Ethiopia: Grain Marketing – Review of Recent Trends

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List of Tables

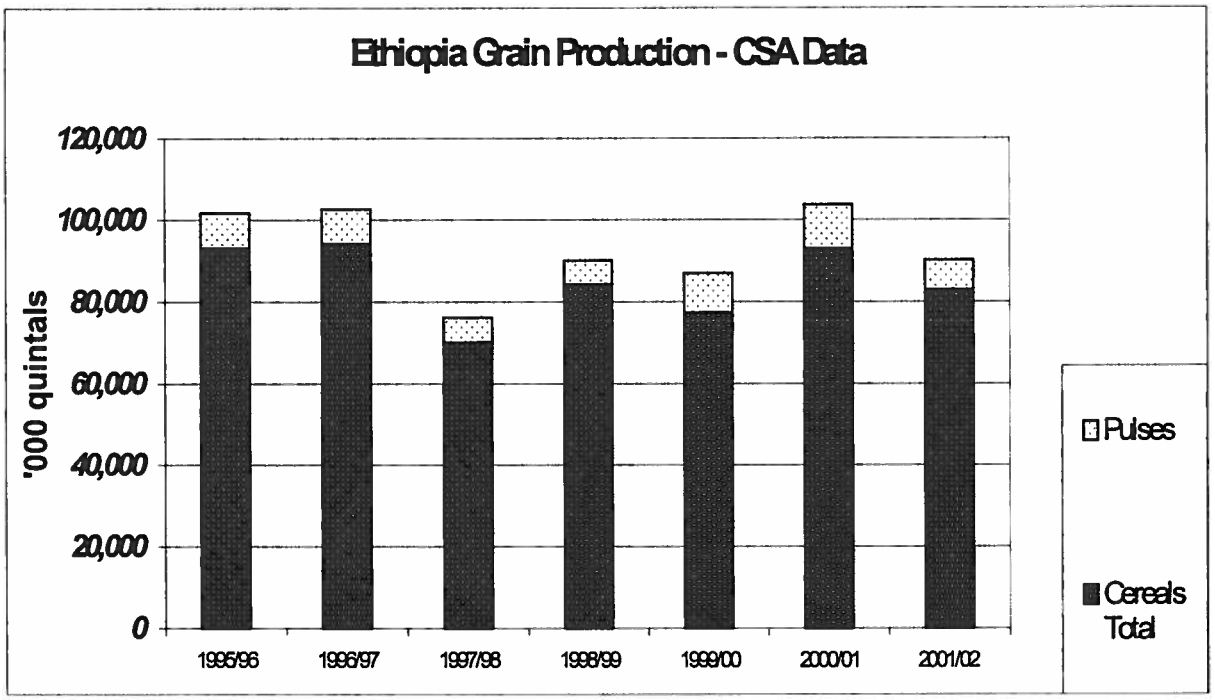
[1] Document drafted by Paul Harrison, Consultant following Mission to Ethiopia, 19 July – 7 August 2002

August 29, 2002

I Grain Market Situation

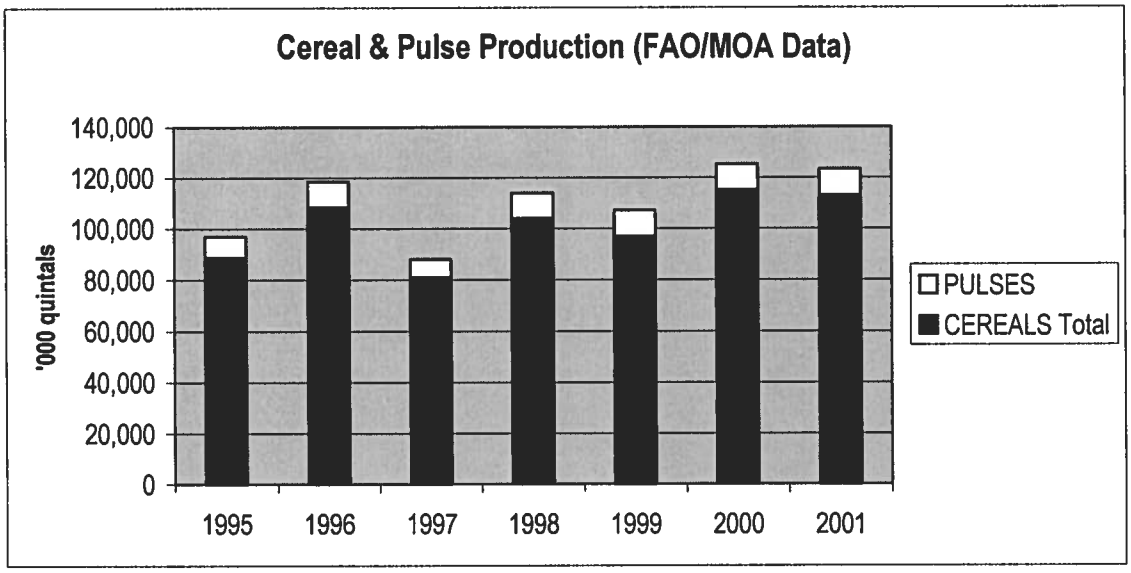
Grain Production, Areas and Yields

Production. Over the past 7 years, cereals and pulses production has averaged about 9.3 million tons according to the Central Statistical Authority (CSA[2]) and about 11 million tons according to MOA/FAO. This level appears to be substantially higher than it was a decade earlier – papers at the recent IFPRI policy forum, apparently relying on CSA data, indicated an average production of about 7.2 million tons over the 1987/88 to 1991/92 period. While there was clearly a jump in reported production between the end of the Derg administration and the mid 1990s there has been no clear upward trend during the 1994/5 to 2001/02 period. Because most Ethiopian agriculture is rain-fed, there are substantial year to year variations as a result of weather conditions. The bumper years in the past 7 years were 1995/6, 1996/7 and 2000/01 while the worst year was 1997/8. According to CSA, the highest production (2000/01) was 11% above the mean for the period, and the lowest (1997/98) 18% below (for details see Table 1).



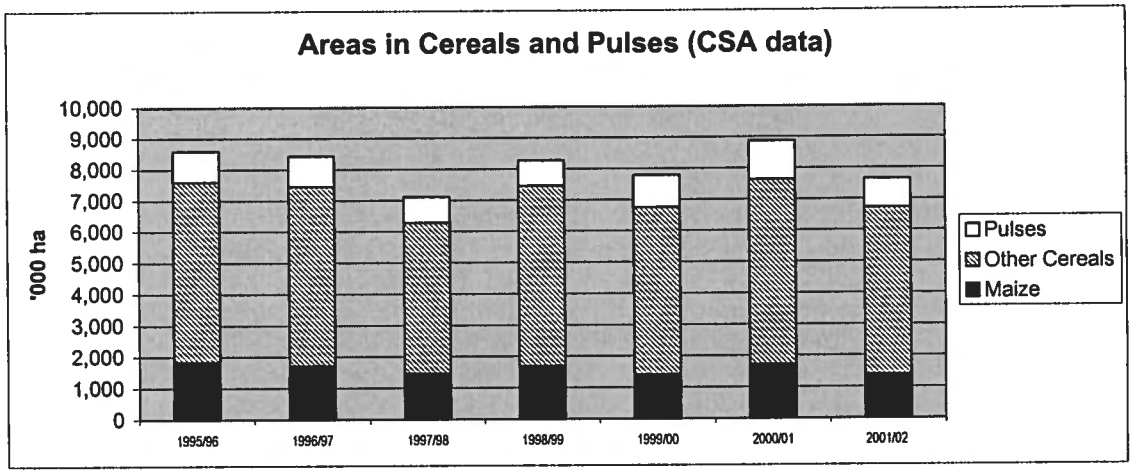
[2] CSA data is based on the Ethiopian Calendar, with the year running from September 11 to September 10, while FAO/MOA data uses the Western Calendar year. Thus for the main Mehr harvest (normally at least 95% of production), CSA 2001/02 equates to FAO/MOA 2001. However the 2002 Belg harvest – July and August, which is of short season crops planted to benefit from the February – May rains which is not included in CSA 2001/02 forecast, may have been part of the FAO/MOA 2002 statistics.

FAO/MOA production figures, which are summarized in the chart below, and detailed in Table 2 indicate both larger overall production and a greater year to year variation during the past eight years. This is indicated by the spread from 13% above the mean in 2000 to 20% below it in 1997. Because the FAO/MOA estimate for total production in 1995 was only 88% of the 8 year average, but that of that of CSA was 109%, and the FAO/MOA estimate for 2001, was much above the CSA 2001/02 figure, the FAO/MOA data does indicate an upward trend, which is just statistically significant at the 90% level.



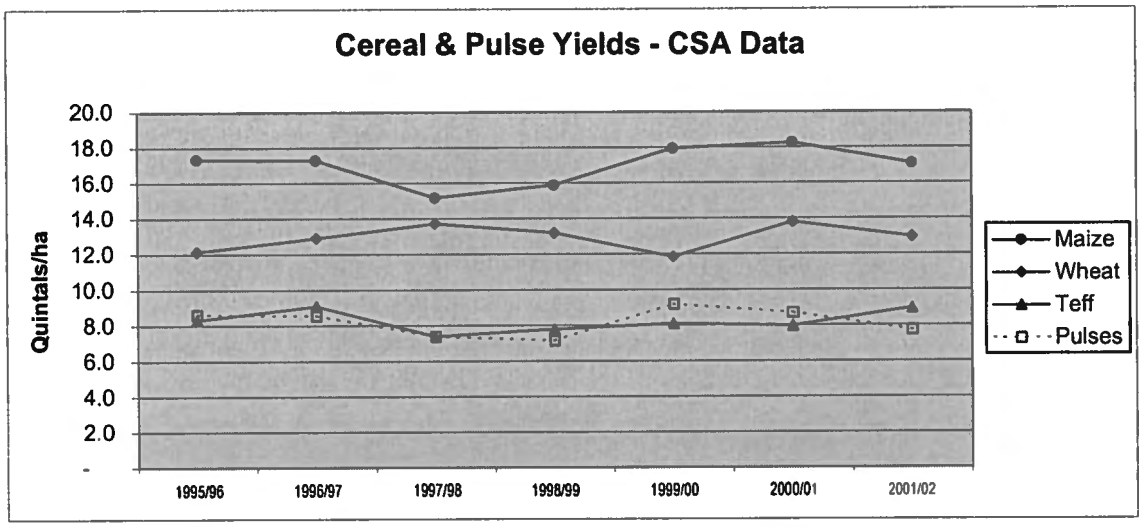
It is generally agreed that the CSA data, while slower to be issued, relies on more consistent methodology than that of FAO/MOA. Overall, it probably reflects year to year changes better, although it may underestimate aggregate production.

