot earn themselves. The National Statistical Institute (INE 2010) estimates that rural income differences between men and women are around 460 Bolivianos (US$65) per month.

Women often control family savings and have relatively good access to credit. Both Quechua speaking migrants and Aymaras from the highlands emphasize that women are responsible for the family's savings. Survey results also indicate this (see Figure 4). As a result, although women generally have less access to cash-income than men, this increases once these earnings enter the household. In terms of access to credit, according to Muller and Riveros (2007), 44% of all micro-credit loans in Bolivia are given to women.

THE GENDER AND CLIMATE CHANGE NEXUS IN BOLIVIA

Climate change can be defined as a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer) (IPCC 2001). However, when we discuss climate change in relation to how it impacts gender roles, we are actually referring to climate change "exposure" and climate change "impacts." *Exposure* can be defined as the character, magnitude, and rate of climate variation to which a system is exposed (IPCC 2001). In other words, this definition would include hazards such as floods, droughts, glacial retreat, inter-annual weather variation, out-of-season frosts and natural disasters. Climate change *impacts* refer to the social and environmental consequences from this *exposure*. These include such effects as increased water scarcity, migration, loss in agricultural yields or drops in livestock production.

Rural Bolivia, where 35% of the population lives, is highly vulnerable to climate change. This vulnerability is exacerbated by the lack of quality infrastructure (e.g. irrigation, water storage or flood control systems) and high levels of poverty. The country's extreme topography, high biodiversity and cultural heterogeneity impose very context specific climate impacts. Both hydro-meteorological experts and other Bolivian case study results expect that the most significant climate change impacts in Bolivia will be related to water (Morales 2010, UNDP 2011). These include risks associated with flooding, water scarcity, unpredictable rainfall patterns and seasonal changes (World Bank 2010b), all of which are made more severe by the ENSO phenomena (El Niño y La Niña). Several recent studies have analyzed climate change projections, impacts and vulnerabilities in great detail, so it will not be repeated here (for more information refer to World Bank 2010b, IDB 2010, UNDP 2011). Locals from all three regions identified, during group discussions, female heads of households, small children and the poor as the most vulnerable to natural disasters and climate change.

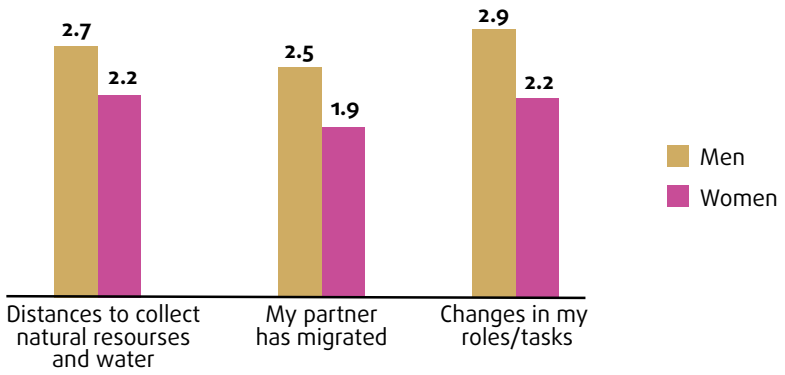
Gendered Perspectives of Climate Change

In all three case study regions, **women and men observe identical changes to the climate**. In the Highlands, locals are observing increased temperatures and water scarcity. In Chapare, it is mainly flooding and the consequent contamination of local water supplies. In the Chaco region, drought is the main observed risk. In other words, women and men tend to identify the same environmental changes and risks despite their differentiated roles and access to resources.

Women perceive impacts from climate change to be more severe than men do (see Figure 5)**.** The survey shows that in 13 out of 14 categories of climate impacts, women perceive them more negatively than men. Women were especially keen to point out how climate changes have led to negative consequences that include changing roles, increased workloads, and increased male migration. Men perceive the impacts more negatively than women only as they relate to agriculture. 55% of men perceive climate change impacts on agriculture negatively compared to only 3% who view it positively. This is likely due to the significant physical work that men are responsible for after natural disasters. Interestingly, 19% of women view climate change as having a positive impact on agriculture. It is unclear why exactly this perception exists, but may be due to the ability to grow new crops in the warmer weather, as evidence has suggested in the Highlands.

Figure 5

Perceived impacts by men and women from climate change
(1 = very negative, 5 = very positive)



Gendered Impacts from Climate Change

The study shows that both women and men face an increased workload as a result of climate change and natural disasters, but the reasons for this are different. The field investigation shows that men see a dramatic increase in their workload during natural disasters while women more often see increases because of incremental, slow-onset climate changes, in addition to natural disasters.

