Impact pathways of trade liberalization on rural livelihoods: A case study of smallholder maize farmers in Mexico*

Sendas de impacto en negocios rurales de la liberalización comercial: un estudio del caso de pequeños cultivadores de maíz en Mexico

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Abstract

Research assessing the impacts of trade liberalization on poor rural populations can be divided into two categories: more quantitative research, assessing relationships between specific, measurable variables (such as changes in the macroeconomic environment and their impact on farmers' income levels); and more qualitative research, which takes trade policy as a context and provides broad, descriptive data about dynamic livelihood strategies. In this paper, we outline a framework that could be used to integrate these two approaches by unravelling the macro-micro linkages between national policies and responses at a household level. Using the Mexican maize sector as an illustration, we trace the pathways through which trade liberalization (including the North American Free Trade Agreement) has interacted with changes in government institutions, and thereby impacted on farmers' livelihood strategies. We identify three pathways through which trade policy affects households and individuals: via enterprises, distribution channels, and government, and we link these to a five-category typology of smallholders' strategies for escaping rural poverty: intensification, diversification, expansion, increased off-farm income and exit from agriculture. Based on a case-study from Chiapas, Mexico, we report on farmers' responses to post-liberalization agricultural policies. Data suggest that farmers have intensified maize production, sought more off-farm employment or have exited agriculture altogether. The potential for smallholders to escape poverty by diversifying farms or expanding their land-holdings or herd-size has been largely unrealized. We provide a conceptual framework for linking the impacts of liberalization to farmers' livelihood strategies and suggest that this framework is useful in the context of agricultural modernisation initiatives that seek to increase agricultural production and productivity.

Keywords: Mexico, trade liberalization, livelihood strategies, smallholder maize producers, poverty

Resumen

Las investigaciones que evalúan el impacto de la liberalización comercial en poblaciones rurales pobres puede dividirse en dos categorías: investigaciones más cuantitativas, que analizan relaciones entre variables específicas y medibles (como cambios en el entorno macroeconómico y su impacto en los niveles de renta de los agricultores); e investigaciones más cualitativas, que toman la política comercial como un contexto y proporcionan datos amplios y descriptivos sobre estrategias de sustento dinámicas. En este artículo se dibuja un esquema que podría emplearse para integrar estos dos enfoques desentrañando las relaciones macro-micro entre las políticas nacionales y las respuestas a un nivel de hogar. Analizando el sector de maíz mexicano, dibujamos las sendas a través de las cuales la liberalización comercial (inclu-

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yendo el Acuerdo de Libre Comercio de América del Norte) ha interactuado con cambios en instituciones gubernamentales y de esta manera ha impactado en las estrategias de sustento de los agricultores. Identificamos tres sendas que impactan hogares e individuos: empresas, canales de distribución y gobierno; y las relacionamos con cinco estrategias de lucha contra la pobreza rural por parte de los pequeños campesinos: intensificación, diversificación, expansión, mayores ingresos fuera de la agricultura, y abandono de la agricultura. En base a un estudio de caso en Chiapas (Mexico), analizamos las respuestas de los agricultores a las políticas de post-liberalización agrícola. Los datos sugieren que los agricultores han intensificado la producción de maíz, han buscado más empleos fuera de las explotaciones o han abandonado la agricultura. El potencial de los pequeños campesinos para escapar de la pobreza diversificando cultivos o expandiendo sus tierras o el tamaño de sus rebaños no se ha materializado. Proporcionamos un esquema conceptual para relacionar el impacto de la liberalización con las estrategias de sustento rural y sugerimos que este esquema es útil en un contexto de iniciativas de modernización agrícolas que buscan incrementar la producción y productividad agrícolas.

Palabras clave: Mexico, liberalización comercial, estrategias de sustento, minifundios de maíz, pobreza

1 Introduction

An argument in favor of lowering international barriers to stimulate trade in agricultural goods is that it has the potential to raise developing-country incomes and contribute to poverty alleviation. Mexico's agricultural markets have undergone liberalization since the mid 1980s and there has been much analysis of the subsequent changes in the country's agricultural sector. Many of these studies have focused on the maize-producing sector, as this is the crop involving the largest number of farmers and largest land area in Mexico. Research on the maize sector has tended to fall into two categories: quantitative studies analyzing relationships between specific variables at a national level, and qualitative studies, which provide broad, contextual analyses of livelihood options available to local smallholder maize farmers.

In general, quantitative research in Mexico has tended to model or test the impacts of trade liberalization and resulting policies on national income distribution. For example, Levy and Van Wijnbergen (1992 & 1994) assessed the overall welfare impacts of liberalization, particularly movements of labor between sectors. De Janvry et al (1995) modeled the impacts of falling maize prices on labor allocation within the maize sector, while Sadoulet et al (2001) assessed the 'income multiplier' effects of the *Programa de Apoyos Directos al Campo* (PROCAMPO), a program intended to help farmers respond to the impacts of liberalization.

Qualitative research, in contrast, tends to focus on maize farmers' responses to liberalization in specific regions or communities. García Barrios and García Barrios (1990), for example, identified specific household labor strategies for maize production in the state of Oaxaca in Mexico, noting that community-level gender roles influenced households' decisions about maize management when male household heads had migrated. Fitting (2004 & 2006) made similar observations about the use of

household labor and the flexibility of maize harvests in Chiapas, noting that farmers' approach to integrating maize production into their livelihoods depended on a pragmatic assessment of current market prices, and that knowledge of maize production (as measured by knowledge of agricultural terms) was less prevalent in younger populations.

These qualitative studies tend to provide rich data on the context in which farmers make decisions and the livelihood options available to them, but do not always link with macro-level policy changes that might influence the local market and the characteristics of the agricultural sector. There is a lack of understanding of how, within economic systems, macro and micro scales connect; specifically little is known about how macro forces impact at micro scales, or how micro responses shape macroeconomic outcomes (Dyer and Taylor 2011).

In this paper, we bridge the gap between these approaches by drawing links between the market and institutional environment and the livelihood framework, and examining ways in which trade policy affects poor farmers' livelihoods. In section 2, we provide background on recent Mexican agricultural policy. In section 3, we describe mechanisms by which liberalization has had an impact on smallholder maize farmers. Firstly, we describe mechanisms by which liberalization has impacted maize farmers using a framework initially proposed by Winters (2000a & 2000b). This framework identifies *enterprises, distribution,* and *government* as the three pathways through which trade policy can influence individuals and households. We locate recent changes in Mexican agricultural and rural development policy and institutions within this framework.