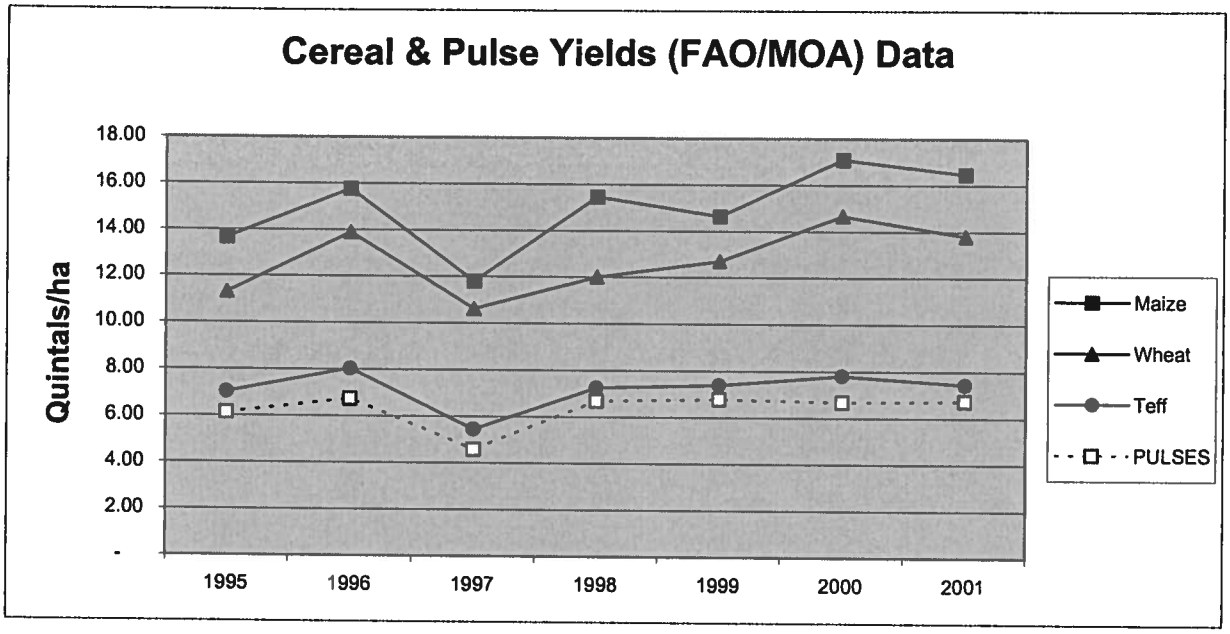
Areas. CSA data indicates that while areas planted to cereals and pulses may have grown slightly over the past seven years, the trend is not strong (Table 2). Following low prices as a result of the bumper 2000/01 harvest, there was a noticeable drop in area (about 15%) between 2000/01 and 2001/0. This was particularly pronounced for maize.



FAO/MOA estimates of area cultivated are substantially larger than those of CSA, but have tended to follow the same trends. The noticeable difference is in the estimate for the most recent year (2001), where FAO/MOA estimated no decline in area from the year earlier, while the CSA estimated a 13.9% decline. Recent discussions with grain traders and the upturn in the price, particularly for maize in April to August 2002, suggest that the CSA figures were the much more likely to have reflected the actual trend.

Yields. Over the same period, despite quite substantial year on year variations, yields of maize appear to have increased slightly, both based on CSA and FAO/MOA data (see tables 3 & 4), but those of wheat and teff, overall do not show significant upward trends. The maize results reflected in the FAO/MOA figures are consistent with the increased fertilizer and improved seed use which has occurred over the 1995 – 2000 period.





Regional FAO data indicates that there is not much difference in yields between Amhara, the Southern States and Oramija, but that yields from the other regions are much lower. In practice, with the four big regions, all have significant numbers of deficit and surplus woredas, so it is not possible to analyze regional data to get the surplus deficit picture. This would need to be done at the woredas' level.

Grains as Food Aid

Food aid to Ethiopia has been substantial. The main constituent has been cereals, of which some 2 million tons in total have been used in 2000 and 2001. Details of the agencies which have provided cereals as food aid year by year are given in Table 5. Main sources of cereals over these past two years have been 45% WFP, 23%, EU and EU member countries, 20% USAID and USDA, 7% GOE and 5% others. Given that probably 80% of the WFP supplies come from US sources, about 55% is effectively from the USA. Of the total food aid figure, some 78% has been imported and 22% procured locally. While GOE supplies have been 100% locally procured in the past two years, the proportions procured locally by other donors have been, EU and EU member countries, 46%, other donors, 26%, WFP 7%, USDA/USAID nil.

Cereals as Food Aid ('000 tons)

	1995	1996	1997	1998	1999	2000	2001
Imported	619	206	249	518	562	1,017	568
Locally Procured	34	109	111	58	110	206	235
Total	653	315	360	576	673	1,224	803

Source: WFP & EU Local Procurement Unit

Over the past two years, imported food aid has amounted to about 9% of total cereals consumed in Ethiopia, but a much larger proportion – about a quarter - of all grain which is distributed, either as aid or commercially.

Consumption

Based on CSA production estimates, plus the volumes of aid grain and deductions for seed and losses, cereal consumption in Ethiopia appears to have averaged about kg 124 per capita for the past 7 years. Various attempts have been made to estimate grain consumption based on calorie needs etc. These suggest a rather higher level, but given the wide availability of livestock, the use of enset (false banana) as an important starch source in some regions, it may be that the proportion of total calories provided by cereals is lower than in some other countries at similar levels of development. While the absolute level is in some doubt, the relationship between population growth and apparent production change over the past seven years suggests that per capita consumption may not have been increasing overall.

The pattern of consumption varies by region and type of family. Roughly there are 10 million urban dwellers who would expect to buy food for cash. The rest of the population is divided between food surplus areas, where there is nearly always excess production, which provides cash income to farmers, areas, which are sometimes in surplus and sometimes in deficit and areas with chronic deficits. Every year, there are significant numbers of people who need to get food aid in one form or another. Most of this is provided as cereals, and this is the reason for the apparent paradox of a problem of low prices (associated with bumper harvests), at the same time as areas of famine and food shortage.

Marketing Systems

The Grain market in Ethiopia is private, although the largest individual firm is the EGTE, which is a Government owned trader and warehouse operator. Prices are freely determined in the market place and most analysts believe the market is reasonably competitive, although 'thin' and 'high cost'. Typically, grain can be handled in a number of ways, involving farmers, assemblers, local merchants, inter-regional merchants, brokers, and centrally located merchants. Based on the 1998 findings of Gebremeskel, Jayne and Shaeffer (GRMP WP8)[3] only about 26% of all cereals and 37% of pulses were marketed, giving an average of about 28% of grains. The general feeling among merchants and the suggestion in the more recent paper[4] by Wolday Amha is that this has probably increased over the past few years.

The findings of WP8 were also that of the marketed total, 31% was grain was sold by farmers to consumers and 20% directly to retailers. In all about 45% of the 2-3 million tons of marketed grain was purchased by interregional traders and of that 69% was sold in terminal markets and deficit areas. Buyers of large quantities, include NGOs Government and other buyers for aid purposes, and processors or millers. Overall though, the processing sector is quite small, and only handles about 1% of the marketed grain.

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3 Gebremeskel, Dessalegn, T.S. Jayne and J.D. Shaeffer. Market structure conduct and performance: Constraints on performance in Ethiopia's Grain Markets. Grain Market Research Project (GRMP) MEDaC Working Paper 8. 1998

4 Wolday Amha. The Structure and Functioning of the Post PADETS Grain Marketing System in Ethiopia, Paper presented at the IFPRI/EDRI policy forum on Agriculture Technology Diffusion and Price Policy, Addis Ababa March 25, 2002

Grain passing from surplus areas is handled from the farm by farmers themselves or assemblers normally using donkeys. A donkey will carry about 70kg for 5km at an assembler's fee of Birr 4-5. This grain is then re-bagged into one quintal sacks by the merchant who normally has some rudimentary storage in the local grain market; typically his expected margin is about 5% for a quick sale. Licensed merchants are subject to income tax, which can be quite arbitrarily assessed, and if dealing with GOE, it takes the form of a 5% withholding. Longer distance transport is largely private sector, with truck owners generally being contracted by merchants, rather than merchants having their own vehicles. Handling is quite costly, from Birr 0.5 upwards for loading or unloading. Trucking costs vary through the season depending on demand and opportunities truckers get for more profitable import cargo. At the time of the mission, (relatively low season) the price for 300 km from the Jimma area to Addis was about Birr 16 per quintal, but about US$0.06 per ton-km. This is high compared with South Asia, partly due to relatively low utilization factors, moderate payload in many cases, and high levels of costs for parts. Budgets prepared by the mission for the operation of a 12 ton truck, typically the size operated by individuals belonging to a Truck Owners Federation and using Ethiopian parameters indicated that the levels of charges are in line with the estimated average costs of operation and an internal rate of return of 15%, but could be substantially reduced for an efficient operator (see Table 7 for details).

Operating Costs of 12 Ton Truck (US$ per ton-km)

	Average Usage	High Usage
Price per ton-km needed to cover costs including finance charges	0.057	0.045
Price per ton km to give 15% Real Internal Rate of Return	0.064	0.049
Price per ton km to give 20% Real Internal Rate of Return	0.070	0.052

An important element in the cost of marketing in Ethiopia is the sales tax. Currently this is supposed to be 5% of the first sale. However discussions with traders indicate that in some cases, particularly if regional boundaries are crossed it may be charged more than once.

Market Price Data

For almost seven years consistent price data has been collected from about 25 markets for the main cereal types. In this study, the detailed prices of three cereals – maize, wheat and teff – which together comprise about 80% of all cereals produced in Ethiopia are considered. At each market, data is collected weekly and consolidated into monthly figures using standard procedures which appear to be well adhered to. Although data reported comprises retail price, wholesale price and producer price, it is the **wholesale price** which is most relevant. This is because the data is physically collected in wholesale markets and so is thought to accurately measure wholesale price for transaction volumes of 2-150 quintals.

The recorded 'producer price' simply represents the prices paid by wholesalers to producers for small quantities of cereals from producers (up to 2 quintals) delivered to the market. What would more normally be thought of as the producer price would be the farm-gate price in the production areas. That is it would be a lower figure, taking account of transport cost, and in many cases margins for assemblers. Similarly, the 'retail price' collected is the price at which small quantities – up to two quintals can be bought from retail merchants in the same physical markets. A more representative 'retail price' would need to take account also of those cereals bought in the wholesale market and transported to separate retail establishments. In addition to the price at the wholesale market location, this would also include handling and transport as well as the retailers' own margins. Wholesaler/retailers selling small quantities of their output at a "retail" level will inevitably be able to sell at lower prices than pure retailers.

Over the past six years, the wholesale price movements in the Addis market for the three main grains are as shown in Chart 1 which indicates prices both at nominal and deflated levels. In this chart, the deflator is the National Consumer Price Index for the period under review, rebased so that the average of January 1996 to July 2002 equals 100[5]. It can be seen that effect of applying the deflator has been to slightly smooth the peaks and troughs, but not by large amounts. This is because there has been no obvious inflationary trend in Ethiopia over the past six years and because cereals are a relatively large part of the consumer price index, the level of cereal prices themselves tends to have an important impact on the index.

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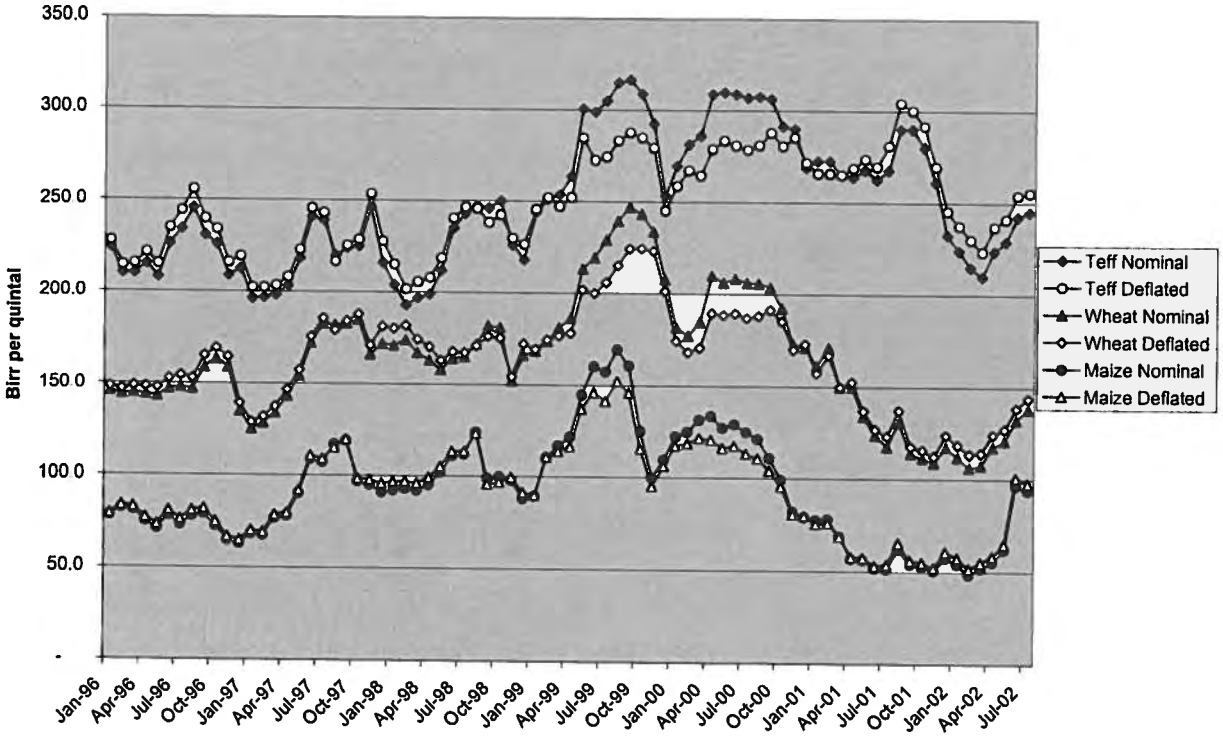
[5] CPI Data from July 1997 to March 2002 ex CSA, April to July 2002 – mission estimate, Jan 1996 to June 1997 interpolated by mission from IMF annual figures. CSA reference document used 'Country and Regional Level Consumer Price Indices Information No.1' published May 20, 2002 did not give relative weights of index constituents.

