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DO FARMERS REALLY BENEFIT FROM HIGH FOOD PRICES? BALANCING RURAL INTERESTS IN KENYA'S MAIZE PRICING AND MARKETING POLICY

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1. Introduction

Making economic policy is a process of working out the rules of the economy and balancing the interests of stakeholder groups. Economic policy research can help inform the process by identifying outcomes of pursuing alternative policy choices. This is a case study of balancing the interests of Kenyan farmers – a very heterogeneous group – in the setting of maize pricing and trade policy.

Kenya, like many countries in the Eastern and Southern Africa region, is undergoing rapid transition and adjustment in its agricultural sector. Adjustment does not necessarily imply liberalization, but the private sector has been allowed a greater role in the marketing of strategic crops, including maize, since the country embarked on a program of macroeconomic and sectoral reform in the late 1980s.[1]

However, the reform process has been controversial. Its effects on farmer and consumer welfare have been the subject of speculation driven by preconceived notions on both sides, which has been compounded by the paucity of ground-level information on how farmers and consumers are responding to the reforms.[2] Partially because of these uncertainties, the Kenyan government has several times reversed its course in the liberalization process, most recently in 1999 by bringing the state-run marketing board back into grain purchase at fixed support prices, coupled with tariffs on maize imports. Both of these measures are intended to protect selected Kenyan farmers from "cheap imports" from neighboring countries and from the world market.[3] One recent analysis indicated that the cost of importing white maize from Durban to Nairobi without tariff was in the range of Ksh 1,300 - 1,450 per 90 kg bag (i.e., US$200 - $215 per ton) during most of 1999 (Nyoro, Kiiru, and Jayne 1999). By contrast, actual wholesale prices in Nairobi and points east have been as high as Ksh 1,600 - 1,900 per bag (US$240 - $280 per ton) and above during the same period. Many government officials contend that supporting maize prices

[1]Less than a decade ago, pricing and marketing of most agricultural commodities were highly controlled by the state, based on a system initiated in the 1930s.

[2]The national statistical office (Central Bureau of Statistics) has not published statistics from an agricultural survey since 1992, several years before comprehensive market reforms were implemented.

[3] For example, after the bountiful 1999 harvest when maize prices were relatively low, the Minister of Agriculture stated that Kenya's food policy is a failure, and that agriculture should be exempted from liberalization to prevent the sector from collapse (Daily Nation, 1999).

at levels higher than would prevail under market conditions raises the net incomes of Kenyan farmers and promote household food security.[4]

This paper uses information on rural households in 18 districts surveyed in 1997 and again in 1998 to inform current debate on maize pricing and trade policy. Specifically, we determine how farm households are being affected by governmental efforts to support maize price levels. We then examine the implications of these findings for the development of strategies to promote agricultural productivity and rural income growth.

Perhaps the most generalizable conclusion from this analysis concerns the danger of treating farmers within the small farming sector as a homogeneous group for purposes of policy analysis. There are great differences in assets, the crops from which household income is derived, and food expenditure patterns -- even within particular regions of the country -- that make it hazardous to generalize about the impacts of commodity pricing and trade policy without solid empirical information. Our findings indicates that:

- Most rural smallholders, even in the major agricultural areas of the country, are net buyers of maize throughout the year, and are directly hurt by higher maize prices. In the 22 agricultural districts examined, 52% of farmers were net maize buyers. About 16% of the farm households neither purchased nor sold maize, and the other 32% were net sellers of maize. Less than 9% of the households both bought and sold maize in the same year, and almost all of these were net buyers. However, there were great variations in these figures across regions.

- Kenya's marketed maize output comes from a relatively small portion of the farm population. Ten percent of the small-scale farmers accounted for 74% of the total maize sold by the small-scale farm sector. Of the 32% of smallholder farmers that were net sellers of maize, only half of them sold more than 10 bags of maize. These farmers are located primarily in the maize-surplus districts of Trans Zoia, Uasin Gishu, upper Kakamega, and Nakuru. When taking into account available data on large-scale farmers, we conclude that the top 10% of farms in the country account for 85% of the domestically marketed maize in Kenya.

- Low-income farm households in Kenya are more likely than high-income households to be net maize buyers. The combination of the NCPB price supports and the maize import tariff have served to raise local prices in Nairobi, Mombasa, and the eastern drought-affected parts of the country by 250 - 500 Ksh per bag than would be the case without the import tariff. Hence, the maize import tariff is acting as a tax on the rural poor.

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[4]Many government officials continue to voice their opinion that supporting cereal prices helps raise the incomes of smallholder farmers, encourages productivity growth and food self-sufficiency. The goal of food self-sufficiency in Eastern and Southern Africa has been a well-entrenched policy objective since the 1930s, when colonial governments throughout the region set up marketing boards to raise maize prices above export parity, support farm incomes, and encourage maize self-sufficiency to avoid reliance on a thin world market for white maize. For a historical survey of the forces shaping maize marketing policy in Eastern and Southern Africa from 1920 - 1995, see Jayne and Jones (1997).

- While reports in the local press would lead one to believe that Kenyan maize prices have been artificially depressed due to cheap imports, wholesale maize prices in Kenya are among the highest in the Eastern and Southern Africa region.

- The elimination of the maize import tariff would save Kenyan consumers an estimated Ksh 2,744 million (US$ 36.6 million) per year. Of this, urban consumers would save about 1,400 million (US$18.6 million) on their maize expenditures, while rural consumers would save about 1,344 million (US$17.9 million). To put these savings in perspective, the estimated US$36.6 million cost savings to consumers is about twice the value of the relief maize being imported by donors to alleviate food insecurity in Kenya.

These findings refute the conventional wisdom that most farmers want and benefit from high grain prices. Most farmers in most regions of the country derive the bulk of their cash income from a wide variety of crops and use this income to buy staple grain. In important respects, their views toward grain price levels are consistent with those of urban consumers. Dealing with the agricultural sector as if farmers are a homogeneous group with similar characteristics may give misleading impressions and can have consequences that go contrary to overall sectoral policy objectives.

However, there is a clear economic rationale for moderating extreme price fluctuations for a strategically important crop such as maize. Protection against extreme downside price risk has been a major problem in the liberalization period. The paper concludes by discussing alternative options for addressing the price instability and profitability issues for maize in Kenya.

2. Conceptual Framework

2.1. Structural Transformation and its Implications for Food Prices

History indicates that the development process in most regions of the world has occurred through structural transformation (Johnston and Mellor 1961; Mellor 1976; Staatz 1994). Structural transformation involves the transition from subsistence production to exchange-based economies, increased specialization of labor, and an increased share of the labor force moving off the farm to non-farm activities. The migration of labor to specialized non-farm activities requires increased productivity of the resources retained in agriculture. Agricultural productivity growth helps to generate the food surplus that frees labor to move into more lucrative activities and raises labor productivity and real wages for those remaining in food production. Because Kenya's poor are predominantly in rural areas and engaged in farming, productivity growth in agriculture is likely to be a precondition for injecting purchasing power into rural areas and hence stimulating demand and employment growth in the broader economy.

