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Drought and Gender Differentiated Vulnerability of Rural Poor in Nicaragua, 1970-2010

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Cover photo: riverbed in Sabana Grande, Nicaragua, October and May 2008. Photo by author

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To Ola and Joar

Contents

List of Maps, Photos, Figures, Tables, and Boxes

Abbreviations

CCF	Community Capitals Framework
GDP	Gross Domestic Product
INETER	Nicaraguan Institute of Territorial Studies
INTA	Nicaraguan Institute of Agricultural Technology
LSMS	Living Standard Measurement Study
MST	Sustainable Land Management project
mz	*Manzana* (0,7050 hectares)
Sida	Swedish International Development Cooperation Agency
SINAPRED	National System for Disaster Prevention, Mitigation and Response
SL	Sustainable Livelihoods
UNO	National Opposition Union
USD	United States Dollar

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Lisa Segnestam
Stockholm, January 2014

List and abstracts of articles

Article I: Segnestam, L. (2009). "Division of Capitals—What Role Does It Play for Gender-Differentiated Vulnerability to Drought in Nicaragua?" Community Development **40**(2): 154-176.

This article explores the gender differentiation of vulnerability to the drought situation within a rural community in the dry zone of Nicaragua. Case study work demonstrates that women and men use different strategies to cope with drought in the short term, and to adapt to the recurring El Niño induced events in the longer term. These strategies combined constitute the livelihoods of the rural poor in the dry zone of Nicaragua – livelihoods that change at times of drought to reduce its impacts. The article uses the Community Capitals Framework (CCF) to look at what resources women and men in the case study area have lost and to analyze what capitals are most central for the coping and adaptation capacity. A gender perspective is applied to see what difference in access to capitals between men and women exist and what that means in terms of gender-differentiated vulnerability to drought.

Article II: Segnestam, L. (forthcoming). "Interactions in Hazard Management Policies – the Case of Drought in Nicaragua, 1976-2010." Disasters.

The literature on adaptive and multi-level governance calls for interactive hazard management to increase societies' resilience. This article maps the hazard management policies in a poor and hazard prone country – Nicaragua – and examines what role the government gives interactions among different actors at different societal levels. This is achieved by developing a new analytical framework that captures scope and direction to capture unidirectional or mutual interactions that are either horizontal or vertical to enable a more complex analysis of interactions than that found in previous research. The review shows that the historical change in the role given to interactions, as a result of a focus on short-term emergency response being complemented by long-term risk management, mainly lies in how they are characterized, with more participants and other types of content categories, and that other interactions than mutual can be positive, illustrating the complexity of the issue of interactions.

Article III: Segnestam, L. (manuscript to be submitted). "Gendered Experiences of Adaptation to Drought – Patterns of Change in El Sauce, Nicaragua"

The changes men and women in a rural community in Nicaragua say they have implemented over the past decades differ in ways that relate to their vulnerability to drought. Short-term coping was more common among the women, especially the female heads of households, while adaptive actions were more common among the men. The Community Capitals Framework offers a tool to understand the differences. Gendered inequalities in access to and control over different capitals has led to a gender-differentiated capacity to respond to climate change, men being able to adapt and women experiencing a downward spiral in capacity and increasing vulnerability.

Prologue

Over the years of writing this dissertation more people than I can remember have asked me how I came to choose the topic of my research. Here is the short version. In 2002-2003 I was part of a team that, on behalf of the Swedish International Development Cooperation Agency (Sida), travelled to Honduras to do research with the aim to identify those factors that needed to be changed in order to reduce poor people's future vulnerability to events such as hurricane Mitch – a hurricane that struck the whole Central American region in 1998 and was the most devastating disaster in the region's history thus far. During the fieldwork three things in relation to natural hazard appeared. When we asked the people we interviewed "Who are the most vulnerable to natural hazards in Honduras?" the most common answer was "women" due to their relative lack of capacity to both cope with and adapt to a changing climate. Many people also said that hurricane Mitch was undoubtedly the most disastrous event they had ever experienced, but they also asked why nobody focused on the issue of drought. Their perception was that the drought had become worse and more frequent. This was especially common in the case study in Nacaome-Valle in the South of Honduras where 70 percent of the interviewees ranked drought as the second most memorable disaster (Segnestam *et al.* 2006: 9). At the time, the interviewees claimed they only got support and attention from the World Food Programme and the Red Cross when they were struck by drought, and that the government and other actors ignored the issue.

Within the Sida project there was not enough time nor resources to explore these aspects as well, and so the idea of creating a separate project on gender differentiated vulnerability to drought developed. It felt natural to place also this project in Honduras considering the already established contacts and the data availability from the above-mentioned project. When I finally received funding from Sida for a PhD-project on this the project was moved to Nicaragua for pragmatic reasons (a greater presence of organizations working with development issues in Nicaragua than in Honduras, which simplified the research process, and family reasons). The questions surrounding drought and gender were similar, however, and still needed exploring. In January 2008 my family and I thus left Sweden for a year of heat, cultural experiences, and fieldwork.

Introduction

The first time I packed my bags to go to El Sauce, the municipality in which my case study area was located, was in mid-May, 2008. In the past, the first farming season of the year would have been under way with farmers planting already in April, certain of the arrival of the rains in the beginning of May. This farming practice was not as common any longer since the early rains could not be counted on, I was told by the couple of dozens of the local population I met with over the coming days. One of them was Fransisco[1], who had moved to the community 50 years ago to look for a better life. His story contained many illustrations of the changes that had occurred in the area over the past decades. He spoke of rains that would fill the river that nowadays could be dry already in November-December (the beginning of the dry season), of fertile land, of backyards with vegetables that would not be infested with bugs, and of work opportunities on the plantations of cotton and bananas as well as elsewhere. Nowadays, he said, there was hardly any rain in the winter unless a "phenomenon" occurred (i.e. a hurricane). Then it would rain heavily for four to five days, and one would have to be careful because "the hills above could come down" (Fransisco, May 13, 2008). But winters like before did not exist any longer.

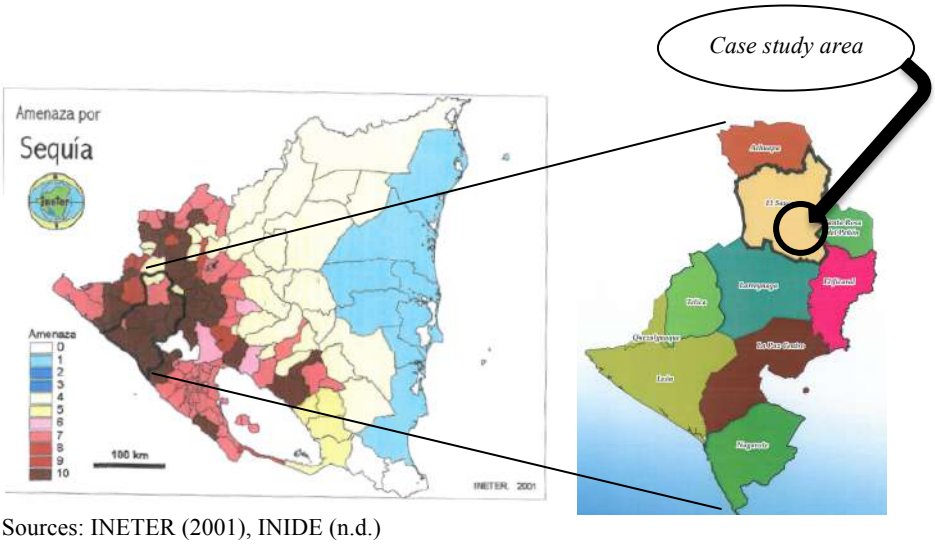
That water was a gendered resource was visible in the interviewees' descriptions of what the drought and the newly installed potable water system had meant in terms of changes in women's workload. Here in the words of Yamileth, who was born in the community and one of the women identified by others as a female head of households[2]:

> *What was this river like when you were little?* Beautiful (…) because in those days, when I was little, the wells of water, from one year to another, filled with water but not now. Now they dry out (…) *And before you had potable water?* Then we did small wells on the riverbanks, small like that. *And when did you begin to do those holes?* It was before the hurricane [Mitch] that they had water. After the hurricane, since it has gone deeper, one doesn't do wells. *So where did you get the water from?* In deep wells where you used a rope. There is one here, there in the corner we have one of those wells. *It hasn't dried out yet?* No. *And has the water always been at the same level or has it gone deeper?* Well, I am not sure since we now have the potable water and

[1] All names of the interviewees are pseudonyms since they were promised anonymity.
[2] All quotes from key informant meetings, interviews, and focus groups have been translated from Spanish by the author.

we don't use it [the well]. In the summer it gets lower, yes, since it gets drier then. *When you had to carry water from the river, who carried it?* When I lived with my mother it was us, children, or her that went to the river. *How many buckets did you take in those times?* Little, like some five buckets [100 liters]. *Every day?* Every day. Yamileth, October 9, 2008

Map 1. Nicaragua's *zona seca*, León department, El Sauce municipality, and the case study area



Sources: INETER (2001), INIDE (n.d.)
Note: the dark areas in the left map indicate the driest municipalities in Nicaragua

Fransisco and Yamileth lived in Sabana Grande[3], a rural *comarca* (county) in El Sauce municipality[4], within the department of León in the North West of Nicaragua, an area which can be found within Nicaragua's *zona seca* (dry zone) (Map 1 depicts the location of León department and its municipalities in Nicaragua and the *zona seca*. El Sauce is the second municipality from the top in the right map. The circle in the right map displays the location of Sabana Grande).[5] This is an area where the Sustainable Land Management project (MST) was active at the time of my fieldwork. MST had as its objective to improve the land use and secure the environmental services necessary to reduce poverty in a part of the country that was highly dependent on agricultural activities. It was also one of the reasons why I selected the area

[3] There is a community named Sabana Grande in the *comarca* Sabana Grande. Hereinafter 'Sabana Grande' refers to the *comarca* if not otherwise specified.
[4] The municipal capital is also named El Sauce. Hereinafter 'El Sauce' refers to the municipality if not otherwise specified.
[5] Nicaragua is administratively divided into 15 department and two autonomous regions, which are further divided into municipalities, the smallest administrative units of the country (INETER 2000). Since 1996, the municipalities are divided into *comarcas*, which in turn consist of a number of communities. (OPLAM 2007b)

for my case study – they provided me with written documentation on Nicaragua's *zona seca*, and, more importantly, introduced me to my first interviewees.

Nicaragua is a poor and unequal country in Central America. The Human Development Report includes an indicator on multidimensional poverty, which takes deprivations in health, education, and standard of living (e.g. access to clean drinking water, sanitation, and electricity) at individual level into account.[6] 28 percent of Nicaragua's population suffers from being multidimensionally poor according to this indicator. (UNDP 2011b) Nicaragua is also one of the world's most hazard prone countries. Drought is among the hazards that seem to have increased in both frequency and severity over the decades, especially in the country's *zona seca*. Leiva and Shankar (2001: 288) go as far as calling the risk of drought "endemic" to Nicaragua. Despite this, and the many other sources stating drought has become a serious problem in Nicaragua, it has not attracted as much attention as other hazards do. Mauricio Rosales Rosales, the then Director General of Meteorology at the Nicaraguan Institute of Territorial Studies (INETER) gave one, of several likely, explanations to this in a key informant meeting:

> However, the drought does not raise the same… the same interest among the civil defense organizations and the governmental organizations that look upon these things, lets say, as erratic. *Why?* Because they are always hoping it will improve, it will change. That is the difficulty, that drought is not a phenomenon that occurs quickly. Its impacts are not noticeable as immediately and, in addition, the people feel insecure about the situation and that it will change. (Mauricio Rosales Rosales, INETER, November 19, 2008)

All of these dimensions – poverty, inequality, and natural hazard exposure – create a social-ecological setting which makes Nicaragua an illustrative example for a study on gender differentiated vulnerability. In this case the focus is on vulnerability to drought since it is one of the main pressures on livelihoods, food security and development, and relatively little researched in Nicaragua. Water stress is furthermore likely to become the most important climate change related risk for Central America and Mexico (Keller *et al.* 2011).

Numerous studies have shown that vulnerability to various hazards is contextual and expresses itself in different ways within different social groups, i.e. that vulnerability is differentiated. Conclusions such as women in Brazil becoming the "widows of drought" as the men have left the household to look for a job in other parts of the country (Melo Branco 1995: 50, my transl.) or "It is also crucial to understand the differential vulnerability which is dependent on gender" (Wisner *et al.* 2004: 238) can thus be found in the literature**.** To be able to achieve a better understanding of what lies

[6] See Technical note 4 in UNDP (2011b) for details of how the index is calculated.

behind such differentiations the vulnerability literature points to the importance of understanding the inequality between women and men in their access to and control over various resources, the character of formal and informal societal structures determining the social construction of masculinity and femininity (i.e. gender), and the allocation of power (e.g. Bolin *et al.* 1998; Wisner *et al.* 2004; Dankelman 2010a). The empirical, systematic analyses of the causal chains that create and sustain vulnerability levels in communities are few, however. Furthermore, research on pre-disaster gendered vulnerabilities and the gendered capacity to reduce the same before a hazard strikes is not so common.

To contribute to existing research, this dissertation uses an approach combining gender, capitals, and vulnerability in a case study on women and men, such as Fransisco and Yamileth, in Sabana Grande. The combination demonstrates the value in using a multidimensional perspective to look at the socio-economic and cultural contexts that form the capacity individuals have had to reduce their long-term vulnerability to drought in Nicaragua. Due to the locally determined characteristics of gender as well as vulnerability the analysis is mainly based on people's stories about the history of their lives. Based on these stories a local level picture is created of the individuals' and their households' situation over time, how their work strategies and management of resources have varied, and how they perceived changes in capacity and vulnerability in relation to continuity and change in the climate. The issue of capacity to make long-term changes to adapt to climate change, which currently is less covered in research on gender and vulnerability and recognized as in need of more attention (e.g. Berman *et al.* 2012), and how it distinguishes itself in relation to vulnerability from the capacity to cope in the short-term, is placed at the center of analysis.

Objective and research questions

The objective of the dissertation is to interpret gender differentiations in vulnerability to drought in Nicaragua in the interplay among structures and resources over the past decades. This objective was addressed through a qualitative case study in a drought stricken part of Nicaragua where the interviewed individuals' views on the following aspects were explored:

1. What has their experience of drought been and what measures have they taken to cope during and immediately after a drought, and to adapt to an increased frequency of droughts and intensity of dry climate?
2. What role have different socio-economic and environmental resources played in increasing their capacity to cope with and adapt to as well as in reducing their vulnerability to drought?
3. What structures have created and sustained their access to and control over the capitals?

Structure of the dissertation

What follows is the part of this dissertation that complements and draws upon the articles. The first section presents the principal characteristics of and change in Nicaragua's agricultural sector, subsistence and export oriented, as well as the country's proneness to hazard exposure, and especially droughts. Both of these belong to the historical context that has shaped the events over the past decades. The historical changes in the agricultural sector, including land tenure, combined with cultural factors and the high exposure to hazards have caused poverty, gender inequality, and migration, all of which are in the center of the life course of women and men in the case study area. The following chapter discusses achievements and gaps in existing research on gender and differentiated vulnerability, and lay out the theoretical and analytical frameworks used to interpret gender differentiations in vulnerability to drought in Nicaragua in the interplay among structures and resources over the past decades. How the frameworks were developed as well as the contributions made to theory are described here. How the fieldwork progressed and what methods that were used in the collection and analyses of the data follow in the succeeding chapter. The case study approach with the use of oral history methods as well as text analysis is introduced and its different components are also discussed critically. In the concluding chapter, key findings and insights from the analyses within all three articles are pulled together and presented.

Political, economic, social, and environmental change in Nicaragua

Nicaragua is the largest of seven countries in Central America, located between Honduras and Costa Rica, with a total population that has tripled over the past 50 years and is now approximately six million inhabitants. (World Bank 2013) It is a country which historically has been primarily agricultural, and that is still described as an agricultural economy despite the fact that the agricultural sector's share of GDP is lower than that of both the industry and the service sector.[7] The characterization is due to the overall contribution of the agricultural sector to the national economy, including GDP, employment, and export earnings.[8] Nicaragua does not only depend on agriculture for its export earnings, however. It is also central for its subsistence economy – as many as 59 percent of the farmers were subsistence farmers in 2005. (Grigsby V. and Perez 2007) The relation between agriculture for export and for subsistence has changed historically, as described below, influencing the current situation in the case study area, which is highly dependent on the production of corn, sorghum, and beans for subsistence. It also has a bearing on the interviewees' capacity to affect their vulnerability to drought – one of the multiple hazards that has afflicted the country and its agriculture and has caused higher levels of poverty, inequality, and migration to other countries.

Political change and the introduction of agroexport

At the time of Nicaragua's declaration of independence from the United Provinces of Central America on April 30, 1838, the agricultural sector

[7] The agricultural sector's share of total Gross Domestic Product (GDP) was 25 percent between 1960 and 1993 when it went down to 20 percent (including cultivation of crops and livestock, as well as forestry, hunting, and fishing). The industry and service sectors have likewise been relatively stable until 1994 when industry went down from approximately 30 to 25 percent and the service sector went up from approx. 45 to 50 percent. Due to methodological reasons the shares do not add up to 100 percent after 1993. (BCN 2013)

[8] Even if the number has gone down from 70 percent in 1950 and 60 percent in the 1970s, 34 percent of the population was still employed within the agricultural sector in 2005, and its share of total export is 80 percent. (Merrill 1993; INEC 2006a: 72; Grigsby V. and Perez 2007: 7)

found itself with the colonial legacy of *latifundios* (large agricultural estates of 500 *manzanas* (mz)[9] or more) and *minifundios*, the small plots of land (0.15-5 mz) the break-up of indigenous communal land had resulted in. The lack of indigenous labor made a majority of the *latifundistas* invest in a combination of food production and cattle ranching, since the latter did not require much labor. This, in combination with indigo (Nicaragua's most important cash crop in the colonial period), was later in the nineteenth century complemented with coffee production. However, it was not until the dictator José Santos Zelaya came into power in 1893 that Nicaragua was opened up for foreign investment. This led to a coffee and banana expansion in the early 1900s controlled by US companies, and Nicaragua's agricultural sector became more export-oriented. Land was during this time taken from small producers. Poor farmers were thus forced to combine subsistence food production with working on the *latifundios* to be able to survive, becoming a 'semiproletariat'. Others, who did not have any land left to farm, were forced to migrate to urban areas. Zelaya's rule lasted until 1909 when the landed oligarchy regained the control over the country with the help of the United States. The agricultural sector continued with few exceptions (e.g. sugar) to be structured around the large cattle and coffee *latifundios* in combination with subsistence food production up until Anastasio Somoza Garcia took over the country in 1937. (Biderman 1983; Zalkin 1988; Spoor 1990; Saravia-Matus and Saravia-Matus 2009)

With the victory of Somoza Nicaragua entered another period of dictatorship, which lasted for four decades (1937-1979 except for a few years). During this period, in the 1950s and 1960s, the commercial agriculture was again in focus and plantations of cotton, coffee, sugar, and beef ranching increased. The amount of land used in Nicaragua for cotton plantations increased thirteen-fold between 1950 and 1977. The flat parts of the department of León belonged to those that were highly exploited for the cultivating of cotton as well as sugar due to its favorable geography and climate (fertile volcanic soil, and a warm climate with rains throughout the year). Even though they did not expand as much as the production of cotton, plantations of coffee and sugar cane also experienced a boom in this period. Finally, the Somoza government encouraged cattle ranching in the 1960s through a number of measures (road construction, credit, and technical assistance). The land used for sugar almost doubled between 1963 and 1976 as a result of the US blockade of Cuba during the Cuban missile crisis in 1962. Similarly, Nicaragua's cattle export increased when North America stopped their import of cattle from South America in order to prevent the spreading of the foot-and-mouth disease. (Paige 1984; Enríquez 1991; Kinloch Tijerino 2008; BCN 2013) What happened to the cotton, coffee, sugar cane, and cattle after 1979 looks slightly different depending on the product. The production of

[9] One *manzana* = 0,7050 hectares (INEC 2002a)

cotton continued to increase for a few more years, when it began to decline to become virtually nothing by 1993. In comparison, neither the production of sugar cane nor that of meat has slowed down. (BCN 2013) Coffee was in the first five years of the 21st century overproduced globally (mainly in Brazil and Vietnam). This resulted in the, so called, coffee crisis in which international coffee prices plummeted due to an excess supply mainly affecting small producers, day laborers, and cooperatives in Nicaragua and farms were abandoned. (Osorio 2004; Agurto *et al.* 2008)

Photo 1. Wood from deforestation in El Sauce, May 2008

Source: Author

The model for economic development during the Somoza years increased inequality in Nicaragua further. The wealth was concentrated in the hands of a few. The Somoza family and its associates alone owned approx. 20 percent of Nicaragua's arable land, and 5 percent of landowners occupied as much as 60 percent of total land, land that was used for agroexport farming with relatively advanced technology. At the same time the land for basic grains had a low level of production and technology. (Zalkin 1988; Enríquez 1991; Grigsby V. and Perez 2007; Saravia-Matus and Saravia-Matus 2009) The rural poverty was further accentuated when the rural population was forced to leave the land that was to be used for export crops, thus reducing the available land for basic grain production and subsistence agriculture. The basic grain producers were thus displaced to the agricultural frontier or to small plots on the large agroexport estates with the consequence of a deteriorating standard of living and stagnating food production in Nicaragua. As

a result Nicaragua went from being a net exporter to a net importer of grains in 10 years. (Paige 1984; Spoor 1990; Enríquez 1991; Kinloch Tijerino 2008) The expansion of agricultural exports furthermore resulted in large areas of forest being cleared, both as a result of the need for land for cotton, coffee, sugar, or cattle raising, but also due to the expropriation of small farmers' land, pushing them towards the agricultural frontier and to clear land for the cultivation of subsistence crops. (Wisner *et al.* 2004) Nicaragua's forested areas have thereby decreased nationally, as well as in León department, and in the seven municipalities included in the MST-project. (INEC 2002b; UNDP and MARENA 2005b; World Bank 2011) Official statistics also show that close to half of Sabana Grande is overexploited with soil erosion as a result (OPLAM 2007b). The deforestation, with its root in Nicaragua's economic history, is thus one of the local causes of the drought (Photo 1 depicts a cause of local deforestation – wood for sale in El Sauce).

Finally, the use of agricultural inputs became a common practice in Nicaragua within the agroexport production. Large quantities of fertilizers and insecticides were imported as early as the 1940s and in 1958 the import of insecticides alone was valued at over 3 million USD. Yields thus increased and the agricultural economy improved. This development was an effect of the government channeling resources to the large, export-oriented producers, who then could make the investments in agrochemicals. Despite the access to cheap labor, the Somoza government's encouragements to increase the productivity of the agroexport business, especially the cotton production, also enabled investments in machinery. By the 1950s, Nicaragua's agriculture was both the most mechanized and used the largest amount of agrochemicals in Central America. Small food producers did not benefit from any of these developments. In combination with less access to productive land, their average yields fell rather than increased during the 1950s and their earnings were extremely low. (Winters 1964; Biderman 1983; Godoy and Hockenstein 1992; Saravia-Matus and Saravia-Matus 2009)

The Sandinista agrarian reform

In the second half of the 1970s Nicaragua went through civil war, including a revolution in which the Sandinista National Liberation Front overthrew the Somoza regime in 1979. Although this ended an era of dictatorship, Merrill (1993) says "the predominance of the [Sandinista National Liberation Front] led to the development of a different kind of authoritarian regime that lasted for more than a decade", thus continuing Nicaragua's history of authoritative governments. The Sandinistas took over a country in ruins, forcing them to prioritize the reconstruction of the Nicaraguan economy. A number of measures were taken, among them an agrarian reform in order to achieve a more equal distribution of land in Nicaragua. Access to and control over

land is essential to most rural livelihoods and one of the more important resources for the capacity to adapt to the drought. Nonetheless, the distribution of land has historically been tremendously unequal in Nicaragua as a result of the agroexport farming and the *latifundio* structure. In 1963, before the reform, the farms of less than five mz (35 percent of the total number of farms) had one and a half percent of the land, while the farms of 500 mz or more (one percent of the total number of farms) had 41 percent of the land at national level (INEC 2002a).

The first of three stages of the agrarian reform was not to distribute land to the peasantry, however. Instead, the Somoza properties were confiscated and converted into state farms under the control of the new Ministry of Agricultural Development and Agrarian Reform. This was partly due to the fear of a reduced productivity of the agricultural sector at a time when foreign exchange was needed for reconstruction after the civil war. Another reason was the continued need for laborers in the agroexport farming, and the insight that such a supply would decrease with more individual landowners. Hence, during the first two years after the revolution, "a substantial proportion of the *latifundios* were only transferred from private to public hands." (Saravia-Matus and Saravia-Matus 2009: 32) In the second stage an agrarian reform law, including the explicit equality between women and men in regard to land rights, was enacted in 1981 after political pressure from the peasantry became too high. This led to a redistribution of land to cooperatives from farms that were more than 500 mz and had low productivity.[10] Another result was subsidies to agricultural inputs, such as herbicides and fertilizers, but also machinery. As opposed to the earlier agroexport promotion, the Sandinista agrarian reform directed its attention towards basic grain producers. To encourage the production of basic grains and to increase the rural standard of living the government thereby offered official credit, subsidies on agricultural inputs, as well as technical assistance to small and medium-sized farmers for the first time. Technological improvements were not as common, but did exist at a small scale. Statistics that go further back than 2001 are not available for agrochemical application, but a pattern of high use, especially among male farmers, at national, departmental, and municipal levels emerges from the agricultural censuses available. A vast majority of the farmers in the municipality of El Sauce used some sort of agricultural inputs in 2000-01 – chemicals (fertilizers, herbicides, and insecticides) or organic compost (used by only eight percent of the farms). Photo 2 shows a man in the case study area on his way to the field to apply agrochemicals. (INIDE 2001; INEC 2002b) The third and final stage came in 1986 when the agrarian reform law was revised, again as a result of increasing pressure from the peasantry. This opened up for the expropriation of farms of all

[10] In the Pacific region. In other parts of the country, with lower population density, they had to be larger than 1 000 mz. (Saravia-Matus and Saravia-Matus 2009)

sizes, independently of whether they were inefficient or not, and increased the redistribution of land to peasant families. In 2001, when Nicaragua's third National Agricultural Census was performed, the distribution of land was still unequal, but had become more equal as a result of an increase in the amount of land owned by medium sized farms (10-50 mz). The largest farms (500 mz or more) still comprised one percent of all farms in 2001, but they now 'only' owned 22 percent of the agricultural land, while the share of small farms (less than five mz) had not changed much nor had their share of land. (INEC 2002a) In El Sauce municipality the most common farm size in 2001 was between 20 and 50 mz (INIDE 2001). (Harris 1987; Zalkin 1988; Enríquez 1991; Spoor 1994; Jonakin and Enríquez 1999; Deere and Leon 2001; Kinloch Tijerino 2008; Saravia-Matus and Saravia-Matus 2009; Baumeister 2010)

Photo 2. Man on his way to apply agrochemicals in case study area, October 2008

Source: Author

The Sandinista period could be described as a decade of egalitarian reform, benefitting the small farmers. Unfortunately, there were other struggles that went less well. The country's history of civil war continued in the 1980s as a result of the Sandinista government's close links to Cuba and the former Soviet Union at the same time as the United States supported anti-government forces in Nicaragua during the Cold War, the so called Contras

(short for *contrarevolucionarios*). Mistaken economic policies, a financial crisis that hit Latin America during the 1980s, the economic blockade by the United States (1985-90), hyperinflation, and natural disasters (hurricane Joan in 1988 and drought in 1989) affected Nicaragua's economy negatively. The impacts of these were aggravated by the civil war, which cost the country not only lives and destruction of the environment and infrastructure, but also financial resources to support the constant fighting. (Merrill 1993; Catalán Aravena 2000; Government of Nicaragua 2001b) In its Strengthened Growth and Poverty Reduction Strategy from 2001, the Nicaraguan government concluded that, during 1987-1990, the country had ended up in "a virtual economic collapse [and] (b)y 1990, Nicaraguans had the same per capita income they had in the 1960s…" (Government of Nicaragua 2001b: ix) The economy recovered and 10 years later the GDP per capita was at the same level as before the dip of the early 1990s. Since then, the GDP per capita has continued to increase. (World Bank 2013) Nicaragua is still the second poorest country in the Western hemisphere after Haiti, however (CIA 2013). The poverty is not equally distributed among the population. Based on data from the latest Living Standard Measurement Studies (LSMS) undertaken in Nicaragua, five out of every ten Nicaraguans live in poverty. Of those, two live in extreme poverty out of which three quarters live in rural areas.[11] (INIDE 2005)

As a result of the agrarian reform of the 1980s, a division of plots, clearing of land at the agricultural frontier, population pressure, and the ending of the armed conflict of the 1980s, the number of basic grain producers increased with almost 90 percent between 1987 and 2005-07. The land used for basic grain production increased with 11 percent between 1987 and 2006. One of the objectives with the agrarian reform was to be able to guarantee the nation's food self-sufficiency. Despite this, food imports continued to grow and imports of corn and beans reached a historical high in 1983. In 1993 the objective of self-sufficiency was still far from being achieved. (Winters 1964; Gibson 1987; Enríquez 1991; Merrill 1993; Baumeister 2010)

The Counteragrarian reform

The civil war ended in the late 1980s, but the Sandinistas lost the elections in 1990 to Violeta Barrios de Chamorro and the coalition of 14 parties she represented (the National Opposition Union, UNO). The coalition consisted of

[11] Poverty in the LSMS is estimated with the unsatisfied basic needs criterion, looking at the (in)ability to satisfy a set of basic necessities through consumption. According to this criterion, a household is classified as poor if it only has one unsatisfied need. Those with two or more unsatisfied needs are classified as extremely poor.

parties from the whole political spectra, from conservative to communist, who shared a common interest in getting the Sandinistas out of power. Chamorro, a former publisher of one of Nicaragua's largest newspapers, was faced by many challenges in the struggle to achieve political stability in the country. On March 27, 1990, the Transition Protocol was signed stating how power was to be transferred from the Sandinistas to the UNO in a peaceful way. To turn the economic problems of the country (primarily external debts) around, Chamorro and her government changed the economic structure from a mixed and planned to a market economy. With the support of the International Monetary Fund, the World Bank, and the Inter-American Development Bank they began a process of neoliberal structural adjustment. They built on policies the Sandinistas had implemented already at the end of the 1980s due to hyperinflation with rates above 33 500 percent in 1988 as well as food, fuel, cloth and electricity shortages. Nicaragua thus moved into a phase of counteragrarian reform in which all of the features of the structural adjustment (government cutbacks on credit and technical assistance, trade liberalization, currency devaluations, and privatization) promoted the large-scale agroexport business once again. The counteragrarian and neoliberal economic reforms continued under the subsequent Liberal governments. The first was headed by President Arnoldo Alemán. During his period (1997-2002), foreign aid and investments increased and the economy improved. In 2002 he was succeeded by his vice president, Enrique Bolaños Geyer, after Alemán and his administration had been accused of and Alemán sentenced for corruption. Bolaños stayed in power until 2007 when the Sandinistas and Daniel Ortega regained power and Nicaragua once again became led by a government opposed to a market economy and privatization processes. (Merrill 1993; Catalán Aravena 2000; Enríquez 2000a; Grigsby V. and Perez 2007; Kinloch Tijerino 2008; CIA 2013; Horton 2013)

The rural poor were among those that were negatively affected due to the neoliberal transformation of the economy. A reduced access to credit affected those who cultivated beans or corn and small and medium sized farmers more than large scale farmers cultivating export crops. By 2006, agriculture represented 80 percent of Nicaragua's exports and still 70 percent of its rural families were under the poverty line. Neither did they get us much technical assistance since they could not afford paying for it. Without credit or technical assistance they were furthermore unable to change focus of their farming to export crops. The trade liberalization implemented together with currency devaluations to promote the agroexport production resulted in lower producer prices for non-export production, further affecting the small farmers. Finally, many subsistence farmers had already been removed from land that was to be used for export crops, such as coffee during the times of Zelaya or cotton in the times of the Somozas. This land concentration process was resumed in the counteragrarian reform, which questioned the land rights they so recently had won and made their land tenure insecure – "processes of

social differentiation [were] powerfully asserting themselves" (Ruben and Masset 2003: 486) since the Sandinista reform. The rural poor thus experienced similar impacts to those of drought-affected populations – they could not produce as much as before (due to a reduced access to credit and technical assistance), they reduced their consumption, they borrowed money, or they had to look for other livelihoods to complement their agricultural incomes. The consequence was an increased subsistence insecurity and rural poverty. Exceptions to this were those that happened to specialize in commercial dairy farming or had access to organizations that could provide them with the support the government had provided them with previously. (Enríquez 1991; Spoor 1995; Jonakin 1996; Jonakin and Enríquez 1999; Enríquez 2000b: 47; Spoor 2000; Cupples *et al.* 2007: 790; Grigsby V. and Perez 2007; Horton 2013)

Gender inequality

As can be understood from the above, Nicaragua is a country of many types of inequalities. Besides being generally unequal, it is highly gender unequal. For example, multiple sources witness to women in general, and female heads of households in particular, being among those who have access to the least amount of resources, have the least rights, and are being discriminated more often than men in Nicaragua. (Galán 1998; Torres C. 2008; Deere *et al.* 2010; OECD n.d.) In addition, Nicaragua's Gender Inequality Index (GII)[12] is alarmingly high despite improvements since the mid-90s – in 2011 Nicaragua was ranked as number 101 of the 146 countries for which the index is calculated (UNDP 2011a; b: 141). There are other sources that speak of less gender inequality, saying the share of men and women in poverty has been virtually the same the last 20 years (Agurto Vílchez *et al.* 2003; INIDE 2005; IMF 2011). The 2005 LSMS also compared poverty levels of female- and male-headed households. The results showed 34 percent of the female-headed households live in poverty in comparison to 42 percent of the male-headed households. They comment on both of these results since "traditionally it has been said that female poverty is higher than male" and say the divergence from the traditional view "suggests that the women have successfully used their ingenuity to cope with the economic stagnation and the impoverishment in a better way than the men." (INIDE 2005: 137, my transl.) In spite of such indications of equality, the gender inequality related to the rural sector and factors central to drought vulnerability is obvious in the be-

[12] The Gender Inequality Index is composed of three dimensions and five indicators: Reproductive health (Maternal mortality and Adolescent fertility), Empowerment (Parliamentary representation and Educational attainment (secondary level and above)), and Labor market (Labor force participation). (UNDP 2011a: 142)

low discussion on land rights, credit as well as in cultural factors such as the division of labor.

