Social Limitations to Livelihood Adaptation

Responses of Maize-farming Smallholder Households
to Neoliberal Policy Reforms in Morelos,
Southern Veracruz, Mexico

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Content

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List of acronyms

ASERCA	*Apoyos y Servicios a la Comercialización Agropecuaria* Support and Services for Agricultural Trading
BANRURAL	*Banco Nacional de Crédito Rural* National Rural Credit Bank
CIMMYT	*Centro Internacional de Mejoramiento de Maíz y Trigo* International Maize and Wheat Improvement Center
CNPR	*Confederación Nacional de Propietarios Rurales* National Confederation of Rural Land Owners
CONASUPO	*Compañía Nacional de Subsistencias Populares* National Company for Popular Subsistence
CONEVAL	*Consejo Nacional de Evaluación de la Política de Desarrollo Social* National Council for the Evaluation of Social Development Policy
FAO	Food and Agriculture Organization of the United Nations
FERTIMEX	*Fertilizantes Mexicanos* Mexican fertilisers
FIRA	*Fideicomisos Instituidos en Relación con la Agricultura* Trust Funds for Rural Development
FIRCO	*Fideicomiso de Riesgo Compartido* Shared Risk Trust
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
Ha	Hectares
ILO	International Labor Organization of the United Nations
IMSS	*Instituto Mexicano del Seguro Social* Mexican Institution for Social Security
INEGI	*Instituto Nacional de Estadística, Geografía e Informática* National Institute of Statistics, Geography and Informatics
INI	*Instituto Nacional Indígena* National Institute for Indigenous People
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Cooperation and Development
PROCAMPO	*Programa de Apoyo Directo al Campo* Programme of Direct Support for the Countryside
PROCEDE	*Programa de Certificación de Derechos Ejidales y Titulación de Solares* Ejidal Rights Certification Programme
PROGRESA	*Programa de Educación, Salud y Alimentación (now Oportunidades)* Programme for Rural Education, Health and Nutrition
PROMAF	*Proyecto Estratégico de Apoyo de la Cadena Productiva de los Productores de Maíz and Frijol* Programme to Support de Production Chain of the Maize and Beans Farmers
RAN	*Registro Agrario Nacional* National Agrarian Register

SAGARPA	*Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca, y Alimentación* Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food
SAM	*Sistema Alimentario Mexicano* Mexican Nutrition System
SEDESOL	*Secretaría de Desarrollo Social* Ministry of Social Development
WTO	World Trade Organisation

Glossary

Agente municipal	Community mayor
Antojito	Snack
Atole	Gruel made with ground maize
Asamblea general	General assembly of the *ejido*
Avecindado	Inhabitant of an *ejido* who only has access to land for housing but does not have agricultural land titles
Barbacoa	Meat slowly cooked over an open fire
Bomba	Sprinkler carried on the back
Cantina	Bar
Casa Ejidal	Community centre; the building where *ejidatarios* hold their meetings
Camioneta	Pick-up car serving as public means of transportation
Caseta telefónica	Telephone house
Chamchamitos	Local type of *tamales*
Comadre	Godmother of one of your children
Comal	A flat iron tray on which tortillas are fried
Comisariado Ejidal	Executive body of the *ejido*
Comité agrario	Agrarian committee
Compadrazgo	Fictitious kinship, refers to a way of formalising a close relation of mutual help, reciprocity and trust
Compadre	Godfather of one of your children
Consejo de Vigilancia	Supervisory Board of the *ejido*
Corazón	*Heart*
Costillas	Spare-ribs
Coyote	Middlemen buying and selling maize
Criollo	Indigenous maize race
Curandero	Witch doctor
Desgranadora	Machine that takes off the grains from the cob
Despacho	Private extensión agency
Doblar	To fold
Ejidatario	Members of an *ejido* who formerly had usufruct rights to *ejido* land
Ejido	Refers to a land tenure scheme, which was established after the Mexican revolution
Floja	Lazy

Hacendados	Large landowners
Juez	Judge
Machete	Long chopping-knife
Masa	Starchy maize dough
Metate	Traditional used rectangular quern on which tortillas are made
Milpa	Maize field, often intercropped with beans and/or squash or other crops that is managed through slash and burn with fallow periods and the use of mulch
Música del racho	Mexican country music
Nixtamal	Maize boiled with lime, rinsed and strained. This is an essential step in the process of making tortillas.
Peones	Unskilled day labourer or farm worker
Pila	A type of cement sink
Potzole	Maize drink
Pozo	Well
Preparatoria	School for pre-university education
Preescolar	Kindergarten
Presidente Ejidal	President of the *Comisariado Ejidal*
Representante	Representative (farmer group leader)
Secundaria	High school
Solar	Land allocated for housing
Tamales	Traditional Mexican dish consisting of maize dough cooked within maize leaves often containing meat or sugar and fruits
Tapachole	Second maize production cycle lasting from autumn to winter
Temporal	Main maize production cycle lasting from spring to summer
Tequio	A form of communal work provided as a service to the community
Tortilla	Round flat pancakes made of maize dough
Tortillería	Mechanised tortilla shop
Tronquito	Pedicel where the kernel is attached to the cob
Unión libre	Unregistered marriage
Vaquero	Typical Mexican farmer's head (cowboy-head)

1

Introduction

Governments around the world have embraced market liberalisation as a means of enhancing efficiency to realise economic growth and alleviate poverty. Likewise, the Mexican government implemented neoliberal policy reforms, the NAFTA in particular, to stimulate sustainable development. Using the Mexican maize sector as illustration, this thesis describes the adaptation process of smallholders to market changes shaped by these policy reforms. Going beyond the aggregate level, this study investigates smallholders' adaptation strategies to provide micro-level data on the significance of market liberalisation for smallholders, about the ways they respond to structural macroeconomic changes, and the consequences for their poverty situation. Special attention is given to the role of social capital in shaping households' adaptation behaviour.

This chapter provides the background of the thesis. The rationale of studying the adaptation process of smallholders in the context of market liberalisation is provided and the research questions are formulated. The chapter closes with an articulation of the organisation of the thesis.

1.1 Economic growth, income inequality, and poverty: pitfalls macro approach

In the economic literature, it is widely accepted that in the long-run market liberalisation, in particular free trade, contributes to economic growth at an aggregate level. During de 1990s, the conviction that openness is good for economic growth was fostered by several cross-country regressions of international trade on income per person, for example in the papers of Sachs *et al.* (1995), Dollar (1992), Edwards (1993), Hoekman *et al.* (2001), Edwards, (1997), and Dollar and Kraay (2001). Critics, like Frankel and Romer (1999), challenge the results of these regressions. In their opinion, trade is an endogenous variable, as countries whose incomes are high for other reasons than trade may trade more. Therefore, they introduce geography as an exogenous determinant of bilateral trade. Nevertheless, also with this approach they concluded that there is a positive causal relation between trade liberalisation and medium-term economic growth. Critical research conducted by Rodríguez and Rodrik argues that the conclusions of earlier cross-country studies[1] rest on indicators of openness that are "poor indicators of trade barriers or are highly correlated with other sources of bad economic performance" (Rodríguez and Rodrik, 1999:1). They conclude that there is no clear-cut relationship between integration into the world economy and economic growth; rather they argue that this relationship depends on a number of external and country-specific factors (Rodríguez and Rodrik, 1999).

Studies arguing in favour of the beneficial effects of trade on economic growth often ignore the effects on income distribution (Barraud and Calfat, 2008). A remarkable exception is the study of Dollar and Kraay (2001). They emphasise the importance of studying the effects on income distribution while analysing the effects of economic growth on poverty reduction. They consider poverty in relative terms and define 'poor people' as "those in the bottom fifth of the income distribution of a country" (Dollar and Kraay, 2001:196). The authors conclude that greater openness results in poverty reduction since there is no clear evidence of a correlation between changes in trade and changes in various measures of inequality, such as the Gini coefficient or the Lorenz curve (Dollar and Kraay, 2001). They also found that average income of the poorest quintile moved almost one-for-one with overall average incomes[2]. This means that there is no intrinsic trade-off between long-run aggregate economic growth and overall equality[3]. This result is consistent with the findings of, amongst others, Chen and Ravallion (1997), Bruno *et al.* (1996), Easterly (1999), and Lundberg and Squire (2000). However, Ravallion (2001) demonstrates that finding zero average impact on inequality of growth-oriented policy reforms does not mean that the benefits of reforms are generally distributed neutrally. Under the surface of the aggregated outcomes are often losers, even when average

[1] Like that of Dollar (1992), Ben-David (1993), Sachs et al. (1995), Edwards (1998), and Frankel and Romer (1999).

[2] Based on the fact that in their data set across countries, log mean income of the poorest quintile changes onto one with the overall log GDP per capita.

[3] Additionally, they emphasise that there are other factors that have their effect on the income of the poor through their effect on income distribution such as primary educational attainment, social spending, agricultural productivity, and formal democratic institutions (Dollar and Kraay, 2001).

poverty falls. In other words, economic growth measured in national accounts is not always reflected in average household living standards. It is important that these diversities of impacts underlying the averages are not overlooked, so that governments know what else they have to do to reduce poverty on top of promoting economic growth (Ravallion, 2001).

While many economic studies investigate the impact of trade liberalisation on economic growth and social differentiation, less is known regarding why some groups of actors are able to take up the opportunities generated by an expanding economy and others are not. Following Bussolo and Lecomte (1999), this study argues that a better understanding is necessary about the way specific trade policy changes affect farmers, including whether they have the assets (skills, capital, land, etc.) that are likely to allow gains from trade liberalisation, the extent to which they interact with markets, and how vulnerable to change they are. By focusing on the local adaptation process, this thesis aims to contribute to the limited micro-level, country-specific data, and to provide insight on how small-holders adapt to the new market conditions shaped by market liberalisation trends. Going beyond the aggregate level, this study intends to achieve a better understanding of the interfaces between macro-level trade policies and micro-level farmer practices.

1.2 Smallholder livelihood adaptation: pitfalls micro approach

This study argues that in examining the capacity to respond to economic changes, there is much to learn from the livelihood literature on adaptation and coping. In a development context, several studies have demonstrated that rural populations have traditionally adapted to market changes and coped with crop failure and climate conditions by engaging in a multitude of livelihood activities, depending for the most part on local natural resources, social networks, and local skills and institutions (Swift, 1989; Davies, 1993; Devereux, 1993; De Bruijn *et al.*, 2005). The concept of livelihood refers to what people do for a living, how they do it, and what they gain by doing it. As the point of departure, this study uses the definition provided by Ellis (2000:10): “the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by an individual or household.”

An important element of livelihood frameworks is that the household asset base is considered being shaped by the so-called ‘vulnerability context’ that determines the availability and accessibility of assets in an area. External factors in the vulnerability context are, on the one hand, conditions and trends, and on the other hand, policies, institutions, and processes that interface with social norms and structures in which households are embedded (Hoon *et al.*, 1997; Scoones, 1998; Carney, 1999; Ellis, 2000). Internal dimensions of vulnerability involve the characteristics of individuals (age, sex, education, skills, health status, etc.), households (gender of household head, size, income, dependency ratio, asset ownership, etc.), and other micro-networks (Blaike *et al.*, 1994). Global economic changes can be seen as mediating processes that affect the vulnerability context under which farmers participate in the agricultural sector. They expose farmers to new conditions to which they have to adapt. Some farmers may be able to take advantage of these changes while others face increased vulnerability (Eriksen and Silva, 2008).

In the last decade, the concept of 'livelihood' is used mostly as an approach to poverty issues in studies that aim to be people-centred, non-sectoral, and grounded in the multi-dimensional reality of daily life. Livelihood studies have in common that they concentrate on the actions and strategies of people trying to make a living in adverse circumstances. However, this focus on people and their actions and strategies causes many studies to adapt a too narrow view on strategic choices and ignore the structural context (Kaag *et al.*, 2004). Thus, even though the livelihood framework includes various contextual factors that can have constraining or enabling effects on the generation of livelihood security (Devereux *et al.*, 2004), most studies downplay these structural features and focus on capitals and activities (De Haan and Zoomers, 2003). Analyses of livelihood strategies are paramount within livelihood studies but are mostly based on assumptions of rational choice and profit maximisation, while less is known about how these strategic decisions are shaped by changes in the wider societal structures (Pennartz and Niehof, 1999; De Haan, 2000a; Murray, 2001).

I have used the concept of social capital to analyse the intersection between social structures and purposive actions. Following Lin (2001:41), social capital is considered as "rooted in social networks and social relations and is conceived as resources embedded in a social structure that are accessed and/or mobilized in purposive actions." I use this definition since it assumes that "social capital contains three elements: structure (embeddedness), opportunity (accessibility through social networks), and action (use)" (Lin, 2001:41). Actors do not only derive resources from their personal networks but also have to be able to mobilise them. By doing so the resources and norms embedded in social structure enter the lifeworlds[4] of the individuals and social groups concerned, and in this way, they are also mediated and transformed by these same actors (Long, 2001). Accordingly, social structures are partly the unintended result of numerous social actions and interactions, which become the enabling and constraining conditions of social action itself (Giddens, 1984). Hence, the concept of social capital allows for an analysis of the interdependence and mutual causation between the wider social structure and individual actions.

1.3 Setting the stage: Market liberalisation and maize-farming in Mexico

1.3.1 Trends towards market liberalisation

Successive Mexican governments have historically supported the agricultural sector to stimulate economic development. In 1917, following the Mexican Revolution, agricultural land held under large private holdings was reallocated under a specific institutional form –

[4] The concept of 'lifeworlds' refers to the "lived-in worlds and largely taken-for-granted social worlds of particular individuals" (Long, 2001:54). This entails that practical action is shaped by a background of intentionality and values, and is therefore essentially actor defined (Long, 2001). Long points out that this should not be interpreted as "a kind of 'cultural backcloth' that frames individuals' actions, but rather as the outcome of individuals' own constant self-assembling and re-evaluating and negotiation of relationships and experiences" (Long, 2001:241). Therefore, lifeworlds embrace actions, interactions and meanings, and are identified with specific socio-geographical space and life histories (Long, 2001).

the *ejido* (Bouquet, 2009). This collective land-tenure system combined communal ownership with individual use. The intention was that the *ejido* would stimulate direct private investment and enable farmers to participate in the private credit market which in the long-term would increase agricultural production (see further Appendix I; Vázquez Castillo, 2004; OECD, 2007).

During the 1940s and 1950s, the Mexican government invested in improvements of the rural infrastructure. Roads and irrigation works, however, were mainly constructed in the regions which had the best potential for rapid increases in farm output; these areas were to a large extent located in the north of the country. On these high-potential rain-fed lands, a 'Green Revolution' took place characterised by intensive use of fertilisers and pesticides, irrigation systems, and improved germplasm (Wiggins *et al.*, 2002). As a result, Mexican wheat production increased seven-fold and its maize production four-fold between 1945 and 1970 (Tuckman, 1976; Naylor *et al.*, 2001). Income inequality in Mexico increased as the northern states, where the new agricultural technologies were introduced, had significantly higher per capita incomes than the states in the south of the country. In the 1960s, the government began to subsidise the prices of farm inputs by directing large amounts of seasonal credit at low interest rates to the *ejido* sector. In 1965, the National Company for Popular Subsistence (CONASUPO) was established to coordinate all of the government's food regulatory activities. Through CONASUPO, the state provided crop price supports to producers of key staples such as maize and wheat; subsidies to agricultural inputs, credit, and insurance; and participated in the processing of grains, oils, and powder milk (Yúnez-Naude and Barceinas Paredes, 2002).

By the beginning of the 1980s, Mexico's smallholder maize farmers had grown used to two decades of intensive state assistance (Wiggins *et al.*, 2002). A peak period in agricultural investment in Mexico were the years 1979-1981, under the government of López Portillo (1976-1982), with the implementation of the Mexican Nutrition System (SAM). This programme was designed to promote rain-fed agriculture in order to curb the rising imports of basic foods and to attain self-sufficiency in the production of maize and beans by 1982 and involved significant price supports for agricultural products, large input subsidies on water, credit, and fertiliser, and major consumption subsidies on basic food products, which were all justified as poverty-alleviation policies (Yúnez-Naude, 1991; Naylor *et al.*, 2001). However, despite the implementation of this programme, during 1981-1982, 2.285 million tons of maize were imported and the value of maize imports more than doubled (Yúnez-Naude, 1991).

In 1981, the situation changed dramatically: oil prices fell and international interest rates rose sharply (Ten Kate, 1992; Wiggins *et al.*, 2002). By mid-1982, Mexico was in a deep economic crisis associated with high levels of public and private debt. During the remainder of that decade, the Mexican government embraced market liberalisation to create substantial gains in efficiency, stimulate economic growth, and reduce rural poverty. The government eliminated price supports for most agricultural products. The commitment to domestic 'food self-sufficiency' was replaced by a focus on 'food security' with an emphasis on allowing domestic food requirements to be met by a mixture of imports and domestic sources.

In 1986, Mexico joined the General Agreement on Tariffs and Trade (GATT, now the World Trade Organisation (WTO)) (Bahmani-Oskooee and Hegerty, 2009), and subsequently signed more trade agreements than any other country in the world (Henriques and Patel, 2004). In 1994, Mexico joined the Organisation for Economic Cooperation and Development (OECD), and in that same year, the North American Free Trade Agreement (NAFTA) was enacted. The aim was to eliminate all trade and investment barriers and secure equal treatment for foreign investors in energy, telecommunications, banking and financial services, and procurement as a motor for economic growth and sustainable development in the three participating countries (United States, Canada, and Mexico) (FIDH, 2006). It was anticipated that Mexico would benefit from NAFTA through expanded trade and employment opportunities with a large and growing market. Mexico was also expected to benefit from greater inflows of foreign direct investments into the manufacturing sector, assembly-line industry, energy, banking, and finance because of its abolition of foreign investment rules and regulations (Ramírez, 2003; FIDH, 2006; King, 2006).

Financial analysts from international institutions such as the World Bank and OECD predicted that the reforms would create substantial gains in efficiency and would trigger a move away from farming. Yet they also recognised that agricultural liberalisation might lead to some distortion in the distribution of the benefits and that interventions were needed to protect those who would lose out in the adjustment process (Levy and Van Wijnbergen, 1992, 1994; De Janvry *et al.*, 1995). In particular, negative effects were expected for the rain-fed maize sector (such as lower value of rain-fed land, reduced rents from this asset, and lower demand for rural labour in the maize sector), while sectors such as fruit and vegetable cultivation and the manufacturing industry would flourish (King, 2006).

Based on these expectations, NAFTA became the first trade agreement using tariff-rate quotas (TRQ[5]), allowing gradually increased import quotas coupled with decreasing tariffs on over-quota imports (Yúnez-Naude and Barceinas Paredes, 2002). These tariff-rate quotas were implemented as a transition mechanism for crops of national importance so that the move towards trade liberalisation would take place more gradually (Nadal, 2000; King, 2006). Different markets opened at different times over 5, 10, or 15-year periods, depending on the sensitivity of the crop. The longest transition period in the agreement, a phase-out period of 15 years of above-quota tariff reductions and quota increases, was settled for United States maize exports to Mexico[6] (Yúnez-Naude and Barceinas Paredes, 2002; Zahniser and Coyle, 2004; King, 2006). However, maize liberalization did not proceed smoothly. The protection negotiated for maize was not enforced; the Mexican

[5] A TRQ is a quota for a volume of imports at a favourable tariff. A higher tariff is applied to additional imports above the limit. The TRQ arrangement required each country to gradually expand each quota while phasing out the associated over-quota tariff (King, 2006).

[6] The quota levels were based on average trade flows between Mexico and the United States and Canada during the period 1989-1991 (Taylor *et al.*, 2005). In 1994, the quota for maize was initially set at 2.5 million metric tons ad valorem for US maize and 1.000 metric tons for Canadian maize. The above-quota base (or consolidated tariff) on maize from both countries was fixed at 215 percent (or 206.4 US$/metric ton) and the quota would expand by 3 per cent each year until the TRQ was eliminated on January 1, 2008 (Zahniser and Coyle, 2004; Taylor *et al.*, 2005).

government allowed imports over the established quota levels until 2004, and charged no tariffs for the above quota imports (Nadal, 2000, 2002; Keilbach Baer, 2005). Effectively, this allowed the national price for maize to drop to world-market prices within a period of 30 months, rather than the planned 15-year transition period (Nadal, 2002).

The reforms of the 1990s were intended to stimulate sustainable growth through structural adjustments and economic liberalisation (Nadal, 2000; Wiggins *et al.*, 2002). This 'modernisation' included a mix of monetary, financial, and domestic policies, geared towards market competition through removal of price controls and encouragement of more private investment to stimulate production according to the country's comparative advantage (Nadal, 2000). Fifteen years after the implementation of the various neoliberal policy reforms and the enactment of the NAFTA in 1994, the link between market liberalisation and poverty reduction remains unclear. Although in rural areas, income poverty levels have decreased by about 5.7 percentage point since 1992, the proportion of the rural Mexican population living in income poverty remains significant: 60.8 per cent in 2008 (CONEVAL, 2008). Critics argue that in the short-run trade liberalisation puts great stress on certain actors in the economy and that even in the longer run successful open regimes may leave some behind in poverty (Manders *et al.*, 2001; Winters *et al.*, 2002; Anderson, 2005; Eriksen and Silva, 2008).

Over the past ten years, several researchers have studied the effects of NAFTA. However, these studies were principally focused on the impact of NAFTA for the Foreign Direct Investments, national income distribution, import and export figures, Gross Domestic Product (GDP), and employment in the three participating countries (see also Murphy Jr., 1997; Esquivel and Rodríguez-López, 2003; Ramírez, 2003). The distinctive feature of this study is its emphasis on the significance of macroeconomic policies for the manoeuvring space and livelihoods of farmers at household level. This research contributes to the growing number of studies that emphasise the importance of local-level knowledge to gain understanding about why some actors do not benefit from the adjustment process (Bussolo and Lecomte, 1999; Ravallion, 2001).

1.3.2 Agricultural reforms

Reforms in the agricultural sector affected both input and product markets. In 1992, a major legal change towards privatisation of land was enacted. The main feature of the reform included the amendment of Article 27 of the Mexican Constitution that opened the possibility of defining individual property rights on land. Land that was previously owned under a collective land tenure system – the *ejido* system - was distributed among the *ejidatarios* (members of an *ejido* who formerly had usufruct rights to *ejido* land), who received official ownership certificates and ever since, may sell the land provided they obtain permission from the *ejido* assembly (OECD, 2006; Barnes, 2009; Bouquet, 2009). In that same year, the fertiliser industry was liberalised with the privatisation of the fertiliser company FERTIMEX (Nadal, 2000). No longer would the government hold domestic fertiliser prices below international prices through budget transfers to FERTIMEX. Additionally, throughout the 1990s, the Mexican government reduced its participation in agriculture by eliminating guaranteed prices to producers of key staples (such as maize and wheat), limiting subsidies to agricultural inputs and the provision of credit and insurance, and reducing participation in the processing of grains, oils, and powdered milk

via CONASUPO (Appendini, 2001; Yúnez-Naude and Barceinas Paredes, 2002; Yúnez-Naude, 2003). In 1999, CONASUPO was completely dismantled and the government no longer bought commodities at prices above world prices which they then subsidised and sold to consumers in order to insulate Mexico from international competition (Appendini, 2001; Yúnez-Naude and Barceinas Paredes, 2002; Yúnez-Naude, 2003). Furthermore, the government removed or reduced credit subsidies of the National Rural Credit Bank, BANRURAL (Naylor *et al.*, 2001; Rosenzweig, 2003). The role of BANRURAL declined and commercial banks were assumed to fill the gap in rural credit provision (King, 2006). Finally, in June 2003, BANRURAL was liquidated due to severe problems in credit recovery and operational inefficiency (Rosenzweig, 2003).

Government support which moved away from direct price supports for grains, beans, and oilseeds – administrated through CONASUPO – was redirected to income payments through the Programme of Direct Support for the Countryside (PROCAMPO) (Yúnez-Naude and Barceinas Paredes, 2002; Taylor *et al.*, 2005; Yúnez-Naude and Taylor, 2006). The main objectives of the programme were to compensate for the anticipated negative income effects of lower crop prices after the implementation of NAFTA and to help farmers to switch to crops that are more competitive in a liberalised context (Nadal, 2000; Sadoulet *et al.*, 2001; Yúnez-Naude and Barceinas Paredes, 2002). Currently, any producer who cultivates a legal crop on eligible land[7], or uses that land for livestock, forestry production, or some ecological project, can receive PROCAMPO payments, which are made on a per hectare basis. In 2001, a special service – PROCAMPO *Capitaliza* – was introduced that allowed farmers to receive the remaining years of PROCAMPO, which was supposed to end in 2008 but has been extended to 2012, in one lump sum. These funds would provide farmers with greater capital to invest in agricultural improvements, such as the conversion from maize to cattle-breeding or other crops that fit more closely to Mexico's comparative advantage (Keleman *et al.*, 2009).

The reforms contributed to a (low) economic growth at an annual per capital rate of 1.6 per cent between 1992 and 2007 (Zepeda *et al.*, 2009). This economic growth has resulted in a gain of about 1.2 million jobs, mostly in the manufacturing and service sector. However, an employment loss in agriculture has more than offset this gain. In total, the employment loss since the early 1990s was more than 2.3 million jobs in the second quarter of 2008. This job loss includes primarily permanent employment. By contrast, there has been a significant increase in seasonal work, drawing large numbers of internal temporary migrants (Zepeda *et al.*, 2009).

In brief, the changed economic landscape has greatly affected the context in which smallholder farmers operate. Traditional maize farmers faced the privatisation of the land and credit market, lower maize prices, higher prices for agrochemicals, and a shift in employment towards the manufacturing and agricultural export sector. The general hypothesis underlying this study is therefore that the adaptation process of the local smallholders is characterised by less maize production, an increased involvement in alternative agricultural activities (for example, a switch towards the cultivation of fruits

[7] Eligible land is defined as having been cultivated with maize, sorghum, beans, wheat, barley, cotton, safflower, soybeans, or rice in any of the agricultural cycles from fall-winter 1990-91 to spring-summer 1993 (Sadoulet *et al.*, 2001).

and vegetables or towards growing pasture in response to the increasing demand for meat) and more off-farm employment in manufacturing and agro-export industries. Due to the large number of changes and the short time in which they were implemented, it is impossible to disentangle the effects of each policy. Therefore, this study investigates the adaptation process to the total spectrum of changes.

1.3.3 Maize in Mexico

This study focuses on the recent changes within the Mexican maize (*Zea mays L.*) sector (see Appendix II for the characteristics of the maize plant). The reason to do so is that maize is traditionally the most important commodity in the Mexican economy in terms of employment and income generation. Maize production utilises 60 per cent of Mexico's farmland, and employs approximately three million farmers (eight per cent of the Mexican population and 40 per cent of the agricultural workers) (Nadal, 2000; SAGARPA, 2006; Gonzalez, 2011). Indirectly around 18 million people depend on maize for their livelihood (Vaughan, 2003). Therefore, from the Mexican point of view, maize is by far the most important crop included in NAFTA. Including the maize sector into NAFTA resulted in greater competition from US export maize on the domestic Mexican maize market with wide-ranging income and employment consequences for local small-scale farmers. Hence, there is a need to analyse these consequences for rural livelihoods at household level.

Maize is also the main component of Mexicans' staple diet. In 2005, per capita maize consumption was 120 kilo in Mexico. Estimations suggest that, on average, maize accounts for about 70 per cent of people's daily supply of calories in rural areas of Mexico. The principal food use of maize in Mexico is tortilla, a food with a history going back thousands of years and an average consumption of tortillas is as high as 325 gram per day per person (Gong *et al.*, 2008). To keep the price of tortillas low, as a welfare measure in the late 1980s the Mexican government pumped millions of dollars in subsidies into maize production. However, these subsidies highly favoured the two largest maize flour manufacturing companies GIMSA and Minsa. Meanwhile, prices paid to maize farmers were kept high, supporting a large number of small-scale producers. However, during the second half of the 1990s, the Mexican government liberalised the tortilla prices as part of post-NAFTA reforms (Zahniser and Coyle, 2004). Lower tortilla prices were projected to have multiple benefits, including lower inflation and greater consumer welfare. Nonetheless, contrary to the assumption that lower maize prices would translate into lower tortilla prices, the price of the tortilla increased at an annual average of more than 127 per cent from 1997 to 1999, and 22 per cent from 2000 to 2002 in real terms (Zahniser and Coyle, 2004; King, 2006). Underlying causes of this increase are related to the institutional characteristics of the maize-tortilla market. Due to low levels of competition among flour producers[8], manufacturers have considerable power to set profit-maximising prices, and are able to continue to raise consumer prices despite falling producer prices. Social unrest was the result as consumers started fighting a tortilla war, a battle over increased prices in tortillas reinforcing their opinion that the tortilla is

[8] The two largest dry maize flour manufacturing companies GIMSA and Minsa commands a 75 per cent and 25 per cent market share respectively (Zahniser and Coyle, 2004).

something incommensurable and incapable of being subjected to an unregulated free market economy.

In the Mexican maize sector, three broad categories of maize producers can be distinguished: competitive producers, intermediate producers, and subsistence producers (De Janvry *et al.*, 1995; Nadal, 2000; King, 2006; López Tostado, 2006). This distinction is relevant as the capacity to adapt to changing market conditions is different for each farmer category. This study concentrates on both intermediate and subsistence producers. Intermediate producers operate mostly on rain-fed land (5 – 20 ha.) and lower quality soils, with fewer inputs, and use a combination of improved varieties, hybrids, and local landraces. Farmers in this category produce for the local or regional markets, as well as for household needs. They are net sellers, and buy very little maize (De Janvry *et al.*, 1995). They are an interesting category since they actively participate at the local maize market and economic changes are directly reflected in household income. Their profit margins are not enough to enable them to withstand the pressure of price reductions and the challenge of competition from maize imports caused by the liberalisation of the market.

Subsistence producers are an important category as well. These farmers operate on small plots (<5 ha.), poor soils, mostly with animal traction and under rain-fed conditions. They usually rely on landraces that are better adapted to local conditions than hybrids. They sell only a small surplus at the local marketplace. According to Nadal (2000), these farmers represent 40 per cent of the total maize producers in Mexico and account for 70 per cent of the national maize production. Subsistence producers do not actively participate as sellers at the local maize market, yet neither do they produce in economic isolation, and so they, too, are affected by monetary flows and changes in the economic context. To meet liquidity needs, subsistence farmers may sell household assets, including labour and parts of their stock of maize (Nadal, 2000). Those households often diversify income sources and in certain periods (for example, during pre-harvesting times), due to seasonality, the income earned from maize production does not constitute the greatest share in the household income.

Apart from its economic significance, the cultural rhythms of a Mexican community, its labours, rituals and celebrations are defined - as they have been for millennia - by the life-cycle of maize. Nowhere in the world is the production of maize so closely interwoven with the social and cultural aspects of people's life as in Mexico (Carlsen, 2003). This makes it an interesting case to explore the effects of economic rationality, social norms, and cultural traditions anchored in daily routines on livelihood adaptation choices.

1.4 Study objectives and approach

This study assesses the adaptation of smallholders in response to neoliberal policy reforms in Morelos, a community located in the south of the Mexican state of Veracruz, which is characterised by relatively small-scale, rain-fed, maize farmers. The overarching aim of this study is to bridge the gap between the macro and micro approaches by examining the interfaces between agricultural policy reforms, household adaptation strategies and their wellbeing outcomes, and the socio-historical context in which they take place. To get a better understanding of the interplay between individual adaptation strategies and the wider social context, I focus on the role of social capital in livelihood generation. In this

study, the enabling and constraining effects of social capital are studied by analysing different trust indicators and farmer group participation. To address this interplay, clusters of research questions are formulated:

1. What adaptation strategies do local smallholder households deploy in response to the changing market conditions? What are the salient characteristics of the livelihood portfolios of the local smallholders? And how does the choice for a particular adaptation strategy affect the level of wellbeing of households? (Chapter 4)
2. How does trust shapes the adaptation process of local smallholders? (Chapter 5)
3. What is the role of social networks, in particular farmer groups, in livelihood adaptation, and what are the constraining and enabling effects of the social structural context on farmer group formation? (Chapter 6)

To answer the research questions, I used a combination of disciplines. This advances the fundamental understanding of problems of which solutions are beyond the scope of a single discipline or field of research. I made use of theories and models developed in anthropology, sociology, and development economics. Accordingly, both quantitative and qualitative research methods were used. The advantage of this multidisciplinary approach is that it not only reveals the quantitative relationships between economic changes and household income but also provides a wider understanding of the underlying socio-cultural systems and traditions which explain the differences.

An actor-oriented approach is applied that puts the farmer at the centre stage, but – at the same time – actions are considered the result and the constituents of broader and longer-term processes. This approach assumes that, although their choices are often limited by a lack of critical resources, farmers should not be seen as passive recipients nor as victims of planned changes, neither are their activities so much dictated by convention that they just follow long-established routines. Like other actors, farmers devise ways of dealing with problems and creatively bring together resources (material and non-material – including practical knowledge derived from past experience) in an effort to resolve problematic situations and make a living (Long, 2001). In the same vein, in this study, smallholder households are the unit of analysis. Households are assumed to have agency by which they are capable to make decisions and choices within a broader social and institutional environment (Moser, 1998; Pennartz and Niehof, 1999; Niehof, 2011). Hence, household adaptation processes can be conceptualised as subject to a continuous negotiation in the search for a compromise between the constantly changing conditions in the material world on one hand (e.g. increasing pressure on natural resources, economic factors, increased market integration, urbanisation, and migration) and individual households' needs, preferences, and values on the other.

1.5 Relevance of the study

The objective of this research is to make visible the adaptation process of smallholder households in response to processes of market liberalisation, taking smallholders in Morelos as the central case in point. The resulting insights can contribute to the theoretical debate on the linkages between trade liberalisation, inequality, and poverty. In order to get a better understanding of the local adaptation strategies pursued, this study presents an evocative picture of the livelihood features of the smallholder households in

the study area, thereby contributing to the knowledge on micro-level, sector-specific household adaptation processes.

By analysing the significance of market liberalisation for household livelihoods, I am effectively studying the implications of structural change for the room for manoeuvre of local agents. This perspective links up with the sociological and ontological debate about how structures and human agency interact with each other (see further, Giddens, 1984, 1987; Turner, 1990; Bryant and Jary, 1991; Urry, 1991). This debate deals with the question of the extent to which day-to-day activities of household members are enabled and constrained by changing structural properties of social systems. In the context of this study, this is a highly relevant question since market liberalisation can be seen as a process that affects the structural properties of local social systems and, consequently, shapes the opportunities and challenges for generating livelihood security. This study aims to contribute to the debate by describing how the engagement between actors and structures is constructed in daily practices. On the one hand, I look at how market liberalisation influences the manoeuvring space of smallholders. On the other hand, I show how structural properties of social systems are shaped by the outcomes of the activities of human agents. Consequently, this study describes how the impact of global economic changes depends on the national and regional context as well as on the responses of local actors. Moreover, it demonstrates that local processes have an important role in the ultimate effect of market liberalisation on the reproduction of poverty at micro-level. These local processes can be considered as being the local reality consisting of the daily activities of the household members (Barros Nock, 1998). Therefore, this study describes globalisation processes in relation to heterogeneous local processes.

To contribute to the political debate on the effects of neoliberal policy reforms is also an important objective of this study. Mexico, in particular, is an interesting case for policymakers as it pursues an extremely progressive trade policy (Carlsen, 2003). The government carried out multiple unilateral trade liberalisation agreements and structural adjustments that accelerated in 1994, when the NAFTA went into effect (Barros Nock, 1998). The lessons from the experience of Mexican farmers under NAFTA are important for several reasons. First, they will yield information on the impact of market liberalisation on rural poverty, which will help the formulation of more accurate estimations of the responses to and outcomes of future trade agreements for rural households. Second, studying the way farmers respond to the market liberalisation process can provide insight into farmers' strategies in response to economic instability and shocks. This knowledge can be used to develop more effective assistance policies and programmes to smooth the progress of adjustment and to reduce the social costs of economic liberalisation. Hence, it appears that looking at Mexico's experience with NAFTA and the transformation towards more market liberalisation during the last decade, provides an opportunity to consider how macroeconomic trade agreements shape the opportunities and challenges they represent for smallholders. A better understanding of these effects can be used for the development of future trade agreements that take into account the interests of vulnerable groups in society. According to Ellis (2001:184) there is a woeful ignorance in this area, and macro policies in general proceed with little knowledge or feedback as to the changes in adaptation strategies they provoke at local levels in rural areas.

1.6 Outline of the thesis

The thesis is composed of seven chapters, each analysing a different aspect of the problem and shedding light on a particular element of local livelihood dynamics in the study area. The chapters complement each other to provide the basis for an understanding of farmers' adaptation processes in the local context.

Chapter 2 elucidates the conceptual and analytical framework underlying this research. I introduce the livelihood framework, which is taken as central point of departure for analysing the adaptation process of local smallholders. The different elements of the livelihood approach are explained, viz. the assets people have, how they employ them in their livelihood activities and strategies, the vulnerability context with which households have to deal, and the processes, policies, and institutions that mediate the transformation of assets into livelihood outcomes. This theoretical framework underlies, more or less explicitly, all aspects of the thesis.

Chapter 3 describes the research design and methods used in data collection. It explains which methods of data collection are used, how samples are selected, and how data is analysed. The chapter ends with a short introduction to the study area, including the geographic location, demographic figures, and socio-cultural background. Assets and resources available at community level are discussed as well. Therefore, this chapter can be seen as a starting point for analysing and interpreting the research questions and results.

Chapter 4, 5, and 6 present the results. Chapter 4 describes the contemporary adaptation strategies and practices of the smallholder households in the study area. First, more information is provided on the characteristics of the various livelihood activities carried out in the study area. Next, the household adaptation strategies are determined and elucidated.

Chapter 5 deals with the role of trust in adaptive behaviour. In particular, it analyses the effects of personalised, generalised, and institutionalised trust on adaptation choices. Special attention is given to how the national policy reforms are interwoven with the endogenous institutional framework and how this results in different levels of trust and heterogeneous outcomes.

Chapter 6 examines the role of social networks in livelihood adaptation strategies that smallholders have developed in response to the neoliberal policy reforms. On the one hand, it analysis how neoliberal market changes have shaped the local social networks with constraining and enabling effects for households' adaptation capacity. On the other hand, it describes how – in turn – the outcomes of the neoliberal policy reforms are being (re)shaped by the responses of the people with feedback effects on the structural context.

Chapter 7 is the concluding chapter in which a general discussion of the research findings in the light of the research problem is presented. It places the findings in a broader perspective and sketches the implications for current debates on the linkages between market liberalisation and economic development, livelihoods, and social capital. Additionally, the chapter discusses policy implications and provides recommendations for further research.

2

Conceptual Framework

This chapter outlines the theoretical and conceptual framework fundamental to this study. In particular, it analyses the appropriateness of the livelihood framework for explaining local adaptation processes within an international context. The actor-oriented approach is positioned as the ontological point of departure and used as a lens to look at the interdependence and mutual causation between household actions and wider societal structures by examining what actors actually do to make a living within complex economic situations. The different concepts and their interconnection are visualised in a conceptual framework presented at the end of the chapter.

2.1 Introduction

The economic argument for market liberalisation and more free trade is based on the assumption that international liberalisation of markets enhances the free movement of goods, increases specialisation in the production of those goods in which a country has a 'comparative advantage'[9], and boosts output and incomes with benefits to all consumers (Kanji and Barrientos, 2002). However, little attention is paid to analysing the economic and social adjustment required to switch towards the production of these more profitable products. Limited knowledge is available about how adaptation takes place at household level and about the factors that determine why some groups of actors are better able to benefit from the newly created opportunities while others remain poor. Therefore, it is necessary to go beyond the aggregate level and focus on smallholders' room for manoeuvre and their decision-making, taking into account the characteristics of the local context in which they operate.

Smallholders' adaptation to global change is a dynamic process of constant longer-term shifts in household strategies in response to actual or anticipated impacts of contextual change (Smit and Wandel, 2006). These strategies can enhance existing security and wealth or reduce vulnerability (Davies and Hossain, 2007). Adaptation can be reactive, concurrent, or participatory, spontaneous, or planned (Pelling and High, 2005; Carr, 2008) in response to changing conditions, stress, hazard, risk, or opportunities in the environment (Smit and Wandel, 2006). While there is much literature on adaptation, this mainly focuses on responses to climate change (e.g. O'Brien and Leichenko, 2000; Adger, 2003; Pelling and High, 2005; Smit and Wandel, 2006). Few studies analyse the role of markets in household adaptation capacity (Bussolo and Lecomte, 1999; Ellis, 2000; Dorward *et al.*, 2003; Hellin *et al.*, 2007). To address this lacuna, this study reviews the concept of adaptation in the context of global market changes. Due to increasing global market integration, smallholders throughout the developing world become exposed to short-term market fluctuations and long-term economic change (Preibisch *et al.*, 2002; Eakin *et al.*, 2006:9; Getz, 2008). Such economic trends and shocks are altering the conditions for the production and marketing of agricultural products, and smallholders are forced to adapt in order to maintain a living (Leichenko and O'Brien, 2002).

To analyse the adaptation process of smallholders to economic changes I use a livelihood approach, since it goes beyond the aggregated figures and provides a framework for investigating how policy changes alter the opportunities and constraints of smallholder livelihoods in terms of household adaptation capacity. The social-economic environment is important because it determines people's access to resources, thereby affecting the options and the capacity to adapt. In this study, I explore the interfaces between individual adaptation and the social context by analysing the livelihood activities while acknowledging and recognising the a priori existence and effect of social structures. From

[9] According to the law of comparative advantage, two countries (or other kinds of parties, such as individuals or firms) can both gain from trade if, in the absence of trade, they have different relative costs for producing the same goods. Even if one country is more efficient in the production of all goods (absolute advantage), it can still gain by trading with a less-efficient country, as long as they have different relative efficiencies (Blanchard, 2000).

this point of view, the concept of adaptation gives rise to the question of how action relates to and interacts with structure. Therefore, in the next section, I position this problem in the context of the debate about structure and agency in economic development. Subsequently, Section 2.3 discusses the elements and dynamics of the livelihood framework. Section 2.4 explains the gender perspective that is applied in this study and, finally, Section 2.5 presents an illustration of the conceptual framework that underlies this research.

2.2 Actor-oriented approach

The actor-oriented approach intends to bridge the gap and to seek a way out of the theoretical discord between macro-level structural theories and voluntaristic models of micro-level interaction and decision-making (Long, 1992a; Booth, 1993; Arce and Long, 1994). Actor-oriented theories attempt to bring together agency and historical-structural perspectives and address the challenge of relating local processes to larger (macro)scale social structures (Long, 1984). In particular, actor-oriented research is concerned with how different individuals and social groups interact and develop strategies for dealing with social change and how different social actors become involved in negotiations over resources, meanings, and control, while attempting to create room for manoeuvre to pursue their own projects. At the same time, actor-oriented studies focus on how, in turn, individual choices and practices are influenced and shaped by other dimensions of social life and interaction (Long, 1992b, 2001). Because of the focus on the interface between actors and structure, the actor-oriented approach is considered a valuable point of departure to explore the adaptation process of smallholders within the context of neoliberal policy reforms.

Aiming for a better understanding of social action and practice from the point of view of the actors involved, actor-oriented research is open-ended, taking as its point of departure real life situations and everyday social practice, or the actors' lifeworlds. The concept of 'human agency' is an important element of the actor-oriented approach and forms the pivot around which discussions aimed at reconciling notions of structure and actor revolve (Long and Van der Ploeg, 1994). In this study, human agency is defined according the definition of Emirbayer and Mische (1994:963) as "a temporally embedded process of social engagement, informed by the past (in its habitual aspect), but also oriented towards the future (as a capacity to imagine alternative possibilities) and towards the present (as a capacity to contextualise past habits and future projects within the contingencies of the moment)." From this angle, actors' strategic and adaptive behaviour is also bounded, not only by structural constraints imposed by geography or demography, but also by its embeddedness in past experiences and cultural meanings. This is what Bourdieu (1990) calls 'habitus', the sum of the 'cultural understandings' of the environment, the cultural means people employ to counter insecurities of every sort (De Bruijn *et al.*, 2005). Hence, actors decide both strategically to attain a pre-set goal as well as act on the basis of a wide range of (cultural) experiences. Therefore, agency concerns "events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently" (Giddens, 1984:9). A valuable contribution to this perception is the definition by Long (2001:16, 112) who refers to the ways in which "actors acquire and sustain appropriate forms of

'knowledgeability' and 'capability' in carrying out their social action" as well as "how they enrol others in the projects they develop" within the limits of information, uncertainty, and other constraints (e.g. physical, normative, or political-economic). Their knowledgeability and capability enables actors to solve problems, learn how to intervene in the flow of social events around them, and monitor their own actions by observing the reactions of others to their behaviour. Following Long (2001), in this study adaptive behaviour is considered socially constructed.

Although the focus is on actors, the actor-oriented approach acknowledges that certain important structural changes may result from the impact of outside forces like the market or the state. Hence, the concept of agency does not deny that actors live under conditions that place certain constraints on their choices and strategies. While meanings, values, and interpretations are socio-culturally constructed, their application may vary considerably according to the circumstances and available cultural repertoires (Long, 2001). Moreover, actors internalise similar social conditions differently and develop diverse strategies to adapt and cope. As a result, social life comprises a wide diversity of social arrangements and cultural repertoires, even under seemingly homogenous circumstances. These differences are, in part, created by the social actors themselves. By deploying strategic behaviour, actors create and reshape the institutional environment and through this the physical and social environment, which in turn define the possible social and natural resources of the locality[10] that can be perceived and used. According to Long and Van der Ploeg (1994:64), "all forms of external intervention necessarily enter the existing life-worlds of the individuals and social groups, and in this way are mediated and transformed by these same actors and local structures." Large scale and 'remote' social forces do alter the life and behaviour of individuals by shaping, directly or indirectly, the everyday life-experiences and perceptions of the social actors concerned (Long, 2001). In the same vein, 'structure' is characterised as an "extremely fluid set of emergent properties, which, on the one hand, result from the interlocking and/or distantiation of various actors' projects, while on the other hand, it functions as an important point of reference for the further elaboration, negotiation and confrontation of actors' projects" (Long and Van der Ploeg, 1994:81). This means that not only the international, national, or local structures affect the actions of the smallholders but that also their adaptation choices and strategies affect the local structure and, therefore, opportunities in the future. In this study it is assumed that processes of adaptive behaviour are, on the one hand, constrained by the structural properties of the local system, and on the other hand, these social structures are the subject of transformation by this interaction as "actors reproduce and transform the systems" (Giddens, 1984:171).

This study uses an actor-oriented approach to explore the adaptation of smallholder farmers to a changing environment. Smallholders and their families are considered to have agency and participate in a wider agricultural structure defined by capitalist rules and relations of production. Within these structures, important changes have occurred related to the neoliberal reforms implemented by the Mexican government. However, not only these wider economic developments determine the particular characteristics of the local

[10] The term 'locality' refers not to a geographical notion but to a "specific social space, i.e. the context in which social action acquires and reinforces its specificity" (Van der Ploeg, 1992:38).

agricultural practices, but also the local socio-historical context on the basis of which actors attribute local meanings and derive strategies. Hence, the adaptation process is taking place in diverse ways depending on how the local geographical, economic, political, social, and cultural factors, which are interrelated, affect each other, and influence in particular adaptation strategies. Although the actor-oriented approach provides valuable insights in the engagement of economic activities within a wider structural context, it does not provide a theory of intentionality and strategic agency of its own. For this reason, this study links it to the livelihood framework. A livelihood approach allows for a more detailed understanding of resource allocation to pursue particular livelihood strategies within a context of (economic) shocks and trends and acknowledges the mediating effect of wider structures, in particular that of social relations, organisations, and institutions.

2.3 Livelihood framework

The livelihood framework is used to analyse how neoliberal policies are articulated in day-to-day activities and social interaction. In line with the actor-oriented approach, the livelihood concept is built on people-centeredness, concentrating on how people act and take initiatives, rather than how they respond passively to imposed change. At the same time, this focus on people does not discount the importance of structures. In this study, it is recognised that livelihoods are generated in the on-going interactions of individuals and the structures in which they find themselves and which they reproduce.

2.3.1 Definition and elements

'Livelihood' is a popular topic in development studies as it seems to offer a more detailed picture of the complexities of survival in low-income countries than terms formerly considered adequate like 'subsistence', 'income' and 'employment' (Ellis, 2000). The Oxford dictionary (2011) defines 'livelihood' as "a means of securing the necessities of life." Accordingly, the concept does direct attention to the way in which a living is obtained, not just the net result in terms of income received or consumption attained (Ellis, 2000). From this perspective, it is therefore quite conceivable that people with a low monetary income are considered to be better off than people with a higher monetary income (De Haan, 2000a).

Chambers (1989:7) defined livelihoods as "adequate stocks and flows of food and cash to meet basic needs", drawing attention to the multidimensional and dynamic nature of poverty and laying the foundations for a debate about the interpretation of the 'livelihood' concept. Critics argue that this definition fails to pay attention to the way in which these adequate stocks and flows of cash come about (Niehof, 2004). A more detailed and much cited[11] definition of livelihood is formulated by Chambers and Conway (1991:5-6) and reads: "A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living[12]." Hoon *et al.* (1997:2) extended this

[11] Several researchers who made use of this definition are amongst others; Hoon *et al*. (1997); Scoones (1998); Farrington *et al.* (1999); De Haan (2000a); Ali (2005).

[12] This definition is based on the definition stated by the World Commission on Environment and Development in 1987.

definition by conceptualising livelihood as simultaneously, "the means, activities, entitlements, and assets by which people make a living", defining assets, not only as natural (i.e. land, water, common-property resources, flora, fauna) but also as social (i.e. community, family, social networks, knowledge, skills) and physical (i.e. roads, markets, health facilities, schools, bridges). The amplification of Ellis (2000) on earlier definitions of livelihood is the most appropriate within the scope of this study. Ellis emphasises the notion of access to resources and recognises the importance of social relations, organisations, and institutions that influence an individual or household capacity to achieve its consumption requirements. Ellis (2000:10) defined livelihood as "the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by an individual or household." Livelihood thus defined is one of the key concepts that guided the research.

This definition, however, is rather static and does not specify the interconnection between the different livelihood components, which mutually influence each other. By considering livelihoods as dynamic systems it is possible to understand the interrelations between the physical natural environment, the social-economic environment and the internal environment of the household (Niehof and Price, 2001). Following Hoon *et al.* (1997:2), a livelihood system is defined as: "an aggregate yet dynamic environment of human activities that integrates both the opportunities and assets available to men and women as means for achieving their goals and aspiration as well as interactions with and exposure to a range of beneficial or harmful ecological, social, economic and political perturbations that change their capacity to make a living." Following this line of thought, the household can be seen as the locus of the livelihood system (Niehof, 2004). The assets are the *inputs* of this system and are a means to generate a livelihood and to meet the basic needs of the household members. The activities and strategies that process, use, and manage these inputs are referred to as *throughputs* or transformation. In the long run, the level of household livelihood security or wellbeing can be seen as the *output* of the system (Niehof, 2004). Hence, food and cash are not just there, but brought about through the process of livelihood generation which comprises the activities, assets, and resources needed to carry out these activities (Niehof and Price, 2001).

Finally, it is important to emphasise the temporal dimension of livelihood generation. Activities vary seasonally and across the years, especially in relation to larger economic trends in the national economy and beyond. Access to resources and opportunities may change for individual households due to shifting norms and events in the social and institutional context surrounding their livelihoods (Ellis, 2000). Consequently, shifts in the structural environment of the livelihood systems may affect the extent of vulnerability households face.

2.3.2 The locus of livelihood systems

In this study, the household is taken as the central unit of analysis because there are solid reasons for considering it as the locus of livelihood generating activities (Gonzáles de la Rocha, 1994; Niehof, 2004). Households can be seen as "the basic unit of human social organisation" within the arena of everyday life (Niehof and Price, 2001:19). Accordingly, households are the units within which social and economic activities are undertaken by its

members to provide people's basic needs. Household members combine their capabilities, resources, and skills to undertake activities related to production, reproduction, and daily maintenance. These activities and decisions are embedded in larger encompassing processes going on within the household and within the societal context (Pennartz and Niehof, 1999). The interaction takes place because individuals have their productive and reproductive function as part of the household, and, at the same time, participate in other social systems such as the political and economic system. Societal structures enter households as household members participate in the society and fulfil different social roles in, for example, the labour market, school, neighbourhood, etcetera. Hence, households are a mediating agency between actors and structure (Giddens, 1984; Pennartz and Niehof, 1999). "Ideology, culture, habits, and practices enter family households, are transformed when passing through and exert a certain influence on the larger society in return" (Pennartz and Niehof, 1999:5). Due to these linkages, households can fulfil a mediating role between structural opportunities and constraints and the decisions and behaviour at individual level. The focus on the mediating role of households permits the study of differential responses to general structural conditions as well as the analysis of changes specific to subgroups of the population. Besides constituting an intermediate level of analysis, households are used world-wide as unit for collecting micro-level empirical data. This links to what Kabeer (1994:114) called the "facticity" of the household, indicating that "despite its shifting guises" the concept relates to an empirically relevant entity of "household relations in daily management of resource entitlements and as the routine context of people's lives." See Chapter 3 for a more detailed definition of household and how it is used as unit of analysis in this study.

2.3.3 Assets, resources, and capitals

Assets are the inputs for the livelihood generating activities and are crucial elements in livelihood strategies. Assets are the basis for production, consumption, and investment. They represent the household's stock of wealth and its capacity to maximise wellbeing, now and in the future. A lack of assets hinders the ability to design and implement effective livelihood strategies, eventually pushing households into the category of households with extremely vulnerable livelihoods (Moser, 1998).

In most livelihood literature, the term 'asset' is used interchangeably with 'resource' (Ellis, 2000). However, according to Niehof and Price (2001) the terms 'assets' and 'resources' are contextualised and assets can be converted into resources when they are no longer kept as stock but actively used to generate livelihood. For example, when kept for value, livestock is an asset. However, when used in production activities such as ploughing, it becomes a resource. Assets are also a form of saving or insurance; they may be sold or converted directly for consumption when the need arises (Karuhanga Beraho, 2008).

Resources can be seen as "immediate means for livelihood generation" (Niehof and Price, 2001:13). This definition links up with the notion of human agency as it assumes an active relationship between households, the material and other assets to which they have access, and the strategies that they use to deploy them within a given social and cultural context. For this reason, resources are not considered stable, fixed categories of assets, but rather as depending on the purposes for which people use them and the context in which they are used (White and Ellison, 2006). A distinction can be made between resources

according to the level at which they are accessible, owned, or used: the individual level or the collective level. Important resources at individual or household level are, for example, skills, income, labour, land, and space. Resources that are accessible at collective level are environmental resources, in the form of the physical and the institutional environment. Such environmental resources are only individually accessible through entitlements (Niehof, 2004).