A related process, involving the relationship between the price of staple wage goods and economic growth, also has been observed throughout the world, starting with Ricardo's observations on England in the early 19th century. One of the most important ways of

supporting the transformation from subsistence farming to a more productive and diversified work force has been to reduce the cost of food through productivity growth in the food system (Mellor 1976; Timmer 1997). A productivity-driven decline in consumer food prices relative to other goods has the effect of transferring resources from the food system to other parts of the economy, as it now takes fewer resources from the non-food sectors to buy a unit of food. Industrial firms can hold down wages without hurting workers, making their firms more profitable and competitive internationally and contributing to employment growth (Staatz 1994; Delgado 1992).[5] The main conclusion from the structural transformation literature is that economic growth in most countries of the world has been driven initially by agricultural productivity growth, which mobilizes a relatively affordable food surplus that consequently allows people to engage in other activities that provide higher returns to their labor.

This point should not be erroneously construed as an argument for laws that reduce food prices. This strategy, pursued in much of Africa through controlled marketing systems during the 1970s and 1980s, has strongly depressed household food security in these countries (World Bank 1981; Schiff and Valdes 1992). However, the opposite approach of raising farm prices above market levels can lead to different but equally serious problems. Empirical findings elsewhere indicate that in countries characterized by a large gap between import and export parity (such as Kenya), high food prices drive up wage costs and the real exchange rate, making these countries less competitive in international trade and slowing overall economic growth by raising production costs in the non-agricultural sectors. Examples of this Ricardian "food bottleneck" have been documented by authors such as Mellor (1976) and Delgado (1992) in analyses of growth strategies in India and the Sahel.[6] Because of important backward and forward linkages, the price of maize influences the general level of prices in the economies of much of Eastern and Southern Africa (Blackie 1987). Efforts to reduce the cost of procuring national food requirements could help increase disposable income in urban and grain-deficit rural areas and also promote competitiveness in labor-intensive non-farm sectors of the economy (Delgado 1992; Reardon, Delgado, and Matlon 1992).

2.2. The Challenge of Increasing Labor Productivity when Farm Sizes are Declining

One of the most salient trends in Kenyan agriculture is declining land holding size. Between 1960 and 2000, according to FAO data shown in Table 1, the arable land (including permanent crops) under cultivation has risen marginally, but the population of households engaged in agriculture has tripled. As a result, the land under cultivation has declined steadily over this 40-

[5]Labor productivity is also determined by skill levels (in addition to labor costs), but this aspect is less directly affected by agricultural policy.

[6]See Staatz (1994) for a concise synthesis.

Table 1. Cultivated Land, Agricultural Population, and Land/person Ratios in Agriculture, Kenya, 1960-2000.

	Land cultivated to annual and permanent crops (000 hectares)	Population among households engaged in agriculture (000 persons)	Agricultural land per person
	(A)	(B)	(C) = (A)/(B)
1960	3,900	7,321	0.53
1970	3,945	9,858	0.40
1980	4,280	13,674	0.31
1990	4,500	18,728	0.24
2000 (estimated)	4,520	22,683	0.20

Source: FAO Agrostat Database (www.fao.org)

year period from 0.53 to 0.20 hectares per agricultural person. The challenge is how to raise labor productivity given the fact that land available per worker has been declining significantly.[7]

By identity, the monetary value of crop production per unit of labor (Y/L = labor productivity in agriculture) can be partitioned into the ratio of land to labor (A/L) and the monetary value of crop output per unit of land (Y/A) (Johnston and Kilby 1975; Hayami and Ruttan 1985):

(1) $Y/L = A/L * Y/A$

Most parts of Africa are experiencing increased land pressure as populations rise. With most arable land already under production, population growth is causing a decline in land/labor ratios (A/L). Equation (1) clarifies is that labor productivity growth, in the face of declining land/person ratios, will require an even greater rate of growth in the value of output per unit of land. There are two sources of this potential growth in Y/A. One comes from productivity-enhancing technology, which requires, among other things, well-funded and well-organized agricultural research and extension systems. The other source of growth in Y/A comes from reallocating land from activities with relatively low values per acre to those with relatively high values. Their ability to do this is contingent on the performance of input, output, and credit markets for high-value crops. Indeed, much of the productivity growth in the developed world has been associated with a shift from semi-subsistence agriculture to more commercialized systems of production and exchange and an increase in the production of crops that maximize

[7]Labor productivity closely tracks per capita incomes and is probably the most relevant indicator of productivity from a welfare perspective. Output per hectare "is important only as a vehicle for raising labor productivity" (Timmer 1988).

financial returns per unit of land. In Section 4, we present evidence that many smallholders in Kenya are seeking opportunities to raise Y/A by shifting into higher-valued activities; many already generate a significant part of their income from high-valued crops. However, these opportunities are impeded and made more risky by measures that raise the costs and risks of acquiring staple food through markets. The higher the cost of food, the greater the incentives to revert to self-provisioning of food staples, with consequences for the growth in Y/A, and ultimately Y/L. The role of government in supporting agricultural land and labor productivity growth (Y/A and Y/L) are to provide a conducive policy environment for investment in such high-value, high-return commodities, support R&D, and, importantly, to support the development of a reliable and low-cost food marketing system to serve rural areas, so that households can benefit from the higher incomes afforded by a well-functioning commercialized agricultural sector while still ensuring their access to food.

The remainder of this paper examines household survey data to examine (a) the evidence of these apparent shifts in cropping patterns, (b) how maize price levels affect farmer labor productivity, incomes, and food security; and (c) the implications of alternative maize pricing and tariff policy options.

3. Survey Design and Data

The data used in this paper is based on a two-year panel of rural household survey data from 1997 and 1998.[8] In April 1997, a total of 1,540 households were randomly selected within the eight provinces of the country, using a sampling frame derived from the Central Bureau of Statistics. In October 1998, half these households were revisited in six provinces where rain-fed agriculture is believed to account for the largest share of household income, giving us 612 households. The panel sample contains 18 districts and 111 villages. Households with land holdings in excess of 20 acres (8 hectares) were excluded to maintain the study's focus on the smallholder sector.[9]

Smallholders were asked about their agricultural and non-agricultural income sources, assets, agricultural practices, crop marketing activities, and demographic characteristics. Perceptions of crop markets and policies were asked only in the 1997 survey. Otherwise, questionnaires used in both surveys were very similar.[10] For the analyses in this paper, we use sampled households that were surveyed both in the 1997 and 1998 surveys. Table 2 shows salient characteristics of the sample.

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[8]These surveys were designed and implemented under the Kenya Agricultural Marketing and Policy Analysis Project (KAMPAP), a joint collaboration between Egerton University/Tegemeo Institute, Michigan State University, and the Kenya Agricultural Research Institute, with financial supports from the U.S. Agency for International Development (USAID) Mission to Kenya.

[9]In Kenya, smallholders are conventionally defined as household owning less than 20 acres.

