
A Multilevel Analysis of Agricultural Trade and Socioeconomic Inequality in Rural Mozambique*

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This study uses a mixed methodology to investigate the relationship between agricultural trade and socioeconomic inequality in Mozambique at multiple geographical scales. The quantitative analysis examines all rural regions of the country and a nationally representative sample of rural households, whereas the qualitative analysis focuses primarily on two case study villages. Research findings suggest that social and geographical context greatly influence the relationships between agricultural trade and regional inequality. Trade-related effects on economic inequality—and the social status of traders—vary across Mozambican regions. Results suggest that trade increases inequality in regions where traders have low social status, but reduces inequality in areas where they have high social status. These findings suggest that social and economic factors work together to shape landscapes of inequality. **Key Words:** *inequality, international trade, mixed methodologies, Mozambique.*

本研究采用混合研究法以调查多尺度的莫桑比克农产品贸易和社会经济不平等性之间的关系。用定量分析来研究该国所有农村地区和一个具有全国代表性的农村住户样本。另一方面，定性分析主要集中在两个案例研究村庄。研究结果显示，社会和地理背景极大地影响了农产品贸易和区域不平等之间的关系。贸易对经济不平等性的影响和贸易商的社会地位，在莫桑比克的不同地区是不同的。结果表明在商人社会地位低的地区，贸易会增加该地区不平等。而在商人社会地位较高的地区，贸易却起着相反的效应。这些调查结果显示，社会和经济因素共同地影响了莫桑比克景观的不平等。**关键词：**不平等性，国际贸易，混合研究方法，莫桑比克。

En este estudio se utiliza una metodología mixta para investigar las relaciones entre el comercio agrícola y la desigualdad socioeconómica en Mozambique, a escalas geográficas múltiples. El análisis cuantitativo examina todas las regiones rurales del país y una muestra nacionalmente representativa de las viviendas rurales, mientras que el análisis cualitativo se concentra principalmente en dos pueblos. Los resultados de la investigación sugieren que el contexto social y geográfico influencia en gran medida las relaciones entre el comercio agrícola y la desigualdad regional. Los efectos relacionados con el comercio sobre la desigualdad económica, y el estatus social de los comerciantes, varían en todas las regiones de Mozambique. Los resultados sugieren que el comercio aumenta la desigualdad en aquellas regiones en las que los comerciantes tienen un estatus social bajo, pero la reduce en áreas en las que lo tienen alto. Estos resultados sugieren que los factores sociales y económicos funcionan conjuntamente para conformar el panorama de desigualdad. **Palabras clave:** *desigualdad, comercio internacional, metodologías mixtas, Mozambique.*

Western development institutions commonly advocate trade liberalization to spur economic growth in developing nations. Although protrade policies may generate aggregate welfare gains in low-income countries, not everyone benefits equally from liberalized trade (Dicken 1998; Kapstein 2000; Wade

2001; Leichenko and O'Brien 2002, 2008; O'Brien and Leichenko 2003). Important questions remain about how these reforms affect inequality in emerging economies, especially at the subnational level. Distinguishing the winners and losers of trade liberalization is of particular importance in southern Africa, where

*Funding support for this study was provided, in part, by dissertation research grants from the National Science Foundation (DDRI Grant BSC-0401776), the Association of American Geographers, and the Social Science Research Council Program in Applied Economics with funds provided by the John D. and Catherine T. MacArthur Foundation. The author thanks her advisor, Robin Leichenko, and committee members Mike Lahr, Joanna Regulska, Lyna Wiggins, and Richard Schroeder for all their help and support during this study. The author also expresses her gratitude to Stewart Duncan, Corene Matyas, and five anonymous reviewers for their comments and suggestions on earlier drafts of this article. The author also thanks Nicholas Campiz for cartographic and graphic design assistance. All remaining errors and omissions are the sole responsibility of the author.



Figure 1 *Map of Africa.*

most countries are extremely poor and already have high inequality (Evans 2001; Wobst 2003). This study investigates the effects of agricultural trade on inequality in rural regions of Mozambique, a country that aims to alleviate poverty by promoting agricultural exports (Figure 1).¹

This study uses a conceptual framework that draws on neoclassical trade theory, new economic geography, and the work of Amartya Sen (1981, 1999) on entitlements and capabilities. Neoclassical trade theory claims that international trade drives levels of inequality, and predicts that inequality in developing countries will decrease as trade levels rise (Wood 1994). Researchers working within the new economic geography framework agree that trade can affect levels of inequality, but suggest that greater trade volumes could increase inequality if certain regions acquire permanent trade-based ad-

vantages over other areas (Krugman 1991). I expand on trade theory frameworks by incorporating the nonmonetary dimensions of inequality and the experiences of individuals. This aspect of the study draws on Sen's (1999) capabilities framework, which states that the freedom to engage in trade increases people's opportunities and reduces social inequities. Thus, this study also investigates the relationship between trade and social inequality.

To benefit from the strengths of qualitative and quantitative research techniques, this study employs a mixed methodology to address three research questions in rural Mozambique:² (1) What effects do agricultural trade and other factors have on income inequality at the regional scale? (2) What factors influence household participation in international or domestic agricultural trade? (3) How does participation in trade-related activities—such as

petty trading of agricultural goods—influence individual experiences of socioeconomic inequality? In investigating these questions, statistical analysis is used together with case studies, interviews, and field observations. The data collection and empirical research were conducted sequentially so that findings at each phase of the analysis could influence the design of later phases. By assessing the effects of agricultural trade at the subnational level, this study contributes to our understanding of how social and geographical context influence rural economies in the developing world.