Assets are potential resources. They are the material or immaterial skills or properties that people or households own, control, claim, or on other ways have access to, which become only a resource when they are used in livelihood generating activities (Niehof and Price, 2001). In this study, the definition of Swift (1989:11) is applied, who defines assets as "a wide range of tangible and intangible stores of value or claims to assistance." Examples of tangible assets are land, labour, capital, savings, while intangible assets are associated with social assets, proximity to markets and health and education facilities, and empowerment (i.e. location, infrastructure, and social, political, and institutional assets) (Siegel and Alwang, 1999). Moreover, intangible assets consist of 'claims' and 'access' to assets. Claims mean that people can call upon moral and practical assistance. Access has to do with having the right or getting the opportunity to use the resource, in practice based on, for example gender, age, or membership of a particular ethnic group (Blaike *et al.*, 1994; De Haan, 2000a).

Traditionally, most economic analyses have focused on productive and tangible assets and the ways these generate returns. Sociologists and anthropologists, by contrast, put more emphasis on intangible assets. However, there is growing consensus that both tangible and intangible assets, and their interplay, are important, especially in the context of risk management of vulnerable households. As pointed out by Narayan and Pritchett (1997:35), poverty analysis that focuses exclusively on tangible household assets misses a large part of the "poverty puzzle", by ignoring the community and social context. This study focuses on both tangible and intangible assets and how they are deployed in adaptation strategies. Furthermore, following Bebbington (1999), assets are not considered only as resources that people use to adapt, survive, or reduce poverty, they also give them the capability to act. Accordingly, I consider assets as the basis of an actor's power to act and to reproduce, challenge or change the rules that govern the control, use, and transformation of resources.

While there are different asset classifications, the most common is the one from Bourdieu (1985) who was one of the first authors to classify assets into capitals[13]. Following Bourdieu, most livelihood studies acknowledge five vital categories of assets, which actors can use strategically to achieve a sustainable livelihood: natural capital; physical capital; financial capital, human capital, and social capital (e.g. Chambers and Conway, 1991; Blaike *et al.*, 1994; Chambers, 1995; Moser, 1998; Scoones, 1998; Bebbington, 1999; De

[13] For Bourdieu "capital can present itself in three fundamental guises: as economic capital, which is immediately convertible into money and may be institutionalised in the form of property rights; as cultural capital, which is convertible, on certain conditions, into economic capital and may be institutionalised in the form of educational qualifications; and as social capital, made up of social obligations ('connection'), which is convertible, in certain conditions, into economic capital and may be institutionalised in the form of a title of nobility" (Bourdieu, 1985:243).

Haan, 2000a; Ellis, 2000; Hordijk, 2002). Although assets are usually classified according to these five categories, this also has its limitations. First and foremost, these categories are not mutually exclusive; some assets may belong to more than one category depending on the context. For example, livestock can be seen as physical capital and as financial capital depending on whether the asset is used as agricultural production means or as a form of saving. Second, the way in which the five capitals are categorised gives the impression that assets are one-dimensional. This leads to a failure to capture other dimensions associated with status and quality, location, or substitutability. Third, this categorisation fails to highlight the fact that people attach different meaning and importance to different assets at different points in time (Karuhanga Beraho, 2008). Despite these difficulties associated with defining and quantifying assets, it is still relevant to incorporate assets as basic building blocks as part of livelihood analysis (Ellis, 2000).

Natural capital

The assets provided by the natural environment are land, water, and biological assets, which can be converted into livelihood resources and form together the natural capital of households and communities (Ellis, 2000). Especially for farmer communities, natural capital is an important source of food security and livelihood generation. Nature as a resource provides material means for agricultural production, living space, and energy. From this perspective, nature is primarily conceived as a means of production, a good of consumption, and a pre-condition of human health (Van Koppen, 2000). However, the natural environment can also be a critical source of vulnerability for rural communities. In Veracruz, the majority of the smallholder households practice agriculture on poor soils located on slopes and rugged terrain less suitable for agriculture. In addition, climate conditions can be a risk to the household livelihood security and strategies to cope with them are essential. Seasonal fluctuations in food and water availability are another source of vulnerability for rural livelihood security (Van der Geest and Dietz, 2004). Hence, natural resource degradation can erode the assets and productivity of individual households (Chambers and Conway, 1991).

Physical capital

Physical capital includes physical and material assets that are created by economic production processes (Ellis, 2000). In other words, physical capital is human made. At community level, it includes infrastructure, such as irrigation canals, roads, electricity, water supplies, medical clinics and hospitals, and schools. At the household level, physical assets that can be converted into individual resources are livestock, basic production equipment and technologies (like machinery, equipment and tools), housing, and other personal or household property (Scoones, 1998; Ellis, 2000). Physical assets can be seen as productive goods, which can create a flow of output in the future (Ellis, 2000). Therefore, also durable consumer goods such as refrigerators or sewing machines and a house constitute physical capital that can be a means of generating income. In addition, the location (e.g. proximity or distance) of infrastructure is considered a critical asset, because it influences the availability and accessibility of goods and services (Siegel and Alwang, 1999). Finally, the infrastructure facilitates transportation and movement of people between places, creating income-earning opportunities at markets for farmers. In farmer communities, physical capital is closely related to the production of food, e.g. agricultural

equipment, household and other productive equipment, and livestock (Mtshali, 2002). Physical or material capital can be a substitute for natural capital, thereby taking the pressure off natural resources that are being depleted (Ellis, 2000). For example, water pipes can substitute open channels, with a reduction in loss from leakage and evaporation. For households, accumulation of physical assets is considered to be one of the primary strategies for dealing with deprivation and household livelihood insecurity (Narayan, 1999).

Financial capital

Financial capital comprises the stock of money to which the household has access, including cash, credit/debt, savings, and other economic assets (Chambers, 1989; Ellis, 2000). It is worth noting that neither savings nor loans are directly productive forms of capital. They owe their role in the asset portfolio of households to their liquidity and convertibility into other forms of capital or directly into consumption (Ellis, 2000). In societies where a financial market is absent, or where there is a distrust of financial institutions, savings are held in other forms than in cash accounts. In rural areas, livestock often plays an important role as a store of wealth and as a form of informal insurance. Livestock, however, is not a perfect means of reducing risk. Holdings are not fully liquid and ownership of livestock fulfils a number of non-insurance objectives. In addition, gold, jewellery, and food stocks are common alternative ways to store surplus (Ellis, 2000). For farmers financial capital is crucial to get access to new technologies and increase agricultural productivity.

Human capital

Human capital refers to the quality and quantity of labour available to the household. The assets that enable this labour are human capabilities and properties such as good health, skills, talent, knowledge, abilities and education of household members (Ellis, 1999, 2000). Human capital increases by investments in education and training of skills required to pursue one or more occupations and generate income. Labour, as a human asset is also made more effective by being free of illness or debilitating health problems (Ellis, 2000). Human capital is an important capital, as it is needed to make use of other types of capitals. It is under continuous flux as a result of internal household dynamics and external pressures. For example, to overcome declining income and deteriorating economic situations, households are likely to respond by mobilising additional labour, often in the form of women and children (Moser, 1998). Moreover, human capital can be increased by macro-level policies and programmes such as public education and health services (Udong, 2011).

The notion of human capital is closely related to what Sen (1997) calls ‘human capabilities’. He uses this concept to refer to the set of alternative ‘beings’ and ‘doings’ that a person can achieve with one’s economic, social, and personal characteristics. However, human capability is a more inclusive concept than human capital. Human capital can, by means of people’s agency, augment production possibilities. As such, it is normally defined in terms of an indirect value (e.g. being able to command a price in the market or bringing about economic change). Human capability, by contrast, focuses on the ability of people to live meaningful and worthwhile lives (e.g. being healthy and well nourished), and can thus be

defined as both a direct and indirect value. However, Ellis (2000) contests the use of the concept of human capabilities to describe human capital, since its meaning overlaps means and ends. Therefore, in this thesis the concept of human capital is used.

Social capital

Social capital can be described as embodied in the relations among persons such as social networks and groups to which people belong (Coleman, 1988; Ellis, 2000). Social capital is about the quality of social networks, social claims, social relationships, affiliations, and associations. The membership of social groups actually makes cooperation easier, which enhances economic efficiency beyond the level reached by the actors acting individually. In most definitions, social capital comprises three elements; social networks; norms of reciprocity or social support; and social trust (Coleman, 1988; Putnam, 1995; Portes, 1998; Ferlander, 2007). At macro level, social capital includes institutions such as the government and national farmer organisations, the rules of law, civil and political liberties, and etcetera. At micro and meso level, social capital comprises the networks and norms that govern interactions among individuals, households and communities. Such networks are often (but not necessarily) given structure through the creation of local associations or local institutions and networks of individuals and households.

Social capital can be mapped as having content (cognitive social capital) and structure (structural social capital). The content of social capital consists of cognitive features, embedded in people and resulting from mental processes. It may range from weak to strong and becomes manifest in trust, local ethics, traditions, morals, shared norms, attitudes, and beliefs (Uphoff, 2000). The structure is derived from the various forms of social organisation in which people are embedded, particularly roles, rules, precedents, procedures as well as a wide variety of networks that contribute to cooperation and collective action (Uphoff, 2000). The content and structure of social capital are intertwined and strengthen each other. Social networks have positive externalities for the group members through shared norms and trust, while at the same time shared trust, norms and values arise from informal forms of organisation based on social networks and associations (Durlauf and Fafchamps, 2004).

In the literature, there is no consensus about the question whether social capital is a form of capital (Uphoff, 2000; Grootaert and Van Bastelaer, 2002; Ferlander, 2007). For instance, Arrow (1999) noted that social capital and physical capital differ in the sense that investment in physical capital always involves foregoing current benefits for future gains and can be sold or transferred to others, while this does not necessarily hold for social capital. Moreover, unlike other forms of capital, social capital may improve in quality the more it is used (Bebbington, 1999). In addition, Ostrom (1999) argues that investments in physical capital are usually based on a conscious decision, while much of the creation of social organisations is unplanned and purposive only in a small way, with social capital as a by-product. However, this study considers social relations as a type of capital since it shares key attributes with other forms of capital (i.e. natural, physical, financial, and human capital). First, social capital is an asset, or an accumulated stock, since it yields flows of benefits (Uphoff, 2000). Although social capital is not available in cash, it is sometimes more influential than financial forms of capital, especially when a household is at risk (Ali, 2005). Second, like all forms of capital, social capital has a price; it requires an

investment – in terms of time, effort and money – that can be significant. Various empirical studies confirm that social capital requires investments to create a lasting asset that enhances output and leads to higher productivity of other resources, such as human and physical capital (Grootaert and Van Bastelaer, 2002; Nombo, 2007). In other words, social capital facilitates productive activity when combined with other forms of capital. In this study, social capital is considered an important intangible asset for livelihood generation and in Chapter 5 and Chapter 6 the role of, respectively, trust and farmer networks in livelihood adaptation is analysed.

2.3.4 Livelihood activities and strategies

Livelihood activities

Households use assets and entitlements to deploy livelihood activities, which comprise the most active part of the livelihood system. Livelihood activities[14] may be defined as the sets of actions through which household members gain their means of living (Ellis, 2000). Some livelihood activities contribute directly to the household income, such as farming, brewing, trading, crafts-making, and transportation, while other activities like childcare, maintaining social and kinship relations, and gift giving, do not directly yield income but are important for social reproduction, provide access to assets, and contribute to social status (Karuhanga Beraho, 2008).

Households divide the various productive and reproductive livelihood activities among their household members. However, the workload related to the production in the unpaid economy and domestic activities, which maintains or 'reproduces' (childbearing and rearing responsibilities) daily life, is mainly allocated to women. More extroverted and distant income-generating activities centred within the production sphere of the paid economy are often allocated to men[15] (Moser, 1993; Gonzáles de la Rocha, 1994; Østergaard, 1994; Benería and Sen, 1996; Ellis, 1998; Niehof, 1999).

The daily livelihood activities of the household members constitute a continuous process, a flow of actions within the context of on-going worldwide developments (Spaargaren *et*

[14] Little is known about the interrelations among livelihood activities. Zoomers (1999) suggests that there are three types of relationships within the range of livelihood activities. First, she distinguishes 'complementary activities', which are activities that facilitate other activities. Secondly, there are activities that replace other activities, which she labels 'substitution activities'. The third type of relationship among activities is named 'reciprocal exclusive'. This means the relationship of internal competition often due to a scarcity of assets. Temporary migration conflicts for example with more permanent jobs. It is interesting to see how macroeconomic changes affect the composition of the livelihood activities portfolio.

[15] Although in most cultures, the workload connected with reproduction and domestic activities is mainly allocated to women, there is a great variability in the allocation of specific tasks between the sexes and ages from one culture to another. Moreover, the division of labour is mutable. Within certain limits, evidence shows that as circumstances change, so may the division of labour. Women, for example, can take over the agricultural tasks of men who have migrated to the cities. It has been argued that women can take over men's tasks more readily than men can adopt those of women, but changes in task allocation occur in both directions (Rogers, 1990).

al., 1986:306). These activities, conducted, either routinely or strategically, are interrelated and affect each other, because they are all geared towards the objective of securing and enhancing livelihoods. Poor people depend for their survival and wellbeing on the pursuit of diverse and multiple activities, simultaneously executed by different household members (Chambers and Conway, 1991) and sometimes at different localities (Karuhanga Beraho, 2008). These activities together form what is called the 'livelihood portfolio', that according to Niehof (2004:323) comprises "the bundle of activities households engage in to generate livelihood and achieve a certain level of livelihood security."

Livelihood strategies

In contemporary livelihood studies, increased attention is paid to how people devise various strategies to access assets and to deploy the activities they engage in to make a living. The concept of livelihood strategy implies that livelihood activities are carried out in a strategic manner and are based on a long-term perspective (Anderson *et al.*, 1994). Contrary to the earlier trend to consider poor people as passive victims, the concept of livelihood strategy emphasises the active or even pro-active role played by households in providing for their own sustenance despite their lack of access to services and an adequate income (Long, 2001).

The use of the term household strategies has gained prominence. However, the use of the term 'strategy' in the context of household adaptation is contested. In the first place, because it infers that individuals in households behave in a rational strategic manner and that they are always in charge of their lives, which is not necessarily true (Crow, 1989; Morgan, 1989). According to Crow (1989:8) a household should not be seen as a 'familia economia' based on economic rationality as household strategies can be also developed in a "fortuitous and haphazard way." Moreover, household members do not act in isolation but in relation to others. As members of cultural and social groups, they interact, support, and need each other. Social identities can bind people together and motivate them to develop communal activities and household strategies. The efforts they make to avoid social disapproval, gossip, ridicule, embarrassment, and feeling of shame can result in activities that may seem irrational from an economic perspective (Granovetter, 1985; Ellis, 2000).

In the second place, some authors argue that poor households have no strategies because of lack of options (Gonzáles de la Rocha, 1994). Without alternatives, there is no choice nor can there be decisions, and therefore the term 'strategy' is not appropriate (Selby *et al.*, 1990). The concept of strategy implies a 'veneer of free choice' which is not always present (Wood, 1981). Consequently, according to Wood (1981), the term 'strategy' is useless as a tool for analysing household livelihood generation in a poverty context. Finally, the term has received much criticism from (gender) studies that have shown that households cannot be considered homogeneous units with members having similar interests. Crow (1989), for example, argues that the use of the term 'strategy' within household studies is mistaken as household strategies might be the outcome of processes of conflict. These conflicts can arise since households are made up of individuals whose priorities and interests may, but not necessarily do, coincide.

Additionally, power relations within households to a certain degree determine the strategies and therefore household strategies are less rational than the term suggests. This raises the question of agency and rationality. According to Laslett (1989:369), households are best regarded as "knots of individual interests." He rejects the dominance of household over individual interests. Considering households as more than an agglomeration of individuals, but something other than homogeneous entities, Pahl and Wallace argue that there is no single household rationality, but rather a "mixture of rationalities" (Pahl and Wallace, 1985:380).

Despite the controversy around the term 'strategy', for several reasons in this study the notion of 'livelihood strategy' is used. First, because it generates insight into how people consciously make a living. It helps to understand which resources are important to which groups and how those resources are combined and used to obtain a living. Moreover, analysing livelihood strategies enables us to gain an understanding of the ways in which people attempt to plan and structure, in a coherent way, their lives in a changing world with a relative long-term perspective (Anderson *et al.*, 1994; Gonzáles de la Rocha, 1994). Furthermore, analysing household strategies steers a course between the 'oversocialised' conception of the individual criticised by Granovetter (1985) and the idea of the calculating and resource-optimising *homo economicus* which is assumed by many economic models (Wallace, 2002). Consequently, livelihood strategies can only be understood by taking account of, and examining, the locally specific contexts in which they are enacted. This study examines the interrelations between the processes that operate at various scales or levels and impinge on livelihoods. In this way, livelihood strategies allow for a better way of understanding the interaction between structure and agency (Morgan, 1989).

This study uses the term 'livelihood strategy'[16] to analyse household adaptation. In general, livelihood strategies can be defined as "composed of activities that generate the means of household survival" (Ellis, 2000:40). Zoomers' (1999:18) equivalent of this definition fits best to the focus of this study and is used as general point of departure. Her definition focuses explicitly on the way households handle opportunities and limitations, and comprises in more specific terms "the way families respond to change, resulting in the reallocation of land, labour and capital resources to achieve their livelihood goals, such as productive activities, providing for basic needs, reproductive choices, etcetera." Zoomers relates livelihood strategies directly to the changing external context (e.g. agro-ecological situation, market access, infrastructure, and the presence of development institutions), the allocation, and availability of resources at the household level (labour capacity, land, and capital) and the family's set of goals and priorities. The nature, scope, and effectiveness of livelihood strategies depend on a variety of factors including exogenous risks and uncertainties that people have to deal with, the availability of resources at household level, the type and status of these resources, household characteristics, people's capability to create or access them, and the set of goals and priorities defined by the household (Sen, 1984; Moser, 1998; Bebbington, 1999; Zoomers, 1999). Changes

[16] There is a large body of literature dealing with many closely related terms to describe the strategic economical behaviour of households, such as 'family survival strategies', 'development style', 'survival strategies', 'existence strategies', 'reproductive strategies', 'life project', 'subsistence strategies', and 'livelihood strategies' (Schmink, 1984; Druijven, 1990).

related to processes of market liberalisation, by altering these factors, (re)shape the structural contexts, and this may have consequences for people's responses and their ability to reduce the risk in the longer-term and the capability to generate household wellbeing (Leichenko and O'Brien, 2002).

2.3.5 Livelihood outcomes

The livelihood strategies that actors adopt result in individual and household livelihood outcomes. In general, people pursue a range of livelihood outcomes such as food security, income security, good health, wellbeing, high status, or reduced vulnerability. The level of satisfaction with these outcomes is subjective and differs between people and households. The quality of the livelihood outcomes can be characterised by their degree of sustainability, or at the other end of the continuum, vulnerability. Sustainability refers to the positive livelihood outcomes for households. Chambers (1989:6) describes sustainability[17] in the context of livelihood as the ability to preserve and improve livelihoods while maintaining or enhancing the assets and capabilities on which livelihoods depend. In accordance, Chambers and Conway (1991:36-37) have defined sustainable livelihoods as livelihoods that "can cope with and recover from stress and shocks, maintain or enhance capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global level and in the short and long term."[18] Security is an important dimension of sustainable livelihoods. Households are considered to be secure when they have secure ownership of, and access to, assets, resources, and income generating activities, including reserves to offset risks, ease shocks, and meet contingencies (Chambers, 1989). Achieving livelihood security implies that households have adequate access to income and resources to provide for their members' needs in a sustainable way, including adequate access to food, drinking water, health facilities, education opportunities, housing, and time for community participation and social integration (Frankenberger and McCaston, 1998; Farrington *et al.*, 1999).

By this definition of sustainability, households can also be rated as unsustainable or vulnerable. Vulnerable households are unable to cope with the uncertainties and shocks in the environment (Niehof, 2004). Accordingly, the most vulnerable households find themselves forced to adopt strategies that just enable them to survive but not to improve their welfare, and can be said to have unsustainable livelihoods (Challe *et al.*, 2011). Households use the available assets and resources to develop livelihood strategies to increase livelihood security and reduce vulnerability. Consequently, there exist a strong relationship between the available assets and the degree of household vulnerability.

[17] Chambers and Conway (1991) make a distinction between environmental and social sustainability. Environmental sustainability concerns the external impact of livelihoods on other livelihoods, while social sustainability is related to the internal capacity to withstand outside pressures.

[18] According to De Haan (2000a:50) this definition primarily emphasises "not undermining the natural resource base" while neglecting the socio-economic aspects. De Haan (2000a:13) considers a livelihood sustainable if "it is adequate for the satisfaction of self defined basic needs and proof against shocks and stresses. If livelihood is sustainable, it is synonymous with social inclusion; if not it equates with social exclusion."

Those households with better access to information, cash, rights to means of production, tools and equipment, and the social networks to mobilise resources from outside the household, are less vulnerable to trends and shocks (Blaike *et al.*, 1994). Therefore, poverty is associated with low asset bases and low asset productivity (Siegel and Alwang, 1999). Moser (1998) confirms this view with her study on the relation between the management of complex asset portfolios and the vulnerability of households. She concludes that the degree of vulnerability of households is related to asset ownership. Moser ascertains that the more assets people have the less vulnerable they are and the greater the erosion of people's assets, the greater their insecurity (Moser, 1998).

Access to assets

Household livelihood outcomes are shaped by households' ability to use and access assets within a specific time-space situation. According to Blaike *et al.* (1994), within the livelihood framework, 'access' involves the ability of individual, family, group, class, or community to use assets in practice. Access to those assets is always based on social and economic relations, usually including the social relations of production, gender, ethnicity, status, and age. Access to resources is a prerequisite for the ability to use them and is secured through norms, rights, and entitlements (e.g. property rights, rights accruing to women in marriage, and other rights sanctioned by law or custom) (Bebbington, 1999). Hence, access to assets is both shaped by the internal characteristics of households and its individual household members as well as by the rules and processes in the wider structural context in which household livelihood generation takes place (Chambers, 1989).

Internal factors: household characteristics

Household characteristics determine household's livelihood outcomes by the way people live, the assets and resources they share, and the nature of support networks, labour potential, and productivity as indicated by household size and composition. Households change over time throughout their life-course with consequences for their access to assets and the activities they can engage in. Individual characteristics influencing the access profile of a household are, amongst others, age, sex, health, status, and skills. Gender is an important factor affecting all societies by channelling access to social and economic assets away from women and towards men (Blaike *et al.*, 1994; Ali, 2005), having consequences for the means necessary to meet the household and gender needs[19]. Intra-household food distribution is, for example, often biased in favour of men, whether young or old (Young, 1994). These entitlements are fundamental for the availability and accessibility of assets that enable household members to implement various livelihood activities. Access to all the assets that every household and every household member possesses at a point in time can be called an 'access profile' (De Haan, 2000a). It is a crucial factor in the generation of livelihood security (Blaike *et al.*, 1994). According to Chambers and Conway (1991), the

[19] According to Moser (1987), a distinction between practical and strategic gender needs has to be made. Practical gender needs are those needs corresponding to the concrete conditions of women's positioning, by virtue of their gender, within the sexual division of labour. Hereby the needs are formulated by women themselves in response to the living conditions the face in daily life. Strategic gender needs, on the contrary, are those needs assisting women in achieving greater equality to overcome women's subordination.

access profile can itself be considered an intangible asset of individuals and households. The study of Moser (1998) confirms this idea and demonstrates that internal life-course factors affect the structure and composition of households and determine the households' ability to respond to external changes. She argues that within households, asymmetries in rights and obligations based on gender and age translate into differences in the ability to cope with economic difficulties.

External factors

Households function in a larger environment. Access to assets and the translation of assets into livelihood strategies to realise certain livelihood outcomes, are shaped by a multitude of socio-economic, political, cultural, and environmental factors. Within the livelihood framework these so-called 'mediating processes and changes', shape the availability and accessibility of assets and resources. They are categorised into conditions and trends ('vulnerability context') on the one hand, and policies, institutions, and processes ('transforming processes'), on the other (cf. Hoon *et al.*, 1997; Scoones, 1998; Carney, 1999). The former category consists of events that can be divided analytically into trends (such as climate changes, demographic changes, migration, technological changes, price fluctuation, and national and international economic trends) and shocks. Trends are phenomena that are typically predictable, continuous, or cyclical, while shocks are impacts that are unpredictable, and often traumatic. It is important to realise that the vulnerability context directly influences the availability of assets and resources and therefore affects the asset base and the options open to people to pursue a specific livelihood strategy. By contrast, the policies, institutions, and processes affect the accessibility of assets and resources for households (Ellis, 2000).

'Policies' include local, national, and international level policies and influence household decision-making and their access to and control of livelihood assets. For example, conservation policies to protect the environment may limit people's access to natural assets where they traditionally depend on. For the conceptualisation of 'institutions'[20], authors generally use the definition of North (1990:3): "the formal rules, conventions, and informal codes of behaviour, that comprise constraints on human interaction (e.g. laws, property rights, marriage, churches, and markets)." Institutions influence access to assets as well as the composition of livelihood portfolios. Institutions can be both formal and informal. Formal institutions refer to the role of the state, for instance in formulating and enforcing laws, regulating markets, or extracting taxes (Ostrom, 1999). Informal institutions include customary practices related to marriage, inheritance, and ownership, access to, and control over assets and resources. Both formal and informal institutions are dynamic, are subject to a process of continual negotiation, and change according to context and power relations. According to Ellis (2000), informal institutions expressed in social relations are considered a key element of the mediating context as they influence the social positioning of individuals and households within society comprising, gender, caste, class, age, ethnicity, and religion. The 'processes' refer explicitly to processes of

[20] Hence, organisations are distinguished from institutions and are groups of individuals bound by the purpose of achieving certain objectives, such as government agencies, NGO's, associations and private companies (Ellis, 2000:38, quoting North, 1990:3-6).

change in policies and institutions, such as law, land tenure arrangements, foreign investment and aid, and culture and rituals, which determine the mode of interaction between structures and individuals.

Diverse policies, institutions, and processes, often working in combination, shape people's access to assets, terms of exchange between different types of resources, as well as the returns to any given livelihood strategy. Consequently, while policies, institutions, and processes can offer opportunities that actors can draw upon to enhance livelihood security, they may also constrain the livelihood activities and choices of actors. Government investments in transport and communication infrastructures can, for instance, influence the availability of information, access to markets, and costs and results of investment (Karuhanga Beraho, 2008). In turn, the choices people make and act upon affect these policies, institutions and processes, as they are the result of historical processes in which people can potentially participate. Rules and social norms are likely to change over time, leading to the demise, alteration, or development of new institutions. So, policies, institutions, and processes are continuously shaped and reshaped by actors' behaviour and accordingly, contain the macro-micro linkages between the state, private sector, civil society, and individuals.

Time and location

Finally, it is important to mention that access to assets changes over time and is unequally distributed geographically and among people. Assets required for people's livelihood, are rarely spread evenly in geographic space. In most situations, the spatial inequality of access to assets is a reflection of economic and social inequalities (Blaike *et al.*, 1994). Access to assets, therefore, has a spatial dimension. The processes and changes taking place within these various structural dimensions are dynamic in nature and operate at global, regional, or local level and can take the form of sudden stresses[21] and shocks, long-term trends, or seasonal cycles and determine the availability of assets and resources in a particular area (Moser, 1998; Ellis, 2000; Van der Geest and Dietz, 2004). Capabilities, assets, and activities are not equally distributed regionally, with the result that the ability of people to cope with (global) challenges is also determined by geographical factors (De Haan and Zoomers, 2003). The same livelihood strategies may have different outcomes in one place than in another according to the particular characteristics of each situation.

An analysis of livelihood systems must also include a time dimension as the different components of the local environment change over time. Assets, on which livelihood activities are based, are continuously in a state of change through use and ageing. Human capital, for example, increases over time since people's experience and knowledge accrue with age (Jelín, 1990; Niehof and Price, 2001; Karuhanga Beraho, 2008). Moreover, the time dimension is also inherent to all livelihood activities, strategies, decision-making, and use and management of resources as internal household dynamics change over time (Niehof, 2004). Livelihood strategies and the livelihood portfolio develop over a certain period as they relate to the phases of the household life-course (Ali, 2005).

[21] Stresses are pressures, which are typically continuous and cumulative, predictable, and affect the household. Examples are declining labour work availability, declining real wages, declining common property resources, and seasonal shortages (Chambers and Conway, 1991).

Effects livelihood outcomes at community level

Summarising from the above, livelihood strategies that actors adopt result in individual and household livelihood outcomes. These outcomes are shaped by external and internal factors that affect households' ability to use and access assets within a specific time-space situation. However, in aggregate, these individual or household livelihood outcomes lead to intended and unintended effects at community level. Collective and individual level responses affect household outcomes and these outcomes feed back to local conditions, institutions, and pathways. Therefore, the feedback mechanisms between individual livelihood strategies and the structural context need to be considered (Brons *et al.*, 2007). Consequently, livelihood outcomes are not the end of a course of action but rather part of a dynamic process, whereby livelihood outputs affect positively or negatively the resource base of the livelihood system. In the words of Niehof (2004:325), "livelihood generation proceeds in a cyclical mode, which may take the form of either an upward or a downward spiral." While these feedback loops from individual decision-making to community level outcomes are an undeveloped topic in livelihood studies, in this study they are a major focus.

2.4 Gender

Gender refers to the qualitative character of women's and men's position in society and is an important aspect of the structural context in which livelihood activities are embedded (Giddens, 1984). Gender encloses the psychological, social, and cultural differences between males and females. It is socially constructed and dynamic, whereas sex is biological and static (Giddens, 1993). Therefore, gender identities cannot be considered static and must be analysed in a broader social-economical context.

The notion of gender identities, and related gender roles, is fundamental in the context of household livelihood generation. Firstly, the different gender roles have an effect on the division of labour between men and women within the household. Consequently, men and women have different responsibilities in the process of livelihood generation. The tasks related to the different gender roles influence the livelihood activities and strategies undertaken by the different household members. Secondly, gender is a factor in the ability to access income-earning opportunities (Niehof, 2004). Men and women have different access and entitlements to assets and resources with implications for the household livelihood security. Finally, gender roles influence the intra-household decision-making process on livelihood strategies and budget management. In other words, gender identities constrain and enable the possibilities of the household since men and women have different roles in (re)production, household strategies, and the allocation of resources (Ellis, 2000). Hence, gender should be an integral and inseparable part of rural livelihood analysis.

A gender analysis involves the systematic gathering and examination of information on gender differences and social relations in order to identify and understand inequalities based on gender. It includes the investigation of the socially defined roles, responsibilities, and relations between men and women in a given society. In doing so, the heterogeneous nature of men's and women's responsibilities and experiences, and differences in their interests and needs are revealed (Karuhanga Beraho, 2008). Therefore, a gender

perspective imparts a multidimensional perspective on livelihood because it takes into account the multiple roles played by men and women in the household, the labour market and society, as well as factors that interrelate with gender, such as age and ethnic group (Clert, 1998 cited in ECLAC, 2004). A gender perspective means that various questions are analysed and elucidated from the perspective of both women and men. A central dimension of the gender perspective is the question of the distribution of power between women and men. Drawing attention to the gender-based distribution of power and influence in society is thus one of the most important aspects of the gender perspective.

2.5 Study framework

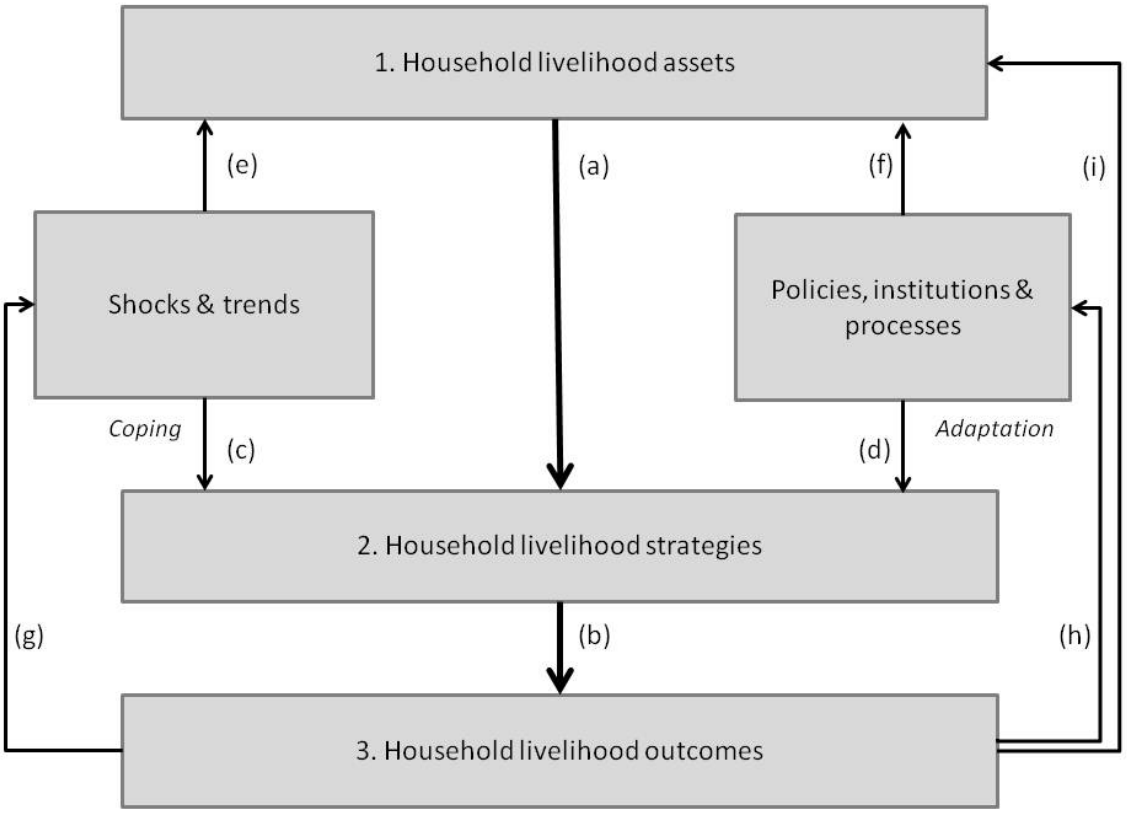
The approach of this study is centred on households and their livelihoods. The household is seen as the locus to which the livelihood system is anchored (Niehof and Price, 2001). Households have agency, as far as household members together develop collective strategies for which they jointly use resources (cf. Pennartz and Niehof, 1999; Wallace, 2002; Niehof, 2004).

Figure 2.1 represents the overall conceptual framework used in this study. At the heart of the framework (box 2) is our study object: a household's livelihood strategy. The capacity and ability of a household to adapt and pursue different strategies or combinations of activities is conditioned by its possession of or access to (natural, human, physical, financial and social) assets[22] (box 1 and arrow (a)) (Scoones, 1998; Bebbington, 1999; Farrington *et al.*, 1999; Ellis, 2000; DFID, 2001). Activity choice may be influenced by exogenous factors in the vulnerability context such as trends and shocks or mediating processes caused by policies, institutions, and processes (arrows (c) and (d)). Contextual factors can also affect the availability and accessibility of livelihood assets (arrows (e) and (f)). This study assumes that poor people will actively respond to contextual changes as they are not passive in the face of the challenges of surviving and thriving (Reardon *et al.*, 1992; Dercon and Krishnan, 1996; Ellis, 1998; Long, 2001; Ellis and Allison, 2004; Jansen *et al.*, 2006a; Jansen *et al.*, 2006b). A specific combination of activities chosen by a household generates livelihood outcomes such as food, cash income, and sustainable natural resource management (box 3 and arrow (b)). At aggregated level, the resulting livelihood outcomes in turn can affect the vulnerability context (arrow (g)), the mediating policies, institutions, and processes (arrow (h)), or capital items (arrow (i)). For example, in case many households invest their gained income in more intensive agricultural production techniques at community level this will lead to erosion and depletion of the natural resource base which might cause floods. Therefore, the assets themselves are endogenously influenced by outcome effects. Though the framework provides a conceptual depiction of the dynamics and endogenous interdependence, given data limitations, the empirical analysis for this study only examines the role of a household's asset holding (or access) in its livelihood strategy choice at a certain point in time.

[22] Some authors pay special attention to household demographics and treat it separately in modelling activity choice. Here, household demographics are included in the broadly-defined concept of 'human capital'.

This conceptual framework underlies all empirical chapters. Chapter 4 focuses on the household adaptation process (arrow (a)) in responses to the neoliberal policy reforms and the changing conditions at the maize market (arrow (c) and arrow (d)). In addition, the outcome of the adaptations strategy in terms of wellbeing is analysed (arrow (b)). Special attention is put on the enabling and constraining role of social capital (box 1) on the livelihood strategy choice (box 2 and arrow (a)). The role of both the cognitive as well as the structural aspects of social capital is analysed in respectively Chapter 5 and Chapter 6. Chapter 5 describes the effects of trust on adaptation choices, while Chapter 6 analyses the effects of farmer group formation on the adaptation capacity of households. Furthermore, in both chapters I not only describe what the outcomes are (box 3) but also study the constraining and enabling effect of the local context of policies, institutions, and organisation (arrow (d) and (f)). Finally, I have analysed potential feedback mechanisms (arrow (h) and (i)) of the certain livelihood choices and outcomes on the wider structural context.

Figure 2.1 Conceptual framework



Source: Adapted from Babulo *et al.* (2008).

3

Research Design and Setting

In this chapter the research approach used in this study and the different data collection methods employed to answer the research questions are presented. It describes the rationale behind the research design, the unit of analysis, and the qualitative and quantitative methods used in data collection. In addition, important methodological issues of data analysis, the challenges of measuring change, and ethical considerations are discussed. The chapter ends with a description of the selected research location.

3.1 The household as unit of analysis

3.1.1 Household definition

In this study, the household is taken as the unit of analysis because it is seen as the locus of livelihood systems where resources are generated, organised, managed, and used for economic activities as well as for the wellbeing and care of household members (Niehof and Price, 2001; Niehof, 2004). Moreover, in the rural context, the household is regarded as the most important institution in which people live. It is the "basic unit of production and consumption" (Wood, 1981:339) where individuals both cooperate and compete for resources (Sen, 1990).

In the literature there is confusion about the overlap between the concept 'household' and that of 'family' (Young, 1994). They are often seen as interchangeable, while they are not (Wilk and Netting, 1989; Jelín, 1990; Gonzáles de la Rocha, 1994; Pennartz and Niehof, 1999; Mtshali, 2002; Ali, 2005). In general, households are considered as task-oriented residential units while families are defined by the kinship links between their members that need not be localised (Carter, 1989; Netting *et al.*, 1989). However, criteria of location, function, and kinship do frequently coincide (Netting *et al.*, 1989). In addition, there are complexities concerning the universal application of the definition of household (Guyer and Peters, 1987). As Russell (1993:779) phrased it "what household members share and for how long varies from culture to culture, from class to class, from place to place, from time to time."

In this study, I use the frequently quoted (e.g. Balatibat, 1994; Mula, 1999; Niehof and Price, 2001; Mtshali, 2002; Niehof, 2004; Ali, 2005) definition of Rudie (1995:228) who sees a household as "a co-residential unit, usually family-based, which takes care of resource management and primary needs of its members." This definition is adopted since it links up with the livelihood framework as it emphasises the relevance of joint management of resources to meet the primary needs of the individual household members. Households use resources in livelihood activities mainly to fulfil primary and daily needs of the household members such as food, shelter, clothing, health, and security (Frankenberger and McCaston, 1998). Because households are social groups that are part of social processes (Gonzáles de la Rocha, 1994) in this study, households are regarded as embedded in the wider social, economical, political, and cultural environment. Following Pennartz and Niehof (1999), I consider households as active agents who mediate between individuals and their cultural and social environment, as household members who are involved in divergent social processes within the household and within the societal context. Rudie's definition also has its limitations. The criterion of co-residence, for example, does in this study not necessarily imply living under one roof, but at least part of the household resources and daily activities must be shared between the household members (Niehof, 2004). This implies that migrants can be considered as being part of households if they contribute to the household resources through remittances used to access food, labour, and other needs, despite not always participating in daily activities (Rogers, 1990; Niehof, 2004).

The operational definition of household used in this study refers to a family-based unit that include individuals who share food and livelihood resources and strategies, and who live in it for at least six months per year. In the study area, hardly any household receives significant remittances and permanently migrated household members are excluded from this definition.

Smallholders

The focus of this study is on 'farming households'. A farming household is a particular type of household where agricultural and domestic production and consumption merge (Niehof, 1999). The agricultural produce is (partly) consumed by the household and the farming system is an integral part of the household and livelihood system (Niehof, 1997). Domestic tasks, social commitments, and non-farm earning activities are integrated into the household system, competing with and contributing to agricultural activities. Farming households operate in a myriad of biophysical, socio-cultural, and economic environments (Dixon *et al.*, 1994). An appreciation of this heterogeneity, complexity, and inter-dependence is necessary to understand the responses of households to changes in their environment. The term 'farming household' applies to all households for whom the main economic activity is agriculture but does not differentiate between types of farmers. Throughout this study, the term 'smallholder' is used since this study focuses primarily on intermediate and subsistence producers. Following Netting, a smallholder is "a rural household which practices intensive, permanent, diversified agriculture on relatively small farms in areas of dense population" (Netting, 1993:2). Smallholders produce for their own consumption and the market, or are partially involved in small industry or off-farm work (Netting, 1993). This definition is applied as it fits well with the profile of the farming households in the study area.

3.1.2 Household composition and resource management

Households are neither homogeneous nor static entities. Their composition changes over time due to internal and external factors. Internal factors that might affect the household composition include birth, death, marriage, marital conflicts (such as separation, divorce, or abandonment), and the need for childcare and care for the elderly. Gonzáles de la Rocha (1994) refers to these internal factors as the family 'life-cycle'. The term 'life-cycle' has been used in reference to the succession of events or critical stages through which a family or household passes over several decades (Glick, 1977). A household passes through different stages because children are born, become adults, marry a partner and form their own household. All these events influence the composition of the household (Dallos, 1995). This concept however has been widely criticised. Wilkes (1995) argues that it does not include non-family households (single people of the opposite sex who are not married) and non-traditional households (never married or single parents). In addition, Pennartz and Niehof (1999) argue that the concept presupposes an unwritten blue-print of the temporal patterning of the life of an individual, the sequence and duration of the various stages of their lives, and the transitions from one stage to another, and therefore has an inherent normative bias. Following Deacon and Firebaugh (1988), I consider the household life-cycle a flow rather than a precise linear set of stages. Because of this I use the concept of 'life-course' acknowledging that changes within a household over the years,

such as adding or losing family members, result in changes in household boundaries (Deacon and Firebaugh, 1988). As a concept, a life-course is defined as "a sequence of socially defined events and roles that the individual enacts over time" (Giele and Elder, 1998:22). These events and roles do not necessarily proceed in a given sequence, but rather constitute the sum of the person's actual experience. Thus, the concept of life-course implies age-differentiated social phenomena that can follow different pathways, unlike uniform life-cycle stages.

In addition to internal factors, the household composition can also change due to external factors such as housing problems, loss of income, education and health care opportunities, and security. The household composition might change for economic reasons. Sometimes members, who want to stay, are edged out by the other members. While others, who want to leave may be pressed to remain if there is a shortage of labour in the household.

In several respects, the household composition determines the way in which households manage[23] and deploy their resources and pool their income (Guyer and Peters, 1987). First, it affects the specific household needs and priorities. The decisions related to resource management are based on the opportunities, constraints, priorities, and capabilities of the different household members. Second, the availability and accessibility of resources and assets are influenced by the household composition because access to assets differs between household members. Moreover, the individual income generating activities must be understood in relation to the social position that people have within the household: the position (as head, spouse, son, daughter, etc.) within the household involves specific behaviour, rights, duties, and responsibilities that consequently determine the way in which the income generating activities take place (Ypeij, 1995).

The household composition is reflected in the household dependency ratio, which is based age, notably on the proportions of members aged younger than 15, those between 15 and 64, and those 65 and older. The young and the old are classified as dependants. It is equal to: [(N<15+N≥65)/(N15-64)]x100. In this study, the household dependency ratio is considered a variable that influences the livelihood adaptation strategies.

3.1.3 Intra-household power relations and decision-making

Household decision-making processes, which underlie the allocation of resources, are inextricably tied to internal authority and power relations (Crow, 1989). Neo-classical models and New Home Economists have studied household decision making. Their 'Rational Choice Approach' is currently a popular model for studying these processes. It assumes that a single 'joint utility function' can adequately represent the dynamics of household decision making. This suggests that household behaviour is motivated by a collective concern for economic efficiency in which labour is allocated according to the principle of comparative advantage, income is pooled, and preferences for consumption

[23] 'Managing resources' means making decisions about the use of resources and finding out what resources are needed by the household, where they might come from, and how they can be put into use. Management requires that household members see available assets as a potential resource that can be used to meet the household needs (Mtshali, 2002).

are shared. Consequently, resources are pooled and allocated to maximise the utility of the household and to meet aggregated needs of the members. Following Chiappori *et al*. (1993) this is called the 'unitary model' because of the assumption of the households as one actor. From this perspective, households are considered single entities without taking into account the different priorities, interests, and strategies of the individual household members (Bennett, 1990; Gonzáles de la Rocha, 1994; Clarke, 2002). This assumption has been widely contested (Kabeer, 1991).

Critics replaced the single, bounded unit by a range of household forms: "shifting, flexible structures in which boundaries are difficult to discern [...] a diversity of family and household composition and social relations, mediated through marriage and kinship, creating a variety of conjugal and residential arrangements" (Kabeer, 1991:5). Households differ in composition according to sex and age of their members. Men and women have separate, culturally defined obligations to meet different sets of needs within and beyond the household (Bennett, 1990). Moreover, they have different control over resources, perform different activities, contribute differently to the household economy, and are likely to engage in different social networks (Boserup, 1970). The different ideas of men and women about the allocation of resources might create conflicts between household members (Bruce and Dwyer, 1988; Chant, 1991; Young, 1994; Moser, 1996). For that reason, Sen (1990:129) suggested that the household is best represented as a case of 'cooperative conflict', referring to the two problems that household members simultaneously face: cooperation, including adding to total availability, and conflict, dividing the total availabilities among the members of the household. When spouses have different goals and strategies, there are a number of potential solutions, which Sen labels 'collusive agreements'. The solution adopted is the result of the bargaining ability of the actors involved (Crow, 1989). Within households, power and authority include the right to resources and the control over household production and reproduction (Mula, 1999).

In my view, households are not homogeneous units in which all members share a common set of preferences but are differentiated units composed of multiple actors with varying and often conflicting preferences and interests. Household decisions on how to apply resources emerge through negotiation, disagreement, conflict, and bargaining (Netting *et al.*, 1989). I prefer this model of internal household dynamics to the neo-classical unitary model because it recognises the existence of more than one decision-maker within the household and the potential for conflicting objectives and strategies. In this study, households are considered as a central unit of consumption and production, without assuming that it always maximises joint utility. Accordingly, in this study both women and men were included in in-depth interviews, case studies, and life-histories, so that the collected data on resource allocation, livelihood strategies, and livelihood objectives reflect both male and female perspectives.

3.2 The challenges of measuring change

Analysing the effects of changes in government policy at household level links up with the debate on impact assessment of government programmes. National governments and development organisations struggle with the question how to measure whether and how their programmes have changed the lives of participants. The issue is the systematic

analysis of "the lasting or significant changes – positive or negative, intended or not – in people's lives brought about by a given action or series of actions" (Roche, 2000:546).

There are several challenges when performing impact assessment. Most important for this study is the problem of missing data. The problem is that data is missing about the difference between the status of the target group with and without the implementation of the reforms (Ravallion, 1999, 2007). Therefore, an impact assessment must estimate the counterfactual, that is, what would have happened if the intervention never had taken place or what otherwise would have been true. To determine the counterfactual, it is necessary to net out the effects of the interventions from other actors – a complex task. This can be accomplished through the use of comparison or control groups[24], whose who do not received benefits or are not affected by policy reforms, which are subsequently compared to the treatment group, individuals who do receive the intervention. However, due to the national character of the neoliberal policy reforms in Mexico, it was not possible to compose a control group or a comparison group.

Related to the above, there is also the problem of attribution of specific effects (i.e. impacts) to specific causes (i.e. interventions) (Hulme, 2000). It is relatively easy to identify change but difficult to attribute changes to the intervention. The assumption that input = output = impact ignores the holistic nature of people's lives and the effects of specific time and place related factors on the final effect of an intervention. Outcomes are in practice not linear as presented in project log frames, but occur in the midst of many factors and are influenced by social actors (White, 2005).

In order to overcome these challenges, I developed a multidisciplinary research design. Moreover, it has to be noted that this study does not focus on the impact of macro-economic policy reforms on livelihood indicators per se but aims at identifying the changes in livelihood patterns, and adaptation processes at household level, in response to the policy reforms. This study analyses the adaptation to neoliberal reforms implemented at the beginning of the 1990s through analysing contemporary livelihood strategies at household level. Adaptation is a long-term and continuous process that takes 10 – 20 years to unfold before significant outcomes and trends can be observed (Blanchard, 2000). For this reason, I consider contemporary livelihood strategies a reliable indicator of the outcomes of the adaptation processes that have taken place. In addition, I used retrospective questions to compensate for the lack of a quantitative baseline study. These methods have allowed me to analyse the livelihood strategies during the period preceding the implementation of most significant policy reforms. Using key informant interviews, focus group discussions, and life-histories, I have gathered detailed information on the livelihood strategies and activities carried out in the recent past. These qualitative tools were valuable to see change following interventions as occurring in an open system, and interacting with other systems, individuals, and local contexts. A literature review of the study area provided additional information on recent trends and day-to-day life in the past.

[24] Control groups are selected randomly from the same population as the treatment group, whereas a comparison group is more simply the group that does not receive the intervention under investigation.

3.3 Data collection methods and tools

3.3.1 Qualitative and quantitative methods

This study is based on a combination of data collection methods. Primary empirical data were collected during a fieldwork period in Mexico, using a combination of qualitative and quantitative methods. Each method served a different but complementary purpose within the research design. Neither quantitative surveys nor qualitative methods on their own provide a complete approach the investigation of livelihood diversity (Scrimshaw, 1990; Moser, 1996; Ellis, 2000).

Quantitative research assumes a reality existing independent of the observer and aims at producing generalisations about causal relations between variables (Scrimshaw, 1990; Ellis, 2000). A household survey was conducted to determine the quantitative livelihood characteristics. In addition, I used qualitative research methods to give meaning to the quantitative findings. This has provided additional (sometimes more sensitive) information about different subjects. According to Denzin and Lincoln (1994:2), qualitative research "is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter", implying that people do not construct meaning in a vacuum but study subjects in their social-cultural environment in which daily life takes place. Accordingly, in this study qualitative methods are used to interpret phenomena in terms of the meanings people attach to them.

The incorporation of both methodologies in the study design enhanced the validity[25] and reliability[26] of the data collected (Scrimshaw, 1990; Marshall and Rossman, 1999). In general, qualitative methods are acknowledged to enhance validity, while quantitative methods are considered to be better in terms of reliability or replicability (Pelto and Pelto, 1978; Scrimshaw, 1990). Therefore, the implementation of different methods is considered worthwhile because the methods mutually supplement each other. This is called 'triangulation', referring to a research strategy whereby the same information is collected by using different methods (Giddens, 1984; Frankfort-Nachmias and Nachmias, 1996). When the findings by different methods are consistent, their validity increases (Janesick, 1994). Implementing the process of triangulation therefore contributes to a more complete and realistic view of the complicated reality of social systems in transition. This approach concurs with the holistic nature of livelihood systems and enabled me to remain open to new information and add categories in the data-collection process throughout the research.

[25] 'Validity' concerns the appropriateness of the research methods, the quality, and the accuracy of the data (Frankfort-Nachmias and Nachmias, 1996:165). Hence, validity is related to the question of whether scientific observations are measuring what they claim to measure.

[26] 'Reliability' indicates the scientific trustworthiness of the data, its repeatability (Scrimshaw, 1990). Consequently, reliability refers to the extent to which a measuring instrument contains variable errors, that is, errors that appear inconstantly with observations measured by the same instrument (Frankfort-Nachmias and Nachmias, 1996).

3.3.2 Secondary data collection

Prior to the fieldwork period in Mexico, I examined available secondary data on the topics related to the research questions. I analysed data on the performance of the Mexican maize sector during the last few decades, maize import and export figures, statistics measuring livelihood indicators at regional and national level, data on wages and prices in the maize market and related sectors, migration figures, history of land usage in the region, and the linkages between NAFTA and the local maize market via enterprises, distribution channels, and government transfers. I consulted various secondary data sources such as archives, government reports, national and regional surveys, district and village farmer authorities, local libraries, statistical institutions, national and international organisations and research centres, and I re-analysed primary data collected by others. The results are used to analyse trends and changes, providing me with a better understanding of the context in which the adaptation process of smallholders takes place.

3.3.3 Primary data collection

The empirical data used in this study were collected during three field visits that together lasted 12 months between March 2007 and May 2010. The first visit to Mexico was made in 2007 (March – August). During this trip, I selected the research area and held the first in-depth interviews. The main aim was to establish contact with relevant individuals and institutions and to develop an impression of life in rural Veracruz by participant observation. Based on the results, the household survey was designed. During the second fieldwork period (May – August 2008), the survey was conducted among 200 smallholder households. I used its outcomes as input for further qualitative data collection. During the last trip to the study area (February – May 2010), the main objective was to gain insight in the local social structure, interpersonal relations, and the position of farmer groups within the local maize sector. To collect data on these more personal and sensitive topics I mainly used qualitative data collection methods. A more detailed description of methods used in the fieldwork is given below. For the time schedule and methodological design, see Appendices IV and V.

Participant observation

Participant observation is one of the main tools used throughout this study. This method allows researchers to become a participant in the social group under study (Babbie, 1998). The researcher can hear, see, and begin to experience reality in the way the participants do (Scrimshaw, 1990; Frankfort-Nachmias and Nachmias, 1996; Marshall and Rossman, 1999). The method includes a blend of techniques that involves social interaction in the field with the subjects of the study, direct observation of relevant events, formal and a great deal of informal interviewing, systematic counting, and collection of documents and artefacts (Frankfort-Nachmias and Nachmias, 1996).