[10]These survey instruments may be viewed and downloaded from the Tegemeo/MSU Agricultural Monitoring and Policy Analysis Website: http://www.msu.edu/agecon/fs2/kenya/index.htm

Table 2. Survey Zones Enumerated in Both 1997 and 1998

Zone	Districts Covered	Number of Sampled Households	Per Capita Income (Ksh)	Cropped Land size (acres)	Maize Marketing Position (% of households)			Net Maize Sales (kgs)		
					Net Seller	Autarky	Net Buyer	Net Seller	Autarky	Net Buyer
Western Lowlands	Kisumu, Siaya	170	10,920	2.95	5	13	82	315	0	-540
Eastern Lowlands	Kitui, Mwingi, Machakos, Makueni	150	19,355	5.36	23	11	66	564	0	290
High-Potential Maize Zone	Trans-Nzoia, Uasin Gishu, Bomet, Nakuru, upper elevation divisions within Kakamega	232	29,922	7.73	68	10	22	3,022	0	595
Western Highlands	Kisii, Vihiga	180	14,055	2.96	23	19	58	580	0	399
Western Transitional	Bungoma, lower elevation divisions of Kakamega	150	16,578	5.31	23	15	62	1,166	0	694
Central Highlands	Muranga, Nyeri, Meru, Laikipia	242	28,010	2.8	16	21	53	413	0	316
Total		1224	21,647	4.81	32	16	52	2,028	0	462

Source: Tegemeo Institute/Egerton University/KARI//MSU Rural Household Survey, 1997 and 1998.

4. Smallholder Production and Marketing Patterns

There is some evidence that a shift to higher-return crops has been occurring in Kenya in association with declining farm size. According to Block (1992), two-thirds of the measured increase in agricultural production value per unit of land in Kenya over the 1980s was due to shifts in crop mix rather than the intensification of existing cropping systems. Nyoro and Jayne (1999) found that since 1980, the greatest sustained growth in area expansion have been in crops with relatively high value per unit of land, such as horticultural crops and during the 1980s, sugarcane, coffee and tea (Table 3). Maize, the main staple crop, has actually experienced a 6% decline in crop area between the 1990-1994 and 1995-1998 periods. And while national maize production appears to be still increasing slightly during the 1990s, per capita production has clearly declined, such that about 15% of the average yearly consumption of 98 kgs per person is filled through imports. Despite the decline in staple maize production, the real value of crop production in Kenya has remained roughly constant over the 1990s, indicating a shift in production patterns from maize to higher-valued crops such as sweet potato, bananas, pyrethrum, and wheat.

4.1. Many Smallholder Farm Households Have Become Net Buyers of Grain

It is commonly viewed that most farm households in Kenya are sellers of grain and therefore benefit from "high" grain prices. In fact, most farm households in Kenya do not produce enough grain to feed themselves and are actually net buyers of grain. By "net buyers", we mean households that over the course of the year either only buy grain or buy more than they sell. In the 22 agricultural districts surveyed in 1997 and 1998, we found that on average 52% of the small-scale farm households were net buyers of maize, 16% neither purchased nor sold maize, and the remaining 32% were net sellers of maize (Table 2). There is only one zone, accounting for roughly 15% of Kenya's rural population, where the majority of smallholder households (68%) sold more maize than they purchased. This zone is referred hereafter as the High-Potential Maize Zone (HPMZ). Table 2 describes the districts included in this and other zones. Only 18% of the households in the remaining areas of the country were net sellers of maize.[11] Of the net buyers, about 88% of them only purchased maize (no sales) while 12% of them sold maize but bought more than they sold.

[11] The finding that the majority of rural farm households are net buyers of grain is not unique to Kenya. Survey findings from other African countries consistently show that most rural farm households do not sell grain, but do purchase grain. See Cousins, Weiner, and Amin 1992 (Zimbabwe); Kirsten and von Bach 1992 (South Africa); Weber et al 1988 (Mali, Zimbabwe, Rwanda, and Somalia); Jayne and Chisvo 1991 (Zimbabwe); Kandoole and Msukwa 1992 (Malawi).

Table 3. Relative Rates of Crop Area and Production Growth

	----- % annual growth in cropped area ----				----- % annual growth in production -----			
	1970-80	1980-85	1985-90	1990-95	1970-80	1980-85	1985-90	1990-95
Coffee	4.3	8.2	4.1	0.6	6.3	4.8	3.1	-4.4
Tea	6.5	3.4	1.5	1.2	8.2	5.5	9.3	3.2
Sugar	3.7	10.9	2.3	1.6	4.3	12.1	0.9	-2
Pyrethrum	2.0	0.4	-1.1	0.4	3.6	1.3	-1.4	1.8
Maize	2.3	0.2	2.1	-1.4	8	3.7	5.1	-1.8
Wheat	-3.1	0.9	5.0	1.7	-2.7	5.1	6	-1.6
Tomatoes	1.4	1.7	3.3	2.5	3.9	4.8	8.6	9.4
French Beans	0.7	3.3	3.1	4.2	4.9	6	7.4	7.9

Source: Nyoro and Jayne (1999).

4.2. Concentration of marketed maize output

On average, the net selling households in the HPMZ sold 3,022 kgs per year. Net sellers in all other areas combined had net sales of 649 kgs. For net purchasing households, the mean amount purchased over the year was 595 kgs per household in the HPMZ and 444 kgs per household in the other areas. All of these figures are averaged across both the 1997 (a relatively good harvest) and 1998 seasons (an average harvest in most areas).

These findings indicate that maize sales are extremely concentrated among a small group of smallholder farmers. The survey findings for 1997 and 1998 indicate that about 10% of the farmers in the sample – all categorized as smallholders – account for about 75% of all the maize sold by smallholders in both 1997 and 1998. Four districts within the High Potential Maize Zone (Trans-Nzoia, Uasin Gishu, Kakamega and Nakuru) account for almost 70% of the maize sold in the sample of 18 districts.

If large-scale farmers' share of maize sales were to be included in this calculation, the concentration of national grain sales would undoubtedly be even more extreme. Estimates of large-scale maize production are not reported in official government documents. However, information from District Agricultural Office Annual Reports and Ministry of Agriculture files. estimates that maize production from the large-scale sector was approximately 264,093 tons in the 1995 season and 330,000 tons in the 1997 season. It was further estimated that about 80% of this production is sold onto domestic markets. By comparison, our 18-district survey indicates that about 21% of smallholder maize production is marketed in 1997 and 1998. When applied to the average national production estimates of about 2.2 million tons over the 1995-99 period, we estimate that total average maize sales from the small-scale sector are roughly 450,000 tons in a normal year. According to these estimates, the few thousand large-scale maize farmers in the country account for about one-third of total domestic maize sales in Kenya (Table 4). In this case, the top 10% of farm households in the country account for roughly 85% of the domestically marketed maize output.

Table 4. Estimates of Maize Production and Sales, Large-scale vs. Small-scale Sector, Kenya

	Maize Production		Maize Sales	
	metric tons	% of total	metric tons	% of total
Small-scale sector	2,285,000	90	457,000	68
Large-scale sector	264,000	10	211,000	32
TOTAL	2,549,000	100	668,000	100

Source of estimates: large-scale production (Tegemeo Commodity Working Files, 1996); small-scale production (based on official national production estimates minus estimated large-scale production figures). Large-scale maize sales (assumed 80% of production); small-scale maize sales (assumed 21% of production based on KAMPAP Tegemeo household surveys 1997 and 1998).