Secondly, we discuss farmers' livelihood strategies for exiting poverty in the context of post-liberalization policies and institutions. We use the typology of rural poverty-escape strategies outlined in Dixon et al (2001), including intensification, diversification, expansion, increased off-farm income, and exit from agriculture. Furthermore, we illustrate these strategies —and how they relate to liberalization-driven policy change— with qualitative data from the *La Frailesca* region of Chiapas, Mexico. This analysis suggests agricultural liberalization policies have led smallholder farmers to intensify production, work off-farm and exit agriculture altogether. Fewer farmers have sought to escape poverty by diversifying farms or expanding their land-holdings or herd-size. This analysis provides a framework linking the impacts of liberalization to specific livelihood strategy choices.

In section 4, we present the case study of *La Frailesca* in the southern Mexican state of Chiapas and the qualitative research methodologies that we used. Meanwhile, section 5 illustrates local farmers' livelihood responses to liberalization-driven policy change in the context of the aforementioned typology. In the Conclusions we suggest that our framework for linking the impacts of liberalization to livelihood strategies could be a useful tool in future livelihood impact studies.

2
Background

2.1. Importance of maize

Maize contributes to the livelihood of millions of farmers in Mexico. At the time of the Spanish conquest, maize was the cornerstone of Mesoamerican culture and economy. Mexico is the center of diversity for maize and the crop is found in a variety of environments. Maize continues to play multiple functions in farmers' livelihoods, such as a source of food, income, cultural identity, social status and as part of a safety net (Perales et al 2005). The historic and cultural importance of maize was not only documented by the priests who arrived as part of the invading Spanish forces, but was also carved in stone in the temples of Aztec, Olmec and other ethnic groups that settled in Mexico (Barker 2002).

Maize plays a key role in local people's diets, not least the tortilla which is made from specially treated (nixtamalized) maize flour and which has been a staple food of the Mexican region since pre-Columbian times. In Mexico, maize is consumed in a variety of ways (Keleman and Hellin, 2009).

— Blue maize, which is an ingredient of *antojitos* (savoury snacks made of maize dough cooked around a meat, cheese, or vegetable filling).

— Large-grained floury maize for making *pozole* (a traditional Mexican maize and meat soup).

— *Totomoxtle* (maize husks), which are used for wrapping *tamales* (savory cakes made from steamed maize dough).

— Red or pink maize, which seldom receives a price premium but may be used as livestock feed, and is used in *tortillas* in some areas.

— *Elotes* (fresh, green maize on the cob), which are sold grilled, boiled, or de-grained (as *esquites*).

— *Huitlacoche,* a fungus known as «corn smut» in English, which is considered a delicacy in Mexico.

Estimates suggest that maize accounts for an average of 70% of calories and 60% of protein consumed in rural areas of Mexico, and 40% and 30%, respectively, in urban areas (Castaños 2007). Higher levels of tortilla consumption are registered among poor consumers in both rural and urban areas.

Farmers may maintain crop diversity for social or cultural purposes, or when local varieties show an agronomic performance superior to that of improved varieties (Bellon 2004, Long and Villarreal 1998). The on-going evolution of maize diversity is closely linked with Mexican cultural traditions, and small-scale farmers' knowledge, preferences, and management practices (Brush and Chauvet 2004, Pressoir and Berthaud 2004).

Maize-producing households make complex trade-offs between maize management and other livelihood options, including shifting to alternative crops or exiting agriculture altogether. Maize landraces under *in-situ* management in Mexico represent a genetic, evolutionary, and cultural resource that is unique when compared to improved varieties or landrace conservation in gene banks. Thus, traditional maize seed systems are not only important for farmers' and consumers' livelihoods, but also for the maintenance and evolution of Mexican maize landraces one of the last reservoirs of maize genetic resources for humanity (Bellon et al 2011).

Specifically, there is widespread concern that the diffusion of modern crop varieties and commercial agriculture results in the replacement of diverse local populations of crops with a handful of modern varieties (Brush 2000) even though this need not always be the case (Bellon and Hellin 2011). The loss of maize genetic resources is worrisome not only to farmers in Mexico, but also to researchers and maize consumers worldwide, as crop genetic resources are the raw materials for continuing advances in yield, pest resistance and quality improvement (Meilleur and Hodgkin 2004, Lipper & Cooper 2009).

2.2. Mexican agricultural policy

Twentieth-Century Mexican agricultural policy was heavily influenced by the process of agrarian reform (Yúnez-Naude 2003). This reform formalized farmers' communal land tenure in *ejidos,* and involved large-scale land-transfers in 1934-1940 (Wiggins et al 2002). The *ejido* system consisted of collectives in which members held their agricultural plots as individual possessions. The idea was that the *ejido* would stimulate direct private investment and enable farmers to participate in private credit markets, leading to increased agricultural production (Fernández Castillo 2004, OECD 2007).

During the 1940s and 1950s, the Mexican government invested in rural infrastructure, such as roads and irrigation works. These investments were largely directed at the north of the country with greater potential for improvements in farm output. In these high potential rain-fed lands, a 'Green Revolution' took place (Naylor et al 2001, Wiggins et al 2002). Mexican wheat production increased seven-fold and maize production four-fold between 1945 and 1970 (Tuckman 1976). Income inequality, however, increased with per-capita income in high-production northern states growing faster than in the center and south of the country.

In the 1960s, the government began to subsidize the prices of farm inputs. In 1965, the *Compañía Nacional de Subsistencias Populares* (CONASUPO, National Company for Popular Subsistence) was established to provide crop price support to producers of key staples such as maize and wheat; subsidies to agricultural inputs, credit and insurance; and government participation in the processing of grains, oils and powdered

milk (Yúnez-Naude 2003, Appendini 2001, Yúnez-Naude and Barceinas Paredes 2002). Despite this widening network of agricultural support, inequality in agricultural investment continued with the largest investments in technology tending to benefit larger-scale, more profitable farmers (Appendini 2001).