The distribution of land is highly unequal from a gender perspective. The 2001 agricultural census shows that the division between female and male farmers was the same at national level and within the municipality of El Sauce: 82 percent of the farmers were male and 18 percent female.[13] (INIDE 2001; INEC 2002a) At the level of *comarca* it looked slightly better with 22 percent of the farmers being female (INIDE 2008: 31). A regional comparison of the ownership of the households producing basic grains, based on nationally performed LSMS, demonstrates that Nicaragua and Costa Rica share the same division between female and male owners. All of the other Central American countries have a slightly more unequal division (12-15 and 85-88 percent respectively). (Baumeister 2010)

Land tenure enables the owner to obtain credit. The MST-project states that women's lack of access to credit in the rural areas constitutes a barrier towards a sustainable land management (UNDP n.d.) and even if it can cause problems, credit access is also important to the capacity to adapt to the drought in the long-term. A majority of those who received credit in El Sauce and León were men. In addition, among the male farmers there was a larger share using credits than among the female farmers in El Sauce as well as in León. The most common source was non-governmental organizations, and the second most common governmental projects or programs. The same pattern is detectable at national level. In rural areas more male-headed than female-headed households had received credits. Furthermore, the average amount received was about 60 percent less in the female-headed households compared to the male-headed households. This is likely to be the result of the unequal distribution of land. Since women traditionally are not the landowners, they do not have the necessary collateral to access credit. Another explanation, given by INIDE (2005), could be the use of the credits. In rural areas, credits are often used for agricultural purposes, which are within the male domain and thus the female-headed households have relatively less credits, both in numbers and amount. As a result of the unequal access to land and credit, more men than women in El Sauce as well as in the department of León used inputs in 2000-01, although the practice was almost as common within each group. Women only constitute approx. 20 percent of the total number of farmers (men and women) who use inputs, however. (INIDE 2001; INEC 2002b; INIDE 2005) These inequalities affect women's capacity to reduce their vulnerability when facing natural hazards, including drought. For example, the analysis of the gender situation in the municipalities included in the MST-project identifies lack of access to and control over land (as well as to technical training and financing) as impeding

[13] The statistical agency in Nicaragua defines farmer as the natural person who works and makes the decisions on the farm. (INEC 2002a; INIDE 2008)

factors when it comes to women's possibilities to be incorporated in their municipalities' productive activities (Rugama F. 2005).

Historically women have not enjoyed the same formal rights as men in Nicaragua.[14] It was not until the middle of the 20th century that women were taken into account in public policies. In the 1950s the Constitution began to recognize women's right to vote, work, and receive equal pay. Women were still restricted and were not allowed to participate in political processes, however. The gender roles were traditional, emphasizing women's private and men's public roles, and thus women's dependency on the men. The Constitution was changed in 1955, providing women the right to be elected or to hold public office. Later Nicaragua's Family Code from 1959 stipulates that all property brought into or acquired during marriage should be shared. This code furthermore states that all property and income should be divided equally between spouses in case of separation or divorce, and that half of the property should remain with the surviving spouse in case of death. Daughters and sons also have the same legal right to inherit. 20 years later, a month after the removal of Somoza in 1979, the Fundamental Statute was published. Women's rights were advanced significantly as they were provided equal "economic, social, cultural, civil, and political rights" (Asamblea Nacional 2010: 84, my transl.) to that of men, rights that were strengthened further in the 1987 Constitution. For the first time, Nicaragua's Constitution provided "the equality of individuals before the law and for the protection and enjoyment of their political rights, without discrimination on the grounds of birth, nationality, political views, race or sex" (CEDAW 2005: 8). (Asamblea Nacional 2010)

There are other laws regulating the access to productive resources central to rural households that also promote gender equality. One example is a law from 1995, which stipulates equal rights for women and men to receive land titles and prioritizes women in access to credit. In 1997 a principle of joint titling for couples, whether married or not, further strengthened women's rights. This applies only in the cases where land is distributed through the agrarian reforms, however. Initially this principle did not function well. Local level functionaries misinterpreted it and assumed joint titling could pertain to any two people. From 1992 to 1996[15], the majority of joint titles issued thus went to two men, such as father and son, rather than to couples. In 1997, the mistake was corrected and the woman in the couple became beneficiaries as well. An agrarian reform could have changed women's vulnerability significantly to the better. Unfortunately the implementation of the Sandinista agrarian reform, despite the priority given to female heads of

[14] The following includes examples of women's formal rights in Nicaragua. For a more complete review, see Asamblea Nacional (2010).

[15] The principle was instituted by administrative decree of the Violeta Chamorro government prior to becoming a law in 1997.

households and to equal access to land for men and women in the new legislation, resulted in only eight percent of those who received land being women. (Deere and Leon 1998; Galán 1998; Deere and Leon 2001; Lastarria-Cornhiel *et al.* 2003; CEDAW 2005; INIDE 2005; Giovarelli and Lastarria-Cornhiel 2006; Ceci 2007)

Despite these formal rights, resources such as land and credit are, as can be discerned from the above, unequally distributed between women and men in Nicaragua. Hence, the inequality of today does not seem to originate from the formal structure in Nicaragua. Instead, several sources speak of the influence of cultural factors such as prevailing patriarchal attitudes and tradition, the *machismo*[16], and stereotypes regarding gendered roles in the family as well as in wider society. This concerns especially the rural areas where men are commonly the heads of households and those who have the power to make decisions. An example is the difficulties with the principle on joint titling, since "joint titling goes against patriarchal norms and is sometimes resisted by both men and women" (Deere and Leon 2001: 58). (Rugama F. 2005; Dore 2006; CEDAW 2007; USAID 2011) Fauné and Matute (2007) also claim that men and women in rural Nicaragua have continued to validate patterns which are "maintained in the patriarchal gender order governing the agrarian and rural world (…) that puts women in a situation of subordination and inequality" (p. 46, my transl.) and the male is thus recognized as the principal property owner. In addition, wives generally accept that the decision-making power lies in their husbands' hands.

Another cultural factor is the division of labor, which still follows a traditional pattern of the men being active in spheres external to the household while women are responsible for taking care of the household. What roles, tasks, and responsibility one has affects the capacity to cope with and adapt to the challenges in society, including drought (see Jungehülsing (2012) and Moser (1997) for examples from Mexico and Ecuador respectively). The possibilities to look for a job in a formal labor market that provides a salary to use when other resources fail, such as the household's subsistence agriculture or kitchen garden, is central. According to Olivera *et al*. (1992) the division of labor and women's subordinate position in Nicaragua stems from the time when agriculture and hunting were the primary livelihoods and when it was necessary to know that the land, the most important resource at the time, would stay within the family. It was thus necessary to be able to defend the land and the number of people in one's 'group' became central. To have enough women to "produce them [the people] they were obtained through kidnapping and the war." (p. 60, my transl.) This has resulted in a situation where the women are responsible for social reproduction, discrimi-

[16] A "social phenomenon that is present in all areas of daily life and influences economic, political and social structures, placing women at a distinct disadvantage to men, and in a position of pronounced inequality with respect to men." (CEDAW 1999: 29)

nated, and have less power than the men in Nicaragua. The gender division of labor has begun to change somewhat in Nicaragua, however, and the labor market has become more accessible to women as well. The promotion of agroexports, the revolution, and the war as well as financial crises during the 1980s are factors that are identified as reasons for this change through their impact on the supply of male labor as well as on the need for more family incomes. This had resulted in an increased need for women to enter the labor market. (CIERA *et al.* 1987; Collinson 1990; Pérez-Alemán 1992; Chavez Metoyer 2000) A continued patriarchal ideology and the gender division of labor – what INIDE (2005: 114) calls a "cultural colander" – has thus continued to de facto discriminate women in terms of access to and control over land and credit. It has also affected the pattern of migration and remittances, as discussed below.

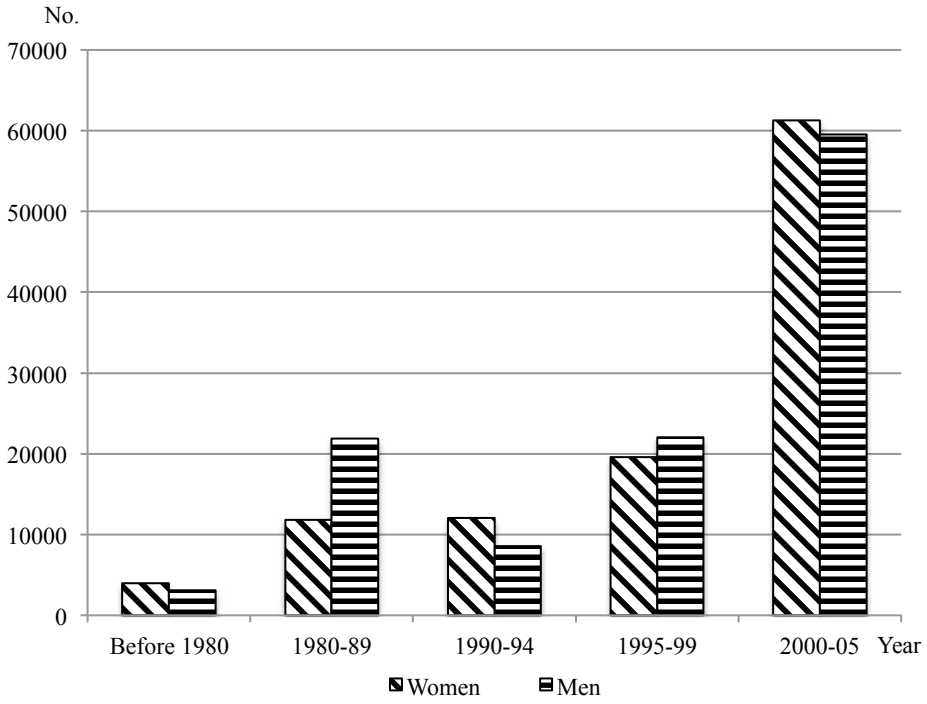
Migration and remittances

The difficulties in the agricultural sector as well as in the war and post-war periods, and the lack of job opportunities and increasing poverty due to the implementation of the Structural Adjustment Programs have caused an increasing number of people leaving the country over the past 50 years. (Torres C. and Barahona 2004; INIDE 2005; Agurto *et al.* 2008; CIA 2013) Apart from these factors, three specific events that have affected the number of migrants are the 1972 earthquake, which resulted in 10 000 Nicaraguans moving to Costa Rica, hurricane Mitch in 1998, and the crisis of the coffee sector in the beginning of the 21st century. (Agurto *et al.* 2008; IOM 2010)

Looking at changes over time it stands clear that the international migration is a relatively recent phenomenon, which has followed a similar pattern for women and men (Figure 1). Before 1980 not many Nicaraguans migrated to other countries. This increased somewhat, and more among the men who were more directly affected, during the 1980s and the civil war. More than half of the migration took place in the period 2000-2005, however. The latter includes the thousands who migrate seasonally, often illegally, combining their own agriculture with paid employment in other countries. From these changes it can be interpreted that the migration has gone from being caused by the war (refugees and asylum seekers) to economic difficulties. (INIDE 2005; Agurto *et al.* 2008; CIA 2013) International migration is still common within the Nicaraguan households. According to the 2005 Population and Housing census 10 percent of the households at the national level have household members living abroad. The corresponding numbers within León and El Sauce are 15 and 21 percent respectively. (INEC 2006b) In the *comarca* where the case study is located, the prevalence of internationally migrated family members is slightly higher – 22 percent (INIDE 2008: 11). A bit more than half of those migrating to other countries go to Costa Rica

and the majority are young men as well as women of working age (20-49 years). (Torres C. and Barahona 2004) Still, about three quarters of Nicaragua's population living abroad (300 000) are permanent residents of Costa Rica. Commonly they work with other activities than the Costa Ricans (e.g. only nine percent of Costa Rican women work in domestic service compared to 42 percent of all Nicaraguan women in Costa Rica (ECLAC 2008)). While the migration to other countries has slowed down, the internal migration, from rural to urban areas has increased. The main reason for this migration is to look for employment and to improve life. (Torres C. and Barahona 2004; Agurto *et al.* 2008; CIA 2013)

Figure 1. Distribution of international migration of women and men, before 1980 – 2005 (number of international migrants)



Source: INIDE (2005)

A change in culture within younger generations, with women living more like men, is one factor explaining the similar participation of women in the migration to that of men. Younger women have thus also begun to look for a job and an income to provide for the family in the everyday life. This could be seen as a positive development since women reduce their dependence on others thus becoming more equal. (INIDE 2005) However, there are studies that say that with migration women risk facing double inequalities –

being both a woman and an immigrant (UNFPA 2006). In Nicaragua, women are also still expected to take responsibility for the reproductive tasks, even when having entered the workforce (Chavez Metoyer 2000; Fauné and Matute 2007).

Agurto Vílchez *et al*. (2003: 19ff.) bring up "two faces of migration": a positive side – remittances – and a negative – "the human capital flight". Within the category of negative consequences, they also mention more personal losses, such as the humiliation of not being able to resolve your financial situation within your own borders, the risk of being exposed to violence, and leaving your family to face uncertain circumstances and situations in far away places. Regarding the remittances, they have both micro and macro effects in Nicaragua. Their importance for Nicaragua at macro level becomes visible once they are compared to other economic macro indicators, such as GDP, Official Development Assistance, Foreign Direct Investment, and incomes from agriculture and tourism (the largest and second largest single sectors in Nicaragua since 1960 (BCN 2013)) For example, as can be seen in Table 1, remittances bring in twice the amount of all agricultural exports. It furthermore constitutes almost 18 percent of the country's GDP.

Table 1. Remittances to Nicaragua compared to GDP, ODA, FDI, tourism, and agriculture (2004)

	Remittances as compared to: (% of) (2004)
Gross Domestic Product (GDP)	17,8
Official Development Assistance (ODA)	127
Foreign Direct Investment (FDI)	310
Agricultural export (2003)	201
Tourism	432

Source: IDB (2005)

The importance of remittances at micro level can be appreciated from data on how many of the Nicaraguan households that were recipients of remittances sent by both internal and external migrants in 2005 – 41 percent. Of these, more were urban than rural, and more were female-headed than male-headed. For many of the households that receive remittances it is their only source of money. (INIDE 2005) Information on how many that sent remittances, and whether they were women or men differ slightly in the sources although the conclusions are basically the same. Torres and Barahona (2004), who combine three different surveys[17], begin by saying that, at "a general level" (p. 56, my transl.), 54 percent of those who have migrated send remittances, of which women and men constitute half each. They con-

[17] The National Survey of Demography and Health, the LSMS, and the Costa Rican Survey of Reproductive Health and Migration

tinue, however, by dissecting the data, identifying a number of circumstances where women tended to send remittances more often than men. First, daughters sent remittances more often than sons. Second, after more time abroad, fewer men than women still sent remittances. Finally, of those working abroad (as opposed to, for example, studying), women more commonly sent remittances than men did. Hence, their conclusion is: "despite the limitations of the information, the main trend in the analyzed scenarios is that more women than men send remittances." (Torres C. and Barahona 2004: 58, my transl.)

Agurto *et al*. (2008) use data from a household panel survey, based on a selection of 1 600 households that were followed for 10 years with the purpose of examining women and their economic roles in Nicaragua. Their conclusion is similarly that more women than men sent remittances (45 percent of the women compared to 29 percent of the men who migrated in 2006). They see cultural factors as a possible explanation to this. Women are, they say, taught since childhood to care for the wellbeing of their families, which may result in them taking greater responsibility for family commitments and contributing more to those still at home.

Comparable data on remittances (i.e. total amount received from both internal and external migrants, or gender differentiated) are not available for the municipal or *comarca* levels. But 14 percent of the households in El Sauce, including the municipal capital and all of its *comarcas*, and 17 percent of the households in the *comarca* of the case study area are reported to receive remittances from people living abroad. (INIDE 2008: 11)

Nicaragua and hazards

Nicaragua has, due to its geographical as well as geological location and nature, historically been affected by numerous hazards of various sort on top of the inequalities within as well as high dependence on the agricultural sector, the volatility in the prices of its main export commodities such as coffee and cotton, and several wars. Germanwatch publishes the Global Climate Risk Index, a composite of four indicators (death toll, deaths per 100 000 inhabitants, absolute losses in USD purchasing power parities, and losses per unit GDP in percent) that analyzes to what extent countries are affected by weather-related hazards[18]. Currently it ranks 192 countries, and since its first report in 2006, Nicaragua has been among the five most affected in the peri-

[18] Meteorological events: Tropical storm, winter storm, severe weather, hail, tornado, local storm. Hydrological events: Storm surge, river flood, flash flood, mass movement (landslide). Climatological events: Heatwave, cold wave, wildfire, drought. (Munich Re 2012: 50)

ods reported on (Anemüller *et al.* 2006; Harmeling 2007; 2008; 2009; 2010; 2011; Harmeling and Eckstein 2012).[19]

One of the natural hazards that have resulted in disastrous impacts, historically as well as in modern times, is hurricanes. Milán Pérez (2010: 116) has a list of 41 hurricanes, tropical storms, and tropical depressions that hit Nicaragua from 1892 to 1998.[20] Other sources report an even higher incidence of hurricanes and tropical storms over the past century (Sistema Nacional de Defensa Civil 1999: 6). One of the worst hurricanes to hit Nicaragua was hurricane Mitch, which struck Central America in October 1998. Close to a fifth of the Nicaraguan population at the time were affected. The departments of León and Chinandega had the greatest number of victims, including both deaths and homeless people (27% of León's population were left homeless). (ECLAC 1999) It also increased the number of female-headed households in Nicaragua from 24 percent to 40 percent, most likely due to men dying and migrating to a greater extent than women (Correia 2001).

It is also a country with many volcanoes – six extinct and seven active, including one of the most active volcanoes in the world – the Masaya volcano. (Sistema Nacional de Defensa Civil 1999; INETER 2007c) Earthquakes and volcanic eruptions have in addition, together with heavy rainfall (as during hurricane Mitch, 1998, when two meters of rain fell in six days (Wisner *et al.* 2004: 246)), caused a number of landslides in Nicaragua. Devoli *et al*. (2007) report having found in different sources a total of 135 landslides in the period between 1500 and 1990. Examples of such events that in these cases have affected Managua include a landslide destroying the whole city "more than 100 years ago" (Sistema Nacional de Defensa Civil 1999: 2, my transl.), and the earthquakes in 1931 and at Christmas time in 1972. (Sistema Nacional de Defensa Civil 1999)

The above shows that Nicaragua is a country highly exposed to hazards of several kinds, whether geologic or weather-related. One of the hazards that historical records show has affected Nicaragua since the Spanish colonization in 1524, but which has become more frequent and severe over the past decades is drought. (Sistema Nacional de Defensa Civil 1999; Kinloch

[19] Nicaragua was in fifth place 1995-2004 after Honduras, Bangladesh, Somalia, and Venezuela (Anemüller *et al.* 2006), in second place 1997-2006 after Honduras (Harmeling 2007); in third place 1998-2007 after Honduras and Bangladesh (Harmeling 2008); in fifth place 1990-2008 after Bangladesh, Myanmar, Honduras, and Viet Nam (Harmeling 2009); in fourth place 1990-2009 after Bangladesh, Myanmar, and Honduras (Harmeling 2010) and then again in 1991-2010 after Bangladesh, Myanmar, and Honduras (Harmeling 2011); and in third place 1992-2011 after Honduras and Myanmar (Harmeling and Eckstein 2012).

[20] These are three different types of tropical cyclones. Whether they are classified as hurricanes, tropical storms or tropical depressions depends on the strength of the maximum surface winds: if less than 17 m/s they are tropical depressions (which NOAA (2011) points out should "not to be confused with the condition mid-latitude people get during a long, cold and grey winter wishing they could be closer to the equator ;-)"), if at least 17 m/s they are tropical storms, and if at least 33 m/s the cyclone is classified as a hurricane. (NOAA 2011)

Tijerino 2008) This is the hazard this dissertation focuses on and its characteristics and implications for agriculture are therefore introduced in more detail below.

"Drought stings and spreads"[21]

The inadequate agricultural and the monoculture practices as well as the deforestation caused by the expansion of agricultural exports, an advance of the agricultural frontier eastwards and increasing populations are considered to cause recurrent droughts in the region wide *corredor seco* (dry corridor) as well as in Nicaragua's *zona seca* (see Map 1 – the dark areas in the left map indicate the driest municipalities in Nicaragua) (Box 1 presents a definition of drought used in Nicaragua[22]). In addition a global causal factor is identified – El Niño, which has become more frequent since the 1970s, returning in irregular intervals between two and seven years, and is related to the climate change the world experiences.[23] (Gutiérrez Cruz 1994; Sistema Nacional de Defensa Civil 1999; INETER 2001; Leiva and Shankar 2001; Caura S.A. 2005; UNDP and MARENA 2005b; INETER 2007a; Magrin *et al.* 2007; Municipality of El Sauce 2007; Baca 2008; Picado Traña and Martínez Ortiz 2008; Rosales Rosales 2008a; Urroz 2008; Milán Pérez 2009; CCAD and SICA 2010; ECLAC *et al.* 2010; Government of Nicaragua 2010; MAGFOR 2013; INETER n.d.-a).

Nicaragua's *zona seca* covers a third of the national territory in the Pacific, North and Central Regions of Nicaragua (UNDP n.d.) and includes areas recognized as being of high risk of desertification in the National Action Program to Combat Desertification and Drought (MARENA and UNDP 2003: 10). A combination between the fertile soils of the Pacific Coast, the generally leached and infertile soils of the Caribbean lowlands as well as the remote areas of the country's east coast has led to a large share (80 percent) of Nicaragua's total population settling down in the *zona seca*. For the same reasons, the land is mainly used for agricultural purposes, and as much as 86,5 percent of the country's subsistence crops are produced in the area.

[21] My translation of the heading of Pérez and Romero's (2009) news article, one of many articles published in the year of 2009 as a result of the El Niño caused drought affecting Nicaragua.

[22] A fifth type of drought is, in addition to the four types in INETER's definition, introduced by Wilhite (2000), Villalobos (2010), and Smucker (2012): socio-economic drought. This is defined as the impact of one of the other types of drought on a human activity. Since the impacts of drought are captured in other ways in this dissertation (see e.g. article I) this fifth type is not included in the following discussion.

[23] It should be noted that the factors are considered to lie behind the deviant drought pattern and not the "seasonal drought", i.e. the dry period, nor the "intraseasonal drought" – the *canícula* (INETER 2001: 34) when they behave 'normally'.

(Merrill 1993; INETER 2001; Caura S.A. 2005; WAFLA 2007; Milán Pérez 2010)

Box 1. Definitions of drought in Nicaragua

INETER (2001) defines drought in terms of four different types. This definition works well for the purposes of this thesis, since all four types are present in Nicaragua and the case study area. The first type, meteorological drought, is defined as "a phenomenon that occurs during one or several months when there is a prolonged absence, a distinct deficiency or a limited distribution of rain that affects human activities adversely." (p. 31, my transl.) Correspondingly, the MST-project uses the number of successive days without rain at, for example, the meteorological station in El Sauce as an indicator of drought (UNDP and MARENA 2005a; UNDP n.d.) Besides the meteorological drought, three other types of drought exist – hydrological, agricultural, and atmospheric. These concern low levels of soil moisture, groundwater flow, and stream flow (hydrological drought), the impacts of meteorological drought and insufficient soil moisture for crops and forage to grow (agricultural), and the simultaneous occurrence of high temperatures, low humidity, and intense sunlight which together results in an exceptionally dry air (atmospheric) (INETER 2001; INETER and COSUDE 2005; Smucker 2012). Examples of all types of drought were clearly visible in the case study area, especially in May 2008 and January 2010 as depicted in Photo 3 (agricultural drought) and Photo 4 (hydrological drought).

According to the third National Agricultural Census[24] corn is being grown on 98 percent of the farms and half of farmland in El Sauce, followed by sorghum and beans. (INIDE 2001; INEC 2002b: 26) They were also the crops the interviewees said they depended on the most. Leiva and Shankar (2001: 285) draw two conclusions of pertinence to the interviewees' agriculture and the increasing presence of drought in the area: that corn is "the crop most affected by drought risk in western Nicaragua" and that El Sauce's corn production suffers from a particularly high drought risk. An evaluation made by the MST-project shows that El Sauce's hydrological resources are insufficient for the water demand for corn, beans, and sorghum (UNDP and MARENA 2005b). In addition to these crops, kitchen gardens are an important part of the livelihoods in the rural areas of Nicaragua. Unfortunately, they are also highly affected by the drought. Women have traditionally been the ones to grow fruit trees, vegetables, herbs, and bred small animals, such as pigs and chicken, on a small patch of land. This is still the case in the rural areas, where the female-headed households to a larger extent than the male-headed households only cultivate their courtyards, probably because they lack access to larger agricultural areas. The opposite is true for the households that only practice agriculture on plots large enough for other types of crops – they are mostly male-headed. (INIDE 2005)

[24] A fourth agricultural census was performed in 2011. According to INIDE (2012: 44) 17 departmental profiles, including all municipalities, have been published, but I have not been able to access these.

Nicaragua's agriculture is to a large extent rainfed. In 2001 three and a half percent of the country's farms had irrigation. 10 years later this had only increased to four and a half percent. (INEC 2002a; INIDE 2012) In El Sauce there are areas that are irrigated, but those are located in the valley to the west of the municipal capital and not in the eastern parts where the case study area was located. (UNDP and MARENA 2005b) The farming there followed the national practice with rainfed agriculture. How much, when, and where it rains are therefore central issues to the Nicaraguan market as well as subsistence economy at both macro and micro scales. This is demonstrated in the 1998 LSMS for Nicaragua where as many as 84 percent of the survey households said drought was the main threat to their agricultural livelihoods, whether they were poor or not (Rocha Núñez 2001: 15). El Sauce and the case study area have a tropical dry climate with two distinct seasons. The dry season (summer) extends from November to April and the wet season (winter) from May to October, interrupted by the *canícula* – a brief dry spell from mid-July to mid-August which separates the first (*primera*) and second (*postrera*) farming and harvest seasons. At least 80 percent of the rainfall is registered in the wet season. (INEC 2002b; BIDE 2005) The temperature also differs between the seasons with a recorded minimum of 24.7°C in November and a maximum of 32.2°C in April in the first years of the 21st century (INIFOM 2007: 1). The seasonal pattern has changed with a climate that has changed over the years, however. The rains commonly do not appear until later in the wet season to be interrupted already mid-June by the *canícula*, which in the drier years lasts until mid-September. This is followed by a shorter than normal second part of the wet season, which can end already in the last days of October (see e.g. INETER 2001; Ramírez and Brenes 2002). Hence, seasonal contrasts were reduced and the wet season shortened, which had made cultivating the *primera* "quite risky" (UNDP and MARENA 2005b: 96, my transl.) and the *postrera* more secure when it came to agricultural production (Milán Pérez 2010) (see also article III). The data presented in INETER (2001) show that it is more common that El Niño caused droughts occur in the *postrera*, however, thus increasing the risk of negative impacts in people's main farming season.