4.3. Correlation between Net Maize Buyers and Low-Income Households

Low-income households are more likely than high-income households to be net maize buyers. Over 80% of the households in the lowest income quartile were net maize buyers, and this declined steadily to 26% among the highest income quintile.[12] Also, because maize is a basic staple, low-income households spend a larger proportion of their expenditures on maize than high income-households. Maize purchases amounted to 28% of annual household income for the poorest quartile of farmers, while it was only 1% for the wealthiest quartile. Policy instruments designed to raise maize prices beyond import parity levels act as a tax on the rural poor.

It is possible that the effect of relatively high maize prices on the poor would be mitigated in some areas if the high prices induced a supply response and raised the demand for hired labor. However, if additional acreage put under maize were to be substituted from production of other crops, then the net effect on hired labor wages depends on the hired labor intensity of maize relative to the alternative crops. In any case, these potential benefits to the poor are unlikely to offset the direct effects of paying higher prices on a basic staple commodity that accounts for such a large expenditure share for the poor.

4.4. Shifts in smallholder cropping patterns

The trend toward rural households becoming net buyers of staple food and the high concentration of maize sales among a small group of farmers has apparently been intensified in recent years coinciding with grain policy reform and liberalization. Table 5 indicates that in every area of the country except the High-Potential Maize Zone, households responded to

[12] The percentages of net maize buyers in each per capita income quintile is: lowest income quintile, 81%; 2nd quintile, 57 %; 3rd quintile 51%, 4th , 44 %; and the highest, 26%.

Table 5. Household Involvement in Cereal Production Compared to 5 Years Ago

	More now	More 5 years ago	About the same	Not sure
	------- % of households -------			
Coastal Lowlands	23.1%	67.9%	9.0%	--
Eastern Lowlands	35.5%	60.8%	3.6%	--
Western Lowlands	19.3%	63.1%	16.0%	1.6%
Western Transitional	14.0%	55.8%	30.2%	--
High Potential Maize Zone	47.8%	29.0%	22.7%	0.4%
Western Highlands	24.4%	56.4%	17.9%	1.3%
Central Highlands	34.8%	48.3%	16.9%	--
Marginal Rain Shadow	11.9%	79.7%	6.8%	1.7%
AVERAGE	31.5%	50.2%	17.7%	0.6%

Source: Egerton University/KARI/MSU Rural Household Survey, 1996/1997 and 1997/98 seasons.

retrospective questions by indicating that they produce less cereals now than they did five years earlier (when food prices were controlled and were at higher real levels than they have been in the post-liberalization period). While still considerably higher than world market levels, real maize price levels in Kenya have declined by 25% in the 1994-99 period compared to the 1985-93 period of maize market control (Nyoro, Kiiru, and Jayne 1999). This decline in the real price of maize appears to be partly because government financing to the NCPB to support maize prices had been severely curtailed between 1994-98 (Nyoro, Kiiru, and Jayne 1999). This shift in cropping patterns away from the staple food, maize, and toward other crops has been cited by many local politicians as a key problem of the grain marketing policy reforms. This has generated pressures for the re-emergence after 1999 of continued state financing of maize purchasing at price levels considerably higher than market levels and a restriction of imports through the maize import tariff.

But why are these pre-1999 shifts in cropping patterns occurring and what do they mean? Several factors are at work. First, as landholdings decline with increased rural population pressure, it becomes increasingly unviable to adopt a food self-sufficiency strategy based on low-value per hectare grain crops, except in the selected areas where grain has a comparative advantage. Over half of the households in the sample have land holdings less than 0.20 acres per capita. Over 25% of the sample own less than 0.05 acres per capita. With farms of this size, and given current technology and productivity levels, it is generally unviable to adopt a food self-sufficiency strategy, because this constrains household income compared to a strategy based on growing some portion of household food needs but using some part of the household's scarce

land to maximize net cash revenues.[13] This view is corroborated by cross-sectional household data showing a strong inverse relationship between household per capita land holdings and the value of output produced per acre (Figure 1). Because there may be village-level differences in land quality and farm sizes, the village difference-adjusted line in Figure 1 can be interpreted as the intra-village relationship between land holdings and gross crop output per hectare, which shows a less dramatic but still clear inverse relationship.[14]

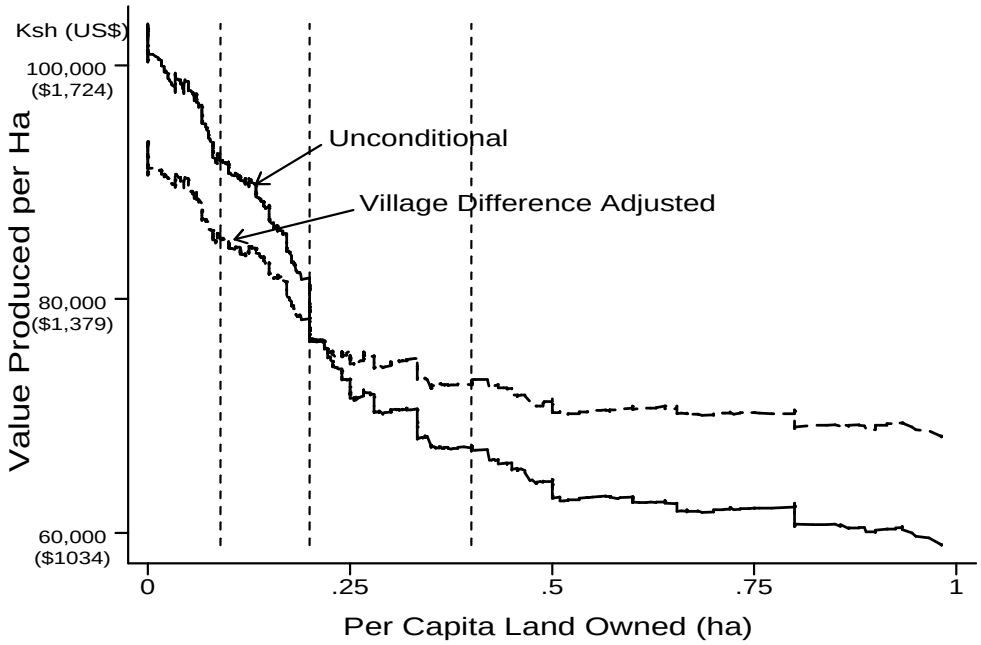
The hypothesis that farmers respond to declining farm sizes over time by intensifying their cultivation and shifting to crops that provide higher returns to scarce land appears to be supported by findings in Table 6 and Table 7. These tables show the importance and ranking of crops according to value of production and value of cash revenue generated in each region. Results in Table 6 indicate that while crop income accounts for an average of 47.6% of total gross income (including home consumption) over the entire sample, maize is tied with horticultural crops as an aggregate (including vegetables, fruits, and flowers) for 13.9%. Coffee and tea account for a combined 5.6% of total gross income. Earlier national survey data from the mid-1970s indicate that maize at that time accounted for about 35% of the value of total crop production (Greer and Thorbecke 1988). While the data sets are not strictly comparable, they include many of the same areas, and the decline in maize production shares would appear to be too large to be explained simply by sampling differences.