Efforts were made to extend agricultural technology to smaller-scale farmers in the late 1970s via the *Sistema Agroalimentaria Mexicana* (SAM, Mexican Nutrition System) (Appendini 2001). In 1981, however, 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. During the remainder of the decade, the Mexican government sought to stabilize the economy and to stimulate sustainable growth through structural adjustments and economic liberalization (Nadal 2000, Wiggins et al 2002). The government eliminated price supports for most agricultural products. The commitment to domestic food self-sufficiency was replaced by an emphasis on 'food security' with an emphasis on allowing domestic food requirements to be met by a mixture of imports and domestic sources.

It was predicted that economic liberalization would create substantial gains in efficiency, stimulate economic growth and reduce rural poverty. However, it was also recognized that interventions would be required to support some smallholder farmers, who would fare less well during the adjustment process. For example, De Janvry et al (1995) predicted highly differentiated impacts caused by the reduction in maize prices associated with trade liberalization and the implementation of the North American Free Trade Agreement (NAFTA) in the mid-1990s. The authors identified traditional producers oriented to the market as those most vulnerable to these changes and agricultural modernization as the best way to respond.

Mexico is now considered a 'middle-income' country, and boasts Latin America's highest per-capita income (World Bank 2008). However, since the implementation of NAFTA, the link between liberalized agricultural trade and poverty reduction remains unclear. Although overall poverty levels have decreased by 10 percent since 1992, the proportion of the Mexican population living in poverty remains significant. The Mexican government has programs to combat rural poverty. These include providing direct support to agricultural activities (such as PROCAMPO, the Program of Direct Support to the Countryside, and *Alianza para el campo,* Alliance for the countryside) as well as support for non-agricultural development, such as *Oportunidades,* a program that focuses on maternal nutrition and education. Critics point out that a disproportional large portion of the resources distributed through post-NAFTA agricultural-support programs have been captured by large-scale, 'competitive' farmers (see Ávalos-Sartorio 2006, Nadal 2000, Puyana and Romero 2006).

3
Impact of agricultural policies on farmers' livelihoods

3.1. Farmers' livelihoods

In this study, we analyze smallholder farmers' responses to trade liberalization from a livelihood perspective. The livelihood approach enables a more detailed picture of the complexities of poverty than measures regarded as adequate proxies, such as 'subsistence', 'income' and 'employment' (Ellis 2000). Development literature and practice has, since the early 1990s, expounded the concept of 'livelihoods' (Scoones 2009). What became known later as the 'sustainable livelihoods approach' is often seen as having started with a paper by Chambers and Conway (1992), where the authors stated that «a livelihood comprises the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base».

Central to the livelihoods approach are people's assets, the building blocks for their livelihoods. There are five classes of assets (natural, financial, social, human and physical). These can be seen as the vehicles for making a living and challenging the structures under which one makes a living (Bebbington 1999). It is important to define livelihoods in terms of a system in order to emphasize that livelihoods have a dynamic character, are embedded in a wider context, and interface with other systems (Niehof and Price 2001).

The household can be seen as the locus of a livelihood system (Niehof 2004). Assets (natural, physical, human, financial and social capital) and resources are the *inputs* of this system, serving as the fundamental basis that households use to fulfill their members' basic needs (Farrington et al 1999, Niehof and Price 2001). The processing, use, and management of these inputs is referred to as *throughput* (Niehof and Price 2001) and forms household livelihood strategies, while livelihood security is the desired *outcome* of the system. Livelihood studies are often micro-level oriented, with a focus on individual preferences and choices based on available local assets and resources (De Haan 2000a, De Haan 2000b, Dorward et al 2003). However, broader institutional and economic drivers may influence assets and outcomes. Contextual factors —political, institutional, social and environmental— can either enable or constrain individuals' and households' pursuit of a viable living (Devereux et al 2004, Ellis 2000, Farrington et al 1999).

One of the gaps in the conceptualization and application of 'livelihoods approaches' has been a lack of emphasis on markets and their role in livelihood development and poverty reduction (Dorward et al 2003), this

at a time when there has been a re-emergence of interest in agriculture and pro-poor growth in rural areas (World Bank 2007). While some agriculturally-based rural households are autarkic, most are linked to markets. Hence, the ability of agriculture to contribute to pro-poor growth is reliant upon a range of markets, institutions, and regulators distant from farm production (Marsden et al 1996).

We consider livelihood strategies (and households' resulting ability to maintain livelihood security) to be an outcome of the interaction between the policy, economic, and institutional environment, and the assets available to a given household. Dixon et al (2001) provide a typology of livelihood improvement strategies by which farmers seek to alleviate or escape poverty:

— *Intensification* – households increase financial or physical productivity of existing production patterns e. g. farmers increase yields by applying external inputs and/or use labor or other resources more efficiently.

— *Diversification* – farmers expand into new or existing market opportunities in order to increase income or decrease income variability. This may include the cultivation of new products and on-farm processing to add value to an existing product.

— *Expansion* – farmers increase income or resources by expanding the extension of their lands, or their herd size. Expansion may come about via the distribution of new lands via land reform, or through the clearing of previously unused land.

— *Increased off-farm income* – farmers resort to seasonal or long-term off-farm employment to supplement farm incomes. The income generated may be re-invested into agriculture, or in other household needs.

— *Exit from agriculture* – takes place when farmers work in another farming system or pursue a non-farming lifestyle.

Many of these strategies are apparent in the La Frailesca region but the degrees to which farmers pursue them is linked to the institutional and policy context. Even though the importance of the institutional context for livelihood strategies has been recognized, discussions of the mechanisms by which international agreements are implemented by national institutions —and how these shape the individual or household livelihoods— are often underdeveloped. Winters (2000a, 2000b) identified three pathways by which trade policy may affect individuals and households: *distribution* (via prices)*, enterprise* (via factor markets, e. g. land, labor, and wages), and *government* (via government services). Market liberalization has important impacts on these three market channels. The repercussions of these changes enable and constrain maize farmers' livelihoods, in the sense that they shape, both directly and indirectly, the availability and accessibility of assets (land, labor, and te-

chnology), and consequently, the ways that farmers use these assets in their livelihood strategies.

3.2. Price changes channeled through the distribution sector

According to Winters (2000a, 2000b), the translation of price shocks from tariff reductions to changes at households' disposable income takes place via the distribution sector. Trade policy affecting the distribution of goods has an impact on consumers primarily by transmitting changes in world maize prices to wholesale prices (or producer prices), and subsequently affecting consumer retail prices. However, the final effect of the price shocks is influenced by the presence and character of market institutions (Winters 2000a). Additionally, the final welfare effect at the household level depends as well on the households' characteristics (its endowment of time, skills, land, etc.), technology and other shocks, such as weather (Winters 2000a).