Men in the different regions are generally responsible for reconstruction after natural disasters.[19] In the Chapare region, men face increased workloads (especially physical labor) from flooding, since they have to prepare fields (by moving dried mud) and rebuild damaged homes. Men in the Highlands also reported a greater workload from preparing fields. Yuqui men, on the other hand, emphasized that flooding actually led to a positive outcome. They reported there being increased accessibility to wild animals during flooding, which reduces their hunting workload.

In all three regions, climate changes impact domestic water supplies and, as a result, add an additional burden to women's ability to provide water for their families. In all three regions, water management is considered a domestic task and is, therefore, a female responsibility. In the Yuracaré community, at times of flooding, families move away from the rivers to protect themselves. As a result, women must walk farther and take more time to fetch drinking water, as flooding destroys access points to the river.[20] Women in all three case study communities in Chapare also observe that the quality of drinking water diminishes during floods, as pollutants mix with clean water supplies.

Women believe this is contributing to an increase in child illnesses, especially diarrhea. Caring for the sick is the responsibility of women. Guaraní women in the Chaco also complained of the increased workload from collecting water during times of drought. One Guaraní women said, "The women suffer most when there is no water, because we use the water to cook, wash clothes, clean the house and give to the small animals. So now we need to walk further away to the lake to fetch water."[21]

Climate changes have made it more difficult for women to provide food for their families. Food security issues, which can be exacerbated by climate change (FAO 2008), become an added burden for women as they attempt to feed their families. This is the case in the Chaco, where subsistence agricultural and animal husbandry yields have been reduced significantly during a three-year period because of a decline in precipitation.[22] This particularly affected the Guaraní population, which does not have access to irrigation. In the highlands and valleys, rain-fed agricultural systems are highly vulnerable as well (Morales 2010). On the positive side, higher temperatures in the Highlands have improved the ability to grow a greater variety of crops in the high altitude and diversify family nutrition.[23]

24

Box 5
Climate change impacts traditional diets

In the Highlands, women and men said that increasing temperatures make it difficult to produce the freeze-dried potatoes, chuño, which are an important part of basic nutrition. Chuño needs at least a couple of continuous weeks with frost at night, but this is becoming more rare because of a warming climate. The Chuño is important because it is a traditional part of the Aymara diet and because it can be preserved and stored for the entire year.

Women are not a single homogenous group and their vulnerability is determined by many different factors, including poverty levels, social group membership and respective livelihoods. For example, in the two Chaco communities, Guarani women felt significant impacts from drought. Specifically, they experienced challenges related to food security and increased workloads related to water collection. In many cases, these women were compelled to sell land or animals and seek work as day laborers, just to afford basic staples like corn.[25] In contrast, the intercultural migrant women of the same communities did not see droughts as a major problem. This was probably because of their access to functional irrigation systems, which reduces the risk of water scarcity.

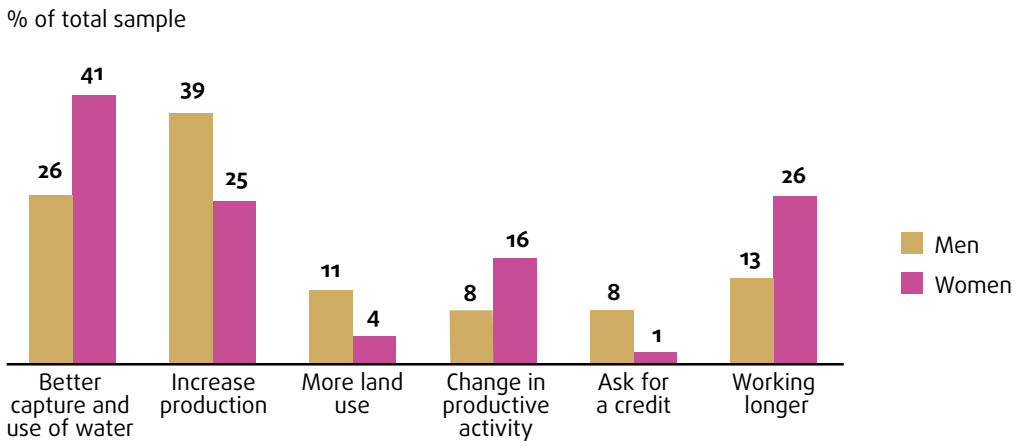
Gendered Responses to Climate Change

Adaptation refers to adjustments in natural or human systems, in response to actual or expected climate stimuli or their effects, which moderates harm or exploits beneficial opportunities (World Bank 2010a). Obviously, the types of adaptation measures that exist are too numerous to examine here. Though, according to Morales (2010), rural community adaptation measures in Bolivia mainly revolve around water and agricultural improvements.