The period of participant observation allowed me to immerse myself in the day-to-day livelihood activities of smallholders in the study area. It provided me with a good opportunity to get a detailed and realistic insight in actual situations and everyday community life. As a member of a host family, participation in different aspects of daily life and traditional events was possible and provided a good understanding of inter- and intra-

household relationships and networks, gender roles, power relations, resource allocation, division of labour, and livelihood strategy choices. These issues either have a personal and sensitive character or the activities occur unconsciously and routinely, which make them difficult to deal with in a household survey. A long-term stay in the study area gave me a realistic insight in the local livelihood systems since people cannot easily hide information for a long period. I used this method to collect data on what people actually do, which is valuable since people do not always act as they say they do.

The qualitative research methods used allow for an analysis that distinguishes an 'emic' and 'etic' view in the study of human behaviour. According to Pike (1967), the distinction between the two is that etic descriptions or analyses are "alien" in view, with criteria external to the system. "Emic descriptions provide an internal view, with criteria chosen from within the system. They represent to us the view of one familiar with the system and who knows how to function within it himself" (Pike, 1967:38). Throughout the different research methods, attention was paid to both the emic and etic point of view. The emic and etic interpretations are combined as they complement each other. In this study, the interfaces between my 'etic' view and the local 'emic' views are considered crucial to confirm the findings needed to understand conditions and interrelations, and the opportunities and constraints in people's responses to the neoliberal policy reforms.

I conducted many informal interviews and conversations. Informal interviews use open-ended questions on specific topics in a flexible way, to allow other issues to come up. Informal conversations with one individual or a group of individuals provided information in addition to data gathered in a more formal way. Both techniques were carried out anytime and anywhere – on horseback, in a *camioneta* (pick-up car serving as public means of transportation), by a cooking fire, during ritual events, in a shop, while walking through the community, and so on. Such casual interactions were essential, for it was often in these conversations that people more freely shared their opinions and experiences. By just listening to conversations, information was gained about subjects that people find important in life and the issues that preoccupy their minds. I spent a lot of time on compounds, maize fields, and the local markets to observe the different activities related to livelihood generation and the production and marketing of maize. I recorded the information in field notes.

Household survey

The household survey gathered answers of many respondents to identical questions about past behaviour, experiences, or characteristics. The method allowed for measuring many variables, testing multiple hypotheses, and understanding the time sequence of events (Neuman, 1991). It was used to make descriptive assertions about the study community. "This method is not concerned with 'why' the distribution exists but merely with 'what' that distribution is" (Babbie, 1998:51-52). The survey provided a more general insight into the livelihood situation of households in the study area. The exploratory phase of the fieldwork period was used for fine-tuning the questionnaire and to determine the sample size and composition. Subsequently, data collected in the survey were the starting point for the in-depth interviews, case studies, and focus group discussions.

The household survey comprised 848 persons from 200 households, representing about 28 per cent of the total research population. For the sample I divided the village proportionally into four neighbourhoods, from which I randomly selected 50 individual households. All respondents of the household survey were identified as household head by him/herself or by other household members. In the community, the household head always represents the household in the local community and at important social occasions. Other household members were usually not willing to participate in the survey and referred me to the household head.

The (face-to-face) interviews took place at the homes of the respondents. Four research assistants were recruited from the village. They were selected based on personality, level of education, and social skills. A friendly personality was deemed important for enlisting the cooperation of the respondents. Because they enjoyed the confidence of the community members, people were willing to participate in the survey. The assistants conducted the interviews in Popoluca but recorded the answers in Spanish. The questionnaire existed of both closed and open-ended questions and consisted of seven sections: general information household head; household characteristics and composition; livelihood assets and resources; income generating activities; perception on poverty and wellbeing; maize production; farmer group participation, and social capital (see Appendix V).

Interviews with key informants

Valuable information was gathered through a series of 30 intensive (partly repetitive) interviews with key informants. These interviews were based on a list of topics (see Appendix VI) rather than pre-formulated questions. The respondents were community members who were particularly knowledgeable on certain issues related to the research problem of this study (for example, government officials, informal leaders, local authorities, farmer group leaders, and local governmental staff in the area such as health officers and teachers). The advantage of in-depth interviews is that they elicit perceptions, motivations, and feelings (Marshall and Rossman, 1999). Moreover, since the setting of the interviews was informal and took place in a friendly atmosphere, confidential information could be gathered more easily. I used the interviews to get a better understanding of the community context by paying attention to the social, cultural, economic, and historical factors. The interview setting was such that it was possible to adjust *ad hoc* to new topics that seemed to be relevant to the purpose of the study. In addition to the notes taken during the interviews, many conversations were recorded on tape and analysed at a later stage.

Although these in-depth interviews were a good method to gain understanding about community matters, it was difficult to assess whether the opinions of the respondents were representative of a wider group. In order to gather a more comprehensive insight of the different issues discussed in the in-depth interviews, the information was cross-checked by group discussions.

Focus Group Discussions

Focus group discussions are a useful research method to collect data through group interaction. This method assumes that an individual's attitude and beliefs do not form in a vacuum. People often need to listen to others' opinions and understandings in order to form their own (Marshall and Rossman, 1999). The group discussions were conducted several times with different individuals.

During my first fieldwork period, I discovered that organising group discussions was difficult, as people in the study area have limited interpersonal interactions with non-family members. For this reason, many smallholders were not willing to participate. Moreover, women were often prohibited by their husbands to join a group discussion. During my second visit, people trusted me more as I had demonstrated that I kept my promise by coming back after a few months. As a consequence, during my second fieldwork period, people involved me in their family and community activities. People were also more willing to participate in focus group discussions and even women participated. For this reason, all group discussions took place during my second and third visit. For each discussion (five in total), the groups consisted of five to eight persons. The people who participated in the discussions were members of different households. I invited the participants of the focus groups to the restaurant run by my host family so that the discussion took place in a more or less neutral environment. Different topics were separately introduced and the only interruptions in the discussion were to ensure that all topics were discussed and that no one person dominated the discussion. The discussions lasted for approximately 90 minutes. Notes were taken during the discussion and all discussions were recorded on tape.

The most important topics of the focus group discussions related to changes and trends which have determined the social-historical characteristics of the local context. The participants in the group discussions were asked to compare the situation now with that of five to ten years ago[27]. The discussions covered several topics, notably trends and changes in the social and institutional context; intra-household dynamics; social capital and collective action; the importance of maize in daily life; and the performance and functioning of farmer groups (see Appendix VII).

Case study

The case study method was used to generate qualitative data to explore the dynamic and complex social relations and processes within and between smallholder households and to capture the processes of change at household level. A case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1984:23). In the case study method, the fundamental structural features of a social field are identified on the basis of a carefully

[27] I assume that the enacting of the NAFTA in 1992 and the privatisation of the *ejido* land in 1994 (see Chapter 1 and Appendix 1) brought about the most significant changes for the smallholder maize producers. It was assumed that the long-term effects of both trends were felt 15 – 20 years after their implementation. For that reason, I asked about changes in the last five to ten years.

studied sequence of social events involving the same interacting actors. An advantage of case study analysis is that it discloses the discrepancy between people's beliefs and professed acceptance of certain norms on the one hand and their actual behaviour on the other (Van Velsen, 1967).

Applied in this study, the method provided a holistic and in-depth perspective of daily life in a socio-economical context and gave valuable insights into variables that could not have been uncovered by a household survey or by single in-depth interviews. The case studies included a combination of in-depth interviews, observations, and life-history interviews. Since the unit of analysis is a critical factor in case studies, the selection of households was based on the results of the household survey. Ten adult members of smallholder households (men and women) were asked to participate in the case studies. I managed to build up a relationship of trust with the respondents that allowed me to ask questions about more sensitive matters. To gather all the data needed for a comprehensive picture of their day-to-day life in the context of economic change, I visited the households concerned several times. Appendix VIII presents the checklist used for the case studies.

Life-history

The life-history method was applied to gain the emic temporal perspective on issues related to this research. Life-histories focus on the subjective experiences of individuals (Neuman, 1991). They document the experiences of individuals, including their interpretation, understanding, and definitions of the world around them. The method facilitates the unravelling of ambiguities, contradictions, and the confusion that surrounds everyday life experiences (Marshall and Rossman, 1999). It concerns the totality of an individual's life as seen within the broader framework in which he or she lives, making it possible to understand the impact of external changes in a retrospective way. In this study, life-histories were used to gain insight into socio-economic changes over the last 20 years, to be able to relate market liberalisation processes to changes at both community and household level. Furthermore, the life-histories were useful for analysing trends in household composition as well as the use and management of household resources.

In this study, life-history interviews had an open character and people were free to speak about a relatively long period of time. The information gathered helped me to understand the livelihood situation before the liberalisation of the maize sector and the developments during the past twenty years. In total eight persons were interviewed. These were of both sexes, aged 30 to 70 years old, and all were members of smallholder households. When telling their stories, the only interruptions made were to ensure that all of the following issues were discussed; livelihood activities, gender roles, role of maize in society in last decades (land use, maize prices, migration), household decision-making, interpersonal relations, norms of reciprocity, and trust, community groups and networks, access to land now and before 1992, developments at the maize market, farmer group dynamics, and the role of local authorities.

3.4 Data analysis

Both quantitative and qualitative forms of data analysis methods involve inference and reaching a conclusion based on evidence. Quantitative data analysis is highly developed, it

builds on applied mathematics, and it makes use of a standardised set of data. Qualitative data analysis, by contrast, is less standardised and uses a wide variety in possible approaches. Another difference is that quantitative data analysis is not done before all data has been collected, whereas for qualitative research, data analysis starts earlier on in the research process and patterns are looked for while data collection is still on-going (Neuman, 1991).

In this study, the quantitative data resulting from the household survey was analysed by making use of the statistical program STATA (version 10.1). The qualitative data was analysed by hand. First, it was coded by an analytical categorisation of raw data into general themes. After that, I focused on causes and consequences, conditions and interactions, strategies and processes, and I looked for categories or concepts that clustered together. Finally, I determined which cases best illustrated selected themes.

3.5 Selection of research location

The research location was selected based on several criteria. First, in the community traditionally people should depend on agriculture for their livelihood and in particular on the production of maize. Second, relatively many households should have access to small plots appropriate for the cultivation of maize and other crops. Third, smallholders should be cultivating crops for their own consumption with a surplus for the market, thus participating in the local market. Fourth, at community level farmers are organised in farmer groups. Based on these conditions, I selected the community of Morelos in the municipality of Soteapan located in the South of the state Veracruz.

The state of Veracruz is one of the top six states in terms of maize production in Mexico. Together with Sinaloa, México, Jalisco, Chiapas, and Michoacán it accounts for 60 per cent of overall output in Mexico. In addition, Veracruz belongs to the states (together with Oaxaca, Chiapas, Hidalgo, and Guerrero) with the highest concentration of production units. Traditionally, in these states maize farmers operate on small plots of land, where rain-fed production predominates, yields are low and there is a strong incidence of poverty. Finally, I also selected Veracruz because of security reasons as this state was relatively little affected by the drugs war.

Once I selected Veracruz, staff of the International Maize and Wheat Improvement Center (CIMMYT) advised me to do the research in San Pedro de Soteapan located in the Sierra de Santa Marta mountain range. They had visited the area frequently for a field study and knew that in the Sierra de Santa Marta maize farming is an important livelihood activity. After a few weeks living in San Pedro de Soteapan, I decided to move on to Morelos, a neighbouring community, where there were not only subsistence maize producers but also more intermediate producers who actively participated at the local agricultural markets.

Because the study involved sensitive subjects like interpersonal relations and poverty, it was important for me to interact regularly and intensively with community members. Therefore, focussing the research on one community was a logical choice. As Silverman and Gulliver (1992:23) put it: “The intensive focus on the small scale allows a deep understanding of the phenomena being analyzed. [...] This permits the inclusion of ‘real

people' along with an exploration of the interdependencies of social-political patterning, economic conditions, and cultural belief." However, the scope of the study is not limited to one community as "the focus on a particular place allows anthropologists to expand in a wider area as they follow the relevant processes, networks, or constraints outward from the particular locality" (Silverman and Gulliver, 1992:23).

3.6 Ethical considerations

Field study is a matter of confidentiality, as personal relationships are essential for data collection. A staff member of CIMMYT, who was familiar with the region, introduced me to the field. He brought me into contact with a few key informants and arranged my first accommodation in San Pedro Soteapan. The positive reputation of CIMMYT in the study area resulted in a warm welcome and receptiveness to me and towards my study. A few weeks later, when I arrived in Morelos, I asked the *Agente Municipal* (comparable to community mayor) for permission to carry out my research. I involved her in the project by requesting for advice regarding accommodation and the selection of research assistants. The members of my host family in Morelos introduced me to other villagers. By living in the village and by participating in the village life, I could establish relationships based on mutual confidence and friendship. I emphasised that participation in the study was completely voluntary. Furthermore, I explained and guaranteed anonymity and confidentiality. To ensure anonymity of the respondents, the names used in this thesis are pseudonyms.

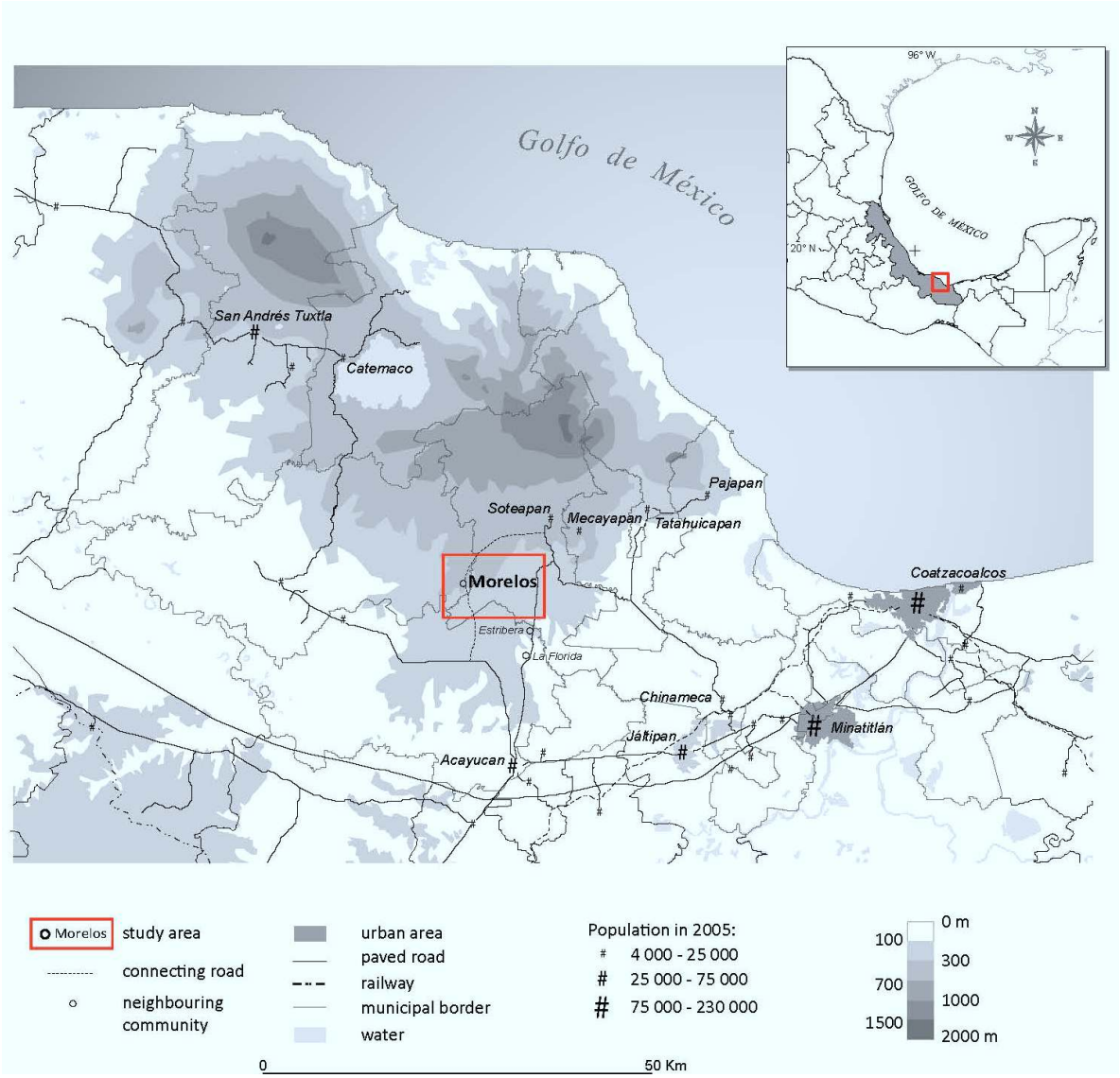
3.7 The setting: Morelos

> *We pass a road sign stating that we have arrived at "my community": Morelos. Impulsively, I knock on the roof of the camioneta and the car stops. Startled and still a little drowsy I look around, then I get off the camioneta and realise where I am. The sun still has to rise and the early-morning freshness sends cold shivers down my back. I stand in the main street of the village. The roads are unpaved, dusty, and full of potholes and large stones. The colour of the soil is red and car tracks and hoofs are printed in the mud. Women walk in brightly coloured skirts along the road, holding small children by their hands. In front of a house on a corner, a few men are sitting on a veranda. Loud music, which I recognise as 'música del rancho' (Mexican country music), is pumping out of an old ghetto blaster. People are staring at me, which makes me feel uncomfortable and hesitant about what to do next. I decide to walk up and down the main street to get an impression of the village. All side streets are at right angles to the main road and end up in farming land. The streets are at a light slope and lined by simple houses. Here and there, a car with trailer body is parked. I feel like an intruder in a small village where people are going about their daily business. I pass some older men sitting in front of their houses. I see young men gathering at the corner of the streets to go to the fields together, women buying ingredients for breakfast and small groups of teenagers walking to their school that is located just outside the village. A few farmers pass by on the back of their donkey or horse and disappear into the horizon (Field notes, 25 June 2007).*

3.7.1 Geographic location and regional context

In 2008, Morelos had 3.005 inhabitants, which makes it one of the largest communities in the municipality of Soteapan, situated in the south of the state of Veracruz (CONEVAL, 2008). The community is located 499 meters above sea level at the foothills of the volcano Santa Marta, which forms the most southern part of the Sierra de Santa Marta mountain range (see Figure 3.1).

Figure 3.1 Morelos situated within the municipality Soteapan



Source: Figure adopted from Kuhfuss (2007).

Sierra de Santa Marta is a remote mountain range sited on the gulf coast between 18° 15'N and 18° 30'N latitude. It belongs to the Tuxtlas region[28]. The Sierra encompasses

[28] The Tuxtla Reservation consists of about 155.122 hectares and encloses the municipalities of Santiago Tuxtla, San Andrés Tuxtlas, Soteapan, Mecayapan, Tatahuicapan de Juárez, and Pajapan. The region includes 93 communities and more than 58.000 inhabitants (Proyecto Sierra de Santa Marta, 2009).

some 1.200 square kilometres rising steeply from sea level at the Gulf of Mexico to more than 1.700 meters at its highest peak. Four municipalities (Pajapan, Soteapan, Tatahuicapan de Juárez, and Mecayapan) make up the north-eastern and southern slopes of the range, while two other municipalities (Catemaco and a small part of Hueyapan de Ocampo) comprise much of the western slope (Velázquez Hernández, 2001).

To the south and east of the Sierra de Santa Marta lie the cities of Coatzacoalcos, Minatitlán, and Jáltipan, which have a total population of about half a million people. These cities accommodate Mexico's most important petro-chemical complex. To the southwest lies the bustling cattle-ranching and commercial city of Acayucan, which has about 70.000 inhabitants (CONEVAL, 2005). This city is the main centre for the regional cattle industry and has an important influence on developments in the Sierra. The major part of the Tuxtlas region is situated to the west. This region is important to the state economy as a centre of tobacco production, cattle-ranching, and commercial maize.

The Sierra de Santa Marta is the most northern tropical rainforest of the continent (Leonti, 2004). The region is known for its biodiversity: 2.383 vegetal and 1.149 animal species, in addition to 15 different types of vegetation, are recorded in the area (Vazquez-Garcia, 2008:67). However, deforestation has brought 140 species of fauna (mainly birds, mammals, and reptiles) to the verge of extinction. Since 1980, the Sierra de Santa Marta has been protected by various government initiatives (it is currently part of the Los Tuxtlas Biosphere Reserve) but about 66.000 hectares of rainforest have already been lost. Deforestation has been attributed to the governmental policy of colonisation of the land and the expansion of cattle-breeding into rainforest areas (Vazquez-Garcia, 2008). The remaining areas can be divided into three zones, each characterised by a different ecosystem. The higher mountain area, where people collect fruits and go hunting; the lower areas that are suitable for the cultivation of, for instance, maize, beans, yucca, courgette, tomatoes, and pineapple; the lowland bordering on the sea and characterised by rivers and lakes where people live from fishing (Paré *et al.*, 1997; Velázquez Hernández, 2001). In the Sierra de Santa Marta, agriculture, cattle-breeding, coffee production, fishing, and the extraction of forest resources are the main economic activities of the population, which are negatively affected by deforestation and the depletion of natural resources.

In the Sierra de Santa Marta, the average annual temperature is 24°C but differences exist between the hillsides (average between 20°C and 22°C) and the valleys (average higher than 26°C) (Blanco Rosas, 2006:16). In Morelos, the climate is humid to sub-humid with an average annual temperature of 23°C (Gobierno Veracruz, 2007). The climate is characterised by a dry season, lasting from February/March through May. In general, rains begin in late May or in early June, increase in intensity in July and August, tone down somewhat in August, are intense in September and October, and continue in considerable strength until February. The annual rainfall is 1.182,7 mm, but during the driest months lower than 60 mm (Leonti, 2004; Gobierno Veracruz, 2007). Apart from the dry season, rainfall is abundant throughout the region and distributed in a bimodal pattern, which allows for a growing season of more than 270 days (Buckles and Erenstein, 1996). These climate conditions allow two maize production cycles per year. Throughout the Sierra, the main season (called '*temporal*') starts when the rainy season sets in since the seeds need lots of water to germinate. However, this season is also marked by hurricanes (mainly in August and September), which can destroy the maize harvest. A second cycle (called

'*tapachol*') lasts from October/November to February/March. In November and December the 'Nortes' (strong winds and rainstorms) bring down the temperature to as low as 5°C. Additionally, due to the dry period starting at the end of February, farmers are not able to use fertilisers and pesticides during the second maize cycle (see further Chapter 4), which affects their profits negatively.

3.7.2 Regional economic activities and livelihood opportunities

Morelos is part of the municipality of Soteapan, which consists of 34 communities. Fifteen of them have less than 70 inhabitants and only four communities have a population between 2.500 and 4.999 people (CONEVAL, 2005). The local government of the municipality is located in the village San Pedro Soteapan.

Agriculture is the most important economic activity and the main source of income in the municipality of Soteapan. Soteapan is traditionally a maize producing area and provides an important part of the total maize production of the state of Veracruz. Table 3.1 indicates that in 2005, Soteapan belonged to the top five municipalities of the total of 212 municipalities of Veracruz in terms of maize production (INEGI, 2005). In Soteapan, maize cultivation is rain-fed. Other important agricultural products in the region are pasture, black beans, sugar cane, coffee, pineapple, mango, and papaya.

Table 3.1 Main maize producing municipalities of the State Veracruz

	Planted (hectares)	Harvested (hectares)	Volume (metric tons)	Value (millions Pesos)
Total Veracruz	625.243,20	565.150,68	1.095.483,96	1.991.325,85
Las Choapas	25.600,00	25.194,50	29.483,00	58.002,80
Papantla	23.550,00	22.472,50	40.608,65	80.115,66
Chicontepec	23.500,00	19.622,08	24.728,41	61.821,03
San Andrés Tuxtla	23.500,00	22.527,20	52.510,72	88.057,15
Soteapan	17.079,00	12.752,00	35.080,80	51.841,16

Source: INEGI (2005:955-979).

Apart from farming, there is hardly any employment in Soteapan and people, in particular landless household heads, have to leave the village in order to find a job in another sector. Some young men travel to nearby rural villages (such as Los Tigres, La Isla, or Jáltipan) to work as a day labourer at plantations. Other men travel on a weekly basis to nearby cities (such as Acayucan, Coatzacoalcos, or Minatitlán) to work in the construction sector or at industrial plants. A few teenagers migrate for longer periods to the northern regions of Mexico to find a job in the agricultural sector, the tourism industry, or military services. Finally, several households have started a small enterprise at their compound and sell small groceries, soft drinks, or beers. As a result of the limited economic opportunities in Soteapan, some 75 per cent of the population lives in extreme poverty and below the

food-based poverty line[29], 82 per cent of the population live in moderate poverty[30], and about 93 per cent of the population live below the income poverty line[31] (CONEVAL, 2005). This makes Soteapan one of the most deprived regions in Veracruz (ranked number 18 of the total 212 on the list of poorest municipalities of the state) and among the most marginal in the nation (Buckles and Erenstein, 1996; CONEVAL, 2005). In 2005, Soteapan ranked 183 of a total 2455 municipalities in Mexico in terms of overall poverty indicators defined by CONEVAL[32]. In Table 3.2, various poverty indicators used by CONEVAL are presented to illustrate the welfare situation of the municipality.

Table 3.2 Poverty indicators (in percentages) at State, municipality, and community level, 2005

	Population of 15 years and older that is an-alphabetic	**Population 6-14 years that does not go to school**	**Population of age 15 ≥ with in-complete basic education**	**Population with no access to health services**	**House-holds with no access to electrical energy**	**House-holds with no access to sanitary facilities**
National	8.4	5.3	45.9	49.8	6.1	9.9
Soteapan	45.5	10.6	82.1	63.7	9.8	35.9
Morelos	49.2	10.5	86.3	88.3	8.9	11.2

Source: Statistical data from CONEVAL at national, regional and local level (CONEVAL, 2005).

3.7.3 The Popoluca: Ethno-history, language, and religion

Like other communities of Soteapan, Morelos is of origin Popoluca. The Popoluca are an indigenous[33] group of approximately 30.000 people living in the south-eastern part of

[29] Poverty Line 1 = US$51.60/capita/month that refers to the impossibility of obtaining a food basket needed for adequate nutrition, given the consumption patterns of Mexicans, using all available resources (World Bank, 2004:8; OECD, 2007:57).

[30] Poverty Line 2 = US$89.57/capita/month, which refers to the failure to reach the level of expenditure needed to obtain a reference food basket plus the expenditure needed for health, clothing, housing, transportation and education (World Bank, 2004:8; OECD, 2007:57).

[31] Poverty Line 3 = US$111.25/capita/month refers to the inability to obtain the value of the reference food basket plus an estimate of non-food expenditure considered as necessary in general (World Bank, 2004:8; OECD, 2007:57).

[32] National Council for Evaluation of the Politics on Social Development (CONEVAL) is a public organisation that is decentralised by the Ministry of Public Affairs which has the autonomy and technical capacity to generate objectively information on the status of social policies and poverty situation in the country.

[33] The population of Mexico can be divided into two main ethnic categories; the '*mestizo*' and '*indigena*', which distinction is defined broadly along cultural rather than racial lines. According to the International Labour Organization, indigenous people can be recognised on account of their descent from the populations who inhabited the country at the time of conquest or colonisation and who retain some or all of their own social, economic, cultural and political institutions (Flores-Crespo, 2007).

Veracruz (Vázquez García, 2001) who have inhabited the area since pre-Hispanic times (Foster, 1943). Apart from Popoluca communities, *mestizo*[34] communities of more recent origin are located at various points throughout the Sierra, although mainly on the northern slope where ranching activities dominate.

Originally, 'Popoluca' was a common term, not a tribal name. It was used by the pre-Conquest Nahuatl speakers (Nahuatl is the Aztec language) to refer to a number of distinct 'unfamiliar' groups or 'strangers' used in a deprecating sense, meaning as much as 'the ones who speak gibberish' and 'one who speaks an unintelligent tongue'. The Popoluca accepted this designation to describe their own culture, but referring to their indigenous language they speak of "Nuntaj¥yi[35]", which probably is their real name (Foster, 1943; Leonti, 2004).

Most of the inhabitants of Morelos speak both (Sierra) Popoluca[36] and Spanish apart from some old people who never learned Spanish. According to key informants, in most families, Popoluca is still the main language that people use to speak with each other. However, nowadays young couples are increasingly aware of the advantages of speaking Spanish. Respondents indicated that people who do not speak Spanish, are handicapped in their access to information; most economic transactions at the local market and all information provided by government agencies and credit institutions are in Spanish.

The Christian veneer which comes from long, though not particularly intense, contact with the Catholic Church, has to a considerable extent effaced aboriginal religious practices (Foster, 1942). Today, the village has four small churches and chapels (representing different Christian affiliations: Catholicism, Evangelism, Seventh-day Adventism, and Protestantism). During interviews and group conversations, most people indicated they were Catholic. However, the majority of these persons pointed out that they do not actively practice their religion in daily life. In Morelos, Catholic services are provided on an irregular basis. From Saturday to Tuesday, a priest from Mexico City organises services at various locations in the municipality of Soteapan. A few times a year, the priest spends several extra days in each community for baptising babies and organising services (first communion and marriage). To a considerable extent the introduction of the Catholic Church has eradicated traditional religious practices and celebrations. For example, key informants pointed out that today Christmas and Día de Guadalupe[37] (12th of December)

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[34] In contemporary usage, the word *mestizo* refers to anyone who has adopted Mexican Hispanic culture. This includes those with solely a European background, those with a mixed European-indigenous background, as well as indigenous people who have adopted the dominant Hispanic societal values (Flores-Crespo, 2007).

[35] Directly translated 'Nuntaj¥yi' means 'real-language' from 'nunta' (real) and 'j¥yi' (language or word) (Elson and Gutiérrez, 1999).

[36] In southern Veracruz, four Popoluca languages are distinguished: 'Texistepec', 'Oluta', 'Sayula', and 'Sierra' Popoluca (Foster, 1943). Speakers of the first three languages live in villages of the same name, while Sierra Popoluca, numerically the biggest group, is used in about 25 Communities scattered over the municipalities Soteapan and Hueyapan de Ocampo (Leonti, 2004).

[37] Diá de Guadalupe is one of the most important celebrations of Mexico and Catholics around the world. Virgin of Guadalupe is the most famous and celebrated of all saints and she is also known as 'Virgen Morena' and is the patron saint of Mexico. Supposedly, an Aztec Indian, San Juan Diego, on

are considered as the most important festivals for the community while '*el carnaval del tigre'* [38] is not celebrated anymore. Older respondents complained that traditional ceremonies and festivals related to the maize cycle die away as young generations do not attach importance to the cultural traditions and are influenced by modern developments. However, underlying the Christian veneer are traditional beliefs that have survived until now. These old traditions and beliefs are interwoven with Christian customs. For example, *curanderos* (witch doctors) are still frequently approached for help in case of prolonged illness[39]. However, they have adopted Christian prayers and beliefs. Another example of how old Popoluca traditions have merged with Catholic customs is the yearly '*La Misa de las Semillas'* (Mass of the Seeds). This mass is organised at the beginning of May (before sowing), to bless the maize seeds and soil and to pray for a good harvest. During this mass, a Catholic priest refers to the traditional maize god Homshuk. Hence, although most farmers in the research community are Christian, behind the altar continues the existence of the still honoured maize god Homshuk.

Cultural significance of maize

In the study area, both woman and man spend the greater part of their daily time with maize: women by washing and milling grains and making tortillas; men by growing maize. As maize is the main source of income, the maize cycle determines the timing of the big expenditures, investments, and savings. After harvesting, households are able to buy construction materials for their house or can invest in cattle. The main harvesting time in autumn also means that many social events are organised in December or January. This is, for instance, the time that most marriages take place and other celebrations are organised. Frequently, a girl is asked to marry in the summer, while the celebration is planned in January. This gives the future husband some time to save money to pay for the costs.

Popolucas perceive themselves as "*los hijos de Homshuk; los hijos del maíz*" (sons of Homshuk: sons of maize) (Blanco Rosas, 2006:64). According to the legend, *'el espíritu de Homshuk'* (the soul of Homshuk) resides in the smallest seeds. Furthermore, the myth tells how Homshuk was reborn out of an egg or seed, which was hatched out by two elder men. Out of this egg, a child with a beard of a golden maize cob was born. He became the god of maize and offered his body to the two men as food for survival (Blanco Rosas, 2006). Until today, smallholders who sow c*riollo* maize (indigenous maize race) for own consumption, save their smallest seeds for next year's production and consume only the bigger seeds as they believe that Homshuk is present in these small seeds. Throughout the municipality Soteapan, various important religious events are organised to worship Homshuk and to bless the land and celebrate a good harvest. But the popularity of these ceremonies and festivals is decreasing, and the young generation does not attach much

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the hill of Tepeyac now part of Mexico City, first encountered her in 1531, shortly after the conquest by the Spanish Conquistadors.

[38] Until 1959 the Popolucas celebrated every year 'carnaval del tigre' (carnival of the tiger) at the end of March after harvesting. However, this tradition ended because there were many festivals during the year and men were not devoted anymore to fast, continence, prayers, and other sacrifices (Blanco Rosas, 2006).

[39] Evidence of which was obtained by my presence at a healing session of a key informant.

importance to them. Nevertheless, these ceremonies are still important and make people gather and celebrate collectively.

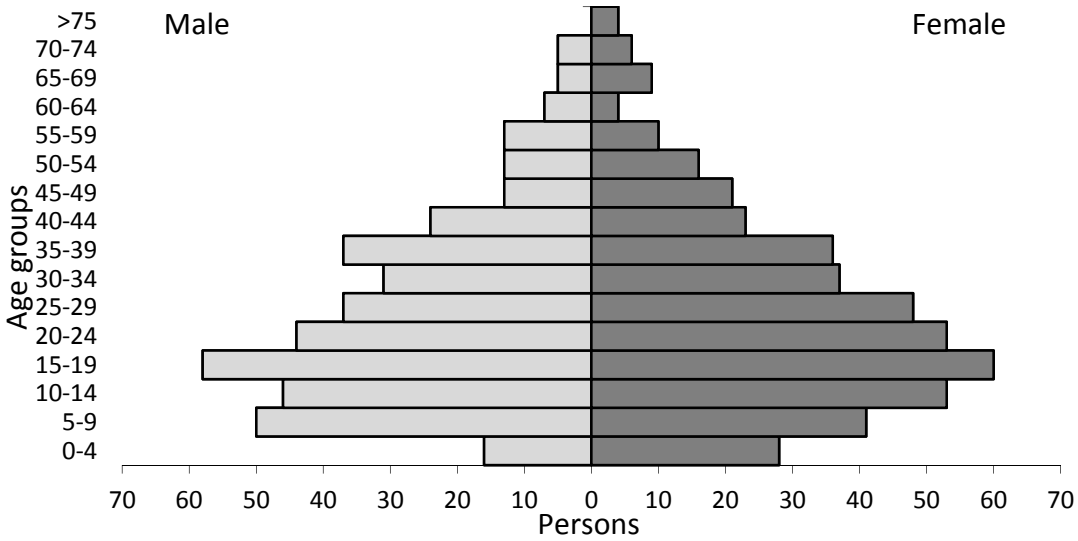
As elsewhere in Mexico, in Morelos maize accounts for an important part of the total daily calorie intake. Maize is by far the most important staple food and of fundamental importance in terms of food security. *"We will have hunger without tortillas"* as key informant Silvia Pascual Mateo (43) explained. Manual Hernandez Cruz (65) sows maize because *"when other crops fail, you will always have some tortillas to eat."* In Morelos, traditional dishes consist mainly of maize and kidney beans. During yearly community festivals, eating together is always an important element and maize then is an indispensable ingredient. During the days preceding the festival, women of the community work together to make *tamales* (traditional Mexican dish consisting of maize dough cooked within maize leaves often containing meat or sugar and fruits) and tortillas. At funerals, maize is common to give to the widow(er) as a form of financial support to the bereaved family.

3.7.4 Household dynamics

Demographic characteristics

In 2008, Morelos counted 3.005 inhabitants (CONEVAL, 2008). Based on the structure of the sample population (see Figure 3.2) I consider the population more or less evenly distributed by sex.

Figure 3.2 Sample sex-age structure (N=848)



Source: Household Survey, 2008

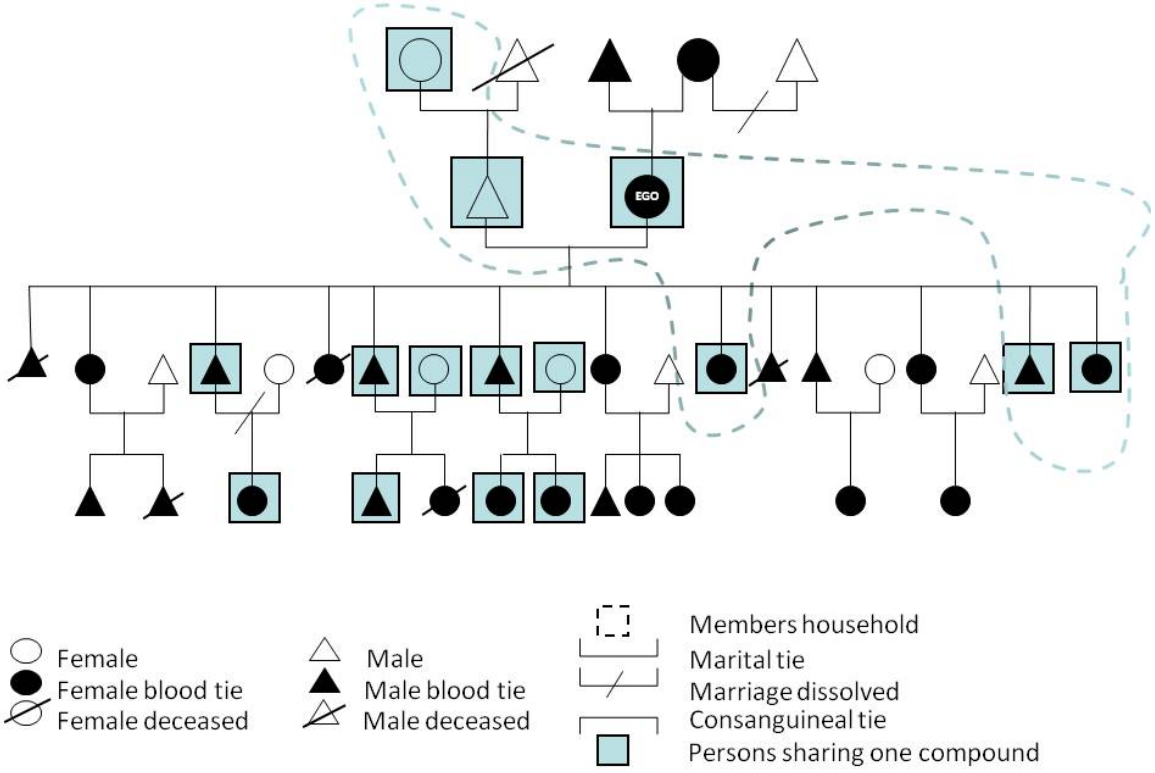
On average, the sample population is relatively young resulting in a high demographic dependency ratio of 0.73. There is a significant number of people older than 75 years despite the fact that most households live in poverty and that the average national life expectancy is 73 years for men and 78 for women (WHO, 2011). The narrowing base in the age groups 0 – 4 and 5 – 9 is remarkable. According to employees of the public health

centre, this trend is caused by declining fertility as a result of the recently introduced family planning programmes.

Kinship and residence

Kinship and residence patterns are important for understanding household composition, livelihood activities and the organisation of community life. Kinship influences, among other things, gender roles, migration patterns, access to resources, individual obligations and rights, agricultural production, and social relations and mutual support. The Popoluca in Morelos have a bilateral kinship system. Residence is virilocal, meaning that couples start their new household at the compound of the family of the husband. According to key informants, young couples frequently live in the same house as the parents and siblings of the husband. After some years, they build their own house at that same compound. Families with many sons are often not able to house all their sons, which forces new couples to settle elsewhere. Figure 3.3 provides an example of the genealogy and residential pattern of a typical Popoluca family of four generations.

Figure 3.3 Genealogy and residential pattern of a Popoluca family, 2008



The life-history of the woman in the middle (ego) of Figure 3.3 demonstrates that household composition changes over time due to marriages, birth, and death.

Case 3.1 Angela Sabalsa Hernandez

Angela was born in Morelos in 1954. At the age of 14, she entered into a unión libre (unregistered marriage) with Valentino. She gave birth to her first child in the following year. Angela has given birth to 13 children in total; seven sons and six daughters. Although Angela is thankful to God that all her 13 deliveries went well, two of her sons and one daughter died before reaching the age of five. Her

husband Valentino was not present during any of the births as he was out drinking with friends. Angela's mother and one of her sisters assisted her during and after the first few births. Angela was exhausted. They stayed several days to make tortillas and help with cleaning the house. Her oldest daughter assisted her during the deliveries of her youngest children. After 13 children, her body feels tired and she is happy that her oldest two daughters were able to have themselves sterilised after giving birth to two and three children, respectively.

Currently, her household consists of her unmarried daughter, youngest two children, husband, mother in-law, and Angela herself. The family eats together twice a day. They all sleep under the same roof. Valentino cultivates maize on the parcel that he rents from his nephew. Last year he earned hardly anything as he invested a lot in agricultural inputs, while his harvest was disappointing and the maize price was low. Angela receives money from Oportunidades[40], her main source of income that she uses to buy food. She shares her income with the other household members. She indicates that without this government support she would not be able to feed her children as her husband spends all his money on alcohol. Her two youngest children still attend school and her unmarried daughter helps her in the kitchen. Her mother-in-law is old and fragile and does not leave her bedroom anymore.

Angela's oldest son, Michel, lives at the same compound but has his own house and financial responsibilities. However, he regularly eats together with his parents since his wife Liz left him. Two years ago, Liz (his girlfriend at that time) accidentally got pregnant. Although they were not married, Michel built a separate kitchen for his new family at the compound of his father. They entered an unión libre and started living together. However, for Angela and her family, problems began the day that Liz and the baby moved into the compound. Although Liz was young and inexperienced she expressed no interest in contributing towards or learning more about housekeeping. Angela and her family subsequently labelled her 'floja' (lazy). Angela initially tried to teach her how to prepare food for her husband and child. Her effort yielded little result, as the girl was too lazy to buy ingredients and seldom even left her bed. Angela felt responsible for the general welfare of the baby. Every day she invited her son and his family for diner. After a few months, Angela was no longer willing to do all the work at home and in the kitchen, which led to daily quarrels. One day, Liz ran away, returning to the house of her parents. Angela was disappointed and angry as this was considered treason and led to much gossip in the community. Although Michel managed to persuade his wife to come back to the compound, she soon ran away again and now lives with her parents. As her family has no money Michel has to take care of the child. In practice, this means that Angela has an extra baby to take care of.

[40] Oportunidades is a social assistance program of the Mexican government designed to target poverty by providing cash payments to families in exchange for regular school attendance, health clinic visits, and nutritional support. See further Section 3.7.5.

Angela also supports her youngest daughter, who she would like to see completing secondary school. She has warned her not to get pregnant during her school years as this would be a big disadvantage to her later in life. Angela believes that young pregnant girls throw away their future since women with children are not allowed to do anything other than housekeeping. Only girls with an education are able to find jobs and live more independent lives. According to Angela, a problem at secondary schools is that girls get pregnant by accident due to behaviour imitated from soap operas on television. Although she was fifteen when she gave birth to her first child, she believes that the situation is different today. Nowadays, girls get pregnant before they get married. Having a child is not always a conscious decision. As a result, an increasing number of girls have to raise their children alone.

In-depth interviews made clear that there are two types of marriage in Morelos: an unofficial marriage (*unión libre*) and an official marriage. A *unión libre* involves a non-registered union between two persons who informally declare to each other and their family that they will stay together for the rest of their lives. People use this form when the couple is less than 18 years old and therefore legally not allowed to marry (Price-Livingston, 2002) or when the family has no money to pay an official to come over to conduct a legal ceremony. Many respondents declared that they do not attach value to official marriages, as this is a relatively new phenomenon in the Popoluca community and is associated with modern and rich families living in the big cities. According to key informants of the public health centre, in Morelos, the average age of marriage is 17. Furthermore, they indicated that about 30 men practice polygamy in Morelos. In the past this phenomenon was more common (Foster, 1943), but today it is still generally accepted as part of Popoluca culture. While in former days, Popoluca men could have up to seven wives (Foster, 1943), today there are no men with more than two wives in Morelos[41]. Officially, people can be married to only one person, so men often have a *unión libre* with their second wife[42]. Although polygamous practices are well established within the Popoluca culture, asking about the subject always provoked giggling and gave rise to gossip. In small talk on the street, people relate this phenomenon to the 'macho[43] nature'

[41] However, in the neighbouring Popoluca community of Buena Vista there are still men with more than three wives.

[42] Information provided in interviews with the doctor who has worked for 33 years at the public health centre in the community.

[43] The term 'macho' is derived from 'machismo', which is often used to describe the gender and power differences between men and women in Mexico (Ypeij, 1995). The most common definition of machismo is formulated by Stevens (1973), who describes machismo as the cult of masculine virility. She mentioned that important features of this cult are aggressive assertiveness in the mutual relationship between men and sexual aggressiveness and arrogance in relationships between men and women. With regard to this definition several characteristics can be distinguished that identify men to be 'macho'. The stereotype of a 'macho' is a strong, independent, authoritative, self-assured, and rational person who makes himself out to be powerful and dominant by demonstrating aggressive, active, rude, and virile behaviour. Machos are in their expression toward women unkempt, courteous, indolent, polygamous, and unfaithful (Vellinga, 1985). Consequently, women are subordinated to men but on the other hand, it is the duty of men to protect women. In Morelos women are expected to obey and have the duty to accomplish the domestic work.

of Popoluca men in general and the wealth of those men in particular (being able to take care of two families). In informal conversations, women admitted that they were sorry for the wives who have to share their husband and kitchen with another woman. Once, when I was travelling from Morelos to Acayucan in a *camioneta,* the driver Don Pedro told me that he had two wives. After a few stops, we were the only two persons in the car, the conversation turned more personal and he explained the advantage and difficulties of having two wives.

> *"When I was 18 years old, I entered into a unión libre with my girlfriend Camila, who was at that time 15 years old. I was in love and dreamed of many children. We started living at the compound of my father, where Camila later gave birth to six daughters. We had a quiet family life. In the beginning, I was very content with my life but after several years, I felt there was something lacking. When I turned 30, I met Beatriz, a daughter of Paco, who is a friend of mine. I fell in love with her and spent many afternoons drinking beer at her compound. I finally got up enough courage and asked my friend permission to marry his daughter. Paco was enthusiastic about my intention to look after his daughter and allowed me to marry her. Beatriz was 18 years when the wedding celebration took place. She gave me another six children, of which two were sons. I was pleased, having both sons and daughters. Both wives have their own house at my compound where they live with their own children and I stay every other day at their respective houses. In spite of this arrangement, both women fight for my attention on a daily basis. Sometimes the tensions mount so high that I have to intervene. These frequent fights and quarrels at home, and resulting gossip in the community, are the downside of having two wives. For example, a few months after my marriage with Beatriz, Camila ran away because of the fights and because she no longer wanted to share me with Beatriz. She went to her mother's house, but her mother was too poor to take her in again. Camila was forced to come back with me. I pay her food and take care of her children. Today people in the village still talk about this incident and like to believe that I am not a good husband."*

Domestic life and gender roles

Division of reproductive work

In all households, the gender division of labour encompasses both productive and reproductive activities. However, the workload connected with domestic activities, which maintain or 'reproduce' daily life, is in Morelos mainly allocated to women. According to key informants and personal observations, Popoluca women in Morelos dedicate their daily time primarily to food preparation, collecting firewood, house cleaning and maintenance, washing clothes, childcare, feeding poultry, and gardening.

Women in Morelos are – above all – responsible for food provision and preparation. Around six o'clock in the morning they start the day working in the kitchen. The most archetypical and traditional task of women is making tortillas, which are part of every meal. This work requires many hours per day. First, maize grains are prepared by boiling them in a mixture of lime and water, a process called '*nixtamal*'. Cooking the maize kernels with lime enhances the balance of amino acids and frees the otherwise

unavailable niacin – a member of the vitamin B complex (Leonti, 2004). The swollen kernels are then grounded with a small mill at home or at a neighbouring shop. The resulting dough is kneaded on a rectangular quern (*metate*) and toasted on a griddle[44] in the form of round flat pancakes yielding tortillas. Before every meal, women spend 30 minutes to one hour on forming dough by hand into round pancakes and toasting the tortillas. Daughters, from eight years on, often assist their mothers with this time-consuming task. Husbands and sons do not know how to make tortillas and jokes are often made that men will starve to death when they find no wife to make their tortillas. Another, traditional and important daily task of women is to provide their husband with *potzole,* which is prepared from maize dough as well. At the maize fields, farmers drink *potzole* for the energy in-take necessary to perform the physical work. In periods of food insecurity, women are expected to solve the food problem. The majority of the interviewed women ask relatives to lend them some money or food that they will pay back after harvest or when they have received their monthly subsidy from the government programme Oportunidades.

Apart from preparing food, women are also in charge of collecting firewood. The majority of the households cook their food on firewood, which has to be collected at the plots. Every day you see women walking from their land to the village with piles of firewood on their heads. In households that have a parcel located close to the village, women set out to collect firewood every day, which often takes them more than an hour. Households that have their plot far away chop firewood once or twice a year and rent a car to transport the wood to their compound where it is stored. Households that do not own land are forced to buy their wood, which saves the women a lot of time. In times of drought or by lack of tap water, women are also responsible for providing the household with water. If the household does not have a well at the compound, women have to walk to relatives at other compounds and ask for water. Finally, if the household keeps poultry, it is the task of the wife to raise them, while the husband takes care of the cattle.

The domestic task of men primarily consists of the building and maintenance of the dwelling and solving technical problems with water, electricity, and drainage. They pay the electricity bill and incidental housing maintenance costs. According to several respondents, men in Morelos decide which investments and savings are made and how the money has to be spent in the future, both in relation to the agricultural production and to the household.

Both husband and wife are involved in raising the children. However, the mother is the key figure in the day-to-day activities such as care giving, feeding, and bringing children to school. The father has the final say when it comes to decisions about the future of the children, for example, whether a son or daughter has to give up school in order to help in the household or work in the field. Moreover, in traditional households the father decides when it is time for a daughter to get married, although in most cases she is free to choose her partner.

[44] Formerly the griddle was made from clay, nowadays from steel.

Women's and men's economic activities

In Morelos, men are considered the main breadwinners and are engaged in agricultural activities, involving crop cultivation and cattle-breeding. In interviews, farmers indicated that they work every day of the week at their field or as a day labourer for other people in the area. However, in practice I observed that this was not always the case and often men stayed at home to rest. In particular, during the slack season - between harvesting and sowing – men pass their days in the village drinking beer with friends.

From early on, sons accompany their fathers to the fields and learn how to grow maize. This implies that in the future, maize might continue to be an important income-generating activity in the community. However, informal discussions indicated that soon there will not be enough land for the growing population and people will have to move out of farming. Moreover, the fact that households only receive government support from Oportunidades when their children go to school (instead of working the entire day at the plot) will accelerate the process of people moving out of agriculture.

According to the men, women only perform domestic work at the compound and are not involved in economic activities. However, I often observed women helping their husbands in the field. Nevertheless, men do not acknowledge this as work. Women's participation in agriculture is underreported due to the locally accepted notion that women only 'help out' in the field. As household heads, men work to provide for their household's needs and are entitled to claim the labour of other household members when necessary. Women's involvement in agriculture is considered inappropriate by some people in the village as traditionally agricultural activities are considered the responsibility of men. When women work in the field they do the same work as their husband. For example, they sow, weed, harvest, and spray (if necessary). Besides providing assistance with these 'male' agricultural activities, there are various 'female' activities, such as getting water at the nearby well or river to dilute fertilisers and pesticides. This is heavy physical work as women walk up and down to the well the whole day. Other activities of women at the plot are weeding with *machetes* (a long chopping-knife), chopping wood, and gathering wild fruits and herbs.

I met many women who, in addition to these agricultural activities, 'assist' their husbands by running a small shop at the compound, while the husband is working on the land or drinking beer with friends. However, in the household survey this economic activity was often ignored by the husbands. Furthermore, some households gain supplementary income by selling *tamales*, *barbacoa* (meats slowly cooked over an open fire), grilled chicken, or fresh meat. For these economic activities, the observation also applies that women mostly do the actual work, while men indicate that they are managing these businesses. During a focus group discussion, women indicated that this 'invisibility' might be caused by the fact that women often combine these 'productive' activities with their 'reproductive' activities, for example, carrying a baby on their backs while working in the fields.

Women's and men's work in the community

Community work comprises organisational jobs undertaken by women and men in the neighbourhood or at community level. The two main institutions that organise community

activities are the *Agente Municipal* and the public health centre. The *Agente Municipal* is responsible for community life and wellbeing and regularly organises collective activities such as cleaning the streets or the cemetery, painting the community centre, or weeding the public area and sport fields. These activities take place on Sundays and participation is voluntary. According to the *Agente Municipal*, nowadays both men and women participate in these activities while in the past only men performed community work. Today women are more often allowed to leave their compound and are developing a voice in community life. The fact that in 2009, for the first time in Morelos, a woman was elected as *Agente Municipal* underscores this trend. The public health centre organises collective activities as well. Information gatherings, cleaning of the centre and improvement of the drainage system are examples of activities introduced by the health centre. Every month, women are called to participate in these activities in exchange for the financial support that they receive from the government programme Oportunidades. For that reason, only women participate in these activities.

3.7.5 Assets and capital profile at community level

Natural capital

In focus group discussions people indicated that land is the most important tangible asset for households in Morelos. To produce food and generate income they primarily depend on land. Morelos covers an area of approximate 3.576 hectares. Its natural landscape is characterised by hills and a few canyons. The soil is bright red (known as *tierra colorada*). In general, land for cultivation is sloping and covered with large stones, which makes mechanisation of the agricultural work impossible. Furthermore, the soil has an argillaceous texture with a high degree of acidity (pH-value) (Buckles and Erenstein, 1996; Kuhfuss, 2007). Consequently, water is not easily absorbed. In Morelos, 98 per cent of the total land is arable and has been sub-divided into parcels and assigned to individuals for their exclusive use and control (parcelled land). The range in hectares land owned by households varies between one and 42 hectares. The majority of the people own between the 14 to 20 hectares. At the time of the study, the price of one hectare of agricultural land was about 10.000 peso[45], and if there is access to water at the parcel about 15.000 peso.

Two per cent of Morelos' total area is allocated to housing, divided into 558 housing plots, called '*solares*' (land allocated for housing). In 2006, however, Morelos counted 633 households, implying that some households share a compound (IMSS, 2006). Sometimes this causes problems since the title deed is required as a guarantee for getting credit. In the nearby future this problem will increase as traditionally young couples settle on the parental compound of the husband. However, compound size is fixed. It can only be divided under the supervision of a surveyor of the National Agrarian Register (RAN), leading to a situation whereby three to four generations may depend on the same title deed.