NAFTA's most direct effect on maize prices was caused by changes in the rules governing maize imports. Maize market liberalization was designed to take place over a 15-year period under a tariff-rate quota (TRQ) system,[1] allowing gradually increasing import quotas coupled with gradually decreasing tariffs on over-quota imports (see Yúnez-Naude 2003). Full liberalization of the maize market (with all tariffs and quotas eliminated) began officially in January 2008. However, maize liberalization did not proceed smoothly. The protection negotiated for maize was not enforced; the Mexican government allowed imports over the established quota levels until 2004, and charged no tariffs for the above quota imports (Nadal 2000, Keilbach Baer 2005, Nadal 2002). 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).

Meanwhile, the institutions involved in the purchase and distribution of maize (and thereby the transmission of maize prices) also changed. CONASUPO's influence was phased out over the course of the 1990s, and its facilities for storage and distribution of maize were privatized (Yúnez-Naude 2003, Appendini 2001). A new government institution, *Apoyos y Servicios a la Comercialización Agropecuaria* (ASERCA), was established to replace CONASUPO. ASERCA administers a target-income subsidy to compensate for differences between world-market prices and national or regional prices. However, it differs from CONASUPO in that it sets no sales price for maize, and does not buy, sell, or store grain (Yúnez-Naude 2003, Ávalos-Sartorio 2006).

Following the elimination of CONASUPO, farmers had to sell their produce to the private sector.[2] Small-scale farmers who produce relatively low volumes of maize tend to sell to market intermediaries, who accumulate larger quantities of maize and in turn pass it on to larger-scale market intermediaries. Although the market offered by small-scale

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

2 In some states farmers' organizations mediate the relationship between individual farmers and private buyers. However, this pattern is more typical of regions in the north of Mexico, where farmers plant large areas and have high yields. It is less common in the poorer regions of southern Mexico where farmers have smaller plots of land and where yields are low.

intermediaries is disperse, at a national level the maize-buying market is relatively concentrated, with only some 27 major buyers controlling the bulk of national production (Puyana and Romero 2006).

A third major price change associated with market liberalization is the rise of the tortilla price. For many years, the Mexican government subsidized this food staple as a welfare measure. 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 liberalized 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 percent from 1997 to 1999, and 22 percent from 2000 to 2002 in real terms (King 2006, Zahniser and Coyle 2004).

Underlying causes of this increase are related to the institutional characteristics of the maize-tortilla market. The two largest maize-flour manufacturing companies, (GIMSA and MINSA) account for, respectively, 70 percent and 27 percent of the market, and benefited from the lower maize prices. Due to low levels of competition among flour producers, manufacturers have considerable power to set profit-maximizing prices, and are able to continue to raise consumer prices despite falling producer prices.

González Dávila (2010), using the Household Income and Expenditure National Survey (Encuesta Nacional de Ingresos y Gastos de los Hogares ENIGH) conducted in 2006 and 2008, found that the poorest rural and urban households i. e. net buyers of maize were the most affected by higher maize prices as their budget share on maize increased significantly. In 2006, poor households spent about 15% of their budget on maize compared to 20% in 2008. In both years the share is less than 5% among the richest households.

The scenario of rising maize prices also presents a problem from the perspective of maize production and maize diversity conservation. Classical economic theory would suggest that rising prices and scarcity should benefit maize producers by providing them with stronger demand and higher prices for their crops. Nonetheless, despite rising international maize prices, Mexican maize producers reported receiving prices lower than what they deemed necessary to cover rising production costs in 2007 (García Rañó and Keleman 2007). As such, farmers suffered both as producers (receiving lower profits), and as consumers (faced with higher food prices).

3.3. Policy effects for maize farmers via enterprises

The second pathway through which changes in agricultural policy may be channeled towards the household level is via *enterprises*. En-

terprises are described as any household or business unit that sells its output and uses inputs by employing labor or using land outside its own household (Winters 2002a). This may include the formal sector, as well as farms, which employ non-family laborers. Enterprises are affected by trade policy as they respond to price shocks, changes in demand and price fluctuations at factor markets by increasing or decreasing output accordingly. In terms of the repercussions of trade policy's enterprise impacts on the poor, it is generally assumed that those in deepest poverty have little to sell but 'unskilled' labor, and as such they perceive impacts primarily via wages and conditions of employment (Winters 2000a: 19-22).

Liberalization of the maize sector might have impacts at household level via enterprises by influencing the demand, supply and factor markets (land, wages and employment) related to the maize market. According to Yúnez-Naude and Taylor (2006), commercial production of maize decreased following the introduction of NAFTA in response to a decrease in maize prices. This indirectly caused a fall in land rents and wages, which are important inputs for subsistence production as well (Yúnez-Naude and Taylor 2006: 172). In Mexico, trade liberalization policies have had diverse effects on labor returns. Skilled workers, for which trade liberalization has produced an increase in wages, have benefited relative to unskilled workers. The implementation of the liberalization policies eliminated the previous structure of tariffs that protected unskilled workers while also reducing the demand on unskilled labor, which caused a decrease in wages in many regions (Hanson and Harrison 1999).

The process of market liberalization has affected the factor market for land via reforms in the land tenure system. These reforms, stated in the Constitutional Ejido Reform of 1992,[3] were designed to strengthen property rights, generating a functional land market and support efficient allocation of land resources. However, the *ejido* reforms have not led to a significant rise in agricultural productivity. According to data from the OECD (2007) there is little evidence of a significant impact on the access of *ejidatarios* to complementary agricultural inputs through better functioning of rural factor markets (OECD 2007). The impact of trade policy on livelihood strategies via enterprises has primarily been via changes in prices of land and labor. For farmers with a skill to sell, the positive impacts of changes in the labor market are likely to have been greater than those who only offer 'unskilled' labor.