Women have more of a tendency to engage in autonomous (individual and low-cost) adaptation while men show more of a propensity towards planned community adaptation measures. These differences in adaptation strategies reflect both differential gender roles and the relative access of women and men to resources. Still, this is not a hard rule, since women and men frequently engage in each type of strategy.

Figure 6

Gendered responses to climate change



Men tend to adapt to climate change by using more resources, while women adapt by using resources more efficiently. Figure 6 shows that men have preferred actions like increasing production, utilizing more land for productive purposes and attaining additional credit to cope with climate change. By contrast, women have preferred actions like making better use of water, changing productive strategies and working longer hours. In other words, a typical male adaptation strategy includes using more resources, while a typical female adaptation strategy includes using existing resources better.

Men, on account of being outside of the community more frequently, have greater access than women to technical training and knowledge resources. As a consequence, they are more likely to apply these techniques.[26] This was seen in the Highlands case study where men engaged in an ambitious attempt with regional NGOs to establish a new integrated farming and livestock association and to obtain funding to improve irrigation systems: a strategy that requires technical knowledge and political capital.[27]

Women, by contrast, tend to stay in the community and adapt their behaviors according to their roles and responsibilities. These roles require them to work directly with local natural resources while maintaining the home and tending to crops or animals. As a result, their adaptation efforts are simple, low-cost activities that can fit into their overloaded workday. These adaptation strategies in case study communities include the creation of vegetable gardens, the use of new seed varieties, the strengthening of the *Ayni* tradition (see Box 6), the discovery of clean water supplies and the development of alternative income sources through activities like apiculture (which took place in the wake of extended droughts in the Chaco).

Box 6
Revitalization of the Ayni

In the Highlands, women have coped with a more unpredictable climate by revitalizing the traditional practice of *Ayni*. The *Ayni* is a traditional form of mutual help within the Aymara community (*Ayllu*) where members assist others. It is primarily practiced during the planting and harvesting agricultural seasons, but also for other tasks such as home construction, animal husbandry and child care. It is expected that this help will be repaid in an equal manner. The *Aynis* also provide women with the opportunity to exchange experiences, develop new capacities and strengthen their position in the community.

The *Ayni* is not solely a female practice and is more of a social and practical custom than a solidarity structure. However, women in highland communities faced with increasing climate vulnerability and high rates of male emigration have seen a strengthening of the *Ayni* tradition. In the Highlands, women used the Ayni to construct water reservoirs capable of supporting entire families. This mutual support system also serves as a form of community insurance during busy periods when work burdens are high. The *Ayni* is an illustrative example of how women are taking a leading role in rural communities to adapt to climate change and other challenges.

The heavy workloads of women are main barriers to their participation in adaptation projects and training. In female group discussions from the three regions, participants emphasized a strong interest and need for more information and technical training related to climate change but emphasized that finding the time for these activities would be difficult. For example, the women from the community, Ingavi in Chapare, expressed such an interest. They proposed that these trainings take place at night once they had completed their extensive daily responsibilities, but were concerned they would be too tired to participate.

Women's adaptation strategies differ depending on their roles and social circumstance. The most illustrative example of this was observed in the Chapare region where Yuqui and Yuracare women do very little about the flooding that affects their communities. As a response, they take only minor, reactive actions to ease the impacts, such as planting crops and moving belongings further away from river. One Yuracare individual stated, "You just have to live with (the flooding) and make minor adjustments while you wait for the water to lower."[28] By contrast, "intercultural" women of the same region make a greater attempt to limit the impacts from these weather events. They store dried food, solicit the municipalities to take preventive actions, stock up on cooking gas and hire day laborers from other regions.[29] These differences reflect the social norms and economic status of each group. This was also observed in the Chaco where Guarani women, because of their dependence on traditional rain-fed agriculture and relative poverty, look for short-term wage-labor opportunities during severe droughts.[30] By contrast, the "intercultural" population of this region takes advantage of the sudden availability of cheap labor to improve their own lands or, in some cases, purchase additional land or irrigation rights from the vulnerable Guarani.[31]

CONCLUSIONS

The study revealed several generally defined gender roles. Men tend to be responsible for community work (including community representation), physical work in the agricultural sector, and high value economic activities (mining, timber, cattle, etc.). Women, on the other hand, are responsible for domestic tasks (cooking, cleaning), reproductive and caretaking activities, supporting the man in productive sectors, subsistence activities (domestic animals, subsistence crops and gardens) and small-scale income generating activities (artisanal crafts, bee keeping, etc.).

Women and men do not have equal access to resources. Men tend to have greater access and control over most local resources. Women only have greater access and control over cultural, reproductive and domestic assets. However, many traditional roles are rapidly changing and in many communities, and under certain circumstances, women are attaining greater access and control over other resources (e.g. credit, family savings, land, etc.).