The Case of Mozambique

Two key factors led to the selection of Mozambique as a case study for researching linkages between inequality and agricultural trade. First, much of the debate surrounding the effects of globalization centers on how much international trade contributes to the rising levels of global and national inequality (Wood 1994; Rodrik 1997; Anderson 2005). Mozambique has an export-led economic development policy that relies on increasing regional and international trade. In-depth empirical studies on Mozambique may well lead to insights on the role international trade plays in generating social and economic inequities in emerging economies at multiple geographic levels (e.g., region, household, individual). Second, Mozambique has introduced protrade policies in an environment where the majority of the population lives in absolute poverty, people are highly vulnerable to natural hazards, and smallholder farmers make up the majority of the agricultural sector. Such poverty and vulnerability of farmers are common in the less developed countries, and therefore these factors warrant inclusion in studies of the relationship between agricultural trade and inequality.

Mozambique adopted a structural adjustment program in 1987, following a brief period of socialism and centuries of Portuguese colonial rule. The country's structural adjustment was one of several austerity programs sponsored by the International Monetary Fund (IMF) implemented in sub-Saharan Africa in the 1980s and 1990s. IMF-sponsored programs commonly involve lowering trade barriers and opening markets, devaluing the national cur-

rency, privatizing state-owned enterprises, and cutting government subsidies and social services. In Mozambique, these reforms were intended to reverse declines in food consumption and agricultural production in rural areas, reduce the national debt and dependence on foreign aid, and establish the conditions for economic growth (Pitcher 2000; Government of Mozambique 2001). In particular, the state aims to increase rural incomes by fostering higher production of cash crops such as sugar, cotton, tobacco, paprika, and chickpeas, in which Mozambique's agricultural sector appears to have considerable export potential (Nathan Associates 2002; Walker et al. 2004).³

Structural adjustment in Mozambique has had similar consequences as IMF-sponsored reforms in other countries.⁴ The privatization of state enterprises led to the closure of state-run factories and a dramatic reduction in the availability of jobs in the formal sector (Mittleman 2000). Access to health care and education decreased, particularly for women and especially in rural areas (Knauder 2000; Sheldon 2002). The findings of Bowen (2000) suggest that privatization has mainly benefited foreign-owned multinational corporations and Mozambique's governing elite.

Mozambique faces considerable obstacles to achieving the necessary export growth to alleviate poverty. Like many developing countries, Mozambique suffers from the adverse effects of distorting terms of trade on agricultural production. Other problems include the absence of risk-spreading mechanisms (e.g., insurance) and weak enforcement of contracts. In addition, connecting smallholders to markets has proven extremely difficult in rural regions. A poor transportation network and limited commodity price information translate into higher risks for farmers as they turn to commercial crops. Moreover, the terms of IMF austerity programs have limited the state's ability to mitigate some common negative effects of market liberalization, such as environmental degradation.

Uneven development in Mozambique has long historical roots. Colonialism and civil war contributed to widespread poverty in the countryside. Colonial and postcolonial policies deliberately channeled development to the southern region of the country, fostering spatial disparities in income and well-being.⁵ Other inequalities in Mozambique stem from

gender roles and gender relations that limit women's opportunities to profit from many commercial activities, including agricultural trade. Mozambican women are responsible for most agricultural tasks, but their access to land and control over the income from these activities varies across the country (Baden 1997). Ethnic groups in southern regions of Mozambique, like the Shona, Tsonga, and Changan, have patriarchal gender relations. Males have more decision-making authority and legal rights, such as the ability to enter into trade contracts (Isaacman and Isaacman 1983). However, male migration to neighboring countries led to many de facto female-headed households in southern Mozambique and greater participation of women in the public sector, although absent men still have a considerable amount of influence over how income is spent (Waterhouse and Vijfhuizen 2001; Arnaldo 2004). In the northern matrilineal societies of the Makua, Lomwe, and Chuwabo, wealth and residence pass through the female line. Women in these matrilineal communities depend on their male relatives—not husbands—for access to land, and elder women in these communities have important ceremonial powers (Baden 1997). Thus wives and widows have a stronger economic position in their communities relative to southern women.

Studies of uneven development in Mozambique find some evidence that higher levels of market integration are associated with higher levels of inequality. For example, Elbers et al. (2002) find that income inequality is highest in the capital, Maputo, where most industry is located. Other studies have found that high levels of income inequality also exist within rural communities (Heltberg, Simler, and Tarp 2001; Simler and Nhate 2002). Heltberg, Simler, and Tarp (2001) suggest that market-oriented growth may increase inequality in Mozambique by rewarding the small minority who possess social and physical capital.⁶

Research Design

This study employs a mixed methodology to study both human experiences and broad regional economic trends, enabling a more comprehensive analysis of the drivers of inequality (Carvalho and White 1997; Tashakkori and

Teddle 1998; Courgeau 2003). The study was conducted between 2002 and 2004 using a sequential process in which findings at each research phase influenced data acquisition and analysis in subsequent phases (Figure 2). For example, macroanalyses informed the selection of the case study sites and local fieldwork influenced the selection of variables for the econometric models. Empirical results were verified in follow-up interviews and discussions with Mozambican farmers, allowing findings from later phases of the analysis to inform the interpretations of earlier results. Factors that cannot be easily quantified, such as social standing and community cohesion, were explored using qualitative analyses. The study can be divided into five phases.