3.4. Policy changes channeled through government programs

The third pathway through which households can be affected by trade reforms is via government services and programs. During the period of market liberalization in Mexico, a number of programs that had previously supported the maize-producing sector were eliminated. In addition to the closure of CONASUPO, the government also eliminated state-owned corporations, which had produced agricultural inputs for farmers,

3 Part of the market liberalization was the liberalization of the property rights in the ejido sector in 1992. This enabled ejidatorios to rent and sell their land. The purpose of this reform was to promote direct private investment.

such as PRONASE (a seed-producing company) and FERTIMEX (which produced fertilizers). Furthermore, public funding for agricultural extension was cut, and technology transfer responsibilities were assigned to the private sector (Appendini 2001). There was also a sharp decline in credit subsidies and official credit given to farmers by public financial institutions for rural development.

New agricultural support programs, however, have also emerged. These programs are designed to support farmers and traders in the transition towards market liberalization without violating the free-market principles. The government introduced *Apoyos y Servicios a la Comercialización Agropecuaria* (ASERCA, Agricultural Marketing and Support Programme) in 1991. ASERCA provides 'income support' for maize production. Beyond this program, ASERCA also runs various other programs to improve market integration.

Another important government program for small-scale maize producers, operated by ASERCA, is the *Programa de Apoyo Directos al Campo* (PROCAMPO). This direct income support program started in 1993 before the enacting of NAFTA, to help farmers cope with the lower trade protection and expected losses in income (Sadoulet et al 2001). This subsidy was designed to avoid market distortion, being provided on a per-hectare basis, rather than per-unit-output. Based on results of a spatial and temporal model, García-Salazar et al (2011) conclude that without PROCAMPO, Mexican annual average maize production would have been lower and maize imports would have been 40.5% higher in 2005-2007. Furthermore, increased producer and consumer surplus and savings from reduced imports reveal that the benefits of PROCAMPO were higher than the program's costs.

Alianza para el campo started in 1996 and serves as an umbrella for around 24 federal and at least 10 state and regional sub-programs to producers. These can be divided into three categories: (i) programs that induce investments in human capital, technology, infrastructure and equipment; (ii) programs that support the transformation of the productive structure in areas where agricultural has a comparative advantage; and (iii) programs that promote the insertion of agricultural producers into the marketing chain and world economy (Cord and Wodon 2001). In addition to the support of the Agricultural Ministry, farmers can also benefit from one of the most important programs of the Ministry of Social Development (SEDESOL), *Oportunidades.* This program was initially established in 1997 (Taylor et al 2005: 91) and provides monetary and in-kind transfers to rural poor female household heads conditional upon children's school attendance, nutritional education, and regular attendance of health checkups (Skoufias et al 2001, Taylor et al 2005).

4
Case study: Farmers in La Frailesca, Chiapas

To understand the effects of liberalization on rural households it is necessary to look beyond the aggregated figures and focus at micro-level impacts and responses. Market imperfections and striking heterogeneity across producers create circumstances in which outcomes can depend on interactions among individual economic actors (Dyer and Taylor 2011).

Qualitative research can capture the multidimensional nature of households' responses to NAFTA, ones that include subtle dimensions of food production and consumption, labor allocation, and technology adoption, which in turn give insight into farmers' livelihood strategies (Fitting 2004, Fitting 2006, García Barrios and García Barrios 1990, Nadal 2000, Nadal and García Rano 2006). The authors conducted field research to provide such qualitative data and carried out the research in La Frailesca, located in the southern Mexican state of Chiapas (see figure 1). The results presented here are based on qualitative livelihood research in 2006 and 2007 in four communities in La Frailesca. The four communities selected are Dolores Jaltenango, Roblada Grande, Libertad Melchor Ocampo and Querétaro are representative of the poverty levels found in La Frailesca (Bellon and Hellin 2011).

La Frailesca occupies an area of 2631 km^2 (Erenstein et al 1998) and is situated in a valley at an altitude of 600 m, but surrounding mountains have an elevation up to 2000 m. Maize, beans and squash *(calabaza)* are the dominant crops, and some farmers also grow vegetables. Farming is both subsistence- and market-oriented, and the region has received strong support from the state and federal governments, particularly for agricultural development. While the region produces large maize surpluses that are exported to other parts of Mexico, it is still dominated by small-scale farmers (Bellon et al 2007). La Frailesca is, hence, representative of many maize-growing areas of Meso-America where small-scale commercially-oriented maize farmers are adapting to the economic changes brought about by market liberalization.

Research tools included participant observation, semi-structured interviews and focus group meetings in each of the aforementioned four villages. Participant observation is fundamental to much qualitative research especially anthropological research (Silverman 1993). Semi-structured interviews and focus group meetings are guided conversations in which topics are predetermined and during which new questions and insights arise as a result of the discussion and visualized analyses (Pretty et al 1995). They are more an art than a set of fixed procedures and the interview process is dynamic and iterative (Norman and Douglas 1994). One-to-one conversations and group meetings are needed because a