Women increasingly participate in community decision-making but often as a "replacement" for the man of the household. This is particularly the case in regions with high male migration rates. In more traditional ethnic groups such as Yuqui, Guarani and Yuracare, women continue to play a limited role in community organizations.

Migration is a predominantly male strategy for reducing risk from climate impacts and for pursuing labor and knowledge opportunities. Migration is generally viewed positively by men and negatively by women. This perception by women in part reflects the fact that migration represents an increased work burden for them.

Gender roles are rapidly changing but this mainly takes the form of women assuming male responsibilities, not vice versa. This study shows a greater tendency for males to migrate and seek wage labor. In these cases, women tend to take over male responsibilities in the communities, which significantly increases female workloads. By contrast, it was not observed that men are becoming more involved in domestic and reproductive responsibilities. How women and men perceived these changes depends on their individual situations, but generally women view them as negative and men often see them more positively.

Gender roles are complex, changing and depend on many factors. As Cleaver (2000) puts it "people's gendered position and priorities are not fixed but change with age and circumstances." These

differentiated interpretations and roles not only vary between regions and ethnicities but amongst them as well. For instance, while Guarani women dominated workshops in one community in the Chaco, in another, hardly any Guarani women participated at all.

Women and men generally observe the same changes to the climate but women view the socio-economic impacts, more negatively than men. This likely reflects women's greater role in domestic and subsistence duties and their exposure to the natural environment. It is also reflective of the greater climate resilience of certain male activities, like mining, timber harvesting, transportation services and certain types of wage labor.

Natural disasters tend to increase the workloads of both sexes, while slow-onset, incremental climate changes lead to a greater increase in the workloads of women. Men's physical work increases significantly during and after natural disasters, as they are responsible for protecting and reconstructing homes, agriculture lands and community infrastructure. Women's workloads also increase during these times as they must attend to the sick, young and elderly and provide water and food at a time of scarcity. During incremental climate changes and the associated impacts, men are changing their activities (more migration and day labor, less community activities). By contrast, women are maintaining their traditional responsibilities but also assuming the former community and/or productive duties of their husbands.

Climate change adaptation strategies employed by men and women differ significantly. Whereas men focus on large-scale community interventions (e.g. irrigation, river defenses), migration, or seek employment as day laborers; women tend to focus more on practical and innovative improvements such as seeking alternative water supplies, protecting assets, planting new crop varieties or supplementing traditional incomes through activities likes honey production or handicrafts. These differences reflect traditional gender roles and the greater access of men to knowledge resources, such as technical trainings. Evidence also shows that women prefer adaptation strategies that employ a more efficient use of existing resources.

RECOMMENDATIONS FOR PRACTITIONERS

Women should be targeted as counterparts in rural development initiatives, as they tend to stay permanently in the community. Women with children do not generally leave the community and mainly view livelihood improvements through local community development. By contrast, men often seek wage employment or migrate as an alternative development strategy. Therefore, community development initiatives should specifically target women to participate since they often become responsible for the day-to-day management of these projects.

Donor and development agencies should promote activities and projects that aim to reduce the workload of women. This study has shown clearly that women are already overworked in rural Bolivia and this situation is worsening because of climate change, migration and natural disasters. This is a main barrier to women's participation in development projects, climate change adaptation efforts, technical trainings and productive activities. Women from the case study communities emphasized that simple investments can make their workloads lighter. Goods such as cooking gas, grinding mills or potable water can significantly reduce their domestic workloads. This is consistent with the 2012 World Development Report's priority of giving women greater voice within households and societies (Domestic Policy Action 3).

Development projects should adapt their methodologies towards specific groups of women, not towards women generally. It was clear from the case studies that women are not a homogenous group but individuals that act according to their specific interests, barriers and social standing. Identifying this heterogeneity can strengthen project outcomes by supporting the relative capacities and deficiencies of certain women's groups. These groups could include widows, single mothers, women leaders, the elderly, the young, and those of different ethnic groups and economic standing.

Technical trainings should take place within individual communities and be targeted towards increasing the access and participation of women. Women's access to community decision-making and training is limited. They do not possess the resources or time to leave their communities to receive training. For this reason, capacity-building workshops should take place locally. Also, as this study has shown, women often feel uncomfortable voicing their opinion in

public, in large forums or in front of men. That is why some training workshops ought to be smaller and open only to women. Such a format allows women to speak more freely and share problems, interests and ideas. These training workshops should consider women's lower educational levels, be held in local indigenous languages and utilize visual aids. Furthermore, these workshops should be held during hours in which women are relatively free. This could mean that meetings take place at odd hours. Speaking to individual women beforehand can help identify ideal times. Finally, it is crucial to keep an open dialogue with men to avoid raising their suspicions when women leave the home. This recommendation reflects the 2012 World Development Report's priority of addressing gender gaps in human capital (Domestic Policy Action 1).