The first phase of the study involved extensive background research and a geographic information system (GIS) analysis of social, economic, and physical factors to select a case study from among the less developed countries. Building on the methodology outlined in O'Brien et al. (2004) and O'Brien and Leichenko (2000), this study used GIS to construct poverty maps and vulnerability profiles for countries. After the selection of Mozambique as the case study country, subnational mapping, data analysis, reviews of secondary literature, and key informant interviews were used to select two case study communities within southern Mozambique (Figure 3). Fieldwork was then conducted in these two villages: one with a relatively high degree of market access (Massavasse in Chókwè District) and one that is more isolated (Matidze in Mabalane District). The geographic proximity of both villages to Mozambique's capital, Maputo, as well as their location in the fertile agricultural zone along the Limpopo River make these areas an appropriate case study for examining the effects of agricultural trade on inequality (Hermele 1988; Roesch 1988). A random sample of sixty-three households was surveyed in the two communities (thirty-three in Matidze, thirty in Massavasse) on topics including household demographics, economic activities, crops, migration and remittance patterns, and access to information, agricultural inputs, and social services. Interviews were conducted in the local language or Portuguese—depending on the language spoken by the head of household—and translated into English. The

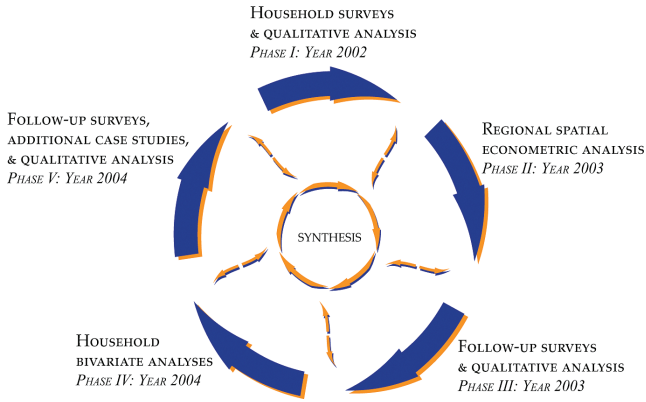


Figure 2 Diagram of sequential research phases.

qualitative data were analyzed using NUD*IST 4 software (Richards and Richards 1997) to identify recurring themes in the interviews, such as the benefits and costs attributed to

agricultural trade and other market-based activities.⁷

In the second phase of the study, a regional trade orientation database was compiled for

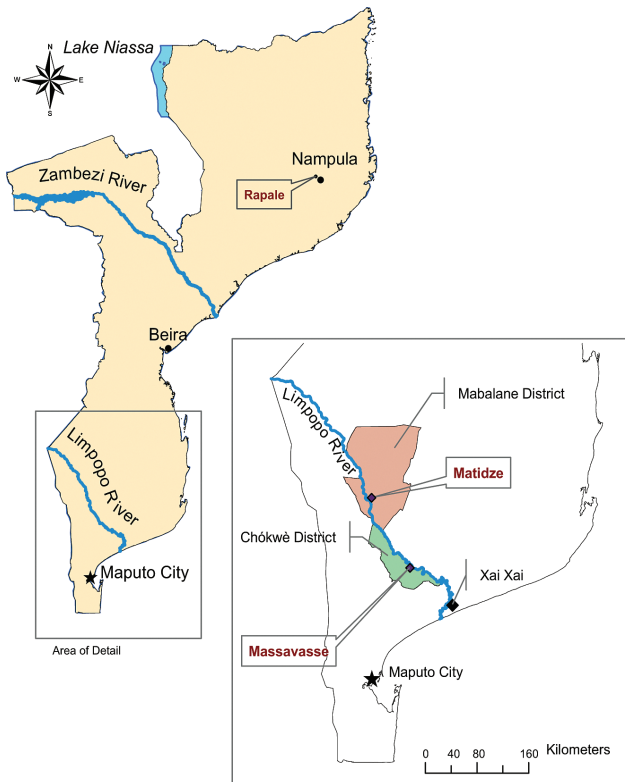


Figure 3 Map of case study villages in Mozambique.

Table 1 Sources used to construct district-level trade orientation database

Data set name	Year	Source	Sample size (households)
Base Topographic and Land Use/Land Cover Data (GIS data)	1999	Mozambican National Directorate of Geography and Cadastre (DINAGECA)	N/A
National Housing and Population Census	1997	Mozambican National Institute of Statistics (INE)	N/A
National Household Survey on Living Conditions	1996–1997	Mozambican National Institute of Statistics (INE)	8,289
Census of Agriculture and Livestock	1999–2000	Mozambican National Institute of Statistics and Ministry of Agriculture and Rural Development (INE/MADER)	23,423

136 rural districts in Mozambique using various secondary data sources (Table 1). Next, regression models were estimated by means of ordinary least-squares (OLS) and as spatial error models (SEM) via maximum likelihood.⁸ Inequality is modeled as a function of trade orientation, agglomeration measures, income measures, locational measures, and demographic factors. This study employed spatial regression analysis to control for the possible presence of spatial autocorrelation in the regional data set. The use of regression analysis also facilitates comparability of this study’s findings with other research on the subnational influence of trade on inequality (Sanchez-Reaza and Rodríguez-Pose 2002; Galiani and Sanguinetti 2003; Edin, Fredriksson, and Lundborg 2004; Silva and Leichenko 2004; Aguayo-Tellez 2006).⁹ Information gleaned from the first phase of the study informed the selection of the variables and the construction of the regression model. For example, interviewees stressed differences between trading vegetable crops—where there were few formal contracts—and trading cash crops such as cotton and sugar. This influenced the design of subsequent phases of the analysis by focusing the investigation of agricultural trade on two separate types of crops: domestically traded vegetables and internationally traded cash crops. Therefore regional orientation toward vegetable cropping was treated as a separate category from other types of cash crop orientation to measure any differential effects on inequality.¹⁰

The third phase of the study consisted of a second research trip to Mozambique to follow up with survey respondents in the case

study communities and conduct twenty-one informant interviews with government officials and development specialists. These interviews were conducted, in part, to verify findings from the regional analysis. They also sought to identify the factors that influence household participation in commercial activities promoted by trade-based growth policies.