[45] During the fieldwork period the peso equivalent in dollars was 11 Mexican peso = 1 US dollar.

The natural resources of Morelos are poor. Scarcity of wildlife has made hunting unimportant as a source of meat. Instead, people raise animals like pigs, cattle, and chicken. Animals that are still hunted are deer, wild boars, raccoons, armadillos, agoutis (type of rodent), and rabbits. Fishing is a more common source of food. Morelos owns about four hectares of water resources, comprising rivers, brooks, and wells. Since the beginning of the 1990s, most dwellings are connected to a collective water pipeline and have a water tap in addition to a private *pozo* (well) located on their compound. Important fruit trees in the forest are the mango, *chicozapote* (*Achras zapota Linna*), *zapote mamey* (*Pouteria sapota*) and *guanábana* (*Annona muricata*) (Foster, 1943; Leonti, 2004; Blanco Rosas, 2006).

Physical capital

In the study area, the physical assets are limited. Morelos is accessible via a (partly dirt) road that connects Acayucan (28 km) with Buena Vista and Soteapan (respectively 5 and 13 kilometre from Morelos). Small pick-up cars commute irregularly between Morelos and the regional market of Acayucan. Electricity is found in almost all households, although after heavy rains there sometimes is a power failure. Despite the weekly gas delivery services in the village, people generally use fire wood or charcoal for cooking and heating (only 14 households in the community utilise gas) (IMSS, 2006). Most households do not have a landline telephone connection but make use of the two *casetas telefónicas* (telephone houses) in the village. Incoming calls are announced through a loudspeaker in the centre of the village. The community has an unstable connection to the closest mobile phone network. There is no post office in Morelos and a mailing system is absent. The nearest facility to send letters and packages is in Acayucan. The public health centre has one computer for public use with access to the internet, though the connection is bad and often breaks down. Except for a few school-going youths, most villagers have no e-mail account and do not know how to use the internet.

Financial capital

Financial capital includes savings, credit, and transfers. In general, smallholders in Morelos have no bank account. People save small amounts at home or invest it in cattle or building blocks. Only seven out of the 200 households in the household survey receive formal credit from a commercial institution. Many farmers in the survey claimed that credit is too expensive and risky, which prevents them from accessing financial resources. Alternatively, occasionally people use their social network to get credit and borrow money from family and friends. In Morelos, transfers are rarely in the form of remittances, but mostly include pensions and conditional payments from government programmes.

Parallel to economic liberalisation and the implementation of the NAFTA, the Mexican government introduced several agricultural support programmes, designed to support agricultural productivity without violating the free-market principles of the trade agreement (Taylor *et al.*, 2005; Keleman and Hellin, 2007). For smallholders in Morelos the most important government programmes are PROCAMPO, Oportunidades and PROMAF:

PROCAMPO

Government intervention in the agricultural sector was reduced by a movement away from direct price supports for grains, beans, and oilseeds – administrated through CONASUPO – to direct income payments to farmers through the Programme of Direct Support for the Countryside (PROCAMPO). This programme was created some months before NAFTA was signed (Yúnez-Naude and Barceinas Paredes, 2002; Taylor *et al.*, 2005; Yúnez-Naude and Taylor, 2006). The main objective was to compensate for the anticipated negative income effects of lower crop prices after the implementation of NAFTA. Besides, it would help Mexican farmers to switch to more competitive crops in a liberalised context (Nadal, 2000; Sadoulet *et al.*, 2001; Yúnez-Naude and Barceinas Paredes, 2002). The programme was planned to last until 2008, when full liberalisation under NAFTA would be realised. In 2001, an amendment to the PROCAMPO law was approved by the Congress. It allows the payments corresponding to one or more cropping seasons to be front-loaded at once to producers, under the requirement that resources must be devoted to a 'productive project' that must be directly related with primary production, food processing, access to inputs, and acquisition of capital goods (Rosenzweig, 2003). According to its promoters, these funds would provide farmers additional capital to invest in agricultural improvements, such as the shift from maize to cattle-breeding or other crops that would enhance Mexico's comparative advantage (Keleman *et al.*, 2009). In February 2007, President Felipe Calderón announced that PROCAMPO would be continued until 2012. Currently, any producer who cultivates a legal crop on eligible land[46], or uses that land for livestock, forestry production or some ecological project, can receive PROCAMPO payments on a per hectare basis.

Oportunidades

In addition to PROCAMPO, rural households can benefit from the Programme for Rural Education, Health, and Nutrition (PROGRESA), nowadays referred to as Oportunidades. It is one of the most important programmes of the Ministry of Social Development (SEDESOL), which was established in 1997 (Taylor *et al.*, 2005). Its objective is to alleviate extreme poverty in rural areas by contributing to human capital formation. The programme provides monetary and in-kind transfers to rural poor women conditional upon sending their children to school, caring about their nutrition, and bringing them to a health centre on a regular base (Skoufias *et al.*, 2001; Taylor *et al.*, 2005). In 2006, 517 of the 633 households in Morelos participated in the programme (IMSS, 2006).

Oportunidades provides monetary educational grants to participating families for each child less than 22 years of age who is enrolled in school between the third grade of primary and the third grade of high school. The health component of the programme Oportunidades provides basic health care for all members of the family, with a particular emphasis on preventive health care. The nutrition component of Oportunidades includes a fixed monetary transfer, equal to 155 pesos per person per month, for improved food consumption, as well as nutritional supplements for children aged between four months

[46] Eligible land is defined as having been cultivated with maize, sorghum, beans, wheat, barley, cotton, safflower, soybeans, or rice in any of the agricultural cycles from fall-winter 1990-91 to spring-summer 1993 (Sadoulet *et al.*, 2001).

and two years, malnourished children aged two to four, and pregnant and lactating women (World Bank, 2004). Oportunidades also provides financial support to elderly people. Every two months any person aged 70 and older receives 490 peso for daily subsistence (Oportunidades, 2011).

PROMAF

The most important credit programme for smallholders is the Programme to Support the Production Chain of the Maize and Beans Farmers (PROMAF). This programme aims to increase the production of maize and beans to guarantee sufficient national supply and increase the level of income of the farmers and their families. It provides support to farmers about how they can commercialise their production, for example, by helping farmers to apply for credit at financial intermediaries such as Shared Risk Trust (FIRCO[47]), explaining the benefits of various agrochemicals, introducing new technologies, and providing information about organisational structures that can help farmers to capitalise their activities (FIRCO, 2011).

Human capital

Level of education is an important aspect of human capital as this enables people to work and generate an income. The provision of public education and health facilities by the state originates from macro-level policies and national programmes that aim to raise the level of human capital across the country. The level of education is low in the study area. Of the total population aged 15 and above, about 49 per cent are illiterate and 86 per cent have not completed primary school (see Table 3.2) (CONEVAL, 2005). Educational facilities in Morelos are one *preescolar* (kindergarten), two ordinary primary schools, one bilingual primary school, one *secundaria* (high school) and one *preparatoria* (school for pre-university education). For other types of education, one has to travel to other communities.

Apart from education, being free from illness is a precondition for developing skills and carrying out livelihood activities. In Morelos, the public health centre has provided basic health services for 27 years. Its doctors provide free services to anyone with a *Seguro Popular*[48] (public health insurance). Eighty-eight per cent of the population in Morelos has no access to regular insurances and relies on the *Seguro Popular* (a system developed for healthcare provision and financing of the uninsured poor population without an official employer (IMSS, 2006)).

[47] FIRCO is a semi-governmental entity created by presidential decree and forms part of Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA) to promote sustainable and competitive agribusiness and rural development by providing access to technical support (FIRCO, 2011).

[48] Although *Seguro Popular* has been designed with some features of a traditional health insurance arrangement (e.g. participants would pay premiums), the progressive rate of the premium charge (the two lowest deciles do not pay any premium) and the heavy public subsidisation of these deciles makes it basically a public instrument for the delivery of basic health services to the poor (World Bank, 2004).

More complicated medical consultations and services are provided by the hospitals of Oluta and Jáltipan, respectively about 25 and 32 kilometres away. For these consultations, people only have to pay five per cent of the total costs. However, there is no public transport, nor ambulances driving from Morelos to these hospitals. People have to arrange private transport, which is often too expensive[49] for the smallholder households. Apart from the public services, people can visit a private doctor in Acayucan, who offers consultations for 20 pesos. The village has neither a pharmacy nor a dentist. Finally, at the public health centre, people can receive free vaccinations for diseases such as typhus and tuberculosis. However, only a few people make use of this service. According to the staff of the clinic, reasons for this careless behaviour are a lack of education, and ignorance.

Social capital and community life

Kinship relations are the most important form of social capital and are the basis of social organisation of the Popoluca community in Morelos. Relatives can claim tangible and intangible support from each other, especially when they belong to the same household. In general, households in the study area are based on a nuclear family, sometimes with additional kin such as grandparents, uncles, and in-laws, illustrating the importance of family and kinship relations for support.

Besides kin, *compadres* are of significant importance to people in Morelos. *Compadres*[50]are the godparents of a newborn child with whom the parents have a close relationship of mutual help and trust. In focus group discussions people declared that *compadres* are the persons beyond your close family you can rely on when you need help. However, in fact, *compadres* provide mainly immaterial support.

Traditionally, in the Popoluca region social organisation at community level is simple (Foster, 1943). Popolucas do not have clans, clubs, or associations. There is no active community life and families retreat to their own compound most of the time. In Morelos, as in most parts of the Popoluca region, there is no central market place or village green where people come together. People only gather when the *Agente Municipal* or the *Presidente Ejidal* (president of the *Comisariado Ejidal,* see also Appendix I) calls the villagers for a meeting to inform them about common issues related to agriculture. For these meetings the *Casa Ejidal* (community centre) is used. There are a few small shops where people can buy food and domestic necessities. These shops are not a social meeting place, as many people buy what they need from the traders who go from door to door in each Popoluca village to sell their products.

The local administration of Morelos is organised along customary Mexican lines and embodies two institutions. The first, the *Comisariado Ejidal,* is responsible for everything related to land tenure and agricultural activities. It has six voluntary members and is in charge of, amongst others, solving conflicts between farmers about land boundaries, attracting potential buyers of maize and other external business partners, representing the community at umbrella organisations and institutions at municipality level, and

[49] A private ride per car costs about 200 Mexican pesos.

[50] *Compadrazgo* is a type of fictitious kinship which refers to a way of formalising a close relation of mutual help, support and trust.

applying for subsidies and inputs at various government programmes on behalf of all smallholders. The president of the *Comisariado Ejidal* is a prominent political figure, who is elected for three years. Only land owners are authorised to vote. The *Comisariado Ejidal* is assisted by a committee of three people, known as the *Consejo de Vigilancia* (Supervisory Board). The role of this body is to control the work of the *Comisariado Ejidal*. In the second place, there is the *Agente Municipal*, who is the official community leader. This person is responsible for informing people about community matters, mediating in conflicts, organising activities with collective aims (e.g. cleaning of the streets, providing drinking water), and representing the community at meetings with the municipality and other external institutions. This position is also voluntary and the *Agente Municipal* is elected for three years by all inhabitants of the community. Finally, an older man is appointed *juez* (judge). His task is to mediate in cases of interpersonal disputes, physical abuse (often of women), and fights between villagers. When he is unable to solve the problem, he enlists the help of the *Agente Municipal* or the public prosecutor. However, people prefer to solve the problems locally without the interference of external authorities. Key informants indicated that nowadays, people do not have much respect for these local authorities, which is detrimental to their power and prestige. Too often leaders did not keep their promises, which means that people do not trust them anymore.

4

Livelihood Portfolios and Adaptation Strategies[51]

Since the introduction of the neoliberal policies and the associated agricultural policy reforms, traditional maize farmers in Mexico have faced difficult economic conditions. Smallholders are forced to adapt to economic pressure from rising imports, increased competition from US import maize and other traditional crops, weak local and regional demand, and large reductions in public sector support for agriculture with far-reaching consequences for their livelihoods. This chapter describes the adaptation process of local smallholders to these market changes. Going beyond the aggregate level, smallholders' adaptation strategies are investigated. Contrary to what economic models predicted, the data suggests that farmers intensified the cultivation of maize instead of switching to sectors in which Mexico has a comparative advantage.

[51] A different version of this chapter is published as:
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4.1 Introduction

The sky was clear and the raindrops from last night's thunderstorm twinkled in the early morning sunbeams. The sun was trying hard to break through the clouds when I walked together with Lorenzo Fernando Pascual (51) and his youngest son Pablo (10) to his milpa. Fernando had invited me to teach me how to sow maize. On the way, my boots got stuck in the mud of the swampy paths leading downhill to the plot. Everywhere around us, I saw people walking to their fields. Fernando was cheerfully whistling because the rainy season was due to start, which could ensure a good harvest.

When we arrived at the milpa, we dropped our raincoats in a small ramshackle shed. Fernando immediately set out to the farthest end of the parcel to put a wooden stick in the ground. He then signalled me to walk with him to the opposite side of the plot. Aiming for the stick, Fernando showed me how to sow in a straight line. It was my turn then to put a stick in the soil every half a meter, drop two maize seeds in the hole thus created, cover the seeds with soil, and compress it with my heel. I found it hard to force the stick into the ground, resulting in a couple of uncomfortable blisters on my hands. Fernando laughed at me and kindly pointed out that even his 10 year-old son could do the job better.

After having sowed a few lines, we took a small break. Fernando proudly told me that from early childhood he had helped his father with the work at the milpa. He never went to school; instead his father taught him how to produce maize and beans. After the death of his father, he inherited eight hectares of land, which he was forced to share with his brother. Producing maize is a tradition in his family: once his sons have reached the age of eight, Fernando regularly takes them to his milpa. In the future, the seven hectares land that Fernando currently owns will be divided equally between his three sons. Fernando realises that there will not be enough land to feed three families and as a result he is worried about the future of his children; "Without land, there is no maize to harvest and hunger will lie in wait." (Field notes, 30 July 2008)

The fragment above gives an impression of agricultural life in Morelos in which the production of maize is vital by providing an important source of income and food. The transfer of indigenous knowledge about seed selection and cultivation of maize goes back many generations. However, nowadays this traditional livelihood activity takes place within the context of recent market liberalisation processes affecting many aspects of local livelihoods. The changing market conditions (re)shape the room for manoeuvre of local famers and raise the question to what extent the local farmers are able to adapt to these changes.

The neoliberal policy reforms have both constraining and enabling effects on local maize production. The liberalisation of trade in combination with the liberalisation and privatisation of the markets for land, fertilisers, and credit affected the competiveness of agricultural products, relative (input) prices, and farm practices in Morelos. The land reforms made legal sale and rental of land possible and allowed smallholders to extend the amount of land they own and to benefit from economies of scale. Alternatively,

individual property rights allow smallholders to sell their land, exit agriculture, and migrate to urban areas to look for a better paid job.

Parallel with the policy reforms, the Mexican government introduced programmes to financially compensate smallholders for the potentially negative income effects of lower crop prices after the implementation of NAFTA. One of the most important government programmes for maize producers is PROCAMPO. Smallholders indicated that they mainly use the financial support provided by PROCAMPO to buy agricultural inputs. Therefore, these subsidies can be seen as an (unintended) opportunity to intensify maize production. Furthermore, the programme enables smallholders to switch to cattle-breeding or start a small business.

After NAFTA, imported maize caused increased competition in the maize market. This resulted in a dramatic fall of maize prices at local and regional markets. According to Nadal and García Rano (2006), local commercial producers saw their incomes, adjusted for inflation, declining by over 40 per cent between 1993 and 2005. To compensate for the lower maize prices and to boost their income, smallholders use more and expensive fertilisers to increase their production. However, the privatisation of the fertiliser industry caused a dramatic increase in prices of fertilisers and other agrochemical inputs. For example, in 2005 real prices of Urea and Diammonium Phosphate (DAP) – commonly used in Morelos – were respectively 191 per cent and 153 per cent higher than their 1990 prices for the average Mexican farmer (SAGARPA, 2002).

During focus group discussions, local smallholders indicated that during the last two decades, significant shifts took place in the local labour market. While in the past people mainly worked at their own parcel, nowadays they can also find seasonal work at fruit and vegetable plantations in neighbouring villages. Groups of 12 to 15 mostly male villagers travel together to these plantations and stay there for six days. Other types of local employment are available by working in construction, cattle ranges, or the petroleum industry located in the nearby cities of Minatitlán or Coatzacoalcos. In addition, local smallholders can (temporarily) migrate to the north of Mexico to work in the fruit and vegetable sector or the manufacturing industry. According to in-depth interviews, an increasing number of young adults leave Morelos temporarily to work off-farm. The household survey data suggest that only a few households have members who have permanently migrated to the United States or other parts of Mexico. Remarkably, these migrated household members do not contribute significantly to the household budget, and therefore remittances are not considered as an important source of income.

In summary, the changed economic landscape has greatly affected the context in which smallholder farmers operate. The traditional maize farmers faced the privatisation of the land and credit market, lower maize prices, higher prices for agrochemicals, and a shift in employment towards the manufacturing and agricultural export sector. The general hypothesis underlying this study is therefore that the adaptation process of the local smallholders is characterised by less maize production, an increased involvement in alternative agricultural activities (for example, a switch towards the cultivation of fruits and vegetables or towards growing pasture in response to the increasing demand for meat), and more off-farm employment in manufacturing and agro-export industries. Due to the large number of changes and the short time in which they were implemented, it is

impossible to disentangle the effects of each policy. Therefore, this chapter focuses on the adaptation process to the total spectrum of changes.

This chapter seeks to explore how farmers in Morelos find their way through the unfolding framework of the contemporary local maize market, navigating between the opportunities and constraints created by processes of market liberalisation. Contrary to what international economic institutions predicted about smallholder adaptation in response to a liberalised maize market, the analysis of contemporary livelihoods in this chapter shows that in Morelos maize still is the main source of income. Predictions based on the generally accepted economic theory of comparative advantage and Rational Choice Theory, such as argued by the OECD (see Chapter 1), indicated that smallholders in the South of Mexico would leave the maize sector and, instead, would start producing crops with higher yields, such as tomatoes and flowers, or would exit agriculture altogether (cf. Levy and Van Wijnbergen, 1992, 1994; De Janvry *et al.*, 1995; Petras and Veltmeyer, 2002).

This chapter is structured as follows: Section 4.2 provides a theoretical background on adaptation strategies. Section 4.3 presents the methodology and data used for assessing the adaptation process of the smallholders. Section 4.4 presents the empirical part of the chapter, describing the rural livelihood adaptation strategies of the local smallholders and their consequences for household wealth. It also discusses the determinants of the adaptation strategy choice and its dynamics. Section 4.5 is the conclusion.

4.2 Conceptual framework

The adaptation process is analysed using the concept of livelihood strategies, which can be defined as a "the way families respond to change, resulting in the reallocation of land, labour and capital resources to achieve their livelihood goals, such as productive activities, providing for basic needs, reproductive choices, etcetera" (Zoomers, 1999:18). Two types of livelihood strategies are usually distinguished; adaptation strategies, which are *ex ante* long-term household strategic decisions anticipating changing circumstances and failures in income streams; and *ex post* coping strategies taken in response to unanticipated failure in major resources necessary to make ends meet (Zoomers, 1999; Barrett *et al.*, 2001).

Adaptation strategies are income and production strategies aimed to generate future income. To this end, people constantly weigh different objectives, opportunities, and limitations in response to external and internal circumstances that change over time. Medium-term coping strategies are employed once the principal sources of production have failed to meet expected levels, and producers literally have to 'cope' until the next harvest (Davies, 1993). Important to note is that coping strategies, being strategies, have to be distinguished from 'coping'. Coping is a short-term reactive response to a crisis or a stressful situation such as to an immediate and inhabitual decline in access to food (Niehof and Price, 2001; Niehof, 2004). Coping has not been premeditated and therefore does not have a strategic character. Hence, coping means acting to survive within the prevailing structural context while when adaptation occurs the rule system themselves change, as do the livelihood systems in which these rules operate (Davies, 1993).

The adaptation capacity of smallholders is the extent to which they can benefit from newly created opportunities and are able to use these to reduce risk and vulnerability. The concept of adaptation capacity links up with the actor-oriented approach, which assumes that smallholders are social actors attributed with agency and therefore capable and knowledgeable to cope with life under difficult circumstances (Long, 2001). Accordingly, in this study, smallholders are considered active participants who process information and use strategies in dealing with various local actors as well as with external institutions, shocks, and trends.

Rural adaptation strategies

With reference to the highly influential paper of Scoones (1998), researchers usually distinguish two main types of strategies which rural households use to generate a livelihood. First, rural households can put into practice agricultural intensification, extensification, or diversification. Agricultural intensification means that on a certain plot the production is increased by intensifying resource use (labour, capital, or technology). Agricultural extensification, on the contrary, implies that keeping labour, capital and technology at the same level, by bringing new land into production, production increases. Both strategies are types of on-farm activities. Households can also initiate agricultural (or intra-sectoral) diversification, including the introduction of new crops into a farming system, investing in livestock (both on-farm agricultural diversification), or by applying wage labour on other farms (off-farm agricultural diversification). However, both on-farm and off-farm types of agricultural diversification are frequently not taken into account in livelihood studies (Niehof, 2004).

In the second place, households can diversify their livelihoods through inter-sectoral (or non-farm) diversification for reasons of risk reduction, realisation of economic scope, diminishing returns, responding to crisis, or liquidity constraints (Barrett and Reardon, 2000). Ellis (1998:4) defines rural livelihood diversification as “the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living.” This can be seen as an on-going social and economic process reflecting factors of both pressure and opportunity that cause households to adopt multi-tasking in order to generate livelihood (Ellis, 2000). Multi-tasking creates multiple income sources implying that “more than one member of a household generates an income or that one member has multiple income sources” (Ypeij, 2000:174). In this study, household income is considered to consist of not only a cash but also of an in-kind component, i.e. consumption of on-farm produce, payment in kind (e.g. food), and transfers or exchanges of consumption goods between households. Within a rural context, multiple sources of income often imply diversification away from farming as the primary means for living (Ellis, 2000). Migration can be an important form of livelihood diversification. Household members migrate temporarily or permanently, sending remittances to their rural homes, to enhance their rural livelihood. This might have implications for the situation of those left behind, the position of women, and the utilisation of remittances to enhance productivity and increase investments (Ellis, 2000; Swift and Hamilton, 2001; Gartaula, 2011).

4.3 Data and empirical strategy

In this chapter local adaptation to neoliberal reforms implemented at the beginning of the 1990s are studies by analysing contemporary livelihood strategies at household level and their correlates. As explained in Chapter 3, I consider contemporary livelihoods as embodying the outcomes of the adaptation process. In addition, the lack of a quantitative baseline study is compensated by the usage of qualitative methods. These methods allowed me to analyse the livelihood strategies and activities at the time preceding the implementation of most significant policy reforms. A literature review of the study area provided additional information on trends and day-to-day life in the recent past.

4.3.1 Data

The data used for this chapter are drawn from quantitative and qualitative data resources. The quantitative data on adaptation strategies were collected by means of a household survey among 200 randomly selected households. The qualitative data on the types of livelihood strategies and activities used now and at the time preceding the neoliberal policy reforms in the study area were gathered from key informants during participant observation, in-depth interviews, a focus group discussion, and life-histories with representatives of various groups of community members. In-depth interviews were conducted with 10 farmers aged 30 and above, and with five representatives of governmental organisations and regional authorities. I organised a focus group discussion, as group members have an overlapping spread of knowledge, which may cover a wider field than any single person. For this discussion, I invited eight farmers representing different key families of the village. The topics addressed in the semi-structured interviews and the focus group meeting were predetermined, had a retrospective character, and included, amongst others, history of the village, agricultural developments, changes in markets, crop choices, technical changes, shifts in level of wellbeing, livelihood activities, and local economic development. The life-history method made it possible to understand the impact of the economic changes in a retrospective way. Life-histories are used to gain insights into socio-economic changes during the last 30 years, which made it possible to relate market liberalisation processes to other changes at both community and household level. In total four men and four women above 30 were interviewed and asked to tell their life-histories.

4.3.2 Defining livelihood strategies and wellbeing

Different from many livelihood studies that classify livelihood strategies on realised income, I based the classification on the main productive assets of rural households: land and labour (cf. Jansen *et al.*, 2006a). I classified livelihood strategies in terms of asset allocation across distinct activities as it reflects the (strategic) choices of the households to generate household income flows and wellbeing. I focus on asset allocation across distinct activities rather than on income shares because these are heavily affected by exogenous factors, such as weather conditions. I distinguished household time allocated to different types of productive activities (farm self-employment, farm wage employment, non-farm wage-employment, non-farm self-employment, and domestic work) and the household land-use pattern (land allocation to maize production, other crops, and pasture).

Subsequently, I used a Ward's linkage hierarchical cluster analysis to agglomerate clusters of observations within the data set (Lattin *et al.*, 2003). Based on the statistical results and common sense checks of the resulting groupings, I identified three distinct strategy clusters in the data. This result and the cluster means are used as input for the k-means cluster analysis that is used to assign each household to a distinct group or, in my case, livelihood strategy.

I analysed the determinants of household choice between livelihood strategies using multinomial logistic regression. Multinomial logistic regression predicts the probability that a household will select each of a set of alternative strategies compared to a reference strategy. I used the traditionally dominant strategy of maize farming as the reference strategy and thus analyse the characteristics of the households that have adjusted to the new situation and revert to an alternative strategy. A positive estimated coefficient indicates an increase in the likelihood that a household chooses the alternative livelihood strategy; a negative coefficient indicates a lower likelihood that a household selects the alternative livelihood strategy.

In the absence of complete income or consumption data, I used the possession of consumer assets as a quantitative indicator for household wellbeing. Following Filmer and Pritchett (2001), a Principal Component Analysis (PCA) was used to detect one or more underlying factors that are responsible for the co-variation between variables. In this context the factor 'wellbeing' is assumed to be underlying the ownership of all the included assets (Clarke, 2006). I used the PCA method to compose an Asset Index for comparisons of wellbeing across households. To ensure the sampling adequacy, the Kaiser-Meyer-Olkin (KMO) test was used for comparing the magnitudes of observed correlation coefficients with the magnitudes of partial correlation coefficients. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is equal to 0.68, indicating that the assets share a common factor (Sahn and Stifel, 2003).

4.3.3 Model design

I use the following model to estimate livelihood adaptation choice:

$$(4.1) \quad LC_j = \beta_0 + \beta_1 CAPITALS_j + \varepsilon_j$$

where, LC_j refers to the livelihood adaptation choice of household *j,* where $CAPITALS_j$ is a vector of the household capital endowments of household *j,* β_0 and β_1 are parameters*,* and ε_j is the error term. Following the livelihood framework, I assume the livelihood strategy choice is determined by slowly changing exogenous variables, including households' natural, human, social, physical, and financial capital. Table 4.1 summarises these variables. Natural capital includes agricultural land owned (more land stimulates farm activities). Human capital variables include household size and dependency ratio (labour availability), sex and age of the household head (female-headed households face competing demand on the time of the household head), and education level of household head (important for the off-farm employment opportunities). Ownership of land entitlements for housing and agriculture are an indicator for financial capital (land titles can be used as collateral and stimulate investments). Physical capital is excluded in our model, as households in Morelos hardly own production means and technologies. By

excluding social capital, I minimise potential endogeneity problems. The role of social capital in livelihood adaptation is reviewed in more depth in Chapter 5 and Chapter 6.

Table 4.1 Summary statistics of household capital endowment variables (N=200)

Description variable	Mean	SE	Min	Max
Household size	4.24	1.79	1	12
Sex household head (female = 1)	0.11	0.31	0	1
Age household head	39.63	13.40	14	72
Household dependency ratio	0.60	0.52	0	2.5
Illiteracy household head (yes = 1)	0.47	0.50	0	1
Solar land title (housing plot) (yes = 1)	0.69	0.46	0	1
Land owned (ha.)	4.40	6.75	0	27

4.4 Results: Rural livelihoods in a liberalised economy

4.4.1 Past livelihood strategies

Traditionally, people living in the study area cultivated many different food crops (horticulture) at small plots scattered out over the different zones of the Sierra de Santa Marta (Velázquez Hernández, 2001). Maize was the most important crop and source of calorie-intake. Other important plants grown at the plots were squash, chayote, sweet potato, sweet manioc, sugar cane, pineapple, papaya, banana, yam bean, and small onions (Blanco Rosas, 2006). In 1956, Morelos became officially an *ejido* - a community-based organisation in which members, or *ejidatarios*, held permanent usufruct rights to one or several plots (for more details see Appendix 1). The implementation of the *ejido* system affected local livelihood activities as the *ejido* law forced farmers to cultivate within the borders of the land surface allocated to the *ejido*. Hence, they were excluded from access to the areas more suited to producing coffee, hunting, and fishing situated in other parts of the Sierra de Santa Marta. As a result, agriculture transformed from a horticulture system into, what is called, a *milpa* system during the 1960s and 1970s. This farming system occupied mostly upland areas in southern Mexico and Central America. The system was characterised by (i) a central role, both agriculturally and culturally, of maize and beans; (ii) a small size of holdings; and (iii) a high degree of on-farm consumption of production (Dixon *et al.*, 2001). Maize and kidney beans became the main crops for subsistence and were used in barter to exchange for pots, lime, salt, and other commodities from towns nearby (Blanco Rosas, 2006).

According to key informants, smallholders substituted monoculture hybrid maize for their traditional *milpa* system during the 1980s, a process stimulated by government programmes that provided subsidised agrochemicals. Consequently, maize changed from an important food crop into a combined food and cash crop, and the cultivation of beans and other crops was reduced to a minimum. Only a handful of smallholders had an additional source of income such as cattle-breeding or a small shop. A few smallholders started growing pastures instead of maize in response to the expanding cattle-breeding industry. At that time, many children and wives were involved in the maize production

process, while nowadays children are obligated to go to school, and mothers stay at home to do domestic work.

4.4.2 Characteristics contemporary livelihood portfolio

According to the survey data, households in Morelos perform various livelihood activities that can be categorised into agricultural activities and non-agricultural activities.

Agricultural activities

Production of maize

The climate conditions in Morelos enable two maize production cycles per year. In mid-April, farmers start preparing their *milpa* for the first cycle. Traditionally, the *milpa* was prepared by slash-and-burn. Brush land and abandoned *milpas* were cleared, which was supposed to last a minimum of five years to justify the work of clearing. Then the land was left fallow for several years to recover from a period of intensive use before it could be transformed into a *milpa* again (Foster, 1943). Today, slash-and-burn is still an often-used technique for the preparation of land. The majority of the farmers participating in the household survey (65%) still burn off their plots before sowing. However, as the pressure on cultivated land is high, the fallow period gets shorter, and increasingly farmers (21%) apply herbicides instead. Five per cent of the farmers leave the stalks from the previous harvest on the ground to protect their land from erosion and keep it moist after rain. These farmers start sowing without preparing the soil. Only a few producers (9%) use a (hired) tractor to plough the soil.

Since farmers produce maize under rain-fed conditions, the time of sowing depends on the start of the rainy season at the beginning of the summer. Usually, farmers start sowing mid-May up to the end of June[52]. Farmers in Morelos sow manually by pricking a hole in the ground with a wooden stick where they put in two seeds and cover those with soil. Given the undulating conditions of the terrain, ploughing and sowing are done in lines transversely to the slope to capture and retain moisture, each line being separated by approximately 40 centimetres. Generally, before sowing, the maize seeds are treated with a liquid fertiliser to improve their growth potential. For 20 years, farmers in Morelos have used *semillas híbridas* (hybrid seeds) or *variedades* (improved seed varieties) in addition to the traditional *semillas criollas* (indigenous varieties). The usage of these improved maize seeds is stimulated by governmental programmes (such as Kilo por Kilo[53]) since the

[52] Farmers wait until the raining season, as heavy rains are needed to soften the ground so that they are able to prick a hole with a pole. Moreover, maize seeds need a lot of water during their first days to sprout. During the fieldwork in the summer of 2007, the rainy season started late and some farmers seeded their parcels mid-August. Owing to lack of time, these farmers were not able to use their plot for the second cropping cycle starting in autumn with consequences for their livelihoods.

[53] 'Kilo por Kilo' is a government programme coordinated by SAGARPA to encourage the use of improved varieties, replacing native varieties in areas where there is potential (Fohner and Hernández Sierra, 2004).

beginning of the 1990s. Improved maize varieties have advantages over indigenous seeds in that they are less susceptible to strong winds. Most farmers prefer the hybrid seeds because they have higher yields and better harvests, as they are better resistant to diseases and climate phenomena. The drawback is that hybrid seeds require treatment with fertilisers and other agrochemicals involving higher costs. Moreover, the seeds have to be bought for each cycle again, while the indigenous seeds are selected by the farmers themselves during the previous harvest and reprocessed. And, according to key informants, many of the hybrid varieties do not have the consumption characteristics associated with indigenous varieties. For instance, indigenous varieties take less firewood and time to cook, they hold together better in tortillas and other dishes, the volume of tortillas that they make is greater, and the products made from them can be stored longer. During informal discussions women declared that tortillas made from indigenous seeds taste better and are easier to make. However, indigenous varieties are only produced for own consumption while at the local maize market mainly hybrid maize is traded.

Eight days after sowing the seeds, most plants have germinated. At this phase, the small plants are vulnerable to plagues. Approximately a week after sowing, all farmers add the first dose fertilisers to the small maize plants. Sixty-eight per cent of the farmers add a second dose of fertilisers to their maize plants when the plant is 40 to 50 days old. Only farmers with sufficient financial resources (9% of all farmers) apply a third dose of fertilisers 15 days after sowing to stimulate the growth process of the plants. The fertilisers are diluted with water and diffused by a hand sprinkler carried at the back (*bomba*).

Nowadays farmers also use pesticides and herbicides at their *milpa*. Most producers (65.5%) use pesticides and herbicides two times during one cycle, while farmers with an adequate financial position (8.5% of all farmers in the survey) add an extra (third) dose of pesticides and fungicides to their land. After fifteen days, the first spraying takes place. A second and third spraying takes place respectively 30 and 45 days after sowing. If there is not enough money, farmers (26%) only stray after 30 days.

Two months after sowing, the maize cob is almost fully-grown and farmers start to 'fold' (*doblar*) the stalks: breaking the stalk beneath the cob. The cob is thus left hanging upside-down until the plant has dried. This practice has various functions, viz. it diminishes the damage caused by birds, fungal diseases, and downpours related to cyclones, avoids the penetration of water into the cobs, and it preserves the humidity that the seed grain requires to germinate. After approximately four months, the maize seeds reach maturity and can be harvest. Once harvested, farmers hire a *desgranadora*, a machine that takes off the maize grains from the cobs to sell at the local market.

According to the data obtained by the household survey during the spring-summer cycle in 2007, farmers in Morelos produced an average 2.75 tons maize per hectare with small variations between the parcels (standard error is 0.157). Factors causing difference in yields are related to the quality of the soil and the quality and quantity of the inputs applied by the farmers. In Morelos, the harvests are small compared to outputs obtained in other areas of Mexico. For example, in the northern state of Sinaloa harvests can exceed the 20 ton per hectare (Nadal, 2000) due to capital-intensive production methods, which leave farmers in the study area as negligible players on the national maize market.

Almost all farmers (98%) in the survey start soon after the first cycle to prepare their *milpa* for a second cycle in November or December. The second sowing period usually takes place in December or January. The harvest time is after about three months during the months February or March. The harvest during these months is always smaller (seldom exceeding one ton per hectare) than the harvest of the spring-summer cycle, because the climate is dryer and the farmers have no access to irrigation. Moreover, without rain, it is not possible to use fertilisers and pesticides, which makes it more difficult to have a good harvest. For those reasons, farmers do not invest much in inputs and labour during this cycle.

In Morelos agriculture is a risky enterprise. The region's chiefly maize-based systems feature extensive use of labour, little use of external inputs, often no mechanisation, limited access to credit or technical assistance, primitive infrastructure for water harvesting or utilisation, and no irrigation. According to the survey data, the most acute problem that the local smallholders are currently facing is the sharp rise in input prices and the limited access to credits (see Table 4.2).

Table 4.2 Reported main constraints to maize production (N=200)

Rank	Reported constrain	Percentage
1.	Limited access to credit	27
2.	High input prices (e.g. fertilisers, pesticides, herbicides)	26
3.	Low maize prices	25
4.	Climate (e.g. hurricanes, lack of rainfall)	4
5.	Plagues, diseases	3
6.	Other (e.g. low harvests, power coyotes, competition)	15

Animal husbandry

Traditionally, hunting and poultry were the only source of meat, while nowadays people are able to buy beef and pork from neighbouring cattle-breeders or at the market of Acayucan. Since the end of the 1990s, government programmes (such as PROCAMPO *Capitaliza*) have promoted cattle-breeding in the study area by providing credits to buy livestock. Since that time, the consumption of meat has increased and respondents indicate that on average they now eat meat once every two weeks instead of once a month as in the past. On Sunday, it is commonest for people to eat meat. They spend quite some time and money on its preparation. Therefore, at the weekend, households that own livestock slaughter a head of cattle and sell the meat per kilo to other villagers.

Local farmers rear livestock and poultry for various reasons. Livestock products, such as meat and eggs, have become a main source of income, are important for animal protein, as part of the bride price, and as a symbol of welfare. In social life meat is seen as a luxury product that not everybody can afford. At special days such as the election of the new

Presidente Ejidal, a wedding, or a 15-años party[54], people are expected to give away meat to all guests, which many respondents see as the most important aspect of a festivity.

At the time of the fieldwork, investing in livestock was lucrative: a young cow costs about 4000 – 5000 peso and yields about 6000 – 8000 peso when it is mature. Farmers consider the ownership of cattle as investment. Seventy-seven per cent of the respondents believe that in the future, cattle-breeding and the cultivation of pasture will be the most profitable economic activity to perform. Nevertheless, only a minority (27%) of the respondents owns one or more head of cattle.

Keeping poultry is more common in Morelos: 40 per cent of the respondents rear about 5 – 8 head (including turkeys and cocks) at their compound. The maximum number of poultry owned by one household was 40 chickens. Chickens are kept as a form of savings and a source of food security. Raising poultry is easily manageable. A tree-days old chicken costs five pesos and can bring in about 25 pesos when sold at maturity. Information obtained in focus group discussions indicates that keeping poultry involves very little or no capital investments. Most households do not use veterinary services or drugs and use their own maize grains to feed the poultry. Moreover, most chickens are *'del rancho'*, meaning that they walk freely at the compound and eat whatever they find in the garden. These chickens are for household consumption or used as a medium of exchange in transactions that enhance social capital. Only a small number of households keep poultry for sale. Keeping poultry is an activity for women, since they are present at the compound most of the time. Often the wife decides when and how many chicken and eggs can be consumed, sold, or given away. Apart from poultry, only a few (nine) respondents also kept pigs at their compound.

Agricultural wage employment

In Morelos, primarily young males perform casual agricultural labour to generate income. There are three main types of agricultural employment: people work as day labourers for farmers in Morelos, work in a nearby village, or migrate to other states to find a job. In Morelos, 10 per cent of the male respondents in the productive age (15 – 65 years) work permanently as a worker in the agricultural sector. The pineapple fields in Los Tigres are, for example, an important source of employment. During sowing and harvesting season, the labour demand at large pineapple fields in the area is high, and local landowners come to Morelos to look for temporary workers. Between 60 and 80 young men[55] originating from Morelos work together in these fields and gain an income of 60 – 80 peso per day. Additionally, labourers are given a place to sleep and receive three meals a day. In the weekends, they get one day off to visit their families in Morelos.

[54] The 15-años (meaning fifteen years) in Mexico is, a young woman's celebration of her fifteenth birthday, which is celebrated in a unique and different way from her other birthdays. It marks the transition from childhood to womanhood. In Morelos, only the households that can afford it celebrate this occasion.

[55] Numbers based on personal observations and information provided in in-depth interviews with key informants.

Non-agricultural activities

Self-employment

A few households are involved in self-employment and run a small business at their compound, a grocery shop for example. The products for sale are bought from wholesalers or at the market in Acayucan. The profits are small and the customers of the shops are primarily friends, relatives, and neighbours. In these shops, customers are often able to buy on tick. In Morelos, the diversity of the products for sale is limited, so many people still travel to Acayucan to replenish their household stocks. Data from the household survey shows that, in general, the husband owns the shop.

In Morelos, there are also a few households which own a *cantina,* selling bottles of beer at their compound. The customers of the *cantinas* are mainly close friends of the owner. These groups of male friends mutually help each other with the work at their *milpas,* and afterwards they spend their afternoon drinking beer together. Other people, mostly representatives of the farmer groups, sell fertilisers and other agricultural inputs to farmers in the village. These representatives have connections with local authorities and representatives of the Ministry of Agriculture and, therefore, receive some reduction on purchases which they resell to farmers in the area.

Another livelihood activity of households in the study area is providing services. For example, the local transport to Acayucan is organised by villagers who invested in a pick-up car and an official driving license. Other men invested in small trucks to provide a transport service for farmers to go to and from the fields during the mornings and afternoons. These trucks are also used for ferrying firewood or agricultural produce from the fields to the village. A small group of young men offers various services on an irregular basis such as providing assistance with electricity cables or water pomp problems, building of a house, making bricks from cement, or cutting trees in the garden. These services are not provided on a strict hourly wage but people help each other based on reciprocal relationships or an amount agreed beforehand.

Finally, a few women have their own business and sell products such as poultry or cloths or prepare dishes for sale, such as *tamales* and *costillas* (spare-ribs). The scale of these businesses is small but they can still provide significant income for the household. However, most women are not allowed to do this kind of work by their husband, and other female respondents indicate that they do not participate in business because they do not know how to organise it or cannot count the change.

Non-agricultural wage employment

A couple of households in Morelos have – primarily male – household members who are working as a day-labourer in neighbouring cities and villages, such as in the construction sector, e.g. as painter, stucco worker, electrician, cable man, etcetera. This type of work is easy accessible since it requires neither special education nor a diploma. The people who apply for these jobs have frequently acquired the necessary skills and experience by building or extending their own house. Other non-agricultural work that people perform is as soldier in the army, shop attendant, truck driver, (door-to-door) salesman, domestic

worker, or gardener. Most of these wage workers have to travel to their employer, as in Morelos there are no paid job opportunities outside agriculture. If the location of the work is distant, people stay overnight during the week and return to their families in Morelos at the weekends.

Non-labour income

Households can also receive some money from non-labour sources by renting out land and by participating in governmental support programmes. A few land owners rent out small pieces of land to others. In particular, female-headed households rent out their land to male relatives who use it for the production of maize. The rent is generally paid in pesos and people pay about 500 peso per hectare per maize cycle. Sometimes people also pay part of their rent in maize grains. Old women, in particular, receive maize as part of the payment so that they do not have to buy maize at the market.

Most households receive money from various government programmes aimed at supporting vulnerable households. The most common source of financial support is Oportunidades. Every two months all households with children and elderly people receive a budget to spend on health and educational purposes. Households consider the transfer as a free budget to spend on whatever is necessary. PROCAMPO is another often-mentioned source of income. The financial support from PROCAMPO is aimed at stimulating agricultural improvements, but in fact is spent more on alcohol and personal items for the husband or food for the household.

Finally, a few households receive remittances from migrated family members. The remittances are often used for expensive purchases such as school uniforms, shoes, bricks, and house ware. However, many households do not receive any support from migrated family members. Key informants indicated that not all households expect remittances from their migrated sons as they have started their own family in a new place and have their own difficulties and struggles. *"We do not expect money from our son because life is complicated for him as well, even though he lives in a big city. He has his own responsibilities for meeting the needs of his household"* (Emanuel López, 55).

4.4.3 Contemporary livelihood strategies

The agricultural policies under liberalisation removed most of the support towards maize farmers. Due to the withdrawal of state support, along with rising prices for agricultural inputs and low maize prices, the crop lost its relevance as a profitable venture (cf. Preibisch *et al.*, 2002). In this section, I use cluster analysis to examine the different adaptation strategies in response to these changes (see Table 4.3). Contrary to what economic models have predicted, the cluster analysis demonstrates that maize farming still is the main economic activity in the study area: 67 per cent of the households are classified as maize farmers. Hence, the majority of the households continue the tradition of producing maize instead of switching to non-farm or off-farm livelihood activities. The other households either diversify into off-farm activities or take up cattle breeding. Below the three strategies are discussed in more detail.

Table 4.3 Livelihood strategy categories estimated via K-median cluster analysis

	Cluster 1		Cluster 2		Cluster 3	
	Mean	*S E*	*Mean*	*S E*	*Mean*	*S E*
Land allocation						
(% of cultivated land)						
Maize	99.1	.40	92.2	3.03	48.1	3.97
Pasture	0.9	.40	7.8	3.04	51.9	3.91
Labour allocation						
(% of productive time)						
Farm self-employment	97.1	.65	39.6	2.79	83.4	3.93
Farm wage employment	0.7	.34	20.9	4.01	3.6	1.69
Non-farm self-employment	1.5	.50	12.9	3.66	10.8	3.45
Non-farm wage employment	0.7	.32	26.2	4.72	0.1	0.00
Domestic time and education	47.3	1.35	40.7	3.25	44.9	4.34
(% of total household time)						
Agricultural time allocation						
(% of farm self-employment)						
Maize	99.1	.44	93.4	2.97	74.0	3.56
Pasture or cattle- breeding	0.9	.24	6.6	1.20	26.0	2.76
N (%)	135 (67.5%)		40 (20%)		25 (12.5%)	
Asset Index	-0.31		0.68		0.56	
Name livelihood strategy	**Maize farmer**		**Diversified smallholder**		**Cattle and pasture farmer**	

SE = Standard Error

Strategy 1: Maize farmer

This livelihood strategy corresponds to the biggest cluster and comprises about 67 per cent of the households in the sample. The most distinguishing feature of households in cluster 1 is that they primarily allocate their household productive time (about 97%) and land (99%) to the production of maize. The survey data indicate that smallholders choosing for this type of livelihood strategy often apply for financial support from PROCAMPO to intensify their maize production. They rarely supplement their maize income with on-farm and off-farm alternatives or other opportunities created by market liberalisation. This category of farmers has the lowest level of wellbeing of the three clusters based on their low Asset Index score.

Strategy 2: Diversified smallholder

Twenty per cent of the households in the sample have diversified their income by engaging in activities outside their farm. The households in this cluster spend the majority of their land (92%) and about 40 per cent of their productive time on maize production. The remainder of their time they spend mostly in temporary on-farm wage-employment at pineapple and sugar cane plantations or in the non-farm sector (47.1% of productive time). Besides, they spend a small percentage of time (about 13%) on non-farm self-employment. They have the highest average Asset Index of the three clusters, and therefore seem to have benefited most from the opportunities offered by the neoliberal

reforms. Notably, households in this cluster spend a high percentage of time on domestic work and education. This is another indication of a relatively higher wellbeing since they do not have to spend all their time on productive activities.

Strategy 3: Cattle and maize farmer

Cluster 3 includes households that use their agricultural land and labour not only for the production of maize but also for pasture: 52 per cent of land and 26 per cent of agricultural labour. In addition to farm self-employment, these households dedicate 14.5 per cent of productive time to non-farm and off-farm activities. This cluster represents 12.5 per cent of the households in the sample and has the second highest Asset Index. Key informants explained that these smallholders have used the opportunity created by the support programmes of the government (such as PROCAMPO *Capitaliza*) to invest money to start cattle-breeding and so respond to the increasing demand for meat.

Farmer portraits

Alejandro and Feliz Hernández García, a maize producing household (Cluster 1)

> *Alejandro and Feliz live in the centre of the village. Their compound borders a street that runs into the main street. When we meet, Alejandro wears his white vaquero (cowboy-head) pushed back. He is tall and slim and in his forties. Feliz is 40 years old, a bit shy at first, but is above all friendly and hospitable. During the conversations she serves us glasses of homemade juice made of fresh tamarind and water. She is the eldest of six siblings, but only two of them are still alive. Her mother is 70 years old and of ill-health. Feliz has been looking after her since the death of her father. Her mother shares a room with the youngest daughter and stays in bed all day. She has friendly wet eyes and her smile reveals one missing tooth.*
>
> *The house has a dirt floor and a roof of asbestos sheets. It consists of three rooms with no windows although each one has a doorway to the compound. The walls are made of cement blocks. A fourth room, somewhat separated from the main house, looks like a later add-on and is made of cement blocks. Their son Octavio (17) lives there with his wife Sandra and their baby boy. Octavio helps his father at the milpa and occasionally earns some extra money as a temporary construction worker in Acayucan. Together they share the kitchen and water well. The kitchen is outside under a roof of palm leaves. It consists of a fireplace with a comal (a flat iron tray on which tortillas are fried), a metate (traditional used rectangular quern on which tortillas are made), and a wooden table with five wooden chairs. No direct sunlight enters the kitchen. In the dark mornings and evenings a single light bulb is the only source of light. Behind the kitchen is an open fire place where daily waste is left to smoulder. The compound is surrounded by a hedge of cactus plants, shielding the house from the street and from the neighbours. Access to the street is through a narrow passage between their house and that of their neighbour's. The passage way ends with a piece of corrugated zinc that serves as a door to the street. Between the compound and the street is a gutter filled with plastic waste and mud.*

Alejandro and Feliz have never been to school. They learned Spanish through regular contact with market vendors and coyotes (middlemen). Together they have four children: two sons and two daughters. Octavio is the oldest child, followed by two girls (10 and 8) and one son – Alejandro Jr. – who is five years old. After the birth of Octavio, Feliz was afraid that she would not be able to bear more children. She prayed every night for a bigger family. After six years, her prayers were answered when she discovered that she was pregnant again. Recently, she participated in a course about contraception organised by the local health centre. Together with Alejandro she has decided to start family planning, by choosing for sterilisation.

Feliz is in charge of the household and takes care of the children. She is responsible for preparing meals, making tortillas, doing the dishes and cleaning afterwards. She primarily stays at home but leaves the compound for small groceries such as salt, oil, and soap. Feliz also brings her two daughters to the primary school located at the main street every morning. In the afternoons, they come home on their own and look after their younger brother. Feliz has never earned any money; she depends on the income that her husband earns with producing maize. At the beginning of the week, Feliz receives a small amount of cash to buy the necessary food for the rest of the week.

Alejandro is a respected man in Morelos. He is considered a competent farmer and hard-working. On his three hectares of land, he grows primarily hybrid maize and sells it as corn-on-the-cob to coyotes. On a small part of his plot he plants traditional criollo maize races for own consumption. Until recently, he intercropped with beans and squash, but the lower maize prices forced him to produce in a more intensified manner. Alejandro sells the hybrid maize to a young man (coyote) from Acayucan who has become a friend of his. The coyote is known to be accommodative and willing to lend money on reasonable terms if there has been a poor harvest and/or income levels are low. The loan enables Alejandro to invest in seeds when he is cash-strapped. He often repays in-kind following the harvest.

In Alejandro's household, the criollo maize grains are stored in plastic bags at the back of the kitchen. In March, both Feliz and Alejandro select the maize before they store it. Some of the seeds are used for consumption, others are kept for next season. For sowing, they select the large and healthy kernels that have a good "corazon" (heart) and avoid kernels with a dark tronquito (the pedicel where the kernel is attached to the cob). Alejandro explains that seed selection during full moon ensures that the ears produced from these seeds will grow best. When possible, the selection takes place at or around full moon.

Eduardo, one of Alejandro's best friends, lives a few houses down the street. He has a cantina, where Alejandro frequently drinks beer in the evening breeze together with friends. Alejandro is very sociable and loves chatting with his friends in the afternoon. Every day, Alejandro returns from his milpa between two and four o'clock to relax with his companions at Eduardo's compound. However, this year the rainy season is late. The weather has been very hot since April and Alejandro has not been able to start sowing. Instead of helping Feliz with the work

in the household, he leaves the house right after breakfast and only comes home for dinner when the sun has already set. He spends the entire day at the cantina of Eduardo. Feliz does not know exactly how much money he wastes on beer, but every day she receives less money to feed the children. Recently, she even had to borrow money from her sister to buy tomatoes and eggs. Her son Octavio is also not of great help. He has his own family to take care of. However, he also spends his days at Eduardo's cantina and shirks his responsibilities. As a result, Feliz is not only burdened with the care of her own family, but that of Octavio's as well. Every day Feliz struggles to get the main meal prepared in the afternoon. Before they start eating, she waits with the children for Alejandro to come home. Now and then Alejandro falls asleep at his chair under the almond tree at Eduardo's compound and arrives home very late. If he makes it home, he can be loud and abusive towards Feliz. She often has to protect her children from him. After diner, Alejandro usually collapses into a deep sleep in his bed. This gives Feliz the freedom to visit her mother and sisters who live at the other side of the village. Normally, Feliz is not allowed to leave the compound after sunset but Feliz takes advantage of his comatose state whenever she can. Feliz's oldest sister also has a husband who drinks a lot. The two women find comfort in sharing their fears and frustrations. (Case study 5, July 2008)

Anabel and Paco Pascual Felipe, a household with multiple income sources (Cluster 2)

Anabel (32) and Paco (34) have been married for 15 years. Since then they have lived together at the compound of Paco's parents located nearby their milpa. Anabel was born as a daughter of a well-known family in the village. She went to primary school where she studied until grade five. She left school to support her mother taking care of her little sisters and brothers. At the age of 17 Anabel became pregnant. Her father then arranged her marriage with the man who had made her pregnant. Anabel has given birth to four children: two daughters and two sons of which the youngest son died within the first months. The two daughters Guadalupe (15) and Beatriz (13) have completed primary school, while Gustavo (10) is now in grade five. Paco, although being the main breadwinner, has no formal education.

Anabel's father-in-law gave Paco two hectares of land for cultivation when Anabel came to live with Paco's family. Paco started sowing maize during the two production cycles in both summer and winter months. However, because the plot was small the yields were not sufficient to feed the family throughout the year. For this reason, Paco decided to start saving the money provided by the government programme PROCAMPO to diversify his income-generating activities.

Paco always wanted to have his own business. Instead of buying agricultural inputs, he decided to buy merchandise products and started a small shop. With the help of his brother, he built a small room next to his house to display his products. Since then, many neighbours, relatives, and friends frequent visit his shop to buy their daily groceries. Little by little, Paco was able to extend the assortment; he now does not only sell basic groceries but also provides services such as copying and telecom. Four years ago, Paco invested in the purchase of a Xerox copying

machine. He is still the only person in the village to own a copying machine. It generates significant extra income for Paco and his family. Business is booming as farmers that participate in credit programmes of the government frequently have to hand-in copies of official documents.

