34641

Environmentally and Socially Sustainable Development Unit
Europe and Central Asia Region

TURKEY

A Review of the Impact of the Reform of Agricultural Sector Subsidization

March 9, 2004

Mark Lundell
Julian Lampietti
Rashid Pertev
Lorenz Pohlmeier
Halis Akder
Ebru Ocek
Shreyasi Jha


The World Bank

The findings, interpretations, and conclusions expressed in this paper are those of the author(s) and do not necessarily reflect the views of the Board of Executive Directors of the World Bank or the governments they represent.

For submission of comments and suggestions, and additional information, including copies of this report, please contact Mark Lundell at:

1818 H Street N.W.
Washington, DC 20433, USA
Email: mlundell@worldbank.org

Cover photos by:– Mary Hill/The World Bank - women working in the field, man loading peppers onto tractor in Adana Plain; Yosef Hadar/ The World Bank - grain harvesting

Printed on recycled paper

Currency and Equivalent Units

(Exchange Rate Effective as of March 9, 2004)
Currency Unit = TURKISH LIRA (TL)
US$1.00 =1,310,000

Fiscal Year

January 1 to December 31

Weights and Measures

Metric System

ACRONYMS AND ABBREVIATIONS

ACC	Agricultural Credit Cooperative
ADC	Agricultural Development Cooperative
ARIP	Agriculture Reform Implementation Project
ASCU	Agricultural Sales Cooperative Union
CAYKUR	State Tea Company
CBAT	Cattle Breeders Association of Turkey
CSE	Consumer Support Estimate
da	decare (0.1 hectare)
DFIF	Support Price Stability Fund
DIE (SIS)	State Institute of Statistics
DIS	Direct Income Support
DSI	State Hydraulic and Water Works Organization
FAO	Food and Agriculture Organization
GAP	Southeast Anatolia Project
GDP	Gross Domestic Product
GDRS	General Directorate of Rural Services
GNP	Gross National Product
GOT	Government of Turkey
GSSE	General Services Support Estimate
MARA	Ministry of Agriculture and Rural Affairs
MIT	Ministry of Industry and Trade
MPS	Market Price Support
NAC	Nominal Assistance Coefficient
NPC	Nominal Protection Coefficient
OECD	Organization of Economic Cooperation and Development
OLS	Ordinary Least Squares
PSE	Producer Support Estimate
QHS	Quantitative Household Survey
SIS	State Institute of Statistics
SOE	State-Owned Enterprise
TEKEL	Turkish (State) Alcohol and Tobacco Company
TL	Turkish Lira
TMO	Turkish (State) Grain Board
TSE	Total Support Estimate
TZDK	Turkish Agricultural Supplies Institute
TZOB	Turkish Chamber of Agricultural Producers
WUA	Water User Association

Acknowledgments

This report was written by Mark Lundell (Team Leader, Lead Agricultural Economist, ECSSD), Julian Lampietti (Senior Social Development Economist, ECSSD), Rashid Pertev (Senior Agricultural Economist, ECSSD), Lorenz Pohlmeier (Senior Financial Analyst, ECSSD), Halis Akder (Consultant, Middle East Technical University), Ebru Ocek (Consultant), and Shreyasi Jha (Consultant). Taras Pushak (Consultant) provided statistical support, and Amy Evans (Consultant) assisted with the preparation of the Statistical Annex. Jennifer Ngaine and Ulker Karamullaoglu were the Program Assistants responsible for editing and managing the team support. Final editing was done by Alan Zuschlag (Consultant).

The team greatly appreciates the information and thoughtful commentary provided during the preparation of the report by the Ministry of Agriculture and Rural Affairs, the Undersecretariat of the Treasury, the State Planning Organization, the State Statistical Institute, the Undersecretariat of Foreign Trade, the Ministry of Industry and Trade, and the State Hydraulic and Water Works Organization. We also thank the representatives of Turkey's Agricultural Sales Cooperative Unions, the Chambers of Agriculture, the Chamber of Agricultural Engineers, the Tekirdag Farmers Association, and the various private sector firms that examined the draft Review and provided useful corrections and clarifications of events in the agricultural sector over the past five years.

TABLE OF CONTENTS

Vice President:	Shigeo Katsu (ECAVP)
Country Director:	Andrew Vorkink (ECCU6)
Sector Director:	Laura Tuck (ECSSD)
Sector Leader:	Benoit Blarel (ECSSD)
Team Leader:	Mark R. Lundell (ECSSD)

Executive Summary

i. In the latter half of the 1990s, budget deficits and debt levels in Turkey were allowed to reach such high levels that the country's macroeconomic stability was severely undermined. High inflation and volatility of the real exchange rate caused growth rates to oscillate excessively in a "boom and bust" cycle. In order to address this instability, the Government of Turkey (GOT) embarked on a path of disinflation in early 2000, requiring a reduction of government expenditures in all sectors. Given the bloated level of annual budgetary and other fiscal support which agriculture had come to absorb by this time, reforms of agricultural subsidies had a significant role to play in this fiscal stabilization program. For this reason, the GOT initiated a politically demanding but thorough realignment of agricultural support policies, aimed at improving the efficiency in their support to the sector at greatly reduced levels.

ii. Three years into the program, the agricultural subsidy reforms have contributed significantly to the fiscal stabilization agenda by reducing fiscal transfers to farmers by US $4.3 billion, and avoiding a more prolonged and deeper recession. The agricultural subsidy reform program also succeeded in reducing significantly the redistribution of income from Turkish consumers to farmers by US $3.6 billion (or from 22 percent to 8 percent of the value of agricultural consumption) to the benefit of the former. Direct payments to farmers are compensating almost half of the income loss imposed on Turkish farmers by the cuts in agricultural subsidies, proving to be an effective policy substitute for transferring income directly to them. The observed loss in agricultural income (16 percent between 1999 and 2002) primarily reflects the re-alignment in agricultural commodity and input prices that Turkey could no longer sustain fiscally; only 20 percent of the observed fall in agricultural income results from the 4 percent decline in agricultural output.

iii. In 1999, fiscal subsidies to the agriculture sector had reached over 3.0 percent of GDP (US $6.1 billion), although the sector contributed only 14 percent of GDP. The reforms of agricultural subsidies focused mainly on reducing the fiscal support to state and quasi-state marketing enterprises and to credit subsidies and debt write-offs in the rural finance system. Inefficiency in past government support was particularly evident in expenditures covering the annual losses of parastatal marketing and processing enterprises, of quasi-state Agricultural Sales Cooperative Unions (ASCUs), of the Agricultural Bank (Ziraat Bank), and the system of Agricultural Credit Cooperatives (ACCs).

iv. In tandem with the reduced intervention capacity of parastatal marketing enterprises, the subsidy reduction program also eliminated fertilizer subsidies and significantly reduced deficiency payments (output price supports) for most of the supported agricultural products. In partial compensation for these subsidy reductions the Government introduced a Direct Income Support (DIS) Program. Starting in 2001, the DIS Program has made annual payments of roughly US $90/hectare to all farmers on the basis of their cultivated area.

v. **The agricultural subsidy reform program contributed significantly to fiscal stabilization**. By 2002, the cuts in agricultural subsidies (US $5.5 billion) coupled with the introduction of DIS reduced the cost of agricultural transfers (subsidies and DIS) by over 2.3 percent of GDP, contributing a third to the success in reaching the GOT target of a 6.5 percent primary budget surplus. By international standards, the magnitude of this fiscal adjustment from agriculture (agricultural transfers were cut by over two-thirds, or US $4.3 billion) and its quality (since the adjustment squarely focused on subsidies rather than investments) are impressive.

vi. By the end of 2002, the reform program reduced the fiscal outlays on agricultural subsidies by about US $5.5 billion to US $0.6 billion. This represents a savings of over 2.7 percent of GDP. Over half of the subsidy cuts is accounted by the US $3.1 billion reduction in the coverage of losses for state financed crop purchases. The elimination of the credit subsidies and debt write-offs generated another US $1.4 billion in fiscal savings. Fiscal transfers to ASCUs, which had reached US $1 billion per year, were also reduced by US $800 million. The other area of subsidy reduction was fertilizer subsidies, which declined by US $300 million. Put together, 70 percent of the subsidy cuts were directed at lowering agricultural commodity prices and was primarily achieved by imposing hard budget constraints on state marketing and processing enterprises as well as the quasi-state ASCUs. The remaining 30 percent cut was aimed at reducing agricultural input subsidies, notably credit and fertilizer.

vii. In 2001, the DIS Program was introduced by the GOT, aiming to compensate partially farmers for the negative impact on their income of subsidy reduction. As participation in the DIS Program reached about 75 percent of farmers in 2002, the cost of the DIS Program reached US $1.25 billion. Thus, the net reduction in the annual fiscal cost of switching from heavy reliance on intervention in the output, input, and credit markets to the DIS Program has been on the order of US $4.3 billion.

viii. Looking forward, the level of fiscal savings from agriculture will likely fall for a number of reasons. First, the accumulation of budget liabilities for the losses of parastatals has not been entirely stemmed. Progress in reducing the intervention purchases of the Turkish (State) Grain Board (TMO) has been significant, and the cost of intervention purchases by the hazelnut ASCU (Fiskobirlik) has fallen, but less progress has been made in the sugar, tea, and tobacco markets. Moreover, there will be costs to the budget when the Turkish (State) Alcohol and Tobacco Company (TEKEL) is privatized and when the debts of Fiskobirlik to private banks eventually need to be covered. Finally, the DIS Program will likely reach a steady annual cost of almost US $2 billion, when the DIS payment is increased by the expected inflation rate and the participation rate rises close to 90 percent in 2004 as expected, and if the TL/$US exchange rate maintains its current level.