The fourth phase of the study involved further quantitative work using the *Trabalho de Inquerito Agrícola* (TIA)—a nationally representative survey of agricultural Mozambican households conducted in 2002 that covered the agricultural year 2001–2002, a typical year with regard to weather conditions and production yields (Walker et al. 2004). Using bivariate tabular analysis, the study investigated the various economic, social, and demographic characteristics of households located north or south of the Zambezi River. The analysis investigated linkages between household characteristics and participation in agricultural trade, and whether significant differences existed between and within northern and southern regions. Household comparisons were conducted within regions: Northern trading households were compared with northern nontrading households, and southern trading households were compared with southern nontrading households. Then household comparisons were conducted between regions: Southern trading households were compared with northern trading households, and southern nontrading households were compared with northern nontrading households.

In the fifth phase of the study, follow-up interviews were conducted with survey

respondents in the southern case study sites. In addition, a case study site in northern Mozambique—Rapale—was added to the analysis. Fourteen small-scale farmers and eight key informants were interviewed there (Figure 3).¹¹ The addition of a northern case study site allowed for a qualitative investigation of those regional differences in the relationship between agricultural trade and inequality indicated in earlier phases of the study. Interviews were conducted with northern and southern villagers about how commercial activities, and agricultural trade in particular, impact economic and social standing of households. Finally, results from all phases of the analysis were synthesized to investigate the drivers of inequality in Mozambique, how they vary within the country and at different geographical levels of analysis, and the implications of these variations for the government's protrade policies.

Data Limitations

Although the use of a mixed-method, multiscalar approach enriched the scope of this study, the analysis has two main limitations. First, the use of large secondary data sources to construct the cross-sectional, regional database might have introduced error into the regression analyses and bivariate analyses depending on the

accuracy of survey data. The reliability of social and economic data gathered through extensive government surveys is a common concern among social scientists, especially given the financial constraints of data collection in less developed countries. However, the variety of secondary data sources that exist for Mozambique allowed me to employ triangulation (i.e., cross-checking the calculations derived from one data set against those of another) to verify the reliability of secondary data sources. This technique indicated the robustness of key measurements derived from the available data sets and used in this study, such as mean incomes and percentages of households engaged in agricultural trade.

The second key limitation comes from the cross-sectional research design of the regression model and bivariate statistics, which prevented the study from capturing the temporal dimensions of inequality. Longitudinal studies that can control for period fixed effects (such as natural disasters) at the district level would enable an analysis of the impacts of changing trade pressures on inequality over time. Unfortunately data limitations currently make such studies impossible. The qualitative component of this study attempts to redress the lack of regionally representative longitudinal data by assessing the relationship between trade and

Table 2 Descriptive characteristics of southern case study households

Category	Variable description	Massavasse (N = 33)		Matidze (N = 30)	
		% of households	N	% of households	N
Commercial agriculture	Sells cash crops ^a	36%	12	3%	1
	Sells vegetable crops ^b	39%	13	37%	11
	Sells basic food crops in emergencies ^a	33%	11	87%	26
Agricultural marketing	Sells crops in a regional market ^b	52%	17	70%	21
	Sells crops locally ^b	33%	11	43%	13
	Sells crops to intermediaries (<i>guebas</i>) ^a	0%	0	47%	14
Off-farm income sources	Has off-farm wage income ^b	45%	15	40%	12
	Receives remittances ^a	64%	21	30%	9
Demographics	Male interview respondent ^b	42%	14	67%	20
	Female interview respondent ^b	58%	19	33%	10
	Interview respondent is literate ^b	45%	15	30%	9
	All eligible children in school ^a	88%	29	70%	21
Access to services	Access to agricultural extension agent ^a	64%	21	3%	1
	Holds title to land ^b	73%	24	83%	25
	Has irrigated land ^a	52%	17	0%	0

^a Chi-square test for independence indicates the relationship between this variable and geographic region is statistically significant at the 0.05 level.

^b Chi-square test for independence not statistically significant at the 0.05 level.

Source: Author's calculations using data collected in the field, 2002–2004.

inequality from a different vantage point, using in-depth qualitative data. Thus, the study presented in this article captures the place-based variation in the effects of trade in Mozambique and provides an important baseline from which to study future change.

Results

Attitudes Toward Agricultural Trade

The case study component of this research focused mostly on two rural villages in the Limpopo River Basin of southern Mozambique: Matidze in Mabalane District and Massavasse in Chókwe District (Figure 3). The overwhelming majority of surveyed households (98 percent) engaged in some type of agricultural production. Although most interviewees were basically subsistence agriculturalists, many did engage in small-scale agricultural trade and other commercial activities (Table 2). Nearly half the households in Massavasse and one-quarter of the households in Matidze grew at least one crop intended for sale.