Paco often travels to Acayucan and other nearby villages to purchase merchandise for his business. Over the years, he has gotten to know many people and build an extensive social network that also functions as a safety net. His only son Gustavo runs the shop in the afternoons when he comes back from school. In Paco's absence, Guadalupe takes over in the morning, although Paco does not like his daughters to do anything other than domestic work. Anabel contributes to the household income by breeding chickens, which her husband sells in his shop. Paco gets a sparkle in his eye when asked about future plans. He shares his dreams with me of buying a jeep within seven years so that his son can start a transport service to Acayucan, an activity that could bring in a lot of money.

Guadalupe and her boyfriend Michael (18) decided to get married after having been together for three months. They know each other from school and fell in love during the daily chats they had on their way home. At the beginning, Paco was not convinced that the relationship would last, because he was afraid that Michael was not trustworthy like his father. However, after a few days he came around and agreed with their proposed wedding plans. Soon afterwards, Michael migrated to Sinaloa (a state in northern Mexican) for more than six months to earn money to pay for the wedding and for maintaining Guadalupe and their children in the future. During his absence, he called Guadalupe three times on the telephone at her compound. These conversations were short and cordial and focussed mainly on his work at the tomato fields and the difficulties he had with the Spanish language. They did not agree on the day of his return. Guadalupe waited anxiously for news of his arrival. A month ago, he suddenly appeared in the village. He did not come to the house of Guadalupe and did not speak to her. A friend informed Guadalupe that he had met another girl and that her relationship with Michael was over. After a week of sorrow, Guadalupe saw him in the street and hardly recognised him. He wore modern jeans, a shirt with an American slogan and a headphone! He had changed so much that Guadalupe now believes that it is for the better that they broke up. (Case study 3, June 2008)

Francisco and Estela García Duarte, a cattle farming household (Cluster 3)

"It is six o'clock in the morning when I wake up frightened. I hear my neighbour shouting through the loudspeaker that is fixed to the roof of his house and facing my direction. He sounds excited. I wonder if there is an emergency, so I listen carefully and found myself smiling: the torrent of words is a sales pitch for meat! "Francisco Perez has slaughtered a head of cattle and is selling meat per kilo at his house"; "Carlos Jiménez has healthy chickens for sale today"; "pork ribs are available at the compound of Señor Aleman"; and "Senorita Lopez has prepared delicious tamales this morning." My first Sunday morning in the field has begun! (Field notes, 22 June 2007)

On his compound in the shade of a mango tree, I meet Francisco. He is 31 years old, small and somewhat heavy set with a dark skin, a set of brown teeth and a dark brown moustache. He wears old, sun-bleached jeans, a black t-shirt with a beer logo print and a white vaquero on his head. Francisco talks with a loud voice and uses wild gestures to strengthen his stories. He strikes me as having a strong personality, a bit macho. He lives with his wife Estela (28) and two daughters at the compound of his father Tomas (50) and mother Amalia (48). Francisco has one sister and one brother. His sister moved in with her husband after her wedding and is currently expecting her sixth child. His younger brother, Angel, is a soldier for the Mexican army and is currently stationed in Chiapas to combat the illegal trafficking of persons. He works many hours a day and has a good salary. Angel transfers 2000 pesos to his parents every other month.

The house of Francisco's parents is a relatively big concrete house located on the main street. At the far back of the compound is a smaller house, where Francisco and Estela live with their two children. The roof has recently been renewed with new sheets of corrugated iron. Francisco shares the kitchen with his parents and his youngest unmarried sister. It is located in a separate hut made entirely of branches, a dirt floor, and corrugated zinc for roofing. The kitchen is dark and full of huge cooking pans and a few plastic stools. Next to the kitchen is a pila, a type of cement sink, where dishes are stacked to be washed. The compound is surrounded by a few trees, which offer some shade during the heat of the day. There is a latrine, which is shared by the two families. Behind the latrine is a low shelter where a donkey is stalled.

Francisco achieved a second degree of primary school. Estela did not attend school and is illiterate. She mainly speaks Popoluca and knows just a few words in Spanish. Their daughters, Anabet (10) and Lucía (8) attend a bi-lingual primary school and learn both Popoluca and Spanish. Together they speak Spanish and switch to Popoluca when they speak to their mother. Francisco is proud that his two children are going to school.

Francisco's father Tomas owns 23 hectares of land that until recently were used for the production of maize. Despite Tomas's hard work, the income generated was insufficient to improve the livelihood of his family. In 2000, Tomas and Francisco decided to get involved in cattle-breeding, as they believed this would lead to maximum returns on investment. Francisco also received about half of the land (11 hectares) to use as permanent grassland. In 2003, he applied for PROCAMPO Capitaliza and received a lump sum loan valid until 2008. With the money from PROCAMPO supplemented with cash borrowed from his brother Angel, Francisco bought five head of cattle. Today, Francisco owns eight head of cattle that he feeds with the pasture he grows throughout the year. Cattle-breeding is far less labour intensive than the cultivation of maize, and therefore he can help his father at the milpa during the demanding pre-sowing or harvesting periods.

Estela is mainly responsible for domestic tasks such as child-care and cooking. However, on Sundays she helps Francisco to sell meat to villagers to generate some extra income. On Sunday mornings, Estela goes to her neighbour with a

telecom shop to announce that Francisco has slaughtered a head of cattle and that meat is available for sale at their house. Estela then hangs up some big chunks of meat on a hook. She prepares the smaller pieces with a traditional sauce and sells them together with rice. She cooks the meat for many hours in an enormous saucepan on a wood fire in front of her house. Neighbours and relatives pass by to chat, to buy some meat or just to observe what she is doing. These social events dominate life on Sunday. Francisco really enjoys having lots of visitors and being the centre of community life. (Case study 4, May 2008)

4.4.4 Explaining persistence of maize production

Despite the strong disincentives to produce maize between 2007 and 2010, as explained in Chapter 1, many households in the study area continued to grow maize rather than purchase it at the market. Table 4.4 summarises the main reasons for producing maize.

Table 4.4 The main reason for the persistence of maize production as reported by farmers (N=200)

Main reason for producing maize	Percentage of farmers
I do not know how to growth other crops	24.5
Maize is basis of local diet/ implies food security	20.5
Family tradition	18.5
Other crops have many pests	12.0
There is no market for other crops	8.5
Village tradition/everybody cultivates maize	6.0
The soil is not adequate for other crops	7.0
Climate is not adequate for producing other crops	1.0
Other	2.0

About a quarter of the smallholders indicated that they do not have adequate knowledge or education to switch to other, more profitable crops. The same number of smallholders continues to produce maize because their own family (18.5%) and other families in Morelos (6.0%) have cultivated maize for many generations. Fathers teach their sons how to produce maize from childhood. This is reflected in the following excerpts.

"Producing maize is a family tradition. My father, grandfather, and all my brothers are farmers and all sow primarily maize. Since I was 6 years old, I have gone together with my father to our parcel and by doing so, I learned all aspects of the work." (Ernesto Arias Pascual, 28)

"Since early childhood I have gone together with my nephews to the parcel of my grandfather. When we were young, my grandfather taught us how to produce maize. Today, we help him with the heavy physical work on the land. I am happy that we have learned how to cultivate maize because that is what we eat every day." (Horacio Gutiérrez Pascual, 42)

> *"At school, boys do not learn how to provide food for their family. That is what they should know! Here (in Morelos) life is a daily struggle, also for those who have a formal diploma. Look at the sons of the doctor, despite that they both have finished secondary school, they do not have any advantage of being educated, as (non-farm) jobs are hardly present in the Sierra!"(Guadelupe Cruz Arismendi, 41)*

In addition, respondents indicated that eating homemade tortillas is part of their culture. For many generations, women have been making tortillas for their husband and children. This is one of the main responsibilities of women, which occupies a major share of their daily time. Making tortillas is a key role of women in household food security. Eating homemade tortillas is also a source of masculine pride and is linked to farmer identity. A key informant illustrated this as follows:

> *"The people of San Pedro de Soteapan (a neighbouring village) are lazy. They do not produce maize for the market and just live from the money they receive from PROCAMPO. They do not make their own tortillas but buy them in a tortillería (mechanised tortilla shop). Here in Morelos, there are no tortillerías because we are farmers. The tortillas from a tortillería are not filling and my husband would soon be hungry when working in the field." (Francisca Arias Jiménez, 22)*

In informal discussions women declared that homemade tortillas taste better and can be stored longer. The fresh maize dough is also an important ingredient in other traditional dishes such as *tamales*, *chamchamitos,* and *potzole*[56]. In interviews people indicated that another important reason for producing maize is that maize is the key source of calorie-intake while *"other crops do not take off the edge of hunger" (Paco Felipe Gutiérrez, 25)*. Producing your own staple is considered safer in terms of food security. Being able to feed oneself is an important drive to produce maize. People do not want to depend on the market and justified the production of maize like this:

> *"If you sow maize, you have the certainty that you will have something to eat. What if you depend on the market and you have no money to buy tortillas? You will starve to death!" (Liz Ramírez Pascual, 19)*

> *"In Morelos, people are poor but we always have tortillas to eat. When we have no money, I prepare many tortillas for my children that we eat with salt, tomatoes, or fresh eggs. That gives them energy for the rest of the day. If we did not have our own grains how could I feed my children?" (Patricia Arias Pascual, 33)*

> *"If you produce maize, you have food and do not need money." (Roberto Cruz Felipe, 43)*

It can be concluded that the preference for cultivating maize reflects a cultural tradition, is a source of identity, and is equated with being food secure. Reasons such as the limited

[56] *Tamales* are a traditional Latin-American dish made of *masa* (starchy maize dough), which is steamed or boiled in a leaf wrapper. *Chamchamitos* are a local type of *tamale*. *Potzole* is a Mexican maize drink.

market for other crops and constraints in soil quality for producing other crops, are less frequently mentioned.

4.4.5 Household characteristics and adaptation

In this section, the household variables which differentiate patterns in adaptation strategies among households are identified. A multinominal logit regression was run to analyse the relationship between household characteristics and adaptation strategy to get a better understanding of the type of households that are involved in alternative livelihood activities.

Table 4.5 Livelihood strategy choice, multinominal logistic regression (N=200)

Variable	Diversified smallholder		Pasture & cattle farmer	
	Coefficient	*SE*	*Coefficient*	*SE*
Household size	.480***	.142	-.094	.193
Sex household head (female = 1)	2.361***	.731	1.798**	.797
Age household head	-.014	.019	.043*	.025
Household dependency ratio	1.233**	.502	-.743	.697
Illiteracy household head (yes = 1)	-1.901**	.443	-.006	.591
Solar land title (housing plot) (yes = 1)	.152	.544	21.276***	1.357
Land owned (ha.)	.047	.039	.178***	.040
Constant	-2.237***	.827	-21.396	.

* significant at 10%; ** significant at 5%; *** significant at 1%
Log Likelihood = -125.44; R2 = 0.2596; Prob. Chi = 0.00
Maize farmer strategy (strategy 1) is the reference group (or base category)
SE = Standard Error

Table 4.5 shows the results of the logistic regressions that examine which variables would affect the probability for households to choose an alternative livelihood strategy other than maize farmer (the reference group). The households can be assumed to be reasonably homogenous in terms of agro-ecological (for example, climate) and physical (for example, access to regional markets) conditions.

Based on the data presented in Table 4.5, it can be concluded that households that have a female household head had a higher likelihood to be engaged in the diversified livelihood strategy or cattle-breeding strategy than in maize production. Survey data and key informant interviews indicate that female household heads are primarily widows. They look for alternative income sources to compensate the loss of the main agricultural producer, especially since maize production in the area is physically very demanding. This is also why older household heads are more likely to be involved in the cattle-breeding strategy than in maize production. There might be another explanation for this relationship. Cattle-breeding requires a significant financial investment. To obtain sufficient savings needs time.

Households that have an illiterate household head had a lower likelihood to pursue a diversified livelihood strategy than the maize producing strategy. Key informants indicated that people without any education often do not speak Spanish properly, which limits access to information and the possibility to switch to wage employment, even though the employment itself (at fruit and vegetable plantations and the manufacturing and tourism industry) does not require much education. Uneducated household heads may not be well informed about market prices and the benefits of pursuing other activities than producing maize. Household survey data on the main reason for producing maize confirm the relevance of access to information; 24.5 per cent of the smallholders indicated that they cultivate maize because they do not know how to produce other crops than maize (Table 4.4).

Households that are involved in a diversified livelihood strategy have in general relatively large families with many members of working age. This stimulates them to engage in other activities besides farming, as the household members can be involved in different income-generating activities besides the production of maize. Households with a high dependency ratio have higher likelihood of being engaged in the diversified livelihood strategy. Presumably, because each household member in the productive age category has to earn a higher income so as to provide also for the needs of the household members who do not have an income. Activities outside maize production seems to be more profitable as households involved in the diversified livelihood strategy cluster have a higher Asset Index score than the maize producers (Table 4.3).

Households that own more land have a higher likelihood to be engaged in the cattle-breeding strategy. These households have the security of permanent access to land for fodder and are therefore willing to invest in a stock of cattle. In Morelos, the land rental market is insecure, as it is based on informal agreements among villagers. The high risk of arbitrariness and abrupt ending of access discourages landless smallholders to invest in cattle. Moreover, for smallholders who rent land, income from maize production is hardly profitable and does not allow for high investments such as cattle. In addition, households owning land for housing are also more likely to be involved in cattle-breeding than in maize production. Households that own a land title for housing might use this as collateral to get access to capital which enables them to invest in cattle.

4.5 Discussion and conclusions

In the 1990s, the Mexican government signed various free trade agreements and started to implement neoliberal policy reforms to stimulate economic growth and alleviate poverty. Due to the introduction of NAFTA and the neoliberal policy reforms, farmers in the Sierra de Santa Marta in Veracruz no longer operate in a protected, semi-closed market, and their private incomes and livelihoods at the turn of the century were subject to both the opportunities and constraints of international markets. The traditional maize farmers were faced with the privatisation of the land and credit market, lower maize prices, higher prices for agrochemicals, and a shift in employment towards the manufacturing and agricultural export sector. To adapt to these developments, they could change their focus on maize production to alternative crops such as tomatoes and fruits, livestock, or off-farm employment.

I have assessed to what extent farmers have made these adaptations and who are most likely to adapt and thus benefit from the new opportunities. The results of the analysis contribute to the limited micro-level knowledge of adaptation processes of local actors and provide an understanding of the decisions that poor people make to specialise or diversify their livelihood activities. Moreover, they show the relation between livelihood strategies and levels of household wellbeing.

I found that local smallholders still primarily cultivate maize in spite of the low prices due to the enormous pressure of maize imports from the United States on the local price. Only 32.5 per cent of households are involved in livelihood strategies other than producing maize. Perhaps local producers need more time to adapt, so it would be interesting to repeat this study in the future. Farmers lack education, which limits their access to the information needed for change. However, the extensive interviews held among the local population suggest that at least part of the reason for sticking to maize cultivation against odds is the socio-cultural significance of maize in their society. The production and consumption of maize are deeply engrained in the local social and cultural fabric. In the study area, maize has not only a market value but also symbolises food security, pride, and identity, and employment for family members. The designers of NAFTA failed to take these 'shadow values' into account, leading to their inability to predict widespread refusal to exit maize production. This finding supports the few articles recognising that even though this behaviour is not income-maximising, it has meaning because it reflects the non-marketable value of maize and emphasises the social embeddedness of the livelihood adaptation process (Preibisch *et al.*, 2002; Ali, 2005; King, 2007).

Local smallholder farmers seek to overcome the lower maize prices and declining incomes by intensifying their maize production. Unfortunately, the intensive cultivation of hybrid maize requires the application of high levels of agrochemicals. This trend has had a dramatic impact on the (agro) biodiversity and puts pressure on income levels since the subsidies on fertilisers and pesticides were abolished.

A minority of the smallholder households has diversified their income into other activities than maize farming. A first group engages in off-farm activities, mostly as wage labourers. These households are relatively likely to have female heads and large families with many members in the productive age. This induces them to search for employment other than maize cropping. Other households have sufficient land to combine maize farming with cattle production. These are often older farmers who lack the physical strength needed for maize farming. The fact that households with more diversified incomes enjoy greater disposable income than those engaged purely in maize suggests that there is a large intrinsic value in maize production above its market price.

5

Trust and Livelihood Adaptation[57]

This chapter explores the relation between trust and household adaptation strategies in the study area. In particular, I analyse how levels of personalised, generalised, and institutionalised trust shape the adaptation strategy choice of smallholders, and find that households characterised by low levels of generalised and institutionalised trust are less likely to be involved in a diversified livelihood strategy. Instead, they tend to continue with the traditional activity of maize production. In contrast, high levels of personalised trust are associated with a livelihood strategy that focuses on cattle-breeding and pasture growing. I argue that trust explains why not all smallholders are able to readily 'catch up' with opportunities created by an expanding market. This chapter thus seeks to contribute to the debate on the role of trust in economic actions and decision-making processes of smallholders.

[57] Based on this chapter the following article will be published:
Groenewald, S.F. and Bulte, E. Trust and Livelihood Adaptation: Evidence from Rural Mexico. *Agriculture and Human Values* (accepted on 28 February 2012).

5.1 Introduction

I was walking along the verges of the village when I discovered that Morelos has a grain silo. It is an exceptional, modern building. It triggered my curiosity, as it was a conspicuous construction in a rural landscape. The building was closed and I decided to ask the neighbours about its history and usage. I entered a compound and asked for permission to disturb an older man during his siesta in his hammock. Despite the disturbance of his forty winks, he was willing to talk with me about the grain silo.

Soon, I found out that it was an emotionally charged topic. Horrified he told me that the silo was built in 2008 as a development project to facilitate the collective storage of maize grains. However, nobody was interested in collectively storing their product as people are used to sell their grains immediately after harvesting. Therefore the grain silo has never been used. "Pre-harvesting time is a hard time for us as we have to invest a lot of money in growing maize. At this time of the year, we face food insecurity and usually eat only two meals a day. Right after harvesting you desperately want money to feed your family. So why would people store their grains if they can also sell them?"

Two neighbours started to interfere in our conversation. One of them explained, "People in Morelos like to be autonomous; nobody wants to become dependent on others, even more when it comes to selling maize. We are not used to cooperate and sell our product in bulk, and we do not know how to organise it in such a way that we will gain from it"."Everybody is selfish and there will always be people who defraud, so for me the risks are too high."If I were to participate in this project, who can guarantee that I will get a good price for my product?" This idea triggered a discussion about trustworthiness of community members, and many recent examples of fraud passed in review. After a few beers the opinion of the men became more insistent, and they started to shout. This was for me not only a sign that the failure of the grain silo project was an uneasy topic, but also that it was time to leave the men to their beers. (Fieldnotes, 13 June 2008)

Since the 1980s, the Mexican government has implemented neoliberal policy reforms to stabilise the economy, stimulate efficiency gains and sustainable economic growth, and alleviate rural poverty. Consequently, the Mexican agricultural sector has undergone substantial reforms with far-going consequences for the livelihoods of smallholders (see also Chapter 1). Local smallholders are forced to adapt to economic pressures caused by increased competition by U.S. maize imports, weak local and regional demands, and large reductions in public sector support for agriculture (Wise, 2007). While there is a growing interest in identifying smallholders' individual adaptation strategies and measuring their impact on poverty, little attention is directed at explaining the factors that shape their choices for a certain adaptation strategy (Pelling and High, 2005).

Smallholders' adaptation to global change is a dynamic process of long-term shifts in household strategies in response to actual or expected effects of contextual change (Smit and Wandel, 2006). These strategies can reduce vulnerability or can enhance existing security and wealth (Davies and Hossain, 2007). In response to changing conditions, stress,

hazard, risk, or opportunities in the environment, adaptation can be reactive, concurrent, or participatory, spontaneous or planned (Pelling and High, 2005; Smit and Wandel, 2006). The social-economic environment is important because it determines people's access to resources, and therefore options and capacity to adapt (see Chapter 2). However, many studies on adaptation can be criticised for having a narrow focus on individual rational choice and ignoring the wider structural context in which decision-making takes place (cf. Pennartz and Niehof, 1999; Murray, 2001). Hence, little is known about the significance of macro-economic changes for rural livelihoods, and why some groups of actors are able to take up opportunities generated by an expanding economy, while others are not (Bussolo and Lecomte, 1999).

The main objective of this chapter is to investigate how trust influences adaptive behaviour of smallholders, affecting economic outcomes. I connect the notions of adaptation and social capital to obtain a better understanding of the social factors that influence household's adaptation choices. Since mid-1980, an increasing number of studies attribute economic differences between groups of actors in addition to standard economic variables to differential levels of social capital. While social capital could be called a container concept in social sciences, most studies agree it exists in three important dimensions: trust, social norms, and membership of social networks (Putnam, 1995; Portes, 1998; Durlauf and Fafchamps, 2004). In this chapter, the effects of trust on adaptation choices will be analysed.

Trust may be considered an asset for economic activities, as it promotes cooperation and stimulates more efficient social and economic exchange (Dasgupta, 1998). As stated by Arrow (1972:357), "virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." Economists have used cross-country studies to demonstrate a positive correlation between trust indicators and macro-level economic performance (Fukuyama, 1995; Knack and Keefer, 1997; La Porta *et al.*, 1997; Knack, 2000; Zak and Knack, 2001; Tabillini, 2007). Similarly, Easterly (2005) argues that top-down market reforms and liberalisation in the 1980s and 1990s in many developing countries failed to yield the desired results due to the absence of sufficient 'trust'. In addition, Uslaner (2002) argued that social trust causes positive economic outcomes such as volunteering, charity, and support for policies promoting growth.

Few studies pay attention to the factors that determine the relationship between trust and economic outcomes. I use the livelihood framework to unravel this relationship at the household level and to analyse the role of trust in the choice of adaptation strategy. I hypothesise that in the choices of livelihood strategy a relationship exists between trust and economic outcomes, and that switching livelihood activities requires a certain level of trust. For example, for giving up producing maize people need to trust the market system regarding their food security. Based on earlier studies I assume that current levels of trust are shaped by experience, which is why I use qualitative data on recent historical events in the social and institutional context to explain contemporary characteristics of trust. This chapter aims to contribute to a more comprehensive understanding of the historical 'embeddedness' of trust-building that contributes to shaping adaptive choices and actions. I provide evidence that households' capacity to adapt to market opportunities is shaped

by local trust indicators, and argue that livelihood adaptation should be understood within encompassing processes going on in the society at large. Before describing the data on which the argument is built, I first outline the conceptual framework, after which the local socio-historical context that has shaped current trust levels will be described. Subsequently, the data are described and the empirical approach presented. The section that follows contains the empirical results and interpretation. The chapter ends with a discussion and conclusion.

5.2 Conceptual framework

The term trust is used in a variety of distinct, and sometimes incompatible ways (Kramer, 1999). Trust may be seen as an optimistic expectation or belief regarding other people's behaviour and the social system of which they are part (Garfinkel, 1963). It involves people's belief in the intention of others not to harm them, to respect their rights and to carry out obligations (Sabatini, 2009). In other words, trust refers to the confidence that one will not exploit the vulnerabilities of the other (Gambetta, 1998). Following Fukuyama (1995:26), I consider trust "the expectation that arises within a community of regular, honest and cooperative behaviour, based on commonly shared norms on the part of other members of that community." Knack and Keefer (1997) argue that trust and norms of civic cooperation are stronger in countries with formal institutions that protect property and contract rights, and in countries that are less polarised along lines of class or ethnicity. Using cross-sectional data from 48 countries, Calderón *et al.* (2002) show that trust is correlated with financial depth and efficiency and with stock market development. Beugelsdijk *et al*. (2004) find that the marginal impact of trust on growth is greater in low-trust countries, and Ahlerup *et al*. (2009) show that the marginal effect of trust decreases with institutional strength. Social capital and formal institutions may be substitutes in development, so social capital is especially important for poor countries where formal institutions are weak. However, Tu and Bulte (2010) found that trust and formal institutions may feed off each other as well. Greater trust results in greater market participation.

Broadly speaking, the literature defines three types of trust. The first is 'personalised trust', existing within established relationships and social networks (Hughes *et al.*, 2000). The second is 'generalised trust' and comprises trust extended to strangers (Dasgupta, 1998; Putnam, 1998; Uslaner, 1999). The third type of trust is 'institutionalised trust', which refers to basic confidence in the formal institutions of governance, including fairness of rules, official procedures, dispute resolution, markets and resource allocation, or the political, tax or juridical system (Stone, 2001). The origin of these types of trust seems to vary. Personalised trust arises from repeated interactions (Fafchamps, 2002), while generalised and institutionalised trust is not based on personal experience but arises from the actors' general knowledge about the population and the support they have received from the government and formal institutions (e.g. Platteau, 1994; Knack and Keefer, 1997). Moreover, generalised and institutionalised trust is transmitted within the family, from parents to children (cf. Dohmen *et al.*, 2006; Guiso *et al.*, 2006; Algan and Cahuc, 2007). Tabillini (2007) argues that political institutions affect current trust attitudes and values with possible economic effects. Trust is influenced by political and economic outcomes in the past. This links up with the notion of agency and the idea that the contemporary

choices of actors regarding future trajectories are informed by past experience (Emirbayer and Mische, 1994).

Since current levels of trust are shaped by significant political and economic events, I first take a closer look at relevant developments in the recent local history. These historical variables will also play a role in the empirical analysis that follows.

5.3 Trust and community development in a historical perspective

5.3.1 The end of the Mexican Revolution: New internal conflicts and social friction

The Mexican Revolution officially ended in 1920, but peace between the various revolutionary bands and guerrilla combatants in the Sierra de Santa Marta did not prevail until 1928 (Kuhfuss, 2007). (See Appendix X for an amplification of Soteapan as the cradle of the Mexican Revolution.) New violent conflicts emerged because of a lack of consensus on the restitution of land among various groups of Popolucas. 'Comunalistas' fought for the restoration of the old situation preceding the revolution. Access to land was common at that time, without boundaries between the different communities in the Sierra. The young 'agraristas', in contrast, preferred the government's proposal to donate each community *ejido* land, and renounce common access to land to stimulate agricultural development and market integration (Velázquez Hernández, 2006). The internal conflicts resulted in the rise of a few political leaders who used the situation to acquire power and authority in a society with low levels of social stratification.

Due to these conflicts, a decision concerning the restitution of land was postponed and, consequently, local smallholders kept their long-established common access to land throughout the 1920s and 1930s. At that time nobody owned land, but usufruct rights were carefully guarded. People cultivated maize and beans on different small plots scattered throughout the lowland zones of the Sierra de Santa Marta. Abandoned plots became part of the public domain (Foster, 1943). People also grew other crops and plants in different ecological zones throughout the Sierra (Velázquez Hernández, 2001).

5.3.2 Foundation of Morelos: community as social capital

By the end of the 1930s, owing to the internal conflicts about land rights, small groups of young families left their villages to search for political and productive autonomy and established new communities (Leonard & Velazquez, 2006). The community of Morelos was founded on the site of an old ranch deserted during the revolution in 1937. The municipality of Soteapan required the institution of an Agrarian Committee[58] (*Comité Agrario*) of which the president became the key authority in the village, representing the community in the municipality. In addition, the villagers appointed one of the founders of the community as local judge to mediate interpersonal disputes among villagers.

[58] The agrarian committee was the first official authority that represented the community within the municipality of Soteapan.

At the time of origin, about 15 families lived in this new community. Agriculture was the main livelihood activity and cultivation was primarily for own consumption. Households were self-supportive and enjoyed a large measure of autonomy. There were no shops; men went to neighbouring villages to exchange their maize and beans for other products, such as salt, soap, sugar, and lime. Intra-household kin relations constituted the most important social network. Inter-household interactions were mainly confined to the exchange of products. Social life in the community was simple and collective action was rare. Key informants explained that the local authority occasionally convened a community gathering, during which community members discussed what improvements were needed in the village, and what collective action had to be taken. This type of communal work, a service to the community, was called '*tequio*'. The system existed until the 1970s. Case 5.1 describes the first memories of Hugo Felipe Arismendi (83) of life in Morelos.

Case 5.1 The foundation of Morelos

It was early morning when Hugo and his family arrived at what now is called Morelos. They arrived on foot together with their horse. The horse was packed with all the food and clothes they had. At that time, Hugo was about eight years old and excited about the start of a new life at another place. He assisted his father and uncle with the building of a small house from palm trees and wood. He gathered branches while his mother and little sisters helped with collecting and weaving palm leaves. It took them a few days before they finished their palm hut.

Daily life mainly consisted of gathering and preparing food. Every day Hugo went with his family to their self-made milpa where they cultivated maize and other products, such as kidney beans, squash, and yucca. They also gathered fruits and vegetables like mangos, bananas, oranges, and tomatillos in the forest surrounding the milpa. Now and then, small groups of male family members went into the mountains to hunt for wild animals. At that time, women also worked at the milpa and contributed to the gathering of food to feed the household members. Small children were tied to the women's backs during the day while they were working. Villagers often worked together at the milpa. For example, during harvesting time a group of about ten people harvested one day at the milpa of one of them and the next day at the milpa of someone else. Since they had no electricity people ate early with their family and went to bed when darkness set in.

The family was the keystone of social life. At that time, social interaction between different families was limited. People simply did not know what to say to each other and they were not used to have small talk. Moreover, men did not talk to women. The communication was in Popoluca, very direct, concise, and always purpose-driven. There was nevertheless a great sense of solidarity among the households scattered out in the area. All families worked collectively for the community. Senor Guadelupe Lopez was the first leader of our 'Comité Agrario'. He was the only one who could read and write. He organised meetings occasionally so that all household heads could come together and decided on what had to be done in the community, such as weeding the trails that connected the various houses and milpas.

When Hugo and his family started to live in Morelos, there was nothing. There was no running water; no shops; no telephone connection, and no road. There were not even any cattle. There was a horse trail to the river nearby. However, the natural environment was abundant and supplied fruits and vegetables for everybody. In addition, young men went on horses to nearby communities to exchange their beans and maize for products such as sugar, soap, salt, and lime. Once every 30 – 40 days, a small group of men went by horse to Acayucan to sell maize and beans. As this was a long journey, they normally left the village at approximately 2 am to arrive in the city at 9 am. Villagers had to make everything themselves; they made shoes from palm leaves, all houses were entirely constructed from wood and palm cane, and they used maize cobs instead of toilet paper. A few goods were exchanged between the households. For example, there was one man who could make candles, which he exchanged for soap that people bought in Acayucan. Families struggled to survive and used everything they could find. As there was no television, news was passed on via traders from other villages or it was picked up during the journeys to Acayucan.

Over the years, the availability of land triggered an inflow of new families from neighbouring villages. As a result, Morelos became one of the fastest growing communities in the Sierra, causing deforestation and a decline of the local natural resource base in the 1950s (Blanco Rosas, 2006). According to key informants, concurrent with the growth of the population, life in the village became more individual. Villagers did not trust the newcomers, and new conflicts started to arise about access to land. Despite the increased number of inhabitants, there were no clubs or associations, and people had few contacts with members of neighbouring communities, except for trade purposes.

5.3.3 Formation of the *ejido*: increased social stratification

Despite the disapproval of the local leaders who fought for the restitution of communal land, a group of 147 farmers of Morelos applied for *ejido* land in 1944 (Blanco Rosas, 2006). In 1956, the government granted their request and allocated 3590 hectares land to the community. From that time onwards, Morelos was officially an *ejido* – a community-based organisation in which members, or *ejidatarios*, held permanent usufruct rights to one or several plots. Under this system, any form of land transaction was outlawed since the Mexican government owned the *ejidos* (Bouquet, 2009). The newly obtained status of *ejido* changed the local governance structure by introducing three new institutions to replace the agrarian committee: an executive and representative body (the *Comisariado Ejidal*), a supervisory committee, and a general assembly, which comprises all *ejidatarios* (see further Appendix I).

The implementation of the *ejido* system affected livelihood activities and local social relations. It forced farmers to cultivate within the borders of the land allocated to the *ejido*, excluding them from access to areas more adequate for producing coffee, hunting, and fishing in other parts of the Sierra de Santa Marta. Moreover, the *ejido* system

created social inequality between smallholders, as only the 147 registered[59] *ejidatarios* had usufruct land rights. Consequently, unregistered household heads and sons of *ejidatarios* who just started their own household no longer had access to land. Those without such rights were called *avecindados*. Social conflicts arose as the *ejido* law conflicted with the tradition according to which not only each *ejidatario* but also each household head – registered or not – should have access to land for an assured supply of food. Conflicts about land intensified, and jealous community members attacked others with *machetes*, robbed each other's harvest, and expropriated community land. According to key informants, at that time, the level of trust among community members was very low, and many houses permanently closed their windows with shutters. Family life took place in the house, and women and children hardly left the compound.

Based on the local history, I hypothesise that the difference in rights between *ejidatarios* and *avecindado* affects even now the level of institutionalised trust in both groups of households, i.e. that *avecindados* are likely to have lower levels of institutionalised trust than *ejidatarios*. I will return to this in sections 5.4 and 5.5.

5.3.4 Land allocation and recovery of trust

Internal conflicts delayed the distribution of land. It was not until 1987 that all land was divided into individual parcels, and allocated to the *ejidatarios*. An important issue causing tensions among villagers was the location of the plots. Preferred plots were those at a short distance from the village. People ending up with land far away were put at a disadvantage. Hence, in what follows, I use the location of the plot as a variable in our empirical model as this might influence the level of trust in local authorities and governmental institutions. A group of *avecindados* organised themselves, and in 1985 asked the general assembly of *ejidatarios* for permission to split up the 590 hectares of common grazing land into individual parcels of 3 hectares each. This was the first time that a grassroots organisation was formed to realise a common goal in Morelos. The *ejidatarios* approved the request and granted 156 *avecindados* usufruct rights to land.

While this has attenuated internal conflicts and increased social cohesion, the level of trust among community members remained remarkably low. Respondents now indicate they hardly trust people beyond the household. Representative excerpts from interviews are the following:

> *"In Morelos you cannot trust many people. People are selfish. My husband cheats on me. This is why I only trust my own children. A few weeks ago I caught him going out with another woman in Acayucan. Maybe it is because of my age that I have a low opinion of the trustworthiness of people. Too often I felt a victim of corruption, lies, and fraud. That is why I lost all my credulity." (Alejandra Aleman Felipe, 74);*
>
> *"I do not trust any local authority or political leader. They all are bandits. They always guarantee developments and prosperity but they never realise their*

[59] According to key informants, a few household heads were not registered because they refused to participate in the national household census due to a lack of confidence in strangers.

promises. The same applies to the previous Comisariado Ejidal. Despite that he was the son of my brother, he deceived me by selling me fertilisers for twice the market price." (Roberto Cruz Hernández, 42);

"I know that if I tell my neighbours a secret or something personal, they will tell the entire community. They always gossip and spread scandals about other people. As a result, I always whisper when I talk about personal things because I am afraid that my neighbours will eavesdrop." (Claudia Velazquez Arias, 32);

"I never lend out money to family or friends because I am not sure they will pay me back. In our community, people often do not follow up on agreements." (Eduardo Mateo Pascual, 24).

Case 5.2 Informal exchange and support

Maribel Lopez Arismendi (63) recently moved into the compound of her son Paco. Maribel is a widow. Fifteen years ago when her husband Michael died, the 15 hectares he owned were inherited by his two sons. These sons cultivate the land together and every harvest they give Maribel about 150 kilo maize grains each. Although Maribel lives at the same compound as her sons, she has her own household and often eats alone. She uses about one kilo of grains a day to make tortillas of which she gives a large part away to relatives when they face a shortage. Family members frequently visit Maribel during the summer months to ask for a bucket of maize grains. Maribel is a generous person and she always shares her food with others if possible.

"I know how difficult the summer months are for mothers who have to feed many children. I always try to help them out. However, I also struggle to make ends meet myself. For this reason, I ask my grandchildren to collect me in return some fruits and vegetables in the forest when they go to the fields. During the year, they bring mangos, herbs, quillites, banana leafs or mushrooms depending on the season."

When Maribel eats alone the meals are simple and without meat. She is not used to prepare meat as her husband always did that for her. When she has diner together with Paco and his family she enjoys fresh chicken in the presence of her three grandchildren. Maribel helps her grandchildren when they need money by lending some pesos. However, she only lends money to relatives as she has bad experiences with lending money to children of a comadre (godmother of one of her children).

"Two years ago I lent some 2000 peso to Alberto, the oldest son of my comadre because he asked for it to pay for his wedding. His wife was already pregnant so it was urgent. I trusted him and gave him my income from Oportunidades. However, I regret my kindness as until today I have never seen a single peso back! I never talked about it with my comadre, and I doubt that she knows about it."

5.4 Data and empirical strategy

5.4.1 Data

Using a combination of qualitative and quantitative approaches to analyse the relationship between trust and household livelihood adaptation enabled me to place the quantitative measurements of livelihood strategies against a local social-historical and cultural background. The qualitative research on smallholder livelihoods included participant observation, semi-structured in-depth interviews, case studies, and life-histories with members of the local community. The qualitative data are primarily used to get insight into the socio-historical context. Semi-structured in-depth interviews yielded a first impression of the characteristics and developments of trust and social relations among community members. In life-histories, male and female respondents provided valuable information on historical events that affected trust. Case studies provided a holistic understanding of contemporary dynamics related to social networks and trust. Quantitative data on livelihood strategies and social capital was collected by means of a household survey. The household survey contained a section of questions on social relations and trust (see Appendix V – VIII).

5.4.2 Measuring trust

The household survey included a set of statements on trust, which are summarised in Table 5.1. The perceptions of respondents on the trust statements were obtained using a 5-level Likert scale (1 = strongly disagree and 5 = strongly agree). To reduce the multi-dimensionality of the trust variables a factor analysis was done. Based on a principal factor model with varimax rotation I defined three main factors underlying trust, representing personalised trust (factor 3), institutionalised trust (factor 2), and generalised trust (factor 1) (see Appendix XI). Importantly, the factor analysis generates data that are consistent with the theory section above. The Kaiser-Meyer-Olkin (KMO) measure of sample adequacy is equal to 0.84, which indicates the variables are appropriate and share a common value.

Based on the factor analysis I thus unbundle household trust (HT_j) into PT_j, an indicator for level of personalised trust of the head of household j, GT_j, referring to the level of generalised trust of the head of household j, and IT_j, an indicator for the level of institutionalised trust of the head of household j. I am interested in the impact of each type of trust on adaptation choices, and therefore include them separately in the model. The different trust indicators can be formalised as follows:

$$(5.1) \quad HT_j = \alpha_0 PT_j + \alpha_1 GT_j + \alpha_2 IT_j$$

were, α_0, α_1, and α_2 are parameters.

Table 5.1 Summarising statistics of trust variables (N=200)

Description variable	Mean	SE	Min	Max
Personalised trust variables				
I trust my family/friends	3.88	0.93	1	5
I trust my *compadres*	3.35	1.06	1	5
I trust my neighbours	3.04	1.08	1	5
Generalised trust variables				
I trust coyotes	2.48	1.14	1	5
I trust leaders of farmer groups	2.45	1.07	1	5
I trust other ejidatarios/farmers	2.56	1.11	1	5
In general, I trust most members of the community	2.65	1.10	1	5
In general, community members have a cooperative attitude	2.68	1.18	1	5
In general, community members are more focused on own individual goals instead of collective goals	2.73	1.09	1	5
In general, community members support each other	2.01	0.91	1	5
Institutionalised trust variables				
I trust the government and their policies	2.72	1.18	1	5
The government treats everyone equal	2.73	1.18	1	5
People are poor because they are not given the same changes as others	2.65	1.04	1	5
I participate in community activities	1.99	1.23	1	5
In general, community members participate in community activities	1.22	0.41	1	5

Note: The perceptions of respondents were obtained using a 5-level Likert scale (1 = strongly disagree and 5 = strongly agree).

Table 5.1 demonstrates that in general households have a higher score on personalised trust than on generalised trust or institutionalised trust. Only on personalised trust is the households' mean score higher than 3, while all other mean scores are lower. These low scores confirm the results of the in-depth interviews in which key informants depicted households as being solitary-minded, preferring to live independently, working individually, and not considering neighbours, friends, and other villagers as a source of support. Another remarkable outcome is the noticeably low score on community participation. On average, household's own participation in community activities is low, as is general participation in community activities of community members.

I first compare the means of trust levels between *ejidatarios* and *avecindados.* Consistent with my expectations, the data in Table 5.2 show significantly lower levels of institutionalised trust among household heads historically excluded from land titles (*avecindados*). There are no significant differences in personalised and generalised trust between the groups.

Table 5.2 Differences in mean trust indicators between *ejidatarios* and *avecindados*

	Ejidatarios **(n=55)**		***Avecindados*** **(n=145)**		**T-value**
	Mean	*SE*	*Mean*	*SE*	
Personalised trust	0.059	0.109	0.039	0.091	0.901
Generalises trust	0.188	0.135	0.105	0.084	0.609
Institutionalised trust	0.463	0.131	0.061	0.083	0.011**

* significant at 10%; ** significant at 5%; *** significant at 1%
SE = Standard Error
N=200

5.4.3 Model design

In Chapter 4 I use the following equation to estimate livelihood choice (*LC*):

$$(5.2) \quad LC_j = \beta_0 + \beta_1 CAPITALS_j + \varepsilon_{j,}$$

where $CAPITALS_j$ is a vector of the household capital endowments of household *j* and ε_i is the error term.

In addition, adaptation strategy choice is now hypothesised to depend on household trust indicators. I therefore extent the model from Chapter 4 to control for trust (*HT*):

$$(5.3) \quad LC_j = \beta_0 + \beta_1 CAPITALS_j + \beta_2 HT_j + \varepsilon_j$$

In Chapter 4 the household capitals that are included in this model are described and their characteristics are summarised in Table 4.1.

Integrating equation (5.1) into the model gives:

$$(5.4) \quad LC_j = \beta_0 + \beta_1 CAPITALS_j + \beta_2 \alpha_0 PT_j + \beta_2 \alpha_1 GT_j + \beta_2 \alpha_2 IT_j + \varepsilon_j$$

$$= \beta_0 + \beta_1 CAPITALS_j + \gamma_0 PT_j + \gamma_1 GT_j + \gamma_2 IT_j + \varepsilon_{j,}$$

where $\gamma_0\ \gamma_1\ \gamma_{2,}$ are the parameters of the trust variables.

I ran a multinomial logistic regression[60] to analyse the determinants of households' livelihood choice (see Chapter 4 and appendix IX), which predicts the probability that a household will select each of a set of alternative strategies compared to a reference strategy. The traditionally dominant strategy of maize farming was used as the reference activity, and the characteristics of households that have reverted to an alternative strategy was analysed. A positive estimated coefficient indicates an increase in the likelihood that a household chooses the alternative livelihood strategy; a negative coefficient indicates a lower likelihood.

5.4.4 Instrumental variables

To obtain consistent estimates of the causal effect of explanatory variable on the dependent variable, the error term of the model must not be correlated with the regressors (that is $E(\varepsilon|X) = 0$). This means that the choice for a certain livelihood strategy should not be determined by (omitted) factors that also influence differences in the level of trust among households. Similarly, before I can interpret the results of a regression model as 'causal', I need to rule out 'reverse causality'. That is, there may be two-way interaction. Trust can impact on strategies, but the economic activities emanating from these strategies in turn may affect trust levels as well. In such cases, the (conditional) correlation between regressor and dependent cannot be interpreted as a causal effect. A common approach to overcome these potential endogeneity problems is to use an instrumental variable (IV) estimator (Dougherty, 1992). This instrumental variable, W, needs to be correlated with the endogenous variables X, and uncorrelated with the error term (so $E(\varepsilon|W) = 0$). Hence, I am looking for exogenous variables that determine trust levels, and do not affect strategy choice in any other way than via trust levels. Needless to say, finding such instrumental variables is difficult (Angrist and Pischke, 2009).

I hypothesise that personalised trust may be treated as an exogenous variable, built up slowly over one's life in response to extended periods of interaction with relatives and friends. I tried to find a suitable instrumental variable to explore this issue further, but was unsuccessful. This implies the coefficients for personalised trust should be treated as associations only, and not that necessarily as causal effects. The same is true for the outcomes of generalised trust.

However, I was able to find an instrumental variable for institutionalised trust, basing my choice on the social and historical context (see Section 5.3). Past experiences influence current levels of trust: people disadvantaged by official authorities in the past might have low levels of institutional trust today. The recent past is characterised by much internal conflict concerning access to land. Some farmers were able to keep the land that they were used to cultivate, while others did not receive land titles or received parcels far away. Since trust is transmitted over the generations, I assume low levels of institutionalised trust among this latter category of farmers as well as among their children. The role of land title and distance of the parcel to the compound is summarised in the following equation:

[60] I use a multinominal logit model because adaptation strategy choice is a polychotomous variable, i.e. it is a categorical variable with more than two values.

(5.5) $IT_j = F(TITLE_j, DISTANCE_j)$[61]

where, $TITLE_j$ refers to the dummy variable for having a parcel land title of household$_j$ (1 = yes) and $DISTANCE_j$ refers to the distance of the parcel of household$_j$ to their compound (in meters). In case the household head was younger than 40 years old, I asked about the distance and land title of his/her father instead because they were too young to obtain land in 1985.

5.5 Results

5.5.1 Correlations between trust and livelihood strategy choice

Based on the livelihood strategies clusters defined in Chapter 4, I ran a multinomial logistic regression (Appendix IX) to analyse how personalised, generalised, and institutionalised trust influenced household's livelihood choice. The outcomes are presented in Table 5.3.

Table 5.3 Trust and livelihood strategies, Multinominal logistic regression

	Diversified smallholder Strategy		**Cattle and pasture farmer strategy**	
	Coefficient	*SE*	*Coefficient*	*SE*
Personalised trust	-0.474*	0.267	0.492*	0.288
Generalised trust	0.507**	0.234	-0.286	0.321
Institutionalised trust	0.839***	0.259	-0.451	0.324
Household size	0.579***	0.156	-0.074	0.214
Sex Household head (female = 1)	2.434***	0.772	1.981**	0.874
Age household head	-0.024	0.021	-0.034	0.028
Household dependency ratio	-1.589***	0.542	-0.797	0.784
Illiterate household head (yes = 1)	-0.628	0.493	-0.132	0.664
Solar land title (housing plot) (yes = 1)	0.240	0.597	20.629***	1.565
Land owned (ha.)	0.017	0.042	0.198***	0.045
Constant	-2.752***	(0.889)	-21.594	.

* significant at 10%; ** significant at 5%; *** significant at 1%
Pseudo R2 = 0.3676; LR Chi2 (20) = 124.55
Maize farmer strategy (strategy 1) is the reference group (or base category)
SE = Standard Error
N=200

[61] This assumption is reliable as the quality of soil is everywhere the same and based on a pair wise correlation test so that I can conclude that there is no significant correlation between "distance", "title" and "strategy 1,2 or 3".

The model outcomes help me to obtain a better understanding of the factors that determine livelihood adaptation choices. Households having more generalised and institutionalised trust are more likely to be involved in the diversified livelihood strategy than those in the maize producing strategy. By contrast, high levels of personalised trust are negatively correlated with livelihood diversification but positively associated with the cattle-breeding strategy. This means that people with high levels of personalised trust are more likely to be involved in cattle-breeding and pasture growing than in the maize production strategy. At the same time, people with a high score on personalised trust are less likely to be involved in the diversified livelihood strategy than in maize production.

Not surprisingly, the table also demonstrates that other household characteristics are correlated with livelihoods. For example, households owning many hectares are more likely to be engaged in the cattle-breeding strategy than in maize production. Similarly, households entitled with *solar* land (land for housing) are more likely to invest in cattle-breeding than continuing maize production. Households with female household heads appear to be involved in an alternative strategy and are less likely to pursue maize production. Furthermore, household size matters: it is positively correlated with participating in diversified livelihood strategies. Moreover, high dependency ratios are positively correlated with being involved in maize production. These outcomes are consistent with the results of the multinominal regression estimated in Chapter 4 (see Table 4.5).

As mentioned, the analysis potentially suffers from an endogeneity problem. For example, one could argue that people participating in diversified livelihood activities are more involved in markets and learn more about the intentions and behaviour of others which may enhance trust (Tu and Bulte, 2010), or perhaps there are omitted variables driving both trust and livelihood choice. I therefore ran a probit regression for endogenous covariates, where I used instrumental variables for institutionalised trust (using land entitlement and location of the parcel as excluded instruments in the second stage). The outcomes of this model were only significant in case of strategy choice 1, the diversification strategy, as shown in Table 5.4.

In case of the diversified livelihood strategy, the results of the first stage suggest my instruments are able to predict institutionalised trust (i.e. to identify exogenous variation in this potentially endogenous variable). Moreover, the (predicted) institutionalised trust still enters significantly and with the correct sign in the second stage of the analysis, supporting the view that there is a positive causal relationship between institutionalised trust and diversified livelihood strategy. Hence, households having more institutional trust are, as a result of that, more likely to be involved in the diversified livelihood strategy. For the cattle-breeding strategy and maize production, institutionalised trust is not a significant variable. This outcome corresponds with the outcomes of Table 5.3.

Table 5.4 Trust and livelihood strategies, probit regression with instrumental variables

	Diversified smallholder Strategy		**Cattle and pasture farmer strategy**		**Maize production strategy**	
	2nd stage	1st stage	2nd stage	1st stage	2nd stage	1st stage
Institutionalised	.911**		-.817		-.512	
Trust	(.377)		(.625)		(.491)	
Personalised	-.186		.043		.033	
Trust	(.171)		(.244)		(.137)	
Generalised	.135		.101		.003	
Trust	(.192)		(.429)		(.170)	
Included 7 control variables (CAPITALS)	Yes	Yes	Yes	Yes	Yes	Yes
Land title		.011*		.010*		.010
(1 = yes)		(.006)		(.006)		(.006)
Distance		.0001***		.0001**		.0001***
		(.00005)		(0.00006)		(.00005)
Wald test of exogeneity Chi2(prob)	1.58 (0.4471)		0.42 (0.5171)		1.14 (0.7081)	

* significant at 10%; ** significant at 5%; *** significant at 1%
Standard errors in parentheses
N=200

5.5.2 Interpreting the quantitative results

To interpret and complement the outcomes of the survey, qualitative data are important. The data confirm the associations resulting from the multivariate analysis (Table 5.3), and support the view that the relations between personalised and generalised trust are not only associations but causal relations (even if I do not have appropriate instrumental variables to formally 'test' these hypotheses). Moreover, the data validate the direction of rationale: trust determines livelihood choices.

Trust and livelihood diversification

The diversified livelihood strategy includes households that allocate a considerable percentage of their labour to non-farm and off-farm income-generating activities. Both push and pull factors stimulate livelihood diversification. Low maize prices and high input costs force smallholders to get involved in additional (non-farm) income generating activities. And changing market conditions and increasing demand for agricultural labour in other areas of the country have stimulated (temporary) migration among farmers from Morelos.

Frequently, household members hear about job opportunities from villagers, middlemen, or suppliers in Acayucan. Thus, access to an extensive network enables people to get involved in off-farm livelihood activities. For this reason, generalised trust is positively associated with the livelihood diversification strategy. The chance to gain additional income makes young men leave their family for a few weeks, months, or sometimes years to work in the construction industry or at fruit plantations. People without strong kin ties are more likely to stay away from their household for extended periods of time. Consequently, low levels of personalised trust are associated with people pursuing labour work outside the community. Finally, people who leave the village for a long time are not able to continue their maize production or other agricultural activities. This requires a high level of institutionalised trust as they have to give up their source of food security and become completely dependent on the market.

Another common type of non-farm work is starting your own business. This livelihood activity requires a high level of generalised and institutionalised trust. A good relationship with middlemen and wholesalers may lead to price reductions or deferred payments, which are crucial to remain in business in the first months. Moreover, running a small shop or *cantina* (small bar) involves generalised and institutionalised trust, as you have to negotiate with strangers and become an active player in the market.

Trust and cattle-breeding

Farmers engaged in the cattle-breeding strategy own a few head of cattle and/or use (part of) their land for pasture instead of maize. Farmers do not have to visit their cattle every day, as the cows are not used for dairy production. They just lead the cattle to the pasture land and occasionally check their livestock. Cattle-breeding is often combined with growing pasture. This is a labour-extensive activity, since pasture needs less fertilisers and pesticides than maize. Consequently, smallholders involved in this strategy are less dependent on hired labour, and interact less with other people. For this reason, trust in strangers (or generalised trust) is not crucial for them.

In contrast, households involved in cattle-breeding often work close together with kin. Investments in cattle are high, and frequently family members share the costs. This involves agreeing on when to slaughter, sell, or buy livestock. Households often start working together when two or three sons each inherit a part of their father's land. They may collectively sell a part of the land and invest the revenues in purchasing head of cattle. Many times, brothers live at the same compound, which stimulates cooperation. Collective investment in cattle requires a high level of trust among kin. This explains the positive association between cattle-breeding and personalised trust in the Table 5.3.

Case 5.3 Cattle-breeding

> *In 2008, Manual (53), the father of Fernando (32) and Ernesto (30), decided to give up maize production and invest in cattle instead. This idea stemmed from his cousin who was making money with a few head of cattle while he was working day and night without sufficient yields to feed his family. He discussed his plan to give up maize production with Fernando and Ernesto, who worked with him in the field. They readily agreed and immediately started to investigate the best places to buy cattle and secure funds for this investment.*

To collect the money, Manual rented out four of his 10 hectares of land to a neighbour for 1000 peso per hectare per year. The remaining six hectares he partly used for grazing and for growing pasture to sell at the market. Fernando decided that he would give up his small shop, and sell all his products in stock. Ernesto saved money by doing small jobs as a construction worker in addition to his work at the plot of his father. Over a period of one year Manual and his two sons were able to buy six head of cattle. They own two head of cattle per household each, which are collectively cared for. This gives each household the right to decide individually when to sell one of their animals.

Every day one of the two sons goes out to the cattle to check if they have enough drinking water, whether the animals are healthy, and if there are no holes in the fence through which cattle can escape or be stolen. Rumours abound of cattle robbers steeling a head of cattle during the night and selling it the next morning at the local market. Manual is responsible for the pasture, and during sowing and harvesting time, he works in the field on a daily basis. Throughout the other months, he spends most of his time with his wife and grandchildren at the compound.

In 2010, two calves were born, and a yearling was purchased collectively from a friend. They gained most of their money back through selling pasture and renting out land. Soon they will be able to sell their first head of cattle.

Trust and maize production

Traditionally, smallholders produce maize to support themselves. From generation to generation, smallholders have transmitted the knowledge on how to grow maize. Consequently, households can cultivate their own produce without any interference of others. For this reason, while trust in kin is important, trust in people beyond the household or in the institutional environment is not required. This is in line with the norms of autonomy and individuality that prevail in the community.

However, since the introduction of monoculture maize production and the introduction of improved seed varieties at the beginning of the 1990s, smallholders have become more dependent on agrochemicals such as pesticides and fertilisers, the application of which is labour-intensive. To produce greater market surpluses, smallholders are using these agro-chemicals and hire wage workers for support. While, historically, reciprocity among kin relations beyond the household and close friends was common, nowadays everybody wants to receive a daily wage for their labour. As a result, an increasing number of smallholders hire people outside the family. This makes generalised trust become more important.