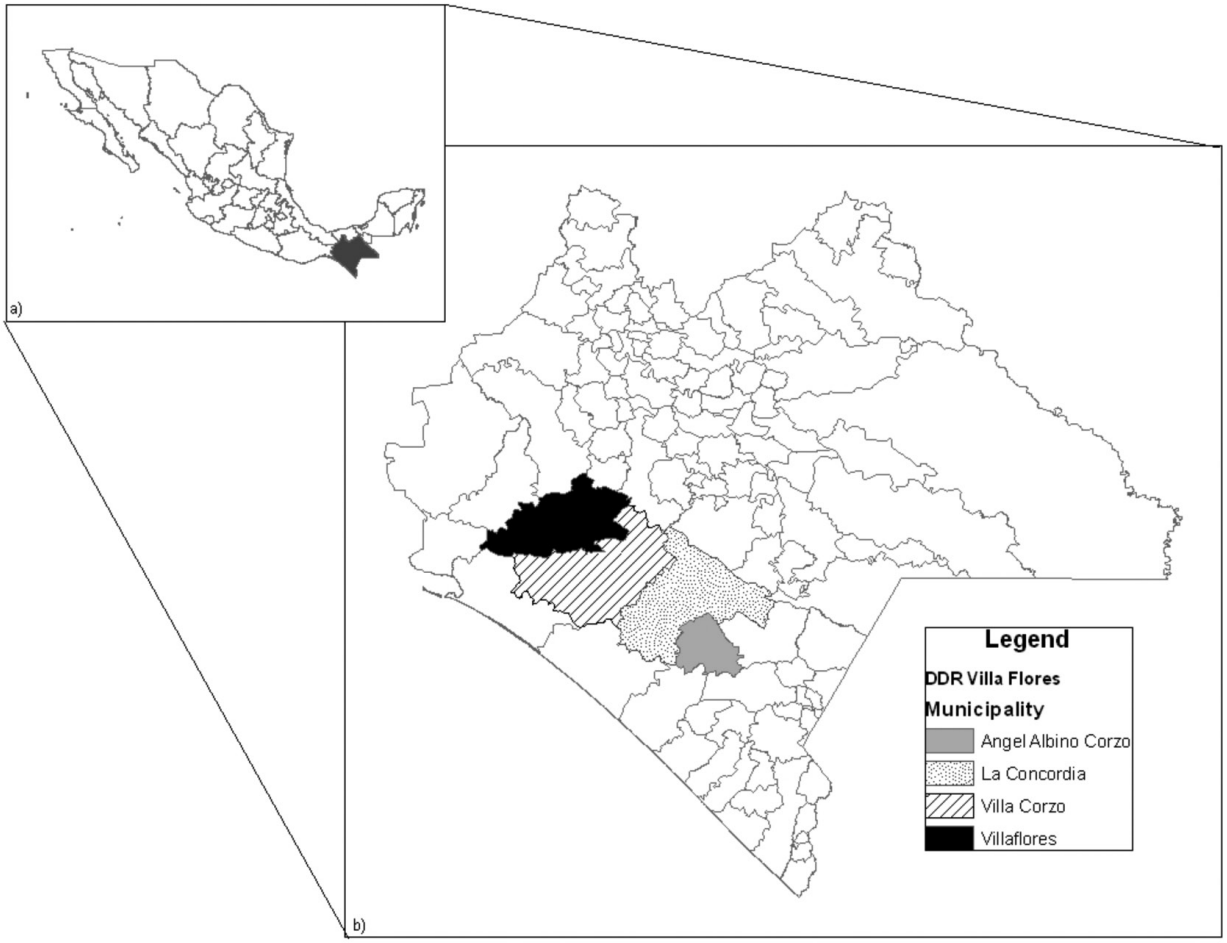

Figure 1
Map of (a) Chiapas as situated in Mexico, and (b) La Frailesca within Chiapas with its four municipalities that are part of the Villaflores Rural Development District (DDR) (Source: INEGI data; map by authors).

frequent bias in agricultural development is to think in terms of 'the farmer' despite the fact that decisions about farming are not made by the farmer in isolation and decision-making is influenced by social pressures and beliefs (Rhoades 1991). Furthermore interviews with groups of farmers may be more instructive than those with individual farmers because group members have an overlapping spread of knowledge, which may cover a wider field than any single person (Chambers 1997, Pretty 1995).

The topics addressed in these focus group discussions centered on farmers' maize and farm-management practices, and how these practices are related to available government policies. Separate focus-group discussions were held with men and women. Discussions with women included topics that were not discussed in-depth with men, including the role of maize in household nutrition, and their experiences with *Oportunidades.* Key informant interviews were also conducted with representatives from the following government departments and research organizations: *Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y*

Alimentación (SAGARPA); *Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias* (INIFAP); *Fideicomisos Instituidos con Relación a la Agricultura* (FIRA), and the *Secretaría del Campo.* These interviews sought to corroborate information provided by focus group discussions with the technical design and implementation of government programs.

5 Results: farmers' livelihood strategies

5.1. Intensification of existing production patterns

Intensification of agriculture is manifested most in the use of inputs to increase maize yields particularly through the adoption of improved maize varieties (hybrid and open pollinated varieties [OPVs]); the use of fertilizers and pesticides; and a reduction in the period that land is left in fallow (Bellon and Hellin 2011). We use the terms *criollo* and improved maize to describe different types of germplasm. *Criollo* describes local varieties derived primarily from landraces, seed of which is usually saved by the farmer from one year to the next. Improved maize refers to open-pollinated varieties (OPVs) or hybrids, which have undergone intensive breeding in research institutions. Maize in Mexico can be described by a more detailed typology (see Bellon et al 2005), but we use a simpler division to follow common usage in the study site.

The greater use of inputs such as improved seed has been facilitated by a variety of state-level subsidies. In more than one of the focus groups, farmers suggested that the roots of the use of OPVs date back to periods of strong agricultural investment in the 1980s when PRONASE was functioning. In 2006, farmer use of hybrid maize was supported by a subsidy for seed and other inputs, distributed on a per-farmer basis. According to local SAGARPA officials, this subsidy was a provided as a federal government program, and will not be provided again in the same form, as these monies are being 'reoriented' and 'integrated' into other programs.

Farmers have transitioned to hybrid or OPV varieties rather than maize landraces *(criollos)* because hybrids and OPVs offer higher yields. Furthermore, improved maize varieties have advantages over the *criollos* in that they are less susceptible to lodging in strong winds. The drawback is that improved varieties require treatment with fertilizers and other agrochemicals that represent a further expenditure. In addition, many of the improved varieties do not have the consumption characteristics associated with *criollo* varieties e. g. they take less firewood and time to cook, that they hold together better in tortillas and other dishes, that the volume of tortillas that they make is greater, and that products made from them can be stored longer. Some farmers choose OPVs as a middle-of-the-

road solution. OPVs are less expensive than hybrids and are less input-thirsty while offering higher yields than *criollo* varieties.

A major constraint to the intensification of existing production patterns is poor access to credit. According to the focus groups, credit is almost non-existent for small-scale farmers on these *ejidos,* although some farmers do acquire credit through intermediaries, seed-buyers, or even the businesses that market inputs themselves: these credits are usually only available at high, monthly-compounded interest rates. In one *ejido* (Roblada Grande) farmers have had experience with credit linked to a technical package via the public/private extension agents known locally as *despachos*. However, farmers did not want all of the elements of the technical package, and as they were not allowed to choose among them, they found the package (and the credit) to be too expensive.

5.2. Diversification of livelihoods (on-farm, including value adding)

The maize-bean system is characterized by extensive and often severe poverty. Yet focusing attention on increasing yields of traditional products can produce limited poverty alleviation at best. Diversification offers the greatest potential rewards but, even among those who can make the transition, support is needed. National urban populations with increased incomes will demand more high value products such as fruits and agriculture. Farmers' participation in high value and/or value-adding activities offers one of the few agricultural-based pathways to reduced poverty and increased livelihood security. Development agencies in Mexico and Central America have actively promoted the expansion or establishment of higher value crops, such as fruit and vegetables, to complement existing food security options such as maize and beans (Hamilton and Fischer 2003).