The survey results suggest that farmers viewed vegetable production as distinct from cash cropping. In general, people expressed a preference for farming vegetables rather than internationally exported crops such as cotton. Even people who did not participate in either activity said that—given equal opportunities—they would rather grow vegetables.

A key difference between farming vegetables and cash crops involved the differing risks and commitments associated with each crop type. Cash cropping required contracts and connections to large companies. Under the terms of cash cropping contracts, farmers were given seeds in exchange for agreeing to sell their produce to a particular company (often at below-market rates). The cost of the seeds—and any other agricultural inputs advanced to the farmer—was later subtracted from the value of the crop. Cash cropping was described as a male activity due to the need for these farmers to enter into binding contracts and qualify for credit. Vegetable trading could be done informally in small amounts, even if farmers lacked the connections to have a stall in the local market. Farmers could sell vegetables outside their homes, or to intermediaries (called

guevas) who later resold the goods to market traders. Women commonly participated in vegetable cropping in southern Mozambique and *guevas* were often female.

Farmers described vegetable sales as the most viable economic activity for households in the Limpopo River Basin that wished to farm commercially. A key benefit was the ability of households to eat produce that they could not sell. Lack of access to cold storage required that produce be sold quickly or eaten. Some interview respondents stated that they would give away what they could not use themselves. Food gifts functioned as a form of social insurance, as they could expect the favor to be returned in the future.

Other factors also contributed to the preference for vegetable cropping. Respondents stated that prior experiences with cash crop production—especially cotton—had been negative. Rural agriculturalists were forced to grow cotton under Portuguese occupation and participate in collective agricultural schemes under the socialist government (Urdang 1989; Abrahamsson and Nilsson 1995; Isaacman 1996). People also described the terms of cash cropping contracts as unfair, making the activity risky and unprofitable. Even households that did not grow cash crops expressed familiarity with market prices for them. The prices of cash crops had been decreasing but prices for vegetables were rising. Urbanization appears to be a factor in the growing demand for vegetables.

Regional Patterns of Inequality

The qualitative research already described revealed strong preferences for growing vegetables, in contrast to the government's preferences for export crop production. The next phase of the study addressed the first research question and investigated whether the two types of trade had differential effects on inequality across Mozambique. The relationship between trade and inequality was analyzed within the Heckscher–Ohlin (HO) framework, a widely used version of trade theory that predicts higher levels of trade within a developing country will be associated with lower levels of inequality. The model was estimated separately for districts north of the Zambezi River and those districts to the south, due to evidence of structural change in the data

set (i.e., linear regression parameters were not equal across northern and southern districts).¹² The regression results, reported in greater detail in Silva (2007), suggest a relationship between inequality—as measured by the Gini coefficient—and agricultural trade, but the direction of the relationship is mixed.¹³ The findings of Silva (2007) suggest that cash cropping is associated with low inequality in the north, although vegetable trading has no significant effects on inequality there. In contrast, vegetable cropping is associated with higher inequality in the south, but cash cropping apparently has no significant effect on inequality there.

The differential effects of trade may be explained, in part, by regional variation in economic development, social structures, and physical geography. Historical factors have contributed to spatial disparities within Mozambique. For example, colonial policies channeled development into the south of the country because, in part, of the region's proximity to South Africa. As a result, the south generally has higher levels of development, including better infrastructure such as roads, health facilities, and schools. Southern Mozambique also has a long tradition of male labor migration to South Africa, which gives some households access to remittance income. Households often use this income to purchase farming inputs and increase their agricultural productivity (Hermele 1992). Although Mozambican trade policy promotes export crop production in both areas of the country, liberalization reforms have taken place unevenly. Private investment has largely happened in the southernmost provinces of the country. The effects of trade on inequality may also vary regionally according to gender roles. Widowed or divorced women in the north may be able to continue commercial agricultural production (because they retain access to their land), leading to less inequality between them and their married counterparts (Waterhouse and Vijfhuizen 2001). However, women in southern Mozambique often lose access to agricultural land after being widowed or divorced. Physical geography also contributes to regional differences. Due to climate and soil conditions, the north of the country has much higher agricultural potential than the south. However, the Zambezi River splits the country physically and there is no central bridge within Mozambique. Thus the Zambezi River acts as

a barrier to regional economic integration by interrupting transportation routes and isolates the north from the more globally linked southern region of the country.

The inequality-dampening effects of cash cropping in the north were unexpected given that southern farmers—who generally have better access to markets—described the activity as risky and often unprofitable. The inequality-enhancing effects of vegetable trade in the south also run counter to expectations, because farmers described vegetable cropping as a relatively accessible activity for poorer households and a way for these households to raise their incomes. To explore these curious results, the next phase of the study investigated the types of households that participated in vegetable and cash cropping, and considered what other factors could be complicating trade's effects on inequality.

Household Dynamics

Because vegetable cropping orientation was significant only in the southern model, and cash cropping orientation was significant only in the northern model, findings were inconclusive as to whether the varying relationships between different types of agricultural trade and inequality have regional explanations. An alternative possibility is that economic and demographic differences between households within regions influence which types of crops are grown, and that this, in turn, impacts inequality. Further qualitative work was conducted to address the second research question and investigate what factors influence household participation in different agricultural activities. These interviews also provided the opportunity to share results from the earlier phases of the analysis and get local interpretations of quantitative findings from farmers involved in the study.