ix. **Agricultural subsidy reforms benefit Turkish consumers**. The agricultural subsidy reform program reduced the burden imposed on Turkish consumers by an estimated US$3.6 billion (per capita – roughly US $50) between 1999 and 2001. Prior to the reforms, agricultural subsidies imposed a heavy burden on consumers by keeping agricultural prices about 25-30 percent above international levels. According to the OECD, transfers from consumers to farmers reached as much as US $ 5.2 billion in 1999, the equivalent of 22 percent of agricultural consumption. Turkish consumers financed 55 percent of the overall support provided to farmers, in the form of higher food prices; about 45 percent of the remaining support to agriculture came

from the budget. By 2001, following the reforms, transfers from consumers to farmers had fallen to only US $1.6 billion annually (equivalent to 8 percent of consumers food budget), indicating a much lower level of support to farmers paid by consumers as agricultural prices fell closer to international levels. By 2001, consumers contributed less than 30 percent of a much lower level of support to farmers, with the remaining 70 percent financed by taxpayers. Consumers have therefore been a significant beneficiary of the reform of agricultural subsidies, and the poor have undoubtedly benefited even more given the larger share of their income spent on food compared to wealthier consumers. The large benefits for consumers is consistent with the earlier observation that 70 percent of the agricultural subsidy reforms was aimed at lowering the support of agricultural commodity prices.

x. **DIS payments compensate almost half of the income loss imposed on Turkish farmers by the cuts in agricultural subsidies**. Between 1999 and 2002, agricultural income fell by 16 percent (US $2.7 billion), while agricultural output declined by only 4 percent. The cuts in agricultural subsidies lowered agricultural commodity prices and raised input prices, bringing both closer to world price levels. By doing so, the cuts in agricultural subsidies realigned downward the profitability of agriculture that had been pushed artificially high by fiscally unsustainable subsidies. An estimated 80 percent of the 16 percent decline in agricultural income is explained by this realignment in agricultural profitability. The remaining 20 percent of the observed fall in agricultural income comes from lower agricultural output as farmers reacted to lower profitability, as well as to lower demand associated with the macroeconomic crisis of 2000 and 2001.

xi. DIS payments, however, reached US $1.25 billion in 2002, and successfully compensated farmers by close to half of their income loss associated with the 16 percent decline in agricultural income. In aggregate terms, Turkish farmers suffered an estimated net income loss of US$ 1.45 billion between 1999 and 2002. The large difference between the fiscal savings from the agricultural transfer (subsidy and DIS) reform program (US $ 4.3 billion) and the net income loss to farmers (US $1.45 billion) is a testimony to the gross inefficiencies of the pre-reform agricultural subsidies in supporting farmers' income. This indicates that, from a fiscal or taxpayers' perspective, the current DIS program is a much more cost effective and fiscally sustainable way at supporting farmers' income than the earlier regime of output and input subsidies. Adding to these fiscal efficiency gains in supporting farmers, the significant savings for Turkish consumers described above would suggest that DIS is an efficient and more equitable substitute for blunt agricultural policies.

xii. **Agricultural prices and profitability adjust to agricultural subsidy reforms**. In the latter half of the 1990s, output and input subsidies encouraged agriculture by artificially raising agricultural prices in real terms, and relative to either agricultural inputs or non-agricultural goods. This trend was reversed in 2000, and the reforms of agricultural input and output subsidies caused a significant re-alignment of agricultural prices. This re-alignment was, however, inevitable since the agricultural subsidies were not fiscally sustainable and had to be cut to help stabilize the economy.

xiii. Between 1999 and 2002, agricultural prices in real terms declined by 13 percent and by 22 percent when measured relative to non-agricultural prices. Within agriculture, crop prices fell by 23 percent relative to input prices, and by 33 percent in the livestock sector. Not all the

decline in agricultural prices results from lower agricultural subsidies. Lower demand for livestock products, brought about by the recession-led decline in per-capita incomes, have caused livestock prices to fall more than crop prices. Prices of the highly regulated crops, tobacco, sugar beet and hazelnut fell the most, between 25 and 50 percent in real terms as the level of government support was significantly reduced between 1999 and 2002. Grain (wheat, maize and barley) prices also declined by about 5 to 10 percent because of reduced interventions by the GOT. Prices of cotton and sunflower seed prices declined the least, either because government interventions were initially limited (cotton) or largely continued unreformed (sunflower). Fertilizer prices doubled when the 50 percent fertilizer price subsidy was reduced and finally phased out in November 2001. The price of agricultural credit witnessed a dramatic shift, as real interest rates increased from about –20 percent during the 90s to about +30 percent in 2001-2002.

xiv. The level of indirect support to Turkish agricultural producers financed by agricultural subsidies and tariffs measures, and measured by the percentage Producer Subsidy Equivalent (PSE), averaged about 25 percent of farm receipts in 1998-1999. By 2001, this measure had declined to 10 percent, with Market Price Support having declined by roughly US $2.3 billion. At this level, Turkey's PSE is one of the lowest of all OECD countries. In terms of individual commodities, crops and in particular grains, sugar and tobacco, account for the bulk of the decline in support to farmers. Since the crop component of the PSE has decreased much more rapidly than that of livestock, the share of support to animal production has increased from 30 to 40 percent. With continued general (i.e., non commodity-specific, such as duty losses and debt write-offs) fiscal support to agriculture still occurring in 2001, Turkey's Total Support Estimate (TSE) remains high (3.8 percent of GDP), although much lower than the peak of 6.7 percent of GDP achieved in 1998.

xv. **Agricultural production adjusts to changing prices, and shows early signs of a shift away from previously highly supported crops**. Over the subsidy reform period, both fertilizer and agro-chemical usage have fallen back by 25 to 30 percent, to levels last seen in the early to mid-1990s. This is due to both the fall in agricultural income, as well as the higher fertilizer prices as the 50 percent subsidy was phased-out. Since flows of credit resources from the Treasury have been discontinued, the two main agricultural sector lenders, Ziraat Bank and the Agricultural Credit Cooperatives (ACCs), have reduced their loan portfolios by about three-fold from the peak level of US$7.3 billion in 1997.

xvi. Despite the lower usage of agricultural inputs and reduced availability of agricultural credit, the volume of crop and livestock output declined by only 4 percent from 1999 to 2001. Crop output was down only 2 percent, but livestock output fell 10 percent. As indicated earlier, it is believed that lower incomes and therefore lower demand for livestock products explain, in part, the larger drop in livestock production, notably sheep meat and eggs where most of the drop was observed. Overall cultivated area decreased by about 450,000 hectares (1.7 percent). The shift across general crop types has been small, as area sown to field crops declined by 2 percent, and the areas under fruit and vegetables increased by only 1 percent. The production volume of cereals, pulses, nuts, and fodder crops increased (in ascending order) by 2 to16 percent, while production of fruits and vegetables has been stable. Tubers (mainly potatoes), industrial crops (mainly tobacco, sugar beet), and oilseeds have seen their volumes fall by 15 to 30 percent. These shifts are often more a result of regional weather variations than of relative prices, but

generally they evidence a shift out of crops where support and prices have fallen the most (tobacco and sugar beet production fell by 40 and 24 percent, respectively) and an expansion of largely deregulated crops (e.g. cotton by 25 percent).

xvii. When one examines the gross crop value per hectare, similar trends are evident. By examining the magnitudes of the declines one can see that the DIS payment of 100 million TL per hectare was able to, on average, more than fully replace lost production value for field crops and for all crops taken together. However, within this wide category, this has likely not been the case for farmers more specialized in tobacco and sugar beet. Thus, the reforms appear to be moving production away from crops which were previously highly supported, but the DIS Program has not fully compensated those that formerly produced the most supported crops (nor was it designed to do so). Moreover, the overall reduction in value added in the sector has made it difficult for farms to find the resources needed to shift into relatively more attractive crops. Supply response in 2001 was particularly sluggish owing to the poor macro-economic environment and very high real interest rates.

xviii. **There are important regional differences in the net impact of the agricultural subsidy reform program**. In examining regional impacts, the total cultivated area has declined across the board, except in the Mediterranean region where it remained stable. These declines have ranged from 3.5 percent in the Central Anatolia region to 0.3 percent in the Aegean region. Indeed, two-thirds of this reduction occurred in the Central Anatolia region, where the sown areas (mainly grains) and fallow areas have decreased by over 300,000 hectares.

xix. The combined effect of area reduction and the fall in agricultural subsidization has been the most notable in the Central Anatolia region, where the PSE (in real 2001 TL) was both highest in absolute terms in 1999 and fell the most in both absolute and relative terms. The lower levels of support to wheat and sugar beet largely explain this large decline in agricultural support to Central Anatolia. The agriculturally most developed regions, Mediterranean, Aegean, and Marmara, experienced absolute declines in agricultural support levels (only 40-60 percent as large as that of Central Anatolia) that are largely explained by the lower support levels for wheat and livestock products. The agricultural weakest regions, Eastern and Southeast Anatolia, experienced small absolute declines in agricultural support, although large in relative terms because of their very low initial level of agricultural support.