Chart 1. Comparison Between Nominal and Deflated Cereal Prices - Addis Wholesale



What can be seen clearly from the chart overall is that for wheat and teff, nominal real prices remained fairly constant from 1996 through the end of 1998. They then rose quite sharply in 1999, peaking in August/September 1999 before falling as the 1999 harvest came in, then rose again from October/December 1999 until about May 2000, from which point the prices of wheat and maize fell with only slight occasional upturns until April 2002. The normal seasonal increase did not occur in 2001 for either wheat or maize, but it did happen with teff. The seasonal increase in 2002 started late, with the upturn only being noted in April.

Because of their different characteristics and price levels, it is useful to look at the three main cereals separately. Also, because there has been no consistent inflationary trend over the period, the analysis of price data for individual products has been undertaken in nominal terms.

Maize. An overview of the price situation for Maize is shown in Chart 2. This presents the nominal wholesale maize price in Addis, which is a typical wholesale clearing market, the nominal wholesale price in Nakempte which currently is a major supplier to the Addis market and in recent years has been a surplus area at wholesale level, and also an estimated farm-gate price for the area around Nakempte taking account of typical transport costs from farm-gate to merchant costs and normal merchants' mark ups.

Chart 2. Maize Price Structure - Addis Ababa and Nekempt

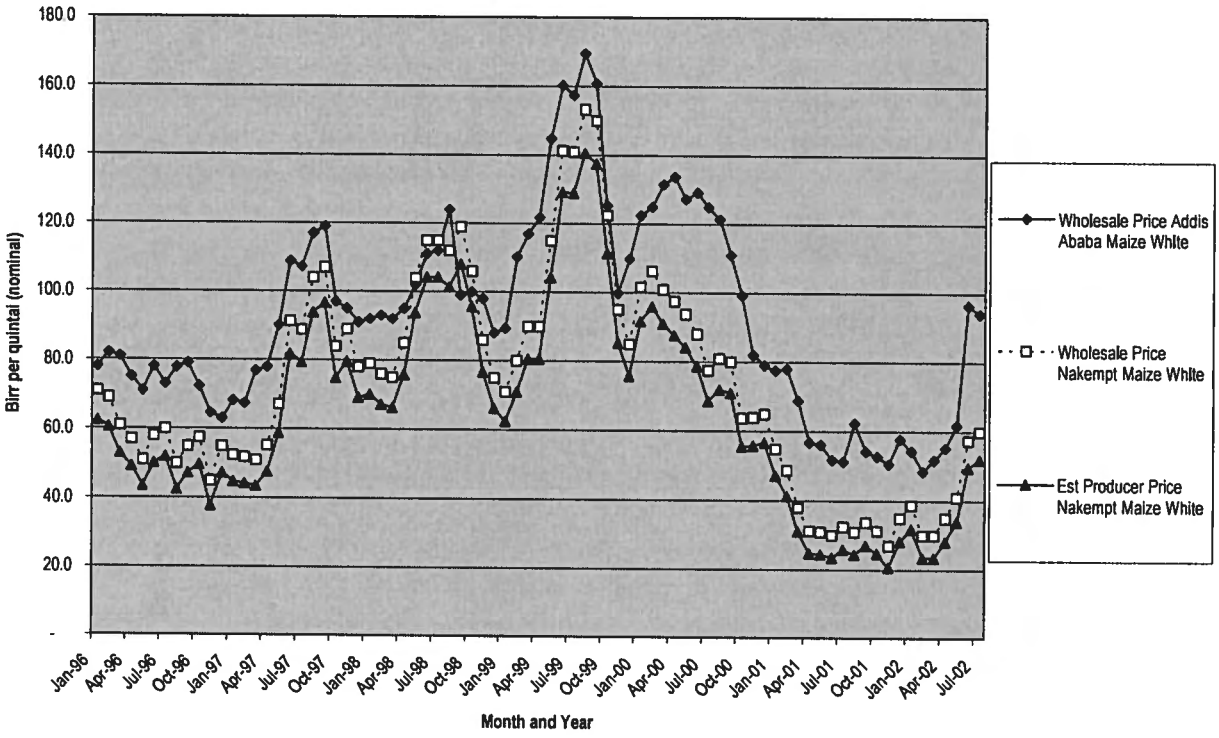
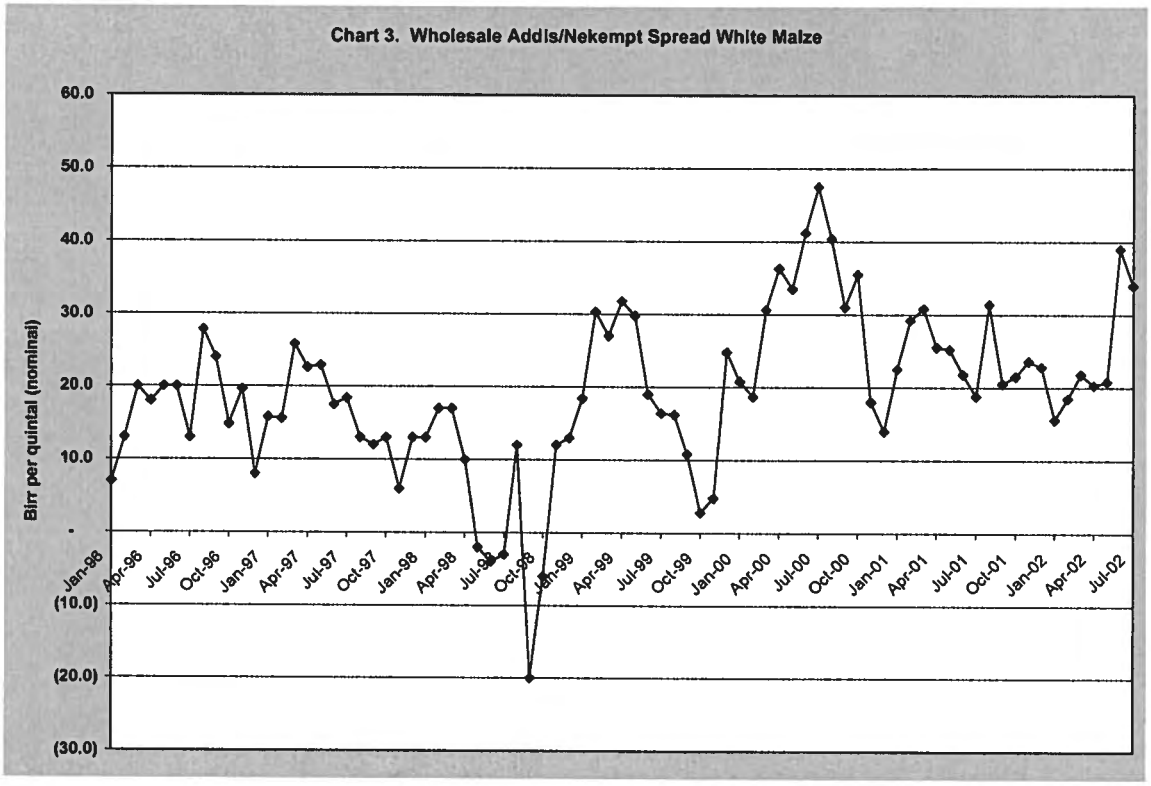
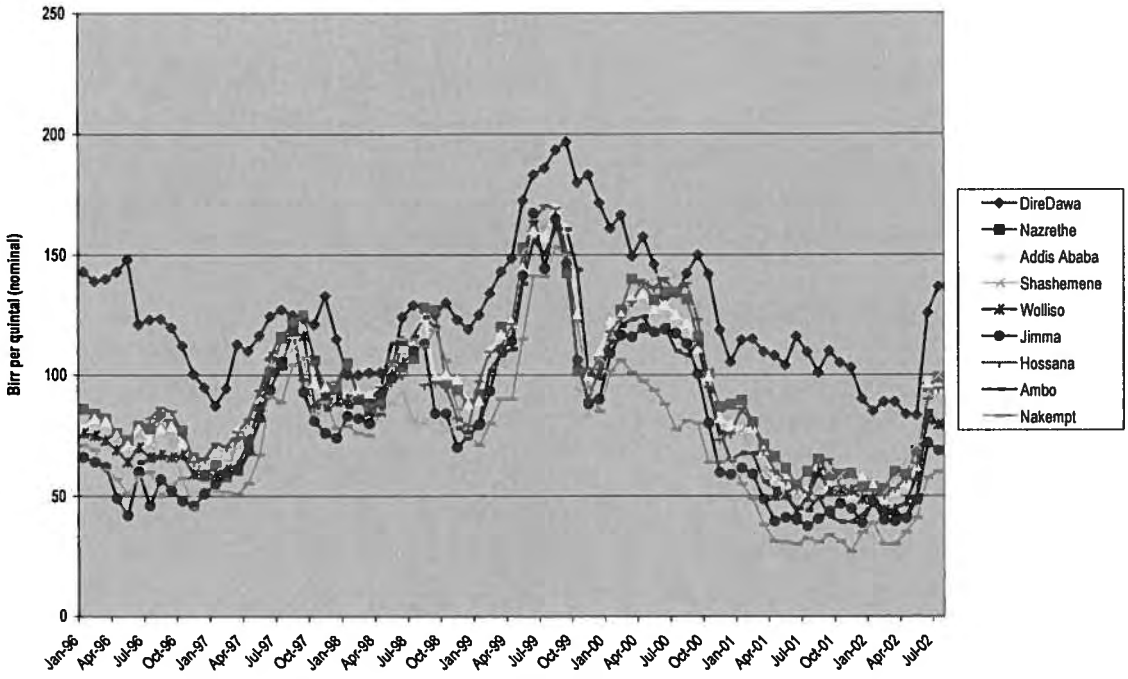


Chart 3 shows the Addis:Nakempte wholesale price spread. It can be seen that this has varied considerably over different periods. Based on present costs, it appears that for short periods of time there may have been excess of profit made trading on this route, but for substantial periods trading probably was not profitable at all (and so probably did not take place). The overall spread between the Addis price and the Nakempte price on average is in line with a reasonable trading spread, given that transport costs are volatile and the degree to which taxes are levied is unclear.