Since the liberalisation of the agricultural sector and the withdrawal of government supports to smallholders, the input market has become complex with a wide spectrum of suppliers. The position of the smallholders tends to be weak because of their lack of education and knowledge. As a result one would expect that smallholders are more dependent on knowledge and information sharing with others, so that in the future personalised and generalised trust will play a more important role in maize production.

Case 5.4 The role of kin in maize production

Fidel Mateo Hernández is 32 years old and was born in a shed at his fathers' maize field. At the age of six he went to a primary school in Morelos where he studied up to the fourth grade. He was born in a family with five children. Now he has two living brothers and one sister. His youngest sister was killed at the age of 12 by a thunderbolt. Fidel got married at the age of 17 to Petra and together they got three children: Marcelo (14), Fernando (11), and Felicita (9). The youngest two children go to primary school. Two years ago, Marcelo finished primary school and ever since helps his father in the field with the production of maize. Petra (30) spends most of her time on housekeeping and taking care of the children.

Fidel hires three hectares land from his neighbour to cultivate maize. He produces for own consumption and the market. His parcel has a good quality of soil and usually he is able to produce three tons of maize per hectare. Apart from the sale of maize, Fidel has no sources of income. Petra complements the household income with the money she receives from the government programme Oportunidades for the education and health costs of the children. They use the money from Oportunidades for household necessities, such as food, clothes, shoes, and school books.

Fidel and Manual work hard to produce the highest possible harvest on their land. They lack money to hire labour. During sowing and harvesting time Fidel's brothers and their sons come to help with the work in the field. In return Fidel and Manual help them when they need additional labour. Fidel says that labour is his main constraint, explaining: "Not being able to hire labour is a huge problem. The help of my brothers at peak season is vital. Without their support I would not be able to produce enough to secure a livelihood for my family."

5.6. Discussion and conclusions

A growing literature identifies the importance of adaptation strategies for dealing with variability and change in the socio-economic systems in which smallholders live. I argue that social capital – and trust in particular – offers ways into understanding the role of the social and institutional context in such adaptive behaviour. I base my conclusions on a qualitative and quantitative analysis of the relationship between trust and livelihood strategy choice. In particular, I investigated the role of personalised, generalised, and institutional trust in the choices smallholders made to adapt after recent neoliberal market reforms.

The most significant result is that households with a high level of generalised and institutionalised trust are more likely to invest productive assets (time and land) in alternative livelihood strategies. By contrast, households with high personalised trust are more likely to be engaged in cattle-breeding and pasture growing activities.

While such correlations are of interest in themselves, they are even more interesting when they can be interpreted as 'causal'. The data allow me to verify this for one specific form of trust, namely institutional trust. The qualitative analysis of the local historical context suggests one plausible instrumental variable that I have used for this purpose.

The historical analysis suggests that livelihood adaptation is the result of long-standing processes that are intertwined with processes of community development and trust building in which contingencies and path-dependency play a significant role. I described how changing market conditions and macro-economic policy reforms have affected the external vulnerability context of smallholders in Morelos. In the course of three generations, land tenure and the farming system changed from an indigenous slash-and-burn, a patchy, common land-use system, into the *ejido* system characterised by individual usufruct land rights, and finally into a community of smallholders with individual land titles. In this process, not all smallholders were treated equally, and not all households have benefitted from new land titles or land reallocations. I used this information to construct an instrumental variable model by assuming that smallholders who received land titles have a higher level of institutional trust than smallholders who did not. Moreover, the location of the appointed land is used as an instrumental variable since plots located nearby the community were preferred. The outcomes of the instrumental variable model validate my assumption that institutionalised trust partly determines the adaptation choice of households. However, it is important to emphasise that the coefficient is small, and the role of institutionalised trust appears relatively modest.

Another result is the positive association between personalised trust and participation in cattle-breeding. Although I did not find an appropriate instrumental variable to verify a causal effect, in-depth interviews with local farmers made clear that, before starting cattle-breeding activities, households often have a high level of personalised trust. Frequently, smallholders and kin relations invest together in cattle as this livelihood strategy requires sufficient land and a starting capital. This supports the view that personalised trust shapes the livelihood choice.

Overall, lack of generalised and institutionalised trust seems to explain why most smallholders continue producing maize. People who do not trust 'markets' show risk-averse behaviour, and prefer to provide for their own food rather than search for other livelihood opportunities. Hence, trust and formal institutions are complementary in the sense that greater trust in strangers and institutions results in greater market participation. This is consistent with evidence presented by Tu and Bulte (2010). The brand new grain silo lying deserted at the edge of the village symbolises the lack of trust among farmers. People do not trust each other, which discourages cooperation and the collective storage and sale of maize.

6

New Types of Social Capital: Farmer Group Formation[62]

This chapter highlights the interfaces between micro-level livelihoods, social networks, and macro-economic trends and policies. Specifically, it analyses the role of social networks in livelihood adaptation. The main argument in this chapter is that neoliberal market changes have shaped the local social structure with constraining and enabling effects for households' adaptation capacity. At the same time, the chapter describes how – in return – the outcomes of the neoliberal policy reforms are being (re)shaped by the responses of the people, thereby changing the structural context. This chapter provides evidence for the heterogeneity of adaptation processes as it demonstrates that outcomes of neoliberal policy reforms are influenced by farmers' participation.

[62] Based on this chapter the following article has been submitted:
Groenewald, S.F. and Niehof, A. Social Limitations to Adaptation: Responses of Maize Producing Households in Neoliberal Policy Reforms in Mexico. *Rural Sociology* (submitted on 13 February 2012).

6.1 Introduction

I observe Doña Elise (83) killing a goose early one morning. She seems very experienced as she wastes no time in plucking and preparing the goose for cooking. She washes the animal and marinades the meat in a huge pan. Whilst the meat is marinating she prepares an enormous pan with maize dough and boils it above a fire, which has been especially made in the middle of the kitchen. A daughter, who passes by for a small chat, helps Doña Elise with the heavy work of moving the pan with maize dough onto the fire-reduced wood charcoal. She has to use a paddle to stir the contents of the pan. Together with a few grandchildren, Doña Elise envelopes the maize dough together with the goose meat in maize leaves which she will later sell as' tamales' to the villagers.

After a whole day of boiling, the tamales are ready for sale. Doña Elise asks one of her grandchildren to walk to her neighbour to make use of his loudspeaker service. A few minutes later, a loud voice announces to the community that Doña Elise will be selling tamales in her kitchen for 5 peso each that evening. I join Doña Elise in the kitchen and together we wait for the customers. Soon a small boy arrives. He does not say anything and just hands over 15 peso. Doña Elise knows that this means that he wants three tamales. She puts three tamales in his plastic bag and the boy leaves. The transaction was completed without a word having been spoken. Soon two other villagers entered the dark kitchen: an older man and a young woman. Doña Elise nods her head in the direction of the woman. In response the woman says "four". She then asks the man "how many?" It takes some time before Doña Elise has prepared everything. Nobody says a word. The customers wait in silence. When Doña Elise hands over the tamales to the woman, she says "greetings to your mother." More customers followed and, by the end of the evening, Doña Elise has no tamales left over. (Field notes, 10 June 2008)

Proponents of market liberalisation make a strong case that for smallholders to succeed in the global economy, it is necessary to create an entrepreneurial culture in rural communities that encourages farmers to produce high-value crops and become engaged in value-adding activities such as agro-processing (Hellin *et al.*, 2007). Accordingly, governments have shifted the focus from production-related programmes to more market-oriented interventions (Barham and Chitemi, 2009). Mexico's neoliberal agenda opened up the agricultural sector to global competition, which was followed by the phasing out-of most government-supported or subsidised agricultural programmes. These policy reforms have supported diversification and entrance into export markets in non-traditional, labour-intensive crops (Getz, 2008). This attracted renewed attention to the role of institutions, collective action, and farmer groups in enhancing farmers' access to markets and allowing them to benefit from emerging market opportunities (Uphoff, 2000; Pelling and High, 2005; Hellin *et al.*, 2007; Adhikari and Goldey, 2010).

A growing body of literature shows livelihood adaptation to be a dynamic social process, implying that the capability of societies to adapt is partly determined by the ability to act collectively (Burton *et al.*, 1993; Adger, 2003). Social capital, built up of "the norms and networks that enable people to act collectively" (Woolcock and Narayan, 2000:226), is a necessary 'glue' for adaptive capacity (Burton *et al.*, 1993). Bebbington (1999) and others

have argued that social networks bring with them an inherent capacity to gain access to resources and, hence, to produce livelihood security and wellbeing. In this way, social relations, in enhancing security and reducing risk, directly or through interactions with the state, market, and other parts of the civil society, are likely to be a key element in any strategy for adapting to economic shocks and hazards. Since social networks do not exist in a vacuum but are created through interactions between individuals (Bebbington and Perreault, 1999; Adger, 2003), "it would seem reasonable to argue that the quality of these relationships is shaped by, and itself shapes the character of the contexts in which they live" (Mohan and Mohan, 2002:193). In this chapter, the interaction between the wider socio-institutional context and the functioning of local social networks is the main focus of analysis of the role of social capital in livelihood adaptation.

The objective of this chapter is threefold. First, I aim to analyse how smallholders adapt to the changing market conditions in the agricultural sector by founding farmer groups and how this has affected the local social structure. Second, I explore the enabling and constraining effects of local social norms and networks on the adaptation capacity of smallholders to benefit from this new type of social network. Third, at the same time, the (unintended) feedback effects of adaptive choices on the wider context in which they are enacted, are analysed, thereby paying attention to the relation between action and emergent structures as well. Doing so contributes to the larger debate on how the local social and political institutions, created during neoliberal reforms, have slowed down the neoliberal economic development in Mexico. Furthermore, I will demonstrate that local social norms and traditions can also have constraining effects. The conclusions are based on case studies, in-depth interviews, a household survey, informal conversations, and personal observations.

The next section provides a conceptual background on social networks and the social embeddedness of economic activities. Subsequently, the data collection methods and approaches used for this chapter are described. Sections 6.4 and 6.5 discuss the empirical results. The most important neoliberal policy reforms for the study area and their effects on local social relations are identified, and the constraining and enabling role of local social norms within the context of farmer group formation are explained. The focus is on the role of social networks in the production of maize, as this is the livelihood activity in which all households in the study area – to a greater or lesser extent – are involved. The concluding section contains a discussion on the effects of recent social network formation on household and community access to resources, and the implications for future livelihood options.

6.2 Analytical framework

6.2.1 Social embeddedness of livelihoods

In considering neoliberal policy reforms the work of Sen (1981) is important for understanding the effects of shocks and stress on livelihoods. It shows that livelihoods depend not only on direct access to capital, but also on how its use is embedded in the wider social, economic, and political context. According to Sen, various contextual factors like market organisation, the labour market, and price policy contribute to or even cause

stress in livelihoods. The livelihood framework refers not only to access to, and the subsequent utilisation of, capital, but also to the particular interaction of social groups, households, and individuals with a wider context (De Haan and Quarles van Ufford, 2001).

Important is Granovetter's (1985) notion of 'social embeddedness', the idea that a social actor processes information and experiences and acts upon it, but whose actions should not be interpreted independently of the context of which the actor forms part. Granovetter (1985:487) argues that "actors do not behave or decide as atoms outside a social context, nor do they adhere slavishly to a script written for them by the particular intersection of social categories that they happen to occupy. Their attempts at purposive action are instead embedded in concrete, ongoing systems of social relations." Thus, people are neither powerless objects nor free agents who can become whatever they choose. This approach is adopted in this study as it relates to the concept of human agency, and gives weight to the capability of actors to process social experience, and also to devise ways of coping with life within a given context that comprises the institutional and normative environment within which daily life is enacted (Niehof, 2007). This means that within the limits of information, uncertainty, and other constraints (e.g. physical, normative, or political-economic), social actors attempt to solve problems, learn how to intervene in the flow of social events around them, and to a certain degree monitor their own actions, while observing how others react to their behaviour, and taking note of the various contingent circumstances (Giddens, 1984). In addition, Beckert (2003) points out that when information is complex and imperfect, uncertainty influences the situation, and actors have little means of knowing which of all courses of action will be the optimal one. He therefore highlights the process aspects of action, and emphasises the necessity to focus on the interpretative acts by which actors construct rationality inter-subjectively in a continuous interaction between means and ends and the expectations of the 'generalised other' (Beckert, 2003:782). In the same vein, I consider that smallholders behave strategically. However, they are not socially isolated, and all economic and strategic behaviour can only be understood as part of social behaviour. This implies that purposive and rational actions also include social elements such as reciprocity, obligations, and trust.

The notion of social embeddedness recognises a mutual interaction between the actions of individual or collective actors and the wider structure in which they take place. Social structures can be seen as a fluid set of emergent properties that, on the one hand are a product of various actors' projects, while on the other, they constitute an important set of constraining and enabling reference points that feed into the further elaboration, negotiation, and confrontation of actors' projects (Long, 2001). Hence, local maize markets, state institutions, and policy reforms should not be seen as determinants that entail self-evident limits beyond which action is judged inconceivable, but rather as markers that can become targets for negotiation, reconsideration, sabotage, and/or change (Bourdieu, 1984). These structures can be characterised by rules and resources, recursively implicated in the reproduction of social systems (Giddens, 1984). In day-to-day practices, actors can mobilise and use these resources in their purposive and strategic activities to gain additional resources or to protect existing valued resources to make a living (Lin, 2001).

For this study, I have used the concept of social capital to analyse the intersection between social structures and purposive actions. Following Lin (2001:41), social capital is

considered "rooted in social networks and social relations and is conceived as resources embedded in a social structure that are accessed and/or mobilized in purposive actions." I use this definition since it assumes that "social capital contains three elements: structure (embeddedness), opportunity (accessibility through social networks), and action (use)" (Lin, 2001:41). Actors do not only derive resources from their personal networks, but are also able to mobilise them. By doing so the resources and norms embedded in social structure enter the existing lifeworlds of the individuals and social groups concerned, and in this way, they are also mediated and transformed by these same actors (Long, 2001). Accordingly, social structures are partly the result of the unintended consequences of numerous social actions and interactions, which become the enabling and constraining conditions of social action itself (Giddens, 1984). In this chapter the focus is primarily on the role of social networks (structural element of social capital) in household livelihood adaptation, and in particular on the dynamics of farmer group formation.

6.2.2 Social networks and economic activity

Social relations and networks may be based on kinship, friendship, village membership, patron-client relationships, participation in farmer group organisations, or political party membership. Ferlander (2007) made a useful distinction between informal and formal networks. The first comprise face-to-face relationships between a limited number of individuals, who know each other and are bound together by kinship, friendship, or other types of close relationships (e.g. neighbours and colleagues). Informal networks among kin and neighbours are important resources for households. It is assumed that the extended family and other close relations will assist households with emotional, instrumental, and informational support and social companionship (Stone, 2001). Formal networks, by contrast, are regulated and are exemplified by relationships between citizens and civil servants and within voluntary associations. Formal networks are set up with specific objectives and members are officially recognised. There are many links between informal and formal networks, and sometimes the distinction between them becomes blurred (Ferlander, 2007). In addition, networks can also be classified by their strength. One of the most familiar distinctions between social networks is whether they are based on 'strong' or 'weak' ties (Granovetter, 1973). Strong ties are intimate ties, for example, with immediate family and close friends that tend to be regularly maintained. Weak ties are non-intimate ties with acquaintances, which are maintained infrequently. Following Szreter and Woolcock (2003), I make a distinction between networks that provide their members access to people with similar demographic characteristics and norms (bonding networks), networks connecting people with heterogeneous backgrounds in relation to demographic and economic characteristics and norms (bridging networks) (Putnam, 1995, 2000), and networks that provide access to people that are in positions of authority (linking networks), whether politically or financially. Linking social capital also includes vertical connections to formal institutions (Woolcock, 2001). Strong bonding ties are associated more with survival than development, while the opposite is true for linking ties (Pelling and High, 2005). In this chapter, the different types of social networks are used to analyse the diverse role of social relations in livelihood adaptation.

Over the last decade, there has been a growing recognition that differences in livelihood outcomes and economic growth cannot be explained fully by differences in tangible inputs,

such as land, labour, and physical capital (Serageldin, 1996; Grootaert, 1998; Bebbington, 1999; Fox and Gershman, 2000; Breugelsdijk and Van Schaik, 2001; Grootaert, 2002). Positive growth effects may materialise via various channels, including reduced transaction costs [63] (precluding the necessity to write contracts that capture all contingencies), facilitated exchange of information, and enhanced trust (enabling communities to overcome social dilemma's) (Dakhli and De Clercq, 2004; Kaasa, 2009). Networks become key elements in these processes for gathering information, forming opinions, legitimising one's standpoint, mobilising resources, and for bridging, defending or creating social and political space within or transcending specific institutional domains (Long, 2001). Especially, social networks affect the flow and the quality of information since "much information is subtle, nuanced, and difficult to verify, so actors do not believe in impersonal sources and instead rely on people they know" (Granovetter, 2005:33). In addition, social networks are often vital to individuals and households in achieving secure livelihoods. It is assumed that the social groups and the community at large will assist households socially, emotionally, psychologically, and materially when they face difficulties (Ypeij, 2000; Nombo, 2007).

The discussion above suggests that both formal and informal social networks and broader social structures are important sources of support in difficult times, provide access to other assets, and are conducive to economic growth. The main conclusion that emerges from studies on social capital is therefore that social networks have positive spill-over effects on economic development. As a result, policy-makers and development practitioners are increasingly stimulating collective action by supporting small-scale producers to associate, collaborate, and coordinate in order to access capitals and achieve economies of scale in their transactions with input suppliers and buyers (Hellin *et al.*, 2007). In Mexico the formation of farmer groups has become a popular strategy in the field of agricultural development since the end of the 1980s. Farmer groups are perceived as a mechanism to improve farmers' access to agricultural inputs and services that compensate for the market-based policy reforms that have cut down subsidies on agricultural credits and inputs (Stringfellow *et al.*, 1997).

6.2.3 Farmer groups

Like other types of formal networks, farmer groups can provide services that contribute to agricultural productivity. Examples of such services provided are marketing services (input supply, output marketing and processing, market information), facilitation of collective production activities, financial services (savings, loans, and other forms of credit), technological services (education, extension, research), educational services (business skills, health, general), welfare services (health, safety nets), policy advocacy, and managing common property resources (water, pasture, fisheries, forests) (Stockbridge *et al.*, 2003). Access to these services is considered a key incentive for becoming a member. However, for farmer groups it is often a challenge to be successful in delivering these services (Stringfellow *et al.*, 1997).

[63] Transaction costs include the costs of obtaining information about parties to a contract and the goods and services being exchanged and the costs of negotiating, monitoring, and enforcing agreements (Stockbridge *et al.*, 2003).

Good communication, a sense of common purpose and cohesion, socio-economic homogeneity, as well as autonomy and freedom from harmful outside interference are all factors that are consistently identified as ingredients of successful collective action. In addition, Stringfellow *et al.* (1997) identify four key factors contributing to sustainable farmer cooperation: i) a match between existing skills/experiences of members and what is required to undertake joint activities; ii) internal cohesion and a member-driven agenda; iii) active membership; and iv) successful, commercially oriented, integration of the organisation in the wider economy. Consequently, farmer groups with a long tradition of cooperative working, as well as those that are small, homogeneous and have face-to-face contact, are more likely to be successful. Moreover, the institutional environment has considerable influence on farmer groups. The formal laws of the state, as well as the local institutions based on customs and tradition, determine whether the environment for farmer group development is an enabling or a disabling one. I use these factors as a starting point to explore local farmer group dynamics in the study area.

6.3 Data and empirical strategy

6.3.1 Data

Both quantitative and qualitative data were used. The quantitative data on livelihood strategies were collected through the household survey. The survey included a special section on the role of social capital in daily livelihood activities (Appendix V). The quantitative data allowed me to get a better understanding of the interrelations between farmer group membership, household characteristics, and adaptation strategy choice.

To collect qualitative data on social capital and farmer group dynamics, several methods were applied: participant observation, interviews with key informants, focus group discussions, life-histories, and case studies. Participant observation plays a key role in the data presented in this chapter. As a member of a host family, I could participate in different aspects of daily life. It provided an understanding of inter and intra-household social relationships, social norms on reciprocity and mutual support, social conflicts, and the type of unacceptable social behaviour that led to gossip. Additionally, valuable information was gathered through ten in-depth interviews (Appendix VI). The results are used to gain an understanding of the social, cultural, economic, and historical context at community level. In addition, topics related to social networks, trust and norms of reciprocity were discussed during these interviews. Two focus group discussions were held with groups of five to eight persons. The following subjects were covered: kinship, social networks and trust, community life, and farmer group formation (Appendix VII). The life-history method is used to elicit emic views on social and economic changes over the last two decades. Four men and four women, all members of maize-producing households, were interviewed. They were old enough to have consciously experienced the most important changes in relation to market liberalisation that took place during the past 20 years. To provide a holistic picture of daily life, the case study method is applied to eight households that represented different livelihood situations with regard to activities and strategies. In both the case studies and life-history interviews, special attention was paid to participation in social networks, reciprocal relations vis-à-vis relatives, neighbours,

villagers, patrons, and middlemen, involvement in community activities, and social norms (Appendix VIII).

6.3.2 Model design

To get a better understanding of the profile of the farmers who were a member of a farmer group, a simple regression analysis was done to model the relationship between the dependent outcome 'farmer group member' and several independent variables. This can be formalised as follows:

$$(6.1) \quad M_j = \beta_0 + \beta_1 X_j + \varepsilon_j$$

where, M_j is the dependent dummy variable for farmer group membership (1 = member, 0 = no member); X_j is a vector for the independent variables; and ε_j is a residual that includes all unobserved determinants of the indicator in question and a random error. Given that the dependent variable M is a dummy variable, I use a logistic regression method. The logit model is estimated using the maximum likelihood approach (see also Appendix IX).

In addition, I did a simple Ordinary Least Square (OLS) regression analysis to model the relationship between group membership and the yield per hectare based on the following model:

$$(6.2) \quad Y_j = \beta_0 + \beta_1 M_j + \beta_2 X_j + \varepsilon_j$$

where, Y_j is the yield per hectare (dependent factor); M_j stands for farmer group membership (1 = member, 0 = no member); X_j is a vector for the independent variables; and ε_j is the error term.

6.4 Effects market liberalisation on local social structures

6.4.1 Changing market conditions: early farmer group formation

Since 1988, the Mexican agricultural sector has undergone important reforms designed to further align the sector with the neoliberal growth model adopted in the early 1980s. During the Salinas administration (1988-1994), the government undertook radical attempts to restructure the agricultural sector by implementing policies of privatisation, deregulation, and trade liberalisation, abandoning incentives to local food production, and allowing market forces, profitability, and productivity to determine production according to the country's comparative advantages (Preibisch *et al.*, 2002). Despite the deterioration of the agricultural sector and the declining welfare of the rural population, the Zedillo administration (1994-2000) continued to pursue the policies for agriculture implemented by the Salinas administration, leading to significant changes in Mexico's rural landscape (Nadal, 2000).

The most important reforms affecting the Mexican maize sector were the liberalisation of the land and capital market, and the privatisation of the industry for agricultural inputs such as fertilisers, seeds, and pesticides. In 1992, an amendment to Article 27 of the Mexican Constitution changed agrarian reform legislation and allowed individual property

rights on land (Bouquet, 2009). In Morelos, the Ejidal Rights Certification Programme (PROCEDE) issued land title deeds to registered smallholders in 1998. Additionally, during the 1990s, the government reduced its participation in agriculture by cutting crop price support to producers of key staples (such as maize), by limiting subsidies to agricultural inputs (e.g. by the privatisation of the fertiliser company FERTIMEX) and the provision of credit and insurance, and by reducing participation in the processing of grains, oils, and powdered milk via CONASUPO (Nadal, 2000). Furthermore, it reduced credit subsidies to the National Rural Credit Bank (BANRURAL) which was finally liquidated in June 2003 due to severe problems of credit recovery and operational inefficiency (Naylor *et al.*, 2001; Rosenzweig, 2003). The post-1988 policies were also geared towards deregulating the markets for agricultural commodities (Appendini and Liverman, 1994). The government accelerated the liberalisation of maize imports by allowing U.S. imports to enter tariff-free by increasing the non-tariff quota. As a consequence, between 1990 and 1998, domestic maize prices fell by 48 per cent (see Chapter 1) (De Ita, 1999).

At the same time, to support smallholder households and alleviate rural poverty, different (semi-) governmental programmes continued to stimulate rural development. For instance, at the end of the 1980s, the National Institute for Indigenous People (INI) in cooperation with BANRURAL and the agro-industry, stimulated cattle-breeding and introduced hybrid seed varieties and dispersed agrochemicals on '*credito por palabra*' (credit upon one's word) to improve and commercialise maize production. In the study area, these new technologies resulted in a local 'Green Revolution', which transformed the traditional *milpa* system towards monoculture maize production with a market surplus. This has resulted in farmers giving up their local seed varieties (*criollo*) in exchange for hybrid seed varieties, which require intensive treatment with fertilisers and pesticides (Blanco Rosas, 2006).

INI granted pesticides, fertilisers, and improved seeds to groups of farmers that were registered at the *Comisariado Ejidal* and represented by the president of the *Comisariado Ejidal*. In Morelos, the first farmer groups were founded in 1990 to get access to these inputs. Hence, between 1990 and 1998, all smallholders were represented by only one person, which encouraged a privileged bond between the president of the *Comisariado Ejidal* and the representatives of the public institution INI. During this period, for the first time, smallholders were exposed to the situation of having one group leader, who looked after their commercial interests vis-à-vis external parties. However, according to key informants, the president of the *Comisariado Ejidal* at that time abused his position of power, committed fraud, and worked together with INI to swindle local farmers. At the same time, the collective form of obtaining inputs and credits also stimulated opportunistic behaviour. The majority of the farmers did not pay back their loan. The collective land tenure system played a role in this. Since farmers did not own land but had only usufruct rights, the bank had no possibility to obtain a land guarantee for their loans. Due to high default, INI stopped their programmes in the area, and the farmer groups dissolved.

6.4.2 Complex input market: a new incentive to establish farmer groups

Despite the dismantling of official assistance to small-scale producers of basic crops, the rising prices for agricultural inputs, and the falling maize prices, the majority of the smallholders in the study area were still producing almost exclusively maize in 2010. However, the context in which maize production takes place has changed considerably. With the withdrawal of state assistance to smallholders, a wide spectrum of private organisations and commercial companies took advantage of the newly arisen market and became part of the local institutional environment. Various private businesses representing national and international agrochemical industries and wholesalers started to participate at the local market by selling seeds, agrochemical inputs, and agricultural tools and machinery. Moreover, several financial intermediaries, and regional and national (rural) credit institutions started to offer their services. Research institutes and semi-governmental organisations, selling innovative products and technologies, are other new actors at rural markets. Furthermore, as a result of the abolishment of guaranteed fixed prices, '*coyotes'* (as middlemen are known locally) have entered the area. As a result, the policy reforms have led to a more complex market characterised by imperfect information among farmers and a general lack of transparency.

Most of the suppliers of agrichemical inputs communicate in Spanish and operate from Acayucan. According to key informants, smallholders from Morelos are weak players in the local input market. They are not well-informed and, therefore, not capable to effectively negotiate with suppliers. Respondents explained that due to a lack of education[64] and limited mastery of Spanish, it is unclear to farmers which products are best to buy, what is a reasonable price for certain inputs, how to access the credit market, or what government (credit) programmes are available and how to apply for them. This is illustrated by the following statement of a respondent:

> *" (...) most salespersons pose as engineers with knowledge of all different products in the market. The problem is that I am not able to verify their stories since I cannot read Spanish and therefore I do not understand the text written on the fertiliser bags. For that reason, I buy only inputs from salespersons I trust. Nevertheless, in the past, too often I bought fertilisers that turned out to be inadequate and useless (...)." (Hector Mateo Cruz, 36)*

With the withdrawal of state assistance to smallholders and the complexity arisen from the liberalised input market, private extension agencies – locally known as *despachos* – started to intervene in the local input market by the mid-1990s. These *despachos* take advantage of the weak position of smallholders in local markets by assisting them for a financial reward. They work only with groups of farmers by, for example, providing

[64] Survey data indicate that 47 per cent of the household heads are illiterate.

technological packages[65], advice, and helping the groups with accessing credit provided by FIRA[66].

Often smallholders use such a loan to pay for the technological packages. Although each group member is individually responsible for his/her loan, the entire group will be excluded from the programme if too many group members fail to repay their loan.

Since the land title programme PROCEDE ended in 1998, and smallholders in the Sierra de Santa Marta own individual land titles – which can serve as collateral for a loan – the number of *despachos* operating in the region has increased. During the time of this study there were four *despachos* operating in Morelos. In response to the advent of *despachos,* local smallholders have organised themselves in farmer groups to get access to their services, technological packages, and credits.

6.5 Farmer group dynamics

In Morelos, about 13 different farmer groups have been established since the land title programme PROCEDE ended in 1998. However, farmer group formation has been a dynamic process; in 2008 there were six farmer groups while in 2010 only four groups remained. Most farmer groups operate for about three to six years before they disintegrate. The number of members ranges from 20 to 150. A distinction can be made between small groups (20 to 50 members) and large groups (more than 50 members). In general, the only formal participation criterion is that (potential) members need to possess an official document that proves ownership of land. Small groups mainly consist of smallholders with strong kinship and friendship ties. Other villagers are not asked to join, which creates an informal entry barrier. Large groups are composed of all types of smallholders who often have weak ties with each other. Irrespective of size, all farmer groups operate in a similar way: they meet about six times a year, apply collectively for credit, and work closely together with a *despacho*. Group meetings take about two hours and have an informative character. All groups aim at providing individual smallholders with access to agricultural inputs and services at a low price to increase their maize production.

6.5.1 Farmer group members

Based on in-depth interviews with group members and group leaders, farmer group members can be broadly divided into two categories. First, those who comply with the requirements of *despachos* and other external parties. These members often have a strong tie with the farmer group leader based on kinship, friendship, or neighbourhood, and actively participate in group activities. They support the collective actions of the group

[65] Technical packages include seeds, fertilisers, weed killers, and pesticides to the amount necessary for the production of one hectare of high-yielding maize.

[66] Established in 1954 by Mexico's federal government, Trust Funds for Rural Development (FIRA) is a second-tier development bank that offers credit and guarantees, training, technical assistance and technology-transfer support to the agriculture, livestock, fishing, forestry, and agribusiness sectors in Mexico.

and contribute to the joint objectives. A second category of group members comprises more opportunistic people. They become a member of large groups that do not have informal entry barriers. They do not have a strong relationship with the group leader and frequently switch from one group to another. This creates uncertainty for the group leader and weakens the group, with negative effects on its potential for collective action. People with multiple land titles sometimes leave a group without repaying their loan and switch to another group to ask for a new loan. A single land title can be used only once to obtain credit through a group, but people with multiple plots and associated titles can use a second title to obtain another loan in a new group. Other opportunistic people use their land title to get access to a loan, which money they, in turn, lend to villagers without a land title at a higher interest rate. Key informants indicate that people who borrow money from members of farmer groups and not directly from a *despacho* feel less responsible for repaying their loan. The associated default has negative consequences for the reputation of the entire group with limiting effects on future borrowing possibilities for the group members.

Despite the services provided to the members of the farmer groups, not all smallholders participate in such groups. To enhance my understanding of farmer group membership, I have explored possible determinants for participation. Building on the social capital literature, a set of relevant variables was selected. The variables were tested for multicollinearity before proceeding to the analysis, using logistic regression. The aim was to understand the role of the independent variables in explaining farmer group participation. Table 6.1 highlights the significant variables in group participation. I have used a probit regression because the independent variable is a dummy variable (membership yes = 1). As in Chapter 5, I use instrumental variables to overcome the possible endogeneity problem caused by including trust indicators. This means that I first regress institutional trust on the capital variables, land title (yes = 1) and distance of plot, and in a second stage use the predicted institutional trust variable as a proxy in a regression for observed farmer group membership on trust and the capital variables (see further Chapter 5).

Three of the tested variables significantly influence farmer group participation: institutionalised trust[67] (a basic confidence in the formal institutions of governance, including fairness of rules, official procedures, dispute resolution, markets and resource allocation, or the political, tax or juridical system (Stone, 2001)), generalised trust (trust in strangers), and illiteracy of the household head. Household heads with a high level of institutional trust are more likely to participate in a farmer group, presumably because farmer groups interact with the local institutional environment. Illiterate household heads are also likely to become a farmer group member, suggesting that these people try to compensate for their weak position in the market through the services provided by a farmer group represented by a person who can read and write Spanish. Generalised trust is negatively correlated with farmer group membership. This could be because people who trust strangers might be more inclined to participate individually in the input and product market and are therefore less likely to participate in farmer groups. It is

[67] The method used to measure institutional, general and personal trust is explained in Chapter 5.

interesting to note is that there is no direct effect of household composition and land owned on farmer group membership.

Respondents indicated that apart from the group meetings, members do not gather together. They do not help each other in times of difficulties, nor do they provide mutual support in the fields. Accordingly, the main reason for almost all farmers (98%) to join a farmer group is to get access to high-quality inputs or financial resources. In general, smallholders indicated that they join a certain group because (i) they have a strong tie with the leader of the group; (ii) the group has a good track record; or (iii) they are asked by the representative to become a member.

Table 6.1 Farmer group membership, probit regression with instrumental variables

	Group membership (yes = 1) *Second stage*		**Institutionalised trust** *First stage*	
	Coefficient	*SE*	*Coefficient*	*SE*
Personalised trust	-.067	.113	-.066	.202
Generalised trust	-.224 **	105	.200 **	.083
Institutionalised trust	.766 ***	.202	-.019	.054
Household size	-.031	.067	.066	.283
Sex Household head (female = 1)	.250	.386	-.008	.008
Age household head	.011	.009	.079	.191
Household dependency ratio	.015	.233	.041	.176
Illiterate household head (yes = 1)	.373*	.235	.028	.014
Solar land title (housing plot) (yes = 1)	.347	.318	.028	.014
Land owned (ha.)	-.017	.018	.008 **	.005
Land title (1 = yes)			.008	.005
Distance plot			.0001 ***	.00004
Constant	-.768 *	.437	-.080	.367

* significant at 10%; ** significant at 5%; *** significant at 1%
Wald test of exogeneity (/athrho = 0); Chi2(1) = 5.29; Prob > chi2 = 0.0215
SE = Standard Errors
N=200

Data from focus group discussions indicate that some smallholders decided not to become a member of a farmer group because they greatly value their independence, individuality, and autonomy. Additionally, farmers do not participate in a farmer group because they have no confidence in the group leaders and they are afraid to become victims of fraud and corruption. Pablo Cruz (55) stated it as follows:

> *"I see many people around me who are weighed down by their debts. They are miserable and as a result, their work suffers. They are not able to make their own choices as their opinion and experience is subordinate to that of the despacho. Despachos will always sell agrochemicals to those farmers who are not in the position to refuse. However, despachos do not sell these products to the farmers because of their outstanding quality but because they receive a commission for*

these transactions. I value my freedom of choice and will therefore never voluntarily participate in this kind of political game."

6.5.2 Farmer group leaders

The leaders of the farmer groups, locally called representatives (*representantes*) are in charge of selecting group members, arranging price reductions on inputs and/or credit for members, organising administrational tasks, encouraging members to refund their loan, and mediating in case of conflict. They have a mediating position between external parties (in particular the *despachos*, but they also negotiate with local authorities, research institutes, commercial businesses, wholesalers, banks, etcetera) and individual small-holders. Therefore, to adequately carry out their function it is important that they speak both Spanish and Popoluca, have preferably finished primarily school, possess good social skills, and have access to an extensive external network. Their position is vulnerable and challenging as they are part of two different systems: the local social structure characterised by local norms and the economic rationale of the *despachos* and commercial businesses aiming at profit. This duality may cause problems. For instance, the social norms can force representatives to accept relatives in their group while knowing that they are in debt, whereas *despachos* request representatives to select members on solvency. In practice, the selection of group members is based on social rather than economic criteria.

The work of the representatives is not remunerated, but they derive prestige and privileges from their exclusive relationships with external agencies and suppliers. Both the individuals who run the *despachos* and the representatives retain a great deal of power over those who seek their services, contributing to a culture of cronyism and corruption. Formally, the farmer group representatives are independent of the local authorities and do not intervene in local politics. In practice, however, group representatives are strong public figures. Successful representatives obtain power which may exceed that of the traditional local authorities. This applies in particular to representatives managing large farmer groups. To stay in power, they have to maintain good relationships with external stakeholders and to compete with other representatives for group members to prevent their members from switching to another group.

All representatives have their own objectives and management strategy (see for example Cases 6.1 and 6.2). A few explained that they prefer to work with a small group of close friends and family members to limit the risks of carelessness and ignorance of group members. Other representatives, by contrast, argue that bigger groups provide economies of scale as inputs can be bought in bulk. These representatives have no rigid selection criteria. Some representatives consider themselves a mediator providing a voluntary service to the members, while other leaders ask a (financial or in-kind) reward for their work.

Case 6.1 Group Fidel

Fidel Cruz Sabalsa (50) has been a representative of a farmer group since 2001 which had 148 members at one stage of its existence. Fidel started his group when he was Comisariado Ejidal. As local authority he had built a large network outside

the village through which he came into contact with the despacho 'Imperio del Campo'. He became confident with the founder of the despacho. Many farmers joined his group partly because he held a leading position. Everybody was welcome and soon he was leader of the biggest group in the community. This gave him power and status even at the time another farmer was elected as Comisariodo Ejidal. Together with the despacho he arranged various projects for his group members. For example, he introduced a new type of yellow maize seeds that enabled farmers to sell their harvest no longer to the cattle-fodder industry but to producers of tortilla dough with higher profits, and a silo was built to collectively store and dry maize grains after harvesting.

Fidel became an important leader in the community. He is one of eight who own a tractor (which he received from a seed company in return for promoting new seed varieties), he has an extensive external network of relations outside the village and he receives payments from agricultural institutions and companies in exchange for providing access to his constituency. This all changed in 2008. In that year the harvest was bad and farmers were not able to pay their loans back. The despacho put Fidel under pressure to refund the loan of his group. At the same time, he had to be strict with his group members to emphasise the urgency of the problem on behalf of the despacho. As a result, Fidel came into conflict with both the despacho and his group members. He suffered under this pressure and became addicted to alcohol.

The situation went from bad to worse when he started to make improper use of the collaterals of new members to get a loan that he never paid out to the farmers concerned. He used the money to buy more alcohol. When group members got wind of the fraudulent practices, several farmers left the group and approached the District Court. Others do not believe in justice as they think that all lawyers are corrupt and will not take seriously a case brought by indigenous people. At the end of my fieldwork, Fidel's health was failing and his reputation and status had been completely eroded to that of a criminal.

Case 6.2 Group Paco

Paco Salinas (39) started his own group three years ago. For two years he was a member of Fidel's group but he left it soon after because of the disappointing results. He believes in the strength of a small group. He prefers a small group because "when a group is large, it loses all its other functions of joint responsibility and solidarity. With a small group, one can better coordinate to realise more things than just paying the loan back. Within small groups, everyone is committed and people feel more responsible for their loan." Paco explained that his status and privileges hardly benefit, compared to the representatives of large groups, but he does not strive after power: "I just want to have a good life together with my wife and children. Therefore, my aim is to improve the production of maize for myself and the other group members." The first 12 members were only relatives. Over the years a few more members joined and now the group has 35 members, all relatives and close friends of Paco. They meet once every six weeks to discuss developments and exchange information on new production techniques. Group members have a good relationship with each other as they all live close together

and know each other well. Nevertheless, mutual support among group members hardly exists.

6.5.3 Effects of farmer groups

I explored the relationship between membership of a farmer group and the yield per hectare expressed in metric tonnes maize. Table 6.2 presents the outcomes of a simple OLS regression which indicates that there is a positive correlation ($p<0.05$) between group membership and yield per hectare. This means that, *ceteris paribus*, a member of a farmer group will have a yield that is 209 kilo maize per hectare higher (average is 2800 kilo per hectare) than those farmers who are not participating in a farmer group.

Table 6.2 Maize yield, OLS regression

Maize yield	**Coefficient**	**SE**
Farmer group membership (yes = 1)	.209 **	.113
Personalised trust	.0008	.054
Generalised trust	.012	.054
Institutionalised trust	.069	.054
Household size	-.007	.035
Sex Household head (female = 1)	-.108	.187
Age household head	.0006	.005
Household dependency ratio	-.034	.123
Illiterate household head (yes = 1)	.021	.113
Solar land title (housing plot) (yes = 1)	.134	.143
Land owned (ha.)	-.030***	.009
Constant	2.531 ***	2.27

* significant at 10%; ** significant at 5%; *** significant at 1%
F (11,188) = 1.56; Prob > F = 0.1128
R2 = 0.084; Pseudo R2 = 0.0303
SE = Standard Errors
N=200

Despite this positive correlation, farmer groups tend to be short-lived. According to key informants, nine of the 13 farmer groups that have been established since 1998 have collapsed or become inactive due to internal conflicts, lack of trust, free-riding, corruption, opportunistic behaviour, and debts. In a few cases, the representatives were corrupt, for example by misappropriating the money they received from farmers paying back their loans. On the other hand, many smallholders fail to repay their loans. In the in-depth interviews, people gave the following reasons for their debts: (i) lack of trust in representatives and accusing them of too high interest rates; (ii) lack of a sense of responsibility for the loan; (iii) indifference about their reputation (iv) not having concern for harmful effects on other group members' access to credit; and (v) inability to refund due to a lack of profitability.

Due to the reputation of unreliability of local smallholders and the many unsuccessful farmer groups, local *despachos* and other credit institutes have become less interested in cooperating with farmers in Morelos and leave the area. As a result, local smallholders have become excluded from credit programmes and technological packages, which constrains their access to the agrochemical inputs they need. Case 6.3 describes the rise and fall of one of the most influential *despachos* in the study area.

Case 6.3 *Despacho 'Unión de Productores de Maíz del Sur de Veracruz'*

In 1999, Patricia Cortés Archimedes founded a despacho called 'El Unión *de Productores de Maíz del Sur de Veracruz' (Unión of Maize Producers of the South of Veracruz). Its general objective is to strengthen and organise local maize producers to support the ability of farmers to adapt and respond to the competitive market as well as providing access to all necessities required to meet their social and economic needs. The organisation belongs to the umbrella organisation CNPR (National Confederation of Rural Land Owners), which has member organisations in all parts of Mexico.*

The despacho provides products aimed at increasing the efficiency and yields of maize production for the local farmer. The various products that the despacho provides are credits[68], insurances[69] and technological packages. They also act as intermediates between local smallholders and government programmes by collecting and distributing allotted public subsidies. Unión de Productores de Maíz del Sur de Veracruz is a non-profit organisation that is financially supported by the Mexican government to cover their administrational costs.

By working with groups of farmers, the despacho reduces the costs of communication, transportation, marketing, selection and administration. Moreover, the staff members of the despacho believe that, although each farmer has an individual contract, people will not renege on requirements of their contracts in the face of peer pressure, social control, the risk of bad reputation and enforcement through the leaders. In 2000, the despacho started to cooperate with two farmer groups in Morelos. In 2006, they worked with eight groups of which only one still existed in 2010. According to Patricia Cortés, farmer groups in Morelos lost their cohesion because "in some cases farmers did not repay their loan, and in a few cases the group leader abused his position and stole loans from group members. In all cases it was not beneficial for us to continue working with these groups. If more farmer groups dissolve, our despacho will run into financial problems. Therefore, we are investigating the possibilities to merge with one of our sister organisations that works in the northern part of Veracruz. It will be a pity to leave this area, but without reliable farmer groups we will not survive."

[68] Nowadays governmental financial organisations (such as FIRA and Agroasemex) provide agricultural credit and insurance only to large companies or intermediaries, which makes smallholders depend on local despachos for financial services.

[69] Rural insurance is provided by Agroasemex. Agroasemex (founded in 1964) is a national insurance institution with the main objective of protecting the productive capacity and heritage of the rural sector. The Mexican government is the majority shareholder of the institution.

6.6 Social context: explanatory factors and constraining circumstances

The formation of farmer groups in Morelos demonstrates that it is difficult to maintain a sustainable group. Despite the economic benefits associated with group membership, many farmer groups in Morelos have fallen apart. In this section, I explain this phenomenon in the light of the local social-historical context.

Low degree of solidarity and cohesion among group members

Social ties among farmer group members are a new type of social capital, which is not grounded in traditional social relations. According to the survey data, the majority of the respondents (85%) considers kin the most fundamental type of social relationship. Households are the principal unit in which relatives support each other instrumentally and emotionally with empathy, trust, and caring. Household members provide the main source of social security, by sharing food, child-caring, and lending small amounts of money.

Beyond the household, relationships among kin living at the same compound are strong. At a compound, usually multiple patrilineally-related households share food and goods (such as cooking utensils), exchange information (for instance about current food prices or events coming up), work together when there is a lot to be done (e.g. during sowing and harvesting time), and help each other to make a living and cope with difficult times. Apart from providing instrumental support, these kinship relations play a vital role in care-giving and fostering trust and are a main source of companionship.

Case 6.4 Social support at the compound

Doña Maria (45) is married with Don Luis (52). Together they have six children: four daughters and two sons. All their daughters are married and have moved out to live in the compounds of their husbands. Doña Maria and Don Luis live together with their youngest son Fernando (31), his wife Reyna (28), and their two daughters Lethy (5) and Jessy (5 months). They live in the same house and share the kitchen and the food. Together they make ends meet. About 22 years ago, Don Luis built the house himself with the help of his older brothers. As local tradition prescribes, Don Luis donated his house to his youngest son Fernando after he married with Reyna. Nowadays, Fernando is the household head who owns the house and compound. In return, he will be required to take care of his parents when the time comes and they can no longer care for themselves. The compound is an open space surrounded by four houses. Fernando gave a quarter of the compound to his brother Gerardo. At this small piece of land, Gerardo built his own house with room for a small grocery shop where he lives together with this wife and 2 daughters. Julia (38), the oldest sister of Fernando, married a neighbour, which is why she also lives next door. Recently, the youngest sister Julia (27) moved into a house bordering the compound because there was no space left over at the compound of her husband's family. Consequently, her father in-law bought a part of the compound of Fernando for his son and his young family. The number of kin related people living close together in bordering compounds is currently 21 (10 adults and 11 children).

Doña Maria starts her daily activities at 6 o'clock by stoking the fireplace, picking up the fresh eggs in her chicken-run and feeding her poultry. Then, she goes to her neighbours to buy some ingredients for breakfast. Afterwards, she prepares a quick meal, such as 'atole' (gruel made with ground maize) or coffee with baked bananas. Meanwhile, the other families at the compound wake up and various women and children gather in the kitchen of Doña Maria to eat the snack she has prepared. At 8 o'clock the youngest children go to school accompanied by their older sisters or mother. Often some women stay in the dark kitchen to chat together. The two daughters of Doña Maria, who live in other compounds in the village, often visit their mother and join them in the kitchen. Throughout the morning various door-to-door vendors sell their goods, such as fruits and vegetables gathered in the forest, cloths or meat. Doña Maria or one of the other women buys food from them for their breakfast. Doña Maria's husband Luis leaves the house early to earn money by helping friends with selling bananas in Acayucan, harvesting maize, or by painting or building a house. He often stays over in Acayucan, where he rents an apartment together with his second wife.

Throughout the morning, Doña Maria washes clothes, cleans and mills the maize grains into masa, sweeps the house and does other daily domestic activities. Around 10 o'clock, Doña Maria and her daughter-in-law Reyna start cooking breakfast, which is an important meal of the day. One of them makes a pile of tortillas, while the other prepares the other elements of the dish. In principle, the food is prepared for their consumption, but, in practice, all other relatives from the bordering compounds around are welcome to join the meal. Afterwards all women help with doing the dishes and cleaning the kitchen.

In the afternoon, women and children spend their time together around the house and fulfil their domestic tasks. If there is a problem, such as lack of water, they collectively look for solutions and help each other out. The women look after each others' children and help with the small activities they undertake to gain some extra money. Reyna sells roasted and grilled chickens together with her sister-in-law, while Doña Maria occasionally makes tacos to sell in the evenings as antojito (snack) to other community members. All children and women serve the customers at the door, although it is not their own business. They know the prices and deliver what is required on behalf of the owners.

Late in the afternoon, Doña Maria starts preparing dinner together with Reyna. However, they do not start dinner until their husbands have arrived from work. Again, many family members of the other households at the compound gather, and the food is shared with everybody who is hungry. In return, the other family members donate some tortillas or other additional food to share with the group. Sometimes, children and their mothers bring their own food from home and just eat together for company. Doña Maria explains that there is a strong sense of community amongst the various kin-members, and they will share their food so that there is always something to eat, particularly in times when one of the households is struggling financially. After dinner, the children of the different households play together at the compound while their mothers chat in the kitchen. The husbands retire to separate rooms and stay aloof from the social chats among the women. They prefer to rest after their day's work.

The above case illustrates that the reciprocal relationship between kin members in daily life is shaped by inheritance traditions, residence patterns, and capital endowment. Given the pattern of virilocal residence, sons are assumed to support their parents financially during their old age. In particular, the youngest son has this responsibility, in return for which he inherits the land and the dwelling of his parents. By contrast, upon marriage daughters leave the household and, therefore, are not expected to support their parents as they have their own household to manage.

Although kinship relations are considered the most important social network, in practice kinship is often a weak institution in time of difficulties. Kin beyond the household are often not able to help others. The story of Susanna Hernández Pascual (72) indicates how the economic problems people are facing pass into social problems, also among kin.

> *"My father and my only brother were murdered when I was eight years old. Nobody has told us the real motive for this violent incident. However, it took place at the milpa so I guess that it had something to do with the harvest. From that moment onwards, my mother was a widow and had to care for me and my four sisters. My oldest sister was at that time 10 years old, and my mother had a hard time to run the household. At the age of 11, I had to marry a 31 year-old man who was a former friend of my father. I cried night and day because I had to leave my mother to live together with this man who was unknown for me. (...) After a few years my mother gave all land that my father owned to my oldest sister Estela. She uses it to support her own household, while my three other sisters and I have never received a part of her harvest. Estela owns four hectares of land, and when I asked her to offer me a small part, just one hectare to produce for own consumption, she was pitiless and asked about 1000 peso for rent, whereas she is my own sister!"*

> *"My husband and I do not own land, and like all other landless farmers, we suffer a lot these times. (...) I do not lay claim on the money from PROCAMPO because they require that you cultivate land. Currently, we completely depend on the financial support from Oportunidades. Last year I was desperate and I decided to sow just a few lines of my sisters' parcel without notifying her. One dark night in June, my husband and I went to the parcel of my sister and sowed black maize. Up till now, my sister did not discover it, so hopefully we will have our first small harvest soon!" (5 March 2010)*

The social ties among non-residential family members are weak and not underpinned by strict norms of reciprocity or social obligations concerning mutual help. Respondents indicated that social support from non-residential kin is rare, because resource constraints make it difficult to maintain reciprocal relations. As a woman said:

> *"In our community, everybody is poor. So how can you expect people to help others if they are hardly able to make ends meet themselves?" (Doña Estéfana, 45)*

In addition to kin relations, *compadrazgo* is a well-grounded social institution in Morelos. It refers to very close social relations, considered almost as family. *Compadre* – the female equivalent is *comadre* – is a term for a godparent. In Morelos, it is common practice to establish *compadrazgo* relations at the baptism of a child. Between the *compadres* and the parents of the child, a special lifelong relationship is established, based on friendship,

trust, and respect. The most important role of *compadres* is that they take responsibility for the child in case the parents die. In addition, *compadres* support the family of the child financially during the baptism ceremony. In interviews, respondents explained that, ideally, *compadrazgo* relations function as a safety net which includes financial support. However, key informants suggested that in practice people do not expect nor receive much from their *compadres* and rather depend on their own inner circle of household members and close relatives.

Friends are another source of social capital in Morelos, but primarily for men. Men have a few friends with whom they share leisure time. Apart from social companionship, friends share information and help each other finding a job. However, often friends ask day wages for their help in the field or interest when lending money.

Neighbours are a relatively new source of social capital. The collected life-histories indicate that, until the fragmentation of land for dwellings in the 1970s, households did not have close neighbours. Families lived independently, scattered throughout the area. Since the introduction of the *ejido* system, each household was allocated a prefixed piece of land for a dwelling. This led to clustering of houses, which made neighbours important. However, many people have not adjusted their behaviour and key respondents indicated that, as a result, there are many disputes and conflicts between neighbouring families, for example about loud music, escaped chickens, or public drunkenness. People argue that they do not feel related to their neighbours and hold negative views on potential support from them. Recently, some people became so annoyed with their neighbours that they started to live (illegally) at their plot, in a small and basic shelter (without electricity or water), to escape from the crowd and the conflicts with neighbours.

Following the idea that purposive and economic behaviour is embedded in a social context, the weak social ties among non-close kin, *compadres*, friends, and neighbours can be seen as a constraining factor. Collaboration between farmer group members requires a cooperative attitude, trust, and social norms supporting collective action. In Morelos, this attitude is lacking, which is an important reason for the unsuccessful implementation of farmer groups.

Lack of trust among group members

Several studies on the role of trust link the emergence of trust to conditions of risk and uncertainty, demonstrating that when uncertainty and risk are high, transactions and information exchange are likely to occur primarily among people within a social network, as a way of limiting risk (Rose-Ackerman, 2001; Adler-Lomnitz and Sheinbaum, 2004). Smallholders in this study, for example, find it difficult to assess the quality of seeds and agrochemicals. Hence, for them, a trustworthy network could be a crucial factor for more profitable production, by sharing their experiences with certain seed varieties, agrochemical products, or their opinion on who are trustworthy persons, or by recommending a new production technique.

However, in Morelos a lack of trust between farmers stymied attempts to encourage farmer cooperation. Despite the benefits that individual smallholders can derive from cooperating and sharing useful market information, cooperation among farmer group members is limited. According to the survey, 40 per cent of the smallholders in Morelos

have little trust in other farmer group members. Respondents indicated that they share their knowledge primarily with close kin relations. During focus group discussions, people indicated that they prefer to buy their inputs individually for the price they think is best, notwithstanding their weak position at the input market and even if cooperation with others might lead to lower input prices. Juan Pablo Hernandez (54) phrased it like this:

> *"I always go to Acayucan to buy my seeds and fertilisers. I ask my neighbour to drive me to a wholesaler located on the outskirts of town. I prefer to negotiate alone as I am afraid that other farmers will agree on a higher price than I am willing to pay. I am used to working on my own without commitments to others."*

Respondents pointed out that they are aware of the advantages of sharing transportation costs or buying their inputs in bulk, but they explained that they do not trust other farmers, and indicated that they are afraid that they fall victim to deceit.