xx. DIS payments fully compensated the income loss caused by subsidy cuts in Central Anatolia, even though that region experienced the greatest reduction in proportional terms. In contrast, the more commercially-oriented regions of Marmara and Aegean suffered the largest absolute declines in agricultural income, though relative to their pre-reform levels, the declines were proportionally less than in Central Anatolia. Thus, in these regions, DIS compensated less of the income loss since it is a fixed per hectare payment. Similarly income loss in Eastern and Southeastern Anatolia (with crop values per hectare below the national average) was fully compensated by DIS, while the Black Sea (with crop values per hectare above the national average) saw only partial replacement of the income loss by DIS.

xxi. **The fall in agricultural income largely reflects the re-alignment of agricultural prices and profitability**. Agricultural income fell by 16% (US $ 2.7 billion) between 1999 and 2002, and the subsidy reform was responsible for about 80 percent of that fall. The adverse

movements in agricultural prices -- the 13 percent decline in real agricultural prices, combined with 13 percent increase in the real cost of agricultural inputs -- triggered by the phase-out of agricultural subsidies is the main factor behind the observed 16 percent decline in the agricultural value added. To a large extent, the fall in agricultural income reflects a downward adjustment in the profitability of agriculture profitability that had been pushed to artificially high levels by fiscally non-sustainable agricultural subsidies. The remaining 20 percent of the observed fall in agricultural value added comes from the (4 percent) decline in agricultural output, as farmers adjusted their production to lower profitability as well as to lower demand.

xxii. **DIS compensates farmers for close to 50 percent of their loss in agricultural income**. The DIS Program has played a strong role in supplementing rural income in the aftermath of the substantial reductions in agricultural subsidization and the downturn in agricultural value added associated with the reforms and the 2001 recession. In a 2002 survey of village households conducted under the Agricultural Reform Implementation Project (ARIP), known as the Quantitative Household Survey (QHS) the DIS payments were shown to account for 7 to 8 percent of household income. Given the evolution of the ratio of net agricultural income to gross agricultural income over the reform period, it appears from the QHS results that the DIS Program is replacing about 40 percent of the net income loss which farmers have experienced. Clearly, the reform of agricultural subsidies and introduction of DIS could not have been expected to date to achieve the pre-reform level of agricultural income, especially for the more commercially oriented farmers who were the most responsive to agricultural policies and received the largest share of subsidies in the past. In 2003, DIS payments reached about US $1.56 billion and replaced over 50 percent of farmers' income loss.

xxiii. Obviously, this affects only those who have actually been able to access the DIS Program, which in 2002 included over three-quarters of the farming population. Registration rates have been the highest in the Central Anatolia region. In addition, the national trend of continued higher shares of registered farmers than land areas was particularly marked in the South East Anatolia region, likely owing to the greater frequency of cadastral registration problems there. The most common reason cited by households for not participating in DIS is that they did not believe they were eligible to enter the program. Thus, improving dissemination of information on eligibility criteria, particularly in areas with high numbers of sharecroppers and farmers with land not registered in the cadastre, may help raise the participation rates.

xxiv. Analysis of the QHS data for 2002 indicate that relative to 2001, the area sown to grains (mainly wheat and barley) has fallen, while the areas sown to sunflower and fruits and vegetables have increased. This is in line with what would be expected as a result of the change in agricultural subsidy policies and represents an acceleration of the shifts observed in 1999-2001. Having constructed a model of gross agricultural income based on the QHS data set, the Review's analysis indicates that those households with greater relative wheat specialization, tobacco specialization, and barley specialization, all experience a significantly negative impact on agricultural income.

xxv. These findings are in accordance with the expected results since tobacco prices have fallen the most of all crops, and the PSEs for wheat and other grains (mainly barley) fell from over 40 percent in 1999 to near zero in 2001. Those households with greater relative specialization in sunflowers have experienced a positive impact on agricultural income, which

reflects the high support still accorded to this crop. The model results also indicate that the impact of the DIS Program on farmer's welfare has been significantly positive: one million TL paid in DIS generates approximately 2.5 million in gross agricultural value added. However, the model results reveal no significantly differential impact of DIS on the poor as opposed to non-poor farming families.

xxvi. **The adoption of the DIS Program should be viewed as only the first phase of an agricultural reform process that fosters agricultural incomes and growth in a manner that is fiscally and economically sound and sustainable**. A second phase is now needed that builds on the DIS Program by promoting agricultural productivity and boosting agricultural profitability through both investments in rural infrastructure, and in sustainable rural institutions that deliver critically needed services, including rural credit, marketing and processing, and technology transfers. Currently, DIS is, in effect, substituting for past distortive, inequitable, inefficient and non-sustainable agricultural policies. DIS transfers are as much a rural income support policy as a more efficient substitute for blunt agricultural policies. DIS needs to remain in place until Turkey formulates and initiates the implementation of an investment-based, regionally tailored rural development strategy focused on promoting greater productivity that restores agricultural profitability and income growth. One strand of such a strategy will have to address reversing the fall (two-thirds in 1999-2002) in formal agricultural credit which retards farmers' shift into more profitable crops.

xxvii. **Needed Improvements to the DIS Program and Other Policies**. Though the DIS Program has been able to replace a large share of the loss in agricultural income lost as a result of the reform of agricultural subsidization, it is unpopular with a number of groups in the agricultural sector for two main reasons. First, the planned timing of DIS payments has not been clearly communicated to farmers, nor has a rationale for targeting particular regions earlier in the payment cycle been set out (though it has been partially formulated). These deficiencies are to be addressed in a Agriculture Framework Law in mid-2004. In addition, DIS could be targeted to a greater degree on the poorest part of the farming community. This should be done by increasing the per hectare payments for the smaller half of farms (under five hectares) and substantially reducing the per hectare payments for cultivated farmland above the median farm size. However, the introduction of such adjustments to the DIS Program should take place only after the Program has reached a higher and steady level of beneficiaries and once a comprehensive rural development strategy has been formulated and initiated.

xxviii. This rural development strategy should recognize the second source of the DIS Program's unpopularity: it does not (as it cannot directly) address the needs of commercial farming. So rather than being a substitute for other efficiency promoting instruments of agricultural policy, the DIS Program should be recognized by the Government of Turkey as a piece in an overall agricultural development strategy, which itself fits into the rural development strategy. The other policy instruments that should be deployed in such a strategy would include the following, many of which can be funded from improved efficiency of investment spending and will not necessarily require substantial increase in budget expenditure:

- Promotion of a sustainable rural finance system to take the place of the past system which has collapsed;

- Increased expenditures in rural infrastructure, including irrigation and storage and marketing facilities in concert with the private sector for higher value (and especially perishable) crops in underserved areas;
- Expansion of agricultural extension activities in low productivity areas, again in concert with the private sector and farmers organizations; and,
- Restructuring government institutions which are not adequately adjusting and enforcing commodity grading and hygienic standards.

xxix. If such an agricultural development strategy could be devised and agreed on by the Government, it could then be built on to form a wider rural development strategy, under which the promotion of off-farm rural employment could be accorded its relevant role. These (and other) areas of agricultural and rural development policy will need to be laid out clearly if the Government is to make more efficient use of Government resources for rural development. They are also the fundamental elements needed to prepare Turkey's rural sector adequately for the challenges of the coming years as the process of accession to the European Union accelerates.

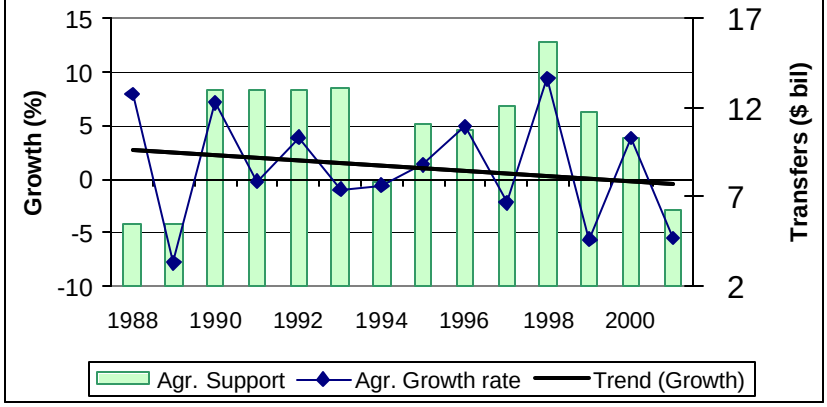
1. The Reform of Agricultural Sector Subsidization

A. The Context

1.1 Turkey is endowed with rich natural and human resources, but its full potential for rural growth went largely unrealized in the period between 1980 and 2002 because of increasingly inefficient rural development policies focused on two main objectives. The first was self-sufficiency in key individual products to be brought about by increasing yields and production levels through the subsidization of agricultural inputs and credit and through the expansion of cultivated land with heavy public investment on irrigation. The second was increasing agricultural incomes by emphasizing output price support policies and protective trade measures.

1.2 During the last four decades agricultural GDP grew about three times slower than the overall economy, resulting in a declining share of agriculture in GDP from 35 percent in 1960 to 15 percent in 2000 (**Figure 1.1,** using SIS and OECD data**)**. However, the share of agricultural labor in total labor force declined by much less, from 55 percent in 1960 to 44 percent in 1997. Although labor productivity in agriculture showed an upward trend over the period 1960-2000, growth rates declined steadily and turned negative in the mid-1990s, with the growth of land productivity showing a similar trend.

Figure 1.1: Agricultural Transfers and Growth



1.3 Agricultural subsidies generated significant and unsustainable fiscal costs, and high import tariff policies placed a heavy burden on low and middle income consumers. As input and price subsidies disproportionately benefited large farmers, this type of agricultural support contributed to income inequality and widening of absolute income differentials in rural areas.