The reports on impacts of droughts Nicaragua has experienced are numerous. Even though some mention the impacts on water sources (rivers, lakes, and dams) (INETER and COSUDE 2005; Rosales Rosales 2008b), many focus on the production losses in basic grain and food, probably as a result of Nicaragua's high dependence on a largely rainfed agricultural sector. Among the reports on drought impacts are the higher imports of corn, mainly for fodder due to failed sorghum harvests in the 1982/83 drought, early reports on the 1997 drought which said as much as 50-80 percent of basic grains was lost and milk production was reduced with 20-30 percent, Nicaragua being one of the countries in Central America that experienced losses in its food production due to drought in 2009, and the precipitation

being insufficient for the traditional subsistence crops (corn, beans, and sorghum) in several of the driest municipalities in Nicaragua. (Spoor 1995; Oxfam 1998; UNDP and MARENA 2005b; CCAD and SICA 2010) Photo 3 and Photo 4 depict examples of agricultural and hydrological drought in the case study area.

Photo 3. Agricultural drought – fields and pasture in case study area, January 2010 and May 2008

Source: Author

The *zona seca* is part of the region wide *corredor seco* that spans mainly along the Pacific Coast from Costa Rica to Guatemala and as far north as the northern half of Mexico. (CCAD and SICA 2010) Regional sources report on an observed declining precipitation trend in the *corredor seco* and temperature increase in Mesoamerica and say there is practically no part of Central America that has not been affected by a drought over the past 30 years. Continued reductions in precipitation and increases in temperature and extreme events, including droughts and hurricanes, due to the changes is furthermore predicted, especially in the *corredor seco*. (Magrin *et al.* 2007; CEPAL 2011; Keller *et al.* 2011) Similarly to the regional scenarios, projections of future climate made in Nicaragua show significant reductions in rainfall and an increase in temperatures (up to 36.6 percent and 3.7°C respectively on the Pacific side in 2100) (Government of Nicaragua 2001a). The drought situation in Nicaragua and its *zona seca* is therefore likely to become worse with increased impacts on rural livelihoods. In combination with the past decades' unfavorable economic conditions, political conflicts,

and civil war, which resulted in "a major misallocation of resources" (Government of Nicaragua 2001b:14), this has caused Nicaragua to become a poor and unequal country in several respects.

Photo 4. Hydrological drought – the main rivers in the case study area, May 2008 and January 2010

Source: Author

The above constitutes the legacy of the past as well as context to the interviewees whose life courses this dissertation builds on. As has been demonstrated, Nicaragua is a country that has experienced multiple political, economic, social as well as environmental changes. The different periods in Nicaragua's history have had different outcomes in terms of land rights, access to credit and agricultural inputs, human rights, and livelihood security. They have all affected the rural poor, however, albeit with differentiated impacts depending, among other things, on gender. That informal norms, value systems, and traditions relevant to gender rights and responsibilities have been relatively stable in Nicaragua can partly explain this. The following chapter presents the theoretical and analytical framework used to interpret gender differentiations in vulnerability to drought in Nicaragua in the interplay among structures and resources over the past decades.

Gender and vulnerability – theoretical and analytical frameworks

The theoretical and analytical frameworks have been used as a guide to and support in the different steps of the research: to design the interview guide, to structure the analysis of the interview material and the policies that are analyzed in article II, and to achieve an interpretation of the gender differentiated vulnerability to drought in Nicaragua. The research draws on and combines the concepts and theories of *gender*, that highlights socially constructed inequalities as opposed to biological differences between women and men, *vulnerability*, that emphasizes the degree to which one's social-ecological situation influences the susceptibility to be harmed, and the *Community Capitals Framework* (CCF) with which gender differences in vulnerability can be interpreted, including the cultural and political structures of society. Before describing the integrative framework used in the research, a brief overview of previous research on the topic of gender and vulnerability is presented.

Previous research on gender and differentiated vulnerability

Vulnerability – "the susceptibility to be harmed" (Adger 2006: 269) – is commonly differentiated, which is evident when considering natural hazard experience in the world where different social groups (or geographical regions and ecosystems) are affected in different ways, even though they may experience the same stress, or the same combination of stresses. (Wisner *et al.* 2004) For example, death tolls from an earthquake in developing countries are commonly higher than in developed countries. This can be seen when comparing the 1972 earthquake in Managua, which killed 10 000 people (Morales H. 2005) with a more intense earthquake in California in 1992, which only killed one person (Bendaña 1999). Gender – the social construction of masculinity and femininity in society – is one of several dimensions which lead to socially differentiated vulnerability and, as a consequence, different impacts on men and women (see e.g. Lambrou and Piana 2005; Röhr 2007; Dankelman 2010b). This is true also in the case of drought, although empirical studies from Latin America are relatively scarce.

(Schroeder 1987; Stehlik *et al.* 2000; Gupta and Gupta 2003; Devereux 2006) Overall, however, research on gender and vulnerability to climate change has increased since Maureen Fordham (2004) noted that a gender perspective was lacking in research on hazards and disasters, despite gender having been recognized as a key variable for some time. Still, there are gaps. Much gender and disaster research, for example, highlight the role and contribution of women in the phases during and immediately after a hazard has struck, in the emergency response and reconstruction. In comparison, gendered differences in the phases before a hazard, in adaptation to climate change, have been less researched.

Vulnerability to climate change and variability is a field of study that engages researchers from as disparate disciplines as development studies, disaster management, economics, geography, ecology, anthropology, and medicine to name a few. As a result, the literature on vulnerability contains a wealth of definitions (for a selection, see Kasperson *et al.* 2010). Sen's entitlement theory is, together with Crawford Holling's theory of ecological resilience and Robert Chambers' work on vulnerability, poverty, and participatory assessment, recognized by Kasperson *et al*. (2010) as the foundational theories behind vulnerability theory, and the explanation to the commonalities that exist in vulnerability literature, despite different perspectives and conceptual approaches. These can be divided into two categories depending on their view on vulnerability. The first sees vulnerability in terms of the (potential) damages a hazard causes. This view has arisen from the approaches that focus on hazard assessments or analyses that were the "first generation of natural-hazards studies" (Kasperson *et al.* 2010: 249). Such analyses focus on the exposure and defines vulnerability in relation to the characteristics of the hazard itself. The second category of conceptual approaches sees vulnerability as a forward-looking concept, a condition that exists already before the hazard strikes, and can be found within the exposed system, independently of the hazard. These are better at taking the social, economic, and political structures that either constrain or enable the choice to cope or adapt into account. With the new literature, the focus shifted from hazards to disasters, where the first is seen as the event itself while the latter is the outcome of a hazard striking a vulnerable system. The naturalness was thus taken out of natural disasters, as O'Keefe *et al.* (1976) said in the title of their early contribution on the topic. (Maskrey 1993; Cannon 1994; O'Brien *et al.* 2007) To distinguish the two categories of conceptual approaches to vulnerability, Kelly and Adger (2000) suggest calling the first 'biophysical vulnerability' and the second 'social vulnerability'. The latter is the approach chosen for this dissertation.

Several of the definitions of social vulnerability in the literature include three main dimensions of vulnerability: exposure, sensitivity, and resili-

ence.[25] Exposure is defined as a function of the stress, perturbation, or shock (magnitude, extent, duration, and frequency) and the system with which it comes into contact (e.g., its location and some characteristics, such as population density). The second dimension, sensitivity, is defined as the degree to which the social group experiences impacts in the moment of any set of stresses, perturbations or shocks. Factors influencing sensitivity include age, health and disability, ethnicity, class or caste, immigration status, family structures, religion and social networks, cultural norms, governance structures, and political ideologies. Finally, resilience is defined as the ability of the social group to either cope with the already experienced impacts in the long-term, or to adjust and adapt to future stresses, perturbations, or shocks. Note that coping capacity is a key component of sensitivity as well as resilience. The type of coping capacity differs, however – the capacity to cope with the ongoing exposure to a hazard is important in the analysis of sensitivity, while the capacity to cope with already experienced impacts (due to high exposure and high sensitivity) is in focus within an analysis of resilience.

It is clear from literature on hazards, disasters, and vulnerability that the political and cultural structures (or what North (1990) calls institutions and Leach *et al*. (1999: 237) call "regularized patterns of behavior") in a country play a significant role in shaping people's vulnerability to natural hazards (see e.g. Adger *et al.* 2001; Kasperson and Kasperson 2001; Wisner *et al.* 2004). Literature on gender and vulnerability to climate change and natural hazards likewise talk about cultural practices and norms constructing gender relations that result in women and men having different roles, responsibilities, and identities. (Enarson and Morrow 1998; Enarson and Chakrabarti 2009; Fordham 2012) Narayan *et al*. (2000: 9) state their view on the linkages between the rules and norms, or institutions, and poverty:

> An understanding of institutions is important in any project attempting to understand poverty, because institutions affect people's opportunities by establishing and maintaining their access to social, material, and natural resources. They also reinforce capacities for collective action and self-help, while their absence can contribute to immobilization and inertia.

Mackay *et al*. (2010) introduce an emerging strand of institutionalism, feminist institutionalism, that "has critiqued the gender blindness of the existing field, arguing that the application of a gender lens provides fresh insights into the core preoccupations of the field" (p. 580). This dissertation contributes to this emerging field, as well as to the field of gender and climate vulnerability, through a focus on the role of formal rules (laws, regulations, and

[25] The following definitions are synthesized versions of the definitions in Moser (1998), Clark *et al*. (2000), Pelling (2003), Turner II *et al*. (2003), IPCC (2007), Kasperson *et al*. (2010) among others.

property rights) and informal norms (customs, traditions, and codes of conduct) in shaping gender differentiated vulnerability to drought in rural Nicaragua. The rules and norms structure human interaction and shape the behavior of organizations[26] and individuals in a society and thus construct gender and social hierarchies. (North 1990; 1991; 1996; Ostrom *et al.* 2001) Examples of how customs and beliefs associated with gender roles as well as how formal structures influence vulnerability can be found in Schroeder (1987) and his case study on gender vulnerability of Hausa households to drought in northern Nigeria and southern Niger. He explains how a "general stigma attached to women moving about in public space" (p. 39) prevent women from selling their labor to access cash in times of drought. He also describes how women were more vulnerable since national inheritance laws (a formal rule) discriminated women by leaving them with a lot less compared to a brother's inheritance. Gendered norms and their impact on vulnerability are also visible in the case of floods, such as in the 1991 cyclone floods in Bangladesh where the cultural norm relating to the preservation of female honor through seclusion in the home proved to decrease women's ability or willingness to cope with the flood. Hence, many more women than men drowned since they delayed leaving the home to seek refuge until it was too late. (Nelson *et al.* 2002: 55) In Nicaragua during hurricane Mitch, the opposite happened: more men than women died due to the men taking higher risks as a result of cultural norms. (Delaney and Shrader 2000)

The Community Capitals Framework (CCF) developed by Flora *et al.* (2004), has been used in this dissertation to be able to interpret the differentiations in vulnerability within the case study area (see below for more details). The CCF grew out of the Sustainable Livelihoods (SL) framework and is a way to capture multi-dimensional poverty. Drawing on the early work of Chambers and Conway (1992) the SL framework was developed in the 1990s for analyses of whether a livelihood "can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones 1998: 5), i.e. whether a livelihood is sustainable or not. Wisner *et al*. (2004) point out that the SL framework was not developed specifically for disaster contexts.

[26] This research follows the model introduced by North for how to relate organizations to institutions. North's model makes a clear distinction between institutions and organizations since he considers it important to differentiate the rules from the actors (organizations can then be defined as social groups (Eggertsson 1996)). The rules determine what organizations are created, and also how they evolve over time. At the same time, the organizations influence how the institutional framework evolves. (North 1990) For example, the National System for Disaster Prevention, Mitigation and Response (SINAPRED) was created through Nicaragua's legal framework. At the same time, SINAPRED develops hazard management policies that in turn will influence the behavior of those involved in hazard related interventions (see article II for details on SINAPRED and the hazard management framework of Nicaragua).

However, Scoones (1998: 6) declares that vulnerability (together with the ability to cope or adapt) is part of the key elements of the definition of sustainable livelihoods. The CCF and the SL framework have both similarities and differences: they emphasize participatory processes, a bottom-up perspective on empowerment, and available resources (or capitals). The number of capitals differs, however. At the core of later versions of the SL framework lies the "asset pentagon", constructed of five capitals – human, social, natural, physical, and financial (DFID 2000). The cultural and political capitals included in the CCF are thus not part of the SL framework's asset pentagon. Their inclusion, explain Gutierrez-Montes *et al*. (2009: 110), "fills in gaps in [the Sustainable Livelihoods Approach] leading to a better understanding of power and access to power as well as highlighting the relevance of local knowledge and traditions."

The gendered access to and control over the different capitals is what Kelly and Adger (2000: 326), based on Sen's (1981) entitlement concept[27], call "the 'architecture of entitlements', the social, economic and institutional factors that influence levels of vulnerability within a community or nation and promote or constrain options for adaptation." Consequently, the capitals are not only important resources on which livelihoods depend, but also that which provides the capacity to change the vulnerability situation. Combining vulnerability with a capital (or asset, or resource) thinking has been done in other vulnerability research as well. However, most have done it in theoretical discussions on vulnerability, or with less detail than what is done in this dissertation. Yet others see capital only in terms of financial capital, and thus measure poverty in terms of income per capita or similar conventional indicators (Adger 1999). Exceptions include Knutsson and Ostwald (2006) who offer an example of how the SL framework can be used for an analysis of climate change vulnerability. They do a quantitative analysis of the five capitals included in the framework comparing two Chinese villages and intra-village differences according to income groups. Their quantitative methodology limits them to look at indicators with good data coverage, however, and institutional factors are to a large degree missing from their analysis. Other empirical studies have created their own, less encompassing, asset frameworks including such assets as labor, infrastructure, housing, household relations, social capital, and intra-household inequality (Moser 1998) or natural, human, on-farm, off-farm, and community owned resources as well as social and political capital (Vosti 1999).

[27] Early versions of Sen's entitlement concept has been criticized by Gore (1993) and Kabeer (1991) for being too focused on the entitlements being legally recognized in a strict sense, which overlooked the "normative entitlements inscribed in social relationships of kinship and family." (Kabeer 1991: 245) Both Gore and Kabeer point out, however, that the entitlement concept was later extended by Sen to also entail "accepted legitimacy" (Sen 1987: 31) to be able to capture gender issues and intra-household distribution as well.

Gender differentiated vulnerability to drought – an integrative framework

Cultural and political capital and the structures of inequality

In this dissertation, gender is seen as a social and highly contextual phenomenon. To be able to capture the consequences of those social structures (formal and informal rules and norms) that shape gender inequalities in society and, in the extension, the differences in vulnerability among women and men Flora *et al.*'s (2004) definitions of cultural and political capitals have in this dissertation been adapted. Hence, you possess cultural and political capital when the humanly devised informal norms and formal rules (North 1990) that society sets up to distribute and control resources work in your favor. As such, they are considered as prerequisites for the access to and control over the other capitals. Cultural and political capital differ in their focus, however. **Cultural capital** is tied to those informal norms that can be said to be shared and internalized understandings by those involved in a specific context about the 'do's and don'ts' involved in particular types of situations. If the traditions, value systems, and customs are constructed such that you benefit from them, you possess cultural capital. For example, in the case study area a norm regarding the division of labor existed saying men were free to find a salaried employment off-farm. That is, they possessed the necessary cultural capital to choose a strategy through which they could access financial capital, thus increasing their capacity to cope and adapt (see article I and Segnestam 2012, for more details on gender division of labor and vulnerability in the case study area). The opposite was true for the women whose mobility was restricted by the same norms, keeping them in the domestic sphere taking care of the household, including children, elderly, and sick household members.

Similarly to cultural capital, **political capital** is about being benefitted by the rules that structure our society, but in the case of political capital they are formal rules and regulations influencing gender differentiated vulnerability to drought. Hence, if you by law are unable to own land, you lack the political capital to access other resources, such as credit (for which land is needed as collateral). The definition of political capital in the latest edition of the book that first introduced the CCF, *Rural Communities: Legacy and Change*, involves such rules but sees the capital as "the ability of a community or group to turn its norms and values into standards, which are then translated into rules and regulations that determine the distribution of resources." (Flora and Flora 2013: 11)

To examine what political capital the interviewees potentially could have access to, a number of drought management policies were analyzed in article II. The purpose was to see how the municipal and national levels look upon

interactions among actors at different societal levels, including the local. The idea for the article stems from a review of literature on social-ecological vulnerability, which claims that a hazard management structure based on interactions among different actors at different societal levels increases the chances of a reduced vulnerability among households (see e.g. Adger *et al.* 2005; Smit and Wandel 2006; Armitage 2008; Pelling 2011). Based on a review of literature focusing on adaptive and multi-level governance of social-ecological systems a number of attributes of beneficial interactions were identified. The literature can be divided into different bodies depending on focus. One body speaks of interactions that are either *horizontal* (between or among actors at the same societal level) or *vertical* (between or among actors at different levels) (e.g. Olsson *et al.* 2004; Lebel *et al.* 2006; Murphy 2007; Armitage *et al.* 2008; Pasteur 2011). Another speaks of *mutual* (with feedback loops) or *unidirectional* interactions (upward or downward) (e.g. Young 2002; Wilbanks 2006: 28-29). While being useful in capturing certain characteristics of interactions, these attributes have not been combined in previous research. Neither does the literature suggest a tool for how to analyze interactions in a setting such as a country's hazard management framework. As described in the succeeding chapter on methods as well as in article II, I therefore developed a framework for the purpose of being able to analyze the policies.

In article I, the definitions of cultural and political capital involved power apart from the formal and informal rules and norms. Hence, "power in relation to more aggregate sociopolitical levels [was] considered part of political capital", while "the division of power between men and women, at a microlevel" (Segnestam 2009: 159) was placed within the category of cultural capital. As my research progressed the view on power developed, however. The analyses made it clear that an unequal division of power could not be explained with the access to (or lack of) cultural or political capitals alone. Rather several capitals turned out to be central to the power structures in the case study area (see Key findings and insights for more details). Hence, a hierarchical order among the capitals appeared, where access to political and cultural capital resulted in a gendered division of other capitals and of labor – two factors that are key to drought vulnerability (see articles I and III as well as Segnestam (2013)). The gender differentiation in vulnerability to drought is thus exacerbated by pre-existing inequalities.

Vulnerability

Like gender, vulnerability is in this dissertation seen as a socially construction and highly contextual. Similar to other literature, the concept of social vulnerability is in this dissertation defined as a function of three dimensions, but they differ from those in the literature for a number of reasons. First, when I began to try and operationalize the above described framework of

vulnerability, I found it difficult to distinguish between vulnerability and sensitivity since their definitions were so similar. Second, sensitivity and resilience seemed to be each other's flip sides (at least in part), thus suggesting a redundancy in one of the dimensions. Finally, I saw a greater need to be able to differentiate between short-term and long-term responses to a hazard since such a distinction seems central to understand what ability one has to make sustained changes in one's vulnerability. Vulnerability is thereby in this dissertation seen as a function of exposure, coping capacity, and adaptive capacity, defined as follows.

Exposure is the degree to which, for example, a social group is exposed to hazards. In line with Wisner *et al.*'s (2004) and Brooks' (2003) definitions of vulnerability, the biophysical component of exposure, i.e. the hazard, is considered to be external to the definition of exposure, however. Exposure is thereby a combination of the location and the characteristics of the system with which the hazard comes into contact. In this particular case, the location is wherever drought occurs and the main characteristic of importance is the type of livelihoods among the interviewees (see the preceding chapter and article III for aspects relevant to the exposure to drought in Nicaragua as well as in the case study area). The second dimension is the **capacity to cope**, i.e. the capacity to implement loss management activities during and immediately after a hazard strikes. Is there, for example, an emergency system in place through which one can receive help? In Sabana Grande, the interviewees said they had had the capacity to implement a number of coping strategies in times of drought, including selling livestock and obtaining a credit in the local store. The aim with coping is to reduce losses in the short-term in order to prevent the natural hazard from becoming a social disaster. However, as discussed in article III and as Davies (1993) concludes, coping risks resulting in a downward spiral in the longer term, ultimately leading to a depletion of resources and an increase in vulnerability. In that sense, it differs from the **capacity to adapt** – the third dimension of vulnerability as defined here. Adaptation generally has a more long-term objective than coping, and involves actions that reform, restructure, and reorganize social-ecological systems to contexts and needs that have changed due to a continuous threat from natural hazards. (Smit and Pilifosova 2001; Haque and Burton 2005; Nelson *et al.* 2007; Agrawal 2008) In this dissertation, adaptation can have as its purpose to either reduce exposure (e.g. by changing one's primary livelihood) or to increase the capacity to cope in times of hazards to avoid a disaster from taking place. Others (e.g. Brooks 2003) see adaptation as actions that enhance a system's ability to cope with external stresses and do not consider a reduced exposure as a purpose. Articles I and III look at the interviewees' capacity to adapt to the climate change in Nicaragua since the droughts have become more frequent and the dry seasons longer. Both articles show that, as opposed to coping, adaptation has the potential of turning the downward spiral of drought exposure upwards and

achieve a reduction in vulnerability over time. This conclusion is drawn by other researchers as well, such as Smit and Pilifosova (2001) and Lambrou and Piana (2005). Examples of adaptive actions from the case study area include migration and a discontinuation of cultivating the *primera*. Such actions were more the exception for the women in general and the female heads of households in particular. Two exceptions are the migration by the younger generation and the installation of potable water in 2007 in the households, which both men and women had done. In total the findings indicate that men have a greater capacity to decrease their vulnerability over time. This shows the importance of including adaptation and coping as two separate dimensions of vulnerability, which is not always done in the literature. Instead there is a tendency to not problematize the concepts of coping or adaptation and the differences between them even though many include both in their discussions.

The use of agrochemicals is another adaptive strategy many of the interviewees said they had begun to use. This, however, belongs to a category of maladaptive measures since it was said to not only involve increased yields but also adverse effects on health and ecological systems (see article III). Maladaptation is recognized by several sources on adaptation and climate change vulnerability (World Bank 2009; Barnett and O'Neill 2010; McDowell *et al.* 2010; World Bank 2012). The equivalent for coping does not exist in the literature but it is clear from the findings in article III, and from the conclusions reached by Davies (1993) and others, that coping may lead to downward spirals. Barnett and O'Neill's (2010: 211) definition of maladaptation – "action taken ostensibly to avoid or reduce vulnerability to climate change that impacts adversely on, or increases the vulnerability of other systems, sectors or social groups" – can thus be said to be relevant also for coping that has long-term adverse effects.

Capitals and differentiated vulnerability

The CCF and the seven capitals (natural, human, social, financial, and physical capital in addition to the cultural and political capitals introduced above) made it possible to identify the differentiated capacities among the interviewees to cope and adapt to the drought situation they said they had experienced more frequently over the past decades. The division into different types of capitals simplified a gender analysis of the interview results, even if the interviewees did not talk explicitly in terms of the seven capitals. The CCF additionally offers a tool to reach a more profound interpretation of how the capitals enhance or detract from each other or transform into other capitals, thus leading to downward or upward spirals of assets with an increase or a decrease in women's and men's vulnerability as a result (Emery and Flora 2006; Flora and Flora 2008; Soares *et al.* 2011). This can be compared to Amartya Sen's capability concept, which refers to being able to

perform certain functionings, whether elementary or more complex, that a person value doing or being (Sen 1993; 1999). Sen's capability approach is by several considered (and at times criticized for being) general and under-specified (see e.g. Chambers and Conway 1992; Robeyns 2003; Alkire 2005). According to Iversen (2003) it moreover fails to encompass intra-household power asymmetries and inequalities. Such aspects are central to my research. The CCF has for that reason been adapted in this dissertation from Flora *et al*.'s (2004) emphasis on the community level, to a focus on the individual and household levels in order to enable an analysis of the gender differentiated vulnerability. In particular, the assets included in each category of capital are assets owned or controlled by individuals or households rather than by communities. The following division includes some adaptations of others' definition of the capitals for the sake of the empirical findings and the analysis in this dissertation (see e.g. Moser 1998; DFID 2000; Jansen *et al.* 2006; Knutsson and Ostwald 2006; Stoian 2007; Flora and Flora 2013):

Natural capital includes the quality and quantity of such natural resources as land, water, soils, forests, and biodiversity. In line with Stoian (2007), wild foods (animals and plants), crops, and livestock (cows, horses, pigs, chicken, and goats) are also included in this capital owing to their importance in the context of drought vulnerability in the case study area.

Human capital includes the level of education and skills, personal health as well as family size and household structure.

Social capital is created through the participation in organizations and networks, formal as well as informal. It includes such assets as trust, and reciprocity, and enables a mobilization of resources that provide the capacity to cope or adapt. Networks are often discussed in terms of bonding – networks within a defined socio-economic group that may be based on family kinship, class, gender, ethnicity, and locality – and bridging – networks with ties that are external to the group.[28] (Woolcock and Narayan 2000; Adger 2003; Flora and Flora 2008) Communities with both types of networks have better capacity to confront natural hazards and reduce vulnerability. (Adger 2003)

The idea behind the policy analysis in article II was to establish how other societal levels in Nicaragua than the local[29] look upon interactions with the local population in an attempt to attain a greater understanding of the latter's (potential) access to bridging social capital in addition to political capital.

[28] The concepts of bonding and bridging social capital were accidentally inversed in their definitions in article I, p. 159. They were correctly used in the analysis, however.

[29] The societal levels included in the analysis are defined according to the levels in Nicaragua's disaster management administration, who are represented by their own committees: national, departmental/regional, municipal, and local with an addition of the local population, in the sense of those that live with and are directly affected by the drought.

Financial capital refers to the incomes, formal credit, and informal loans that the individuals and households had access to. Incomes from migration (remittances) are also included in this category considering the importance they were given by the interviewees to their capacity to reduce vulnerability.

Physical capital is part of the SL framework and includes such assets as infrastructure (e.g. buildings, water systems, roads) as well as machinery and equipment (DFID 2000). In accordance with Cepeda Gómez (2008: 67), other physical possessions, such as bicycles, clothes, TVs, and furniture, which can be transformed into other assets and capitals through sales or exchange, are also included in this category for their potential importance to vulnerability reduction. Being an important asset in the context of drought vulnerability, agro-chemicals are placed within this category as well. The category of built capital – "human-constructed infrastructure" (Flora and Flora 2013: 11) – in the CCF is thereby part of physical capital. It is therefore replaced since the slightly broader definition of physical capital permits an analysis of coping and adaptation capacities at a more disaggregate level.

A use of capitals to understand the details of the three dimensions of vulnerability (exposure, coping capacity, and adaptive capacity), as is done in this dissertation, and as an integrative framework for the analysis of gender and vulnerability to climate change is not that commonly encountered in the literature. This dissertation provides the field of vulnerability research with a structured framework to interpret the structures that lie behind the inequalities in rights and obligations that result in a, gendered or in other ways, differentiated vulnerability. It does so by using the CCF, with its seven capitals, in combination with a definition of vulnerability that captures capacities to respond in the short- as well as in the long-term. The framework is also more transparent, without being too simplistic, than many of those that exist in the literature, which not seldom get criticized for being too complicated, difficult to operationalize, or to overlook variables vital for a vulnerability analysis, such as gender or institutions.

Methods for data collection and analysis

Primarily oral history methods have been used in this research to explore how the vulnerability to drought has been changing over the life course of women and men in the case study area. Oral history is defined by Hoffman (1984: 68) as "a process of collecting, usually by means of tape-recorded interview, reminiscences, accounts, and interpretations of events from the recent past which are of historical significance."

This project has mainly used three qualitative and participatory methods in the process of oral history, as defined by Hoffman – interviews, focus groups, and key informant meetings. The different methods were used for different purposes and with the intention that they would provide different types of information (e.g. historical, institutional, environmental, cross-level). In addition to providing individual views and perceptions of the drought and its consequences, the oral sources have provided me with elements of 'external realities'. Hence, similar to how Thor (2006a) describes her oral history research, I have used the results of the key informant meetings, interviews, and focus groups in two different ways, partly as subjective accounts of the history of gendered life in drought, which I have been able to analyze using the analytical framework described in the previous chapter, partly as 'factual' accounts that complement and can be complemented by existing written sources in a reconstruction of the same history. An example of the latter include patterns that were retold often and similarly enough to reach a saturation, such as the installation of potable water. Another example is phenomena that I could observe myself when being in the field, such as the high level of deforestation, the lack of water in the rivers, and the lack of people of a certain generation due to them having left the *comarca* to look for other livelihoods.

As a complement to the participatory methods a policy analysis of the main policies concerning drought and hazard management at local, municipal, and national level was performed (see article II). This chapter describes how the case study area was selected as well as the methods used to collect and analyze the data. Focus is mainly on the oral history methods since they were used the most and are more complex.

A dry, rural, and poor case study area

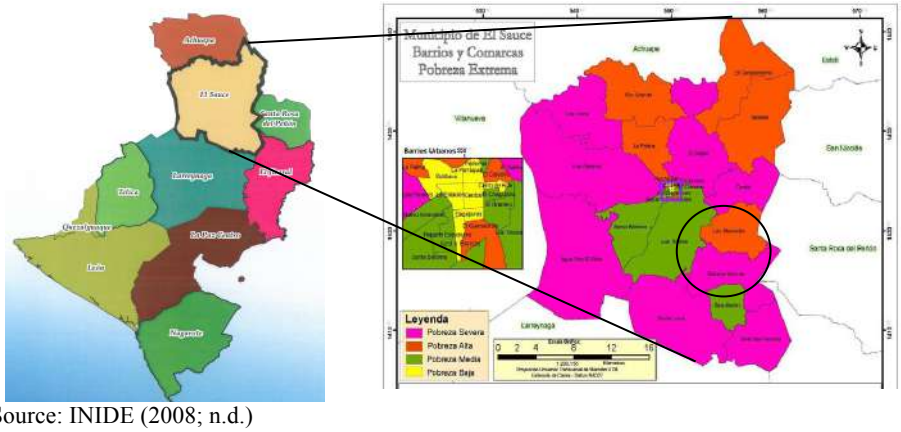
What Nicaragua's poverty, inequality, and drought exposure implicate in terms of gender differentiated vulnerability is in this dissertation explored with the help of a local level case study. This approach was chosen primarily to be able to address the complex and socially constructed vulnerability situation experienced by those who live in Nicaragua's *zona seca*. With the objective to explore two phenomena that have received little attention so far in risk and vulnerability research on Central America – gender differentiated vulnerability and drought – both ecological (drought stricken) as well as socio-economic (rural and poor) criteria were used to select a case study area.