Also with respect to the local maize (or output) market, the role of farmer groups is limited. Farmers primarily sell maize at an informal market to *coyotes* who transport maize from the farm to the formal market. They negotiate the farm-gate price and deliver the product to regional and national wholesalers, thus reducing transportation costs for farmers who would otherwise not be able to access the maize market. The maize market in Morelos consists of a few local *coyotes* (originating from Morelos or neighbouring Popoluca villages) and external *coyotes* (from outside the region) on the one hand, and many small suppliers of maize on the other.

Maize producers could receive a good price for their maize if they sold it collectively to a *coyote*. In 2008, a *despacho* built a silo in Morelos to facilitate the common storage and gathering of maize to facilitate bulk supply, but it was never used. Instead of operating as one powerful supplier, each smallholder functions as an autonomous supplier and negotiates individually with *coyotes*. Smallholders pointed out that they do not want to store and sell their maize collectively because they are afraid that conflict will arise regarding the quantity of maize in deposit, the common price, and the individual profit.

> *"If I bring all my maize to the silo, nobody can guarantee me that I will receive a good price for my product. There will be always people who practise fraud and your money will disappear. These risks are too high." (Tomas Pascual, 45)*

Respondents also indicated that they prefer to act as an individual supplier because this gives them freedom to sell their product at the time their household is in acute financial need. The poor economic situation forces most smallholders to sell their product immediately after harvesting. At that time, maize is abundant and prices are low. Smallholders accept these lower prices, as they have to repay debts to be able to buy inputs for the next cycle. Farmers with the most urgent financial problems accept the lowest prices with adverse financial implications for other farmers: the lowest price becomes the starting point for other negotiations. Hence, farmers compete with each other, while they all would gain from cooperation and price-fixing. At the same time, this individual approach creates an opportunity for those smallholders who are able to store their harvest a few weeks to benefit from higher prices at the time supplies are less abundant.

Group leaders lack required skills

The representatives have limited skills to manage collective activities for a group of farmers. Like most group members, the representatives are not educated, nor can they read and write Spanish. Therefore, they are hardly able to verify information provided by commercial organisations and governmental agencies. Consequently, group leaders face difficulties in meeting the objectives of the group members and often fall victim to swindlers. Since the first farmer groups were established, their results are constrained by a long history of corruption and fraud among local authorities. In most cases, the key asset of representatives is their extended social network that allows them to link the external environment with the local community members. However, this may also lead to farmer groups being used for political ends and subjected to manipulation by corrupt leaders. While, at the same time, representatives are not only group leaders and contact persons for the external world, they also form part of various social networks within the community. Group members might therefore be relatives, friends, or neighbours of the representatives. This makes it difficult for a representative to be strict in the event, for example, that a family member does not refund the loan. The trustworthiness of the representative is then negatively affected, as people are not treated equally and internal conflicts easily arise.

Limited experience with collective action and cooperation

A commonly cited explanation for the failure of farmer organisations is that they do not have experience with collective action (Stringfellow *et al.*, 1997; Stockbridge *et al.*, 2003; Hellin *et al.*, 2007). In Morelos, indeed many newly-introduced farmer groups fall apart as smallholders are not used to work together. Traditionally, Popolucas do not have clubs, or associations. Only a few formal social networks can be distinguished. Since the introduction of the Catholic Church, people gather now and then on Sundays for a service. However, nowadays the number of people who visit the church is decreasing and the mutual solidarity crumbles away. During election time, members of political parties gather to discuss the election programme. However, these more formal networks do not organise collective activities. Hence, in Morelos, smallholders are unfamiliar with the cooperation required to make farmer groups successful and sustainable.

At community level, collective action is rare as well. Respondents explained that people dislike collective activities and that, due to a lack of participation, cultural festivities ceased to exist. Moreover, informants remarked that poor economic conditions make people self-centred and individualistic. Only death is an event that triggers collective participation. People grieve together and the community members supply the stricken family with basic needs, such as maize, money, salt, sugar, beans, chickens, etc. Especially when the breadwinner has passed away, these basic goods are vital for the survival of the household members left behind (see also Case 6.5).

In general, community activities are initiated by the *Agente Municipal* (comparable to mayor) or the *Comisariado Ejidal.* Occasionally, these local authorities call the villagers for a meeting to inform them about common issues. Attendance is obligatory. In addition, the *Agente Municipal* organises collective activities such as cleaning the streets or the cemetery, painting the community centre, or weeding public spaces and sport fields on a

regular basis. However, survey data indicate that the majority of the respondents (66%) almost never participates in these activities. Nowadays, it is mainly women who perform community work.

Case 6.5 Collective grief about the death of an old lady

Yesterday Doña Vicente Sabalsa Filipe, the mother of Luis, died. She was 87 years old and had suffered a lengthy period of illness caused by throat cancer. In her final weeks, her children visited her daily to keep her company and to prepare food for her. In particular, her (grand) daughters regularly came to clean the house and take care of the old lady. Luis lived next to his mother, which meant he could easily drop in on his mother to observe her health. Other relatives also came to take leave of their beloved family member shortly before she passed away.

Immediately after she had died, her sons and daughters started to work together to organise a dignified vigil. Her grandson Gerardo used the loudspeaker service he operates to announce the death of Vicente to all members of the community and invite them to come to her house to pay their respects. The oldest son of Vicente went to Acayucan to buy a coffin and rent some additional candlesticks, flowers, and a stand to support the coffin. Afterwards, he slaughtered a pig together with his brothers. The daughters and granddaughters brought their biggest pans from home and lighted various fires for stewing the pork meat and roasting the chickens.

Throughout the day and night, most of the community came to the house of Doña Vicente. They came in small groups, each group representing a household. All visitors donated food and/or money to the family of the deceased. Common in-kind presents given included sugar or salt, tortillas, maize grains, oil, candles, chickens, and rice. On arrival, visitors first walked to the open coffin to see the face of the deceased. They then took a simple seat positioned opposite the coffin and grieved collectively. Some people talked about the deceased and her illness. Others mourned in silence. A few people wept openly. People soon gathered at various tables spread across the compound. The slaughtered pig and the donated food were served to the visitors. All (grand) daughters participated in continuously preparing food. Some visitors are asked to help and to make tortillas at their house from a bucket of boiled maize grains that they had received. Some people came twice to the house for second helpings of the food and to chat to other community members. In addition to grieving, people also consider the death of a community member a social event, during which the latest news is shared. A few old men wore their vaquero and stayed many hours watching what was happening. At nightfall, people started dancing the traditional Popoluca dance because this was a favourite activity of Doña Vicente. Throughout the entire night, family members kept vigil over the deceased.

The coffin was brought to the local burial ground the next day, followed by a silent procession of community members. Once at the burial ground, the family members muttered some religious phrases. A trio of musicians played their traditional violins while the coffin was lowered into the ground. Afterwards the community members passed by the coffin and blessed the deceased by sprinkling

some purified water over the coffin. All that remained after everyone had left for home was a simple cross and some candles against the backdrop of an arid landscape.

6.7 Discussion and conclusions

This chapter provides new insights into the current debate on the role of social relations in the adaptive behaviour of smallholders. Arguing that in understanding this role the historical context is crucially important, it presents evidence showing that economic policies aimed at including smallholders in the process of market liberalisation will not be effective if they do not resonate with local social norms.

The neoliberal policy reforms have confronted local smallholders with a new institutional environment consisting of many private businesses and semi-governmental organisations mediating between farmers and the state. Since the beginning of the 1990s, the market reforms have encouraged local smallholders to organise themselves into farmer groups to enlarge their access to credit and technological packages, and to enhance their market performance. In Morelos, the formation of farmer groups has introduced new types of bonding ties among farmers within the community. Traditionally, formal groups hardly existed and the president of the *Comisariado Ejidal* was the only person who looked after farmers' interests. However, contrary to the opinion in the literature that bonding ties provide access to resources and are a safety net in times of difficulties (Midgley, 1995; Morduch, 1999; Grootaert, 2002), I found that in Morelos this was not the case. Among farmer group members there is not much solidarity and collective action. Group members do not share information, they hardly help each other in the field, nor do they buy fertilisers or other inputs in bulk to reduce costs.

Apart from bonding ties, farmer groups offer new linking ties by providing access to representatives, i.e. people who are in positions of authority. Through the farmer group representatives, farmers gain access to the facilities offered by *despachos*, wholesalers, government agencies, and other new players in the input and product markets. Survey data demonstrates a positive correlation between group membership and yield per hectare, indicating the beneficial effects of farmer group participation. Nevertheless, many farmer groups fall apart after a few years.

I demonstrated that new forms of social capital can be induced but are difficult to sustain if they do not link up with local forms of social capital, as there is a continuous interaction between the local forms of social capital and newly introduced social capital. Traditionally, households in the study area do not have strong social ties with people other than their kin. Contrary to studies that assume a high level of social cohesion in rural communities, in Morelos this is visible only at the level of the household and immediate family. Although in the social capital literature the role of families in constructing social capital tends to be underemphasized (Stone, 2001), in Morelos kinship relations are regarded as the most fundamental form of social capital accumulation and transmission. Apart from helping out family members, smallholders hardly have reciprocal relationships and households individually struggle to survive. The social ties among non-residential family members lack the context of 'condensed morality' that one finds in households (Pennartz and Niehof, 1999). In addition, the weak social ties among *compadres* is noteworthy, as *compadrazgo*

is an important institution in most parts of Mexico (Cohen, 1999). The lack of strong social ties among villagers, limited experience with collective action, low levels of trust, and the individualistic attitude of people have resulted in unstable and unsustainable farmer groups. It can be concluded that, for assessing the adaptive potential of smallholders, it is essential to understand the structures in which their activities are embedded.

Due to the lack of successful farmer organisations, banks have lost interest in lending money to smallholders and *despachos* have left the area. This trend leads to the exclusion of local smallholders from credit programmes and technological packages. Moreover, the bad performance of farmer groups prevented farmers from cooperating and collectively participating in the product market for maize, which has a constraining effect on their market performance. In other words, the individualistic behaviour of local smallholders negatively affects the local availability and accessibility of resources at community level. This shows how individual-level strategies can have unintended effects at the level of the collective (Brons *et al.*, 2007). This study strengthens the idea that people – to some extent – influence the structures and rules of economic and political institutions that govern the control, use, and transformation of resources (Bebbington and Perreault, 1999). These 'feedback effects' of livelihood activities are crucial for understanding people's future adaptation capability. More research should be done on this issue, as this is still an undeveloped theme in livelihood studies. Furthermore, policymakers should take into account the heterogeneous and historically shaped character of social norms present in different rural communities to realise their rural development objectives.

7

General Discussion and Conclusions

Using the Mexican maize sector as an illustration, this study focused on livelihood adaptation of smallholders to market changes shaped by neoliberal policy reforms. It investigated the role of social and historical factors in shaping smallholders' adaptation capacity and strategic choice. The livelihood framework is used to unravel strategic choices fundamental to resource allocation and farming practices, taking into account the wider structural context in which they take place. This study demonstrated that economic rationality, social norms, trust, and cultural traditions anchored in daily routines are significant for livelihood adaptation choices. While most livelihood studies focus on one-way causality and analyse how the external structure affects livelihood outcomes, this study has demonstrated the interdependence between action and structure. This chapter discusses the main findings and policy implications of this thesis.

7.1 Introduction

The main purpose of this thesis was to analyse household livelihood adaptation of maize-farming smallholders in response to market liberalisation processes. Market and trade liberalisation have been major elements of economic policies for the past decades. Governments around the world use market liberalisation as a means of enhancing efficiency to realise economic growth and alleviate poverty. Ever since, a growing number of economic studies have investigated the impact of trade liberalisation on economic growth. Most of the studies measure economic growth in national accounts. However, trends in aggregated income and consumption measures do not always reflect differences at household level. Consequently, less is known regarding which groups of actors take up the opportunities generated by an expanding economy and why others are not able to do so and remain poor. Therefore, this study focused on the diversities of impacts and responses under the surface of these aggregated outcomes.

In this study the livelihood framework is used to go beyond the aggregated numbers and to analyse adaptation in response to changing market conditions at household level. However, in most livelihood studies little attention is directed at explaining the factors that shape households' adaptation choices. Therefore, the research objective of this study was to provide not only micro-level data on the adaptation strategies pursued by farming households, but also to gain a better understanding of the constraining and enabling role of social factors in livelihood strategies and adaptive behaviour of these households.

Throughout this thesis, I have tried to render visible the struggles of smallholders in the Mexican community of Morelos, Veracruz, and their capacity to respond to the risks and opportunities of market liberalisation. I focused on the strategies used by smallholder households to adapt to the changing circumstances in which they were immersed. Through the analysis, I have showed how and under what circumstances farmers can become active agents through their integration in diverse livelihood activities. In the analysis, I have moved from the macro- to the micro-level, from the tendencies at the national and international levels to the struggles, negotiations, and interfaces among the different local actors involved. I have made an effort to explain how, in response to market liberalisation, new local processes are developing in a rural context, influenced by farmers' local history and socio-economic, political, and cultural circumstances. This contributes to the limited knowledge of how, at an aggregated level, individual and household responses lead to intended and unintended outcomes that feed back to local conditions, institutions, and structures.

The thesis concentrates on three main thematic areas. In Chapter 4, I sought to categorise the adaptation strategies local smallholders have developed within the context of neoliberal market reforms by drawing on household data from Morelos. In Chapter 5, I tried to provide insights into the role of trust in adaptation strategy choices. I have analysed the importance of three types of trust: 'personalised trust', 'generalised trust', and 'institutionalised trust' for smallholders' adaptation capacity. In Chapter 6, the research aimed at gaining a better understanding of the enabling and constraining effects of the local social context on farmer group formation as part of smallholders' adaptation

processes. While the three research themes have been dealt with separately in this thesis, clear linkages exist between them.

Both quantitative and qualitative methods of data collection and analysis were used to study these issues. Household survey data enabled me to cluster adaptation strategies, while qualitative data on livelihood choices and social capital allowed me to interpret the outcomes of the statistical analysis. The strategies and their implications were studied and analysed using an actor-oriented approach. It highlighted the importance of human agency in local processes. An actor-oriented approach generated the methodological tools for the analysis of the interfaces between actors involved and the changing processes in the wider structural environment. Moreover, with the help of an actor's perspective, I was able to analyse the ways in which economic decisions and strategies are interrelated and influenced by social and cultural factors. It helped me to show how these relations, bound by specific norms and values, have changed and are adjusted to new circumstances.

In the remainder of this chapter, the main findings and policy implications will be discussed. Section 7.2 summarises and discusses the key findings. Subsequently, section 7.3 addresses the theoretical and methodological concerns emerging from this study. Finally, in section 7.4 I describe policy implications and identify further areas of research.

7.2 Synthesis of the main findings

In rural Mexico, the 1980s and 1990s were characterised by dismantling official assistance to small-scale producers of basic crops, after several decades of significant state interference in smallholder agriculture. The neoliberal market reforms removed most of the support to which maize producers had become accustomed. With the withdrawal of state support, along with rising prices for agriculture inputs and falling maize prices, maize production lost its relevance as a commercial venture for surplus-producing maize farmers (Preibisch *et al.*, 2002). Nevertheless, based on the results provided in Chapter 4, I can conclude that smallholder households in Morelos are continuing to produce maize instead of increasing their participation in potentially more profitable livelihood activities.

Chapter 4 demonstrates that the liberalisation of the maize market has not led to the changes foreseen by (international) institutions (e.g. the WTO and the World Bank), such as the substitution of maize for more profitable crops like fruits and vegetables. I found that only about 32 per cent of the households combine maize farming with cattle-breeding or off-farm activities with positive effects on their wellbeing. This runs counter to the studies arguing that 'diversification is the norm', especially among agricultural households facing substantial crop and price risks and related agricultural income risks (Barrett *et al.*, 2001). The findings in Chapter 4 underscore the role of the constraining effects of the absence of well-functioning land and capital markets as well as the importance of traditions, at the expense of the feasibility of these diversification strategies. Clearly, household labour supply and allocation decisions are not made simply on the basis of profitability calculations, but involve weighing both profitability and food security shaped by the local institutional environment. Hence, although the higher profits in the fruit and vegetable sector are a "pull" factor (Barrett *et al.*, 2001), most local smallholders stick to maize production.

Chapter 4 demonstrates that a minority of the smallholder households has diversified their income into other activities than maize farming. A first group engages in off-farm activities, mostly as wage labourers. These households are relatively likely to have female heads and large families with many members in the productive age group. This compels them to search for employment other than maize cropping. Other households have sufficient land to combine maize farming with cattle production. These are often older farmers who lack the physical strength needed for maize farming. The fact that households with more diversified incomes are better off (a higher Asset Index score) than households mainly involved in maize production would indicate that other factors than its market prices are important in adaptation choices.

While maize production provides only a marginal income, the results of the qualitative data analysis in Chapter 4 show the reasons for growing the crop. The production and consumption of maize prove to be deeply engrained in the local social and cultural fabric. In the study area, maize has not only a market value, it also symbolises food security, pride and identity, and employment of family members. Maize provides households with an important safety net as maize grains serve as a means of exchange for the most vulnerable members of the community. For example, some shops accept maize grains as currency, which allows poor households without additional cash incomes to meet their basic needs. In addition, 24.5 per cent of the household heads indicated that they produce maize because they do not have enough knowledge about other crops. This finding suggests that additional investments in extension and training should be provided to make smallholders able to benefit from the opportunities created by the liberalised agricultural market.

Chapters 5 and 6 go deeper into the role of social factors in livelihood adaptation. This connects with a growing literature that identifies the importance of social capital for adaptation strategies of smallholders in dealing with variability and change within the socio-economic systems in which they live. Chapter 5 argues that social capital – and trust in particular – offers ways into understanding the role of the social and institutional context in adaptive behaviour. The findings of Chapter 5 are based on a qualitative and quantitative analysis of the relationship between trust, livelihood strategy choice, and wellbeing. In particular, I assessed the role of personalised, generalised, and institutional trust in adaptation choices of smallholders confronted with neoliberal market reforms. The most significant result is the finding that households with a high level of generalised and institutionalised trust are more likely to invest productive assets (time and land) in alternative livelihood strategies. As a result, these households appear to be able to generate higher economic benefits than those who are continuing to produce maize. Households with high personalised trust are more likely to be engaged in cattle-breeding and pasture growing activities.

I found a positive association between generalised and institutionalised trust and the diversified livelihood strategy. My qualitative analysis of the local historical context shows that this correlation is rooted in social and institutional changes and experiences in the past. The historical analysis of Morelos demonstrates that livelihood adaptation is the result of long-standing processes that are intertwined with processes of community development and trust building, in which contingencies and path-dependency play a

significant role. This study yields clear evidence that changes in livelihood activities and trust building are shaped by the wider socio-economic context.

In Chapter 5, I described how changing market conditions and macro-economic policy reforms have affected the external vulnerability context of smallholders in Morelos. In the course of three generations, land tenure and the farming system changed from an indigenous slash-and-burn, a patchy, common land-use system, into a regulated and registered *ejido* characterised by individual usufruct land rights, and finally into a community of smallholders with individual land titles. Throughout this process, not all smallholders were treated equally and not all households benefitted from the new land titles and reallocation of land. Given this historical background, I hypothesised that smallholders who received a land title have a higher level of generalised and institutional trust than smallholders who have no access to land. The outcomes of the regression model confirmed this hypothesis, although the coefficient is small. So the role of institutionalised trust is less than other household characteristics.

Another result of this study is the positive association found between personalised trust and participation in cattle-breeding activities. Unfortunately, I did not find an appropriate instrumental variable that allowed me to definitively conclude that personalised trust determines the adaptation strategy choice. However, in-depth interviews with local farmers made clear that before households start cattle-breeding activities they often already have a high level of personalised trust. Frequently, smallholders and kin relations invest together in cattle, as this livelihood strategy requires many hectares of land and a large starting capital. This endorses the viewpoint that personalised trust shapes livelihood choices.

Lack of generalised and institutionalised trust might explain the fact that most smallholders continue producing maize while alternative opportunities are more lucrative. People who do not trust the market and institutional environment show risk-averse behaviour and prefer to provide for food security through own production rather than searching for other livelihood opportunities. Hence, trust and formal institutions have complementary roles: greater trust in strangers and institutions results in greater market participation. This is consistent with evidence presented by Tu and Bulte (2010) and Guiso *et al.* (2004, 2008). If this is the case, policy-makers should design policies that strengthen the local social-institutional context. However, there is still ample room for research, given our limited knowledge of how generalised and institutionalised trust is built.

The findings in Chapter 6 underscore the fact that the historical context is crucially important. The chapter presents evidence showing that strategic economic policies aimed at including smallholders in the process of market liberalisation will not be effective if they do not resonate with local social norms. The data demonstrates that new forms of social capital can be induced but are difficult to sustain if they do not link up with local forms of social capita. This is due to the fact that there is a continuous interaction between the local forms of social capital and newly introduced social capital. Traditionally, households in the study area do not have strong social ties with people other than their kin. Contrary to studies that assume a high level of social cohesion in rural communities, in Morelos this is visible only at the level of the household and immediate family. Although the role of families in constructing social capital tends to be underemphasised in the social capital

literature (Stone, 2001), close kinship relations in Morelos are regarded as the most fundamental form of social capital accumulation and transmission. Apart from helping out family members, smallholders hardly have reciprocal relationships and households individually struggle to survive. The social ties among non-residential family members lack the context of 'condensed morality' that one finds in households (Pennartz and Niehof, 1999). In addition, the weak social ties among *compadres* is noteworthy as *compadrazgo* is an important institution in most parts of Mexico (Cohen, 1999). The lack of strong social ties among villagers, limited experience with collective action, low levels of trust, and the individualistic attitudes of people have resulted in unstable and unsustainable farmer groups. If formal institutional structures are not supported by culturally-embedded informal structures of social interaction, trust, and conducive norms, collective action is constrained, and, consequently, prevents such structures from having positive effects on individual actors.

Chapter 6 shows that the limited access to social capital can have negative effects on smallholders' adaptation capacity. Due to the lack of successful farmer organisations, banks have lost interest in lending money to smallholders and *despachos* have left the area. This trend leads to the exclusion of local smallholders from accessing credit programmes and technological packages. Moreover, the bad performance of farmer groups prevented farmers from cooperating and participating collectively in the product market for maize, which has a constraining effect on their market performance. In other words, the historically-grounded individualistic behaviour of local smallholders negatively affects the local availability and accessibility of resources at the community level. It also shows how individual-level strategies can have unintended effects at the level of the collective (Brons *et al.*, 2007). This study strengthens the idea that people – to some extent – influence the structures and rules of economic and political institutions that govern the control, use, and transformation of resources (Bebbington and Perreault, 1999). These 'feedback effects' of livelihood activities are crucial for understanding people's future adaptation capability. Therefore, more research should be done on this issue, as this is still an undeveloped theme in livelihood studies. Furthermore, policymakers should take into account the heterogeneous and historically-shaped character of social norms present in different rural communities to realise their rural development objectives.

7.3 Theoretical implications and methodological considerations

7.3.1 Social capital

Over the last decade, there has been a growing recognition that differences in livelihood outcomes cannot be explained fully by differences in tangible asset inputs, such as land, labour, and physical capital (Serageldin, 1996; Grootaert, 1998; Bebbington, 1999; Fox and Gershman, 2000; Breugelsdijk and Van Schaik, 2001; Grootaert, 2002). Growing attention is given to the role of social capital in affecting the wellbeing of households, acknowledging that lack of, or changes in, social capital may hinder social and economic development of communities and nations (Dhesi, 2000). Previous studies demonstrate that social interaction among kin, neighbours, friends, and members of groups and associations, generate social capital that creates the ability to work together and share

information, which is especially important for poor and vulnerable people (Moser, 1998; Bebbington, 1999; Grootaert, 2002; Ali, 2005; Nombo, 2007). Furthermore, social capital is regarded as an important buffer helping people to cope with shocks, functioning as an informal safety net to ensure survival during periods of intense insecurity, compensating for limited human capital or a lack of other types of capital (Evans and Syrett, 2007; Nombo, 2007). As a result, inducing the formation of organisations or groups in the community has been a popular strategy in the field of development since the 1970s, especially within the context of market liberalisation as it is seen as a method to support farmers without market intervention. Studies with social capital as the main focus have almost taken community organisations for granted (Adhikari and Goldey, 2010). However, the way the concept of social capital has been used in the literature does little to explain the conditions that facilitate or impede the building and sustainability of farmer groups. This study contributes to the extension of knowledge in this regard. It shows the importance of social norms and previous experience for the success of farmer groups.

Based on historical analysis of local social norms, trust levels, and farmer group dynamics I found that farmer groups need to be supported by local social norms and attitudes. In Morelos, households traditionally operate in a self-supportive and sovereign manner. Although collective action at the community level has existed since the community was founded, individuality, independence, and autonomy are highly valued. Support networks beyond kin relations hardly exist. Norms of mutual support are weak; people emphasised straightforwardly time and again that it is everybody's individual responsibility to meet the basic needs of one's own household. In addition, I found that many households are vulnerable and unable to participate in reciprocal relations – even among kin – due to lack of resources to invest in them. Consequently, most people are excluded from support from such networks. The same was found by Nombo (2007) among households made vulnerable by AIDS in Tanzania. Hence, like other types of capital, social capital is a resource that requires investment to be able to benefit from it.

The lack of supportive social norms and possibilities to invest in strong social networks has negative effects on the process of sustainable farmer group formation. This finding captures the same mechanism as in the notion of the poverty trap, which refers to a household asset status characterised by an extremely low accumulation potential for improved wellbeing. It assumes the existence of threshold effects, the clustering of the poor and rich households depending on their initial asset endowment. Households with an initial status below this threshold eventually converge to a low level equilibrium state, while those above the threshold move towards a high equilibrium state (Banerjee and Newman, 1994). Constrained by poor initial conditions, with possible superimposed (economic) shocks, low status households find it difficult to cross the threshold point and remain stuck at the low level equilibrium poverty trap (Berhanu and Fayissa, 2009). Similarly, households having low levels of social capital in Morelos face struggles to build sustainable farmer groups that might help them to pass the threshold point, because successful collective action might lead to higher individual benefits and improved levels of wellbeing. It would be interesting to study further the importance of social capital in overcoming the poverty trap and reducing poverty in the future.

7.3.2 Economic trends and policies within the livelihood framework

Following the livelihood framework, global economic changes and neoliberal policy reforms are mediating factors that affect the structural context under which farmers participate in the agricultural sector. The economic changes are exposing farmers to new conditions to which they have to adapt. The significance of macro-economic trends and policies as a structural property of local systems is, however, neglected in the majority of livelihood studies as they most often focus on micro-level complexities in a local context (De Haan, 2000b; Kanji and Barrientos, 2002; Dorward *et al.*, 2003). In other words, the livelihood approach may tumble into the actor-structure pitfall when its people-centeredness comes close to the narrow instrumental '*homo economicus*' principle (Kaag *et al.*, 2004). Analyses of livelihood strategies are paramount within livelihood studies and are mostly based on the assumptions of rational choice and profit maximization, sometimes paying insufficient attention to the impacts of changing market conditions and macro-economic policy reforms.

This study emphasises the importance of global processes and increasing international trade relations for rural livelihoods. Livelihoods are based on a range of resources, income opportunities, and product and labour markets, which are located in different places and interact in turn with other places, meaning that livelihoods both depend on, and are shaped by, supra-local and global forces (De Haan and Zoomers, 2003). For this reason, this study considers the local arena in a wider perspective and argues that livelihood studies should take into account the larger national and international ecological, social-cultural, economic, and political-cultural structures while analysing the adaptation processes of actors.

7.3.3 Feedback effects: an underexposed element of the livelihood framework

Data provided in Chapter 6 demonstrated that, due to the lack of successful farmer groups, banks become less interested in lending money to smallholders and local *despachos* leave the area, leading to the exclusion of local smallholders from accessing credit programmes and technological packages. Moreover, the bad performance of farmer groups prevented farmers from cooperating and participating collectively at the product market for maize, which has a constraining effect on their market performance. In other words, the individual behaviour of local smallholders negatively affects the overall local availability and accessibility of resources. This finding supports the evidence in the literature that social capital might have a downside as it can constrain the household adaptation capacity (Dhesi, 2000; Lin, 2001; Adhikari and Goldey, 2010). It also shows how individual-level strategies can have unintended effects at the level of the collective (Brons *et al.*, 2007). However, the livelihood approach does not provide a theoretical peg to explore the mutual causation between action and structure. Most livelihood studies do not analyse how this interplay takes place.

The finding strengthens the idea that people – to some extent – influence the structures and rules of economic and political institutions that govern the control, use, and transformation of resources (Bebbington and Perreault, 1999). These 'feedback effects' of livelihood activities are crucial for understanding people's future adaptation capability.

They underscore the significance of the interdependence between action and structure. Proceeding from the assumption that actors are human agents whose activities are embedded in a structural context, I recognise a complex and continuous interrelation between actors (i.e. individuals and households) and their structural environment, which mediates the opportunities and acts of the agents involved and goes beyond the notion of 'entitlement' or 'access'.

Livelihood studies often fail to address the reproduction of the structural environment through the mutual relationship between actors and social structures. I found that individuals and households have agency and are therefore capable of monitoring, interpreting, and shaping their experiences and the world around them. Linking agency and structures emphasises how structures emerge as products of people's practices and actions, both intended and unintended. While routinised action reproduces structures, reflexive action may change the system over time. This study demonstrates that the social norms and values underlying routinised social interaction may constrain the adaptation process of local smallholders, as illustrated by the disappointing collaboration between smallholders in farmer groups which limits their access to financial resources.

Hence, one should conceptualise access to resources in terms of structural embeddedness. This suggests that within the context of current globalisation processes, livelihood studies should focus more on the structural embeddedness (or interlocking aspects) of livelihoods, taking into account the global arena as well as the local socio-historical context. For this reason, I consider the structural environment not only as a source of changes that provokes human responses, but also as produced by the adaptation strategies of the farmers. This is in line with Leach *et al.* (1999:239) who describe the feedback linkages between the human activities and the environment thus: "[…] environmental conditions at any given time can be seen as the product of both ecological and social history. […]. Seen in this way, the environment provides a setting for social action but is also a product of such action. […]. As present practices build on the legacy of past ones, so the causality of environmental changes need to be seen as cumulative, sequential or path dependent." More research should be directed towards these unintended feedback loops, as this is still an undeveloped theme in livelihood studies. Furthermore, policymakers should take into account the heterogeneous and historically-conditioned character of social norms present in different rural communities to realise their rural development objectives.

7.3.4 Livelihood adaptation calls for a multidisciplinary research

Livelihoods are complex and the multi-dimensional nature of the interactions between different factors and processes in the wider context, and between and within the household, make them difficult to investigate. Chapters 5 and 6 demonstrate the embeddedness of contemporary decision-making in past experiences. Data provided by the household surveys was not sufficient to unravel the path-dependent nature of livelihood adaptation, because this method is limited in eliciting changes over time. Through retrospective questioning in the household survey and collecting life-histories and case studies, it was possible to assess and understand adaptation processes in response to changes caused by neoliberal market reforms. I could gather detailed information on the livelihood strategies and activities carried out in the recent past. This

mix of methods allowed me to get a picture of the livelihood strategies in Morelos at the time preceding the implementation of the most significant policy reforms. These positive effects of a multidisciplinary approach confirm the increased number of articles arguing that the use of mixed qualitative and quantitative (Q-Squared) methods in the analysis of poverty is a good development with large potential beneficial payoffs (Carvalho and White, 1997; Kanbur, 2003; Barrett, 2005; Njeru, 2005; Kanbur and Shaffer, 2007).

7.4 Implications for policies and further research

7.4.1 Policy implications

This thesis explored various dimensions of rural livelihood generation within a context of changing market conditions. The findings have several policy implications.

In Chapter 1, I conclude that a high poverty incidence in Mexico at a time when the national economy has experienced macro-economic growth suggests that market liberalisation alone is not sufficient to alleviate poverty. Policies aimed at (rural) poverty reduction need to be complimented with pro-poor growth policies that create opportunities for smallholders. Chapter 4 makes clear that market-oriented state interventions directed at stimulating productivity and improving livelihoods do not always have the intended outcome. While it was expected that Mexican smallholder maize producers would switch to the more profitable production of fruit and vegetables, they continue producing maize. Consequently, instead of gaining from the new market conditions they are facing lower prices for their product and are confronted with higher input prices. How can poor people benefit from macro-economic growth and liberalised markets?

Over the last decade literature on pro-poor growth has increased rapidly with the result that different definitions are being used. In general, pro-poor growth focuses attention on the extent to which poor women and men are able to participate in, contribute to, and benefit from growth, as measured by changes in the incomes of the households in which they live and the assets they and their children acquire to earn higher incomes in the future (OECD, 2006). Pro-poor growth requires growth in the sectors where the poor are active, regions where the poor live, and sectors that use the productive factors that the poor possess. In Mexico the majority of the poor (60 per cent) lives in rural areas and agriculture has been identified as a vital sector that can reduce poverty (CONEVAL, 2008).

In Mexico, growth has to focus on the maize sector as most poor smallholders depend on the production of this crop for their livelihood (Nadal, 2002). Because of the importance of maize for the rural poor, it had a 15 year phase-out period within NAFTA, which gave smallholders time to adapt to the liberalisation process. However, two decades after the implementation of NAFTA, smallholders are still poor and did not use the newly created market opportunities. Therefore, Mexico has to implement education programmes and training to support smallholders in their adaptation process, as the findings demonstrate that a lack of knowledge and information is an important reason to continue producing maize. These programmes should be implemented in addition to the subsidies that have

been provided by Oportunidades since this government programme facilitates mainly primary and secondary education for children.

Due to a lack of information and alternative financial opportunities, smallholders continue maize mono-cropping which may result in the depletion and contamination of the soil. Governments should provide and stimulate alternatives so that livelihoods will become sustainable. In Chapter 4, I found that smallholders seek to overcome lower maize prices and declining income by intensifying their maize production. This has stimulated the cultivation of hybrid maize varieties which require the application of agrichemicals, a trend that has had a dramatic impact on (agro) biodiversity. The government should implement policies and give good advice on how to use land in a sustainable way so that future generations are not forced to move to the already overpopulated cities.

The findings in Chapter 5 on the factors underlying adaptation strategy choices underscore the importance of social factors. It demonstrates that, in order to meet the needs of the vulnerable and poor people, governments should take into account local situations, the actors involved, the power structures within the communities, and the possible conflicts this might cause. My data suggests that the social-historical context affects local institutions. Weak institutions and unstable governance has resulted in low levels of trust which restrains smallholders from market participation and livelihood diversification, despite the higher incomes gained with livelihood diversification. However, governments disregard cultural and political factors. It is therefore necessary to decentralise policy formulation and implementation, taking into consideration the existing heterogeneity in the rural areas and creating flexibility to accommodate individual cases.

The findings of Chapter 6 suggest that governments and NGOs promoting farmer groups and collective action should take into account that this is only useful and successful if such novelties link up with existing social norms. In Morelos this was not the case and the pro-poor initiative had an opposite effect. In the worst case, the negative experiences of farmer group members will contribute to undermining future self-help initiatives. In the light of this, policy-makers need to reassess the role that groups can play, basing the assessment on a more realistic understanding of what contributes to successful farmer cooperation. The popular idea that farmer groups or organisations are a success formula for realising a better market position for farmers does not always apply. It became clear that state intervention is a dynamic process, socially constructed, where outcomes not only depend on government programmes and policies at national level but also on the local actors involved and their environment.

7.4.2 Further research

Some key insights and limitations emerged from the study generating further research questions.

Chapter 3 described the research design and elaborated on the methods used in this study. Disentangling the impacts of changing market conditions is difficult and this is aggravated by the incremental nature of the impacts; even longitudinal studies are unlikely to enable isolation of the market effects on smallholder households. Small-scale location-specific studies that are conducted on a regular basis on the effects of certain market changes on

smallholder households are likely to be more useful than large-scale surveys to find ways in which to support these people. Such studies must be linked in a comprehensive framework. There is a need for a holistic multi-disciplinary and multi-sectoral approach to deal with livelihood vulnerability to market trends. On the other hand, because the impacts and adaptation responses are context-specific, the lessons learned from this study are only applicable to areas that are comparable to the study area. Hence, doing a similar study in another area would allow for more general conclusions.

The current study could have benefited from panel data to add more value to the research findings. A longitudinal study using both qualitative and quantitative methods could have better captured the local dynamics of neoliberal policy reforms impacts. It would also have provided more information on micro socio-economic trends, households' ability to adapt, and the complex causal relationships involved. However, panel data sets are costly and take time to generate. A longitudinal approach to the subject matter of the study would have to include the variables of household composition, assets portfolio, livelihood activities, social relations, and adaptation responses. However this approach does not solve the problems related to the isolation of impacts on livelihoods.

From Chapter 4, it appears that the engagement of a rural household in agricultural activities is an economic choice in its pursuit of making a living, given its resource endowments, household characteristics, and exogenous factors. Livelihoods form parts of complex realities. Farmers participate in and respond to changes in the global economy and their activities are influenced by regional and local socio-economic and political conditions as well as by the local history and culture, producing specific local processes. Therefore, I argue that the current globalising realities and adaptation processes have to be seen in relation to the emergence of local processes. Further research on the interface between global and local processes can be recommended.

Chapter 5 and Chapter 6 also show that the limits to household and community responses to market changes stem from the nature of the general market conditions and national policies and from the particular socio-economic and cultural features of the community involved. Through which channels the local conditions influence the adaptation capacity of smallholders is an interesting topic to study that should be explored. Further research should be holistic and not just address the immediate effects but also take into account important contextual circumstances and underlying causes to market vulnerability. In particular, it would be interesting to not only analyse which contextual factors affect people's adaptation capacity but also to go one step further and unravel the factors that determine this causal relation. Hence, it is not only an analysis if there is an effect of trust on livelihood adaptation that is needed, but also an investigation into what causes this relationship and how trust is built. This study demonstrates that more detailed knowledge on how the social context influences economic decisions is required for the successful implementation of policy interventions aimed at improving the level of wellbeing of local smallholders.

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Appendices

Appendix I Mexican *ejido* system (1917-1992)

Article 27 of the New Mexican Constitution of 1917 established the states domination of all land and water in the republic and defined two principal forms of land tenure. One form is '*pequeña propiedad*' (small private property), where owners make own productive decisions on an individual basis however constrained by maximum permitted landholding. The other form is '*propiedades sociales*' (communal land tenure or social property), which included both *comunidades agrarias* and *ejidos*. These two forms of social property differ due to the fact that *comunidades agrarias* (agrarian communities) were founded since the pre-Hispanic period and remain up to now keeping some traditional practices of organisation and agricultural production, while *ejidos* were settled down since the Agrarian Law of 1917.

The Agrarian Law of 1917 offered Indian populations the procedure of restitution through which they could reclaim rights to lands that had been taken away from them in the past. However, in order to get their lands restituted the Indian communities had to prove their claim by official land titles. Frequently, Indian communities could not provide the necessary documents and consequently changed their petition into a request of endowment. As a result, the establishment of *ejidos* became a much more common procedure than the creation of agrarian communities (Nuijten, 1998). With article 27, the access to land became a right registered in the Constitution and engaged the State to endow communities with sufficient land to provide for the needs of the population. The Mexican Agrarian Law has been changes several times, but the key characteristics of the *ejido* system did not change between 1917 and 1992 (Nuijten, 1998; Bouquet, 2009).

The *ejido*, as defined by the Agrarian Law of 1933, was a community with its own legal identity and estate. *Ejidos* had a legal status and a clean inheritance and were owners of the land that they received. *Ejido* land was divided into (1) land used in common (*tierra de uso común*); (2) land that has been sub-divided into parcels and that was assigned to individual *ejido* members for their exclusive use and control (*tierras parceladas*); and (3) land used for housing and shelter (*tierras para el asentamiento humano*).

Until 1992, the holder of a parcel land title, the *ejidatario*, held permanent usufruct rights to one or several plots. They had not the entitlements to transfer those usufruct rights to non-heirs nor to rent, nor sell the land. According to the law, the only way to access *ejido* land was either through allocation by the *ejido* governance bodies or through inheritance from a relative. Any form of land market transaction (sales and tenancy contracts) was prohibited by law. *Ejidatarios* did not hold individual property titles to their plots. Rather, the agrarian administration issued a collective property title for the whole *ejido*, and individuals were only provided with *ejido* membership certificates, which did not specify the number or location of their plots (Bouquet, 2009).

Very few collective *ejidos* were established in which productive activities were carried out on a cooperative basis and land was not divided into individual plots (Nuijten, 1998). The

typical and most-commonly found *ejido* is made up of individually managed parcels and a collective area devoted for grazing or wood collection (Bouquet, 2009).

The internal composition and government of the *ejido* was laid down in the Federal Agrarian Reform Law of 1971. This law mandated that all *ejidos* were obligated to have three internal bodies: an *Asamblea General* (general assembly) of which all farmers of the *ejido* were a member of; the *Comisariado Ejidal* (executive body); and the *Consejo de Vigilancia* (supervisory committee) whose task was to see that things worked correctly in the *ejido* by making controls. The general assembly was the highest authority in the *ejido* used to discuss and take decisions by majority vote (Baitenmann, 1998). Thus, the *ejido* corresponds to a socio-political organisation as well as to a specific form of land tenure, subject to regulations that are distinct from that of the private sector.

In 1992, a major legal change towards privatisation of the land market was enacted. The main feature of the reform included the amendment of Article 27 of the Mexican Constitution in 1992, and the subsequent Agrarian Law. These amendments opened the possibility of defining individual property rights on land held under the *ejido* or communal property system through PROCEDE (OECD, 2006; Bouquet, 2009). This reform introduced formal titles for agricultural plots, the legalisation of land markets, the formal registration of land transfers, and attracted capital and investment to Mexican agriculture. After registering the limits and uses of the land in the National Agrarian Registry (RAN), *ejidatarios* received a certificate with a map defining the limits of their plots, and their rights to residential and common land. *Ejidatarios* were given the right to sell, rent, or use as collateral their plots of land; inherit their *ejido* rights; enter into long term (30 years, renewable) association agreements with third parties to exploit their parcels and common use land; and acquire full ownership and title to land allocated for housing and transfer them to any third party including foreigners, without restrictions. Two new national institutions were created to regulate conflicts, arbitrate, and settle agrarian conflicts: the Office of the Agrarian Attorney General and of the Superior Agrarian Court.

PROCEDE was launched in 1993 to implement these steps with all the usual guarantees. By August 2004, 69 per cent of the *ejido* and community land had already been certified under the PROCEDE programme (OECD, 2006).

Appendix II The maize plant

Maize (*Zea mays L.)* is a member of the grass family *Gramineae* to which all the major cereals belong (Dowswell *et al.*, 1996). Despite decades of research, the ancestry and place of origin and domestication of maize remain ambiguous and several controversial theories have been proposed in the past (Paliwal, 2000b; Piperno and Flannery, 2001). Today, however, teosinte[70] is widely recognised by scientist as the ancestor and the closest wild relative of maize (Dowswell *et al.*, 1996; Doebley, 2003). Considerable disagreement exists still about how long maize has been grown and where it originated. However, the oldest evidence of domesticated maize comes from archaeological sites in the Central Valleys of Oaxaca, Mexico, where small cobs estimated to be 6.250 years old have been found in the Guila Naquitz caves (Piperno and Flannery, 2001). This estimation compares well with the generally accepted dates for the origin of agriculture 8.000 to 10.000 years ago (Dowswell *et al.*, 1996). Other theories suggest that the genetic diversity of maize, and the widespread cultivation of maize indicate that maize domestication developed independently in multiple locations in the Andean countries of South America (Dowswell *et al.*, 1996). Today, it is widely accepted that humans were an important selective agent in the evolution and domestication of maize (Dowswell *et al.*, 1996; Paliwal, 2000a). Wild maize is unknown in the world and the cultivated maize that we know today is fully domesticated (Paliwal, 2000a, b). The maize seeds are so compactly packed in the husk that maize is hardly able to reproduce itself without human interference (Bech Badstue, 2006).

Maize has the highest grain yield potential of all the cereals and is able to transforms the energy of sun into food energy in an exceptionally efficient manner (Dowswell *et al.*, 1996). Modern maize has no equal among other cultivated species or in the wild as an efficient producer of grain. In about three months time a single maize seed can develop into a more than 5 meters high plant, carrying more than 1000 seeds (Wallace and Brown, 1988; Dowswell *et al.*, 1996). A matter maize plant normally has a single stalk, which has between 8 and 20 nodes from which a leaf emerges on alternative sides of the stalk (Bech Badstue, 2006). At the top the stalk ends in a tassel with 5 – 20 branches, each with hundreds of little spikelets, which are the male flowers of the maize plant (Wallace and Brown, 1988). From nodes along several ear shoots may develop, each covered by a protective layer of husk leaves. While most of the ear shoots degenerate, one or two will continue to develop into the female inflorescence of the maize plant (Bech Badstue, 2006).

Maize needs a lot of water to germinate. Therefore, in Mexico the main sowing season is in May-June when the raining season starts. After 1 – 2 weeks in the field, the silks are pollinating. This is a critical stage, because during this time each silk must emerge for pollination[71] if a kernel is to develop. The silk grows 2.5 – 4 centimetres a day and continue to lengthen until fertilised (Dowswell *et al.*, 1996). Each silk is connected to ovules on the

[70] The name 'teosinte' comes from Náhuatl language of Mexico and it has been suggested that its meaning is maize (centli) of the gods (teo) (Doebley, 2003).

[71] Pollination takes place when the falling pollen grains are caught by the new moist silks. A captured pollen grain takes about 24 hours to grow down the silk to the ovule where fertilisation occurs and develops into a kernel (Dowswell *et al.*, 1996).

maize cob, and each ovule is a potential maize kernel. Ovules and silks make up the female element of the maize plant. Each spikelet on the tassel contains a number of pollen sacs. When these ripen they began to shed pollen and at the moment a pollen grain lands on a silk, it starts to travel down through the silk for 20 – 25 centimetres to the ovule, where the pollination is completed (Bech Badstue, 2006). Although all types of maize belong to the same species, variety exists in the size, texture, shape, and colour of the maize kernel, ear, and cobs. This great diversity is the result of centuries of selection, mutation, and hybridisation (Dowswell *et al.*, 1996). A maize ear contains between 400 – 800 kernels and come in different sizes ranging from 7.5 – 40 centimetres (Wallace and Brown, 1988). Moreover, the kernels can have different colours, including white, yellow, black and red[72] (Bech Badstue, 2006).

[72] Some ears have kernels existing of a combination of two to four of these different colours (Bech Badstue, 2006).

Appendix III Time schedule research project

Time Period	Location	Phase	Activities
Part 1: Preparation			
May 2006 – August 2006	The Netherlands	Literature review and designing research	Reviewing relevant literature on international trade, livelihoods, household dynamics, livelihood adaptation, social capital, and gender. Writing (draft) introduction and theoretical chapter and developing the research design and methodology.
September 2006 – February 2007	Shanghai	Preparation fieldwork period	Finalising the theoretical chapter and working out the research design. Contacting relevant institutions and persons in Mexico.
Part 2: Fieldwork			
March 2007 – August 2007	Mexico	Extensive period of fieldwork (I)	Selecting research location and contacting local authorities. First introduction to the field and starting qualitative data collection. Developing, pre-testing, and finalising questionnaire.
September 2007 – April 2008	The Netherlands	Analysis, interpretation and feedback on data	Analysing data and writing article on background market liberalisation in Mexico. Start writing empirical chapters. Searching for additional literature and background information on relevant issues based on findings during first fieldwork period. Discussing the results with supervisors and incorporating feedback in new questionnaires. Preparing for fieldwork period II.
May 2008 – August 2008	Mexico	Extensive period of fieldwork (II)	Carrying out household survey and in-depth interviews.
September 2008 – January 2010	The Netherlands	Analysis of empirical data and results from the household survey	Incorporating data from fieldwork period in empirical chapters. Continuing writing empirical chapters. Writing article on livelihood adaptation strategies. Preparing for fieldwork period III.
February 2010 – May 2010	Mexico	Final extensive field work period (III)	Collecting qualitative empirical data on social capital and findings acquired by the survey.
Part 3: Thesis writing			
May 2010 – December 2011	The Netherlands	Data Analysis. Finalising dissertation	Incorporating findings of fieldwork period III in empirical chapters. Writing thesis. Writing two articles on the role of trust and farmer group participation in livelihood adaptation.

Appendix IV Time schedule fieldwork period

Objectives	Methods	Sample	Topics
Phase I: Exploratory (March – August 2007)			
- Fine-tuning questionnaires, topic lists and - Preparing sample for survey - Collecting qualitative data	- 20 In-depth Interviews - 2 Life-histories - 3 Case studies - Secondary data collection - Systematic observations	Members smallholder households; health service providers; teachers; government officials; local and regional authorities; farmer group leaders; representatives of financial institutions	Historical, cultural and demographic profile of the area; infrastructure; education and health facilities; market structure & function; community organisations; agricultural performance; maize production; community life; employment; physical characteristics NAFTA.
Phase II: Survey (May – August 2008)			
- Collecting quantitative information on performance indicators; - Collecting qualitative data on findings household survey	- Household survey - 10 In-depth Interviews - 2 Focus Group Discussions - 3 Life-histories - 3 Case studies - Systematic observations	Household heads of smallholder households; farmer group members; representatives; coyotes; cattle-breeders; shop owners	Household and socio-demographic characteristics; productive & reproductive activities and their time allocation; income & assets; felt cultural & institutional constraints; local organisations and networks; opportunities and constraints; market competition and changes; maize production; livelihood strategies; political parties; migration.
Phase III: In-depth study (February – May 2010)			
- Collecting information on sensitive issues	- 10 In-depth Interviews - 3 Focus Group Discussions - 3 Life-histories - 4 Case studies - Systematic observations	Household heads of smallholder households; farmer group members; representatives; coyotes; cattle-breeders; shop owners	Bonding, bridging and linking social capital; norms of reciprocity; trust, social networks, strong/weak social ties, community participation, social cohesion, *compadrazgo*; gender roles; recent developments maize sector; government programmes; dynamics local maize/input market; perspectives on future of maize production under NAFTA; perception winner/loser NAFTA.

Appendix V Questionnaire household survey

HOUSEHOLD SURVEY, MORELOS 2009

Name respondent: ……
Region respondent: ……
Number respondent: ……
Date interview: ……
Name interviewer: ……
Signature interviewer: ……

General observations: ……

……

……

……

A. General Data

1. A. Are you the head of the household?
   1 = yes, 0 = no (if no, ask for the household head)

   B. Gender household head: 0 =female 1 = male
   C. In case of a female household head, what is the reason?
   1 = Single
   2 = Deserted by husband
   3 = Migrated husband
   4 = Widow
   5 = Ejidatario
   6 = Other (specify): _____

2. What is your ethnical background?
   1 = Popoluca
   0 = Other (specify): _____

3. A. How many years have you lived in Morelos?
   0 = Since birth (ever)
   1 = Total:….. years

   B. What is your place of birth?
   0 = Morelos
   1 = Other (specify): _____

4. What is the place of birth of your parents?
   Father: … Mother: …

B. Household Compositions

5. Of how many people does your household consist? ……..

6. Write the answers to the following questions in Table 1:

A. What are the names of your household members?
B. What is the relationship of each household member with the household head?
   1 = Household head
   2 = Husband/wife
   3 = Father/mother
   4 = Son/daughter
   5 = Grandson/granddaughter
   6 = Step father/stepmother
   7 = Son/daughter in law
   8 = Brother/sister in law
   9 = Nephew/niece

10 = Cousin
11 = Uncle/aunt
12 = Other (specify): _____
13 = Domestic worker

C. What is the sex of each household member?
0 = Male
1 = Female

D. What is the age of each household member?

E. What is the civil status of each household member?
1 = Married
2 = Single
3 = Widow/widower
4 = Divorced
5 = *Unión Libre*

F. What is the health condition of each household member?
1 = Good (able to work 41 ≥ hours/week)
2 = Weak (able to work 21 ≥ 40 hours/week)
3 = Very weak (able to work 8 ≤ 20 hours/week)
4 = Bad (not able to work)

G. Can household member X read and write?
1 = yes / 0 = no

H. What is the level of education of each household member?
1 = Nursery class
2 = Primary school
3 = Secondary school
4 = High school
5 = University/*preparatoria*
6 = Adult education
7 = No education because age < 4 years
8 = No education

I. Does household member X speak Spanish?
1 = yes / 0 = no

J. How many months per year does each household member live outside of the household?

C. Household Activities

7. Write the answers to the following questions in Table 2:

   A. What is the main/primary occupation of each household member (if any)?
   B. What is the secondary occupation of each household member (if any)?
   C. What is the tertiary occupation of each household member (if any)?

      1 = Farmer
      2 = Entrepreneur / own business
      3 = Employed in agricultural
      4 = Employed in manufacturing sector
      5 = Working in cattle industry
      6 = Construction worker
      7 = Public servant
      8 = Teacher
      9 = Pupil/ Student
      10 = Domestic worker
      11 = Other (specify): _____
      12 = Not employed

   D. Which share of your working time do you allocate to activity a,b, c?

   E. What is your income per month gained by activity a,b,c?

   F. Does your wife gain an addition income?
      1 = yes / 0 = no
      If yes, how and what amount does she gain per month? _____

   G. Does your household receive support from Oportunidades?
      1 = yes / 0 = no
      If yes, what amount do you and the other household members receive per month?

   H. Do you receive *Seguro Popular*?
      1 = yes / 0 = no

Table 1 Household Composition

Nr HHM	Name	Relation to HHH	Sex	Age	Civil status	Health condition	Read	Education		Spanish	Migration
								Code	*Grade*		
1											
2											
3											
4											
5											
6											
7											
8											

Table 2 Household Activities

Nr HHM	First occupation	Second occupation	Third occupation	Time allocation per occupation (% total labour time)			Income generated per occupation			Oportunidades
				First	*Second*	*Third*	*First*	*Second*	*Third*	
1										
2										
3										
4										
5										
6										
7										
8										

D. Migration

8. Write the answers to the following questions in Table 3:

A. What are the name, sex and age of the emigrated household members?
B. What are the main reasons for them to emigrate?
C. Where have they emigrated to?
D. What type of work are they doing?
E. Did your household receive assistance from these emigrated household members during last 12 months?