B. Reforms Targeted Subsidies and Hard Budget Constraints

1.4 The non-sustainability (fiscal, economic, and social) of agricultural support policies prompted the Government of Turkey (GOT) to adjust them in 2000 in an effort to promote fiscal stabilization and allocative efficiency. These reforms were part of a larger fiscal stabilization program. The reformed agricultural subsidy policies focused on two broad themes. The first was the phasing out of subsidies for fertilizer, credit and price supports and the introduction of a national program of Direct Income Support (DIS) for farmers through a uniform per hectare payment (roughly $90/ha) unlinked to the production of any specific crop. This was done to partially compensate for the removal of the old subsidy system and to continue to provide adequate income support to the rural sector, but in an incentive-neutral way.

1.5 The second main theme has been domestic price reforms through commercialization and privatization of national parastatal enterprises, including SEKER (Turkish Sugar Company) and TEKEL (Turkish Alcohol and Tobacco Company), and the restructuring of TMO (the Turkish Grain Board) as the support price mechanisms for these crops were reduced. Government has also been supporting the restructuring of the quasi-governmental Agricultural Sales Cooperative Unions (ASCUs), which in the past also intervened to support certain commodity prices. These are being made into sustainable, self-financing organizations dedicated to marketing and conducting primary processing (e.g., cotton ginning, olive curing) of as much of their farmer members' output as possible. These two efforts have reduced the state's direct role in agricultural production and processing considerably.

1.6 The changes to agricultural output subsidization have taken the form of greater market deregulation through reduction and phasing out of state-set prices, and reduced intervention purchases financed by the budget. For example, in the sugar sector, state set prices for sugarbeet were reduced by 21 percent (in real 2001 TL) over 1999-2001, and starting in 2002, these prices have been set on an annual basis under agreements reached directly between the operators of sugar factories and growers. Sugar sales prices are now freely set by the operators of the sugar factories, and in 2002 they fell by an additional 5 percent. Sugar quotas have been set for a five year period by the Sugar Agency (established in 2001), and sugar beet purchases agreed to by the factories have declined by 26 percent over 1999-2001.

1.7 In the tobacco sector, state set prices were reduced by a third over 1999-2001, and were abolished starting with the 2002 harvest. Over the same period tobacco purchases from farmers fell by 30 percent. Under the Tobacco Law of January 2002, there are provisions for purchasing tobacco produced by growers based only on written contracts or open auction. The price of tobacco produced under contract between the producers of tobacco products and the growers is set by mutual agreement. Tobacco produced by growers other than under written contracts is sold on an open auction method. In 2002, tobacco purchase prices fell by an additional 13 percent in real terms (compared to 2001).

1.8 In the grains sector, the Turkish Grain Board (TMO) reduced its volume of intervention purchases by over 45 percent from 1999-2001 to about 2.4 million tons. In 2002, these purchases were reduced further to about 800,000 tons. In 2002, TMO also ceased announcing minimum purchases, and wheat import tariffs were reduced substantially, though they remain at about 45 percent. The prices paid by TMO dropped by 13 percent over 1999-2001, and by an additional 10 percent in 2002. In the hazelnut market, the intervention purchases and announced support prices made by the parastatal Fiskobirlik (hazelnut ASCU) declined by about 25 and 40 percent, respectively, over 1999-2001.

1.9 A related initiative under the reform program provides grants to farmers who require assistance in switching out of crops that are no longer profitable. One-time payments are offered mainly to hazelnut and tobacco producers and are designed to help cover the transitional costs of switching to other crops. However, participation in these programs is not robust, as many farmers are not fully convinced that the GOT will continue to reduce its presence in agricultural marketing in the tobacco, sugar and hazelnut sectors. By completing the privatization of TEKEL and SEKER, ending hazelnut support purchases and facilitating the restructuring of Fiskobirlik, and selling off TMO's excess grain storage capacity, the GOT would ensure hardened budget

constraints on important large marketing enterprises in the sector and improve the efficiency of agricultural markets. This would also improve the outlook for sustained macro-economic stabilization.

1.10 In distinct contrast to the policy of reduction in agricultural subsidies, the GOT has maintained the level of agricultural sector investment outlays financed by the central budget at a fairly constant level during the reform period. These investments have been fairly steady at roughly 600 trillion 2001 real TL, averaging almost US $600 million annually. This represents a 7-9 percent share of the total central budget investment expenditures and roughly 0.3 percent of GNP.

Table 1.1 - Agricultural Sector Investment Outlays By Turkish Central Budget, 1999-2003

	1999	**2000**	**2001**	**2002**	**2003**
Real 2001 Billion TL	567,918	616,541	503,060	566,124	664,876
US$ Million	580	636	410	547	761
Share of Total Investment Budget	6.8%	6.7%	7.3%	8.4%	9.2%
Share of GNP	0.31%	0.32%	0.28%	0.29%	0.40%

Source: SPO website – www.dpt.gov.tr/kamuyat

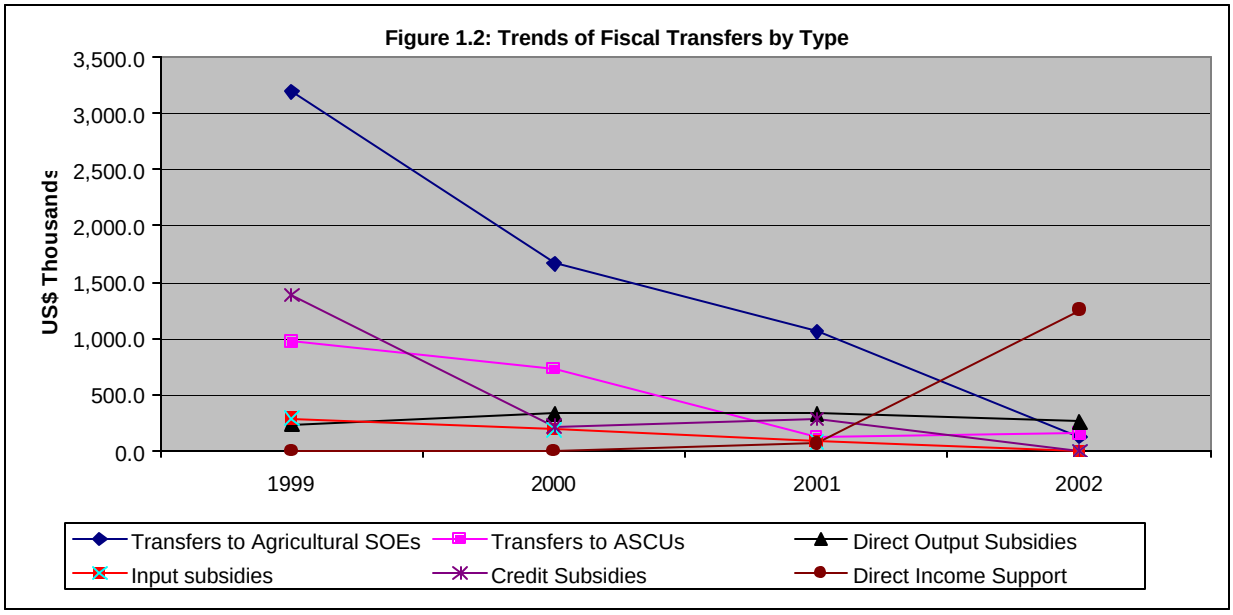
1.11 The next rural development policy challenge for Government is now to define the priorities where it can lead, and promote private sector development. However, before embarking on the formulation of these policies, it is necessary to examine the impact of the various reform policies of the 2000-2002 period so as to take stock of the starting point for the next phase of agricultural and rural sector reforms. The rest of Chapter One concerns itself with the scale of fiscal tightening achieved through subsidy reduction, while Chapter Two examines changes in agricultural terms of trade and Producer Subsidy Equivalents (PSEs) which have resulted from the subsidy reforms. Chapter Three focuses on how the reforms have affected the availability and use of agricultural inputs and credit, and Chapter Four examines resulting changes in agricultural output structure and foreign trade flows. In Chapter Five the Review examines the impact of the of subsidy reforms on agricultural sector productivity at the national and regional levels. Chapter Six presents the analysis of survey data (from 2002) regarding the welfare impact on farmers resulting from the interaction between subsidy reduction and the introduction of the Direct Income Support (DIS) program.

C. Achievements in Reducing Subsidies

1.12 By the end of 2002, the implementation of the main themes of the program had significantly reduced artificial incentives for inputs and particular crops and switched the main focus of agricultural policy to the DIS Program. Annual fiscal transfers have been reduced from US $6.08 billion (3.06 percent of GDP) in 1999 to US $1.79 billion or 0.67 percent of GDP in 2002. This has been effected largely through elimination of credit subsidies, and substantial reduction in crop price subsidies and state financed crop purchases. TMO grain purchases declined from 3.6 million tons in 2000 to less than 1 million in 2002, and budget-financed tobacco and hazelnut purchases decreased by half as well. Many ASCUs have initiated restructuring programs, returned to profitability, and begun to increase value added for their member farmers through improved and expanded marketing activities. At the same time, the DIS Program has expanded to become the main instrument of rural income support. In 2002, the

DIS Program covered approximately 75 percent of farmers and accounted for more than half (US $1.25 billion) of the budget and other fiscal subsidies to the agricultural sector.