Good meteorological data coverage made Leiva and Shankar (2001) include El Sauce as one of nine municipalities in their study on drought risk in Nicaragua. Access to drought data was also one reason why key informants from the Ministry of Environment and Natural Resources, INETER, and the Nicaraguan Institute of Agricultural Technology (INTA) in Managua identified El Sauce as a potential municipality for the case study area. Just south of El Sauce city there is a meteorological station with records on precipitation and temperatures beginning 1962 and ending 2005 (INETER 2007a; b). INETER (2001: 43) classifies El Sauce as being in a severe risk of drought, giving it a '7' on a scale of 1-10 (where 10 signifies the highest risk of being affected). This is to be compared with hurricanes and floods, which both get a '5'. WAFLA (2007, my transl.) furthermore claims it is one of Nicaragua's seven driest municipalities which all are considered to be "extremely poor, severely affected by drought, and with a highly vulnerable food security". Of the seven municipalities within the MST-project, El Sauce is the one that experiences the most frequent droughts, with a recurrence of every 6 years as compared to between 10 and 15 years in the others. (UNDP and MARENA 2005b: 97-98)

The municipality of El Sauce is divided into 17 *comarcas* (16 rural and the city of El Sauce with its semirural periphery). (INIFOM 2007: 3) Sabana Grande is one of the rural *comarcas*, established in the 19th century in the southeastern part of the municipality (see circle in Map 2 for the location of Sabana Grande). (OPLAM 2007b) It is located in a part of El Sauce where precipitation levels are on average below that of the municipality and therefore fits the ecological selection criterion. (UNDP and MARENA 2005b) An area located within Sabana Grande that the MST-project collaborated with was selected for the case study. The socio-economic selection criteria for the case study area were that it should be a relatively poor rural area. While poverty and (climate change) vulnerability are not necessarily the same thing, "the two conditions are often very highly correlated." (Wisner *et al.* 2004: 78) The rural population's high dependence on natural resource based livelihoods, furthermore, makes them directly exposed to the drought

and thus more vulnerable than the urban population. Sabana Grande fits these selection criteria well. It is a rural *comarca* consisting of almost 500 households, out of which about 90 are female-headed. Close to half of the 500 households live in extreme poverty[30]. The right map in Map 2 shows the incidence of poverty in El Sauce (going from severe poverty (pink) to low poverty (yellow)). As can be seen, the case study area, marked with a circle, is among the poorest in the municipality. (INIDE 2008)

Map 2. León department, El Sauce municipality, and the case study area



Source: INIDE (2008; n.d.)

There are, unfortunately, many other places in Nicaragua than El Sauce and Sabana Grande that fit the selection criteria for the case study area (drought stricken, rural, and poor). However, two aspects made Sabana Grande stand out. The first was the presence of MST, which both facilitated the introduction to the households and increased the information available on the area. Not only did MST have a specific focus on communities in Nicaragua's *zona seca* it also had gender and equality as a component to ensure that women and men in the project area would have equal access to the resources, benefits, and services offered by the project. (UNDP n.d.)

The second aspect that made Sabana Grande stand out was its poverty level. Judging by the quality of houses (Photo 5 depicts a typical house in the case study area. It also shows how dry the area was in May 2008), the number of animals, the dependence on subsistence agriculture, and other similar expressions their multi-dimensional poverty was high. Land tenure in the *comarca* is another indicator of this. According to official statistics from 2007, as many as 36 percent of the farmers in the *comarca* did not own any land at all, 20,5 percent were small producers, with properties of 1-5 mz, 41 percent medium sized (6-50 mz), and only two and a half percent had

[30] Defined as the households who cannot afford two or more basic needs (housing, water and sanitation, primary education, economic independency) (INIDE 2008).

farms with more than 50 mz. (OPLAM 2007a: 24; 2007b: 25) Still it was not as severe as in some of the other potential case study areas. Since I was interested in studying the changes that were said to have been implemented by women and men as a response to drought and understand possible gender differences in the capacity to cope with and adapt to drought the area could not be so poor that no actions would have been possible. In other words, I was looking for a case study area where there had been some capacity to respond to as opposed to only suffer through the droughts.

Photo 5. A typical house in the case study area, May 2008

Source: Author

Fieldwork – oral history

To include otherwise 'invisible' groups is one of the main purposes and advantages with oral history according to several researchers (Odén 1996; Thompson 2000; Thor 2001; Perks and Thomson 2006). Even if it is not its main objective, an aim in the dissertation has been to emphasize the history of otherwise 'invisible' groups of people and by giving them a voice, formulating their own "forgotten history" (Thor 2001: 325). This relates to one of the first aspects to include in a critical review of one's sources, according to Ågren (2005) – visibility. What is visible in what sources and why? This question illustrates why the traditional sources are not always appropriate or useful since certain issues or perhaps more commonly certain groups and their perspective are not always included. Sangster (1994: 5) speaks of the use of oral history as "a means of integrating women into historical scholarship" since feminist historians recognized that "traditional sources have often neglected the lives of women". Similarly, Hoffman (1984: 72) considers the possibility to preserve "the life experience of persons who do not have

the literary talent or leisure to write their memoirs" as the main advantage of oral records compared to written documents.

Hence, written sources may exist but certain issues or groups, such as ethnic minorities, elderly, or women, are 'invisible' for various reasons. Vulnerability to drought, for example, has not been studied as much as vulnerability to floods. This was explained by Marcio Baca at INETER as being a result of Nicaragua's constant emergency situation, which forces the country to prioritize the hazards that immediately risk resulting in disasters. Another reason he mentioned was the problems brought by flooding that occur every year, as opposed to every three to five years as in the case of drought. Finally, he considered drought to be more complex and difficult to mitigate. Even more invisible within vulnerability research are the differences between women's and men's vulnerability, not to mention the specific situation in Nicaragua. It is quite unlikely that this means that such differences do not exist. More likely, this invisibility points to power structures, both within the groups affected by drought and within the research world.

Another commonly mentioned reason to use oral history is simply the lack of traditional written sources (e.g. Thompson 1984; Kjeldstadli 1998; Perks and Thomson 2006). If no documents regarding the research question exist, there may be no other option than to turn to oral history for information about the course of events in the past. In the case of Nicaragua, available censuses do not always include gender differentiated data at the local level or cover enough aspects to enable an analysis of people's lives and the grounds for their decision-making throughout history. For example, data on alternative land management practices (e.g. living fences and zero tillage) or irrigation are in the third National Agricultural Census only available at the more aggregate departmental level, and the data on additional livelihoods (e.g. day laborer and off-farm employment) or livestock holdings are not disaggregated by gender. The fourth National Agricultural Census has, according to INIDE (2012: 44) also resulted in departmental profiles, including data for the municipal level, but I have not been able to obtain access to these. One can also question to what extent subsistence agriculture and other non-market activities are covered. The Population and Housing censuses report on an even more aggregate level, only including data for the local level once – in the 2005 census. Otherwise they have data at the best on municipal level, and more commonly at the departmental or national level, and gender differentiated data are scarce. It was therefore clear that there was not sufficient source material to answer the research questions, which is one rationale behind the choice of participatory methods.

However, the methods and sources were not only, or even primarily, chosen because there was a lack of sources on gender differentiated vulnerability to drought in Nicaragua. It was instead driven by the research focus, which would be difficult to achieve without listening to the people's own stories directly. The information given by the interviewees and key inform-

ants is thus taken to be local and contextual, insightful for them as well as the place and time in which the interviews and meetings were performed. I consider it highly unlikely that the full picture is obtained without this first-hand information, and the risk for misinterpretation is therefore high if it was not included in the research. The Nicaraguan government expresses a similar opinion in their Strengthened Poverty Reduction Strategy from 2000 saying "the organized participation of the people at local level is necessary for a correct assessment of their own vulnerability and often the historical and current knowledge of the local socionatural hazards." (Government of Nicaragua and UNDP 2000: 20, my transl.).

Key informant meetings

To meet with representatives of organizations involved in issues of relevance to the research fulfilled a different purpose than interviewing the community members. In general, the aim was to achieve a more complete picture of the larger societal structures around gender and drought in Nicaragua, and to locate historical data. Hence, the local interviews were important to capture the informal and locally relevant norms, value systems, and traditions, and thus the interviewees' cultural capital. Meeting with key informants, on the other hand, had as one of its objectives to identify the formal rules and regulations but also plans and strategies that provide the local actors with more or less political capital. Interviewing representatives of different societal levels (from local to national) thus permits an analysis of those structures existent at other levels than the local that may be of relevance to the gendered vulnerability at local level. Another objective was to identify the main drought management policies in Nicaragua. This was, as is discussed below, more difficult than I had anticipated, and I had to turn to other means to get hold of the principal documents governing Nicaragua's drought management. The key informant meetings in the months prior to the first interview session (see Box 2) had in addition an explorative purpose to get a sense of the drought issue, and to identify a suitable case study area as well as to find as much written material as possible relevant to the research.

The meetings were held in 2008 and January 2010 with representatives of different societal levels (international, national, and municipal) as well as organizations (governmental, academic, and non-governmental) (see Box 2 for a list of the organizations that were represented). The meetings were held in the offices of the key informants in all cases but one.[31] The key informants were selected based on their role and organizational belonging. A central selection criterion was thus that they be key representatives of their

[31] The only exception was the meeting with Dr. José Antonio Milán Pérez, who at the time was an independent consultant and climate change expert writing a book on climate change in Nicaragua (Milán Pérez 2010) whom I met at a café in downtown Managua.

organizations, which all had a connection to drought, either as a natural phenomenon or as a hazard event, to development, or to gender. The snowball method (a type of non-probability sampling, (Bryman 2004)) was used to identify the key informants. The snowball method can be criticized from the perspective of representativeness due to the lack of randomness in the selection. It was in this case employed to increase the likelihood of obtaining information from the meetings on aspects relevant to the research, and the randomness was thus of less importance. The snowball method furthermore made it possible to get hold of key informants that worked with the topics in case and in organizations of relevance. It is likely that I would not have gained access to several of those that I interviewed without the help of the first contacts I was able to make.

Box 2. Organizational belonging of key informants

In the months prior to the first interview session, meetings were held with representatives of the Inter American Development Bank (IDB), Netherlands Development Organisation (SNV), the Nicaraguan Institute of Agricultural Technology (INTA) in Managua, the National Office of Clean Development and Climate Change at the Ministry of Environment and Natural Resources (MARENA), and the Nicaraguan Institute of Territorial Studies (INETER).
Apart from these, the key informants were representatives from the Ministry of Agriculture and Forestry (MAGFOR), the National System for Disaster Prevention, Mitigation and Response (SINAPRED), INTA in El Sauce, the municipality of El Sauce, the Institute of Nicaraguan and Central American History at the Central American University (IHNCA UCA), the Interdisciplinary Programme of Gender Studies at the Central American University (PIEG-UCA), the National Autonomous University of Nicaragua (UNAN), Centro Humboldt, the National Farmers' and Ranchers' Union (UNAG), United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations including its Special Programme for Food Security (FAO PESA), the Tropical Agricultural Research and Higher Education Center (CATIE) in Nicaragua and in Costa Rica, Oxfam, the regional office of the International Union for Conservation of Nature (IUCN), the Regional Program for Reduction of Vulnerability and Environmental Degradation (PREVDA), the Swedish International Development Cooperation Agency (Sida), the US Agency for International Development (USAID), and the Manejo Sostenible de Tierra (MST)-project in Nicaragua.

The meetings circled around a few themes relevant to the research objective: drought, livelihoods, gender, assets and decision-making, social networks, emergency plans, and deforestation (Appendix 1). Depending on the role and organizational belonging of the key informant, the conversations treated slightly different themes, however. For example, when I met with representatives of INETER the conversations concerned drought aspects (drought history, plans and strategies, and the impacts of climate change) to a greater extent than gender, even if that was touched upon as well. In comparison, the meeting with the Director of the Interdisciplinary Programme of Gender Studies at the Central American University (PIEG-UCA) focused on drought to a much lesser extent. Instead information and studies on gender and

women in Nicaragua, but even more on women and nature (Ecofeminism) in general was in focus.

In most cases it was pointed out explicitly that me being from Sweden was something they considered a positive aspect as a result of the many years of support Sweden had given to Nicaragua, an experience similar to that described by Tornhill (2010). That they thereby would be 'strategic' in their answers, something Thompson (1995: 135) calls "the management of visibility" – to make oneself visible for a certain purpose – was not probable, however. First, they were all aware of me being a PhD student without any funding to contribute with. Second, Sweden was in 2008, at the time of my fieldwork, in the process of closing its embassy and downscaling the bilateral support to Nicaragua. Another risk could have been that especially the representatives of Nicaraguan organizations (since their country was in focus) wanted themselves and Nicaragua to appear in their best light. However, they spoke of the great problems Nicaragua had when it came to drought and gender, and that they were 'behind' in both fields in relation to what was necessary for a good development. All of the key informants also expressed their appreciation of the focus of the research, saying the issues were both important and needed more attention. Both these aspects (being a Swede researching a 'forgotten' issue) may have resulted in them placing me in a context which gave me more access to them than what otherwise would have been possible.

The meetings were held in Spanish, English, or Swedish depending on the key informants' preferences. Those that were held in English or Swedish have not been transcribed. Nor have all of the 19 held in Spanish. Instead, a selection of the 13 meetings that provided the most relevant information was transcribed by Evelia Centeno Altamirano (see below). Even if she had not been present during the nine meetings held in Managua, this most likely resulted in better transcriptions had I transcribed them myself due to the quality of sound and the local language, i.e. Nicañol[32], not being my mother tongue.

Preparations and pilot study

Before going to the case study area, where the interviews with those living with the drought were going to take place, I decided to find somebody to help me with the interviewing since I was unsure whether my Spanish would be sufficient to properly understand the dialect and terminology used by the local population. Through contacts at the Tropical Agricultural Research and Higher Education Center a Nicaraguan woman with a master's degree in

[32] In Nicaragua, one jokingly calls the language spoken 'Nicañol', indicating the local variant of *español* (Spanish), which, similar to variants spoken in other countries in Latin America, has its own vocabulary and pronunciations.

Integrated Watershed Management, who at the time of the fieldwork was employed by INTA, was identified – Evelia Centeno Altamirano. We met a couple of times to discuss the purpose and contents of the interview guide. Adjustments were made to increase the cultural sensitivity and the intelligibility of the questions, both in terms of concepts and words used, so that the academic vulnerability terminology was changed for local words and expressions to decrease the risk of misunderstandings in the interviews. In each of the interviews, pilot as well as in the following sessions, we collaborated so that Centeno Altamirano was the one asking the questions while I sat next to her, recording. In this way, the interviewees interacted primarily with Centeno Altamirano in the interview situation at the same time as I could pose follow up questions on what they told us. Having another person supporting me in the interviewing furthermore opened up for observations and note taking during the interviews on reactions, household standard, clothing, animals, and other indicators of the standard of living of the interviewees. Such direct observation as well as "non-verbal communication" (Thor 2001: 338, my transl.) are important parts of the research process and data collection, which together with the recorded interviews influence the final analysis (Thor 2001). It was later in the research used both as a material in itself, e.g. as visible indicators of what assets they had access to, but moreover as a context within which the statements on capital access and capacities could be interpreted.

The first step in the fieldwork was to conduct a pilot study with the main objective to test the interview guide to be used for all interviews within the project – a tool which provided the structure that Clausen (1998: 196) considers necessary to be able to "mobilize data systematically on some particular issue or transition". On April 3-4, 2008, four one and a half hour long in-depth, semi-structured, and open-ended pilot interviews were conducted with women and men separately in a community south of Matagalpa in the central highlands (*Región Norte Central*) of Nicaragua. Owing to Centeno Altamirano's contacts within organizations working in the area, it was identified as an area congruous with the main selection criteria for the local case study.

An exploratory review of literature on vulnerability, climate change, and gender, and an analysis of empirical as well as theoretical research provided a first understanding of what creates and sustains gender differentiated vulnerability. This was used to design the interview guide (Appendix 2). The themes covered were personal data (name, age, marital status), family information (who is part of the household, education levels, occupation), livelihoods (work, assets, and decision-making), changes over time, and aspects related to natural resources and drought (ecological as well as socioeconomic, such as impacts of drought on economy, social networks, health, education, and strategies and actions to reduce the impacts of drought). The questions were all open but to various degree, ranging from questions such as Are you involved in any community organization? What kind? Since

when?, to more open-ended, e.g. Why do you think there has been a change [in your access to the household's resources]?, Could you tell me what your life was like when you were a child?, or Do you think your life has changed? In what way?

The pilot interviews showed that some questions in the guide did not work as well as hoped for, and had to be less open than they were. While the questions were developed with the expectation that drought was a phenomenon that people historically had suffered from and therefore remembered, this proved to be only partially true. The complexity in defining drought became apparent when the pilot study area was considered by the interviewees to be affected by drought every year. The extreme events that I had in mind when beginning my research were thus present, but in addition the dry period in the area had become both longer and drier. The historical developments and the institutional influences were furthermore difficult to capture. Following the pilot study, the interview guide was therefore changed to include more specific questions on what the interviewees perceived as drought, what they thought influenced gendered patterns in access to and control over assets and decision-making, what they had done or had not been able to do in times of drought, and what they would do if there was another drought. The order of the questions was also changed slightly to follow what turned out to be the natural flow of the conversation. Finally, the interview guide was revised once again to ensure an even higher relevance of the questions asked, and for the questions to be formulated in a way that was comprehensible for the interviewees.

Interviews and participatory observation

Selection of interviewees

Jacobsen (2002) suggests an upper limit of 20 people for a qualitative study to be enough. More than that and it would partly take too much time to collect the data, partly be too difficult to analyze all the collected information and its details. For this dissertation, a slightly higher number was decided upon in order to be able to include people from three social groups to cover the theme of gender – female heads of households (women that were identified by others in the community as such and that were either widows, separated, or living with husbands that were disabled), male heads of households (men living with a female partner), and women living with male heads of households. That the vulnerability of these groups can differ significantly has been shown in previous research and was therefore something I wanted to explore in the case of Nicaragua. (Enarson and Morrow 1998; Wiest 1998; Rivero Reyes 2002; Bradshaw and Linneker 2009; Dankelman 2010a; Vincent *et al.* 2010) Representatives from the MST-project helped identify the first few interviewees, who were then asked to identify elderly female

and male heads of household within the community. Being introduced to the first interviewees by MST seemed to increase their trust in us, thus making them more accessible for our purposes. In that way, 21 (13 male-headed) households were selected within which 26 people were interviewed on an individual basis. Out of the total sum of interviewees, nine were women in male-headed households between 47 and 68 years of age (except for one 35 year old), nine were male heads of households between 45 and 78, and eight were female heads of households between 46 and 80. The majority of the interviewees were deliberately from an older generation in order to facilitate the questioning on historical changes. In a few cases the choice was made, based on pragmatic reasons, not to interview both husband and wife in the same household (the one who was not interviewed was either not accessible, unwilling to be interviewed for what to appeared as idiosyncratic reasons, or unable to perform an interview for other reasons). It did not seem as if livelihoods, social groups, or other aspects important for the research were lacking due to this, however.

Especially the female heads of households would have been difficult to both find, since they are fewer and not as easily identified as the male heads of households, and gain access to without others' recommendations on where and whom to turn to. Not requiring the selection of interviewees to be representative also enabled me to interview those farmers that MST introduced me to, which were among the more talkative and informative interviewees. This was also a way to make use of knowledge that would have taken a long time to acquire in the limited time available. Finally, the selection process minimized the risk of the interviewed women and men having a chance to prepare themselves by talking to others about what to say or not. In the cases both husband and wife were interviewed we explicitly asked them not to be present during the other's interview, and an effort was made to interview one after the other in order to prevent them from discussing the topics with each other. However, on a few occasions during the interviews, the interviewees' statements were influenced by other actors that had been or were present in the case study area. Hence, despite the relatively low participation in organizations that had been working actively with land management issues there was a clear presence of such organizations in the *comarca*. The interviewees' interpretation of deforestation as one of the driving factors behind the drought was therefore said to have been something they had learned from those and that had become part of the "social discourse" (Bodnar 1989: 1202). The following quotes from one of the interviewed men and one of the women in a male-headed household illustrate this although similar expressions could be found in all three groups of interviewees:

> *What actions or what activities has the community performed to reduce or prevent the drought?* Reforestation, that is what it has done, a project is coming that helps them to reforest. *Do you think they decided to do it because*

they are conscious or because the project came? Because the project came. Fransisco, May 13, 2008

Do you think they have implemented any measures or actions to reduce the drought, so that there won't be as much drought? I don't know. As a community, what they have told us, is that it is necessary to grow trees. *Who has told you that?* For example INTA has pointed out to us not to have deforestation in order to not have as much drought, and instead of deforesting we should plant trees by the rivers so that the water doesn't go deeper. Maria, May 13, 2008

The interview sessions

Three series of semi-structured, recorded in-depth interview sessions (approx. 40 hours) in Spanish were performed where the interviewees were asked to describe their way of life in the case study area and how that had changed over the years. This was partly done to be able to keep each interview session within reasonable bounds, but also since one interview session is hardly sufficient to draw legitimate inferences about the research topic, as pointed out by Clausen (1998: 212).

Meeting the interviewees for the first time – May 2008

The first interview session took place in May 2008, when the rainy season would normally have begun but that this year had only experienced a little rain (see Photo 4 in the introduction to drought in Nicaragua above for an illustration of how dry the area was at the time). During this session, eight interviewees from each group were interviewed. All interviews took place within the interviewees' homes or in the shade in their yards, on plastic chairs brought out by the interviewees, often with other people (household members and/or neighbors) sitting around listening or offering their perspectives on what the conversation concerned. These interruptions did not seem to alter the interviewees' stories except in one case where the comments from a grown-up son of one of the female heads of households seemed to make her more quiet. In another case, when an interviewee, a wife to an already interviewed man, was asked who lived in the household she referred to the answer of the husband. Nevertheless, when asked to provide the answer anyhow, she did.

All interviews in the first session began with a short introduction of me and of the research project. It was explained to them that the interviews were for the sake of my PhD project and that I did not have any money to offer them, which, surprisingly enough, was seen as something positive. Not being able to attract any funding with the 'right' answers may furthermore have led to more sincere answers and reflections on the questions asked. From a research ethics perspective, it was explained to them that they would be quoted anonymously and that the photographs of them were for my own memory's sake. The promise on anonymity derived from experiences from

the previous research project in Honduras (Segnestam *et al.* 2006) where information given turned out to be such that it could even have been life threatening for the interviewee had it become known what had been said and by whom.

In the first session women as well as men were asked questions that were intended to elicit their views on what livelihoods their parents had had, whether they lived differently from their parents, what daily activities they and other household members performed, if there were any differences depending on the time of year and between different years, and whether drought or other climate aspects affected them (Appendix 3). Finally they were asked whether they had any questions for us, which in most instances was answered with a "no" or provoked questions about where I came from (country and organization) and the purpose of the interview. In one case, the interviewee, a man, wanted to know whether we had a political interest since he did not want "politics from any party" (Fransisco, May 13, 2008) in his house. Another man, the community leader at the time, asked how they as a community could benefit from the research at the same time as he said he could understand that the main purpose was to get to know the drought problem better rather than us working with the communities to change their situation. After each session they were given a small gift for their participation, and for taking their valuable time to help me with my research (after since I did not want to influence their sense of the interviews being something they did voluntarily). The gift was such that they would benefit from it in the sense that they would have to spend less of their own savings on things that they commonly consumed in their every day life, but could not produce themselves – rice and oil.

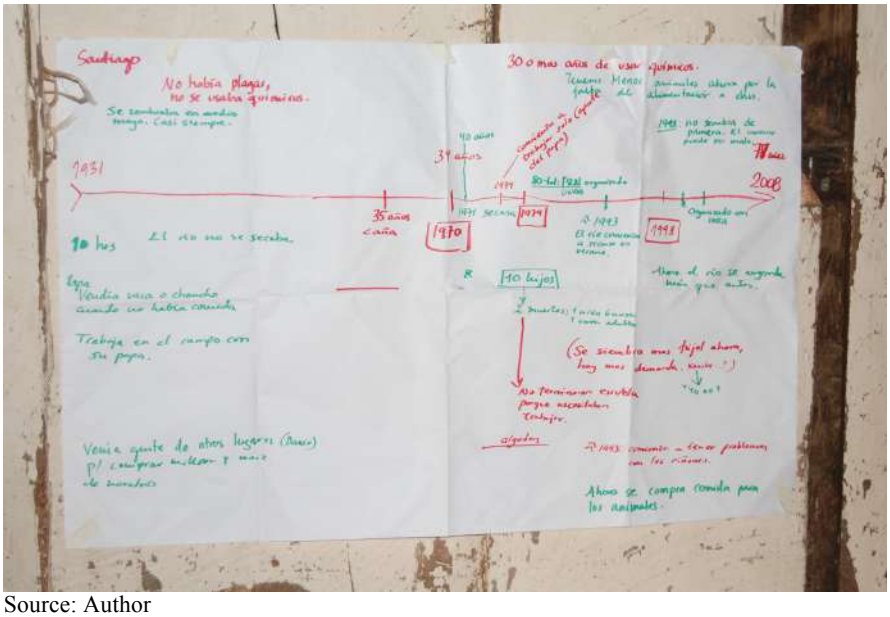
To be able to understand whether vulnerability had increased or decreased, the changes in and interactions between events over time were especially important to capture. During the first interview with the revised interview guide it became evident that the questions and structure, developed particularly to capture changes over time in the most central components of the research – impacts of drought, practices chosen to cope with and adapt to drought, and the capacities influencing the choice of adaptation practices – did not work very well. The questions regarding change seemed to be easier to respond to if the attempt to identify specific years of drought was dropped. Instead, an emphasis was put on the general trend of change of increasing drought and a prolonged and drier dry season that the interviewees in both pilot studies and the first interview during the first main interview session identified.

Digging deeper into change – October 2008

Especially the follow-up interviews in October 2008, after the hurricane season, when there was a lot more water in the area, circled around the change over time. For this session a selection of the interviewees from the

first session was identified based on their interest in and ability to talk about historical events. Thus, four male heads of households, three female heads of households, and two women in male-headed households, in ages between 47 and 80, were interviewed. They were told the main focus of the interview was going to be their childhood and youth and the changes that had occurred since with regard to what they had brought up in the first round. Issues covered included e.g. migration patterns and remittances (e.g. why had migrated family members left, and has there always been people sending them remittances?), livelihoods (e.g. what did they do, had it changed, and if so, why?), food and forage (e.g. have they lacked food and fodder, and why?), agriculture (e.g. have you lost crops in the *primera*, if so, why?), and land tenure (e.g. do you consider it a difference owning your own land and not?) (see Appendix 4 for all the questions asked). The historical changes were explored with the help of interviews structured around certain events, both personal (e.g. marriage or birth of first child) and other (e.g. the revolution or hurricane Mitch) and periods to help create time lines for each interviewee (see Photo 6 for an example of a time line from one of the interviews).

Photo 6. A time line from one of the interviews, October 2008



Source: Author

The time lines were drawn on a big paper that was put up on the wall in front of both interviewee and interviewer, and used in an effort to cover all periods of the interviewees' life, from childhood, through youth, married life, and sometimes life after separation from or death of a spouse. This encouraged them to fill in those gaps that became apparent as their stories were

placed on the paper and gave us, as interviewers, the support in identifying the periods that had been covered less and thus needed more attention. This combination between a focus on a specific topic (drought) and their life course is moreover likely to have increased the interviewees' memory since the changes could be put in a context (Kjeldstadli 1998).

After a major drought – January 2010

The third interview session took place in January 2010, after a year of severe drought in the *postrera*. This time the interviewees were asked to talk about what they had been able to do in terms of preparations, coping, and changes for future livelihoods when faced with the lack of rain (Appendix 5). While the first two sessions lasted between 45 minutes and close to two hours, the interviews in the third session were much shorter (approx. 15-35 minutes) as a result of its narrower focus on one particular drought. A conscious effort was made to revisit all of those who had been interviewed in May 2008, but especially those who had been interviewed twice already (May and October 2008). Not all of them were available, and one of the male heads of households that we had interviewed twice was not willing to be interviewed again, since he considered himself having said all that he had to say on the issue. In addition to those who had been included in previous sessions, two of the female heads of households, one woman in a male-headed household, and one male head of household interviewed in May 2008 were included. Finally, two new younger interviewees – a woman in a male-headed household, and a male head of household – were interviewed. They were the current and the former community leader and included with the intention that they would be able to provide a different perspective on the research focus. A total of 14 people were thus interviewed.

Transcribing

All interviews were transcribed within days after each interview session by Centeno Altamirano. Possible misinterpretations by the transcriber could thus be minimized since she had been present at the time of the interviews, had knowledge about the agriculturally related terminology used by the interviewees, and was a native Nicañol-speaker. Especially the first was a clear advantage. Due to the heat in the area (in May the temperature was often above 35°C) the interviews commonly took place outside, in the interviewees' yards. Surrounding sounds from other people, wind, and animals were therefore captured on the recording making it more difficult to hear the interviewees' voices. The transcriptions follow the recording as much as possible, thus containing all the characteristics of an oral history (e.g. repetitions, partial and unfinished sentences, and incoherent reasoning), as expressed by the interviewees. This makes the text less readable but opens up for interpretations of the words as they were spoken, rather than of the transcriber's interpretation. The transcriptions are also, as is common in oral

studies, the material I have mainly used in my further research and analysis. (Kvale and Brinkmann 2009) The recordings have been saved making it possible for others to verify the transcriptions and thus the oral sources.

In relation to all three interview sessions more informal, observational techniques such as walking tours in the communities were performed. In this way, a sense was acquired of what their subsistence agriculture, the surrounding rivers and environment, the impacts of drought, and some of the strategies looked like.

Focus groups

Another qualitative method employed to collect primary data was focus groups (small groups of participants that discuss a particular predetermined issue or a number of issues). As opposed to other studies (e.g. Stehlik 2004), where focus groups have been used initially to identify the themes for individual interviews to focus on, they were in this project used so that the participants could support and inspire each other in remembering the community's history of drought, rather than their individual histories which were captured in the interviews. It was also important that the interviewees would not be influenced by what had been said in the focus group, so that they would only repeat what the group's opinion was. This is a risk with having focus group discussions before individual interviews since there may be power relations within the group that the researcher is unaware of, and that may have an impact on what is said in an interview at a later stage (Jacobsen 2002: 175). This made it vital to end with the group discussions, rather than to have them in the beginning of the fieldwork.