A more general view of the maize prices in the country at wholesale level is given in Chart 4, which appears to show that prices in deficit areas, such as Diredawa, do not go down to the same extent as prices in producing areas, or even prices in major trading areas like Addis and Nazaret. While there seems to be a fairly close correlation between the Addis price and the producing area prices, the Diredawa price never fell anything like as far as might have been expected during the low price period. This could be because Diredawa is a deficit area and the spread during the low price period represents the real cost of moving grain from the production areas to Diredawa, whilst in the high price periods, grain for Diredawa is provided by imported wheat, sorghum or other food aid.

Chart 4. Wholesale Maize Prices in major producing and consuming centers



Maize prices in various important producing areas, Ambo, Jimma, Nakempte and Shashemane, have varied from year to year between areas, depending on whether the particular area is a major surplus producer in the year concerned or not. For example, in 1998, the Shashemane price was substantially below the Ambo, Jimma and Nakempte prices, whilst in 2000 the Shashemane price was above. Similarly, the current price in Shashemane (July 2002) is in line with the wholesale price in Addis Ababa itself, indicating that there is no flow of maize at the moment from there to the Addis market. This was confirmed by the field visit. Similarly, the Jimma price is currently above the Nakempte price as very little supplies are available in Jimma just now and the Addis market is being supplied by Nakempte.

The abnormal seasonal price behavior in the past three years for maize in the Addis market is clearly shown in Chart 5 which compares the monthly average prices 1996 to 1999 with the prices for 2000, 2001 and 2002. It can clearly be seen that in the Addis market the past normal behavior had been for maize to increase from about Birr 80 per quintal in January, up to 115 in June or 121 in August, before falling down again to about Birr 88 in December. The graphs for the last three years show that between April 2000 and February 2001, the movement was downwards in pretty well every month from about Birr 135 per quintal in April 2000, down to Birr 50 in February 2002.

Chart 5. Seasonal Wholesale Maize Price - Addis

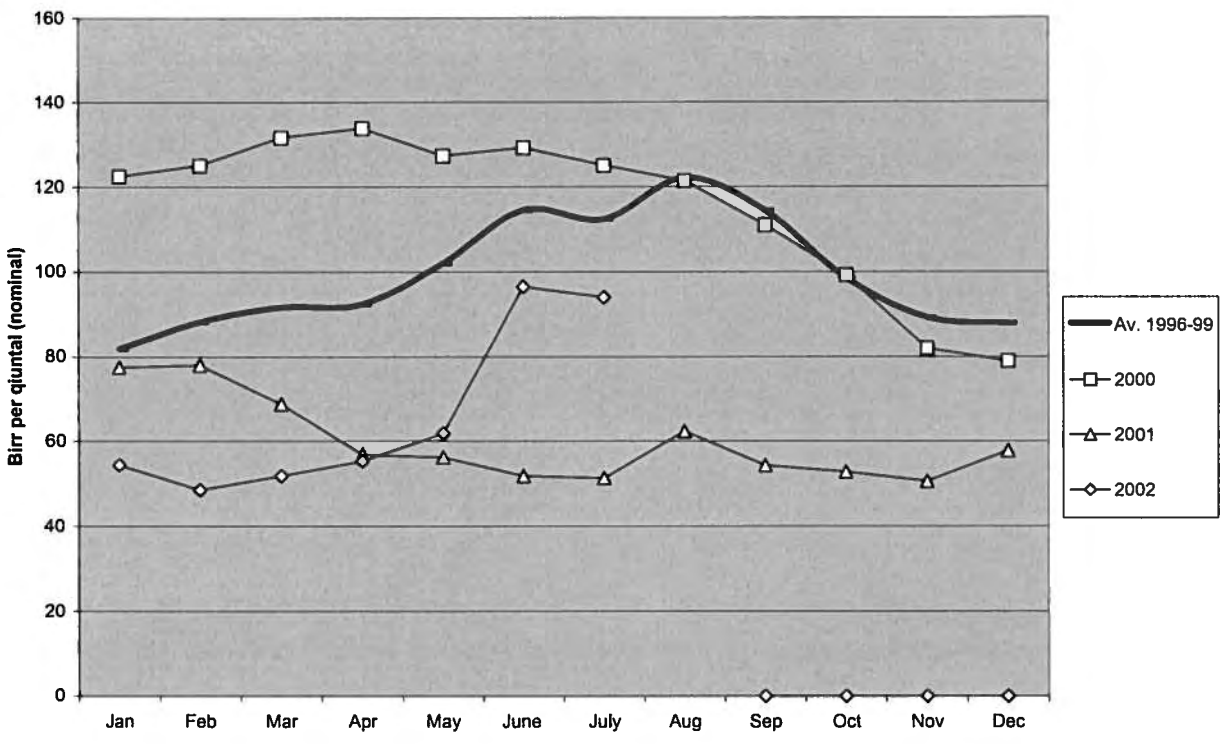
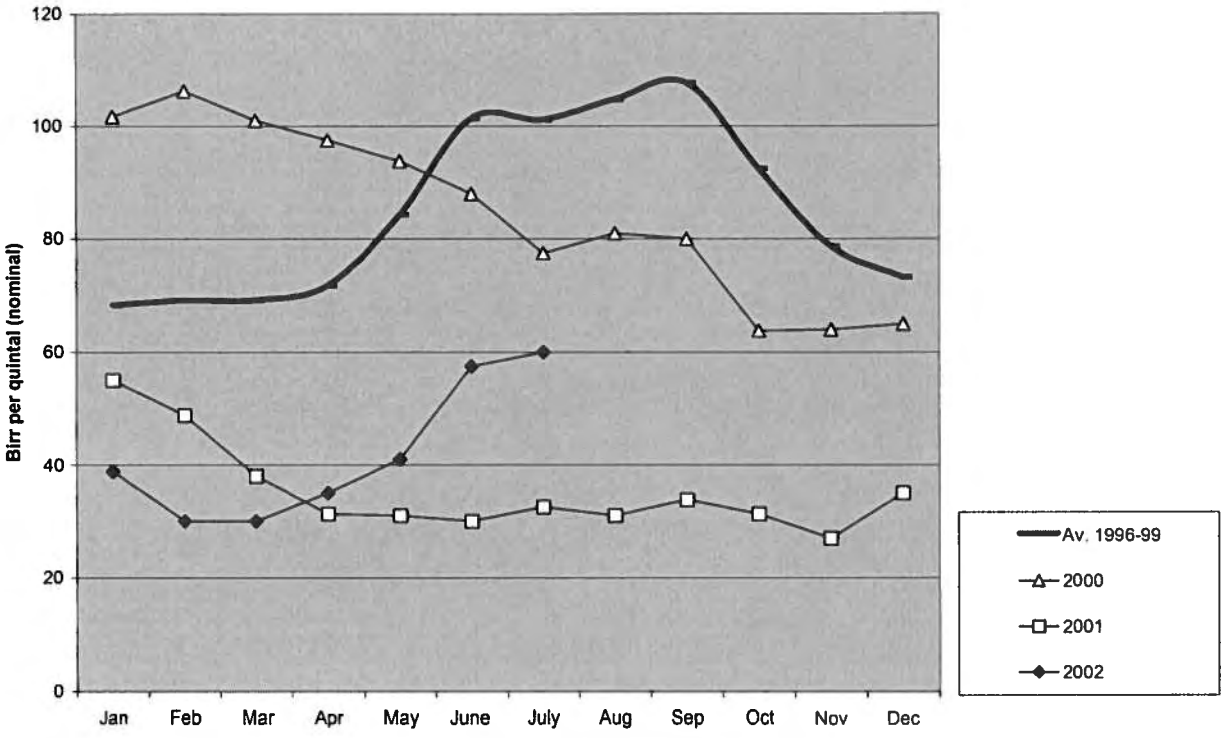


Chart 6, which shows the Nakempte wholesale price is more dramatic. Normal seasonal movements would be a price increase of 30-35% between January and June, with a slight further increase going on to September. The chart shows, however, that since February 2000 the price was downward before picking up in March 2000 from the extremely low level of Birr 30 per quintal at the wholesale level. However, by July 2002 the price had doubled to Birr 60 per quintal.

Chart 6. Seasonal Wholesale Maize Prices in Surplus Area - Nakempte



Wheat. The overall wholesale wheat price structure is shown in Chart 7, which presents the wholesale price in Addis and the wholesale and estimated producer prices in estimated producer prices in Bale Robe, which is now a major surplus area. In Bale Robe, the fall between July 2000 and March 2002 was about 65% at the producer level, but the fall in the months when producers normally sell – say January, was a bit less – from Birr 106 per quintal in 2000 to Birr 49 per quintal in 2002 – the price in January 2001 had been virtually the same as in January 2000. The Addis: Bale Robe spread at the wholesale level is shown in Chart 8.

Chart 7. Wheat Price Structure - Addis Ababa and Bale Robe

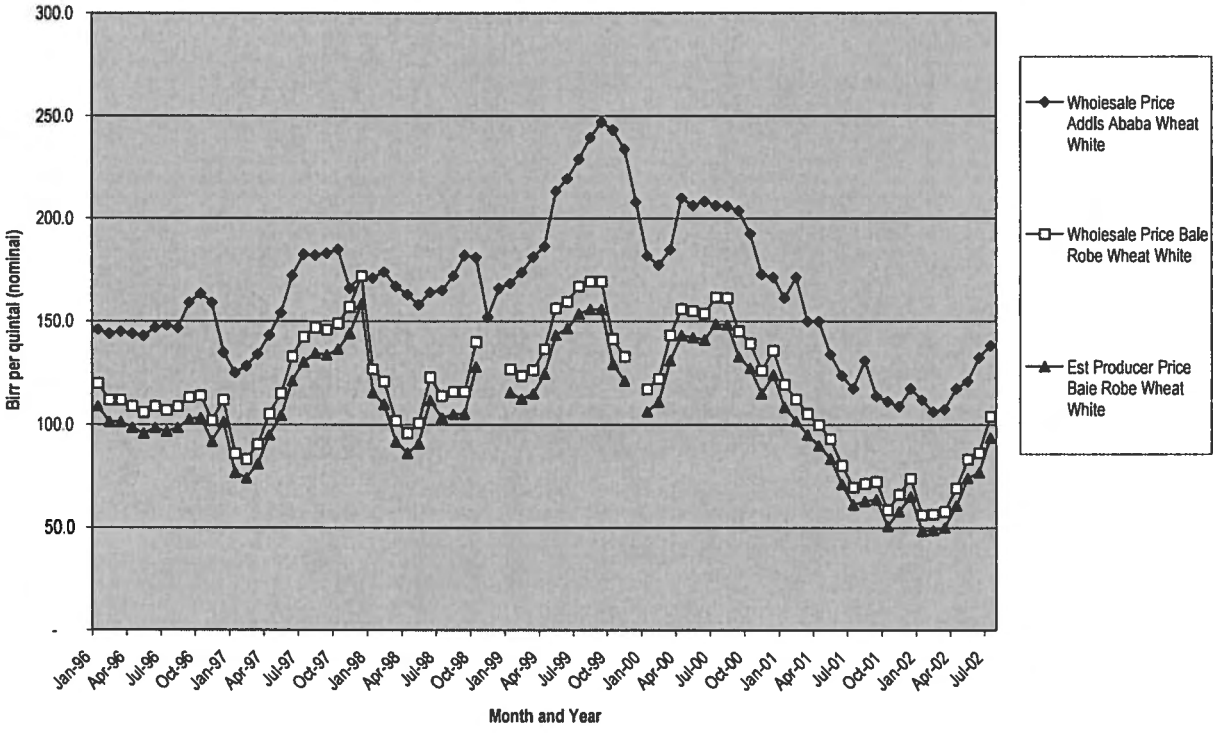
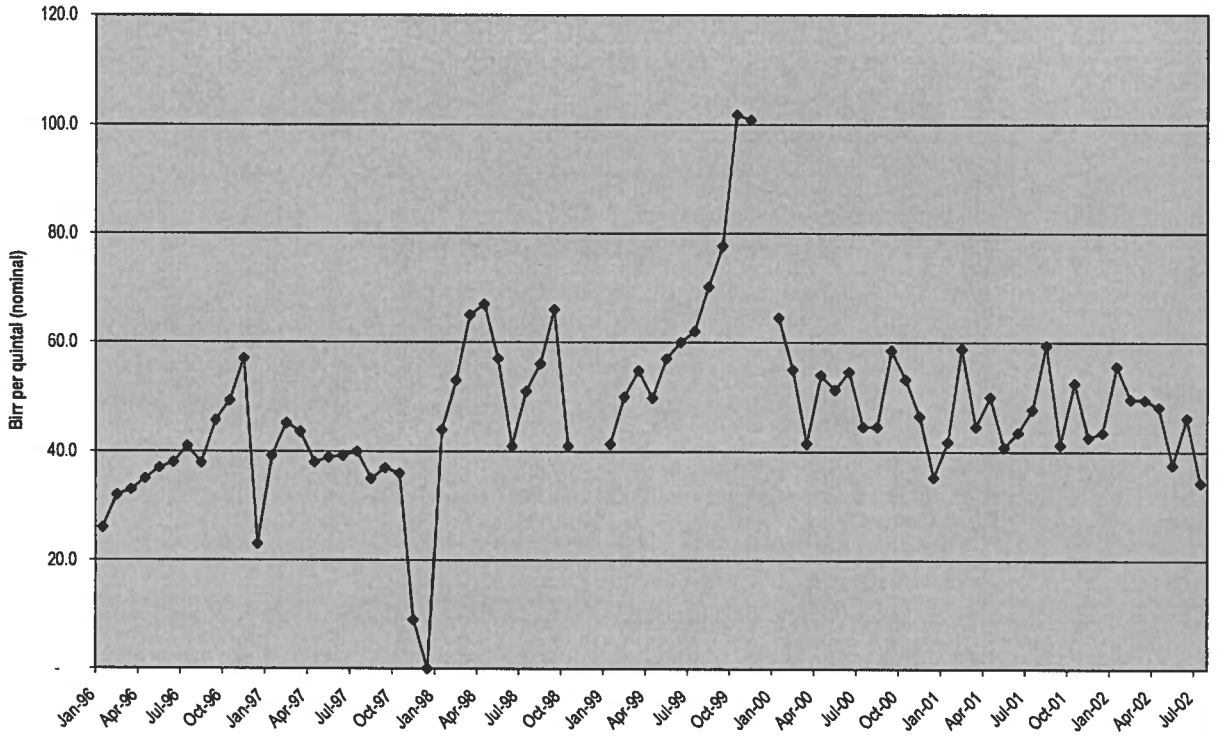