Table 3 Migration

Nr.	Name	Sex	Age	Education	Reason	Location	Profession	Contribution	
1								Type	Amount
2									
3									
4									
5									
6									
7									

E. Household assets

9. Which of the following assets does your household own and how many?

Table 4 Resources

	Asset	Yes	No	Nr.		Asset	Yes	No	Nr.
A	Television				M	Bicycle			
B	Refrigerator				N	Car			
C	Oven				O	Motor cycle			
D	Radio / Sound system				P	Horse			
E	Molino de Nixtamal (maize grain mill)				Q	Donkey			
F	Gas cooker				R	DVD player			
G	Computer				S	Watch			
H	Telephone (land line)				T	Bed with mattress			
I	Mobile phone				U	Plank bed			
J	Blender (licuadora)				V	Ventilator			
K	Freezer				W	Microwave			
L	Washing machine				X	Chicken			

10. How often are you travelling to Acayucan?
    1. Every day
    2. More than once a week (every 2-3 days)

3. Once a week
4. Once every 15 days
5. Once a month
6. Once every 2 months
7. Once every 3-6 months
8. Hardly ever

Financial assets

11. Does your household own an official land title document demonstrating that you own a *solar*?
    1 = yes / 0 = no

12. Apart from your household, are there more households living at the *solar*?
    1 = yes, if yes, how many? _____ / 0 = no

13. A. Are you using this *solar* title as collateral to access credits (for agricultural activities or the house)? 1 = yes / 0 = no

    B. **If no**, why not?

    1. I do not own assets to obtain credit
    2. I have already run up a debt
    3. I do not need credit/loan
    4. I do not want to take the risks
    5. I do not know where I can get a loan
    6. I have no confidence in the credit programmes of the government/credit institutions
    7. I have no confidence in the farmer group leaders
    8. Other (specify): _____

    C. **If yes**, up till now, which proportion of the loan have you refunded?

    1. Everything
    2. More than half
    3. Less than half
    4. Nothing

14. Which of the following programmes or possibilities did you make use of last year?

Table 5 Government programmes

Programme/possibility		Provided by?	Since when?
1. Credits/Loans	1 = Yes / 0 = No		
2. Technological packages	1 = Yes / 0 = No		
3. Seeds from Kilo X Kilo	1 = Yes / 0 = No		
4. Contract farming	1 = Yes / 0 = No		
5. Ingreso Objetivo	1 = Yes / 0 = No		
6. PROMAF	1 = Yes / 0 = No		
7. PROCAMPO	1 = Yes / 0 = No		
8. PROGAN	1 = Yes / 0 = No		
9. Loan to buy production tools	1 = Yes / 0 = No		

15. Imagine that I give you 10 million pesos, how would you spend the majority….?
    1. Consumption (food/cloths)
    2. Savings
    3. Investment:
        a. in agriculture: in maize production
        b. in agriculture: in production of other crops
        c. in head of cattle
        d. in the dwelling/house
        e. in a car
        f. in own business
    4. Other activities beyond agriculture (specify):_____
    5. Education

16. Do you save money or food (maize) for times of difficulties? (more than one answer is possible)
    1. No
    2. Yes, money
    3. Yes, food

17. A. Do you lend money or food to other persons now and then?
    1 = yes / 0 = no

    B. If yes, how often?

    1. Every day
    2. More than once a week (every 2-3 days)
    3. Once a week
    4. Once every 15 days
    5. Once a month
    6. Once every 2 months
    7. Once every 3-6 months

8. Hardly ever

C. If yes, to whom? (more than one answer is possible)

1. Family
2. Friends
3. Neighbours
4. *Compadres*
5. *Agente municipal*
6. Representatives of farmer groups
7. *Coyote*
8. Other (specify): _____

E. Opinion on wellbeing

18. What is the source of drinking and cooking water?

1. Water bottles
2. Chlorified
3. Piped water system

19. What is the source of washing and cleaning water?

1. No access
2. Piped water system
3. Water tank/water reservoir
4. Well
5. River
6. Other (specify): _____

20. What type of roof does your house have?

1. Concrete
2. Corrugated iron/asbestos
3. Palm leaf
4. Other (specify): _____

21. What type of floor does your house have?

1. Concrete
2. Dirt
3. Other (specify): _____

22. What type of walls does your house have?

1. Concrete
2. Corrugated iron/asbestos
3. Wood
4. Mud

5. Other (specify): _____

Food security

23. In general, how many meals do your household members consume during a day?

1. One meal per day
2. Two meals per day
3. Three meals per day
4. More than three meals per day

24. A. Do you experience food insecurity sometimes?
1 = yes / 0 = no

If yes, during which months do you experience food insecurity?

_____

B. How many meals do you eat during these months?

1. One meal per day
2. Two meals per day
3. Three meals per day
4. More than three meals per day

C. How do you survive during times of food insecurity? *What do you do? Where?* Please give details.

1. _____

2. _____

3. _____

25. How often do you eat meat in this household?

1. Every day
2. More than once a week (every 2-3 days)
3. Once a week
4. Once every 15 days
5. Once a month
6. Once every 2 months
7. Once every 3-6 month
8. Hardly ever

26. In your opinion, what are the most urgent issues that need to be addressed in the household? (1 = the most urgent): 1_____; 2 _____; 3 _____

1. Lack of food
2. Health condition

3. Habitat condition
4. Education
5. Lack of government contribution
6. Lack of income
7. Downward maize prices
8. Land fragmentation
9. Bad soil conditions
10. Other, (specify)_____

Livelihood circumstances

27. Compared to other households in the community, do you feel ...?

1. Rich
2. Not rich not poor
3. Poor
4. Very poor

28. Compared to 5 years ago, how would you say things have changed for you and members of this household?

1. Much better
2. Better
3. Neither better nor worse
4. Worse
5. Much worse
6. Uncertain/ do not know

29. How do you think things will be for you and members of your household in five years time? Do you expect things to get better, worse or the same? ____

1. Much better
2. Better
3. Neither better nor worse
4. Worse
5. Much worse
6. Uncertain/ do not know

30. Are you …?

1. Very happy
2. Happy
3. Not happy not unhappy
4. Unhappy

5. Very unhappy

31. How satisfied are you with the household's access to food, shelter, clothing, health and education?

1. very satisfied
2. satisfied
3. neither satisfied nor dissatisfied
4. dissatisfied
5. very dissatisfied
6. uncertain/ do not know

F. Agricultural production

32. Do you or other members of your household own agricultural land (*titulo parcelario*)?
1 = yes / 0 = no

If no:

33. A. Did you rent land for agriculture in 2007?
1 = yes / 0 = no

B. How many hectares of land did you rent in 2007?
Total hectares rented: _____ ha.

C. How much was the rent and how did you pay the rent? Did you pay rent per harvest/semester/year?

1. Money: _____peso/ per ____
2. Harvest: _____kilo/per ____
3. Work: _____ days/per____
4. Other_____/ per____

34. Did/does your father own a parcel? 1 = yes / 0 = no
Is/was he *ejidatario*? 1 = yes / 0 = no
Did he receive land by PROCEDE? 1 = yes / 0 = no

B. If yes, at what distance from your house was/is the parcel of your father situated?
_____meters from the house

(Continue with question 41)

If yes:

35. How many hectares do you own?
Total hectares owned: _____

36. Do you or other members of your household own agricultural land (*titulo parcelario*)?
    1 = yes / 0 = no

37. Do you use this title deed as collateral to access credits or technological packages?
    1 = yes / 0 = no

38. At what distance from your house is your parcel located?
    Distance to current parcel _____meters

39. A. In the past, did your father own a parcel?
    1 = yes / 0 = no

    B. If yes, at what distance from your house was/is the parcel of your father situated?
    _____meters from the village

40. A. In addition to the land you own, did you also rent land in 2007?

    1 = yes / 0 = no
    B. If yes, how many hectares land did you rent in 2007?
    Total hectares rented: _____ ha.

    C. How much was the rent and how did you pay the rent? Did you pay rent per harvest/semester/year?

    1. Money: _____peso/ per ____
    2. Harvest: _____kilo/per ____
    3. Work: _____ days/per____
    4. Other_____/ per____

41. Did you cultivate all your land?
    1 = yes / 0 = no

42. In spring 2007, how many hectares did you cultivate in total?
    Total hectares cultivated in Spring 2007: _____ ha.

43. If you did not cultivate all your land, for what did you use the rest of the land?

    1. Pasture land for grazing cattle
    2. Fallow land
    3. Lend to other people
    4. Since when did you lend your land? _____
    5. How much rent did you received during the last 12 months? _____pesos.
    6. Other (specify): _____

44. Characteristics of the soil at your parcel:
    1. Do you have access to water at your parcel? 1= yes / 0 = no
    2. How much is the slope of your land? 1 = plain; 2 = hilly; 3 = steeply
    3. Do you have stones at your parcel? 1 = no; 2 = some; 3 = many
    4. What is the quality of your soil? 1= very bad; 2= bad; 3= regular; 4= good; 5=very good

45. Which of the following production means does your household own and how many?

Table 6 Production means

Productive assets	Yes	No	Quantity
1. Spade			
2. Hand saw			
3. Knap-sack sprayer			
4. Pruning equipment			
5. Irrigation system			
6. Tractor			
7. Cultivator			
8. Sewing machine			
9. Shed and other buildings			

46. What type of crops did you cultivated last year?

Table 7 Agricultural production

Crop **0. Pasture** **1. Maize** **2. Courgette** **3. Beans** **4. Other.....**	Since (year)	Total hectares	Total harvest per crop (in tonnes)	Time per crop	Percentage harvest for consumption/ market/ storage		
					Consumption (%)	Market (%)	Storage (%)

47. A. Are there crops that you used to grow 5 years ago but not anymore?
    1 = yes / 0 = no

    B. If yes, which crops? _____
    C. Why did the number of crops/varieties that you have grown change? _____

48. A. Has there been a change in net income from agricultural activities over the last 5 years?
    1= yes / 0 = no

    B. If yes, did it increase or decrease? _____
    C. What are the most important reasons for this change?_____

49. A. Do you currently grow crops that you did not grow 5 years ago?
    1= yes / 0 = no

    B. If yes, did it increase or decrease? _____
    C. What are the most important reasons for this change?_____

50. A. Has there been a change in the total land surface that you have allocated to the production of maize over the past 5 years?
    1= yes / 0 = no

    B. If yes, did it increase or decrease? _____
    C. What are the most important reasons for this change?_____

51. Which crops/activities do you think have the best potential in the nearby future to provide the highest income?
    _____
52. A. Do you own livestock?
    1= yes / 0 = no

    How much animals do you own?
    1. I do not own livestock
    2. Cows (cattle) Nr.:____
    3. Goats Nr.: _____
    4. Turkey Nr.:____
    5. Pigs Nr.:____
    6. Sheep Nr.:____

    B. Since when do you own livestock? Since:_____ (year)

    C. Did you sell livestock in 2007? 1 = yes / 0 = no.
    If yes, how many heads? _____

    D. How many hours per week do you spend on your livestock? Total: _____hours

53. Which position did you father occupy in the *ejido*?
    1. Comisariado ejidal

2. *Ejidatario*
3. *Avecindado*
4. Other (specify):_____

Maize production

54. A. Did you cultivate maize during the Spring-Summer cycle in 2007?
    1 = yes / 0 = no

    B. If yes, how many hectares did you use for the production of maize during this cycle?
    I used_____ hectares for the cultivation of maize.

    C. If no, why not?_____

55. A. Did you cultivate maize during the Spring-Summer cycle in 2007?
    1 = yes / 0 = no

    B. If yes, how many hectares did you use for the production of maize during this cycle?
    I used_____ hectares for the cultivation of maize.

    C. If no, why not?_____

56. In general, what are for you and your household the 3 main reasons to produce maize?
    1. ----------
    2. ----------
    3. ----------

57. A. How was the yield of your maize production in 2007?

    1. Very good
    2. good
    3. regular
    4. Bad

B. What are the reasons for a bad harvest?_____

58. How many tons of maize did you harvest per hectare during the Spring-Summer cycle and during the Autumn-Winter cycle?

    _____ metric tons maize per hectare during Spring-Summer cycle 2007

    _____ metric tons maize per hectare during Autumn-Winter cycle 2007

59. Can you provide the following information on your maize production activities in 2007? (See Table 8)

Table 8 Maize production

	Spring – Summer **2007**	Autumn - winter **2007/08**
a. Total number of metric tons harvested (total tons x hectares)		
b. Total number kilos/tons for own consumption		
c. Total number kilos/tons for the market		
d. Total number kilos/tons for storage		
e. Price received per kilo		
f. Kilos of maize that your household consumes per day		
g. Did you buy maize at the market for household consumption or to feed your cattle? 1 = yes (how many kilos?) / 0 = no		

60. A. To whom did you sell your maize?

1. Coyote
2. MASECA/ MINSA
3. Local market in Morelos
4. Nobody (harvest used for own consumption)
5. Other (specify): _____

B. In case you answered "nobody", why did you not sell your maize?

1. I do not produce sufficient (use everything to feed my household)
2. I use all my maize to feed the household members and my cattle
3. I use my maize to pay in-kind the day workers
4. I give maize away
5. I use maize to pay in-kind the costs of my household
6. Other (specify): _____

61. In general, what do you consider to be the 3 main constraints to maize production (in order of priority, where 1 = the most important and 3 = least important constraint)

Major constraints in maize production: 1. ------ 2. ------ 3. ------

1 = Limited access to credit
2 = Low price of maize
3 = Low demand (not many consumers)
4 = The power of MASECA/MINSA (they dominate the market price)
5 = Poor soil conditions (erosion, stones)
6 = High seed prices
7 = High prices for fertilisers / pesticides / herbicides
9 = High labour costs
10 = Bad harvests

11 = Climate (hurricanes, lack of rain)
12 = Lack of technological production means
13 = Strong market competition
14 = Land fragmentation
15 = The position of power of the coyotes
16 = Pests and diseases
17 = Other (specify) _____

Maize production process

62. How did you prepare your land last year?

1. Mechanised
2. With oxen
3. With fire (burn down)
4. Other (specify):_____
5. Sowed without preparation

63. Did you use herbicides to prepare/clean the land?
1 = yes / 0 = no

64. What type of liquid (name) did you use? _____

65. How many people provided assistance with the preparations of the land?
Total nr. _____ paid labourers
Total nr. _____ unpaid labourers (*mano vuelta*)

66. Did you use a tractor to prepare the land?
1 = yes / 0 = no

67. Last year, did you use *Semebin* to treat the seeds?
1 = yes / 0 = no

68. Last year, did you apply fertilisers?
1 = yes / 0 = no

69. How many times did you use fertilisers during the Spring-Summer Cycle?
Total applications: _____

70. When did you use the fertilisers?
First time: _____days after sowing. Name of fertiliser used:_____
Second time: _____days after sowing. Name of fertiliser used:_____
Third time: _____days after sowing. Name of fertiliser used:_____

71. Last year which type of maize seeds did you sow?
    Name seeds:_____

72. How many people provided assistance with fertilising the land?

    Total nr. _____ paid labourers
    Total nr. _____ unpaid labourers (*mano vuelta*)

73. Did you use a tractor for sowing maize?
    1 = yes / 0 = no

74. When did you use the pesticides?
    First time: _____days after sowing. Name of pesticide used:_____
    Second time: _____days after sowing. Name of pesticide used:_____
    Third time: _____days after sowing. Name of pesticide used:_____

75. How many people provided assistance with applying pesticide to the land?

    Total nr. _____ paid labourers
    Total nr. _____ unpaid labourers (*mano vuelta*)

76. How many people provided assistance with *doblar* the maize stalks?

    Total nr. _____ paid labourers
    Total nr. _____ unpaid labourers (*mano vuelta*)

77. How many people provided assistance with harvesting and *desgranar*?

    Total nr. _____ paid labourers
    Total nr. _____ unpaid labourers (*mano vuelta*)

78. Did you use a *desgranadora* to shell the grains?
    1 = yes / 0 = no

79. How are the people who provided assistance during the production process related to you? (more than one answer is possible)

    1. Kin
    2. *Compadres/padrinos*
    3. Neighbours
    4. Friends
    5. Villagers
    6. Other (specify): _____

80. How did you pay them?

1. In money: _____peso/ per ____
2. In harvest: _____kilo/per ____
3. In work: _____ days/per____
4. Other_____/ per____

Farmer group participation

81. Are you currently a member of a farmer group?
    1 = yes / 0 = no

82. If no, have you ever participated in a farmer group? Until which year?
    Group member until: _____ (year)

83. If no, why are you not a member of a farmer group (anymore)?

    _____
    _____
    _____

84. A. If no, do you want to become a member of a farmer group in the future?
    1 = yes / 2 = no

    B. Why yes/no?
    _____

85. If yes, since when (year) are you a member?

    Since_____(year)

86. If yes, for what reasons do you participate?

    1. To get access to PROMAF
    2. To make use of contract farming
    3. To get access to information
    4. To get access to technological packages
    5. Other (specify): _____

87. If yes, what type of member are you?

    1. Inactive
    2. regular
    3. Active
    4. Group leader (representative)

88. If yes, how did you become a group member?

    1. Born in this group
    2. By invitation

3. Everybody can become a group member
4. Through a selection procedure
5. Other (specify): _____

89. If yes, who is the representative of your farmer group?

Name representative: _____

90. If yes, how many people are in the group?

Total nr. men: _____
Total nr. women: _____

91. If yes, how often are group activities organised?

1. Once a week
2. Once every 15 days
3. Once a month
4. Once every 2 months
5. Once every 3-6 months
6. Once a year

92. If yes, how often do you participate in these group activities?

1. Always
2. Many times
3. Sometimes
4. Few times
5. Hardly ever

G. Social resources

93. See questions and statements in Table 9.
Code "other":
1 = Municipality of Soteapan
2 = Other smallholders
3 = Coyotes
4 = Representative (leader farmer group)
5 = President of the *Comisariado Ejidal*
6 = *Agente municipal*
7 = Church
8 = Other farmer group members
9 = Other (specify): _____

Table 9 Trust and Cooperation

	Nobody	Family	Friend	Neighbour	*Compadres*	Other
1. How do you ask assistance when your wife (a household member) has a prolonged illness and you need help in the kitchen/house?						
2. Who do you ask if you need help with constructing your house?						
3. Who do you ask for help in case of food shortage?						
4. Who do you ask if you want to borrow money?						
5. Who do you ask to assist you at the land or in your business?						
6. Who provides most help a daily basis?						
7. Who do you lend money to?						
8. **To what extent do you agree with the following statements?**	**Completely**	**To great extent**	**To some extent**	**To little extent**	**Not at all**	
a. I trust my family and household members						
b. I trust my *compadres/comadres*						
c. I trust my neighbours						
d. I trust *coyotes*						
e. I trust the farmer group leaders (representatives)						
f. I trust other ejidatarios						
g. I trust the government programmes and believe that they will contribute to rural development						
h. The government approaches everybody equally						
i. In general, community members are trustworthy						
j. In general, community members have a cooperative attitude						
k. In general, people are more interested in their own concerns and do not worry about the concerns at community level						
l. People are poor because they are not given the same chances as others						
m. People are poor because they are lazy and have no will power						

94. When was the last time that you asked someone for assistance/help? What was the reason? Who did you ask for assistance? Did he/she provide help? Please describe the situation in detail.

_____

_____

_____

95. In case you are confronted with a serious problem such as a bad harvest, how many people beyond your family provide assistance?

    1. No one
    2. One - two persons
    3. Three - four persons
    4. Five or more persons

96. During the past 6 months, how many persons with personal problems have asked you for assistance?

    Total number of persons that have asked you for assistance: _____

97. A. During last month, what type of assistance did you offer other people?

    1 = Time: _____
    2 = Money: _____
    3 = Work: _____
    4 = Food: _____
    5 = Nothing

    B. In case you offered nothing, what was the reason for this?

    1. Nobody asked for assistance
    2. I do not have sufficient money to help others
    3. I do not have sufficient time to help others
    4. Other (specify) _____

98. To what extent do people help each other nowadays?

    1. Always
    2. Many times
    3. Sometimes
    4. Few times
    5. Hardly ever

Community life

99. During the past 12 months, how often did you participate in community activities (such as día de San Isidro, día de Guadalupe; día de Homshuk, general meetings in the casa *Ejidal*)?

1. Always
2. Many times
3. Sometimes
4. Few times
5. Hardly ever

100. During the past 6 months, what did you do for the community?

1. Nothing
2. I paid _____pesos
3. I was involved in (several) community activities (fill in table below)

What type of activity?	How many hours/days?	Voluntary?

101. What part of the community members contributes time or money to collective activities?

1. Always everybody
2. The majority of the population
3. About half of the population
4. The minority of the population
5. Almost nobody

102. A. Do you have friends or family members who own a shop and where you can buy on tick?

1 = yes / 0 = no

B. If yes, How often do you make use of this possibility?

1. Always
2. Many times
3. Sometimes
4. Few times
5. Hardly ever

♣♣♣♣♣ Thank you very much for your cooperation! ♣♣♣♣♣

Appendix VI Topic lists for in-depth interviews

General topics (applicable to all respondents)

1. Date interview
2. Name respondent
3. Age
4. Sex
5. Location interview
6. Household composition
7. Livelihood activities/occupation

Specific topics (select relevant topics)

Maize production system & marketing

1. Agricultural cycle (differences spring-summer versus autumn-winter cycle)
2. Dynamics *ejido* system (membership, internal administration and decision-making, land division, history) and changes since abolishment system (1992)
3. Local land tenure system, land allocation, access to land
4. Local characteristics agriculture (intercropping, crops, inputs, use of machines)
5. Characteristics maize production (types of seeds, inputs, production tools, seasonality (climate), yields, labour input, time investment, hectares, marketing, storage, usage)
6. Local irrigation system / access to water
7. Price maize over years 1980-2005
8. Livestock (investments, trends, prices, history)
9. Land surface community/ household
10. Available and access to technologies
11. Use of fertilisers/ pesticides
12. Maize market (suppliers, buyers, middlemen, trends and changes)
13. Cooperation among farmers

Community characteristics

1. Total population (men/women)
2. Religion composition
3. Ethnicity
4. Number of households
5. Migration patrons (no. outgoing adults male/female) and effects
6. History community and region
7. Community level events, traditions and festivals
8. Administrative and leadership structures
9. Inter-household relations and social organisations
10. Nature of community level activities and who participates
11. Social cohesion among community members
12. Community level capitals (availability of natural, human, physical, social and financial assets)
13. Communication facilities
14. Transportation facilities

15. Labour market in region

Household dynamics

1. Household composition
2. Household headship
3. Household decision-making
4. Household division of labour (tasks allocated to household members by age/gender)
5. Income sources and educational background household members
6. Nature of intra-household relations between spouses, children, and adults
7. Type of dwelling (roof, walls, floor, sources of energy/water)
8. Food intake/ food insecurity
9. Daily life at compound/household
10. Changes and trends during last five years (climate changes, hurricanes, price fluctuations, diseases)
11. Family planning
12. Relationship with neighbours/other households
13. Community participation
14. Perception on migration
15. Ways of coping with livelihood insecurities

Farmer groups

1. Ways of coping with livelihood insecurities
2. Aims and objectives farmer groups
3. Membership requirements
4. Organisational structure/leadership/decision-making process
5. Background/ history farmer group
6. Opportunities and challenges
7. Social relationships among group members
8. Trust, solidarity, and norms of reciprocity among group members
9. Services/activities provided by farmer groups
10. Problems and challenges farmer groups
11. Reputation/status farmer groups
12. Future prospective farmer group
13. Characteristic of relationships with other farmer groups/ traders/despachos/local authorities/organisations/government programmes/agencies

Maize market

1. Changes in government programmes and transfers
2. Maize price trends/changes
3. Production trends/changes
4. Marketing trends/changes
5. Profile of local suppliers/buyer
6. Changes in competition among maize suppliers (smallholders)
7. Role of middlemen
8. Role of MASECA/ MINESA
9. Government programmes developed for maize farmers/rural households

10. Requirements participation programmes
11. Communication and information provision
12. Farmer perception functioning programmes
13. Reputation government and the government programmes
14. Changes in programmes over last decade
15. Changes government programmes and market liberalisation policies
16. Perception on effects of market liberalisation

Social capital

1. Level of trust among kin, neighbours, villagers, farmer group members, *compadres,* friends
2. Level of trust in government (agencies) and government programmes
3. Level of trust in local authorities
4. Level of corruption in community
5. Reasons for asking/providing (material/in-kind) support to others
6. Reasons for not asking/providing (material/in-kind) support to others
7. Activities at community level
8. Social networks and groups within community
9. Important social relationships
10. Importance of kinship, household members, *compadres*, neighbours, villagers
11. Social conflicts in community
12. Community/household level mutual support in times of difficulties
13. Norms of reciprocity at community and household level
14. Role of social networks in coping with food insecurity
15. Role of social networks in livelihood adaptation

Despachos

1. Aims/objectives
2. Services/products provided by *despachos*
3. Organisation structure
4. History/ background
5. Relationship with farmer groups and government
6. Role at local input market
7. Competition among *despachos*
8. Problems and opportunities
9. Future perspective
10. Perception on performance farmer groups in study area
11. Characteristics of relationship with local farmers
12. Perception on recent (maize) market changes/ effects of market liberalisation

Wellbeing and poverty perception

1. Men and women perception on wellbeing
2. Indicators of 'poor' households
3. Indicators of 'rich' households
4. Relationship migration and wellbeing
5. Relationship farmer group membership and wellbeing

6. Relative poverty community compared to nearby villages
7. Impact government programmes on daily life
8. Advantages and disadvantages government programmes
9. Quality information (communication) provided by government agencies
10. Effect programmes on income distribution community
11. Corruption and government programmes

Appendix VII Checklist Focus Group Discussions

General topics (applicable to all discussions)

1. Date focus group discussion:
2. Number of participants:
3. Number of male participants:
4. Duration of discussion (minutes):

Specific topics

Trends and changes in the social and institutional context

1. Changes in main income sources
2. The emergence of new activities (labour market)
3. Agricultural production and marketing problems
4. Access to national resources
5. Ways in which life was perceived to have improved or worsened over past 10 years
6. Changes in prices at maize market and other consumption goods
7. History of maize production in community
8. Changes at maize market
9. Changes at other economic sectors
10. Changes in prices of wage and land
11. Effects of changes in *ejido* system
12. Changes in (symbolic) significance of maize in daily life over years
13. Effects of migration for community and households
14. Effects of changes in government programmes over years and effects for household livelihood

Intra-household dynamics

1. Participation in household resource allocation by gender
2. Participation in household decision making by gender
3. Participation in household budgeting by gender
4. Participation in household management by gender
5. Productive activities by sex
6. Domestic activities by sex
7. Community work by sex
8. Gender roles and changes
9. Life circle (age to give birth, to get married, to move, pensioning, start and stop working)

Social capital / collective action

1. Norms and values regarding kinship, obligations and rights
2. Neighbourhood relationships
3. Friendship
4. Trust in community members
5. Norms of reciprocity with kinship, friends, neighbours, *compadres*

6. Changes during last 20 years
7. Borrowing from kin, neighbour, family, *compadre,* villager
8. Support in times of insecurity
9. Participation in networks and groups at community level (advantages/disadvantages)
10. Farmer group participation (advantages/disadvantages)

Importance of maize in daily life

1. Importance of maize production for household income
2. Perception on changes in maize prices over last decade
3. Traditions, ceremonies related to the production of maize
4. Importance of maize in local politics
5. Social relations and the production of maize
6. Importance of maize for household food security
7. Importance of other crops for household income and food security
8. Significance of Homshuk in daily life
9. Rhythm of family life and maize production

Farmer groups

1. Background/ history farmer group
2. Reasons for foundation (objectives and necessity)
3. Group organisation (organisation chart and decision-making process)
4. Requirements membership
5. Membership fluctuations/movements
6. Trust and solidarity among group members
7. Activities farmer group
8. Struggles functioning group
9. Benefits membership (access to credit and technologies?)
10. Future prospective farmer group
11. Contact with other farmer groups
12. Contact with traders/ fabrics
13. Contact with other organisations/government programmes
14. Reputation of farmer group

Appendix VIII Checklist case studies

Household profiling:
- Household composition
- Socio-demographic characteristics
- Educational background household members
- Wellbeing indicators, type of dwelling, daily struggles

Household activities and sources of income
- History of livelihood generating activities household
- Importance of maize production for household
- Farm and non-farm activities of household members and changes over last 10 years
- Gender division of labour over time
- Access to resources (men/women) over time and factors that influenced traditions
- Effects changes maize market for household livelihood activities and wellbeing
- Adaptation and coping strategies
- Access to credit, savings
- Livelihood security changes over last 10 years and factors that influenced this trend
- Asset accumulation/depletion
- Perception on increased/reduced household vulnerability to shocks

Perception on change:
- Changes at the maize market and other economic sectors
- Changes in prices of labour and land
- Changes in land tenure system, i.e. the abolishment of *ejido* system
- Changes in household income and expenditures related to maize production and other crops
- Changes in (symbolic) significance of maize in daily life over years
- Changes in migration patterns and effects for community and households
- Changes in government programmes over years and effects for households

Perception on community life, social relations, and farmer groups
- Cultural beliefs and values associated with marriage, socializing the young, care, inheritance of land and property and household and community maintenance, friendship, kinship ties, neighbours, community members, group members, etc. Intra-household power relations and gender relations (decision-making, resource allocation, division of labour, access to resources)
- Changes and importance of community life over last 10 years
- History of farmer groups and effects on community
- Advantages and disadvantages of farmer group membership
- Role of religion, ethnicity, political background, education level and profession in social relationships
- Status and position of local authorities
- Social events within community and household
- Trust towards community members, strangers, government (agencies), kin, friends, neighbours

Appendix IX Statistical notes

Multinomial logistics

In Chapter 4 and 5 I use a multinomial logit regression to identify the choice for a particular livelihood strategy. A multinomial logit regression is a regression model that allows more than two discrete outcomes. It is used to predict the probabilities of the different possible outcomes of a categorical distributed dependent variable, given a set of independent variables.

According to this model, the probability that a household chooses a particular livelihood strategy lies between zero and one. The model assumes that the household makes a choice that maximises its utility (Greene, 1997).

The model can be expressed as follows:

(A1) $\text{Prob}(Y_i = j) = \frac{e^{\beta_j' x_i}}{1+\sum_{k=1}^{J} e^{\beta_k' x_i}}$ for j = 1,2, .. J,

$$\text{Prob}(Y_i = 0) = \frac{1}{1+\sum_{k=1}^{J} e^{\beta_k' x_i}},$$

where *Prob(Y_i = j)* is the probability that household *i* chooses livelihood strategy *j*, x_i is a vector of household specific characteristics associated to household *i*, and β_j is a vector of the estimated parameters associated to alternative *j*.

The model implies that the J log-odds ratios can be computed as follows:

(A2) $\ln \frac{P_{ij}}{P_{i0}} = \beta_j' x_i$,

which means that the odds ratio, P_j/P_k, does not depend on the other choices. This requires that the random disturbance terms are independently and identically distributed, an assumption commonly known as the Independency of Irrelevance Alternatives assumption (IIA).

Estimation of the model is straightforward and involves maximization of the following log-likelihood function:

(A3) $\ln L = \sum_{i=1}^{n} \sum_{j=0}^{J} d_{ij} \ln Prob(Y_i = j)$,

where d_{ij} is a dummy variable, d_{ij} = 1 if alternative *j* is chosen by individual *I*, and 0 if not, for the J+1 possible outcomes.

Appendix X San Pedro Soteapan: Cradle of the Mexican Revolution

Historically, Mexican Indians have had their land expropriated by the country's rulers since colonial times (1521-1821). When Mexico was conquered by Spain, the Spanish monarchs used land to compensate their soldiers for their service. The expropriation process continued during the time Porfirio Díaz was president (1876-1911). His land policies resulted in the granting of large areas of land to a very small number of people. Porfirio Díaz implemented two laws relating to the agricultural sector. The legislation called 'Ley de los baldiós' declared all land without formal title properties of the state, and a next legislation, called 'ley sobre la subdivision de la propiedad territorial', gave way to the possibility to divide collective land into private property (Leonti, 2004:37). As a result, after 30 years of these laws being effective, in 1905, 8431 *hacendados*[73] (large landowners), representing 0.2 per cent of the total population, controlled 87 per cent of the total agricultural land. Meanwhile, 3.2 million *peones* (unskilled day labourer or farm worker), accounting for 91 per cent of the population, were landless (OECD, 2007:140).

Regarding southern Veracruz, the enactment of the 'Ley de los baldiós' caused that by 1887, the major part of the land belonging to the municipalities Soteapan and Mecayapan were allotted to the father-in-law of Portfirio Díaz, Romero Rubio de Díaz. In addition, in 1902 the local land rights were reconsidered and Romero Rubio de Díaz and his heirs acquired all land of the municipalities Soteapan and Mecayapan that later he sold to the English company S. Person and Son Limited (Chevaliers and Buckles, 1995; Velázquez Hernández, 2006:153). Hence, the best agrarian land was confiscated resulting in a high pressure on the remaining Popoluca land. In response, the Popolucas of Soteapan and the Nahuas of Mecayapan used different strategies attempting to get their land back. The Nahuas started negotiating with an envoy of Romero Rubio de Díaz. By contrast, Popolucas originating from various villages[74] gather for a violent attack in 1903. On their way, they burnt down everything they came across, including the houses of the former hacienda 'Corral Nuevo' which ruled in the region until the 1880s (Velázquez Hernández, 2006:153).

The inequality in land ownership and distribution was for General Hilario C. Salas from Oaxaca and his forces reason to plan a rebellion and went to the Sierra de Santa Marta to organise themselves. The rebels joined forces with Popoluca farmers and together they considered attacking simultaneously the city centres of Coatzacoalcos, Minatitlán, and Acayucan in order to soil confusion within the official bodies of the local government on 30 September 1906. Because of drunkenness and disunity, the attacks on Coatzacoalcos and Minatitlán failed but Hilario C. Salas and his troops managed to take over the central plaza of Acayucan (Chevaliers and Buckles, 1995). However, a ricochet injured him and he saw himself constrained to take off back to the Sierra. The federal government was upset and all military forces in the south of Veracruz got the order to fight the revolution

[73] According to Karst and Rosenn (1975:247) "a hacienda is not just an agricultural property owned by an individual. It is a society under private auspices." The hacienda governs the life of the people born on the plantations and they do not leave because the hacienda is more a way of life than a business.

[74] People gathered from the villages Cuilonia, Buenavista, Michapan, Sogotegoyo and Aguacate (Velázquez Hernández, 2006:153).

originated in Soteapan. At the same time in the northern states of Mexico, the Liberal Mexican Party was founded, which sympathised with the revolutionaries in the south and collected financial support. After years of practising guerrilla techniques, Hilario C. Salas was shot at 'Arroyo Verde' (Green river) between the villages Ocozotepec and Buena Vista in February 1914. The uprising in the Sierra de Santa Marta precedes the official beginning of the Mexican revolution (November 1910) by about four years. Without any doubt, the people fighting together with general Hilario C. Salas have operated as the vanguard of the Mexican revolution (Leonti, 2004).

In 1910, a strong farmer movement consolidated around the leadership of Emiliano Zapata played a decisive role in the outcome of the Revolution. A major redistributive land reform was ensued. During the 1917-1992, half of the country land was reallocated by the state to approximately 3 million landless and land-poor farmers, with a specific institutional design: the *ejido* system. In Appendix I this system is explained.

Appendix XI Rotated factor analysis trust indicators

Variable	Factor 1	Factor 2	Factor 3	Uniqueness
1			0.736	0.415
2			0.873	0.229
3			0.837	0.290
4	0.650			0.487
5	0.315			0.365
6	0.437			0.398
7	0.779			0.342
8	0.832			0.303
9	0.715			0.460
10	0.505			0.627
11		0.343		0.635
12		0.306		0.300
13		0.284		0.465
14		0.303		0.694
15		0.332		0.757

(Blanks abs(loading) < 0.25)
Chi2(91) = 1299.55; Prob > chi2 = 0.00
N=200

Summary

Market and trade liberalisation has been a major element of economic policy advice for the last fifteen years. Governments around the world use market liberalisation as a means of enhancing efficiency to realise economic growth and alleviate poverty. Likewise, the Mexican government implemented neoliberal policy reforms, the NAFTA in particular, to stimulate sustainable development. A growing number of economic studies have investigated the impact of trade liberalisation on economic growth. Most of the studies measure economic growth in national accounts. However, trends in aggregated income and consumption do not always reflect differences at the household level. Hence, less is known about which groups of actors are able to take up the opportunities generated by an expanding economy and why others stay behind in poverty. Therefore, this study looks at the diversity of impacts under the surface of these aggregated outcomes.

The main purpose of this study is to analyse the adaptation process of smallholder households in response to neoliberal market reforms. The aims of this study are threefold: (1) To categorise the adaptation strategies that local smallholders have developed within the context of neoliberal market reforms; (2) To provide insights into the role of trust in adaptation strategy choices, distinguishing between three types of trust: 'personalised trust', 'generalised trust', and 'institutionalised trust'; and (3) To explore the enabling and constraining effects of the local social context on farmer group formation as part of smallholders' adaptation processes.

Throughout this thesis, I try to render visible the struggles of smallholders in Morelos and their capacity to respond to the risks and opportunities of market liberalisation, focusing on the strategies used by smallholders' households to adapt to the changing circumstances. In the analysis, I move from the macro- to the micro-level, from the national- and international-level trends to the struggles, negotiations, and interfaces among the different local actors involved. It is explained how, in response to market liberalisation, new local processes are developing in a rural context, influenced by local history and socio-economic, political, and cultural circumstances.

Quantitative and qualitative data collection methods were used to explore the research questions. Household survey data enabled me to cluster adaptation strategies, while qualitative data on livelihood choices and social capital allowed me to interpret the outcomes of the statistical calculations. The strategies and their implications are studied and analysed using an actor-oriented approach, highlighting the importance of human agency in local processes. An actor-oriented approach provides the methodological tools for analysing the interfaces between actors involved and the wider structural environment. Moreover, by using an actor's perspective, it is possible to analyse the ways in which economic decisions and strategies are interrelated and are influenced by social and cultural factors. This shows how these relationships, bound by specific norms and values, have changed and are adjusted to new circumstances.

The research site is Morelos, a rural community that is part of the municipality of Soteapan, located in the biosphere reserve Sierra de Santa Marta in the south of the state of Veracruz, Mexico. The people of the community are indigenous Popoluca, for whom

Spanish is a second language. Soteapan is one of the most deprived regions in the state of Veracruz and among the most marginal in the nation. In 2005, about 75 per cent of the population of the municipality lived in extreme poverty, with household incomes of on average less than US$51.60 per month (CONEVAL, 2005). Agriculture is the main livelihood activity and local smallholders primarily cultivate maize. The local maize farming system is based on both subsistence and commercial production through which farmers interact with (local) maize markets. Smallholders produce maize in a so-called 'less-favoured area' as the production takes place under rain-fed conditions and is entirely manual, due in part to the steep, rocky terrain. Nevertheless, in terms of maize production, Morelos belongs to the top five municipalities out of 212 municipalities in Veracruz (INEGI, 2005).

The thesis explores how farmers in Morelos find their way through the unfolding framework of the contemporary local maize market, navigating between the opportunities and constraints created by the processes of market liberalisation. This adaptation process is analysed by making use of the concept of livelihood strategies, which can be defined as a portfolio of activities, decisions or choices people employ in the pursuit of income, security, improved wellbeing and a strengthened resource base for survival. These choices are reflected in the way people use their assets to generate wellbeing. To go beyond the aggregated numbers and to analyse adaptation in response to changing market conditions at the household level, the livelihood framework was used as a conceptual framework. Most livelihood studies focus on categorising the different types of livelihood strategies and their effects for household wellbeing, but pay little attention to explaining the factors that shape households' adaptation choices. Therefore, the research objective of this study was to gain not only micro-level data on the adaptation strategies pursued, but also to gain insight in the constraining and enabling role of social factors in strategic livelihood decisions and the adaptive behaviour of households.

Contrary to what international economic institutions estimated about smallholder adaptation in response to a liberalised maize market, the analysis of contemporary livelihoods in this study shows that maize is still the main source of income in the study area. Based on the economic theories of comparative advantage and rational choice, such as used by the OECD (cf. Levy and Van Wijnbergen, 1992, 1994; De Janvry *et al.*, 1995; Petras and Veltmeyer, 2002) it was predicted that smallholder farmers in the South of Mexico would leave the maize sector to start producing crops with higher yields, such as tomatoes and flowers, or would exit agriculture altogether. This did not happen in Morelos.

The thesis continues with investigating how trust influences adaptive behaviour of smallholders, affecting economic outcomes, thus connecting the concepts of adaptation and social capital to gain a better understanding of the social factors that influence a household's adaptation choices. Few studies pay attention to the factors that determine the relationship between trust and economic outcomes. The livelihood framework was used to unravel this relationship at the household level. Based on earlier studies it was assumed that current levels of trust are shaped by experience. Qualitative data on recent historical events in the social and institutional context were used to explain the contemporary characteristics of trust. In this way, the thesis contributes to a more comprehensive understanding of the historical 'embeddedness' of trust-building that

ultimately shapes adaptive choices and actions. The thesis provides evidence that the capacity of households to adapt to market opportunities is shaped by local trust.

Subsequently, the interaction between the wider socio-institutional context and the functioning of local social networks is described. I analyse how smallholders adapt to the changing market conditions in the agricultural sector by founding farmer groups and how this has affected the local social structure. The enabling and constraining effects of local social norms on smallholders' adaptation capacity to benefit from this new type of social networks are explored. At the same time, the (unintended) feedback effects of these adaptive choices on the wider context in which they take place are analysed (cf. Brons *et al.*, 2007). Thus, this study goes beyond analysing how social structure affects individual purposive actions and also pays attention to the issue of action leading to emergent structures. This contributes to the debate on how the local social and political institutions created during neoliberal reforms have slowed down the neoliberal economic development in Mexico. It is demonstrated that local social norms and traditions can also obstruct social network formation.

The final chapter summarises the main findings of the study. It concludes that this study makes five main contributions to our understanding of smallholder adaptation within the context of changing market conditions. First, micro-level empirical evidence on the effects of market liberalisation on poor people is provided. Second, the added value of combining qualitative and quantitative research methods is demonstrated in understanding the constraining and enabling contextual factors that explain why some groups of actors are able to benefit from the opportunities created by neoliberal policy reforms while others do not. Third, by analysing the role of trust in adaptation processes, this study enhances our understanding of the importance of the social context and past experience in contemporary livelihood decisions. Fourth, it contributes to the debate on social capital by demonstrating that new forms of social capital can be induced but are difficult to sustain if they do not link up with local forms of social capital. Fifth, it is shown that through the working of feedback loops, the introduction of farmer groups that are not embedded in social norms and traditions can even have negative effects on people's adaptation capability. The chapter ends with addressing the policy implications of the findings, and identifying future research areas.

Samenvatting

Sinds vijftien jaar wordt vrijhandel gezien als een belangrijk onderdeel van economisch beleid. In de hele wereld gebruiken overheden het liberaliseren van de markt als middel om de efficiëntie te vergroten, economische groei te realiseren en armoede te verminderen. Ook de Mexicaanse regering heeft neoliberale hervormingen doorgevoerd, met name door het ondertekenen van de NAFTA, om duurzame economische ontwikkeling te stimuleren. Een groeiend aantal economische studies heeft onderzoek gedaan naar de gevolgen van vrijhandel voor economische groei. Het merendeel van deze studies meet de gevolgen van de economische groei voor de nationale balans. Maar de trends zoals terug te vinden in deze nationale productie- en consumptiecijfers geven niet de verschillen op huishoudniveau weer. Vandaar dat er minder bekend is over de vraag welke groepen actoren in staat zijn te profiteren van de kansen die gecreëerd worden door een groeiende economie en waarom andere actoren achterblijven in armoede. Dit onderzoek kijkt daarom naar de uiteenlopende effecten die schuil gaan achter deze totaalcijfers.

Het belangrijkste doel van deze studie is de analyse van het aanpassingsproces van kleine huishoudens in reactie op de neoliberale hervormingen van de markt. De focus van deze studie is drieledig: (1) In kaart brengen en categoriseren van de aanpassingsstrategieën die de lokale kleine boeren hebben ontwikkeld in reactie op neoliberale hervormingen; (2) Inzicht verkrijgen in de rol van vertrouwen (*trust*) bij de keuze voor een bepaalde aanpassingsstrategie, waarbij onderscheid wordt gemaakt tussen gepersonaliseerd vertrouwen (*personalised trust*), algemeen vertrouwen (*generalised trust*), en vertrouwen in instituties (*institutionalised trust*); en (3) Verkennen van de stimulerende en beperkende effecten van de lokale sociale omgeving op groepsvorming onder boeren, als onderdeel van de aanpassingsprocessen van de kleine huishoudens.

In dit proefschrift probeer ik de dagelijkse strijd van kleine boeren in Morelos om in hun levensonderhoud te voorzien zichtbaar te maken evenals hun vermogen om om te gaan met de risico's en mogelijkheden van handelsliberalisatie. Ik doe dat middels het analyseren van de strategieën die door de huishoudens worden gebruikt om zich aan te passen aan de veranderende omstandigheden. In de analyse beweeg ik mij van macro- naar microniveau en van nationale en internationale trends naar de strijd, onderhandelingen, en interacties tussen de verschillende betrokken lokale actoren. Er wordt uitgelegd hoe, in reactie op de liberalisering van de markt, nieuwe lokale processen zich ontwikkelen in een rurale context, beïnvloed door de lokale geschiedenis en de sociaal-economische, politieke en culturele omstandigheden.

Kwantitatieve en kwalitatieve dataverzamelingsmethoden zijn gebruikt om de onderzoeksvragen te verkennen. De data die verzameld zijn met behulp van een enquête onder huishoudens maakten het mogelijk om de verschillende aanpassingsstrategieën te clusteren, terwijl de kwalitatieve gegevens over livelihood keuzes en sociaal kapitaal mij in staat stelden de statistische uitkomsten te interpreteren. De strategieën en hun implicaties zijn bestudeerd en geanalyseerd met behulp van een actor-georiënteerde aanpak waarbij de nadruk ligt op het belang van het menselijk handelen in de lokale processen. Een actor-georiënteerde aanpak biedt de methodologische instrumenten voor

het analyseren van de interacties tussen de betrokken actoren en de structurele omgeving. Bovendien maakt een actor-benadering het mogelijk om te analyseren hoe economische beslissingen en strategieën zijn verbonden met en worden beïnvloed door sociale en culturele factoren. Aangetoond wordt hoe deze relaties, gebonden aan bepaalde normen en waarden, zijn veranderd en worden aangepast aan nieuwe omstandigheden.

De onderzoekslokatie is Morelos, een ruraal dorp dat deel uitmaakt van de gemeente Soteapan, gelegen in het natuurreservaat Sierra de Santa Marta in het zuiden van de staat Veracruz, Mexico. De mensen in Morelos behoren tot de inheemse Popoluca-gemeenschap, voor wie Spaans een tweede taal is. Soteapan is een van de meest achtergestelde regio's in de staat Veracruz en een van de meest arme regio's van het land. In 2005 leefde ongeveer 75 procent van de bevolking in de gemeente in extreme armoede met een gemiddeld huishoudinkomen van minder dan 51,60 US dollar per maand (CONEVAL, 2005). Landbouw is het belangrijkste middel van bestaan en de lokale kleine boeren verbouwen voornamelijk maïs. De lokale maïsproductie is zowel bestemd voor eigen gebruik als voor commerciële doeleinden, waardoor de lokale boeren op de (lokale) maïsmarkt participeren. De kleine boeren produceren maïs in een zogenaamd 'probleemgebied', aangezien de productie plaats vindt onder regenafhankelijke omstandigheden en volledig handmatig wordt uitgevoerd, hetgeen deels te wijten is aan het steile, rotsachtige terrein. Desalniettemin behoort Morelos tot de top vijf van de 212 gemeenten in Veracruz als het gaat om maïsproductie (INEGI, 2005).

Het proefschrift onderzoekt hoe de boeren in Morelos hun weg vinden binnen de ontwikkelingen van de hedendaagse lokale maïsmarkt, daarbij navigerend tussen de mogelijkheden en beperkingen gecreëerd door het proces van handelsliberalisering. Dit aanpassingsproces is geanalyseerd door gebruik te maken van het concept '*livelihood strategy*'. Dit kan worden gedefinieerd als een verzameling van activiteiten, beslissingen of keuzes die mensen maken om een inkomen, veiligheid, een verbeterd welzijn, of om een versterkt vangnet van hulpbronnen om te overleven te genereren. Deze keuzes komen tot uiting in de manier waarop mensen hun hulpbronnen aanwenden om welzijn te genereren. Ik maak gebruik van het concept '*livelihood*' (levensonderhoud) omdat het de mogelijkheid biedt verder te gaan dan de nationale cijfers en het proces te analyseren op huishoudniveau. De meeste livelihood studies ordenen de verschillende *livelihood strategies* en hun effecten voor het welzijn van een huishouden naar categoriën, maar besteden daarbij weinig aandacht aan het verklaren van de factoren die ten grondslag liggen aan de keuze voor een bepaalde aanpassingsstrategie. Daarom is het de doelstelling van deze studie om niet alleen met behulp van microniveaugegevens de verschillende aanpassingsstrategieën in kaart te brengen, maar tevens inzicht te krijgen in de beperkende en stimulerende rol van sociale factoren bij de beslissingen over de te volgen livelihood strategy en het aanpassingsgedrag van kleine huishoudens.

Tegen de verwachtingen van internationale economische instellingen in, laat deze studie zien dat maïs nog steeds de belangrijkste bron van inkomsten is voor kleinschalige boeren in het studiegebied. Op basis van de economische theorieën van relatief kostenvoordeel en rationele keuze, zoals gebruikt door de OESO (cf. Levy and Van Wijnbergen, 1992, 1994; De Janvry *et al.*, 1995; Petras and Veltmeyer, 2002) werd voorspeld dat kleine boeren in het zuiden van Mexico de maïssector zouden verlaten om andere gewassen te

gaan produceren met hogere opbrengsten, zoals tomaten en bloemen, of helemaal geen landbouw meer zouden bedrijven. Echter, dit is in Morelos niet gebeurd.

Vervolgens wordt in het proefschrift onderzocht hoe 'vertrouwen' het aanpassingsgedrag van kleine boeren beïnvloedt en wat de gevolgen zijn voor de economische resultaten. In andere woorden, het legt de link tussen de concepten 'aanpassing' en 'sociaal kapitaal' om een beter begrip te krijgen van de sociale factoren die de keuze voor een bepaalde aanpassingsstrategie beïnvloeden. Er zijn maar weinig studies die aandacht besteden aan de factoren die de relatie tussen vertrouwen en economische resultaten beïnvloeden. Op basis van eerdere onderzoeken wordt aangenomen dat de huidige niveaus van vertrouwen worden bepaald door ervaringen uit het verleden. Kwalitatieve informatie over sociale en institutionele veranderingen in het recente verleden zijn gebruikt om de hedendaagse kenmerken van vertrouwen uit te leggen. Op deze manier draagt dit proefschrift bij aan een diepgaander begrip van de manier waarop het opbouwen van vertrouwen is ingebed in het verleden hetgeen uiteindelijk het aanpassingsproces vorm geeft. Het proefschrift toont aan dat de capaciteit van de huishoudens om zich aan te passen aan de mogelijkheden die worden geboden door de veranderingen in de markt wordt beïnvloed door het vertrouwen op huishoudniveau.

Aansluitend wordt beschreven hoe sociale instituties en lokale sociale netwerken elkaar beïnvloeden. Ik analyseer hoe de kleine boeren zich aanpassen aan de veranderende marktomstandigheden in de agrarische sector door boerenorganisaties op te richten en wat de gevolgen hiervan zijn voor de lokale sociale structuur. De versterkende en beperkende effecten van de lokale sociale normen op het aanpassingsvermogen van de kleine boeren om te profiteren van deze nieuwe sociale netwerken worden verkend. Tevens worden de (onbedoelde) gevolgen van deze aanpassingen op de bredere omgeving waarin ze plaatsvinden, geanalyseerd (cf. Brons *et al.*, 2007). Dus, dit onderzoek gaat verder dan het analyseren van de wijze waarop de sociale structuur individuele doelgerichte acties beïnvloedt omdat het ook aandacht besteedt aan de manier waarop een actie leidt tot veranderende en opkomende structuren. De bevindingen dragen bij aan het debat over hoe de lokale sociale en politieke instituties die tijdens de neoliberale hervormingen tot stand zijn gekomen de neoliberale economische ontwikkeling in Mexico vertragen. Aangetoond wordt dat bestaande lokale sociale normen en tradities de formatie van nieuwe sociale netwerken kunnen belemmeren.

Het laatste hoofdstuk vat de belangrijkste bevindingen van het onderzoek samen. Er wordt geconcludeerd dat deze studie een vijftal belangrijke bijdragen levert aan onze kennis over het aanpassingsproces van kleine boeren in reactie op een veranderende markt. Ten eerste, het verstrekt empirische data op microniveau over de effecten van handelsliberalisatie voor arme mensen. Ten tweede wordt de toegevoegde waarde gedemonstreerd van het combineren van kwalitatieve en kwantitatieve onderzoeks-methoden door het inzichtelijk maken van de beperkende en stimulerende factoren die verklaren waarom sommige groepen van actoren profiteren van de mogelijkheden die door de neoliberale hervormingen zijn gecreëerd, terwijl anderen dat niet doen. Ten derde, door het analyseren van de rol van vertrouwen in de aanpassingsprocessen, vergroot deze studie ons begrip van het belang van de sociale omgeving en van de ervaringen uit het verleden bij de hedendaagse beslissingen ten aanzien van livelihood strategy. Ten vierde, de studie draagt bij aan het debat over sociaal kapitaal door aan te

tonen dat nieuwe vormen van sociaal kapitaal kunnen worden gecreëerd, maar dat deze moeite hebben om te blijven bestaan als ze niet aansluiten bij lokale vormen van sociaal kapitaal. Ten vijfde wordt aangetoond dat door de reacties van de achterban de invoering van boerenorganisaties die niet zijn ingebed in de sociale normen en tradities zelfs negatieve effecten kunnen hebben op de aanpassingscapaciteiten van mensen. Het hoofdstuk eindigt met het vaststellen van de politieke implicaties van de bevindingen en er worden suggesties voor toekomstige onderzoek gedaan.

Curriculum Vitae

Sytske Floortje Groenewald was born on the 7 July 1979 in Leiden, The Netherlands. In 1998 she graduated from secondary school at Montessori Lyceum Amsterdam. At Utrecht University she obtained her masters in Cultural Anthropology in 2004 and finalised her bachelors in Economics in 2005. In spring 2006 she wrote her proposal for the research project described in this thesis. Under the supervision of prof. A. Niehof she started the research in May 2006. In August 2006 she accompanied her husband to Shanghai where she accomplished the literature study for this thesis. Spring 2007 she went to Mexico for fieldwork. Upon return to the Netherlands she started working at Fairfood International and recently switched to Oxfam Novib. The last four years of the research was done on a part-time basis.

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