Women and men's response strategies to climate change differ and should both be supported. Men and women often propose different climate adaptation projects based on their differentiated roles, responsibilities and access/control over resources. Projects proposed by women tend to be more innovative, individual, small-scale and low-cost. Projects proposed by men are often larger-scale, more capital intensive and more technically complex. Climate adaption funds should therefore be equally directed towards large, formal projects AND smaller informal projects. These projects should be measured by total investment, rather than the number of projects being implemented, to avoid giving preference to initiatives that differentially benefit men.

Investing in women can improve climate change adaptation outcomes. Evidence suggests that increasing women's access to resources will increase the positive outcomes of activities in which women typically participate. For example, Thomas (1990 and 1992) shows that income or assets in the hands of women are associated with larger improvements in child health and a greater share of expenditures on household nutrients, health, and housing. The reason for this is that women are typically charged with the role of caring for the children and maintaining a healthy and functional home. Extending this logic to adaptation, it becomes pertinent to ask what roles do women carry out related to climate change. Women play a central role in local water resource management and crop management, therefore, greater resources (especially human/knowledge, political and financial capitals) in the hands of women would likely improve climate change adaptation related to water and food security.

REFERENCES

Adger, W. Neil (2006). Vulnerability. Global Environmental Change 16 (3), 268-281. Elsevier.

Ashwill, Maximillian, Cornelia Flora and Jan Flora (2011). *Building Community Resilience to Climate Change: Testing the Adaptation Coalition Framework in Latin America*, The World Bank, Washington DC.

Bohrt, Julio Prudencio (2009). Género, Estrategias Productivas y Alimentación, Fundación TIERRA, La Paz, Bolivia.

Brooks, N., W. N. Adger, and P. M. Kelly (2005). The Determinants of Vulnerability and Adaptive Capacity at the National Level and the Implications for Adaptation. Global Environmental Change Part A 15 (2), 151-163. Elsevier.

Burawoy, Michael (1998). "The Extended Case Method," Sociological Theory, 16:1, American Sociological Association.

Butler, Judith (1999). *Gender Trouble: Feminism and the Subversion of Identity*. New York: Routledge.

Cleaver, Frances (2000). Analysing Gender Roles in Community Natural Resource Management- Negotiations, Lifecourses and Social Inclusion, in IDS Buletin Vol 31 No 2, 2000.

Elson, Diane (1995). *Male Bias in the Development Process*, Manchester University Press.

FAO (2008). *Climate Change and Food Security: A Framework Document*, FAO's Interdepartmental Working Group (IDWG) on Climate Change, Rome.

Flora, Cornelia and Jan Flora (2008). Rural Communities: Legacy and Change, 3rd edition. Boulder: Westview Press.

IDB (2010). *Cambio Climático en Bolivia hasta 2100: Análisis de los cambios en la demanda hídrica y el Índice de escasez a nivel provincia, not published.*

INE – Instituto Nacional de Estadística (2010, Agosto). Actualidad Estadística – Estadística e Indicadores Económicos y Sociodemográficos de Bolivia, www.ine.gob.bo

IPCC (2001)."Climate Change 2001: Impacts, Adaptation and Vulnerability," Contribution of Working Group II to the Third Assessment Report of Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge.

Leach, Melissa, Robin Mearns and Ian Scoones (1999). "Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management", World Development, vol 27, no 2.

Lund, Christian (1994). "Tinkering Methodology: Some Considerations Concerning the Study of Access to and Control over Natural Resources", in Occasional Paper no. 13. Roskilde Universitets Forlag, Denmark.

Morales, Miguel (2010). The Social Dimension of Adaptation to Climate Change in Bolivia; World Bank Discussion Paper no. 13.

Müller, Herbert &. Riveros, Vanessa (2007). Microfinanzas: Una Historia de Éxito, Asociacion de Entidades de Financieras Especializadas en Micro Finanzas (ASOFIN), www.asofinbolivia.com/sp/documentos.as

Nightingale, A. J. (2006). The nature of gender: work, gender, and environment. Environment and Planning D: Society and Space 24, 165-185

Otzelberger, Agnes (2011). Gender-Responsive Strategies on Climate Change: Recent Progress and Ways Forward for Donors. BRIDGE/Institute of Development Studies.

Reeves, Hazel and Sally Baden (2000). Gender and Development: Concepts and Definitions. Report No. 55.BRIDGE/Institute of Development Studies.

Ribot, Jesse C. & Puluso, Nancy Lee (2003). A Theory of Access, in Rural Sociology, Volume 68, No 2, pp. 153-81.