Chart 8. Wholesale Addis/Bale Robe Spread Wheat



The typical Addis – Bale Robe spread in recent years, at the wholesale level has been Birr 40-60 per quintal. It has been more stable recently than in the past and since 2001 study, has edged downwards, tending to confirm the view that this is a competitive main trade route.

The wholesale wheat price in Bale Robe for the past three years, compared with the 'normal' seasonal trend is shown as Chart 9. This represents the situation in a major surplus area. Chart 10 shows similar information for Nazaret, a main center of trade and area with a lot of storage capacity, and Chart 11 gives the situation for Diredawa, which is a grain deficit area.

Chart 9. Seasonal Wholesale Wheat Prices Surplus Area - Bale Robe

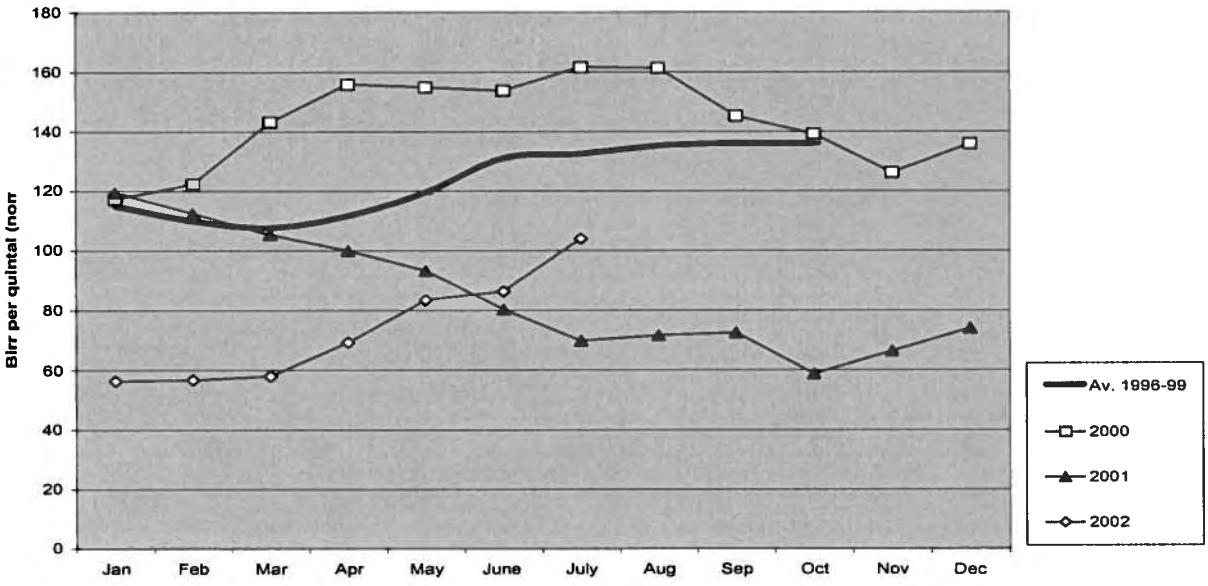


Chart 10. Seasonal Wheat Prices - Nazarethe

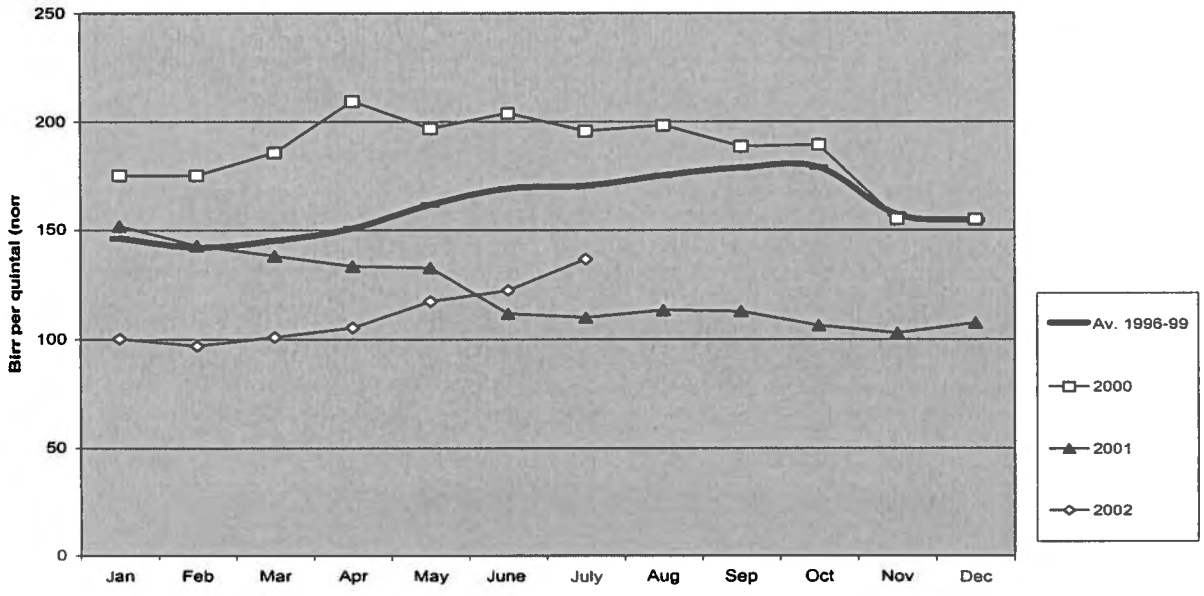
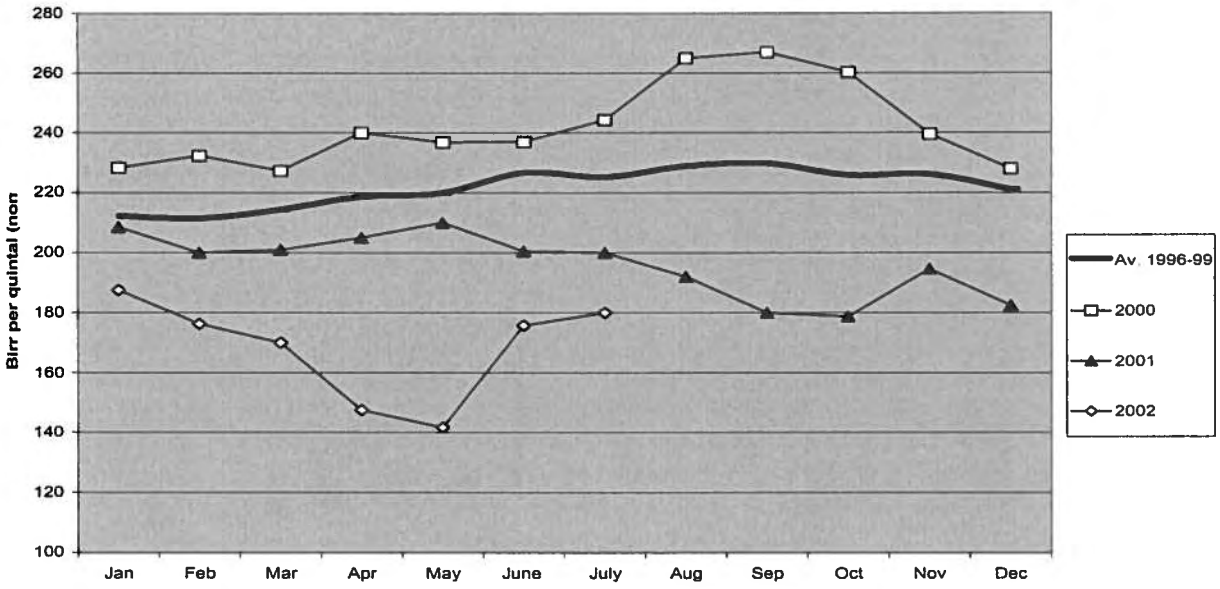


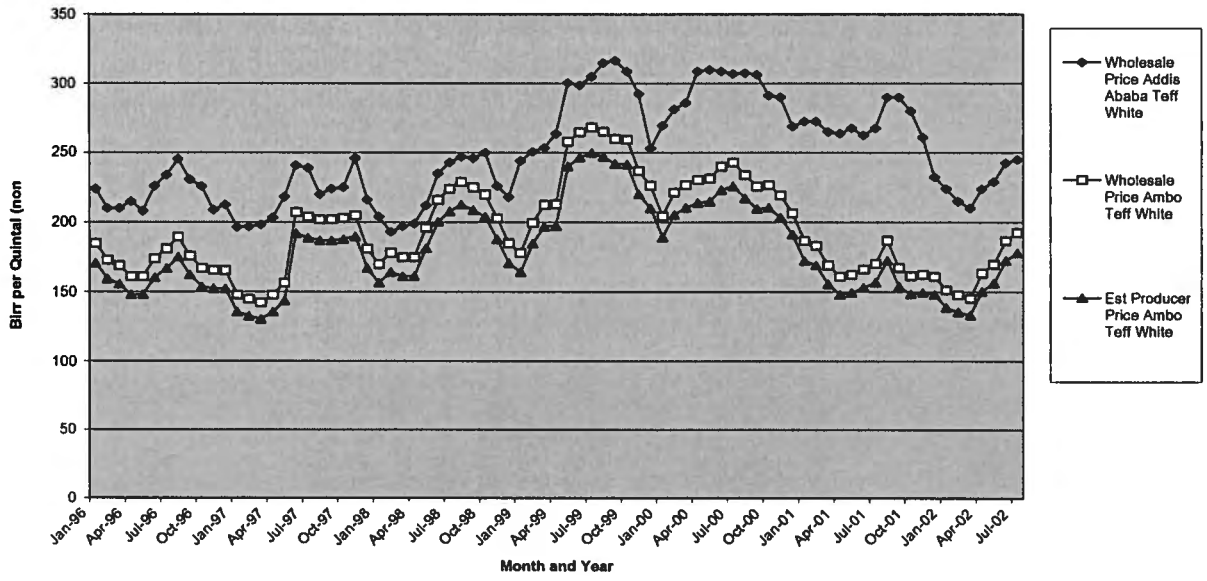
Chart 11. Wholesale Wheat Prices - Diredawa



It can be seen that the normal seasonal price movements for the Diredawa market has been substantially less both in percentage terms and in absolute terms than those of either Nazaret or Bale Robe. Also, of note is the fact that in 2002, the Diredawa price fell through until May, by a substantial amount, but that in Nazaret and Bale Robe has increased since February. This is probably because there may have been significant non domestic supplies (resold grain which had been distributed as food aid), coming into the Diredawa market during that period.