1.13 Between 2000 and 2002, subsides to state owned enterprises (SOEs) witnessed the largest declines from US$3.2 billion to US$130 million (**Figure 1.2**). These subsidies include budget for support purchases (the largest share), "duty losses" (compensation for losses on exports or written-off tax arrears), and injections of equity into the SOEs. TMO and TEKEL were the largest recipients of these subsidies. As estimated US $1.0 billion, 35% of the $3.1 billion decline in subsidies to SOEs, was a loss of income for agricultural producers. The other 65% has been an efficiency gain, as these funds were formerly absorbed within the SOEs[1].



Source: Undersecretariat of Treasury and own calculations.

1.14 The second largest decline was in credit subsidies, which by 2002 had been phased out from their level of US $1.4 billion in 1999. Since these credit subsidies were also administered by a state entity (Ziraat Bank, the state-owned Agricultural Bank) or quasi-state entities (the Agricultural Credit Cooperatives, ACCs), a significant share of these subsidy reductions did not fall fully on farmers, given ACC overstaffing, and high administrative costs. Since the incidence to farmers in the past for these credit subsidies was roughly 80 percent[2], they have lost roughly US $1.1 billion as a result of reduced credit subsidies. The third largest area of subsidy reduction were transfers through ASCUs, which have been reduced by over 80 percent. Similar to output subsidy flows through SOEs, an estimated 40 percent of these subsidy reductions represent losses to farmers: roughly US $320 million. Input subsidies declined by US $300 million and have been borne entirely by farmers through higher input prices As a result, the reduction in these three subsidy areas by the above amounts has meant that farmers lost roughly an additional US $1.4 billion in fiscal transfers in 2002 compared to 1999.

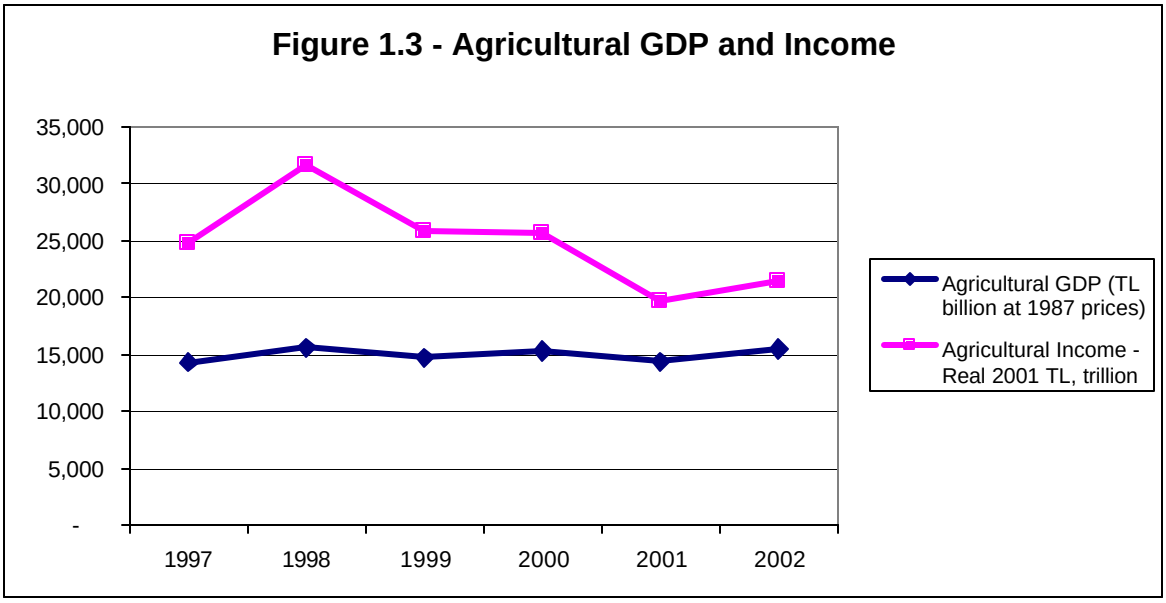
[1] This estimate is based on examination of the past administrative cost margins, trading losses, and interest penalties of a sample of SOE's and ASCU's.
[2] This estimate is based on examination of ACCs and Ziraat Bank's past administrative margins and the timing of past debt write-offs.

Table 1.2 – Scope and Incidence of Agricultural Subsidy Phase Out, 2002 compared to 1999

Million US $	Decline in Fiscal Cost	Change in Agricultural Transfers to Farmers	Efficiency Gain
Transfers to SOEs	3,063.0	-1,026.0	2,037.0
Transfers to ASCUs	814.2	-325.7	488.5
Direct Output Subsidies	-23.6	23.6	0.0
Input subsidies	290.2	-290.2	0.0
Credit Subsidies	1,387.6	-1,110.1	277.5
Sub - Total	**5,531.5**	**-2,728.4**	**2,803.0**
Direct Income Support	**-1,246.7**	**1,246.7**	**0.0**
Total	**4,284.8**	**-1,481.8**	**2,803.0**

Source: Undersecretariat of Treasury and own calculations

1.15 The overall impact on farmers of the fiscal subsidy reductions was roughly US $2.7 billion when comparing 2002 to 1999 (**Table 1.2**). By factoring in the US $1.25 billion given back to farmers as compensation through the DIS Program, one can estimate that the farming sector's interaction with the budget has deteriorated by about US $1.45 billion. This is the equal to roughly half of the magnitude of the observed decline in agricultural income from 1999 to 2002 (shown in Figure 1.3). The other main factor responsible for the reduction in agricultural income, reduced flows from consumers to farmers which have resulted from less market intervention by the state, is examined in Chapter Two in the measurement of changes in Consumer Subsidy Estimates in the agricultural and food sector.

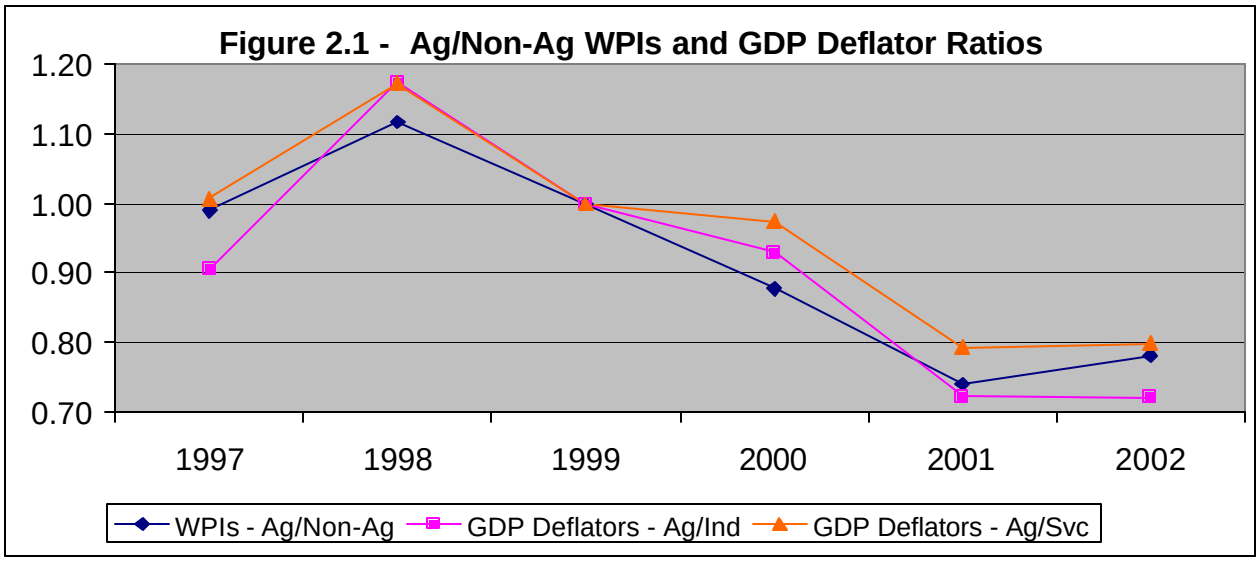


Source: SIS and own calculations.

2. Agricultural Terms of Trade and Support Measures

A. Agricultural Terms of Trade

2.1 Output Terms of Trade. Output terms of trade measures agricultural commodity prices relative to non-agricultural prices. From the farmer's perspective, it measures the profitability of agriculture relative to other economic sectors. Examining the ratio of the wholesale price index for the agricultural sector relative to that of the non-agricultural sectors over 1997-2002 (**Figure 2.1**), it is evident that the agricultural sector's output terms of trade peaked in 1998. From 1999-2001 these declined by 26 percent as the subsidy reforms were phased in. Following the severe devaluation in 2001, they recovered to about 78 percent of their pre-reform (1999) level.



Source: SIS (2002) Quarterly Gross National Product 1999-2001, Publication No. 2557 and SIS website data

2.2 Comparative Sectoral Profitability. Sectoral GDP deflators summarize the combined impact of output and input prices on the sector's profitability. Examining the evolution of the GDP deflator for the agricultural sector compared to those of the industrial and service sectors (**Figure 2.1**) shows that the profitability of the agricultural sector declined substantially relative to both the industrial and service sectors from 1999 to 2002. The range of this comparative deterioration was 20-28 percent over this period, with agriculture performing the worst relative to relative to industry particularly in 2001-2002. The accentuated deterioration vis-à-vis the industrial sector in 2001-2002 is likely associated with the substantial real devaluation of Turkish lira, as this caused industrial sector goods (largely tradeables) to grow more than those of the service sector (largely non-tradeables).