Sikor, Thomas & Lund, Christian (2009). Access and Property: A Question of Power and Authority, in Development and Change, 40 (1): 1-22.

Thomas, Duncan (1990). "Intra-household Resource Allocation: An Inferential Approach," *Journal of Human Resources* 25(4): 635-664.

Thomas, Duncan (1992). "The Distribution of Income and Expenditures within the Household," *Annalesd'Economieet de Statistique*29: 109-136.

Westermann, Olaf; Ashby, Jacqueline and Prette, Jules (2005). Gender and Social Capital: The Importance of Gender Differences for the Maturity and Effectiveness of Natural Resource Management Groups, in World Development, Vol 33, No 11, pp. 1783-1799.

WHO (2002). *The World Health Report 2002 - Reducing Risks, Promoting Healthy Life,* World Health Organization.

World Bank (2003). *Gender Equality and the Millennium Development Goals*, The Gender and Development Group, April 4.

World Bank (2010a). *World Development Report 2010: Development and Climate Change*, Washington DC.

World Bank (2010b). "Adaptation to Climate Change — Vulnerability Assessment and Economic Aspects: Plurinational State of Bolivia," background paper for the global report *Economics of Adaptation to Climate Change*, Washington DC.

World Bank (2011). *World Development Report 2012: Gender Equality and Development*, Washington DC.

UNDP (2011). Tras la Huellas del Cambio Climatico en Bolivia: Adaptación en Agua y Seguriadad Alimentaria, Bolivia.

Annex 1 KEY TERMS

ACCESS
The ability, right, or permission to approach, enter, speak with, or utilize community resources or assets. These resources can be used, invested, or exchanged to create new resources. These include seven types of assets: *natural, cultural, human, social, political, financial* and *built.*

ADAPTIVE CAPACITY
The degree to which an individual, community or system can adjust practices, processes, or structures to moderate or offset the potential for damage as a result of, or take advantage of opportunities created by, a given change in climate.

CLIMATE CHANGE ADAPTATION
An adjustment in natural or human systems in response to climate change vulnerability.

EXPOSURE
The character, magnitude, and rate of climate variation to which a system is exposed.

GENDER
The socially constructed concepts of "woman" and "man," "femininity" and "masculinity." Gender is used to describe male and female characteristics determined through social practices, behaviors, and relations among and between the sexes, which change from context to context. Gender lies at the heart of the relationships and systems that shape societies at all levels.

GENDER ANALYSIS
An essential tool for gender-responsiveness. It entails the systematic collection and study of information on gender differences, inequalities, roles, and relations, and how they intersect with other determinants of inequality and poverty.

GENDER DIVISION OF LABOR
The socially determined ideas and practices that define what roles and activities are deemed appropriate for women and men and result in context-specific patterns of who does what by gender and how this is valued.

GENDER INEQUALITY
Result from the unequal power relations between the sexes, maintained by different types of political, economic, legal and socio-cultural mechanisms. Gender and inequalities based on gender are inherently relational, meaning that "gender issues" are not "women's issues" and that addressing such inequalities requires the participation of men as well as women.

GENDER RELATIONS
The complex, changing, and contested relations of differential power between male and female produced through the division of labor, resources and rewards between women and men, and through social and cultural ideas shaped by expectations of male and female.

GENDER ROLES
The behaviors, tasks and responsibilities a society defines as "male" or "female." They are profoundly interlinked with the sustenance of all types of livelihood systems and with the management of natural resources in rural communities.

GENDER VULNERABILITIES TO CLIMATE CHANGE
Vulnerabilities caused by heightened exposure and/or sensitivity to climate change impacts as a result of gender roles and gender-based inequalities.

GENDER-NEUTRAL
Laws, policies, and adaptation projects are often assumed to be gender-neutral. That is, it is assumed that they will affect men and women equally. Gender inequalities mean that this is not often so.

GENDER-RESPONSIVENESS
The practice of studying and incorporating understanding of the socially-constructed roles and opportunities associated with being a man or a woman in any given community in project planning, implementation and evaluation, with the ethic of reducing gender-based inequalities and improving project effectiveness and sustainability.

INSTITUTIONS
Community institutions are both understood as community-based organizations but also as more regularized patterns of practices and behavior between individuals and groups. These diverse institutions are operating formally and informally at different scales, which are in fluencing access to and control over natural resources as well as decision-making. These institutions are dynamic and changing over time as social actors alter their behavior to suit new social, political or ecological circumstances.

INTRA-HOUSEHOLD RESOURCE DISTRIBUTION
"The dynamics of how different resources that are generated within, or which come into the household are controlled and accessed by its different members.

RESILIENCE
The ability to cope with and/or adapt to long-term, systemic change while maintaining or enhancing core properties.