Teff. Prices at the wholesale level for Addis and Ambo, a major producing area are shown below in Chart 12.

Chart 12. White Teff Price Structure Addis Ababa and Ambo



Teff prices, represented here by white teff, have not been as volatile as those for wheat or maize and the price decline between mid 2000 and April 2002 was less in percentage terms at all levels. It is technically easier for farmers to store, and as the 'preferred cereal' in most of Ethiopia, with a higher normal price, demand for it is likely to have been more price elastic than for maize or wheat. Charts 13 and 14 below show the Teff prices in the past three years compared with the 1996-1999 averages in Addis and Ambo.

Chart 13. Seasonal Variation in Wholesale Teff Prices - Addis

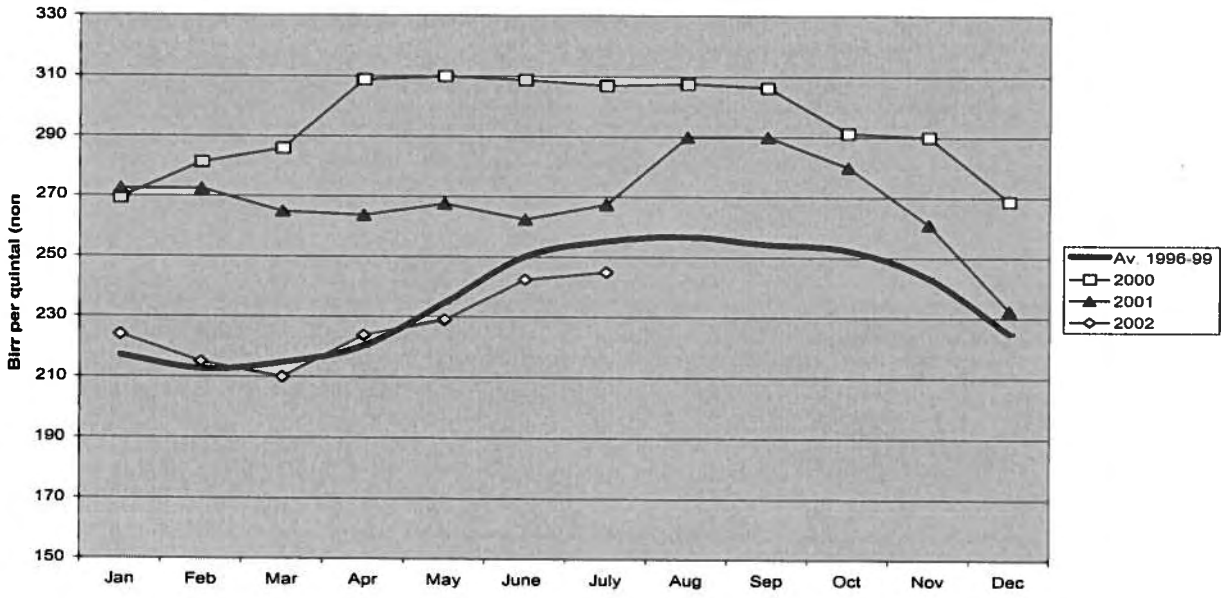
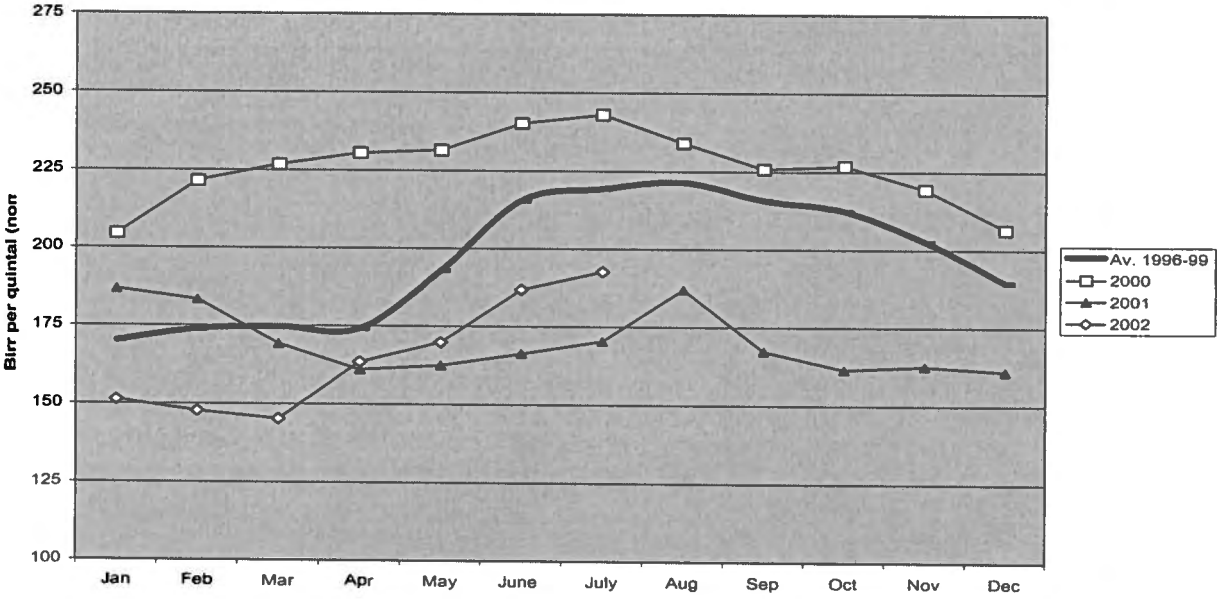
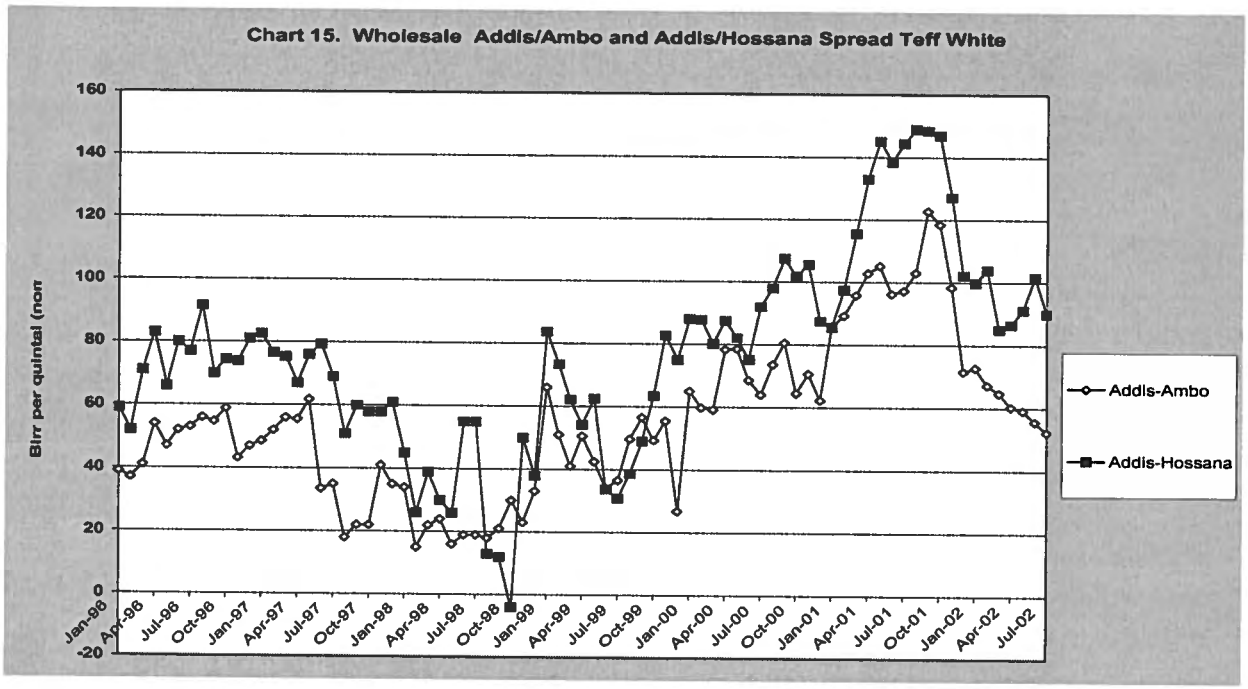


Chart 14. Seasonal Teff Price Variations - Ambo



Wholesale prices were slightly above the 1996-1999 levels in Addis in 2001 and very close to them in 2002. However in the production areas, levels were comparatively lower, indicating that the marketing spreads on Teff had increased.

Chart 15 below shows the Teff price spreads between Addis and Ambo and Addis and Hossana, since 1996. They both appear to have been very large in 2001, but have fallen somewhat by mid 2002. Both spreads have for several months in succession been well above the likely cost of a wholesaler to wholesaler trade. It is possible that part of the apparent discrepancy results from quality differences, although there may also be week market connections.



Reason for Low Prices to February 2001 to April 2002

The evidence reviewed here and wide ranging discussions with people involved with the grain trade from both the commercial and aid standpoints suggests that the low prices from about February 2001 to December 2001 were largely a result of excess supply[6], caused by both a very good harvest – 17% above average (Oct 2000-Jan 2001) and a lot of imported aid grain in parallel c.550,000 tons. The previous year had seen an average harvest and over one million tons of imports.

Although the Oct 2001 to Jan 2002 cereal harvest was not so good (13% lower than the previous year's according to CSA), there were carry over stocks from 2000/01. The low prices which continued through March 2002 were largely a result of (i) the need of farmers to sell quickly, in part to repay fertilizer loans, and (ii) the general lack of interest or resources of the private commercial sector to buy grain to store and also relatively little local aid purchase during the first two months of the year. Lack of interest by merchants largely resulted from the huge losses they had taken during the previous year, which had meant that many of them were heavily indebted to the banks.

Following the poor 2002 Belg rains, which will substantially reduce the 2002 Mehr maize harvest, as well as the Belg harvest of Teff and some pulses, supplies have tightened `and prices have now kicked rapidly upwards. The Addis Ababa wholesale price for maize at the end of July 2002 is about Birr 100/quintal or 70% up on what it was three months ago. It is now close to the average level of 1996 to 2000[7]. Farm gate prices in Nakempte are currently (July 2002) Birr 52 per quintal, or about 150% above the previous harvest time price[8], but supplies on farms are now reported to be very limited.

While there are inefficiencies in transport and handling of cereals in Ethiopia, the improvement of which could help to reduce the wholesale to farm-gate price gap, these are not seen as the major cause of the low level of farm prices in the past two years. Discussions with traders transporters and brokers as well as a review of earlier analytical work carried out by IFPRI[9] suggests that trading margins are quite tight and markets, particularly in surplus areas are competitive. The 'market failure' is connected with smoothing out temporal supply and demand inequalities rather than spatial ones.