The extent to which this is an accessible livelihood strategy for farmers in La Frailesca remains unclear. During the focus group meeting in Dolores Jaltenango, farmers reported that the production of vegetables is not popular because they require large amounts of chemicals to control pests and diseases and that these chemicals are expensive. Some diversification from maize production to cattle ranching has in theory been encouraged by government programs such as PROCAMPO *Capitaliza,* which was introduced in 2001. This program allowed farmers to receive the remaining years of PROCAMPO that in one lump sum, with the theory that these monies would provide them with greater capital to invest in agricultural improvements such as the conversion from maize to cattle ranching.

However, Puyana and Romero (2006) point out that this program has had less impact than anticipated, due in great part to the unwillingness of national financial institutions to provide a parallel program of agricultural credit for small-scale producers. This was borne out during our research. In 2005, during the focus group meetings, farmers expressed a wish to

convert to cattle raising as it is seen to be more profitable than maize production (due to high costs of production). Farmers mentioned PROCAMPO *Capitaliza* as a program that would facilitate this conversion. However, two years later, during focus groups in 2007, it was apparent that very few smallholder farmers have converted to cattle; the reasons for not doing due to lack of financial capital both to buy animals and to purchase cattle feed.

Despite the challenges of producing high-value products such as fruits and vegetables and the small impact that government programs have had in encouraging farmers to diversity into other crops, there is still a potential for doing so. There is a big movement toward organic production in Chiapas, as well as the production of specialty products. However, technical assistance via either government support or private funds is needed to help farmers diversify into other products.

5.3. Expanded farm or herd size

Expansion of land area or herd size was not a major strategy mentioned by farmers. Despite government programs such as PROCAMPO *Capitaliza* (see above) small-scale farmers report that the funding provided by this program was not sufficient for the expansion of herd size. PROCAMPO was generally not devoted to the purchase of livestock, because farmers either possessed small land areas or had failed to register all of the land they farmed for PROCAMPO due to fears that the program would serve as a platform for government appropriation of *ejido* lands. Because of the small land areas registered in PROCAMPO, most people during the focus group meetings said that the lump sum they received was less than what was necessary to buy even one head of livestock. Instead, farmers used these monies to pay off their debts, fix their houses, or make smaller investments in farming. While land is becoming more available, qualitative data suggest that less land is in production rather than more due to temporary or permanent migration.

5.4. Increased off-farm income

Throughout Meso-America, a large proportion of smallholders is likely to continue to rely on the farm for their basic sustenance, but turn increasingly to off-farm employment as a means of earning the income needed to finance basic household expenses (medicine, education, clothes, etc.). This income may also finance greater input use, raising yields. Off-farm employment and other rural employment may initiate an upward spiral of employment, earnings expenditure, and increased demand for goods and services among those unable to diversify production. Increased off-farm income is an important strategy in La Frailesca. The most prominent manifestation is men going to work short-term in coastal cities or the United States. This short-term migration is related to patterns that lead to the exit from agriculture, which are discussed at greater length below.

De Janvry et al (1989) describe a common situation whereby producers' engagement in (commodity) markets often exposes them to market forces and large-scale expropriation. Farmers are obliged to work as part-time wage laborers to make up shortfalls of staples and cash requirements for household goods, as well as to pay for inputs for the production process itself on their farms (Blaikie 1989). Employers accumulate profits by paying less than the cost of reproducing the farm household, since the smallholder's farm makes up the shortfall to the level of the full economic wage, which would otherwise have to pay for the full costs of living for the worker and his/her dependents. Farm household production, therefore, acts as a subsidy to wages since part of the subsistence cost of farm households is borne by household labor (De Janvry and Helfand 1990). Farmers, although increasingly dependent on non-farm sources of income, are unable to find sufficient employment opportunities either to migrate and abandon the agricultural sectors or to depend fully on wage earnings for their subsistence (De Janvry et al 1989). It was not clear from the focus groups the extent to which this was a common phenomenon in La Frailesca.

5.5. Exit from agriculture

Exit from agriculture is not a phenomenon specific to La Frailesca. Throughout Meso-America, fragmentation due to inheritance and other causes has increased the number of holdings and decreased the average size over recent decades. Land degradation has also led to the abandonment of some land. La Frailesca is increasingly acting as a 'poverty pump' exporting unskilled workers to urban centers within Mexico and also to the United States. During focus group meetings in all four communities, farmers reported that since the beginning of the century, the rate of emigration has increased. Migration is undoubtedly stronger in some of these communities than in others, but even in communities with a source of income beyond maize (e. g. coffee in Querétaro; the Buenaventura chicken farm in Melchor Ocampo) there has been a marked increase in migration.

Another contributing factor to migration is the government program *Oportunidades.* Women interviewed in Dolores Jaltenango said that migration was a strategy chosen equally by those who had completed secondary school and those who had not. However, in Querétaro, mothers pointed out that although children with *Oportunidades* continued to help their parents in farming on the weekends, they generally did not continue as full-time farmers after finishing school, as they were not accustomed to the hard labor, and felt they could seek better opportunities elsewhere. Others pointed out that those with a higher degree of education might have a better chance of being successful if they migrated, as reading and math skills were less likely to make them easy targets for those who might take advantage of them, either within Mexico or in the US.

5.6. An integrated approach

The aforementioned results from the research in La Frailesca suggest that the macro-micro linkages between market liberalization policies and local household responses should be more integrated when analyzing the impacts of NAFTA and related policies and government programs. The relationship between these livelihood strategies and outcomes, government policy and institutions, and the changes brought about by trade liberalization are outlined in figure 2.

In this figure, dark arrows between boxes represent enabling relationships, whereas dashed lines represent potential impacts that have not been fully realized. A framework like this one would be useful when carrying out ex-ante and ex-post impact assessments in the context of agricultural modernisation initiatives that seek to increase agricultural production and productivity. Qualitative research underpins the specifics of the framework, but the framework also allows for complementary quantitative research to analyze more rigorously the relationships between specific trade policy impact pathways and farmers' livelihood strategies.