Results in Table 7 show that – in terms of gross revenue generated from crop production – maize is the most important cash crop in only two of the 18 districts surveyed in 1997/98. Wheat, tea, sugarcane, banana, and horticultural products commonly generate the greatest sales revenue for smallholders in the surveyed districts. Maize is ranked as the second most important cash crop in six districts, but two of these districts are of low agro-ecological potential and the majority of households in two of these districts are net buyers of maize.

[13]Considering that school fees, farm inputs, health and transportation fees, and social functions create a high need for cash, there are pressures on farm households to attempt to maximize the expected returns from scarce land.

[14] The locally-weighted bivariate regression lines in Figure 1 are created using locally weighted smoothed scatter plots (LOWESS) with window length set at .6 or .7 of the neighboring observations (Cleveland 1979). We truncated the graph at the bottom and top five percent of per capita income because the shape of the line is sensitive to the small number of observations.

Figure 1. **Value of Crop Output Produced per Hectare**



Source: 1996/97 and 1997/98 Tegemeo Institute Household Survey Data, Nairobi.

Referring back to equation (1), recall that farm labor productivity originates from increasing the net value of output produced per unit of land in an environment where land/person ratios are declining due to population pressure. Farm budget information in Kenya indicates that the crops providing the highest net returns to land and labor vary widely across the country, but generally are the crops typically viewed as "cash crops" – horticulture, sugar, tea, coffee (Tegemeo Institute, 1996). Nyambane (2001) shows that in some areas, irish potatoes, beans, and other crops provide higher returns to land and labor than maize/bean intercrop, even in the presence of the maize tariff which inflates domestic maize prices, and especially without it. However, for households that are net buyers of maize, Nyambane's analysis shows that the profitability of maize rises because the opportunity cost of not growing maize is buying it in the market, and buying prices in rural areas are typically higher than farm-gate selling prices. In a few areas such as Trans Zoia, Uasin Gishu, and Kakamega, in the HPMZ, maize is generally the most lucrative cash crop even for net sellers, and these locations are where the bulk of the marketed maize surplus is generated. In other areas, farmers cannot diversify into horticultural and other relatively high-valued crops because of inadequate water control potential and poor access to markets. Yet overall, as average land holdings decline over time, there appears to be noticeable shifts in cropping patterns from subsistence-oriented crops toward commercialized crops (which in a few districts include maize) that provide relatively high returns per unit of scarce land.

Table 6. Crop Income Share (Including for Home Consumption), 1996/97 season.

	Off farm income share	Livestock income share	Crop income share	Income Share by Crop Categories						
				Maize	Other grains	Coffee /Tea	Sugar-cane	Horti-culture	Dry Beans/ Peas	Roots/ Tubers
Coastal Lowlands	70	8	22	7	0	0	0	10	1	4
Eastern Lowlands	50	14	36	9	0	1	2	15	6	3
Western Lowlands	41	14	45	17	7	0	5	4	5	7
Western Transitional	23	16	61	13	1	0	18	18	3	8
High Potential Maize Zone	26	25	49	25	8	4	0	6	5	1
Western Highlands	26	17	57	16	1	7	0	25	4	4
Central Highlands	29	21	50	5	0	19	0	19	1	6
Kenya	34.7	17.7	47.6	13.9	2.9	5.6	3.1	13.9	3.6	4.6

Source: Egerton University/KARI/MSU Rural Household Survey, 1996/1997 season.

Table 7. Crop Rankings by Value of Production and Value of Sales, by District, Kenya 1999/2000.

	TOP 5 CROPS BY									
District	**Production Value Ranking**					**Sales Value Ranking**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Kitui	dry maize	mangoes	beans	pigeon peas	pumpkin	dry maize	beans	cassava	pigeon peas	oranges
Machakos	dry maize	pigeon peas	beans	cowpeas	miraa	dry maize	miraa	beans	mangoes	bananas
Makueni	bananas	dry maize	avocado	beans	cabbage	bananas	avocado	macadamia	cabbage	coffee
Meru	tea	irish potatoes	coffee	cabbage	dry maize	tea	coffee	bananas	irish potatoes	cabbage
Mwingi	dry maize	beans	mangoes	pigeon peas	oranges	oranges	beans	dry maize	pawpaws	mangoes
Kisii	fodder	bananas	dry maize	tea	beans	bananas	commercial trees	tea	fodder	dry maize
Kisumu	sugarcane	rice	dry maize	sorghum	beans	sugarcane	rice	dry maize	oranges	mangoes
Siaya	dry maize	bananas	beans	cassava	sorghum	bananas	dry maize	sweet potato	beans	cassava
Bungoma	sugarcane	dry maize	bananas	beans	commercial trees	commercial trees	bananas	sugarcane	dry maize	sukuma wiki
Kakamega	industrial flowers	dry maize	bananas	beans	sweet potatoes	industrial flowers	bananas	dry maize	beans	tomatoes
Vihiga	dry maize	bananas	tea	sw. potatoes	fodder	bananas	tea	dry maize	french bean	tomatoes
Muranga	coffee	bananas	dry maize	tea	fodder	bananas	coffee	tea	avocado	dry maize
Nyeri	tea	coffee	dry maize	potatoes	fodder	tea	coffee	bananas	coffee	dry maize
Bomet	tea	dry maize	beans	fodder	cabbage	tea	bananas	dry maize	cabbage	irish potatoes
Nakuru	dry maize	wheat	barley	beans	oranges	dry maize	barley	wheat	bananas	coffee
Narok	dry maize	beans	wheat	potatoes	cabbage	dry maize	wheat	beans	cabbage	bananas
Trans Nzoi	dry maize	beans	bananas	pumpkin	sukuma wiki	dry maize	bananas	beans	tomatoes	sukuma wiki
Uasin Gishu	dry maize	wheat	beans	pyrethrum	pumpkin	wheat	dry maize	pyrethrum	beans	irish potatoes

source: Tegemeo Institute/ Egerton University, MSU KAMPAP household survey database, 1999/00.

A second explanation for the shift in cropping patterns away from maize to other crops as observed in the 1997 and 1998 data had the decline in real retail maize prices over the 1994-98 period and the greater availability of maize in retail markets since market liberalization. Over 60% of the households surveyed in 1997 (outside the HPMZ) indicated that the availability of grain to buy in local markets has improved since the market reforms, compared to 26% who indicated that it had deteriorated (Table 8). Formerly, with controls on inter-district movement of maize, farmers had heightened incentives to achieve cereal self-sufficiency because of localized grain shortages, which made households dependent on relatively expensive sifted meal.