SENSITIVITY
The degree to which a system will respond to a given change in climate, including beneficial and harmful effects.

VULNERABILITY
The accumulation of risk through climate change exposure, sensitivity, and lack of adaptive capacity.

(Sources: Adger 2006, Brooks et al. 2005, Butler 1999, Nightingale 2006, WHO 2002, Otzelberger 2011, Reeves and Baden 2000, IPCC 2001, Flora and Flora 2008, Reeves and Baden 2000)

ENDNOTES

1. Meeting with Chapare investigation team (9/30/2011).

2. Nelly Ruiz, migrant woman, 43 years old, Chaco: "*Otros pueblos* [los Guaraníes] *recibieron tierras pero no las trabajan, entonces cuando ocurre un desastre natural, tienen hambre, y sus hombres deben ir a trabajar como jornaleros.*"

3. María Aguilar Moreno, 23 years old, APG-Chaco: *"Cuando mi esposo sale a trabajar (a jornalear), también ayudo para que cobre más rápido."*

4. Dora Segundo, 50 years old, Chaco: "*vivimos más con lo que gana mi esposo, el trabajo que yo hago y lo que vendo es solo para ayudar."*

5. Bertha Poma, 37 years old woman, Batallas: "*La mujer tiene que asumir más trabajo tanto en la producción agropecuaria como en las labores cotidianas del hogar debido a la migración de su esposo."*

6. Focus group interview #2 (elderly, mixed gender), Palca: "*Afecta más a comunidades de la parte baja, solo siembran con la lluvia. Por ello migran a la mina o a la ciudad principalmente los hombres.Muchos hombres mueren en la mina y las mujeres se quedan solas y tienen que asumir más responsabilidades.Los hijos se crían más débiles por falta de buen alimento."*

7. Informational interview with CARE Bolivia, Chullo-Oxani: *"Mediante conversaciones con gente de la comunidad de Chullo se tiene información a que aproximadamente hay viudas en 15 familias de las aproximadamente 70 familias asentadas en el lugar y no hay más que una madre soltera."*

8. Antonia Altamirano, 56 years old, Palca: "*Más impacto en las persona de la tercera edad, porque no tienen fuerza. Las mujeres viudas, las mujeres viudas jóvenes con hijos."* And focus group discussion #1 (elderly, mixed gender), Batallas: *"Los más afectados son los niños y la viudas."* And expert interview with Jhonny Mamani, specialist from CARE Bolivia, Batallas: "*Se observa mayor desigualdad con las mujeres viudas, porque tienen a su cargo toda su familia y ellas no tienen todos los conocimientos y habilidades necesarias para la siembra y uso de plaguicidas, además son más temerosas de consultar. También las personas mayores porque sus hijos-as migran a La Argentina y Brasil. Los más jóvenes a la ciudad de El Alto."*

9. Focus group discussion with Ingavi women, Chapare: "La participación en espacios de decisión comunal es principalmente cuando la mujer no tiene pareja, porque la asistencia obligatoria es del 'filiado' en este caso el hombre, si la mujer asiste a la reunión no se le hace valer, a menos que la mujer sea sola."

10. Meeting with Chapare investigation team (9/30/2011).

11. Focus group discussion (adult women and men), Tahiguaty: "*Una solución para muchas familias ha sido la producción de miel, por lo menos se tiene un ingreso seguro. Las mujeres participan muy bien en esta producción."*

12. Comment from focus group discussion with Ingavi women, Chapare: "En cuanto a capacitación manifiestan que les gustaría pasar cursos, tal vez por la noche, aunque están muy cansadas y no saben si podrán asistir."

13. Meeting with Chapare investigation team (9/30/2011).

14. Juana Alí, 25 years old, Batallas: *"No cuenta con información y capacitación suficiente para el manejo de sus recursos naturales."*

15. Nelly Ruiz, 43 years old, Tahiguaty, el Chaco.

16. Expert interview with the director of the Municipality of Batallas: "El hombre toma las decisiones pero también consulta con la familia dependiendo de los temas**."**

17. Jhonny Mamani, Investigator of CARE Bolivia, Batallas: *"Participan hombres y mujeres en las reuniones. Pero en las mismas las mujeres tienen poca intervención, por ello sus opiniones no son escuchadas y empleadas. Cuando están solo entre ellas opinan."*

18. Elsa Soruco, 53 years old, President of the "Bartolinas," Chaco: "*En las organizaciones participan las mujeres, pero las instituciones no dan importancia."*

19. Nicolasa Zapata, Ingavi: "Los hombres son los que enfrentan la inundación en el chaco, se meten al lodo, es más duro trabajar así, porque es pesado, pero no se puede hacer nada. El trabajo no puede parar. Con el banano es peor no se puede descansar."