The focus groups were, similar to the interviews, organized with women and men separately in order to address gender aspects of vulnerability to environmental stress (Appendix 6). To have separate discussion groups for men and women is suggested by many to better capture gender differences that can be sensitive to discuss in mixed settings (see e.g. Stehlik *et al.* 2000). The first focus group, which lasted for one hour and 15 minutes, was with a group of six women, mixed in ages and in their role within their households (i.e. four were women in male-headed households, one was a female head of household, and one was the daughter of another participant) (Photo 7). A couple of them had been interviewed before, but the others were new to the project. The women's focus group took place over lunch, and one of the participants, in whose yard the group discussion took place, was paid to prepare a simple meal of chicken and rice. The focus group with the men had a similar set up although it took place indoor in one of the previously interviewed men's home and lasted for almost two hours. They were served soda and buns instead of coked food since it took place in the afternoon. Four of the five participants were elderly, among them two that had been interviewed already. The fifth participant was a son of one of the oth-

ers, but old enough to be a head of household. Just as in the case of the interviews the discussions began with an introduction of the project and its objective, what they were there to discuss, and a promise of anonymity. It was also Centeno Altamirano who moderated (and later on transcribed) the discussions, asking questions according to what we had agreed beforehand insofar the discussion deviated from the topic, and making sure that everybody had a chance to express their views.

Photo 7. Focus group discussion with women, October 2008

Source: Author

The group sizes fell within what is commonly considered preferable in the methods literature (see e.g. Slim (2006: 147), who suggests a group to be ”between five and twelve people”, or Jacobsen (2002), who considers five to eight participants as optimal). Both groups worked well, interacting with each other rather than with Centeno Altamirano, and inciting each other to tell their views on what changes they had experienced over their life course. None of the participants ‘monopolized’ the conversation, and nobody sat silent throughout the sessions.

Focus groups can provide a great deal of information on opposite and controversial visions at low cost. Another advantage is that the members are encouraged to share and compare experiences and thoughts. (Wibeck 2000) Bryman (2002: 466) and Jacobsen (2002: 174) furthermore suggest they are particularly useful if the issues to be discussed are well defined, as in the case of this dissertation. Similar to the interviews, the focus groups talked more about the community’s drought history in general terms and their experiences of and views on that history, rather than identifying specific events that had affected them.

Reflections on oral history as method

Thompson (2000: 3) says oral history is a method among other methods available for historians in research, claiming "the use of interviews as a source by professional historians is long-standing and perfectly compatible with scholarly standards." My ambition has been to try and be conscious about the challenges of the methods, but still value the interviews, focus groups, and key informant meetings in relation to the objective of the research. The social constructivist stance taken and the relatively small number of interviews, focus groups, and key informant meetings undertaken affects the reflections over the sources and material. Questions regarding whether the interviewees, focus group participants, or key informants could remember what actually happened and the issue of veracity become less important. The reasons behind this is partly that oral history is "a construction influenced by the circumstances that triggered the review, the quality of the person's relationships at the time, and the accuracy of memories of past events" (Clausen 1998: 194), partly a wish from my side to tell the story told by those living in the dry zone over the past 50 years or more since they are ultimately the experts on their own vulnerability situation. Life reviews and similar oral history material can be seen as stories, variously modified by the teller according to different circumstances. The extent of this problem cannot be determined, but it must be assumed that the interviewees, to differing degrees and more or less consciously, tend to reinterpret their lives. (Clausen 1998; Plummer 2001) The material therefore allows only a partial reconstruction of the history of drought as a hazard and disaster in Nicaragua. In the cases I have used it to understand 'factual' accounts (see above) it has been done in combination with other sources and methods as described above. More importantly for my purposes, the material can be used to interpret the interviewees' view upon their own drought experience and capacity to influence their own situation and how that had changed over time. As mentioned above, this interpretation would be impossible to achieve without listening to the people's own stories and it would be difficult to make an assessment of how they perceived their vulnerability situation without it.

Many researchers before me have chosen qualitative sources for their vulnerability studies for the same reason I have – it is considered one of the best way of getting at a problem where local culture, power structures, and other drivers behind socially differentiated vulnerability have a great influence (see e.g. Adger 1999; Omari 2010; Ravera *et al.* 2011). A common criticism against oral history has concerned proximity in time and space since interviews are commonly performed years after a certain event has occurred (Thor 2006b). The fallibility of human memory has often been used by critics of oral history to question both the reliability and validity of the sources, even though there are also researchers who point out the lack of relationship between memory and time elapsed (Hoffman 1984; Kjeldstadli

1998; Thompson 2000). In the case of the current research, however, the interviews were performed with women and men not only having experienced one historical event, but recurrent events. This should increase the likelihood of the interviewees remembering as ”one can observe a *general* tendency for recurrent processes to be better remembered than single incidents.” (Thompson 2000: 158, ital. in original) Neither is the event a phenomenon from the past in the sense that it took place before their lifetime, demanding of them to retell rumors or legends. They are still living in the midst of the drought situation that has evolved over time in parallel to the actions they said they had taken in an attempt to reduce their vulnerability, in the short- and the long-term. Still living in the area that they lived in when the climate took a turn for the drier furthermore puts them close to the researched phenomenon geographically, and thus proximate in terms of space.

Proximity can also be in terms of interest – whether the issue at hand is part of one’s concern or not. Thompson (2000: 157) considers this key to remembering, and thus to how reliable the oral source is. Also in this respect, the interviewees’ statements can be said to fulfill the proximity criterion. They all expressed dramatic experiences of drought and had felt its consequences, often to the extent that it had affected their food security. In total, it is probable that the interviewees had vivid memories of how the climate had changed in the case study area, and what that had meant for their livelihoods and life situation. Hence, the interviewees can be assumed to have been sincere when they told their view on the development of drought in the case study area as well as on their life course in relation to the drought. To test this assumption one could suppose the opposite, that what the interviewees told me was something they made up on the spur of the moment, either because they could not remember, or because they did not want to tell me their view. This is unlikely considering the saturation that was reached and the degree of consistency between the different interviews (both when comparing the interviewees with each other, and with themselves in the different interview sessions) as well as between the interviews and other sources around certain topics, such as the overall changes within the community. An advantage the oral historian has is the possibility to revisit the source and ask for more information or explanations (Thor 2001), an advantage that I exploited going back to the *comarca* twice after the first field visit.

The question of how to gain the trust of interviewees to tell their view on the changes that had occurred over their life course, as they remember them, is raised by Kvale (2006: 482) who suggests ”Creating trust through a personal relationship.” Power asymmetries are often present in qualitative interviewing in relation to trust as well, and there are researchers who consider inequality and power aspects to be endemic to qualitative, ethnographic studies. (Finch 1984; Stacey 1988; Kvale 2006) Kvale (2006) mentions the researcher’s scientific competence and role in defining the interview situation

as two aspects resulting in power asymmetries in the interview situation. This is clearly true, but it could be problematized. The interviewees were not only the ones who were much more familiar with and knowledgeable about the issues that were discussed. In addition, even though I was the one deciding on the topic for the interview they still had a lot of control over the interview situation, deciding whether they wanted to be interviewed or not, where to sit, whether I was allowed to record them or not, and when to end the conversation. Not once during the interviews did I get the impression that the interviewees did not trust us, or that they felt powerless or uncomfortable talking about their history in the community. Nor did the information they provided seem sensitive for them to reveal. Even issues that in other studies have been identified as such were talked about in detail (see e.g. Beckman (2006: 15), who brings up informal loans as an example).

There were obviously differences among the interviewees, but especially when we came back the third time, showing we had not forgotten about them, they demonstrated a more talkative side. At the same time it was clear that it was not all about me; through words and gestures (such as offering us to share the little food they had) they expressed their appreciation of having the opportunity to tell their story, to have somebody from the outside listen to them. This may, according to Yow (1994: 117), give the interviewee a sense of being worth listening to, a validation which is especially important to "women, the elderly, political dissidents, and minorities", i.e. people that are often devalued in society.

They were determined to make us understand what they perceived had happened in their lives, from childhood up until the day of the interviews, how different life as a child was to where they were now, living under insecure conditions, and with children that lived in another country. Bernhardtson (2013: 148), in his dissertation on how some of the largest corporate owners in the Swedish private sector handle their role in public life, speaks of interviewees who wanted to entertain the interviewer, an experience that I share. Especially one of the interviewed men told many stories laughing aloud at his own jokes, clearly enjoying the attention he got from us. Still, when he returned to the questions he became serious, illustrating the gravity of his and his family's life situation.

It might have been my role as a student and, thus, a relatively non-authoritative person or Centeno Altamirano's own experiences of living a similar life to theirs that resulted in their candor, as I experienced it. The presence and role of Centeno Altamirano may have had an even more positive effect on the openness in that it de-emphasized the difference in class, age, and, at times, gender, and me being a *chela* – the term used by Nicaraguans to denote blond and white people from other countries – in the interviewees' eyes. That she was working at INTA and had a professional background in agricultural technology also seemed to have a positive influence on the interview situation. She did not only understand the agriculturally

related terminology and their life situation as farmers or people living close to an agricultural economy very well. She was moreover able to follow up on issues that I, with my background, was not able to identify as central to the research at the time. In addition, she could help the community members with minor problems and questions on what to do to protect their courtyard vegetables from insects and other similar issues, thus increasing their trust in us and making them accept our presence in the community and in their homes. Finally, that I was Spanish-speaking, with a familiarity of vulnerability issues in the region prior to carrying out the fieldwork, may furthermore have led to a sense of mutual understanding between me and the interviewees, as well as between me and Centeno Altamirano.[33]

Neither did they seem to modify their stories according to some, from their side, perceived expectations. They knew from the beginning that this was my personal endeavor, that I did not represent any organization that could offer potential support, or that I was liable for any suffering they were experiencing due to, in their eyes, failed promises (compare with the experiences of Beckman (2006: 20)). My impressions was moreover that the proximity and severity of the issue of drought made it easier for them to consider the questions posed and answer with what I perceived as sincerity and honesty.

Interpreting and analyzing the oral sources – articles I and III

The work with structuring, interpreting, and analyzing the material began already in Nicaragua in 2008. A challenge was to be able to overview the many hours and pages of interview material. This required a method – thematization – that allowed me to condense the information while ensuring that not too much information was lost. First, I read the transcriptions several times, highlighting themes that appeared that I could either link to the analytical framework used to develop the interview guides, or to existing literature on vulnerability, climate change, as well as gender. Other themes were 'new' and came out of the individual stories. The following themes were identified: formal and informal (values/culture) institutions; division of labor; livelihoods; drought; other hazards; impacts; micro-level strategies (against food insecurity); social networks; cross-level strategies against food insecurity; agricultural practices; causes of drought (soil erosion, deforestation); and resources. An example from one of the older female heads of households, who talked about life when living with her parents, includes

[33] In 2002-2003 I was part of a team that, on behalf of Sida, travelled to Honduras to do research on poor people's vulnerability to events such as Hurricane Mitch (see Segnestam *et al.* 2006). Furthermore, during my time at the World Bank (1997-2000) I worked with the Latin American region in various projects concerning environment and sustainable development.

words that clearly capture the themes of drought (or lack thereof) and agricultural practices:

> *In what month did the winter begin when you lived with your parents?* In May. *In the beginning or the end?* In the beginning. Before, the people sowed in April. Already when it was April it was sown and it rained already in May and those people produced. (Yamileth, October 9, 2008)

In my strive to capture the interviewees' view on change over time I was careful in looking for descriptions of how they remembered their childhood and time since. There were plenty of expressions in the interviews on this, but they covered slightly different time periods since the interviewees' life courses did not look the same. In most of the interviews, three periods in life appeared, often their life up until they got married or left their parents' home, their life until some divider in their grown-up life, and life since. For each interviewee I therefore identified three time periods discernible in the interviews as being considered by the interviewees as periods with their specific characteristics. One example is the case of a female head of household whose interview could be divided into the period up until marriage, when living with a healthy husband, and the period since the husband got disabled. Another example is a woman in a male-headed household, whose story differs whether she speaks of the period from early childhood onwards, the period when she and her husband lived with her parents-in-law, or the period since.

Combining themes and change over time resulted in a matrix for each of the interviewees. The transcribed interviews were then read again and quotes from the transcriptions on the interviewees' perceptions as well as more 'factual' accounts were copied into the different cells of the matrix (see Table 2 for an example with selected examples of themes and quotes from one of the interviewed male heads of household). This facilitated the process of understanding the individual life courses, and what the interviewees said had occurred over time. To structure the material this way can, however, also lead to a loss of meanings that fall in between or go across the themes. With the amount of data in the project (the interviews, focus groups, and key informant meetings add up to 70 hours of recorded material or close to 400 000 words in total), this consequence was difficult to avoid in the endeavor to fulfill the research objective. In an attempt to minimize this risk of vital information not being captured, the themes were wide enough to allow for the interviewees' responses to guide my systematization of the data. For example, quotes that were put under the theme of resources spanned from reasons for the children to migrate (lack of resources) to how many cows or how much land they had depending on what came up during the interview.

Table 2. Matrix with selected examples of themes and quotes from interview with a male head of household

	1947-1964	**1968** (when he moved away from home) **-1997**	**1998** (when the rains began to change) **-time of the interview**
Division of labor	*When you were little did your sister work in the field, in agriculture as well or only brothers?* Men. *And not the women?* No (…) the daughters had more opportunities to go to school, so they, the mothers, stayed alone at home doing the chores and they sent them to school.	*When you went to work [in other places] what did your wife do?* Well, she stayed at home and took care of the children, working, cooking their food, and clean them up.	*This year when you cultivated did your wife help you in the field?* No, she doesn't work in the field. *Has she never worked?* Not in the field.
Drought	*Do you remember when you were young with your parents if there was lack of water?* (…) like I said before, the winters were better before…	*Do you remember if there was sometimes, before the revolution, some drought that affected these crops?* Oh yes, of course there has been droughts.	*Since when, more or less, have you seen this change [in the rain], since what year?* Yes, that is some 10 years since that has changed, that it has begun to rain more in the end [of the year] than in the *primera.*
Micro-level strategies (against food insecurity)		*When there has been these droughts, have you had to work in other places?* Well yes, I have worked in other places. *Where or with what?* We left in those times, well, the rich people cultivated cotton and we left to pick cotton, to prune cotton, to crop sesame, sugar cane in the mills...	*And what have you done [when there is no pasture]?* Rent.
Agriculture	*What did [your parents] cultivate?* We cultivated corn, wheat, sesame.	*And what did you cultivate?* Well, the same, corn, wheat, sesame and beans as well. Sometimes rice can be grown here. One time I cultivated like two years of rice.	*And this year, what did you cultivate?* Yes, we cultivated a little, no more. *What did you cultivate?* Corn.
Resources	*When you lived with your parents, whose was the land where they lived?* My father's, it was his.	*How much land did you have when you got married?* I did not have land.	*This land is yours then?* Yes, my father gave me this (…) I have something like 15 mz which is what my father gave me.

Considering the complexity of the topic of gender differentiated vulnerability as well as the flexibility in the themes, quotes at times had bearing on more than one theme. On those cases a note was made next to the quote not to lose this potentially critical information, such as in the following example in which one of the interviewed men touches upon informal institutions that determine who has the decision-making power at the same time as he talks about the division of labor:

> …here, in this place, we have almost never gotten used to the women working in the field. *Why?* Who knows why, but it seems that men in this place haven't liked that. (Marco, October 8, 2008)

Adding quotes, rather than '+' or '-' to denote whether an aspect is mentioned or not in the interview, or a number on a scale e.g. from 1-7 to indicate to what extent the aspect is discussed (see Kvale and Brinkmann 2009) is furthermore a way to make more rather than less information available for the analysis. A similar process was performed with the transcribed key informant meetings, although without the three time periods and according to somewhat different themes: drought in Nicaragua, global causes to Nicaraguan drought, mitigation, adaptation; coping; other actions; vulnerability and impacts; institutions; constraints; gender; cross-level interactions; multi-level interactions; and intra-level interactions.

After having systematized the interviews according to the different themes and time periods, the material was analyzed using the analytical framework, identifying the patterns of capital access and control from the perspective of the interviewees, and their bearing on drought vulnerability. This was done using the CCF, with which both assets and institutions can be captured. I reread the interviews from May 2008, the only interview material I had at the point of the first analysis, with the aim to see whether the different capitals could be used as a way to map the relationships between the different themes, such as resources and micro-level (coping and adaptation) strategies against food insecurity.

With a focus on the multiple realities perceived by those experiencing a phenomenon, such as drought vulnerability, interpretation becomes central and comes into the research at several levels. First, the interviewees and focus group participants have told their different views of what has occurred in the case study area in relation to drought and how that has changed over the years. But, in addition, I have interpreted their stories to see if there are any distinguishable patterns to be found. It would also have been impossible to exclude my own being[34], previous experiences, and impressions from the

[34] See Johansson (1999: 83) for reflections on the ethnographer as a positioned subject who will "grasp phenomena differently depending on gender, class, ethnicity, sexual preference and also outsider's status, my being married or not, having children or not, my age, physical appearance and presence."

field in my interpretation of the collected data. For example, when I returned to the case study area in January 2010 after a serious drought in the *postrera* of 2009 had taken place, I could at first not understand why so many of the interviewees looked a lot older, despite only a bit more than a year having passed since the previous interview session. Listening to their stories, I realized the reason was the loss of weight they had experienced as a consequence of the drought. This expression of their drought vulnerability has most likely colored my reading of their interviews and, as is common with "direct observation and non-verbal communication" (Thor 2001: 338, my transl.), the final product, i.e. this dissertation and the articles on which it rests. Finally, Jacobsen (2002: 45) suggests the reader of the final results interprets them in her/his own way.

Article III includes many quotes from the interviews. In this way, the emphasis is on the interviewees' perceptions and experiences as expressed by them, and the reader's possibility of 'direct contact' with the interviewees enhanced. The alternative would have been me retelling a summarized version of their statements. When I translated the quotes, my ambition was to stay as close to the original text as possible, which at times makes the quotes difficult to read. Despite the intention of allowing the interviewees to speak for themselves, I have, obviously, altered their story by making a selection of what and from whom to include in the article, by translating their Nicañol to English, and by interpreting and telling their stories with my concepts and theoretical framework. Just as Sangster (1994: 11-12) suspects the women she studied would not agree with her using the word "paternalist as a description of their relationship to management" I may therefore have used words the interviewed women and men would question. One example is the concept of drought. At the time of the first interview session in May 2008 it was extremely dry in the case study area and several said the dry season had become longer and longer over the years, extending well into May, when their parents in their time often already had put the seeds into the ground. This was the reason why the farmers nowadays did no longer plant in the *primera*. I therefore perceived the situation as one of drought. Still, almost all of the interviewees in the May session seemed to define drought as something that occurred later in the season, when there were crops to be harvested, and did not necessarily consider the prolonged dry season as being drought, here in the words of one of the interviewed women in a male-headed household:

> *Can you tell me when it is dry season and when it is drought?* Well, here there has been drought that has not given any yields. Right now there is drought, but it is not like it is not going to rain at all. (Rocio, May 14, 2008)

Due to practical reasons it has, unfortunately, not been possible to go back to the interviewees, focus group participants, or key informants and ask them to

read my interpretations and analysis, such is recommended by Borland (2006). However, working as described above, i.e. revisiting the interviews numerous times, looking at quotes over and over again, consciously including the text preceding and following a quote in the matrix in order not to lose the context of it, analyzing what the interviewees said from different angles with different analytical perspectives, and taking many more steps over the years in a strive for transparency, my ambition has been to deliver interpretations and analyses that do justice to the women and men whom I interviewed and their views on their own life courses, as well as new credible empirical findings on gender differentiated vulnerability.

The first results are presented in article I on the role of the division of capitals to gender differentiated vulnerability to drought in Nicaragua in which the participatory methods were complemented and the results substantiated and put in a wider context whenever relevant. This concerned primarily exposure where existing research and other secondary material, quantitative data (e.g. data on precipitation, temperature, and health), Population and Housing as well as Agricultural censuses (e.g. data on poverty levels, farm size, migration, and remittances), and central policy documents (such as Poverty Reduction Strategies) were used and analyzed. The findings in article I were developed in article III on changes in livelihoods the interviewees said they had implemented over the past 40 years due to the increased frequency of drought. In writing this article, the interviews from May 2008, October 2008, and January 2010 as well as the transcribed key informant meetings were read and reread. The time lines created in the second interview session, in October 2008, were also used. These enabled a comparison among the interviews with the three groups of interviewees regarding, for example, drought, chemical use, and the installation of potable water to see if there were any differences in how they described what had happened in the case study area over their life course. The categorized material for article I was complemented with quotes from the two latter interview sessions of what drought responses had been implemented and by whom. Early thinking on hierarchies within the capital structure and the political and cultural capitals being the base for gender (as a socially constructed phenomenon) that was a result of writing the first article made me focus even more on the upward and downward spirals in vulnerability in article III than what I did in article I. How I interpreted what the interviewees said the first time has thereby been interpreted and reinterpreted over and over again with the consequence of me having focused more on certain themes (e.g. the micro-level strategies and the resources), creating sub-categories (such as the different strategies) to be able to see how they appear in the interviews. These reinterpretations of my empirical material with support from the theories behind the CCF have also contributed with new empirical findings that have influenced the analytical framework and tools used leading to an iterative process, mixing both deductive and inductive research processes, resulting in

a new understanding and formulation of the analytical framework (see previous section). Hence, the analytical work can be described as an abductive approach (Alvesson and Sköldberg 1994: 42-43) or a process of retroduction – "The interaction of ideas and evidence [that] culminates in theoretically based descriptions of social life (…) and in evidence-based elaborations of social theory." (Ragin 1994: 47)

Policy analysis – article II

What role other societal levels see the local level fulfill in times of drought was established in article II in order to examine what access the interviewees potentially had to political as well as to bridging social capital for their reduction of vulnerability. For this purpose, I consider Nicaragua's main hazard and drought management policies as a good source. Those are the official expressions of the actors and organizations at national and municipal level that work with the issues on a daily basis and who have as part of their responsibility to reduce the vulnerability of the Nicaraguan population. From the testimonies given by the interviewees one could be left to believe that almost no initiatives or policies for hazard management existed at other societal levels. I therefore decided to map Nicaragua's hazard policy framework with the help of key informants and a search through national archives as well as the Internet to see whether any policies existed. A different picture unfolded as a result of this where eighteen national and municipal policies were identified (see Appendix in article II for a list of the policies). The analyzed policies were selected based on their pertinence to drought management in Nicaragua and include strategies, programs, plans, and technical/administrative documents[35] for climate change, hazard management generally (since drought is one of the hazards covered), and drought management specifically. The majority has their origin in the Nicaraguan national and municipal governments, though a couple has been written together with international organizations active within the themes listed above. Particular policies for other types of hazards than drought were not included in the analysis due to the research's focus on vulnerability to the increasing frequencies and severity of droughts in Nicaragua. However, all policies that could be found and that were pertinent to drought management in Nicaragua were analyzed.

It was not easy getting hold of policies concerning drought, nor natural hazards, in Nicaragua. Even such a central, and by key informants often mentioned document as the National Risk Management Plan could not be

[35]Either technical or administrative guidance for studies of climate change, natural hazards generally, and drought specifically or for the development of the hazard management system as such.

found in their offices, nor did they know where I could get hold of it. Nicaragua not having Sweden's policy on public access, and thus not a mandatory registration of all public documents, made the search for the policies complicated and time consuming. At a later stage, I was able to track down this plan in the archives of the Ministry of Agriculture and Forestry. Having detected the policies it was surprising that it was so difficult, and that the key informants were so unaware of them since the documents are published from 2000 and onwards with one exception that was published in 1976. The lack of public records in combination with the changes in government that have occurred – Daniel Ortega was in power 1985-90 and then again from 2007. In between Nicaragua was governed by Violeta Barrios de Chamorro (1990-97), Arnoldo Alemán (1997-2002), and Enrique Bolaños (2002-07) – could potentially be one explanation since it is common to change supposedly non-political staff in government authorities if the government changes. Without the help of the key informants to identify and access the documents there is a risk that not all policies pertinent to drought in Nicaragua have been included in the analysis. However, I have only found one reference in the policies to an earlier version of the National Action Program to Combat Drought and Desertification that I have been unable to locate. Otherwise I believe the analysis covers those policies that can be considered as central to Nicaragua's drought management.

That the policies are public could have as a consequence that they do not contain everything that is of relevance to the topic they are supposedly concerned with. That is, they could be written to make things and actors look better than they are. However, in this case, as is discussed in article II, it rather seemed as if the policies contained reasoning and views that may be considered to have come from external influences. Hence, both Nicaragua's dependence on donors and international organizations and its involvement in various international and regional processes related to climate change as well as to desertification are brought up as possibly having influenced the focus of the policies (from emergency response to risk management) and the description of interactions in the policies (see article II). To analyze what the policies say or do not say regarding the role of interactions is, moreover, the objective of article II and could therefore be considered to have been looked upon in some detail.

To be able to achieve a more precise argumentation on interactions than that found in other research, the attributes of interactions were combined in a framework for analyzing the existence and character of interactions as they are described in Nicaragua's hazard management policies. In the beginning of the policy analysis I considered using hierarchy theory since the literature suggested it to be a useful tool (e.g. O'Neill 1988; Gibson *et al.* 1998; Cash and Moser 2000). It seemed too simplistic for a case with several levels, actors, and types of linkages, however. I therefore decided to focus on two dimensions to get a fuller picture of the character of the cross-level interac-

tions in the case of drought management in Nicaragua: scope and direction (see Figure 1 in article II).

The scope (whether the interactions were horizontal or vertical) was analyzed based on an examination of the view on participants in the policies. For example, in the National Climate Change Action Plan of 2003 the planning phase is said to involve ”governmental organizations, the private sector, and civil society organizations.” (Picado Traña 2003: 6, my transl.). This was in the policy analysis interpreted as a description of vertical and horizontal interactions. The direction (whether the interactions were mutual or unidirectional), on the other hand, was analyzed by examining the view on content of the proposed interactions. For this part of the analysis, expressions such as ’capacity building’ and ’food aid’ were interpreted as unidirectional interactions, while policies using expressions such as, for example, ’consultations’ and ’interconnections’ were interpreted as seeing interactions as more mutual. Combining the two dimensions it could be established whether the policies saw interactions as unidirectional horizontal, unidirectional vertical (upward or downward), mutual horizontal, or mutual vertical, and if there had been a change over the past 40 years. The policy analysis was performed similarly to the analysis of the interviews. Each of the 18 policies was read several times and quotes as well as my own impressions put into an Excel-file under relevant headings (Name of document; Level of originator; Originator/creator; Type of document (e.g. strategy, action plan, law); Relation to drought; Gender/differentiated vulnerability; Focus; Participants; Content; and Coping/adaptation/mitigation). Another, as it turned out, important feature to determine was the policies’ focus on emergency response vs. risk management, since this tended to determine the view on the role of interactions, as depicted in Figure 2 in article II.

The analysis did not include an examination of if and how the policies are implemented due to the lack of such data. Whether the change in how interactions are described in the policies (with more interactions in general, but primarily more mutual horizontal as well as vertical interactions) has any real implications for vulnerability levels in Nicaragua was thus not examined either. Still, the interviewees expressed a lack of external support in times of drought, which could be interpreted as a lack of political as well as bridging social capital. However, the review of the policies shows that several prerequisites for a reduced vulnerability to drought seem to be in place, and it thereby contributes with a piece of the puzzle. The different picture, reflected in the interviews, illustrates the difficulty of taking the written documents as an indicator of the practice around drought management, and the value of the oral sources as an additional source in the current research.

Key findings and insights

The objective of this dissertation is to interpret gender differentiations in vulnerability to drought in Nicaragua in the interplay among structures and resources over the past decades. The use of qualitative participatory methods contributes with empirical data on an issue that clearly has not received sufficient attention so far, despite its severe impacts on Nicaragua's people and economy – drought. It has furthermore created sources and material on the perspective of women in a society where they are relatively invisible due to the gender structure. By applying adapted theoretical and analytical frames based on a combination of gender, vulnerability and a capital framework, the research presented in the articles demonstrates that vulnerability to drought in a rural community in Nicaragua's *zona seca* is indeed gendered. The interviewees' accounts of their lives in the case study area lead to several reflections regarding these differences in vulnerability. Within the case study, age and household structure (whether the household is female- or male-headed) are often superimposed on gendered inequalities, and may become factors that also determine the drought vulnerability. Hence, women in general, but the elderly female heads of households in particular as a result of their limited capacity to adapt to the changing climate, were found to be more vulnerable to the increasingly dry climate and recurrent droughts. In the following I therefore discuss the key findings from a perspective of gender, household structure, and age. The first key finding regards the access to cultural capital, a capital that traditionally has been highly gendered, and the central role it played in the progression of vulnerability in the case study area.

Gender inequalities – the role of political and cultural capital

All three articles, albeit in different ways, touch upon the aspect of cultural and political capital and the role they play for the interviewees' vulnerability. The significance of the unequal distribution of cultural capital and the coupled social hierarchy is something that stands out in the analyses made. This could also be deduced from the interviewees and focus group members expressing how they perceived themselves as living in a hierarchical and

gendered society, here in examples from an interview with one of the female heads of household and from the focus group with women:

> *But if you would have wanted to cultivate something else, do you think he would have listened to you?* Who knows? The man is the one who decides. *Why?* Because he is the one who decides, he is the head of the household, they say. *What makes you think that he is the one who decides and that he is the one that has to decide?* He is the head of the household, he is the one who says what is to be done. *Is there a norm, a law that says that he is the one to rule?* He is the head of household. *Who told you, taught you that he is the head of household, that he is the leader who decides?* He is the head. I have read that. *Where?* In the Bible. He is the head of the household. (Paula, May 15, 2008)

> *What does Juanita mean when she says the machismo?* That the man sometimes, even though he is in the way in the house and if he looks at the woman that is doing something, because the work of women is gentle but complicated and sometimes the man, even though he can do it he doesn't because he says that it is for women. That is what I call *machismo*. *Do you think that there are men that are machista like that here, in the community?* Look, ha ha ha, I get tired because there isn't. *What else does it mean to be machista?* It is when one is limited to, for example, that you don't have the right to think freely, to have an opinion, to decide. I think that, or I feel that is male *machismo*. *Do you think that we as women are machistas?* The woman, no, the women we are females, we are almost obliged to by the man. (Women's focus group, October 10, 2008)

Other research and analyses on gender and women's situation in Nicaragua demonstrates the influence the patriarchal, discriminatory, and *machismo* culture has had, and still has (e.g. Lancaster 1992; INIDE 2005; Dore 2006; Cupples 2007), pointing to similar findings as that of this dissertation – that the cultural capital is highly gendered. Traditional norms regarding the view on women and their role in society (as mothers and the ones responsible for the household) have not changed much over time either, despite other transformations the country has gone through and a "Sandinista rhetoric about the need for the emancipation of women" (Fernández Poncela 1996: 62).