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6 Clearly lack of purchasing power among the very poor is a contributing factor, but largely because the need to feed them institutionally has been largely fulfilled by bringing in food aid from outside and so adding to the aggregate grain supply. Had they been fed with locally procured cereals, prices would not have fallen so far for so long.

7 Addis Ababa overall average wholesale maize price in current Birr from 1996 to 2000 was Birr 103/quintal. The average July price over the same period was Birr 113/quintal.

8 Farm-gate prices hit an estimated minimum in Nakempte of Birr 21 per quintal in November 2001.

9 Eleni Z. Gabre-Madhin Market Institutions, Transaction Costs, and Social Capital in the Ethiopian Grain Market, Research Report 124, IFPRI.

Profitability of Grain Production and Input Use

Over much of the period 1996-2000, grain prices at the farm level have been above world prices and high enough for reasonable returns to inputs. However, the maize/wheat differential is greater than in most countries, with wheat, typically being worth 1.7 times maize. This compares with perhaps 1.3 on the world market (depending upon wheat quality).

In 2001 and 2002, harvest time prices, meant that on average farmers following extension advice and using inputs, and in particular for maize almost certainly did not cover their production costs. Data from the Fertilizer marketing and credit study (DSA December 2001) indicated maize production costs for farmers using improved inputs in 2001, taking account of labor and animal traction costs were Birr 98 per quintal for Hadiya, 131 per quintal for East Wellaga and Birr 70 per quintal for East Gojam, compared with output prices of between Birr 48 and 57 per quintal. These were respectively 104%, 173% and 23% above the 'cost of production'. It is clear that farmers in surplus areas, where the farm gate price last year was much lower would have made losses. Indeed taking the average seed and fertilizer costs from the study areas (Birr108/ha for seed and Birr360/ha for fertilizer), farmers in Nakempte would probably not have covered those cash costs from the sale of their crop.

Provided, there is adequate moisture and appropriate planting materials, incremental outputs of 4 or 5 to 1 on a material used basis can be expected from applying DAP or Urea to maize at recommended dosage levels. On this basis, the policy of promoting fertilizer use probably resulted in sound benefits to maize growers on average from 1995 to 1999. However, Ethiopian fertilizer prices at the farm level are very high (see Table 7). Indeed for maize planted in 2000 and 2001 to be sold early the following year, the Urea and DAP to maize price ratios at 6.0-1 and 9.0-1 respectively were almost certainly so unfavorable that use of fertilizer was uneconomic. At the international trade level, the ratios between fertilizer prices and grain prices are about 1.7 to 1 for Maize DAP and 1.2to 1 for Maize to Urea. The ratios facing UK farmers – Wheat to Urea are about 1.5:1.

Farm Gate Maize Prices and Fertilizer Prices near Nakempte

		1996	1997	1998	1999	2000	2001	2002
Maize Price January	Birr/q	63	45	70	63	92	47	32
Urea Price –Previous Year	Birr/q	168	190	234	184	160	189	195
DAP Price – Previous Yr.	Birr/q	178	200	249	238	249	282	287
Maize/Urea price Ratio		2.7	4.2	3.3	2.9	1.7	4.0	6.1
Maize/DAP price Ratio		2.8	4.5	3.5	3.8	2.7	6.0	9.0

The price data in this table is based on prices to farmers in the accessible surplus area around Nakempte, which is a major supply point for the Addis wholesale market. It is calculated from the well collected price data of the EU Local purchase unit. Area specific data, for more remote places which indicates substantially lower prices of birr 20/kg for maize has been quoted in the IFPRI 2020 Vision Network for East Africa Report. . With such poor prices, farmers would have been in an overall loss making situation. Potentially such a situation can give rise to forced sales of work oxen and hence a reduction in farmers' capacity to grow crops as farmers struggle to repay their fertilizer credits. The position with wheat was a little better, with surplus area prices of about $70/ton, while Teff prices were generally above the US$150/ton level.

Impact of Food Aid on Grain Prices

As a consequence of the volume of its supply, relative to traded grain, food aid is likely to have a major effect on prices. Analysis for the past 7 years suggests that the demand for marketed grain at the wholesale level is inelastic, particularly in years of good production. However, because of the difficulty in disaggregating supply data, it was not possible to estimate meaningful wholesale demand elasticities using Ethiopian time series data. Therefore the following analysis is based on the 'normal' situation for staple foods. That is, it is assumed that the own price elasticity coefficient of regionally marketed grains is likely to be a bit less than –1 at the wholesale level. Because of the mostly fixed costs of moving produce from farm gate to wholesale level and hence farm gate prices are much lower than wholesale prices, this coefficient is much more inelastic at the farm gate level. So from the farmers' point of view, the effective impact of small increases in supply can be harsh, particularly in high production periods when the price is very low anyway. For sure, imported aid grain has a substantial negative impact on real farm incomes in years of high production – this is quantified in the 'model' overleaf.

The assumptions of the model are based on a range of different studies. Firstly, the levels of production (A) – these represent the range of typical bumper, average and poor harvests over the past 8 years, based on CSA data. Secondly, the volume of grain marketed by farmers (D) is based on the 1998 findings of Gebremeskel, Jayne and Shaeffer (GRMP WP8)[10]. These indicated that about 26% of all cereals and 37% of pulses were marketed – to give an average of about 28% of grains. The general feeling among merchants and the suggestion in the more recent paper[11] by Wolday Amha is that this has probably increased over the past few years, so the assumption in the model is that farmers aim to retain 70% of an average harvest, but if the yield is higher, they retain an extra 30% of the additional production, and if lower, 30% less. The net result is that in a bumper year, about 34% of production is marketed, in an average year 30% and in a low harvest year, 24%.

The findings of WP8 were also that of the marketed total, 31% was grain was sold to consumers and 20% directly to retailers. In all about 45% of the 2-3 million tons of marketed grain was purchased by interregional traders and of that 69% was sold in terminal markets and deficit areas. For the sake of this analysis, it has been assumed that the traded proportions have increased a bit – to 50% in an average year, and that all of that is linked to the market. In high volume (hence lower price years), it is assumed that farmers direct sales to consumers and local retailers are higher and in years of shortage they are lower. In the model – base case, it is assumed that these customers take 30% of the amount more than they would have taken on average in a bumper year and 30% less in a short year (F).

By deduction therefore the volume of domestic grain for sale in main markets and deficit areas can be calculated as G, or about 1.2 million tons in an average year.

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10 Gebremeskel, Dessalegn, T.S. Jayne and J.D. Shaeffer. Market structure conduct and performance: Constraints on performance in Ethiopia's Grain Markets. Grain Market Research Project (GRMP) MEDaC Working Paper 8. 1998

11 Wolday Amha. The Structure and Functioning of the Post PADETS Grain Marketing System in Ethiopia, Paper presented at the IFPRI/EDRI policy forum on Agriculture Technology Diffusion and Price Policy, Addis Ababa March 25, 2002

Model Showing Impact of Additional Aid Grain Supply on Domestic Prices Under Different Scenarios.

		Bumper Year	Average Year	Poor Year
		----------million quintals----------		
A	Assumed Total Grain Production - (CSA)	92.0	82.0	72.0
B	Farmers' Own Consumption - Basic (70% Av Year)	57.4	57.4	57.4
C	Adjustment for available supplies (0.3*(A-A_{av})	3.0	-	(3.0)
D	Volume Marketed by Farmers (A-B-C)	31.6	24.6	17.6
E	of Which Local Sales – 50% of Average (0.5*D_{av})	12.3	12.3	12.3
F	Adjustment for available supplies (0.3*50% of (D-D_{av})	1.1	-	(1.1)
G	Sales in main markets and deficit areas (D-E-F)	18.3	12.3	6.4
		----------ETB/quintal----------		
H	Addis Average Wholesale Price (based on Maize). Poor year and bumper year based on average year, but adjusting price for lower/higher supply, assuming a price elasticity of demand of -1 at wholesale level	60.7	90.0	174.3
I	Broker's Margin	1.0	1.0	1.0
J	Transport Cost 1/	16.0	16.0	16.0
K	Tax (5% 0f W/S Price)	3.0	4.5	8.7
L	Merchant's Margin - Production Area	4.0	4.0	4.0
M	Storage Cost & margin (av 6 months)	7.9	12.5	25.5
N	Bag Depreciation	0.5	0.5	0.5
O	Donkey Transport - Farm to Regional Market	5.0	5.0	5.0
P	Ex Farm Price shortly after Harvest	23.2	46.5	113.6
Q	Derived Price Elasticity at Farm-Gate Level	(0.44)	(0.61)	(0.79)
	Assuming 30% of Aid leaks into the W/S market one million quintals of imported cereal aid would alter prices as follows.			
R	- W/S price change	-1.6%	-2.4%	-4.7%
S	- Farm-Gate price change	-3.8%	-4.0%	-6.0%
	Conversely, with 30% leakage, one million quintals of Local purchased aid would reduce supply by 700,000 q net, which would have the following price effects.			
T	- W/S price change	3.8%	5.7%	11.0%
U	- Farm-Gate price change	8.8%	9.3%	13.9%

1/ based on Maize ex Nekempte

Note: while in a glut year, the price in surplus areas would be closely linked to the Addis price, in some short years, there may be no trade and so prices in production areas may be higher than the level derived from the Addis market.

Taking the grain price in an average year, and applying the figures to maize in the Addis wholesale market, a typical price figure of ETB90/quintal is assumed. With a price elasticity assumed at -1, and **no other supply sources**, the resultant wholesale prices in a bumper year would come out at ETB60/q and in a poor year at ETB174/q (H).

The price in surplus areas is derived from these figures by deducting the costs between farm-gate price shortly after harvest and average wholesale price e.g. after about 6 month's storage. Estimates of these costs, for maize are shown in lines I to O. These are estimated costs, including profit margins' for 2002 obtained mainly through discussions with local merchants, urban merchants, truckers and assemblers. Storage costs include the cost of storage, the value of weight losses and a presumed return on investment of 12.5% over 6 months. The transport cost from farm to local merchant is appropriate for producers living about 5km from the roadside. For those in more remote areas, the cost would be higher.

Based on these figures a reasonable derived producer price per quintal shortly after harvest for maize at for example Nakempte would be ETB46 in an average year, ETB23 in a bumper year and ETB 114 per quintal in a poor year. At the producer level therefore the derived elasticity of demand with respect to farm-gate price (Q) is -0.44 in a bumper year, -0.61 in an average year and -0.79 in a poor year, compared to the assumption of -1 at the wholesale level for all three cases. That is demand is much more inelastic with respect to farm-gate price than it is to wholesale price, particularly in high production/low price years.

Given that there is virtually no commercial international grain trade in Ethiopia, the main way in which supply can be affected is through food aid. There is a need for significant amounts of food aid in Ethiopia practically every year. It is clear that in most cases, a significant proportion of that food aid finds its way on to the commercial market. Assuming the proportion is 30%, imported food aid has the effect of increasing marketed grain supply by 30% of the volume of aid, while locally procured food decreases supplies by 100%-30% =70% of the volume of aid. The model shows that in a poor year, one million quintals of imported food aid (about one seventh of the total average amount) would reduce wholesale prices by about 5% and farm-gate prices by about 6%, whilst in a bumper year, the same volume of locally procured food aid would increase wholesale prices by 4% and farm gate prices by 9%.

Market Linkages – Spatial – Temporal

Spatial Price Linkages. To summarize the findings in the section on price data, there appears from the charts to be a strong relationship between the monthly prices of grains in the main markets. Correlations are quite high, particularly for wheat and maize. Among the nine markets considered over seven years, for maize, average correlation was 0.89 with a similar figure (also 0.89) among seven markets reviewed for wheat. For Teff, the average correlation figure was 0.73 among eight markets. This indicates that there is spatial interconnection between markets. However, the recent Food Marketing Study[12], suggested that often, for significant periods of time, apparent price spreads yielded 'super profits', implying an inefficient interconnection. Generally, the inclusion of the last year's data (July 2001-2002) has indicated tighter margins, particularly for wheat or maize, and particularly in the key trading period – January – April.