This encouraged maize production in the drier grain-deficit areas of the country.[15] But since these agro-ecological areas are generally not well suited to maize production, the decline in cereal production after cereal market liberalization may reflect a shift in cropping patterns more in line with comparative advantage, and a shift to higher-valued crops in the drier areas. This is consistent with aggregate production figures showing that growth rates for crops such as horticulture are the highest in Kenya, while growth in cereal crop production has been generally stagnant. The only area where the majority of households stated that they have increased their involvement in cereal production since market liberalization was the High-Potential Maize Zone.

Hence, it is important not to overgeneralize and location-specific factors drive the results, but for most farmers in most parts of the country, the most important sources of household crop income are not maize. And a sizable share of household income – about 40% across the entire sample -- is from off-farm activities.

5. Effects of Maize Price Supports on Smallholder Farmers

The foregoing household survey findings indicate that, in most parts of the country, (a) most farmers are net buyers of staple maize, (b) low-income households are more likely to be net buyers, and (c) most farmers are devoting a sizeable portion of their land to crops designed for sale rather than for consumption, from which the cash proceeds are used to buy maize in local markets, among other things. These findings suggest that most farmers in the country, who are net buyers of maize, are actually directly hurt -- not helped -- by efforts to raise local maize prices above import parity levels. And because the proportion of maize net purchase out of income is much higher for low-income households than high-income households, a unit increase in maize prices will hurt low-income consumers more than high-income consumers.

[15] In fact, an examination of provincial-level production patterns shows that maize production was higher in the dry provinces of Northern, Northeastern, Coast, and Nyanza provinces during the 1985-90 period of controlled markets than the 1995-99 period. The decline in production in these drier areas is largely responsible for the decline in national maize production in the country.

Table 8. Household Perceptions of the Performance of the Current Marketing System Compared to the Controlled Marketing System, Kenya

	Maize grain availability 1995-1997 compared with control period			Convenience of selling grain 1995-1997 compared with control period			Marketing system preference		
	------ % of households -----			-------- % of households -------			------ % of households -----		
	Better now	Better during control period	No change	Better now	Better during control period	No change	Prefer current system	Prefer control system	No change
Coastal Lowlands	85	8	7	50	10	40	67	23	10
Western Lowlands	68	21	11	81	14	5	52	44	4
Eastern Lowlands	85	7	8	87	3	10	75	17	8
High-Potential maize zone	42	52	6	93	5	2	61	36	3
Western Highlands	69	21	10	84	11	5	53	44	3
Western Transitional	58	37	5	99	1	0	37	61	2
Marginal Rain Shadow	32	45	23	90	5	5	71	27	2
Central Highlands	56	28	16	82	8	10	76	16	8
National Average (weighted)	59	31	10	88	7	5	61	34	5

Source: Tegemeo Institute/Egerton University/KARI//MSU Rural Household Survey, 1997.

5.1. But what are the farmers saying themselves?

Are the foregoing conclusions consistent with what Kenyan farmers themselves are saying? To examine this, we directly asked the surveyed farmers the question "is your household better off with high or low maize prices?" Maize prices for the previous season (1996) were used as a reference point; 1996 was a year of relatively low maize prices throughout the country.[16] The results show that about 67% of all households surveyed preferred maize prices lower than those prevailing in their location in 1996 (Table 9), and these figures mirror very closely the proportion of households in each zone that are net maize buyers as reported in Table 2. The preference for lower maize prices was particularly evident in the low-potential areas such as Western Lowlands, and Coastal Lowlands, but also in relatively high-potential but grain-deficit areas such as Western Transitional and Marginal Rain Shadow. Only in the High-Potential Maize Zone did the majority of households state a preference for higher maize prices than in 1996. And this is clearly because the majority of rural households in this particular zone are net sellers of maize.

Table 9. Relationship Between Grain Prices and Households' Perceived Welfare

	% of households stating preference for	
	High maize prices	Low maize prices
Northern Arid	18.5%	81.5%
Coastal Lowlands	6.3%	93.8%
Eastern Lowlands	23.5%	76.5%
Western Lowlands	6.4%	93.6%
Western Transitional	18.6%	81.4%
High Potential Maize Zone	68.9%	31.1%
Western Highlands	25.6%	74.4%
Central Highlands	31.0%	69.0%
Marginal Rain Shadow	1.7%	98.3%
KENYA	32.8%	67.2%

Source: Tegemeo Institute/Egerton University/KARI//MSU Rural Household Survey, 1997.

[16]Monthly maize prices deflated by the CPI in 1996 ranged from 71-89% that of the average over the 1994-1998 period for selected markets: Eldoret, Kisii, Kitale, Kisumu, Nakuru, Nyeri, Meru, Mombasa, and Nairobi.

To assess Kenyan farm households' direct perceptions of how they have been affected by the cereal market and pricing reforms in the 1990s, respondents were asked the following three questions: (1) The government has liberalized ("soko huru") the maize market since 1992. Compared with 5-10 years ago, is maize grain now (for the past 2 years) more readily available or more scarce in the local market?" (2) Compared with 5-10 years ago, is it now more convenient or difficult to sell your maize? and (3) Overall, would you prefer to go back to the controlled grain marketing system as it existed in the 1980s or do you prefer the current liberalized marketing system?

Table 8 contains the results. Overall, almost 60% of the households surveyed felt that the availability of maize grain for purchase has improved since the controlled marketing period vs. 31% who felt it had deteriorated. Ten percent of the households perceived no change. The regions where the greatest proportion of households perceived an improvement in the availability of maize grain were in the Eastern Lowlands, Coastal Lowlands, Western Lowlands, and Western Highlands -- areas that are now increasingly trade-dependent on maize. Another advantage to the majority of maize-buying households is that inflation-adjusted maize prices in local markets have generally declined by 15-25% in the 1994-1998 period compared to prices in the 1980-89 period (Nyoro, Kiiru, and Jayne, 1999). This also undoubtedly contributes to the perception of better conditions for net-grain buyers.

Regarding how conditions have changed over the past 5-10 years with regard to selling grain, in spite of the fact that grain wholesale prices have declined during the post-liberalization period, the overwhelming majority of households in all regions (88%) stated that it was more convenient to sell grain since liberalization (Table 8). There are two reasons for this: First, most traders buying maize now pay cash immediately at the time of the transaction, in contrast to sales to the National Cereals Produce Board (NCPB), which often took months to pay farmers. Second, most farmers are now able to sell their grain at or very near the farm premises. Just under 70% of farmers selling maize sold to traders who collected the grain from the farm (Argwings-Kodhek 1998). Lorries to local markets account for 17% of sales transactions. Human portage is the most important transport mode after lorries, suggesting that most sales take place very near the farm.

Concerning households' overall preferences for the controlled marketing system vs. the current liberalized system, responses to this question are shown in the final 3 columns of Table 8. Overall, 61% of households stated a preference for the current system while 34% preferred the former system. As with the previous questions, the preference for the current liberalized system was strongest in the grain-deficit areas such as Central Highlands, Coastal Lowlands, Eastern Lowlands, and Marginal Rain Shadow. Only in the Western Transitional zone (Kanduyi division of Bungoma District and the Kabras and Mumias divisions of Kakamega District) did the majority of households prefer the formerly controlled marketing system.