2.3 Input Terms of Trade. Input terms of trade (TOT) measures agricultural commodity prices relative to agricultural input prices. We expect input TOT to have declined substantially because of lower output market intervention and sharp reductions in input subsidies. Terms of trade statistics have been worked out for the crops and livestock sector using data available from SIS for input costs in 1987 constant prices and in current prices (available through 2002 only).

The ratio of current to constant (values) produce an input cost deflator[3], which is then compared to the crops and livestock price indices. The ratio of these to each other may be interpreted as input terms of trade indices. These results are presented in Table 2.1. These measures of input terms of trade show steady year-on-year deterioration in terms of trade for both the crops and livestock sector in 2000 (-11 percent) and in 2001 (an additional drop of 12 to 22 percent). Compared to the peak year for input terms of trade in 1998, the erosion has been on the order of 45 percent. Thus, there is a certain cyclical nature to the terms of trade, but the trend over the past four years has clearly been steeply downward.

Table 2.1: Input Terms of Trade - Commodity Output Prices versus Input Prices

Year	Input Cost Index	Crops Nominal Price Index	Livestock Nominal Price Index	Crops Terms of Trade Index	Livestock Terms of Trade Index
1997	37.78	38.83	34.26	102.79	90.70
1998	57.05	70.28	68.61	123.19	120.26
1999	100.00	100.00	100.00	100.00	100.00
2000	162.67	144.96	144.28	89.11	88.70
2001	276.21	212.23	184.63	76.84	66.84

Source: SIS and own calculations.

2.4 The relative rise of input costs may be further analyzed with the help of more disaggregated data available for the crops sector. Here a comparison is made of the value of crop production and input costs to the crop sector in both real 1987 prices and in current prices deflated into real 2001 TL terms. The series available from SIS for crop production and input costs in constant 1987 prices provide quantity indices for crops and a number of separate types of agricultural inputs. Since the prices are constant, these series reveal the trends in aggregate crop production and input usage (in physical terms). Similar series for crop value and input costs in real 2001 TL terms are also then constructed. The ratios of these value and quantity indices are measures of the implicit real price indices for the crops sector as a whole and the separate types of agricultural inputs (**Table 2.2**).

2.5 Examination of Table 2.2 below reveals a number of clear trends in 1999-2001. The volume of crop production fell only 2 percent, and aggregate input usage declined by a slightly larger 4 percent. However, input usage across the separate types of inputs show a large degree of variability. The largest change is the fall in chemical fertilizer application by over 25 percent. This is to be expected as fertilizer subsidies were phased out and removed during the period, and fertilizer prices rose by over 30 percent (as can be seen from the derived price index value in Table 2.2). This large adjustment in the fertilizer sector is examined in detail in Chapter 3.

2.6 Usage of seed and manure (as natural fertilizer) declined by only 3-4 percent, roughly in proportion to crop production. The decline of seed usage is most probably a reflection of the decline in area sown. The declining amount of manure used probably reflects the declining number of animals, but as chemical fertilizer prices have risen sharply, some farmers are likely substituting manure used for fuel (heating) for field use. This substitution has therefore

[3] This is an approximate measure which has been used since it was not possible to construct an exact index of agricultural input prices owing to the lack of 1999 base year weights for the inputs to the agricultural sector.

moderated manure usage for fertilizer despite the large drop off in herd sizes and manure availability.

Table 2.2 - Quantity, Value, and Price Indices for Crops and Input Types, 1999=100

	1997	1998	1999	2000	2001
Quantity Index					
Crops	94.8	107.1	100.0	106.6	97.7
Seed	100.1	99.3	100.00	97.9	97.1
Manure	109.4	102.0	100.00	100.3	96.4
Chemical Fertilizer	85.2	100.9	100.00	93.2	74.2
Fuel	94.8	97.7	100.00	101.8	102.5
Repairs	95.9	98.2	100.00	101.5	101.9
Pesticides	91.3	108.7	100.00	95.9	107.8
Irrigation	93.3	96.3	100.00	102.0	102.7
Total	94.3	99.8	100.00	98.7	95.6
Value Index (Real Terms 2001 TL)					
Crops	100.6	117.3	100.0	102.4	88.5
Seed	116.3	101.7	100.00	89.2	94.9
Manure	97.1	83.4	100.00	102.3	99.2
Chemical Fertilizer	60.0	93.8	100.00	95.5	97.6
Fuel	112.4	81.1	100.00	124.0	132.2
Repairs	82.6	82.7	100.00	102.6	107.8
Pesticides	124.1	115.1	100.00	82.8	104.3
Irrigation	336.2	56.2	100.00	80.6	83.2
Total	97.1	88.6	100.00	106.4	112.6
Derived Price Indices (Real Terms)					
Crops	106.0	109.5	100.0	96.1	90.6
Seed	116.2	102.4	100.00	91.0	97.7
Manure	88.8	81.7	100.00	102.0	102.9
Com. Fertilizer	70.4	93.0	100.00	102.4	131.4
Fuel	118.5	83.0	100.00	121.8	129.1
Repairs	86.1	84.3	100.00	101.1	105.7
Pesticides	136.0	105.9	100.00	86.4	96.7
Irrigation	360.1	58.4	100.00	79.0	81.0
Total	103.1	88.8	100.00	107.8	117.8

Source: Own calculations based on Quarterly Gross National Product of Turkey (1996-1997), (1998), (1999-2000).
Input Cost data for all years has been kindly provided by SIS.

2.7 Fuel usage has been quite stable despite a 30 percent price increase over 1999-2001. This basically reflects inelastic price demand, which has increased as the machinery fleet has expanded. The stable volume of repair (parts and maintenance) costs also likely reflects mainly the increasing amount of machinery used by farmers The implied highly price inelastic demand

for fuel is not so unusual, but it implies that the largest share of machinery is in the hands of the more commercially oriented and wealthier farmers in the west and southern regions of Turkey. This pattern has also been found in the detailed analysis of fertilizer demand in Chapter 3, but could not be investigated for fuel owing to the lack of sufficient data at the provincial level.

2.8 The results regarding pesticides show that this is the input type which demonstrates the greatest fluctuation in volumes used from year to year. This quantity index shows swings of 15-20 percent from 1997-2001. The derived price index for pesticides show continuous decline for 1997-2000, but prices rose in 2001. As demand also rose strongly in 2001, there must be other important factors that affect this demand as compared to other input types.[4]

2.9 Data on water charges (obtained from the General Directorate of State Hydraulic Works) that show quite a low and stable level may be incomplete. According to these data, irrigation costs account for less than 1 percent of total input costs to the crop sector. However, past droughts, together with increasing vegetable and fruit production, have actually encouraged private irrigation efforts by many farmers. Even if farmers do not pay directly for water, pumping is an important irrigation cost. It would be more probable to have seen a rise in irrigation and irrigation costs. Apparently, the General Directorate of State Hydraulic Works reports only the charges it collects from its own, relatively large irrigation schemes.

2.10 Table 2.2 shows the same magnitude of reduction in input terms of trade in the crops sector as depicted in Table 2.1: input terms of trade for the crop sector declined steadily by a cumulative 23 percent in 1999-2001. While the index of real prices for crop inputs rose by almost 18 percent, the index of crop prices deteriorated by almost 10 percent. The extent of this fall in real crop prices for Turkey's major crops will be examined in Chapter 4.

Table 2.3: Gross Value of Crops and Input Cost Shares (in 2001 Constant TL)

Trillion TL	1997	1998	1999	2000	2001
Gross Crop Value	22,746	26, 528	22,620	23,171	20,017
Input Costs	5,433	4,955	5,593	5,948	6,299
Cost Shares					
Seed	14%	14%	12%	10%	10%
Manure	3%	3%	3%	3%	2%
Chemical Fertilizer	10%	16%	15%	14%	13%
Fuel	35%	27%	30%	35%	35%
Repairs	13%	15%	16%	15%	15%
Pesticides	5%	5%	4%	3%	3%
Irrigation	0%	0%	0%	0%	0%
Other Costs	21%	21%	21%	21%	21%

Source: Quarterly Gross National Product of Turkey (1996-1997), (1998), (1999-2000).
Value added 2001 and Input Cost data for all years has been kindly provided by SIS upon request.

2.11 Table 2.3 above presents the crop values, input costs, and cost shares in real 2001 TL. The ratio of total input costs to gross crop value is another indicator of the deteriorating terms of trade. From 1999-2001, this ratio increased from 25 percent to 31 percent. In 1998 this was only

[4] It might be again the increasing number of machinery used or maybe the growing fruit and vegetable cultivation may require more pesticides.

19 percent. The main changes in cost shares have been a jump in the share of fuel costs and reductions in the shares of seeds and chemical fertilizers.