In interviews discussing the regional regression analysis, southern farmers supported the interpretation that vegetable trade increased inequality, noting that the scale at which farmers could engage in the activity was determined by their access to resources. For example, households that had access to irrigated land could produce more vegetables and become wealthier than households that relied on rain-fed agriculture. The demand for irrigated land far exceeds availability, even in Massavasse, which is located near a large irrigation scheme. Thus

historic rights to irrigated land (or the ability to rent it) coupled with opportunities to engage in the vegetable trade appear to have the tendency to increase and reinforce inequality. Southern producers also speculated that the inequality-dampening effects of cash crop trade in the north could arise from the low market prices for cash crops. Farmers believed that cash cropping would not increase inequality if those who produced the crops did not make a profit. Most farmers' explanations thus did not focus on north-south differences, but on the different returns for vegetable and cash crops.

Key informant interviews with government officials and rural development specialists supported the view that farming in the south rather than the north did not bring commercial benefits, such as greater profits, to most farmers. For most southern farmers, market access and prices were much the same as for northern farmers. The interviews revealed, for instance, that government heavily focuses its efforts to improve market access on a few areas in the country that are seen as having the most agricultural potential. Although the south receives more government and private investment, development is spread very unevenly within this region. Therefore most southern farming households face the same challenges to making a profit as do northern ones (e.g., poor transportation structure, limited access to inputs and services). Rural producers across the country are largely left on their own when it comes to commercializing and developing linkages to export markets.

Findings from the key informant interviews suggest that the differential effects of trade may be due to differences between households within each region. Evidence from further quantitative analysis using the TIA survey of rural households supports these qualitative findings. Results of bivariate tabular analyses indicate that there were many significant differences between the northern and southern households with regard to participation in commercial agriculture, physical conditions, access to services, and demographic characteristics (Table 3). However, chi-square tests of independence found that, in general, the characteristics of cash and vegetable cropping households did not differ by region.¹⁴ A few notable differences include (1) southern vegetable cropping households were more likely to

have access to off-farm wage income than their northern counterparts, $\chi^2(1, N = 758) = 12.07$, $p > 0.01$; (2) female-headed households were more likely to participate in vegetable cropping in the south than in the north, $\chi^2(2, N = 758) = 10.57$, $p > 0.01$; and (3) a minority language was more likely to be spoken in a northern vegetable cropping household than in a southern one, $\chi^2(1, N = 758) = 59.83$, $p > 0.01$.

Despite these differences, findings suggest that northern and southern vegetable farmers form a fairly homogeneous group with regard to literacy levels, disease burdens, access to services, and proximity to markets. The results from difference of means tests lend further support to the hypothesis of the homogeneity of the group of small-scale commercial agriculturalists, as these tests indicate that the mean per capita consumption of vegetable farmers and cash crop producers, respectively, did not significantly differ across regions (Table 4).¹⁵ However, some economic differentiation existed within the same region between commercial agriculturalists and other (non-participating) households (Table 5). Northern cash-cropping households had higher mean per capita consumption than their non-cash-cropping neighbors. In contrast, the mean per capita consumption for southern cash-cropping households was not significantly different from that of non-cash-cropping households. A similar set of relationships hold for vegetable-cropping households.

Lived Experiences of Inequality

Given the intraregional differences between households that participate in agricultural trade and those that do not, the final phase of the analysis addressed the third research question, examining how crop-trading households fit into their local social systems, and how this affects trade's relationship to inequality. This phase of the research involved a third round of interviews with southern households as well as interviews in a new case study site, Rapale, in northern Mozambique. Interviews with northern and southern farmers centered on (1) incentives and disincentives for participating in agricultural trade, and (2) the status of commercial agriculturalists in their communities. The findings from these interviews suggest that the context of agriculture trade—and the social

Table 3 Descriptive characteristics of northern and southern rural households

Category	Variable description	North (N = 2,692)		South (N = 1,913)	
		% of Northern households	N	% of Southern households	N
Commercial agriculture	Sells cash crops ^a	10%	269	2%	31
	Sells vegetable crops ^a	19%	511	13%	247
Labor market participation	Has off-farm wage income ^a	13%	353	23%	437
Demographics	Male-headed households ^a	78%	2,106	74%	1,417
	Female-headed household (not widowed/not divorced) ^a	18%	476	20%	386
	Female-headed households (widowed/divorced) ^a	4%	110	6%	110
	Speaks minority language ^a	47%	1,270	26%	492
	Household head is literate ^a	2%	58	6%	112
Health	Prolonged illness in household (>2 years) ^a	5%	135	6%	124
	Death in household ^a	7%	196	10%	200
Physical infrastructure	Market in village ^b	28%	750	28%	530
	Accessible by paved roads ^a	14%	366	23%	438
Access to services	Access to agricultural extension agent ^b	15%	410	14%	264
	Member of agricultural association ^b	4%	111	4%	84
	Receives price information ^a	36%	982	24%	453
	Holds title to land ^a	9%	235	21%	409
	Has irrigated land ^a	1%	30	3%	51
Climate and location	Experienced drought ^a	30%	799	54%	1,039
	Experienced flood (2002–2002) ^a	27%	723	51%	975
	Located in coastal area ^a	15%	414	9%	180

^a Chi-square test for independence indicates the relationship between this variable and geographic region is statistically significant at the 0.05 level.

^b Chi-square test for independence not statistically significant at the 0.05 level.

Source: Author's calculations using data from Trabalho de Inquerito Agrícola 2002 (MADER 2002).

status of traders—varies greatly between the two regions.