5.2. Comparison of wholesale maize prices between Kenya and its regional neighbors

As mentioned above, while real maize prices have generally declined since liberalization (up to 1999), they are still quite high by world standards. Average monthly wholesale maize prices between January 1994 and December 1999 in three major maize production areas of Kenya in

the High-Potential Zones were as follows: Ksh 968, 925, and 1069 per bag for Eldoret, Kitale, and Kakamega, respectively. When converted into US dollars at nominal exchange rates for each year, the average price for these three surplus markets was $186 per ton -- well above those in most producer regions in other African countries and the world (Table 10).

5.3. Effects of the import tariff and support price policies on consumer expenditure

In early 1999, under pressure from large farmer lobby groups, the government reimposed maize price supports at levels well above average wholesale prices in producer regions. The support price at the buying depots of the National Cereals and Produce Board has been Ksh 1,188 per bag since the main harvest period of December 1999 - April 2000,[17] compared with wholesale prices in Western Kenya of Ksh 700-850 per bag over the same period. To further raise local maize prices, the government has imposed a variable tariff on maize imports. The tariff rate was 75% until June 2000, when it was effectively reduced to about 30%. According to 1999 cost build-up budgets of imported white maize from South Africa through the port of Mombasa to regional markets in Kenya, the combination of the NCPB price supports and the maize import

Table 10. Prices for Maize Grain and Maize Meal, January 1996 - August 1998

	Ethiopia	Kenya	Zambia	Zimbabwe	South Africa	Mozambique
	US$ per metric ton (average from Jan. 1996 - Aug. 1998)					
Wholesale price, surplus regions	97	190	133	119	113	101
Wholesale price, capital city	135	241	174	127	n/a	217

Sources:
Ethiopia, surplus regions: average of Shashemene and Nekempt markets, and Addis Ababa markets (Grain Market Research Project Information System, Ministry of Economic Development and Cooperation, Addis Ababa.
Zimbabwe: GMB selling price; Zimbabwe Agricultural Commodity Exchange price quotes (ZIMACE), Harare.
Zambia: surplus regions: average of Choma and Chipata markets; wholesale Lusaka public markets (Agricultural Market Information Centre/Ministry of Agriculture, Food, and Fisheries database).
Kenya, surplus regions: average of Kitale and Eldoret markets; and Nairobi public markets (Market Information Bureau, Ministry of Agriculture).
South Africa: Randfonteine (South Arica Futures Exchange).
Mozambique: surplus regions: average of Manica and Mocuba markets; and Maputo public markets.

[17] The net NCPB support price since 1999 has been the official price of Ksh 1,212 per 90kg bag less 1% for county council cess and 2% for presumptive income tax, yielding a net payment to farmers of Ksh 1,188 per bag.

tariff have served to raise local prices in Nairobi, Mombasa, and the eastern drought-affected parts of the country by 250 - 500 Ksh per bag higher than would be the case without the import tariff (Nyoro, Kiiru, and Jayne 1999). NCPB has argued for the maintenance of the tariff to keep local prices high until it is able to sell off the stocks it accumulated at Ksh 1,200 per bag from farmers in the North Rift, so as to prevent large-scale millers from sourcing maize more cheaply from the world market. While beneficial to large-scale farmers and the NCPB's financial situation, the tariff, especially in a drought year, is be forcing both urban and rural consumers to spend more for their staple maize than would be the case if imports were not taxed.

To obtain a rough estimate of the magnitude of this tax on consumers, we simulated the effects of removing the tariff. Using conservative estimates based on Nyoro, Kiiru and Jayne (1999) that a 30% tariff on an average c.i.f. price of maize at Mombasa adds roughly Ksh 250 to the cost of a 90kg bag, or Ksh 2.78 per kg of maize purchased by consumers, and using information on rural and urban populations and net purchases per capita as shown in Table 11, we conclude that the elimination of the import tariff would save consumers roughly Ksh 2,744 million (US$ 36.6 million) per year. Of this, urban consumers would save about Ksh 1,400 million (US$18.6 million) from their expenditures on maize, while rural consumers would save about Ksh 1,344 million (US$17.9 million). To put these savings in perspective, the estimated US$36.6 million cost savings to consumers is roughly enough to have purchased 144,000 tons of maize from the world market (at US$250 per ton) and distributed it for free to needy households to alleviate food insecurity in Kenya. Removing the tariff and allowing cheaper imports to flow into the country would reduce the need for donor food aid in drought affected areas, increase overall supplies in the country, and reduce the price of food paid by the poor.

As a last analysis, we simulate the effects of alternative maize price levels on the profits per acre of large-scale farmers, and compare these profits with the gross household incomes of Kenya's small-scale farmers. Using cost of production data presented in Argwings-Kodhek (1999), we summarize the per acre production costs and maize yields for large-scale farmers in the North Rift Valley in Table 12. Total production costs, including land rental rates, are estimated to be around Ksh 15,952 per acre (US$212) and yields are estimated at 2,250 kgs per acre. Then, simulating different producer prices ranging from Ksh 700 per bag to Ksh 1,188 (the NCPB support price in 1999/2000), the net revenue per acre (gross margins) may range between Ksh 1,548 per acre during a low price year to Ksh 13,748 per acre with the 1999/2000 NCPB support price level. Large-scale farms vary in size from 50 acres up to many thousands of acres. Taking a smallish large-scale farm of about 200 acres of maize, we conclude that the total profits, given the production figures in Table 4, range from Ksh 309,600 (US$4128) up to Ksh 2.7 million ($36,661). Overall, there are about 160,000 acres of maize under production by the large-scale sector (Tegemeo Institute data files, 1996). Therefore, policies that are effective in increasing the producer price of maize received by large-scale farmers from, say, 900 to 1188 Ksh per bag (a net change of 288 Ksh per bag) would confer an income transfer to these farmers worth Ksh 1,152 million (US$15.4 million).

Table 11. Cost Savings to Urban and Rural Maize Consumers from Abolition of Maize Import Tariff.

Derivation of cost reduction to consumers		Amount
a.	Average urban consumption per year: kgs per adult equivalent (source: Argwings-Kodhek and Jayne 1996).	86.8 kgs per adult equivalent
b.	Population of urban consumers (in adult equivalents)	5.8 million
c.	Average net purchases of rural households who are net buyers of maize (average of national findings from 1997 and 1998 KAMPAP household surveys)	46.5 kgs per capita
d.	Population of rural consumers who are net buyers of maize (52.8% of rural households as per KAMPAP household surveys * 22.8 million persons)	10.4 million
e.	Average reduction in retail maize price expected from elimination of import tariff (25% tariff on landed Mombasa price of Ksh 988 per 90 kg bag)	2.78 Ksh/kg
f.	Cumulative annual reduction in urban expenditures on maize (row a * row b * row e)	Ksh 1,399.6 million (US$18.6 million)
g.	Cumulative annual reduction in rural household expenditure (row c * row d * row e)	Ksh 1,344.4 million (US$17.9 million)
Total Cumulative Savings to Consumers from Elimination of the Maize Import Tariff (row f + row g)		Ksh 2,744 million (US$36.6 million)