B. Producer Support Estimates and Total Support Estimates

2.12 OECD Statistics on Total Support Estimates (TSEs). The source of TSEs, Producer Support Estimates (PSEs), and Consumer Subsidy Estimates (CSEs) presented in this section is the Organization for Economic Cooperation and Development (OECD), which publishes the estimates of support to agriculture for its member countries. The PSE is a measure of the part of agricultural producers' revenue which accrues from market price support (MPS – farm gate prices relative to border prices) as well as support to farmers through payments based on their output and input usage. The TSE is the sum of the PSE and a measure of the farmer's indirect support through subsidies not provided on the basis of outputs or inputs (known as the General Services Support Estimate, or GSSE). The CSE, when negative as in the case of Turkey, is a measure of the part of the GSSE which is paid for by consumers through consumer prices which are above border prices (adjusted to reflect retailing margins)[5]. Since these estimates are frequently revised, it is not possible to complete a long time series, but Table 2.4 below presents data for the years 1998-2001. Earlier data is also available but is not comparable to more recent statistics, as the share of commodities for which MPS estimates were available was less than 50 percent for Turkey. For the later years this share has increased above 60 percent and has become comparable to other OECD countries.[6]

2.13 Large Support to Agricultural Producers.[7] Support to producers, as measured by the percentage PSE, has increased in Turkey to 25 percent of farm receipts in 1999, just prior to the reform of agricultural subsidization. MPS (either in the form of tariff/non-tariffs or governmental price support programs) accounted for three-quarters of this PSE, and the remaining quarter was largely input subsidies. Additional transfers for "marketing and promotion" included under the General Services Support Estimate (GSSE) were almost as large as the MPS. In Turkey, these "marketing and promotion" transfers include the large amount of losses of agricultural marketing parastatals and credit subsides and debt write-offs covered by the budget. In 1999, the TSE (sum of the PSE and GSSE) totaled US $9.8 billion, and this was a reduction from the peak level of US $10.8 billion in 1998.

2.14 Support Largely Paid by Consumers Through Taxation. Though the flows to the agricultural sector embodied by the TSE served a relatively large agricultural population, they imposed a heavy burden on consumers and taxpayers. In 1999, the CSE reached a level of –US $5.2 billion, and one fifth of outlays by consumers on agricultural products consumption was a transfer from consumers to producers (above what farmers would have received if consumers paid

[5] Since the PSE and CSE are measured relative to border prices they are usually considered a better measure of the impact of changes in agricultural policies since they would not reflect trends in international prices if agricultural policies were neutral and allowed complete transmission of international prices into domestic markets. In this important way they are different then the measure of output terms of trade which does not isolate the impact of movements in international prices. When expressed as a percentage, the PSE reflects the share of agricultural producers' revenue which accrues from the MPS and the indirect support to farmers through payments based on their output and input usage

[6] Along the standard list of crops -- wheat, maize, other grains, rice, oilseeds, sugar (beet) -- tobacco, cotton, apples, tomatoes, grapes and potatoes are now also considered. As these products are not listed explicitly but are covered, they are included in the estimates for "other products."

[7] See for more details, OECD (2002) Agricultural Policies in OECD Countries, Monitoring and Evaluation, Paris, p.142-146.

prices which directly reflected border price levels). Moreover, as the ratio of support to GDP in Turkey, the TSE in 1999 was 6.5 percent, one of the highest in the OECD countries.

Table 2.4: Estimates of Support to Agriculture (Real 2001 Prices – TL Billion)

	1998	1999	2000	2001
Total Value of Production (at farm gate)	**35,775,693**	**30,963,384**	**30,605,996**	**26,861,614**
of which share of MPS commodities (%)	64	64	63	63
Total Value of Consumption (at farm gate)	**28,498,809**	**27,087,904**	**25,277,835**	**24,390,422**
PRODUCER SUPPORT ESTIMATE (PSE)	**9,467,519**	**7,567,047**	**6,559,971**	**2,764,989**
Market Price Support (MPS)	7,609,620	5,626,934	5,478,683	1,909,348
of which MPS commodities	4,882,082	3,577,990	3,455,037	1,201,294
Payments based on output	110,695	264,939	307,651	557,997
Payments based on area planted / animal numbers	0	0	0	0
Payments based on historical entitlements	0	0	0	83,640
Payments based on input use	1,747,204	1,675,174	773,638	214,004
Percentage PSE	**26.46%**	**24.44%**	**21.43%**	**10.29%**
Nominal Protection Coefficient – NPC	**1.28**	**1.24**	**1.23**	**1.10**
Nominal Assistance Coefficient – NAC	**1.36**	**1.32**	**1.27**	**1.11**
GENERAL SERVICES SUPPORT ESTMATE (GSSE)	**3,694,443**	**4,350,400**	**3,611,820**	**3,879,726**
Research and development	36,606	28,525	22,534	36,680
Agricultural schools	6,532	4,668	5,277	3,984
Inspection services	72,789	65,779	72,823	69,490
Infrastructure	9,080	8,130	4,807	4,729
Marketing and promotion	3,555,339	4,234,190	3,495,033	3,751,569
Public stockholding	0	0	0	0
Miscellaneous	14,097	9,109	11,346	13,274
GSSE as a share of TSE (%)	**28%**	**37%**	**36%**	**58%**
CONSUMER SUPPORT ESTIMATE (CSE)	**-7,200,868**	**-6,045,079**	**-5,485,991**	**-1,894,429**
Transfers to producers from consumers	-7,750,762	-6,411,071	-5,588,728	-1,870,852
Other transfers from consumers	-135,034	-202,256	-207,760	-53,071
Transfers to consumers from taxpayers	0	0	0	0
Excess feed cost	684,928	568,249	310,498	29,494
Percentage CSE	**-25%**	**-22%**	**-22%**	**-8%**
TOTAL SUPPORT ESTIMATE (TSE)	**13,161,962.46**	**11,917,447.63**	**10,171,791.26**	**6,644,715.00**
Transfers from consumers	7,885,795.42	6,613,327.25	5,796,488.64	1,923,923.00
Transfers from taxpayers	5,411,201	5,506,377	4,583,063	4,773,863
Budget revenues	-135,034	-202,256	-207,760	-53,071
Percentage TSE (expressed as share of GDP)	**6.74%**	**6.50%**	**5.21%**	**3.77%**

Source: The years 2000 and 2001 are taken from an unpublished OECD draft-document. Data for 1999 is taken from Agricultural Policies in OECD countries 2002 and 1998 from Agricultural Policies in OECD countries 2001.

2.15 Reforms reduced the levels of indirect support to farmers and costs to consumers. Once agricultural subsidy reform began, the PSE fell to 10 percent by 2001. Preliminary calculations for 2002 show an increase to 13 percent. This increase is largely owing to the payments initiated in 2001 under the DIS Program, since the bulk of the payments under the 2001 DIS Program were made in calendar year 2002. At a level of 10-13 percent, Turkey's PSE is among the lowest across

OECD countries. Transfers from consumers have fallen to only US $1.6 billion annually, indicating a much lower level of support to farmers paid by consumers. The fall in this support (roughly US $1.9 billion[8]) is the market wide (non-fiscal) effect on agricultural income of adjustments to reductions in marketing interventions. It is more than half the total impact over the period 1999-2002 (US $2.7 billion), and exceeds the net reduction in fiscal transfers (found in Chapter One to be on the order of US$ 1.45 billion). Though the TSE has fallen by almost 50 percent to US $5 billion, it is still relatively high at 3.8 percent of GDP. This is because the GSSE, in Turkey's case largely budget support to agricultural parastatals, has remained important throughout the reform period.

2.16 Reforms of the agricultural subsidies explain most of the fall in agricultural income. Movement in the Nominal Assistance Coefficient (NAC) summarizes the impact on farm income of reduced subsidization of both outputs and inputs. (The NAC is simply the ratio of total farm revenue including all direct subsidies reflected in the PSE relative to the underlying value of farm output at border prices without other output and input-based subsidies.) From 1999-2001, as market intervention levels and support prices for grains, hazelnuts, tobacco, sugarbeet, and tea declined, and other payments based on output and input use were also reduced significantly, the NAC declined by 16 percent, explaining two-thirds of the fall in agricultural income observed between 1999 and 2001. Preliminary data indicate that transfers to agriculture rose by almost 5 percent as the DIS program accelerated in 2002. Thus, over the whole period 1999-2002, subsidy reform was responsible for about 80 percent of the total (16 percent) fall in agricultural income.

Table 2.5: Turkey - Main PSE Indicators by Commodity (Billion Real 2001 TL)

		1998	1999	2000	2001
Wheat	PSE (TL. bn)	1,575,871	1,254,393	588	-157,257
	Percentage PSE	42	42	21	-6
	NAC	1.72	1.72	1.27	0.94
Maize	PSE (TL. bn)	183,722	141,555	101,055	20,068
	Percentage PSE	45	39	32	7
	NAC	1.82	1.64	1.47	1.08
Other Grains	PSE (TL. bn)	702,282	515,792	260,128	44,218
	Percentage PSE	55	48	27	5
	NAC	2.22	1.92	1.37	1.05
Oilseeds	PSE (TL. bn)	134,300	156,795	114,545	71,992
	Percentage PSE	35	41	42	27
	NAC	1.54	1.69	1.72	1.37
Sugar	PSE (TL. bn)	1,078,794	860,893	564,918	184,181
	Percentage PSE	65	70	56	30
	NAC	2.86	3.33	2.27	1.43
Other Crops	PSE (TL. bn)	3,113,186	1,809,413	2,704,841	1,479,235
	Percentage PSE	13	9	13	8
	NAC	1.15	1.10	1.15	1.09

[8] To be compared to the measure of agricultural income in US dollars, the 5.3 quadrillion TL reduction in the CSE is converted into US dollars (at the average 2002 TL exchange rate) and then from gross agricultural output terms to agricultural income at a factor of 0.6, the average share of value added in gross value.

Total Crops	PSE (TL. bn)	6,788,154	4,738,841	4,333,278	1,642,437
	Percentage PSE	22	18	17	7
	NAC	1.28	1.22	1.20	1.08
Livestock	PSE (TL. bn)	2,679,365	2,828,209	2,226,693	1,122,553
	Percentage PSE	42	42	44	25
	NAC	1.72	1.72	1.79	1.33
Total	PSE (TL. bn)	9,467,519	7,567,050	6,559,971	2,764,990
	Percentage PSE	25	23	21	10
	NAC	1.33	1.30	1.27	1.11

Source: OECD and own calculations.