The availability of political capital was also examined through an investigation of the interviewees' access to formalized support in terms of regulated drought management. The interviewees as well as the key informants were asked whether they were familiar with any emergency plans, or other types of policy documents, regarding drought. A clear majority of the interviewees said no such plan existed. Most commonly the key informants agreed: there were no drought management policies. After having mapped Nicaragua's hazard policy framework, a number of policies were located and analyzed with the objective to see what role interactions among different actors at different societal levels were given (see article II). The results of the analysis could be interpreted as positive. The emphasis had gone from post-

disaster emergency response to pre-disaster risk management. With that change, interactions were also given a new role and were described as more mutual, involving actors from international to local level, and from various sectors in the hazard management policies and work. With such interactions, the local population could potentially have access to more political capital since the formal institutions (policies, programs, and strategies) regarded their participation and opinions as important for an improved risk management. Hence, there were more opportunities to benefit from the formal structures governing the management of drought could Nicaragua overcome the factors impeding a successful implementation of the policy framework (see below). Other capitals an implementation of the policies would make accessible include bridging social (due to the interactions with other actors), human (e.g. training), natural (e.g. food, animals, and drought resistant crop varieties), physical (e.g. rain water harvesting techniques, agricultural inputs, and infrastructure), and financial (e.g. credit).

Unfortunately, with only a few exceptions, the policies did not recognize differences in vulnerability between different social groups, and gender inequalities turned out to be close to invisible. That relatively invisible social groups are less likely to be the ones to partake in the interactions, and thus more likely to experience less coping and adaptive capacity is therefore not a farfetched assumption. In the case study area, the interviewed men participated more in formal social networks and had greater decision-making power than the women (see below). Assuming this would be the case also in interactions concerning drought management it would risk resulting in a lack of women's perspectives and interests in the actions concerning both emergency response and risk management. One can therefore assume that the men, due to the prevalent gendered norms and culture, have access to more political capital in hazard management situations than the women. At worst, as suggested by Paavola *et al*. (2006), the policies can aggravate existing inequalities and vulnerability rather than reduce them. Apart from this a difference in political capital does not seem to play as significant a role as the difference in cultural capital in the case of Nicaragua since men and women have the same rights formally in Nicaragua. Informally, on the other hand, they are highly unequal. In other countries, where formal rules such as laws and regulations discriminate women or men, the political capital would play the same determining role as cultural capital does in Nicaragua for what capacity one has to act. However, in the case of Nicaragua the unequal access to cultural capital is noticeably at the root of the gendered access to and control over different capitals according to the interviewees' perceptions as well as existing literature.

Taking the different findings on the role of cultural (and political) capitals together, the dissertation contributes to an enhanced comprehension of these "particularly challenging organising concept[s]" (Booth *et al.* 1998: 100). The empirical insights on Nicaragua's drought management policy frame-

work as well as the theoretical contribution regarding interactions provided by article II furthermore fill gaps within existing research (see e.g. Paulson and Gezon 2005; Armitage *et al.* 2007; Kasperson *et al.* 2010). Finally, the analysis of the spirals of increasing or decreasing capacity (article III) exposed the influence of cultural aspects on the division of labor, land rights, and decision-making power. These in turn, appeared as key factors in the interviewees' perceptions of what their capacity to respond to the drought was and had been. Thus they were central to explaining the gender differentiations in coping and adaptation to the drought as well as in drought vulnerability in the case study area.

Division of labor and land

What role the gender division of labor played in the households for the capacity to influence one's vulnerability was first analyzed in article I and explored further in article III. The gender division of labor on-farm was often traditional and had not changed much over the years for the interviewees, or since their parents' time. Hence, similar to what Galán (1998: 43) says about Nicaraguan cultural stereotypes, the women were considered and considered themselves as housewives[36] primarily, while the men were identified as farmers. Several said that their mothers had not worked in the fields at all, as expressed by one of the older men:

> *And your mother, what did she devote herself to?* The same, she was a housewife, as they call working in the house, in the kitchen. (…) *And your mother worked in the field apart from working in the house?* No, only in the house. (José, October 7, 2008)

There were only a couple of exceptions to this division among the interviewees – a woman in a male-headed household who, when asked what she devoted her time to, answered "agriculture, livestock rearing" (Angela, May 15, 2008), and a man who said he was the one taking care of their vegetable garden.

Norms regarding the gender division of labor brought with them a gender differentiation in the capacity to choose an off-farm labor-based strategy to cope with and adapt to the drought. This was especially true for those women who took care of small children or disabled household members. With an access to human capital, in terms of healthy men and younger household members, the capacity to choose an off-farm labor-based strategy increased

[36] It should be noted that while the women were responsible for taking care of the other household members in terms of cooking, cleaning, washing clothes, and similar, it was the men who were responsible for bringing in the food into the household. Hence, the men can be said to have carried the main subsistence burden.

even more since that implied a higher supply of manpower and, thus, income sources. Human capital was scarcer in the smaller female-headed households. In turn, the extra incomes an off-farm labor-based strategy contributed with opened up for a larger set of options when it came to coping and adaptation as described in the upward spiral in the concluding section of article III (see also Figure 5 below). Hence, the men but also other household members in male-headed households had had greater capacity to reduce vulnerability than the smaller female-headed households.

Despite relatively stable traditions regarding the division of labor, it seemed to have begun to disintegrate within the younger generation. According to the interviewees, the greatest change was visible among younger women who, owing to an increased mobility, could work off-farm to a greater extent than their mothers and grandmothers. Hence, they acted more like the men always had, moving from the community to urbanized areas within Nicaragua and to other countries, minimizing their exposure to drought. This left the elderly women who were still living in the community with an increased responsibility for taking care of the children of those who emigrated, further reducing their own capacity to diversify their livelihoods through work off-farm. As concluded in article III, it would not have been possible for the younger women to leave to work without this gender (and generational) division of labor, and the human capital of female labor, since women in Nicaragua are still expected to take responsibility for the reproductive tasks, even when having entered the workforce (Chavez Metoyer 2000; Fauné and Matute 2007).

As has been mentioned previously, other research on women's situation in Nicaragua claims that political and economic events (the introduction of agroexport, the revolution and Sandinistas, the civil war, and the economic crisis of the 1980s) lie behind a change in the gender division of labor when the demand for workers superceded the supply of male labor (CIERA *et al.* 1987; Collinson 1990; Pérez-Alemán 1992; Chavez Metoyer 2000).[37] This dissertation shows, however, that those alone do not explain the change. The interviewees instead emphasized "*la situación*" – the situation they found themselves in, with high levels of poverty and new challenges for the subsistence agriculture, caused by drought and climate change. Repeatedly they said the younger generation had decided to leave to find a job so that they could afford "the necessities".

Similar to the division of labor, the interviewees clearly perceived both the division of land and of large animals to be central to the spiraling-up of capitals owing to their salability and value as collateral in accessing credit.

[37] Note that a traditional gender division of labor still persists in Nicaragua even if there are signs that it has begun to disintegrate. Hence, even though boys to a larger extent than their fathers are helping out with the domestic work, it is still mainly the responsibility of the girls. (Agurto *et al.* 2008)

Due to prevailing traditions and ideas, there was a visible gendered bias in land tenure as well as in the ownership of livestock in the case study area and elsewhere in Nicaragua (men owned the cattle and other work animals (horses, donkeys, and mules in the few cases any of those were present) while women owned the chicken and pigs. See Photo 8 for examples of the animals within the interviewed households). (Galán 1998; Rugama F. 2005; Deere *et al.* 2010) The farms of the interviewed households' demonstrated great differences in size depending on gender and household structure and were much smaller than most of the farms in the municipality in general, which most commonly are between 20 and 50 mz. (INIDE 2001) In general, the men owned more land, in terms of both number and acreage of plots. The female heads of households owned more land than the women living in male-headed households, but their plots were smaller than those of the men – in all cases less than one mz and often only the plot of land where their houses were located. The two women in male-headed households who owned land had in one case inherited it from her father, and in the other bought the land together with her husband. Those who owned their land had, independently of gender, either bought it or inherited it. Both ways were equally common. The others either rented or borrowed land to be able to cultivate.

Photo 8. Livestock in case study area, May and October 2008

Source: Author

Other vulnerability studies of the region and elsewhere also highlight the importance of access to land (Wangari *et al.* 1996; Segnestam *et al.* 2006), and those that are either landless or own very little land are, together with female-headed households, identified as the most vulnerable families by Oxfam (1998) in their assessment of the 1997 El Niño-caused drought in Nicaragua and Honduras. As described above, the politics of land in Nicaragua does not cause any difference in the access to political capital between women and men concerning the possibilities to own land. Rather, the issue of land tenure is yet another coming out of the interviews where cultural capital plays a central role due to a culture that for centuries have seen "the women [to be] of the house and the men of the land" (INIDE 2005: 114).

Power structures

In their introduction to the special issue of *Community Development: Journal of the Community Development Society* focusing on sustainable rural development the guest editors not only bring up the "interdependence, interaction, and synergy among the capitals", they also point out that the cultural and political capitals improve the understanding of power (Gutierrez-Montes *et al.* 2009: 109 & 110). The analyses in this dissertation certainly show that the unequal access to cultural capital can be found as a root cause to a likewise unequal division of decision-making power, both on- and off-farm. However, the inequalities in cultural capital are not enough to explain the power structures. In addition, the division of other capitals and labor has clear implications for the capacity to exert influence and to being able to invest in and change your own or the household's livelihoods so as to be less vulnerable. CIERA *et al*. (1987) and Bradshaw (2001) draw similar conclusions when they derive the unequal power relations between men and women to the traditional division of labor. Hence, it is the interplay between cultural capital, gender division of labor, and access to the other capitals that leaves the women with less control over their own situation, and thus with less capacity to reduce their vulnerability to drought.

To capture the interviewees' view on the gendered division of power within and among the households, the interviews were not only focusing on ownership of material resources, but also on decision-making and participation in various networks (i.e. what social capital they had access to). Participation in organizations or projects (and other social networks) affects the power that a person holds in the sense that information and assets provided by these networks enable the participants to plan and strategize in a different way than without these resources. One example is the credit the interviewees said were more commonly accessed by men. This access mostly depended on them owning land or houses (material resources) necessary as collateral but contacts with credit organizations, a bridging social capital,

was also necessary. Another example is the above described chain of events that might occur if the hazard management policies were put into practice.

In an attempt to get at the interviewees' perceptions of the effects the access to capitals and division of labor had on their decision-making power, questions on the following aspects were asked: who decides where to work, what to produce, what and when to sell (e.g., animals), when and for what purpose to buy, if children should go to school or not, and what to do with one's own or other household members' incomes. The answers can be divided into those being a decision of the interviewee, a common decision (usually between husband and wife), and another person's decision (Table 3). One difference between the men and the women (in both male-headed and female-headed households) can be found in the number of aspects they mentioned, where men generally mentioned more than the women (female heads mentioned the least number of aspects, and also fewer farm related aspects). There is also partly a difference in what aspects they mentioned. Male heads of households mentioned two that did not come up in the interviews with the women: decision-making over a well and over large animals. That no woman in a male-headed household mentioned large animals is somewhat remarkable considering their importance to the households' livelihoods. In the case of the female heads of household it is less surprising since only a couple of them had large animals. The man who mentioned decision-making power in relation to a well was the community's fireman and the one in charge of the potable water pump, which may explain his attention to the issue of water. He had furthermore been the one making the decision on where to place the well despite his wife being the property owner and thus the one with the legal right to make the decision. His wife was not interviewed so her view on the issue is lacking, but judging by what he said this may be an illustration of men's dominating decision-making power within the household, whether the property is the man's or not. Otherwise water seemed to be viewed as a household resource that was to be used according to each person's own liking (except that the households with potable water strived to stay within the 10 m^3 of water they received for the monthly fixed rate of C\$60[38] in order to avoid having to pay an extra charge of C\$6/m^3).

Comparing what the interviewees said on women's and men's decision-making, there is a clear gendered pattern (Table 3 – the rows show who mentioned what, the columns whose decision they considered it to be). In almost all of the interviews decisions concerning agriculture came up as being within the domain of the men (regarding large animals, what to cultivate, and purchases to the farming). In one case the purchases for the farming was said to be a common decision between husband and wife. In yet another case, the male interviewee said that this was a decision that they made to-

[38] US\$1 = C\$19 at the time of the interviews.

gether as a couple, while his wife said it was his decision. The woman perceiving herself as being in a subordinate position could potentially explain this. In the female-headed households that did not have a husband present the decision on what to cultivate was made by other male household members (sons, grandsons, or brothers). Other studies have come to the same result, saying women who own the land only in part make decisions regarding such issues as what to cultivate, what inputs to buy, whom to sell the products to and to what price, and more. Otherwise they are made by a man. (Agurto Vílchez *et al.* 2003)

Table 3. Gendered decision-making power according to the interviewees

	Men's decision	**Common decision**	**Women's decision**
Male heads of households	What to produce Large animals	Education What to produce, Purchases for farm, Purchases for household, Own income	Small animals Purchases for household, Other's income
Women in male-headed households	What to produce Purchases for farm	Purchases for household Where to work, What to produce, Purchases for farm	Purchases for household, Own income Education, Small animals, What to sell
Female heads of households	What to produce Other's income	Education, What to produce, What to sell	Own income Education

Note: Only the two most commonly mentioned aspects are included in the table

In comparison, women's decisions were said to commonly concern the small animals, purchases for the household, their own income, education, and their own production. Decisions regarding what to sell were limited to the capitals they had access to (small animals or products from their own production). Whether they could spend money as they wished on private consumption, also outside of the household boundaries, is not discernible in the interviews. It is also worth noting that it was only in two of the female-headed households that somebody else was said to decide over the interviewee's income. The women in male-headed households said they decided over their own income, while the male heads of households reported being either the sole or one of two decision-makers regarding their own income (the wife being the other person).

The gendered division of decision-making power in the households thus followed a traditional pattern with the men deciding over the productive and 'external' factors (the farming and the capitals he had access to that related to this, i.e. how to manage the farming, investments in the land, and the large animals), while the women had some decision-making power in relation to reproductive and 'internal' factors. This is a consequence of the prevailing gender division of labor but also of the other capitals, as described above. Similar results are reported for studies in, for example, Mexico where access

to especially economic resources are identified as key to decision-making power at home as well as in the public sphere (Jungehülsing 2012). The inequality in decision-making power in the case study area was expressed in various ways in the interviews, especially concerning intra-household power relations, here by two of the interviewees, one male and one woman in a male-headed household:

> *If your wife or you would like to sell a chicken or a pig, can you do that or do you have to consult one another?* Look, let's suppose that there is a pig to sell and I go to the field and she is authorized to sell it, she can sell it. We agree and we sell it. *When you say authorized, what do you mean?* I mean that she has the right to sell it. *Do you give her the right [to sell]?* That is right. Carlos, May 13, 2008

> …you want to work and you can't because the man tells you not to. *Why doesn't the man let you [work] sometimes?* Because he is jealous, he doesn't like letting the woman go (…) *And why do you think there are people that think like that, that they should not let the women leave?* Because they like having the woman hidden and themselves being the only ones with freedom. Isabel, May 14, 2008

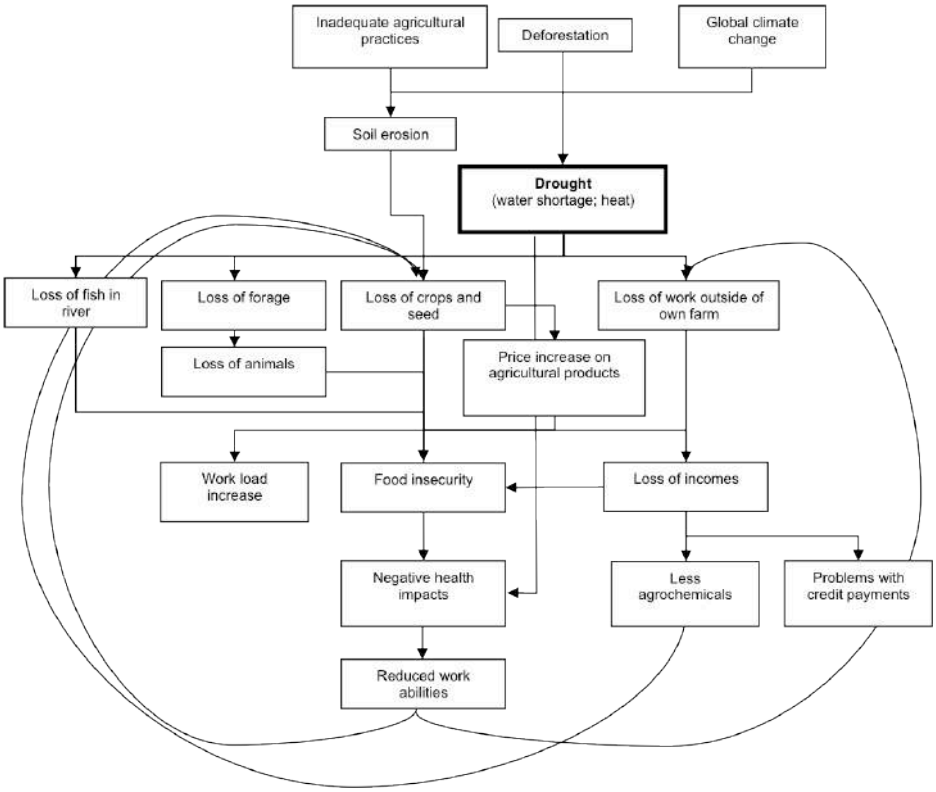
The importance of cultural capital is visible here as well, with norms and traditions providing men with a greater control over other forms of capital and more power. This is necessary for the capacity to adapt to the drought situation and reduce one's vulnerability – a capacity the men had more of (see also articles I and III). The difference in vulnerability between women in male-headed households and male heads of households discussed in article I can partly be explained by the control over the capitals. While the women may have access to as many capitals as the men in the same household, they are not necessarily the ones to control them due to the power structures. As a result they experienced a greater vulnerability.

Coping vs. adaptation

Combining the above findings on power asymmetries with women's relatively restricted freedom of choice in terms of where and what to work with, and their limited access to the various capitals, it certainly seems as if women, in both female- and male-headed households, have less capacity than the men to choose strategies to reduce their vulnerability to drought. This insight leads to another finding that calls for some reflection, and contributes to a research gap identified by Berman *et al*. (2012) on the difference and interaction between coping and adaptation. Both coping and adaptation are performed to reduce the negative impacts of a natural hazard so that a (or multiple) disaster can be avoided. Figure 2 and Figure 3 depict the direct and indirect impacts of the drought in the case study area, their interactions,

and their respective downward spiral (the spirals are discussed in more detail in article I). The spirals look differently depending on whether the livelihoods are natural resource (Figure 2) or non-natural resource dependent (Figure 3).

Figure 2. Drought impacts on natural resource dependent livelihoods

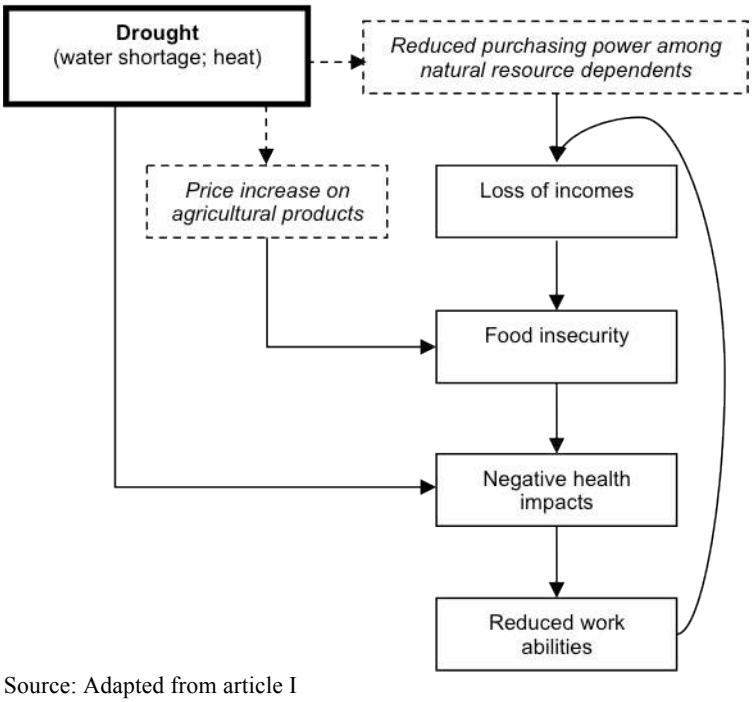


Source: Adapted from article I

In the interviews it can be observed that adaptive responses (e.g. migration or the use of agrochemicals) were commonly directed towards earlier phases of the chain of impacts of drought. The coping, in contrast, was commonly to reduce the food insecurity. Financial capital had been a prerequisite to many of the responses to the climate change, whether short-term coping (buy food and fodder) or long-term adaptation (potable water and chemical use). Just about all of the interviewees stated that their incomes were not enough to make a living on, but especially the female heads of households repeatedly said they had had few other options than to endure and suffer from food insecurity due to the lack of financial capital, as in the following quote:

What is it that makes it difficult? To me there are many things that obstruct. There are times when there is nothing, one doesn't have the money to buy the food, so one endures. *What have these obstructions been?* Money. Milagros, May 17, 2008

Figure 3. Drought impacts on non-natural resource dependent livelihoods



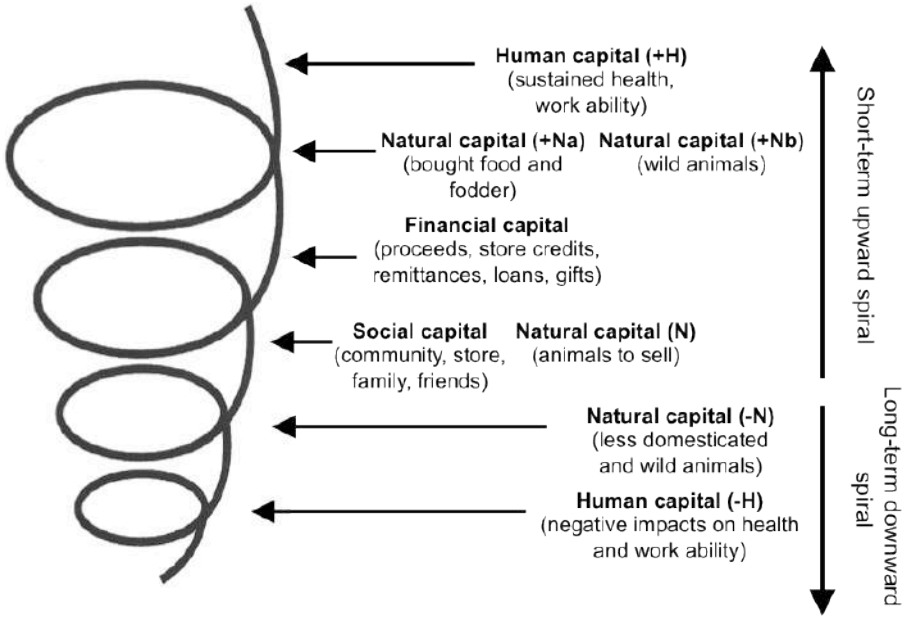
Source: Adapted from article I

The analysis in article I therefore concluded that a common intervention point in the downward spirals caused by the drought was 'Loss of incomes' (Figure 2 and Figure 3). Depending on how one accessed the financial capital, the capacity to adapt, and thus achieve an upward spiral, had differed significantly (the spirals of adaptation and coping are discussed in more detail in article III). Among the responses to drought the interviewees mentioned five that had as their main purpose to increase the financial capital. In the interviews all strategies were repeatedly described in a way that made the influence of the gendered division of labor and land rights, as well as the access to human as well as bonding and bridging social capital stand out. In article I they were therefore placed within the category of strategies that depend on one or several types of capitals to be achievable.[39] Three were

[39] Two other categories of strategies were identified: basic short-term coping strategies that do not require any capital to implement and that slow down or stop the downward spiral (e.g. reduced consumption), and strategies that depend on other strategies to be successful (e.g. land management change).

used by men as well as by women – to sell assets, mainly smaller animals, to borrow money from friends and get store credit, and to use remittances from migrated relatives or household members. The other two were primarily male – off-farm work and formal credit. It is noteworthy that those strategies that were primarily male were also those that generated the largest sums of money. One exception to this 'rule' could have been the remittances. However, the interviewees expressed an uncertainty regarding when and how much their relatives were going to be able to send money next. In addition, the female-headed households had smaller families, which had as a consequence that they had fewer relatives abroad that could provide them with support in terms of remittances. Still, as seen in article I, except for a few they were totally dependent on remittances and sales for their access to financial capital.

Figure 4. The spirals of coping

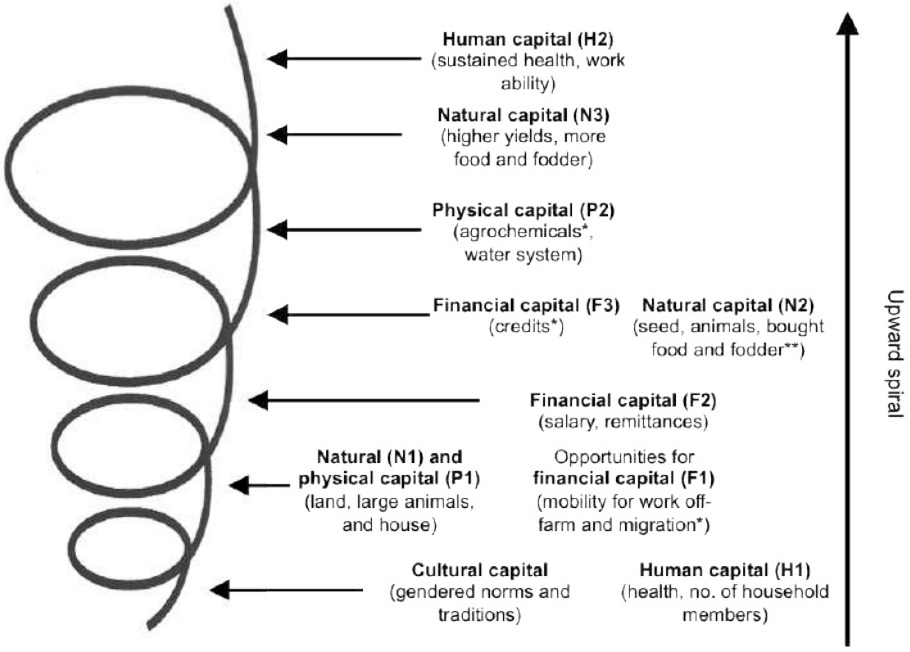


Source: Article III

Selling one's assets in distress was a short-term solution to the problems while the other strategies to get money were based on relatively continuous inflows of financial capital. To mainly have the capacity to cope, as was the case of the women in general and the female heads of households in particular according to the interviewees, thereby resulted in them experiencing an increase in their vulnerability due to a downward spiral in the capitals (i.e. a reduced access to capitals). In combination with the lack of cultural capital

this depleted the possibilities of an upward spiral when faced by the recurrent droughts in Nicaragua, especially through impacts on health and work ability (Figure 4). While it is virtually impossible to separate the dimensions of gender, age, and household structure it can be argued that men, more persistently, could avoid coping while women had less capacity to do so. Hence, at large the men had been able to build assets on assets thus increasing their adaptive capacity (and reducing their vulnerability) (Figure 5). Just as Armitage (2007: 65) concludes those that only had the capacity to cope may therefore "find it difficult to cross those critical thresholds that lead to higher-level dynamic equilibria." A "vicious circle of poverty" thus emerges when the responses of those living in the drought vulnerable municipalities in Nicaragua destroy the ecosystem services they depend on for their livelihoods. (UNDP n.d.: 5, my transl.)

Figure 5. Spiraling-up with adaptation



Source: Article III
*Note that the downward spirals resulting from the negative impacts of credit, agrochemicals or migration are not included in the figure.
**To buy food and fodder was by the interviewees described in terms of coping, not adaptation

The review of Nicaragua's hazard management policy framework (article II) reveals that several prerequisites for a reduced vulnerability to drought seem to be in place. Although article II does not examine if and how the policies

are implemented or whether the changed view on interactions has had any real implication for vulnerability levels, the interviewees gave the impression not much was happening by commonly answering "*ninguno*" (none) when asked what support they received from the government or other organizations when affected by the drought. Christoplos *et al*. (2009) and Linneker and Rodríguez Badilla (2007) corroborate this impression, testifying to a lack of risk reduction in Nicaragua despite a change in the right direction in the policies. Article II brings up a number of factors that could explain why this is the case, including the short time span that has elapsed since the majority of the policies were developed and a more participatory risk management initiated, the amount of hazards Nicaragua is exposed to, lack of financial capital, a relative lack of attention given to drought as a hazard, and a lack of integration between poverty alleviation, development, and environmental work in Nicaragua. Yet another conclusion in article II is that Nicaragua's increased vertical interactions with international actors and processes may partly explain the change in what role interactions with the local level is given in the policies. If Nicaragua's government does not believe in the practice of local participation and have only changed their policies as a result of requirements from international actors, the implementation of the policies may not involve as much interactions as the policies. Were Nicaragua able to overcome these impeding factors, a reduction of drought vulnerability of their population could hopefully be achieved. Especially considering the increased focus on pre-disaster risk management as opposed to post-disaster emergency response, i.e., more adaptation than coping.

In sum, the dissertation presents a complex picture of how the interplay among various factors – environmental, material, and social – have lead to different coping and adaptive capacities among the interviewees, and in turn differentiated vulnerability to drought in a rural community in Nicaragua's *zona seca*. The men, with the basis in a culture that works in their favor, had been able to build assets on assets, thus increasing their adaptive capacity and reducing their vulnerability. Women, and especially the older female heads of households, on the other hand, had not experienced the same possibilities. Instead they had mainly had the capacity to cope by using the assets they had access to, with an increasing vulnerability as a consequence. Clearly, the groups 'women' and 'men' are not homogenous. Thereby, the category of gender is not necessarily enough to understand differentiated vulnerability. This dissertation shows that in the case study area intersections between gender and such characteristics as age and household structure are important to recognize, both within the groups of 'women' and 'men', and at times as characteristics that cross the divide between the groups. Hence, even if the women in the male-headed households seemed less vulnerable (having access to both 'male' and 'female' capitals) than the female heads of households, they still expressed a lack of capacity since they were not the ones with control over the capitals that were considered 'male' in the house-

hold (and sometimes not even over their own capitals). As long as their men used their capitals for the best of the household the women also had capacity to respond to the drought situation. They were a lot more dependent on others than the men were for this, though. Lastly, interpreting what the interviewees said, the younger women and men who had been able to migrate and reduce their exposure to the drought seemed to be less vulnerable than the older men. Bradshaw (2002) draws a similar conclusion in her study on multidimensional poverty in Nicaragua. Female heads of households in her study are identified as more vulnerable due to a lack of a regular source of income, while women living in male-headed households are vulnerable given their dependence on the men and their incomes. If Enarson and Morrow (1998: 53) are correct in saying that female-headed households are likely to increase by number with natural disasters, which hurricane Mitch certainly caused (Correia 2001), and if the cultural context in Nicaragua does not change more than it has, the amount of vulnerable households is therefore also likely to increase in the case study area and Nicaragua.