Findings from the local analysis suggest that material or monetary inequality exists and is noticed, even in the poorer and more isolated

regions of the country. However, not all descriptions of inequality related to income and assets. Custom and tradition were strong disincentives to engaging in commercial agriculture (of both vegetables and export cash crops).

Table 4 Comparison of daily per capita consumption between regions

Variable category	North		South		t tests	
	M	SD	M	SD	t value	p
Daily per capita consumption of participating households	6,625	2,3181	Cash cropping		0.51	0.61
Daily per capita consumption of nonparticipating households	3,175	14,492	4,480	7,686	2.24	0.03
Daily per capita consumption of participating households	5,901	29,895	Vegetable cropping		0.05	0.96
Daily per capita consumption of nonparticipating households	2,978	9,567	5,990	9,519	2.13	0.03
Daily per capita consumption of nonparticipating households	2,978	9,567	5,228	42,269	2.13	0.03

Note: Values given in Mozambican Metacais.

Source: Author's calculations using data from Trabalho de Inquerito Agrícola 2002 (MADER 2002).

Table 5 Comparison of daily per capita consumption within regions

Variable description	Participating households		Nonparticipating households		t tests	
	M	SD	M	SD	t value	p
Southern <i>per capita</i> consumption	4,480	7,686	5,340	39,906	0.52	0.61
Northern <i>per capita</i> consumption	6,625	23,181	3,175	14,492	-2.43	0.02
				Cash cropping		
Southern <i>per capita</i> consumption	5,990	9,519	5,228	42,268	-0.64	0.53
Northern <i>per capita</i> consumption	5,901	29,895	2,978	9,567	-2.18	<0.001
				Vegetable Cropping		

Note: Values given in Mozambican metacais.

Source: Author's calculations using data from Trabalho de Inquerito Agrícola 2002 (MADER 2002).

Subsistence farming—regardless of whether it was a successful enterprise—warranted a great deal of respect in all case study sites, and people said that subsistence farmers had higher social standing than people who did not farm. Village leaders, teachers, and nurses were also considered to be in positions of authority and were considered to be better off than other villagers, even if their incomes were not significantly higher than those of other community members.¹⁶

In both northern and southern Mozambique, strong preferences for subsistence farming and self-sufficiency often led people to favor subsistence agriculture even when other economic opportunities were available. Interviewees in southern Mozambique noted that participating in small-scale commercial activities did not necessarily improve their food security, but forced them to specialize and lessen household self-sufficiency with regard to farming. For example, southern survey respondents reported that profits from participating in commercial activities were often negligible. Moreover, commercial farming had high social costs. Interviewees gave the highest social esteem to those who met all of their food needs from their own farms. Households lose respect and social standing in the community as they move away from growing their own food toward purchasing food grown by others.

Northern households appeared to have more financial and social incentives to participate in agricultural trade, particularly cash cropping. Because of the abundance of fertile agricultural land, northern households said they could maintain self-sufficiency via subsistence farming and also participate in commercial agricul-

ture. In the north, cash cropping was seen as a high-income occupation, providing households with a strong incentive to participate if they could. Vegetable cropping also appeared to be popular in areas close to the larger cities in the north. In the south, however, several other income-earning activities seemed to be available. Southern interviewees were more likely than their northern counterparts to unfavorably compare commercial agricultural production with forms of formal employment. Interviewees in the south noted that people with formal employment earned enough to maintain family farms using employed farm hands. The formally employed were thus able to retain respect in the community by remaining self-sufficient with regard to household food production. However, small-scale, informal trading took time away from subsistence farming and typically did not generate enough profit for traders to hire replacement labor to work family farms.

The results also suggest that the social costs of market participation—including vegetable sales—are particularly high for women. Several female respondents in the south said that selling vegetables in the market diminished their social standing because it is an undignified activity. Informal market vendors, who in southern Mozambique are overwhelmingly women, reported being treated disrespectfully by clients. Gender discrimination may play a role in the difficulties faced by female traders. The fact that both formal and informal markets are generally unpoliced spaces may contribute to this phenomenon. Another possible explanation for this poor treatment is that vendors engaged in the direct trade of services or products for cash are operating outside traditionally

governed social structures (and thus breaking gender norms). For example, before the growth of the cash economy, goods and services were exchanged according to the principal of *ajuda mútuo*, or mutual help, where community members received goods in kind for help provided during the harvest season. Petty trading and street vending have to a considerable extent replaced these forms of exchange, and are much less regulated by tradition.

Although most of the women in the southern case study sites stated that they lost respect in their community when they marketed agricultural produce (mostly vegetables), few women in the north mentioned similar experiences. This was most likely related to the role women played in commercial activities. Women in the southern case study communities play a much more visible role in the market economy than do women in the northern site. In the southern sites, vegetable sellers tend to be women in both the formal and informal markets. In marked contrast, few women participate in markets in the northern case study site. When asked, male farmers in the north stated that their wives never took produce to the markets. Moreover, women do not tend to participate in off-farm activities. Gendered divisions of labor and social norms appear to prevent them from engaging in these activities.