20. Reyna Cuellar, 30 years old, Chaco: "*El abastecimiento del agua es la "friega," porque hay que ir a traer agua de la laguna, para los animales y otros usos."*

21. Testimony of Nelsy Espinoza, Guarani woman, 42 years old.

22. Nelly Ruiz, 43 years old, Chaco: "*La sequía afecta también como en los últimos años, porque no se cosecha el maíz y eso daña la economía doméstica, sin maíz no hay qué comer, no se pueden criar gallinas ni chanchos."* And Clemente Condori, 71 years old, Chaco: "*A los que más les afectan estos desastres son a los de la APG porque ellos siembran solo media hectárea o máximo una. Por lo general los varones trabajan al jornal, para el día y las mujeres tienen que ver cómo alimentarse y como cubrir otros gastos en la casa."*

23. Focus group discussion #3 (4 men, 4 women), Batallas: *"Tanto hombres como mujeres indican que le cambio climático les ha favorecido, hace más calor en la comunidad y ahora pueden cultivar verduras."*

24. Focus group discussion #3 (4 men, 4 women), Batallas: *"Los cambios mencionados constantemente son que las heladas son de corta duración, lo cual no les está permitiendo hacer chuño de calidad."*

25. Individual interview with Fernando Castillo, Chaco: *"Cuando ocurren estos desastres como la sequía, tenemos que ver entre nosotros (con la esposa) que hay para vender, como el ganado, las gallinas o un chancho por que ya no hay maíz."* And individual interview with Santos Perez, Chaco: *"La gente que puede producir está comprando más tierra y los que no pueden producir, casi ya no tienen terrenos, están vendiendo y se dedican a trabajar al jornal."*

26. Male focus group discussion, Puesto García: *"Han buscado apoyo en diferentes autoridades como ser la alcaldía, gobernación para que se solucione el problema por la emergencia de la sequía. Ahora buscan asesoramiento para prevenir los desastres naturales, porque se pueden presentar de nuevo."*

27. Israel Quispe, Batallas: "*Se organizaran en una Asociación Agropecuaria Integral. Una vez asociados y con estatutos será mas fácil pedir apoyo. Se organizan para acceder a un proyecto de CARE con la contraparte del Gobierno municipal de Batallas. Están agilizando este proyecto de riego. Ya se acercaron a PAR/PASA Fondo Indígena (para ella están agilizando du estatuto orgánico)."*

28. Individual interview with Vicente Le, Yuqui, Chapare: "No se puede hacer nada en contra de las inundaciones, que una vez que llega el agua solo hay que esperar que baje. En esos días ellos prefieren esperar en comunidad y agotan todas las posibilidades de obtención de alimentos, principalmente mediante la cacería." Vicente Le, Yuqui, Chapare

29. Interview with Abelina Soria, Yuracare, Chapare: *"Las mujeres continúan con sus labores domésticas. Los hombres suelen descansar en estas épocas."* Women's group discussion, Chapare: *"Las estrategias que las familias usan es contratar peones, que es gente que llega de Potosí, de Sucre, de las provincias de Cochabamba para trabajar en los chacos para no perder la producción."* And interview with Emilina Sipe, Intercultural, Chapare: *"En los últimos años se ha sentido los desastres naturales. La organización igualmente es la que vela por estas situaciones, se hace inspección y se gestiona ante el municipio, la gobernación y las ONGs que trabajan para hacer llegar apoyo a los afectados. A nivel del sindicato también la gente se apoya."*

30. Women's discussion group, Tahiguaty: "*Existen desigualdades entre familias que tienen más y otras menos recursos económicos. Esto afecta a las mujeres de las familias que tienen menos (Guaraní) porque tienen que trabajar en su casa y al jornal."*

31. Women's discussion group, Tahiguaty: "*Existen desigualdades entre familias que tienen más y otras menos recursos económicos. Esto afecta a las mujeres de las familias que tienen menos (Guaraní) porque tienen que trabajar en su casa y al jornal."* Interview with Fernando Castillo, Chaco: *"Cuando ocurren estos desastres como la sequía, tenemos que ver entre nosotros (con la esposa) que hay para vender, como el ganado, las gallinas o un chancho por que ya no hay maíz."* Interview with Santos Perez, Chaco: *"La gente que puede producir está comprando más tierra y los que no pueden producir, casi ya no tienen terrenos, están vendiendo y se dedican a trabajar al jornal."* And interview with Esmerito Montes, Chaco: *"Los que no tienen riego y solo cultivan maíz, joco y poroto a secano, son los más afectados (se refiere a las familias guaraníes). Ellos la pasan mal, salen a trabajar para los "chapacos" cavando papa o en el tomate."*

www.worldbank.org