Sammanfattning på svenska

Syftet med den här avhandlingen är att tolka genusdifferentierad sårbarhet inför torka i Nicaragua som uppstår i samspelet mellan strukturer och resurser under de senaste årtiondena. Många studier har visat att sårbarhet inför olika naturhändelser (*natural hazards*[40]) är kontextuell, eller platsspecifik, och kommer till uttryck på olika sätt för olika sociala grupper, dvs. att sårbarhet är differentierad. Slutsatser såsom att kvinnor i Brasilien har blivit ”torkans änkor” när männen har lämnat hushållet för att leta jobb i andra delar av landet (Melo Branco 1995: 50, min övers.) eller ”det är också viktigt att förstå den differentierade sårbarhet som beror på genus” (Wisner *et al.* 2004: 238, min övers.) återfinns därför i litteraturen. För att kunna uppnå en större förståelse för vad som ligger bakom sådan differentiering pekar sårbarhetslitteraturen på vikten av att förstå ojämlikheterna i tillgång till och kontroll över olika resurser mellan kvinnor och män, karaktären på formella och informella samhällsstrukturer som bestämmer den sociala konstruktionen av maskulinitet och femininitet (genus) samt fördelningen av makt (t.ex. Bolin *et al.* 1998; Wisner *et al.* 2004; Dankelman 2010a). Empiriska, systematiska analyser av platsspecifika orsakskedjor som skapar och upprätthåller sårbarhetsnivåer är dock få. Dessutom fokuserar en stor del av litteraturen om genusdifferentierad sårbarhet på kvinnors kapacitet att delta i katastrofhanteringsprojekt och återuppbyggnad (s.k. *coping capacity*) snarare än på den genusifierade sårbarhet och den genusifierade kapaciteten att minska densamma genom anpassning (s.k. *adaptive capacity*) som existerar innan en naturhändelse inträffar. Mer forskning om anpassningskapacitet har därför efterfrågats (Berman *et al.* 2012) och är centralt placerad i denna avhandlings analys.

Politiska, ekonomiska, sociala och miljömässiga förändringar

Sedan Nicaragua blev självständigt 1838 har det gått igenom ett antal politiska förändringar bland dem perioder av diktatur och inbördeskrig, inklusive

[40] Inom den del av sårbarhetsforskningen som den här avhandlingen utgår från skiljer man på *natural hazard* (naturhändelse) och *disaster* (katastrof), där den förstnämnda ses som en händelse i sig. En katastrof, å andra sidan, uppstår endast när ett redan sårbart socialt system eller ekosystem drabbas av en händelse. (O'Keefe *et al.* 1976; Maskrey 1993; Cannon 1994; O'Brien *et al.* 2007) Som Wisner *et al.*(2004: 49) påpekar kan det därför inte bli någon katastrof om sårbarheten är obefintlig, eller vice versa – om ett sårbart system inte exponeras inför en händelse.

en revolution 1979. Den nicaraguanska jordbruksekonomin har påverkats mycket av de politiska förändringarna. I början av 1900-talet öppnade den dåvarande presidenten, Zelaya, upp landet för utländska investeringar vilket resulterade i att produktionen av kaffe och bananer ökade explosionsartat i händerna på amerikanska företag. Senare, under 1950 och 60-talen, ökade odlingarna av bomull, kaffe, socker, och boskapsuppfödning under Anastasio Somoza Garcia och hans fokus på kommersiellt jordbruk. Som komplement till detta har jordbruk för självhushåll länge varit viktigt för den nicaraguanska befolkningen och andelen mark som används i jordbrukssyfte har ökat över årens lopp. På hushållsnivå har kökträdgårdar traditionellt hört till kvinnornas ansvarsområde. Nationella data visar att detta fortfarande är fallet i rurala områden där hushåll med kvinnliga familjeöverhuvuden i större utsträckning än den manliga motsvarigheten endast odlar sina trädgårdar. Motsatsen gäller hushåll som nästan enbart odlar på ytor stora nog för andra sorters grödor – de är framförallt sådana med manliga familjeöverhuvuden. (INIDE 2005) Efter ett inbördeskrig störtades Somoza i revolutionen 1979 och Sandinisterna tog över makten. En jordbruksreform genomfördes för att jämna ut den oerhört ojämlika markfördelningen som var ett resultat av exportjordbruket. Småbönderna fick till slut mer mark, men fattigdomen ökade trots detta i slutet av 80-talet på grund av ytterligare ett krig, ekonomisk blockad av USA, en finanskris, hyperinflation och naturkatastrofer. 1990 förlorade Sandinisterna makten till Violeta Chamorro och en era av neoliberalism började. Med den återgick man till att uppmuntra jordbruksexport och landets ekonomiska och politiska system återverkade återigen negativt på småbönderna.

Nicaragua är ett av de länder i världen som är mest drabbat av naturhändelser. Historiska källor visar att Nicaragua har drabbats av torka sedan den spanska kolonialiseringen 1524 (Sistema Nacional de Defensa Civil 1999; Kinloch Tijerino 2008) men både dess frekvens och svårighetsgrad verkar ha ökat över årtiondena. Trots denna utveckling finns inte mycket forskning på torkans problem i Nicaragua. Inte heller får torkan lika mycket uppmärksamhet hos beslutsfattare och andra aktörer som andra, mer plötsliga, naturhändelser får. Nicaraguas torra zon (*la zona seca*) täcker en tredjedel av landet där 80 procent befolkningen lever och marken framförallt används i jordbrukssyften (INETER 2001; Caura S.A. 2005; Milán Pérez 2010). Bevattningssystem är inte vanligt i Nicaragua vare sig jordbruket är för marknadssyften eller för självhushåll. Hur mycket det regnar samt när och var det regnar är därför centrala frågor för Nicaraguas jordbruk på makro- och på mikronivå. I *la zona seca* återfinns också fallstudieområdet – i El Sauce, en av de sju torraste kommunerna i Nicaragua (WAFLA 2007). Jordbruks- och skördesäsongerna i regionen formas av årstiderna och är därmed under de år som är så kallat normala uppdelade i två – *la primera* och *la postrera*. Dessa har dock förändrats de senaste 40 åren med ett annorlunda klimatmönster där

torkan nu sammanfaller med El Niño (t.ex. Wheelock Román 2000; INETER 2001; 2007a; INIFOM 2007).

Som ett resultat av de senaste årtiondenas politiska konflikter, inbördeskrig och ogynnsamma ekonomiska förhållanden i kombination med naturkatastrofer är Nicaragua ett fattigt och ojämlikt land. Mätt med konventionella fattigdomsindikatorer är Nicaragua det näst fattigaste landet på västra jordklotet (CIA 2013). Landsbygden är dessutom fattigare än städerna enligt nationella data, som visar att tre fjärdedelar av landets extremt fattiga bor på landsbygden (INIDE 2005). Men landet är inte bara generellt ojämlikt, det är också mycket ojämställt. Flera källor rapporterar att kvinnor i allmänhet och kvinnliga familjeöverhuvuden i synnerhet är de som har tillgång till minst resurser, har minst rättigheter och är oftare diskriminerade än män i Nicaragua (Galán 1998; Torres C. 2008; Deere *et al.* 2010; OECD n.d.). Detta verkar inte ha sitt ursprung i de formella strukturerna i Nicaragua. Istället visar forskning och analyser att genus och kvinnors situation i Nicaragua har påverkats och fortfarande påverkas av en kultur som domineras av patriarkat, diskriminering och *machismo* (t.ex. Lancaster 1992; INIDE 2005; Dore 2006; Cupples 2007). De visar därmed på liknande resultat som den här avhandlingen – att det kulturella kapitalet är kraftigt genusifierat. Detta har bland annat lett till att fördelningen av mark, en av de viktigaste resurserna för kapaciteten att anpassa sig till torkan, har blivit en av de mest ojämställt fördelade resurserna.

Teori och metod

Hur kan skillnader i sårbarhet hos kvinnor och män förstås och tolkas? För att bidra till befintlig forskning används en ansats som kombinerar genus, kapital och sårbarhet i en kvalitativ fallstudie av kvinnor och män i nordvästra Nicaragua: Sabana Grande, en rural *comarca* (delområde av en kommun) i El Sauce kommun. Med hjälp av kontakter inom ett projekt om hållbar markanvändning som var aktivt i området valdes 21 hushåll (varav 13 hade manliga familjeöverhuvuden) ut inom vilka nio män, nio kvinnor i hushåll med manliga familjeöverhuvuden och åtta kvinnliga familjeöverhuvuden intervjuades individuellt. En majoritet av intervjupersonerna valdes avsiktligt från gruppen äldre personer (45 till 80 år, med ett undantag av en 35-årig kvinna i ett hushåll med manligt familjeöverhuvud) för att underlätta frågor om förändringar över tid. Utöver intervjuerna i fallstudieområdet samlades data in genom fokusgrupper med kvinnor respektive män samt i möten med representanter för organisationer som arbetade med frågor av relevans för forskningen. För att undersöka det politiska kapitalets relevans för genusstrukturerna och de sociala hierarkierna, genomfördes slutligen en policyanalys av 18 nationella och kommunala strategier, program, planer och tekniska/administrativa dokument rörande klimatförändring, hantering av naturhändelser i allmänhet och av torka i synnerhet.

Att genus – socialt konstruerade och kulturellt varierande skillnader mellan kvinnors och mäns roller, ansvar och rättigheter i samhället – är en av flera dimensioner som leder till socialt differentierad sårbarhet inför torka har visats i flera studier (Schroeder 1987; Stehlik *et al.* 2000; Gupta and Gupta 2003; Devereux 2006). Empiriska studier från Latinamerika är dock relativt få. Hur skillnaderna mellan kvinnor och män ser ut och vad de innebär för sårbarhet analyseras i den här avhandlingen med hjälp av the Community Capitals Framework (CCF), en analytisk ram som utvecklats av Flora *et al*. (2004) som ett sätt att undersöka multidimensionell fattigdom. Den bygger på sju kapital (socialt, natur-, human-, fysiskt, finansiellt, kulturellt och politiskt) som kan användas för att strukturera en analys av olika resurser som samhällen, hushåll eller individer har tillgång till och kontroll över. De kulturella och politiska kapitalen fångar betydelsen av de informella normer och formella regler (det som North (1990) kallar institutioner eller Leach *et al*. (1999: 237) kallar ”reglerade beteendemönster”) som strukturerar mänsklig interaktion och därmed formar genus och sociala hierarkier i samhället. Kapitalen är därmed viktiga för människors försörjning, men är också det som ger kapacitet att förändra den sårbarhetssituation man befinner sig i. Sårbarhet definieras på olika sätt i litteraturen. I den här avhandlingen ses den som bestående av tre komponenter. Den första är i vilken utsträckning och på vilket sätt man själv, ens försörjning och ens tillgångar *exponeras* inför torka. Den andra är vilken kapacitet man har att *hantera* eller undvika negativa konsekvenser under en pågående torka. Slutligen ingår kapaciteten att *anpassa* sin försörjning och på så sätt minska exponeringen inför torkan alternativt öka kapaciteten att hantera torkan. Kapacitet bygger i båda fallen på vilka kapital man har tillgång till och kontroll över. I avhandlingens artiklar framgår att anpassning, till skillnad från hantering, har potential att vända en nedåtgående spiral som orsakas av exponeringen inför torka och därmed uppnå en minskad sårbarhet över tid.

Kombinationen mellan genus, kapital och sårbarhet visar värdet av att använda ett multidimensionellt perspektiv för att undersöka de socioekonomiska och kulturella sammanhang som formar de möjligheter personerna har haft att minska sin långsiktiga sårbarhet inför torka i Nicaragua. Eftersom både genus och torka är platsspecifika till karaktären baseras analysen främst på intervjupersonernas berättelser om sina egna liv. Genom en tolkning av dessa har en bild skapats av intervjupersonernas syn på:

1. Deras erfarenheter av torka och vilka åtgärder de har vidtagit för att hantera en pågående torka, liksom de effekter som den leder till, på kort sikt samt för att anpassa sig till oftare förekommande torka och allt torrare klimat.
2. Vilken betydelse olika socioekonomiska och miljörelaterade kapital har haft för att öka möjligheterna att hantera och anpassa sig till liksom att minska sin sårbarhet inför torka.

3. Vilka strukturer som har skapat och upprätthållit tillgången till och kontrollen över kapitalen.

Artiklarna

Artikel 1: Segnestam, L. (2009). "Division of Capitals—What Role Does It Play for Gender-Differentiated Vulnerability to Drought in Nicaragua?" Community Development **40**(2): 154-176.

Den här artikeln utforskar genusdifferentierade skillnader i sårbarhet inför torka i Sabana Grande, ett ruralt samhälle i Nicaraguas torra zon. Fallstudien visar att kvinnor och män använder olika strategier för att hantera torkan på kort sikt och för att anpassa sig till den återkommande El Niño-orsakade torkan på längre sikt. Tillsammans utgör dessa strategier försörjningen för de fattiga på landsbygden inom den torra zonen i Nicaragua – försörjningssätt som förändras vid torka för att minska dess negativa effekter. Artikeln använder the Community Capitals Framework för att undersöka vilka resurser kvinnor och män i fallstudieområdet har förlorat och för att analysera vilka kapital som är mest centrala för möjligheterna att hantera och anpassa sig till torkan. Ett genusperspektiv tillämpas för att se vilka skillnader i tillgången till kapital som finns mellan kvinnor och män och vad det innebär i termer av genusdifferentierad sårbarhet inför torka.

Artikel 2: Segnestam, L. (forthcoming). "Interactions in Hazard Management Policies – the Case of Drought in Nicaragua, 1976-2010." Disasters.

Litteraturen om anpassningsbar styrning och förvaltning som involverar aktörer från flera samhällsnivåer anser att samverkan är nödvändig i hanteringen av naturhändelser för att öka samhällens resiliens. Den här artikeln kartlägger policydokument för hanteringen av naturhändelser i ett fattigt och katastrofdrabbat land – Nicaragua – och undersöker vilken roll interaktionen mellan olika aktörer på olika samhällsnivåer tilldelas i dessa dokument. Ett analytiskt ramverk utvecklas med vilket omfattning och inriktning på interaktioner undersöks. Genom att kunna identifiera om interaktioner är enkelriktade eller ömsesidiga samt antingen horisontella eller vertikala möjliggörs en mer komplex analys av interaktioner än den som finns i tidigare forskning. Undersökningen visar att rollen som interaktioner ges har förändrats som ett resultat av att ett fokus på kortsiktiga katastrofinsatser har kompletterats med långsiktig riskhantering. Detta framgår främst av hur de karakteriseras, med fler deltagare och andra innehållskategorier. Dessutom visar artikeln att andra interaktioner än ömsesidiga kan vara positiva, vilket visar på komplexiteten i frågan om interaktioner.

Artikel 3: Segnestam, L. (ännu ej inskickat manus). "Gendered Experiences of Adaptation to Drought – Patterns of Change in El Sauce, Nicaragua"

De förändringar som män och kvinnor i Sabana Grande, ett ruralt samhälle i Nicaragua, säger att de har genomfört de senaste årtiondena skiljer sig på sätt som kan kopplas till deras sårbarhet inför torka. Kortsiktigt hanterande var mer vanligt förekommande bland kvinnor, särskilt kvinnliga familjeöverhuvuden, medan anpassning var vanligare bland männen. The Community Capitals Framework är ett verktyg som gör det möjligt att förstå skillnaderna. Genusskillnader i tillgång till och kontroll över olika kapital har resulterat i genusdifferentierade möjligheter att reagera på klimatförändring, där män kan anpassa sig och kvinnor upplever en nedåtgående spiral i möjligheter och ökad sårbarhet.

Resultat och slutsatser

Avhandlingen presenterar hur en komplex samverkan av olika faktorer – miljörelaterade, materiella och sociala – har lett till att intervjupersonerna har olika möjligheter att hantera och anpassa sig till det förändrade klimatet. Detta har, i sin tur, resulterat i genusdifferentierad sårbarhet inför torka i ett samhälle på landsbygden i Nicaraguas torra zon. Grupperna 'kvinnor' och 'män' är dock inte homogena. Genus som kategori är därför inte tillräcklig för att förstå differentierad sårbarhet. Den här avhandlingen visar att i fallstudieområdet är intersektioner mellan genus och dimensioner som ålder och hushållsstruktur viktiga och kan vara det som bestämmer sårbarheten inför torka. Följaktligen uttrycker kvinnor i hushåll med manliga familjeöverhuvuden en maktlöshet på grund av sin brist på kontroll över delar av hushållets resurser, trots att de verkade mindre sårbara (tack vare deras tillgång till både "manliga" och "kvinnliga" kapital) än de kvinnliga familjeöverhuvudena. Så länge männen använder sina resurser för hushållets bästa har kvinnorna också mer möjligheter att klara av torkan. De är dock mycket mer beroende av andra än männen för detta.

Något som framträder tydligt i analysen är den betydelse som ojämlik fördelning av kulturellt och politiskt kapital har. Informella normer (och ibland formella regler) i stor utsträckning bestämmer genusarbetsdelningen, tillgången till och kontrollen över de andra kapitalen samt makten att ta beslut. Dessa aspekter framkom i intervjuerna som centrala för kvinnornas och männens möjligheter att komma till rätta med torkans problem, både på kort och på lång sikt, och därmed för deras kapacitet att minska sin sårbarhet. Resultaten rörande det kulturella kapitalets roll samt artikel II:s empiriska och teoretiska bidrag om interaktioner bidrar till att fylla luckor om frågor som i litteraturen både anses centrala och i behov av mer forskning (se t.ex. Paulson and Gezon 2005; Armitage *et al.* 2007; Kasperson *et al.* 2010).

En genusarbetsdelning, där kvinnorna primärt sågs av andra och sig själva som hemmafruar medan männen ansågs vara bönder, resulterade i ett syste-

matiskt missgynnande av kvinnor, särskilt kvinnliga familjeöverhuvuden, som inte hade haft samma möjlighet att välja strategier utanför hushållet för att hantera och anpassa sig till torkan och därmed minska sin sårbarhet. Att ha friska män och yngre hushållsmedlemmar i hushållet, och därmed tillgång till humankapital, ökade möjligheten att söka sig ut på arbetsmarknaden ytterligare. Hushållen med kvinnliga hushållsöverhuvuden var mindre och hade därför också brist på humankapital. Möjligheterna till extra inkomstkällor, som gav finansiellt kapital till fler alternativa sätt att hantera och anpassa sig till torkan, tedde sig därför begränsad i dessa hushåll. Den traditionella arbetsdelningen verkade dock ha börjat luckras upp inom den yngre generationen. Enligt intervjupersonerna var yngre kvinnor rörligare och hade möjlighet att söka arbete utanför hushållet, vilket hade lett till att de flyttat till urbana områden inom Nicaragua eller till andra länder. På så sätt minskade deras exponering inför torkan.

Annan forskning om kvinnors situation i Nicaragua menar att politiska händelser ligger bakom denna förändring (CIERA *et al.* 1987; Collinson 1990; Pérez-Alemán 1992; Chavez Metoyer 2000). Den här avhandlingen visar dock att det finns ytterligare förklaringar. Intervjupersonerna menade att ”situationen”, karakteriserad av fattigdom och de nya utmaningar för det självförsörjande jordbruket som orsakades av torka och klimatförändringar, låg bakom förändringen.

Den ojämna fördelningen mellan könen av mark kunde tolkas som att det hade resulterat i att männen hade större möjligheter att anpassa sig med tanke på att marken kunde säljas och användas som säkerhet vid lån. I Nicaragua är det ingen skillnad mellan kvinnor och män i tillgången till politiskt kapital vad gäller möjligheterna att äga mark – båda grupperna har samma lagliga rätt. Istället är den ojämna fördelningen av mark ytterligare ett exempel på hur det kulturella kapitalet påverkar. På grund av rådande traditioner och idéer finns det därför en tydlig snedfördelning mellan kvinnor och män i naturkapital – i ägandet av mark samt av boskap (män ägde kor och andra arbetsdjur ifall de fanns några medan kvinnor ägde höns och grisar) i fallstudieområdet och andra delar av Nicaragua (Galán 1998; Rugama F. 2005; Deere *et al.* 2010). Eftersom både mark och djur var viktiga tillgångar för anpassningsförmågan innebar fördelningen en lägre sårbarhet hos männen.

Genusarbetsdelningen samt fördelningen av olika kapital påverkade också makten att ta beslut, som följde ett traditionellt mönster. Männen sades nästan uteslutande vara de som beslutade över det som hade med jordbruket att göra (de stora djuren, vad som skulle odlas samt inköp till jordbruket). I de fall hushållen med kvinnliga familjeöverhuvuden inte hade en make närvarande togs beslutet om vad som skulle odlas av andra manliga hushållsmedlemmar (söner, barnbarn, bröder). Kvinnorna, å sin sida, hade viss makt vad gäller besluten som rörde de ”interna” aspekterna i hushållet. Det kulturellt kapitalets betydelse framkommer här genom att det är basen för konstrukt-

ionen av de genusifierade rollerna, ansvarsområdena och rättigheterna. I artikel I och III visas sålunda att normer och traditioner har tydliga implikationer inte bara för tillgången till utan också för kontrollen över olika sorters kapital. Detta gör i sin tur att männen har mer makt och kapacitet i tider av torka. Att ha kontroll över olika kapital är nödvändigt för förmågan att anpassa sig och sin försörjning i en situation av torka och att minska sin sårbarhet. Detta förklarar delvis skillnaden mellan kvinnor och män i hushåll där männen är familjeöverhuvud. Medan kvinnorna säger att de har tillgång till lika många kapital som männen är det inte nödvändigtvis kvinnorna som kontrollerar dessa till följd av maktstrukturerna.

Om man tar i beräkning maktasymmetrin och kvinnornas relativt begränsade valfrihet vad gäller var och med vad de kunde arbeta samt deras begränsade tillgång till de olika kapitalen i beräkning verkar det onekligen som om kvinnor, både i hushåll med manliga och med kvinnliga familjeöverhuvuden, hade färre möjligheter än män att välja strategier för att minska sin sårbarhet inför torka.

Utifrån intervjuerna tycks de handlingar som innebar anpassning oftare riktades mot de tidiga faserna av kedjan av negativa effekter orsakade av torkan. Hanteringen handlade istället om att minska livsmedelsosäkerheten. Finansiellt kapital hade varit en förutsättning för många av reaktionerna på klimatförändringen, oavsett om det handlade om kortsiktigt hanterande (att köpa mat och foder) eller långsiktig anpassning (dricksvatten och kemikalieanvändning). Nästan alla intervjupersoner sade att deras inkomster inte var tillräckliga för att försörja sig på, men särskilt de kvinnliga familjeöverhuvudena sade upprepade gånger att de inte hade något annat val än att stå ut och lida av livsmedelsosäkerhet på grund av bristen på finansiellt kapital.

Beroende på hur man hade fått tillgång till finansiellt kapital skiljde sig anpassningsförmågan och därmed förmågan att uppnå en uppåtgående spiral avsevärt. I intervjuerna framkom att valet av strategier påverkades av genusarbetsdelning och rätten av mark, men också av human- och socialt kapital. Tre strategier användes av män och av kvinnor – försäljning av tillgångar, framförallt små djur, lån från vänner och inköp på kredit. Andra strategier användes framförallt av männen: arbete utanför det egna jordbruket och krediter. Det är värt att notera att de strategier som framförallt männen använde sig av också var de som gav mest pengar. Ett undantag från denna ’regel’ skulle ha kunnat vara penningförsändelserna från migrerade släktingar. Intervjupersonerna uttryckte dock en osäkerhet kring när och hur mycket de skulle få nästa gång. Dessutom hade de kvinnliga familjeöverhuvudena mindre familjer vilket ledde till att de hade färre migrerade släktingar som kunde skicka pengar. Ändå, som artikel I tar upp, var de med undantag av några få totalt beroende av penningförsändelser och försäljning för sin tillgång till finansiellt kapital.

Försäljning av tillgångar i nödläge var en kortsiktig lösning på problemen medan de andra strategierna för att få fram pengar var baserade på ett relativt

kontinuerligt flöde av finansiellt kapital. Att framförallt ha kapacitet att kortsiktigt hantera torkan, vilket enligt intervjupersonerna var fallet med kvinnorna i allmänhet och de kvinnliga familjeöverhuvudena i synnerhet, gjorde därför att de upplevde en ökad sårbarhet på grund av nedåtgående spiraler i kapitalen. Kombinerat med bristen på kulturellt kapital minskade detta deras möjligheter att skapa en uppåtgående spiral vid återkommande torka i Nicaragua, särskilt på grund av effekter på hälsa och arbetsförmåga. Även om det är nästan omöjligt att skilja på dimensioner som genus, ålder och hushållsstruktur kan man hävda att män mer konsekvent kunde undvika att bara hantera torkan medan kvinnor ofta inte hade kapacitet att göra något annat än att just hantera torkan på kort sikt. I stort sett hade männen därmed kunnat öka sina resurser med hjälp av andra resurser och på så sätt öka sin anpassningsförmåga (och minska sin sårbarhet).

Undersökningen av Nicaraguas policydokument rörande hanteringen av naturhändelser visar att flera förutsättningar för en minskad sårbarhet inför torka verkar finnas. Även om undersökningen inte tittar på hur och om det som står i dokumenten också genomförs är intrycket från intervjupersonerna att inte mycket händer. De svarade ofta ”*ninguno*” (inget) på frågan om vad de fick för stöd från regeringen och andra organisationer när de drabbades av torkan. Artikel II tar upp ett antal faktorer som skulle kunna förklara varför det var så (bl.a. att relativt lite tid har gått sedan majoriteten av framförallt riskhanteringsdokumenten togs fram, mängden katastrofer de drabbats av samt brist på finansiellt kapital). Om Nicaragua kunde få bukt med problemen skulle en minskad sårbarhet inför torka hos befolkningen förhoppningsvis kunna uppnås. Särskilt med tanke på landets ökade fokus på riskhantering innan katastrofen är ett faktum snarare än katastrofhantering i efterhand, dvs. mer anpassning än hantering.

Enligt vad intervjupersonerna gjorde gällande verkade de yngre kvinnorna och männen, som hade kunnat migrera och på så sätt minska sin exponering inför torkan, slutligen vara mindre sårbara än de äldre männen. Bradshaw (2002) kommer fram till en liknande slutsats i sin forskning om multidimensionell fattigdom i Nicaragua. Hon pekar på att kvinnliga familjeöverhuvuden är mer sårbara på grund av avsaknaden av en reguljär inkomstkälla medan kvinnor i hushåll med manliga familjeöverhuvuden är sårbara på grund av deras beroende av männen och deras inkomster. Om Enarsons och Morrows (1998: 53) slutsats om att kvinnliga familjeöverhuvuden troligen kommer att öka i antal med att naturkatastrofer inträffar och om den Nicaraguanska kulturen inte förändras fortare än den gjort kommer därför förekomsten av sårbara hushåll sannolikt att bli vanligare i fallstudieområdet.

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Appendix 1. Questions for key informants

Meetings with key informants in Managua
Fecha y hora para la entrevista:_____2008 _____:_____–_____:_____
Ubicación:_____
Nombres y apellidos: _____
Ocupación */ papel*: _____
Organización:_____

- Sequía
  - ¿Están trabajando con el problema de la sequía?
  - ¿Cuándo empezaron a ver la sequía como un tema específica?
  - ¿La sequía viene más frecuente ahora que antes? ¿Qué significa antes – cuándo empezaron de cambiar las lluvias? ¿Por qué?
  - ¿Tienen algún plan de cómo trabajar con la sequía?
  - ¿Cuándo empezaron a elaborar o implementar ese plan?
  - ¿Qué han hecho para divulgar ese plan?
  - ¿Cómo ha sido el proceso para trabajar con el tema de la sequía?
  - ¿Cómo comparan sequía contra otros tipos de desastres naturales?

- Medios de vida
  - ¿Cómo ha cambiado el nivel de vida de las personas en la zona seca (Sabana Grande o en El Sauce)? ¿Por qué? *1970-*
  - ¿Tienen datos históricos sobre personas que han emigrado por sexo?
  - ¿Tienen datos históricos de la población total por sexo?
- Impactos
  - ¿Hay diferencias entre cómo la sequía afecta a los hombres y las mujeres? ¿Quiénes sufren más – las mujeres o los hombres – durante una temporada seca? ¿Y durante una sequía?
    Economía; Redes sociales; Salud (seguridad alimentaria); Educación; Trabajo; Papel en el hogar / comunidad / país; Poder; Cultural; Político
  - ¿Por qué? ¿Ha cambiado?
  - ¿Cuentan con información sobre los impactos de la sequía a nivel nacional o municipal? *Datos históricos: 1970-*
  - ¿Esa información está desagregada por sexo o está general?
- Género

- ¿Cuáles son las diferencias más grandes entre mujeres y hombres en el campo / la zona seca? ¿Cómo ha cambiado (1970-)?
- ¿Qué obstáculos hay para el equidad entre mujeres y hombres (en el campo / la zona seca)? ¿Cómo ha cambiado (1970-)?
- ¿Existen leyes, normas u otras reglas que impiden la aplicación de estrategias para hacer frente o adaptar a la sequía? ¿Para mujeres? ¿Hombres?
- ¿Siempre ha sido así? ¿Los leyes, normas y reglas han cambiado históricamente?
- ¿Cómo puede disminuir las diferencias entre mujeres y hombres (en el campo / la zona seca)? ¿Para qué aumente la capacidad de hacer frente a la sequía?
- ¿Trabajan con el tema de género?

• Recursos, acceso y decisiones
- ¿Tienen información histórica sobre las actividades a las que se dedican las mujeres?
- ¿Cuáles son las fuentes de ingreso más comunes e importantes para las mujeres? ¿Y para los hombres?
  ¿Venden mano de obra (¿En qué?), cultivos de huerto familiar, aves, cerdos, huevos, remesas, otros?
- ¿Cómo ha cambiado (1970-)?
- ¿Quién hereda un esposo/padre cuando muere? ¿Una esposa/madre? ¿Siempre ha sido así?
- ¿Puede hombres como mujeres ser dueños de tierra? ¿Siempre ha sido así?
- ¿Cuales son los requisitos para obtener crédito?
- ¿Existen normas, reglas, leyes que influyen a la división de recursos? *(p.ej. relacionado con herencia, tenencia de la tierra, crédito)*
- ¿Siempre ha sido así? ¿Los leyes, normas y reglas han cambiado históricamente?
- ¿Existen normas, reglas, leyes que influyen a la división de poder entre mujeres y hombres?
- ¿Siempre ha sido así? ¿La división de poder ha cambiado históricamente? ¿Y los leyes, normas y reglas?