6
Conclusions

Since the Mexican peso crisis at the beginning of the 1980s, the Mexican government has introduced a series of economic policies leading to greater market liberalization. An objective of these policies was to stimulate the domestic agricultural sector, which the majority of the poor population still depends on for its livelihood security. These market liberalization processes and policies have created the institutional environment that shapes the opportunities and constraints of smallholder farmers' livelihood strategies. The responses at household level to these changes and processes depend on the characteristics of the local environment and the capabilities of the individual households.

The case study of the small-scale maize producers in the La Frailesca region of Chiapas, illustrates that government programs brought about by trade policy and farmers' livelihood options are closely interwoven and shape the livelihood strategies chosen by the farmers. These policies have enabled some farmers to benefit in terms of intensifying production, building up many of the livelihood assets and increasing market opportunities. However, qualitative research shows that many maize producers have been unable to build up their assets from farming alone and have chosen other ways out of poverty through increased off-farm income and in some cases permanent exit from agriculture. This analysis implies that post-liberalization agricultural policies have rarely led to smallholder farmers diversifying farm production and/or or expanding their land-holdings or herd-size.

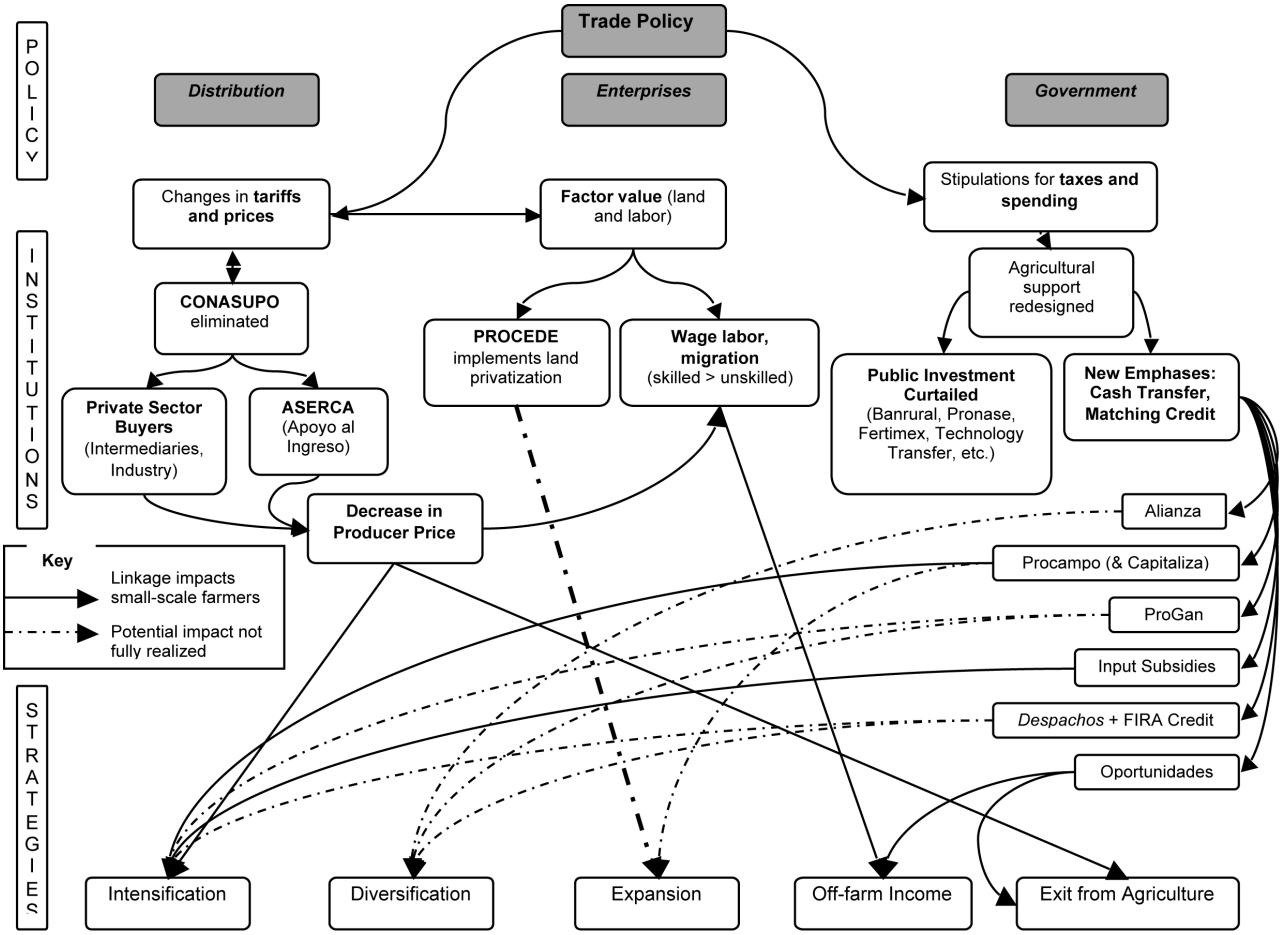

Figure 2
Schematic of the impact pathways linking trade policy, Mexican agricultural and rural development support institutions, and farmers' livelihood strategies.

The Mexican maize sector is characterized by its heterogeneity and, hence, maize farmers are affected in very different ways by similar policy changes. The links between the market and institutional environment and farmers livelihoods can be analyzed by tracing the impact pathways. The three pathways we use: *enterprises, distribution,* and *government* together with a livelihood typology of rural poverty-escape strategies provide a framework for analyzing and understanding the different impacts at household level of government agricultural in the various heterogeneous local environments. Such a framework can be used in other regions and countries undergoing similar trade liberalization.

The framework is particularly relevant in Mexico in light of the Federal Government's launch of the the Mexican *Sustainable Modernization of Traditional Agriculture* (MasAgro) initiative. MasAgro is an initiative of Mexico's Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA) and of the International Maize and Wheat Improvement Center (CIMMYT). MasAgro targets small-scale farmers who

lack access to modern agricultural technologies and functional markets and aims to help them increase their income through a combination of improved cropping practices and conventionally-bred, high-yielding maize and wheat varieties. In terms of maize, the objective is to increase Mexico's maize production by 5-9 million tons annually in rain-fed areas (a nearly 85% increase) by 2021.

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