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12 Food Marketing Study, Emerging Market Economics Ltd. September 2001,

This mission's interpretation is that where there are strong regular trading links and substantial trade volumes, arbitrage is competitive but fairly high cost. However, because of variation in demand for haulage, different and interpretations of taxes, the cost of arbitrage probably varies considerably through the year and between years, as does the quality of grain in the different markets. These factors together probably mean that the true amount of 'super profits' taken from the system may be lower than implied by the Charts in the Food Market Study. The current spreads among, to and from the markets visited by the mission in July 2002 (Shashemane, Nazaret, Addis, Jimma, Wolliso and Diredawa) appeared reasonable in relation to transport costs, handling charges taxes and acceptable margins, although this is an area of investigation which could be pursued further.

Temporal Linkages. In a well performing market for grain with one main harvest season, prices are expected to increase through the year in a way which covers the cost, including a reasonable profit, of storing the grain. With the grain storage largely a private sector operation, reasonable and consistent returns need to be available to people who store grain. It has been shown in the charts earlier that this has not been the case in some recent years. Indeed, historically, over the past seven years, storage on a formulaic basis (buy in January sell in July) would have been moderately profitable on average. However, there has been huge year on year variability. This is summarized in the table below and detailed in Tables 8 to 10

Storage Margins at Major Wholesale Level – Year by Year January - July

	1996	1997	1998	1999	2000	2001	2002	Average
Maize	-14%	44%	13%	63%	-5%	-39%	56%	15%
Wheat	1%	46%	-4%	36%	13%	-27%	23%	7%
Teff	2%	18%	16%	22%	11%	-4%	7%	10%

The margins recorded here are the percentage difference between the wholesale grain value in July less the estimated direct cost of storage as a percentage of the cost of grain plus direct storage costs. They do not cover either traders' overheads or finance costs. Finance costs over the years under consideration would have been about 11% p.a. or 6% for a six month storage period. Taking those factors into account, Wholesale merchants who stored would have, on average, lost money in 1996, and 2001, made money in 1997, 1999 and 2002 and had mixed results in 1998 and 2000.

Profitability on average appears to have been higher, as a percentage for storing at the farm or local merchant level than at the terminal markets for teff and wheat, but lower for maize.

Average Margins from January to July Storage 1996-2002

	Farmer	Regional Merchant	Addis Merchant
Maize	10%	13%	15%
Wheat	8%	9%	7%
Teff	17%	18%	10%

While on average the seasonal price movements of grains have been as expected, the huge year on year variations have made it difficult for the emergent private sector to flourish. Discussions with a number of merchants indicated that as a result of the recent heavy losses, incurred in 2001, many were reluctant to participate in the market in 2002. This almost certainly exacerbated the problem of low farm-gate prices through March 2002.

Impact of Low Grain Prices on the Food Insecure

The impact of low food prices on the poor depends on what their income sources are. In general, poor urban people who are food insecure but are just surviving and do not receive food aid are likely to have benefited from food lower prices. As long such a household is a net buyer of food overall, the real cost of food to them would have gone down. For rural people, the impact may have been different; farmers' net income would have gone down by a greater percentage than the food prices themselves. This would have affected food insecure people on the income side as farmers had to either lower wages or replace poor hired laborers with more of their own inputs, making poor rural workers worse off. . Similarly, marginal farmers, producing a tiny surplus would be worse off, as they would have needed to use more grain to pay for inputs and so become food insecure. People who are receiving food under "food for work" programs, and are therefore selling part of it in order to acquire other goods would, of course, be worse off as a result of lower food prices, if the "food for work" payments were based on specific physical quantities of food, rather than on food of a certain value linked to a wage rate. Indeed any recipient of food aid, who sells part of it would suffer as a result of the very low food prices. The only real beneficiaries of the low cereal prices have been people earning incomes which do not depend on agriculture – perhaps less than a quarter of the population.

II Recommendations

Towards More Stable Grain Prices

Prices at levels which **reward production adequately** and **give incentives for storage**, and **movement between markets** are important elements of a functioning grain market system. In view of its reasonable self sufficiency aims, **Ethiopia should try to keep grain prices on average in line with 'world prices', or even a bit above them** – i.e. closer to import parity than to export parity **and in parallel encourage seasonal movements which reward storage**. The main macro tool which it has is in this regard concerns **influencing supply through co-coordinating the flow of aid grain,** so that at times of high prices, this is brought in from outside, but when prices are low it is procured locally.

Co-ordination of Domestic Prices and Source of Supply for Aid Grain.

Because of the weather variability, Ethiopia will always have the need to cope with emergencies and feed drought afflicted people. A priori, aid grain should only be imported when within the country as a whole, there is a shortage. In times of regional deficits, but available supplies in country, grain to deal with the starving should be domestically procured.

Ethiopia has substantial good quality emergency reserve grain storage (up to about 300,000 tons in the Strategic Reserve[13]) as well as quantities held by EGTE and DPCC. The Strategic Reserve grain is available for use at short notice by aid agencies or government as a loan, to deal with emergencies, but has to be replaced within a specified time frame. To the extent possible, GOE should agree with the agencies who borrow from the reserve to replenish it in a way which helps to stabilize prices. This not only needs co-ordination between GOE and donors, but also close co-operation within the various GOE bodies with an interest in grain production (MOA), grain marketing (Ministry of Trade and Industry), emergency preparedness (DPPC) and grain storage (ESFR). A series of indicator price bands, for wheat and maize for the Addis wholesale market needs to be developed – changing through the year to reflect storage costs. Then, in principal. if the Addis wholesale price is below the target range aid grain imports should not be allowed, similarly, if the Addis wholesale price is above the range, aid grain should be imported and local purchase not accepted While donors should be able to withdraw grain from the emergency stores according to need, it is very important that the timing and sources of restocking, should be aligned with a policy for rational domestic grain prices. Clearly, a policy based on these concepts will need 'selling' to donors, particularly those wishing to bring grain into the country and 'monetize' it.

Storage by the Private Sector.

With little linkage to the outside world's grain trade and no domestic futures market in which to hedge, grain merchants, who have suffered badly in the past two year's may be reluctant to engage themselves in storage. Other potential storers of grain to be marketed are farmers, who in any case store about 70% of the crop for their own and local use, processors (who only handle

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[13] The Strategic reserve is officially 407,000 tons, but the actual storage which it can accommodate is about 300,000. The balance represents supplies which have been advanced to donors against pledges.

about 1% of traded grain) or the public sector, which in any case controls the stored emergency supply system or about 20% of all traded/food aid grain.

One source of encouragement for merchants to store may be a warehouse receipts system, which would improve access to finance. However, based on the past few years' results, traders risk losing a lot if they store, but if they are smart, they can make good money turning stock over fast and buying and selling in the same market. Thus, there may be little enthusiasm by them for storage, even if they have better access to debt finance. Taking on board more debt of course increases risk, and unless traders can expand their equity in parallel, encouraging them to do this may be risky. Private storage of grain for sale is more likely to be of interest to producers. This would be aided by (a) improved extension to reduce farm level losses, and (b) lengthening the time period for farm level production credit to cover the storage period as well. In the medium term, development of multi-purpose farm co-operatives may be an important option for encouraging farmer controlled storage and would link well into a warehouse receipts financing system. Because of the small unit volumes to be stored for sale by individual farmers, there would seem little chance of small farmers themselves benefiting directly from a warehouse receipts program.

Commercial International Grain Trade

The price differential from ex- farm to f.o.b. Djibouti for cereals is close to $100 per ton for exports and the spread from c.i.f. Djibouti to Ethiopian wholesale markets is about $60 per ton. All in all, at the farm level, the import parity/export parity spread for cereals is of the order of $120 per ton, for commodities whose 'international prices' are in the $80-$150 per ton range. It is clear therefore that using commercial imports or exports to 'stabilize' domestic cereal and grain prices is not realistic. However, there may be some limited opportunities for exports to landlocked areas in neighboring countries, particularly for aid purposes in surplus years and for exports of teff to countries with significant expatriate Ethiopian communities.

Dissemination of Market Information

Data for a range of commodities has been collected weekly at 25 markets by enumerators who are supervised by the EU local procurement team, who picked up on the work of the earlier Grain Marketing Project, which had been advised by Michigan State University, but stopped in 1998. The EU team has indicated that its present function will be radically changed in December this year. It will be important to ensure that well implemented present system is kept going and usefulness enhanced. At present, the good data which is being collected remains available to EGTE, the EU and the Government, and has been kindly provided to this mission. However it has not been disseminated to farmers or the grain trade. It is strongly recommended that GOE picks up on this and with support from a suitable donor, continues to collect price data and in addition arranges for its wide dissemination.

Taxation of Grain

It appears that the present system of a 'first sales' tax of 5% is not always followed. In some cases, it is avoided and in others, particularly when regional boundaries are crossed, additional taxes appear to be charged, especially when grain flows from production areas to Addis or Nazaret and then on to other final destinations e.g. Diredawa. The proposed advent of VAT on grain (likely to be at 15%) should reduce irrationality in the market place, but it will increase the producer/consumer price spread by close to 10% of the wholesale value of the product. [Any

grain passing through the hands of a VAT registered trader – likely to apply to all grain which is moved around the country – will incur a 15% tax rather than the present 5%] Ceteris paribus, this will result in an increase of Birr 10 – 20 per quintal, which will be shared between producers and consumers. The 50% of traded grain which goes from the producer directly to consumers or to small retailers will not be affected.

Summary of Priorities for GOE in the Grain Marketing Sub-Sector

There are a number of activities which need undertaking in the grain marketing sub-sector, some of which might be best tackled by setting up a grain marketing policy body, supported by a secretariat or technical unit. Such a body could co-ordinate grain related activities of the various agencies and Ministries whose actions are likely to affect grain markets, so that GOE policy is internally consistent. Important items include

- Coordinating grain production forecasts between CSA and MOA/FAO, so that the best possible timely estimates are obtained.
- Ensuring that the good flow of market price information continues to be available, and in addition information on grain transport and other storage and marketing costs are collected and systems are set up for dissemination of this information.
- For policy purposes, establishing guideline price levels for grains at key markets throughout the year and monitoring prices against these guidelines.
- Devising rules for rationalization of supply sources for aid grain based on explicit policy with regard to actual/projected price levels and guideline prices (see above), so that local procurement is emphasized when prices are likely to be low and imports of grain when prices are likely to be high.
- Encouraging donors to procure ahead of time in the local market when prices are low so that in surplus years, aid grain for the future could be bought up and stored in ESFR. That is it would then 'take deposits' as well as 'make loans', and so could fulfill more of a stabilization function as well as being 'a ready source of short term food aid'.
- Drawing up proposals for the future role of EGTE, including providing for the effective utilization of EGTE's substantial underutilized grain storage capacity, possibly by taking it out of EGTE's balance sheet.
- Reviewing taxation policy for grain (VAT introduction) in the light of GOE's various social policies, and the impact it will have on spreads between surplus area markets and consuming markets and on retail grain prices in urban areas.
- Advising on legislation required to make commercial contracts for supply of grain enforceable.
- Reviewing the present input finance system to small farmers with the aim of ensuring that, where appropriate, there is flexibility, so that the period financed, matches not only the production period, but also covers the option of on-farm storage by creditworthy borrowers.

Other important elements would include

- Supporting applied research and information dissemination on on-farm grain storage, possibly through existing donor supported projects.
- Support mechanisms for encouraging and improving the quality of commercial grain storage.
    - Implementation of a warehouse receipts program, linked to credit (depends on success of proposed pilot investment)
    - Encouraging municipal investment in infrastructure around and within grain markets.