• Redes sociales
- ¿Qué organizaciones están activas en la zona seca (El Sauce o Sabana Grande)?
- ¿Desde cuándo? ¿Y "antes"? *¿Cuándo?*
- ¿Qué hacen? ¿Y "antes"? *¿Cuándo?*
- ¿Con cuáles podríamos hablar para enriquecer la información que necesitamos?
- ¿Qué ayuda externa han recibido durante la sequías? *1970-*

• Planes de emergencia

- ¿Qué planes o estrategias a nivel nacional o municipal hay para trabajar con el problema de sequía? ¿Cuándo se desarrolló o implementó, o se está implementando actualmente?
- Si existe, ¿se trata algo de género?
- ¿Existen recursos para implementarlas?
- ¿Esas recursos están dirigidas equitativamente para jefas o jefes del hogares? ¿O equitativamente para hombres y mujeres?
- ¿Jefes y jefas están involucrados en la implementación de estrategias?
- ¿Han tenido éxito o hay cambios? ¿Ven diferencia en la situación de la sequía?
- ¿Qué afecta la implementación y la obtención de resultados?

• Escenarios de sequía o inseguridad alimentaria
  – Si la sequía regresó, ¿qué tenía que hacer todos los actores? *Mujeres, hombres, la comunidad, iglesia, alcaldía, municipio, organizaciones nacionales, internacionales, no-gubernamentales*

• Deforestación
  – ¿Es ilegal el corte de árboles? ¿Existe monitoreo? ¿Quién lo hace? ¿Cómo lo hace? ¿Hace cuándo? *1970-*
  – ¿Existe multas o tienen que pagar multas si corten árboles? ¿Cuánto? ¿Para qué? ¿Hace cuándo? *1970-*
  – ¿La deforestación es un gran problema? ¿Existen datos históricos sobre la deforestación?
  – ¿Cuáles son las causas de la deforestación?

• Quemar
  – ¿Es legal realizar quema de terreno? ¿Es monitoreada? ¿Cómo? ¿Quién lo hace? ¿Hace cuándo? *1970-*
  – ¿Qué pasaría si está monitoreando y encuentra a alguien quemando? ¿Y antes? *1970-*

• Más material
  - ¿Qué datos colectan para saber si hay riesgo de sequía?
  - Datos históricos (nacional y municipal):
    - Área cultivada (por cultivo; época/meses)
    - Cosechas (por cultivo; época/meses)
    - Producción de leche (época/meses)
    - Nivel de aguas subterráneas
    - Riego
    - Principales de medios de vida (agricultura – (agro)pecuaria (animales) – no agrícola)
    - Consumo de alimentos
    - Gastos en alimentos
  - Estudios sobre medios de vida
  - Estudios sobre género
  - Estudios sobre sequía

- Estudios sobre vulnerabilidad
- Estudios y diagnósticos sobre la seguridad alimentaria (sequía – salud)
- Canciones o cuentos sobre la vida en el campo / la sequía / la vida de las mujeres (y hombres)
- 'Plan ambiental municipal, 2003-2008' (2002) Alcaldía
- 'Caracterización municipal' (2000) INIFOM

• Más contactos
  – Sequía y recursos naturales
  – Vulnerabilidad
  – Género
  – Medios de vida
  – Migración

Appendix 2. Interview guide for pilot interviews

Guía de entrevistas sobre diferencias de género en la vulnerabilidad a la sequía en Nicaragua

Fecha:_____2008

Datos personales

1. Nombres y apellidos: _____
2. Edad: _____ ¿En que año nació? _____
3. Estado civil: Soltera: _____ Casada: _____
4. ¿Cuánto tiempo tiene de estar casada? _____
5. ¿Está jefa/e del hogar?:_____
6. Comunidad: _____

Composición familiar

1. Número de personas que son parte de la familia/del hogar: _____ Hombres_____ Mujeres _____

	Parentesco	Edad	Sexo		Nivel académico/ puede leer y escribir	Vive permanente en la casa	Vive temporalmente en la casa (¿Dónde vive, cuando no está en casa?)	Vive (temporalmente) afuera de la casa. ¿Dónde?	Ocupación
			M	F					
1									
2									
3									
4									
5									
6									
7									
8									

Actividades familiares y cómo ganarse la vida

1. ¿A qué actividades se dedica usted; podrá describirme un día normal de usted?
2. ¿Podría describirme un día poco normal para usted?
3. ¿Cuáles son las fuentes de ingreso para usted? ¿Vende mano de obra (¿En qué?), cultivos de huerto familiar, aves, cerdos, huevos, remesas, otros? ¿Es suficiente para ganarse la vida?
4. ¿A qué se dedican las personas que viven en su casa; cómo sería un día normal para ellos(as)?
6. *De acuerdo a la actividad a que se dedican* ¿Existe alguna diferencia en las épocas del año?
7. ¿Participa en una organización comunitaria? ¿Qué tipo? ¿Desde cuándo?
8. ¿Quién tiene acceso a qué recursos? ¿Quién es el dueño de la tierra? ¿De la casa? ¿De las animales? ¿Vehículos? ¿Seguros? *¿Otros recursos?* ¿Por qué?
9. ¿Quién toma las decisiones en el hogar? ¿Sobre qué producir, en qué trabajar, qué comprar con las ganancias, estudio de los hijos e hijas y de qué manera? ¿Por qué?
10. ¿Antes tenía más o menos acceso a los recursos del hogar? ¿A qué creé usted que se debe este cambio?
11. ¿De quiénes reciben ayuda? ¿Económica, crédito, apoyo en el cuido de los niños, ropas, zapatos, herramientas, recursos personales, comida, agua?
12. ¿A quién otorga ayuda? ¿De qué tipo?

Cambios que se han dado en el transcurso del tiempo

1. ¿Cuánto tiempo hace que vive aquí?
2. ¿Cómo decidió vivir aquí?
3. ¿Le gustaría contarme como fue su vida de niño(a)?
4. ¿Creé que su vida ha cambiado, dé qué manera?

En medios de vida: ¿Qué tipos de medios de vida se han dedicado a usted? ¿Por qué?
En la educación: ¿Continúo con sus estudios? ¿Por qué?;
En la salud: ¿De qué se enferma y con que frecuencia? ¿Por qué?

5. ¿Estos cambios han afectado a la familia o sólo a usted?
6. ¿Su vida es similar o diferente a la vida de sus padres, por qué, cuál es la diferencia?

Situación de los Recursos Naturales y consecuencias del fenómeno de la sequía

1. ¿Observa diferencia en los recursos naturales (bosques, suelo, agua) desde que usted vive aquí? ¿Cuáles?
2. ¿Observa diferencia en los recursos naturales (bosques, suelo, agua) desde 1930? ¿Cuáles?

3. ¿Con qué frecuencia llueve? ¿A qué se debe? ¿Le parece como sequía o más como épocas secas normales?
4. ¿Cómo ha sido afectada (o) por la sequía? ¿De qué manera? ¿Con que frecuencia? ¿A partir de qué fecha (historia)? ¿E históricamente?
5. ¿Cómo ha influido la sequía en la familia? ¿Qué ha tenido que cambiar? *En el corto y largo plazo*
En la economía: Todo lo que ellos tienen para ganarse la vida. ¿Qué cultivos producían antes?
En lo social: Redes sociales, organización local
En la salud:
En la educación: *Todas las personas en el hogar*
Y en lo personal:
6. ¿Quién decidió el cambio? ¿Por qué?
7. ¿Esos cambios han sido permanentes o sólo para manejar la crisis de la sequía?
8. ¿A qué se debe que haya más sequía en esta zona? *Opiniones de hombres y mujeres*
9. ¿Alguna institución gubernamental o no gubernamental ha apoyado durante la sequía? ¿Qué tipo de apoyo?
10. ¿Cómo han asegurado la alimentación durante la sequía?

Estrategias o acciones para mitigar la sequía según actores locales
1. ¿Existe algún plan de emergencia durante la sequía? ¿Quién es el encargado *(institución y persona de la comunidad)*?
2. ¿Qué acciones han realizado como comunidad para reducir el impacto de la sequía sobre el hombre? ¿Y la mujer? ¿Por qué?
3. ¿Qué actividades o acciones podrían disminuir la sequía?
4. ¿Quiénes deberían proponer esas acciones o actividades? ¿Hombres, mujeres, la comunidad, las instituciones, las organizaciones, el estado quién? ¿Y realizar? ¿Por qué?

Appendix 3. Interview guide, May 2008

Guía de entrevistas sobre diferencias de género en la vulnerabilidad a la sequía en Nicaragua
(comentarios en cursiva son como ayuda para la entrevistadora)

Fecha:_____2008
Hora en que comenzó la entrevista:_____
Hora en que terminó la entrevista:_____

Datos personales
1. Nombres y apellidos: _____
2. Edad: _____ ¿En qué año nació? _____
3. Estado civil: Soltera: _____ Casada: _____
4. ¿Cuánto tiempo tiene de estar casada / soltera (y por qué)?
   _____
5. ¿Está jefa/e del hogar?:_____
6. Comunidad: _____

Composición familiar
7. Número de personas que son parte de la familia/del hogar *(incluidos los migrantes)*: ____ Hombres_____ Mujeres _____

	Parentesco	Edad	Sexo		Nivel académico/ puede leer y escribir	Vive permanente en la casa	Vive temporalmente en la casa (¿Dónde vive, cuando no está en casa?)	¿Ha emigrado? ¿Adónde? ¿A partir de qué fecha? ¿Va a quedarse?	Ocupación
			M	F					
1									
2									
3									
4									
5									
6									
7									
8									

8. ¿Cuánto tiempo hace que vive aquí?
9. ¿Cómo decidió vivir aquí?

Actividades familiares y cómo ganarse la vida

10. ¿A qué actividades se dedica usted; podrá describirme un día normal de usted?
    ¿Existe alguna diferencia en las épocas del año?
    ¿Existe alguna diferencia en comparación con otros años? ¿Por qué?
11. ¿Cuáles son las fuentes de ingreso para usted? ¿Vende mano de obra (¿En qué?), tierra, cultivos de huerto familiar, aves, cerdos, huevos, remesas, ahorros...?
    ¿Es suficiente para ganarse la vida?
12. ¿A qué se dedican las personas que viven en su casa; cómo sería un día normal para ellos (as)?
    ¿Existe alguna diferencia en las épocas del año? ¿Existe alguna diferencia en comparación con otros años? ¿Por qué?
13. ¿Participa en una organización comunitaria / actividades comunitarios *(acerca de la sequía / escasez de agua)*? ¿Qué tipo? ¿Desde cuando?
14. ¿Qué influye la división de actividades entre las mujeres y los hombres? (*normas y reglas)*

Situación de los Recursos Naturales y consecuencias del fenómeno de la sequía

15. ¿Cuáles son los problemas más graves que enfrenta su hogar para ganarse la vida?
16. ¿Observa diferencia en los recursos naturales (bosques, suelo, agua) desde que usted vive aquí? ¿Cuáles?
17. ¿Puede usted distinguir una sequia de una temporada seca (*que es parte del ciclo climatológico de la zona*)? ¿Cómo los diferencia?
18. ¿Con qué frecuencia llueve? ¿Es esta zona afectada por la sequía cada año? ¿Siembran en el periodo mayo-julio además de en el periodo agosto-octubre?
19. ¿A qué se debe que haya mucha sequía en esta zona?

Cambios debidos a la sequía que se han dado en el transcurso del tiempo

20. ¿Cómo ha sido afectada(o) por la sequía?

Economía	**Salud**	**Educación**	**Personal**
Pérdidas de recursos (*animales, cultivos, producción, calidad de tierra, ingreso*) o de trabajo afuera de la casa Enfermedad o mortalidad del ganado Escasez de forraje Menos recursos para pagar créditos Mayores precios de alimentos	¿De qué se enferma (*malnutrición, hambre*) y con qué frecuencia? ¿Por qué? Escasez de alimentos Enfermedades por compartir fuente de agua animales y personas	¿Tiene que trabajar en vez de estudiar? ¿Estudia más para aumentar las posibilidades de encontrar un trabajo?	El aumento de carga de trabajo (*productivo, reproductivo, comunitario*)

21. ¿Cómo ha sido afectada la familia por la sequía? ¿Qué han tenido que cambiar debido a la sequía repetida?

Economía	**Salud**	**Educación**	**Personal**
Pérdidas de recursos (*animales, cultivos, producción, calidad de tierra, ingreso*) o de trabajo afuera de la casa Enfermedad o mortalidad del ganado Escasez de forraje Menos recursos para pagar créditos Mayores precios de alimentos	¿De qué se enferma (*malnutrición, hambre*) y con qué frecuencia? ¿Por qué? Escasez de alimentos Enfermedades por compartir fuente de agua animales y personas	Niños (y otras personas) tienen que trabajar en vez de estudiar Personas estudian más para aumentar las posibilidades den encontrar un trabajo	El aumento de carga de trabajo (*productivo, reproductivo, comunitario*)

22. ¿Cómo ha hecho frente y se ha adaptado a los cambios que son debidos a la sequía? *¿Cómo han asegurado la alimentación? ¿Quién ha sido el principal productor de alimentos en la familia?*

Ejemplos: ***Reducir el consumo*** *(no. de comidas/día, comidas más pequeñas);* ***Buscar trabajo afuera de la casa****;* ***Establecer redes sociales****;* ***Recibir ayuda*** *(comida, dinero, remetas, de quién?);* ***Reducir gastos en no alimentarios****;* ***Comprar(en vez de producir) comida*** *(vender recursos, prestar dinero, vender leña, vender carbón, niños trabajando);* ***Diversificar el consumo*** *(recolectar alimentos silvestres, caza, pesca);* ***Migración*** *(a otro país, a las zonas urbanas); depender en la artesanía, mendicidad, vender forraje, alquilar animales, vender terreno, alquilar terreno, actividades ilegales,* ***Cambio en la gestión de la tierra*** *(insumos)*

23. ¿Quién decidió los cambios? ¿Por qué elegió estas actividades?

24. ¿Había actividades que quería hacer pero que no eran posibles de hacer por usted(es)? ¿Cuáles? ¿Por qué no eran posibles de hacer?
25. ¿Los cambios que hizieron han sido permanentes? ¿Por qué sí / no? *CUALES ESTRATEGÍAS SON PARA HACER FRENTE A LA SEQUÍA (EN CORTO PLAZO) Y CUALES PARA ADAPTARSE (EN LARGO PLAZO) A UN MEDIO AMBIENTE MÁS SECO, CON SEQUÍAS MÁS FRECUENTES?*
26. ¿Su vida es similar o diferente a la vida de sus padres? ¿Por qué, cuál es la diferencia? *¿A qué actividades de subsistencia se dedican su madre / padre? Si eran diferente, ¿Por qué?*
27. ¿Cómo aseguraron sus padres el alimentación? ¿Y durante las sequías más graves?

Recursos, acceso y decisiones (poder)

¿Quién tiene acceso a qué recursos? ¿Por qué? *¿Herencia? ¿Leyes?* ¿Cómo ha cambiado el acceso de los recursos con el tiempo y las sequías? *¿Antes tenía más o menos acceso a los recursos del hogar*

¿A los **ingresos** que usted gana?	**¿Quién es el dueño de / tiene acceso a la:**		
	¿**Tierra**? ¿Qué tipo de tenencia de la tierra tienen? ¿Alquilan? ¿Qué cultivan? ¿Cuántas manzanas tienen? ¿Dónde están? *(La ubicación importa al riesgo)* ¿Es de buena calidad? ¿Utilizan insumos agrícolas?	¿Casa? ¿Animales (*grandes, pequeños*)? ¿Vehículos? ¿Créditos? ¿Seguros? ¿Información?	¿**Agua** (*para tomar, cocinar, lavar, animales, cultivos*)? ¿Qué tipo de fuentes de agua tienen (*ríos, lagos, pozos pocos profundos o profundos, recoger la lluvia, grifos, tanques de agua*)? ¿Qué tipo de sistema de irrigación usan (*gravedad, goteo, aspersión convencional, pivote*)? ¿Hay diferencia en las fuentes en las épocas del año? ¿Pagan por el agua? ¿Cuánto (*época seca / lluviosa*)? ¿Hay conflictos de (fuentes de) agua?

28. ¿A qué creé usted que se debe estos cambios? ¿Qué ha significado los cambios en los recursos para su papel en el hogar (/su relación con los otros miembros del hogar)?
29. ¿Quién toma las decisiones en el hogar?
    ¿Sobre en qué trabajar?
    ¿en qué producir?
    ¿en qué comprar con sus ganancias?
    ¿otras ganancias?
    ¿estudio de los hijos e hijas (y adultos?)?
    ¿y de qué manera? ¿Por qué? *¿Normas?*

¿Cómo ha cambiado la toma de decisiones en el hogar con el tiempo? *¿Antes tomaba más o menos decisiones en el hogar?*

30. ¿A qué creé usted que se debe este cambio? ¿Qué ha significado para su papel en el hogar (/su relación con los otros miembros del hogar)?
31. ¿Puede contarme un poco de lo que influye la división de recursos y poder entre las mujeres y los hombres los cambios con el tiempo?

Estrategias o acciones afuera de los hogares para mitigar la sequía según actores locales

32. ¿Existe algún plan de emergencia durante la sequía? *Si no, ¿existe algún plan de desarrollo" en general" por la comunidad / el área? Si existe, ¿se trata este plan algo de la escasez de agua?* ¿Cuándo fue creado? ¿Quién es el encargado *(institución y persona de la comunidad)*?
33. ¿Qué acciones han realizado como comunidad para reducir el impacto de la sequía sobre el hombre? ¿Y la mujer? ¿Por qué?
34. ¿Qué actividades o acciones podrían disminuir la sequía?
35. ¿Otorga ayuda a alguien?
36. ¿Quiénes deberían proponer esas acciones o actividades? ¿Hombres, mujeres, la comunidad, las instituciones, las organizaciones, el estado quién? ¿Y realizar? ¿Por qué?
37. Si la sequía *del año pasado* regresó, ¿qué haría? *¿Ya tienen una vida / viven en una manera diferente de antes debido a la sequía repetida?*
38. ¿Hay cuentos, canciones o arte que se tratan de la sequía en Nicaragua?

¿Tiene usted algo más que le gustaría contarme o preguntarme?

Appendix 4. Interview guide, October 2008

Guía de entrevistas, segunda gira

Queríamos hablar sobre su niñez y juventud y sobre los cambios que han pasado desde estos años. Podría contar un poco sobre su vida como joven - cómo se ganaba la vida, a qué usted se dedicaba, qué cultivaba, si siempre había alimentación, etc.?

Información general

1. Nombres y apellidos: _____
2. ¿Sabe leer y escribir?
3. ¿Cuantos años tenía usted cuando se mudó de la casa de sus padres?

Hijos y nietos

4. ¿Cuántos hijos tiene?
5. ¿Cuántos nietos tiene?
6. ¿Cuando usted criaba a sus hijos, qué pensaba era lo más importante a darles?
7. Ahora cuando cría a sus nietos, ¿ha cambiado lo que piensa es lo más importante a darles?
8. ¿Usted piensa que ciertas cosas son importantes por la educación de sus padres? ¿Como qué cosas?

Medios de vida / papeles de los miembros del hogar

9. ¿A qué se ha dedicado usted? ¿Cómo ha cambiado? ¿Por qué?
10. ¿Ha tenido más de un trabajo al mismo tiempo? ¿Qué tipo de trabajos? ¿Por qué?
11. ¿Estaba usted/su esposo en ejército? ¿FSLN/contras? ¿A qué se dedicaba usted/su esposa cuando no estaba aquí?
12. ¿A qué se dedica su vecino/a? ¿Y antes? ¿Están ellos más o menos pobres que ustedes? ¿Por qué?
13. ¿Sabe usted si su vecino/a tiene un trabajo con salario? ¿Ha cambiado con tiempo?
14. ¿Si podría decidir su mismo, a qué se dedicaría - agricultura o otro trabajo? ¿Por qué no se dedica a esto? (*calidad de terreno, cantidad de terreno, cantidad de agua/lluvia, no hay trabajos urbanos, ……..*)
15. ¿Puede describir cómo el acceso a agua ha cambiado desde su niñez? ¿Por qué ha cambiado?

16. ¿Puede describir cómo la lluvia ha cambiado desde su niñez? ¿Por qué ha cambiado?
17. ¿Quién ha sido responsable de traer agua? ¿De donde ha traído el agua? ¿Para lavar, cocinar, tomar, aguar animales, ……? ¿Por qué ha cambiado?
18. ¿Qué cantidad de agua ha traído? ¿Para lavar, cocinar, tomar, aguar animales, ……? ¿Por qué ha cambiado?
19. ¿Con qué frecuencia ha traído agua? Para lavar, cocinar, tomar, aguar animales, ……? ¿Por qué ha cambiado?
20. ¿Qué hace una ama de casa? ¿Ha cambiado con tiempo?

Alimentación

21. ¿Usted ha tenido problemas con escasez de alimentos? ¿Cuándo? ¿Por qué?
22. ¿Había más variedad en la comida cuando era niño/a? ¿Cuándo y por qué cambió?
23. ¿Qué comió ayer en todo el día? ¿Y eso era el mismo cuando era pequeño? ¿Por qué ha cambiado?
24. ¿Ha tenido que comprar alimentos a veces que normalmente producía usted mismo? ¿Qué tipos de alimentos? ¿Cuánto? ¿Cada cuánto? ¿Por qué?
25. ¿Ha tenido que recolectar alimentos silvestres, cazar o pescar en su vida? ¿Qué tipos de alimentos? ¿Cuánto? ¿Por qué?
26. ¿Usted ha tenido problemas de salud? ¿Qué tipos de problemas? ¿Cuándo? ¿Por qué?

Migración y remesas

27. ¿Cuándo migraron sus familiares que han emigrado?
28. ¿Dónde han vivido? (Dónde viven, si todavía viven en otro lugar?)
29. ¿Han regresado en períodos o se quedaban permanente afuera de acá?
30. ¿Por qué se fueron?
    [REFIERE A LAS OCASIONES QUE MENCIONÓ EN 27]
31. ¿Qué han hecho en Costa Rica/Managua/León/El Sauce/…….?
    [REFIERE A LAS OCASIONES QUE MENCIONÓ EN 27]
32. ¿Siempre ha habido personas que han enviado remesas al hogar?
33. ¿Cuánto han enviado?
34. ¿Ha sido suficiente para los costos de los niños/as que han dejado en el hogar? ¿Ha sido posible comprar otras cosas también por ese dinero?
35. ¿Siempre ha sabido cuando puede esperar las remesas?

Forraje

36. ¿Usted ha tenido problemas con escasez de forraje? ¿Por qué?
37. ¿Ha tenido que comprar forraje a veces que normalmente producía usted mismo? ¿Cuánto? ¿Por qué?

Otros aspectos

38. ¿Ha habido períodos en su vida cuando no ha podido comprar los básicos? Jabón, fertilizantes, ropa, servicios de salud, educación, …… ¿Cuándo? ¿Por qué?
39. ¿Qué tipos de pérdidas ha sentido en su vida? Pérdida de animales, problemas con el salud, niños (o su mismo) han tenido que trabajar en vez de estudiar, cambios en la carga de trabajo, …… ¿Por qué?

Cultivos

40. ¿Usted/su esposa ha participado en la siembra este año? ¿Cuántas horas por día ha trabajado con esto?
41. ¿Qué otros tipos de actividades ha hecho usted/su esposa en el campo? ¿Cómo ha cambiado? ¿Por qué?
42. ¿Usted/su esposa ha pasado más tiempo trabajar en el campo o con otras cosas? ¿Cómo ha cambiado? ¿Por qué?
43. ¿Siempre ha sembrado en la primera? ¿Qué ha sembrado?
44. ¿Usted ha tenido pérdidas en sus cultivos durante la primera? ¿Por qué?
45. ¿Siempre ha sembrado en la postrera? ¿Qué ha sembrado?
46. ¿Usted ha tenido pérdidas en sus cultivos durante la postrera? ¿Por qué?
47. ¿Qué cultivos han sembrado en el patio? ¿Ha estado importante para la subsistencia de la familia?
48. ¿Usted ha tenido pérdidas en sus cultivos de patio? ¿Por qué?
49. ¿Los cultivos que ha sembrado, eran resistentes o susceptibles a la sequía? [P.EJ. AJONJOLÍ - SUSCEPTIBLE?]
50. ¿Ha aprendido algo sobre la sequía por el radio, tele o periódico? ¿Esta información ha ayudado a usted en alguna manera?

Insumos

51. ¿Qué tipo de insumos eran los primeros que usaba? ¿Por qué?
52. ¿Y después - qué tipos de insumos ha usado? ¿Por qué?

Terreno

53. ¿Quién era el dueño o la dueña del terreno de sus padres?
54. ¿Cuánto terreno ha tenido en su vida? ¿Por qué ha cambiado?
55. ¿Ha estado propio (de quién?), de herencia, alquilado o prestado? ¿Por qué ha cambiado?
56. ¿Piensa usted que hace una diferencia en la vida ser dueño de su propio terreno?
57. ¿El terreno siempre ha sido de buena calidad?
58. ¿Cuanto terreno ha tenido para producción de patio? ¿Cómo ha cambiado? ¿Por qué?
59. ¿Ha estado propio (de quién?), de herencia, alquilado o prestado? ¿Por qué ha cambiado?

Animales

60. ¿Siempre ha tenido animales? ¿Cuántos? (*bueyes, terneros, vacas, cabras, cerdos, gallinas*) ¿Por qué ha cambiado?
61. ¿Ha estado propio (de quién?) o de herencia? ¿Por qué ha cambiado?

Ingresos

62. ¿Cuáles han sido sus fuentes de ingresos en su vida? ¿Por qué ha cambiado?
63. ¿Cuánto ha ganado? ¿Por qué ha cambiado?
64. ¿Ha tenido ingresos con regularidad? ¿Más o menos cada cuánto?
65. ¿Qué tipos de ingresos ha tenido en su vida? *Trabajo afuera (mujeres: parteras, domestica, cocinar, coser, ...), ventas, (remesas,) ……..* ¿Por qué ha cambiado?
66. ¿Han tenido que vender algunos recursos para ganarse la vida? ¿Qué y cuánto? *Terreno, animales, cultivos, productos no agrícolas, ropa, ……..* ¿Por qué?

Precios

67. ¿Cuánto costó frijol/azúcar/aceite/arroz/jabón/…… antes? (¿Cuándo?)

Deudas

68. ¿Cuántas deudas ha tenido en su vida? Informales, formales/créditos,……...

Participación en organizaciones

69. ¿Usted participa en una organización comunitaria? ¿Desde cuándo? ¿Por qué?

FINALMENTE…

70. ¿Cómo describiría su mismo, su identidad? ¿Cómo ha cambiado eso durante su vida?
71. ¿Qué ha sido lo mejor en su vida?
72. ¿Y lo peor?
73. ¿Cree usted que las mujeres o los hombres son los más vulnerables a la sequía aquí en Sabana Grande/Nicaragua? ¿Por qué?

Appendix 5. Interview guide, January 2010

Nombre:
Fecha: enero, 2010

1. ¿La falta de lluvia ha provocado algunas perdidas en el hogar de usted?
2. ¿Este año, sabía que no iba a llover mucho? (¿Había escuchado de algún lugar / alguien que había riesgo de sequía? Fue posible prepararse antes?)
3. ¿Qué hizo para prepararse de las consecuencias de la falta de lluvia, para evitar pérdidas?
4. ¿Hizo algo diferente este año en comparación con años anteriores?
5. ¿Cree que ahora van a cambiar su forma de vivir por la falta de lluvia aquí? (Lo que comen, lo que están cultivando, como ganar dinero, etc.)
6. ¿Saben de otras personas que hayan sufrido perdidas por la falta de lluvia?

Appendix 6. Guide for focus group discussion, October 2008

- La sequía y estrategias
  - ¿Cómo han cambiado los ríos? ¿Cuándo había pescados? ¿Cómo ha afectado a la comunidad?
  - ¿El hecho que hay menos agua en el río, cómo afecta a la comunidad?
- Cultura
  - ¿Han cambiado las actividades para hombres / mujeres con el tiempo?
  - ¿Qué entienden por machista? ¿Y aquí, qué es ser machista? ¿Aquí los hombres son machistas? ¿Y las mujeres? ¿Por qué?
- Redes sociales
  - ¿Qué han pensado hacer si la comunidad fuera afectada por la sequia? ¿Han pensado en organizarse? ¿Han pensado organizarse para formar un banco de semilla? ¿Tener fondos y dar créditos a bajas intereses y no tener que ir al banco? ¿Buscar ayuda en el alcaldía?
  - ¿Qué tipo de ayuda ha tenido la comunidad? ¿Por qué? ¿Para qué? ¿Cuándo?
  - ¿Toda la comunidad se beneficiada? ¿Por qué?
- Impactos
  - ¿Han visto otros cambios, por ejemplo la frecuencia de la lluvia, la entrada del invierno?
  - ¿Se han sentido afectadas cuando ha habido poco lluvia o cuando el invierno entra tarde? ¿Cómo? ¿Por qué?
  - ¿En esta comunidad, todos siembran en la primera? ¿Siempre ha sido igual? ¿Siempre ha sido las mismas áreas o los mismos cultivos?
  - Cuando los hombres / mujeres en esta comunidad han sido afectados por falta de lluvia o porque el invierno empieza tarde, ¿cómo afecta la convivencia familiar? ¿Están enojados, preocupados, tristes?

- ¿Qué han hecho para no ser afectada? ¿Qué han hecho para disminuir ese efecto? ¿Antes y después?

• Normas y reglas

- ¿Existe algún reglamento para el uso del agua potable? ¿Hay límite?
- ¿Qué tanto las mujeres son dueñas de terreno? ¿Eso es porque han comprado o porque han heredado?
- ¿Cuando las mujeres son dueñas pueden decidir sobre el terreno, por ejemplo si quieren sembrar, si quieren vender, etc.?
- ¿Pueden decidir cuando son casadas o sólo cuando son jefas?

• Salud

- ¿Cuáles son las enfermedades más comunes que afectan a la comunidad?
- ¿Cuáles afectan más en verano?
- ¿Esas enfermedades han afectado las capacidades de trabajar?