Conclusion

Using a sequential, mixed-methods approach, this analysis has looked closely at the effects of agricultural trade on inequality in Mozambique. Results from this study suggest a complex relationship between agricultural trade and inequality in rural regions. Qualitative findings suggest that the commercial activities that people are often able and inclined to do differ from those promoted by the government's export-led development strategy. For example, southern farmers prefer small-scale vegetable farming to cash cropping. Quantitative findings at the regional level indicate that trade has differential effects on inequality. Regression results suggest that vegetable crop orientation is associated with higher inequality in the south, whereas cash cropping orientation is associated with lower inequality in the north. Later research phases investigated the reasons for the differential effects of trade, both across and

within Mozambican regions. Findings suggest that anticipated profitability, not regional location, plays a major role in determining which crops households chose to produce. Another key finding of the investigation is that trade appears to increase inequality in areas where trading has a low social status, but does not increase inequality in areas where it has a high social status. This is the case even when participation in high-status trade increases mean per capita consumption (e.g., cash cropping in the north) or when participation in low-status trade does not (e.g., vegetable cropping in the south).

The results of this study point to the difficulties in using either neoclassical trade theory or new economic geography to predict the effects of trade on inequality in rural regions of less developed countries. The predictions of neoclassical trade focus on economic mechanisms—such as wages—as drivers of trade-induced inequality, which may be unable to explain the dynamics in Mozambique where employment, formal or otherwise, is scarce (Wood 1994). The predictive powers of new economic geography in the Mozambican context may also be limited given that it best fits places where economic sectors are relatively advanced (Krugman 1991). This is not the case for the least developed countries, and it may take decades before the regional dynamics of the Mozambican economy can be explained by economic trade theories developed for industrial and postindustrial nations. New economic geography does, however, account for the fact that initial advantages tend to be reinforcing. This may be a critical factor in explaining inequality in places where colonialism, corruption, civil conflict, and ethnic strife have played a strong role in determining which regions receive initial investments.

Taken together, the study's findings imply that social and geographical contexts greatly influence the relationship between agricultural trade and regional inequality. For example, case study interviews revealed that people often felt that commercial activities—such as selling vegetables in markets and other types of informal sector work—damaged their social standing in the community, even when their incomes were improved or unchanged. The findings of this study support the suggestions of Sen (1992, 1997, 1999), Chakravorty (2005), and others that understanding income

inequality requires knowledge of the social structures and processes of change in particular places. Discovering the mechanisms by which these social drivers of inequality work merits further attention. A better understanding of the social determinants of inequality would give the Mozambican government greater ability to combat inequality via social policy without drawing back from those export-based strategies that succeed in reducing absolute poverty. ■

Notes

- ¹As this study focuses on agricultural production, urban areas and households were excluded from the analysis.
- ²For a series of helpful discussions on the use of mixed methods in geography, see Rocheleau (1995) and the special 1999 issue of *The Professional Geographer* (volume 51, issue 1) on multimethod research in population geography.
- ³A more extensive discussion of Mozambican crops is contained in Bias and Donovan (2003).
- ⁴For a more nuanced description of structural adjustment programs and their impacts in Africa, see Mohan et al. (2000) and Mittleman (2000).
- ⁵Although a detailed discussion of the roles that Mozambique's colonial history and civil war played in shaping inequality are beyond the scope of this article, interested readers should see Sheldon (2002), Mittleman (2000), Bowen (2000), Isaacman (1996), Abrahamsson and Nilsson (1995), and Urdang (1989).
- ⁶In my use of the phrase *social capital*, I am drawing on the work of authors like Brouwer and Nhasengo (2006), Schuurman (2003), Sen (1999), and Rose (1998), who approach social capital (i.e., access to and strength of social relations) at the individual level to link the concept to uneven access to opportunities and exposure to risks.
- ⁷Interviews conducted in phases three and five of the study used a similar procedure and the data were analyzed in an identical fashion.
- ⁸Before estimating the regression model, I performed several specification tests to determine the best model. The results of spatial autocorrelation tests calculated for each model grouped determined if the regression was estimated via OLS or as a SEM. The SEM is a spatially autoregressive model used to control for spatial autocorrelation in the residuals and thus the error term is assumed to be made up of a vector of spatially lagged errors, an autoregressive coefficient, and a vector of independent random errors. See Silva (2007) for a more detailed description of the regression model and results. The results

from all spatial diagnostic tests are available from the author on request.

⁹There are other ways in which one could conduct regional analyses, such as multilevel analyses. However, standard multilevel models do not easily allow for controlling spatial dependency. Some recent work has started to develop techniques for combining autoregressive models and multilevel models within ecology (Wu and David 2002; Thogmartin, Sauer, and Knutson 2004) and regional science (Parent and Riou 2005). The use of spatial hierarchical analyses remains an important future endeavor to see what light they can shed on trade and inequality linkages.

- ¹⁰Cash crops are comprised of cotton, sunflower, sugar, tobacco, soybeans, sisal, tea, rice, and ginger. Vegetable crops are horticultural crops, including melons and beans.
- ¹¹Because of the 2004 Mozambican presidential election, I was unable to access village registries and select a random sample of northern households. Therefore a snowball sampling technique was used to select households for interviews.
- ¹²The Chow test result, given by the *F* statistic, was significant at the 95 percent confidence level. The results are available from the author on request.
- ¹³Silva (2007) exclusively discusses, in greater detail, the modeling of income inequality in Mozambique as a function of trade orientation and other factors using a regression analysis. This article presents a more holistic account of the relationship between trade and inequality by drawing on both qualitative and quantitative methodologies, and synthesizing the findings from both approaches.
- ¹⁴Chi-square results tables are available from the author on request.
- ¹⁵The use of consumption values as a proxy for income is common in studies of developing countries where subsistence activities are widely prevalent and income can be difficult to quantify.
- ¹⁶In both Massavase and Matidze, interviewees defined "better off" as being more socially respected and having an easier life than others in the community.

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