Table 12. Simulation of Alternative Maize Producer Prices on Net Revenues for Large-scale Maize Production, 1999 Figures

Operations	Scenario 1 @ Ksh 700 producer price per bag	Scenario 2 @ Ksh 900 producer price per bag	Scenario 3 @ 1999/2000 NCPB support price, Ksh 1,188 per bag
Land Preparation	3,000		
1st ploughing	1,200		
2nd ploughing	1,200		
harrowing	600		
Planter	600		
Seed (10 kgs)	910		
75 Kgs DAP fertilizer at Ksh 29 per kg	2,175		
100 kgs CAN at Ksh 20 per kg	2,000		
fertilizer transport costs	175		
manual weeding * 2 passes	1,000		
top dressing labor	100		
stooking	500		
harvesting	500		
shelling	805		
poly-propolene bags	625		
land rental	1,800		
transport cost of maize to market @70 Ksh per bag, assuming 25 bags per acre	1,750		
working capital	1,615		
Total Production/Marketing Cost (Ksh per acre)**	15,952	15,952	15,952
Yield (bags per acre)	25	25	25
Price (Ksh per bag)	700	900	1188
Gross Revenue (Ksh per acre)	17,500	22,500	29,700
Net Revenue (Ksh per acre)	1,548	6,548	13,748
Acres under maize, simulated large-scale farm	200	200	200
Total Profit (Ksh)	309,600	1,309,600	2,749,600

Source of production cost data: Argwings-Kodhek, 2000.
** at a yield of 25 bags per acre, production and marketing costs convert to Ksh 638 per bag.

By contrast, the total annual gross household income (including crops, livestock, and non-farm income) for small-scale farm households in 1997 and 1998 ranged from Ksh 54,600 (US$ 728) in the Western Lowland areas of Kisumu and Siaya, to Ksh 149,610 (US$ 1,995) in the High-Potential Maize Zone. Clearly, policies designed to raise the domestic price of maize (e.g., through tariffs and price supports) have the effect of transferring income from 3 million urban consumers and almost 16 million small-scale farm households (who buy maize) to about 5 million small scale farmers in the High Potential Maize Zone (who sell maize) and a few thousand large-scale maize farmers.

6. Conclusions and Policy Implications

Maize is a strategic crop in Kenya: it is the major staple crop and accounts for more cultivated area than any other crop. Maize policy in Kenya revolves around the goals of income growth, food security and equity. While these goals are widely accepted, the policy debate is often guided by conventional wisdom rather than actual information on small farmers' production and marketing patterns. There is an enduring perception that most farmers in Africa are grain-self sufficient and that their incomes can be raised through policies that support grain prices.

However, survey findings across two years, 1996/97 and 1997/98 indicate that most small farmers in Kenya are net buyers of maize. Most of these households do not sell any grain at all. Except in the maize breadbasket of the North Rift, most small farmers derive the bulk of their income from non-farm income and from other crops. While they grow maize for consumption, it is generally insufficient for household requirements and they use the income derived from their non-farm and cash crop activities to buy much of their maize needs. The strategy of growing other crops to buy maize is partially due to efforts to maximize the incomes that can be derived from increasingly small farms and also because of more reliable access to maize in local markets after maize market liberalization in the early 1990s. But these land-constrained net maize-buying farmers, especially those in the drier parts of the country, tend to have lower incomes than those farmers in the high-potential maize zones such as Trans Nzoia, Uashin Gishu, Nakuru. Hence, policies that raise local maize prices beyond import parity levels in the major regional markets are a tax on the rural poor. The current maize import tariff of 25-30% has raised local prices in Nairobi, Mombasa, and the eastern drought-affected parts of the country by at least 250 Ksh per bag. We estimate that the elimination of the import tariff would save urban consumers roughly Ksh 1,400 million (US$18.6 million) and rural consumers about Ksh 1,344 million (US$17.9 million) on their expenditures on maize. To put these savings in perspective, the estimated US$36.6 million cost savings to consumers is about twice the value of the relief maize being imported by donors to alleviate food insecurity in Kenya in 1999 and 2000. Meanwhile, the policies adopted by the Kenyan government to raise domestic maize prices in 1999/2000 have transferred at least Ksh 1,152 million (US$15.4 million) to the large-scale farm sector. Policies designed to raise the domestic price of maize (e.g., through tariffs and price supports) have the effect of transferring income from 3 million urban consumers and almost 16 million small-scale farm households (who buy maize) to about 5 million small scale farmers in the High Potential Maize Zone (who sell maize) and a few thousand large-scale maize farmers.

Those with public views on agricultural policy would do Kenya and smallholder farms a great service by no longer overgeneralizing as to what is in the best interests of farmers. Farmers in Kenya are not a homogeneous group. When one reads that "farmers" want higher maize prices, it is easy for one to conclude that this means all farmers – smallholders and commercial farmers alike. However, based on evidence from rural household surveys we suspect that the calls for higher maize prices and a ban on imports are coming from a relatively narrow segment of farmers and from just a few districts. Moreover, while reports in the press would lead one to believe that Kenyan maize prices are artificially depressed due to "cheap imports", in fact Kenyan producers receive relatively high prices for maize compared to most other countries in Eastern and Southern Africa.

One of the most important attributes of countries undergoing sustained economic development has been the reduction in the cost of food through productivity growth in the food system. Agricultural productivity growth mobilizes a relatively affordable food surplus that consequently allows people to engage in other activities that provide higher returns to their labor. Because Kenya's poor are predominantly in rural areas and engaged in farming, productivity growth in agriculture is likely to be a precondition for injecting purchasing power into rural areas and hence stimulating demand and employment growth in the broader economy. But this will require viewing agricultural income growth as deriving from many crops. Important regional differences suggest that tailoring policies with their regionally dis-aggregated impacts in mind can lead to improved outcomes.

However, there is a clear economic rationale for moderating extreme price fluctuations for a strategically important crop such as maize. Protection against extreme downside price risk has been a major problem in the liberalization period. Schemes to reduce such downside risks have been shown to encourage more intensive use of productivity-enhancing inputs and other farm investments. But a floor price must be carefully set to take into account costs of production for relatively efficient farmers under different weather scenarios, regional and world market conditions, and poverty alleviation objectives. And there are clearly problems with cost of production information being manipulated in support of particular groups' objectives. In general, there are advantages to the economy from attempting to make food production profitable by reducing costs rather than supporting prices above world market levels. There are a range of policies and investments that could, over time, effectively reduce the costs of growing maize for farmers in the major surplus-producing parts of the country, including agricultural research systems that generate more productive technologies, well-functioning extension systems, and improvements in transportation infrastructure. Such investments are likely to make maize production in Kenya a more profitable venture over the long run than intervening through price policy or protecting farmers from competition. But these will require sustained financial commitment from the government, and a greater public understanding of the important role of government in supporting the development of a liberalized marketing system. Sound investments to make Kenyan agriculture more competitive will lead to lower production costs, and maize production will be profitable even at 'seemingly' lower prices which are preferred by majority of Kenyans.

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