2.17 Crops, in particular grains and sugar, account for the bulk of the decline in support for farmers. Table 2.5 above demonstrates the size of the relative declines in support for different types of agricultural production by tracing the evolution of the PSE by commodity. Overall, the reduction in support is in line with the reduced market intervention during the 2000-2001 period and lower levels of deficiency payments. Before the introduction of agricultural reforms, almost 70 percent of the aggregate PSE was accounted for by the crop component, while the livestock sector garnered about one-third. Since 1999, the support to the crop component decreased by over 3.1 quadrillion TL (US $2.5 billion), with the grains sector absorbing about two thirds of this reduction. The sugar sector absorbed about 20 percent of the reduction. Support to the livestock sector dropped by about 1.7 quadrillion TL; proportionally less than in the crops sector. Hence, the relative importance of support to animal production has increased, to over 40 percent of the aggregate PSE.

2.18 Regional PSEs. Turkey's PSE has been regionally disaggregated in order to provide insights into how the reform of MPS has been shared among regions and crop sectors in each region. The support calculated for commodities by the OECD (Table 2.5) has been distributed to Turkey's 81 provinces in proportion to the provincial share in each of the commodities' production values at the national level. These PSE values for each province by commodity have then been aggregated at the regional level. One assumption made in this methodology is that the PSE for the category for "other commodities" includes only crops for which PSEs have not been separately reported by the OECD.

2.19 The aggregated regional PSEs are presented below in Table 2.6. As in Tables 2.4 and 2.5, the values shown have been computed using the current year values for 1999 reflated to 2001 real TL. Each crop and livestock product's direct contribution to the regional PSE may be seen from the disaggregation in each column of Table 2.6. Similarly, each region's contribution to the overall PSE may be seen from the row totals. The lower part of the table shows the aggregate changes from 1999 to 2001, along with percentage reductions from the 1999 base year levels. The totals have been calculated for both crop and livestock components separately and then aggregated (in the final row of the table).

2.20 Reduced Grain and Sugar Support Cause Largest PSE Decline in Central Anatolia. In the crops sector, Central Anatolia has absorbed more than a third of the 3.1 quadrillion TL decline in the PSE, with losses there being about 60 percent in the grains sector and 40 percent from sugarbeet. The Marmara, Black Sea, and Mediterranean regions have all seen losses on the order

of 400 trillion TL. Losses in the grain sector have been dominant in all three regions, but the Black Sea region has also suffered substantially reduced flows of producer support in the sugarbeet and "other crops" category (e.g., hazelnut). The East Anatolia and Southeastern Anatolia regions have suffered losses mainly in the grains sector, each of these represent only about 10 percent of the fall in the grain sectors' PSEs nation-wide. Being the most diverse region agriculturally, it is not surprising that the Aegean's losses have been more evenly distributed across the grains, sugarbeet, and "other crops" categories.

2.21 Marmara Loses Most in Livestock Support. In the livestock sector, the most affected region has been Marmara, in which the milk, sheep, cattle meet, and poultry sub-sectors have suffered equally. Central Anatolia has been the second hardest hit, with large reductions in support in the areas of milk and cattle meet. The Aegean and Black Sea regions are the next most affected, with losses distributed evenly in much the same pattern as in Marmara. Eastern Anatolia has had the most losses in the milk sector, while the Mediterranean and Southeast Anatolia have experienced relatively greater losses in sheep raising.

Table 2.6 - Regional PSEs by Crops and Livestock Product, 1999 and 2001, Billion Real 2001 TL

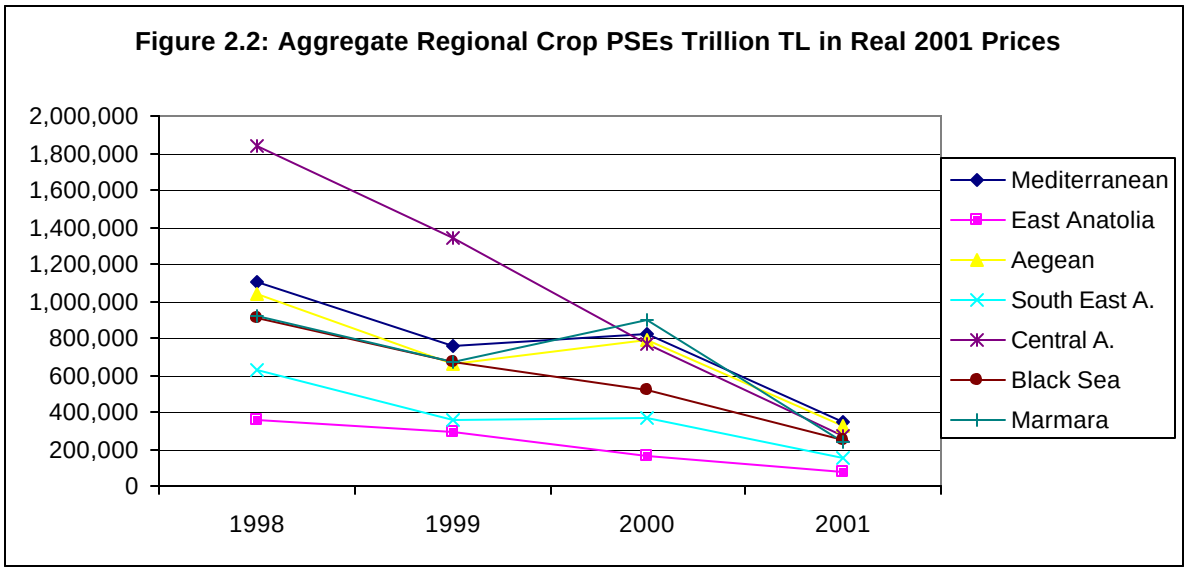
	1999	Mediterranean	East Anatolia	Aegean	South East A.	Central A.	Black Sea	Marmara	Turkey
Crops	Wheat	213,995	91,632	114,205	122,191	380,724	142,287	189,358	1,254,391
	Maize	60,115	438	10,267	2,468	380	42,328	25,563	141,558
	Other grain	31,246	37,849	65,681	54,610	221,475	47,573	57,354	515,788
	Sugar beets	48,840	94,044	68,024	2,789	464,672	139,491	43,033	860,893
	Oil seeds	21,490	954	13,618	2,838	11,952	6,934	99,012	156,797
	Other	385,682	64,406	389,842	166,980	264,909	286,771	250,822	1,809,413
	Total Crops	**761,368**	**289,323**	**661,636**	**351,875**	**1,344,111**	**665,383**	**665,142**	**4,738,839**
Livestock	Milk	115,381	181,127	111,046	69,111	164,547	177,952	148,933	968,097
	Sheep Meat	41,953	25,047	42,262	39,631	37,936	15,282	55,062	257,173
	Cattle Meat	62,149	110,755	197,267	30,191	228,906	165,513	243,241	1,038,022
	Poultry	5,671	15,933	51,549	2,184	40,172	91,562	142,929	350,001
	Hen Eggs	8,661	6,595	46,490	6,051	66,648	31,255	49,215	214,916
	Total Livestock	**233,816**	**339,457**	**448,614**	**147,168**	**538,210**	**481,563**	**639,380**	**2,828,209**
Total		**995,183**	**628,781**	**1,110,250**	**499,043**	**1,882,321**	**1,146,947**	**1,304,522**	**7,567,047**
	2001	**Mediterranean**	**East Anatolia**	**Aegean**	**South East A.**	**Central A.**	**Black Sea**	**Marmara**	**Turkey**
Crops	Wheat	-26,032	-12,757	-13,738	-24,638	-38,108	-16,368	-25,616	-157,257
	Maize	7,313	36	1,623	414	249	5,364	5,068	20,067
	Other grain	2,665	3,536	4,731	10,649	13,599	4,022	5,018	44,220
	Sugar beets	11,926	25,479	17,375	596	89,758	25,799	13,248	184,181
	Oil seeds	13,501	513	8,574	1,218	4,789	2,496	40,901	71,992
	Other	338,392	54,581	307,534	158,532	196,835	226,840	196,521	1,479,235
	Total Crops	**347,765**	**71,388**	**326,099**	**146,771**	**267,122**	**248,153**	**235,140**	**1,642,438**

Table 2.6 (cont.)

Livestock	Milk	46,392	62,882	38,868	24,891	63,642	59,867	52,936	349,478
	Sheep Meat	-16,284	-11,477	-18,512	-13,799	-17,453	-7,076	-28,147	-112,748
	Cattle Meat	43,846	71,365	108,401	17,441	117,969	107,750	139,123	605,895
	Poultry	10,765	3,498	12,473	224	10,413	34,494	56,456	128,323
	Hen Eggs	8,036	5,142	40,208	5,665	37,834	24,987	29,730	151,602
	Total Livestock	**92,755**	**131,410**	**181,438**	**34,422**	**212,405**	**220,022**	**250,098**	**1,122,550**
Total		**440,520**	**202,798**	**507,537**	**181,193**	**479,527**	**468,175**	**485,238**	**2,764,988**
	Change, 2001-1999	**Mediterranean**	**East Anatolia**	**Aegean**	**South East A.**	**Central A.**	**Black Sea**	**Marmara**	**Turkey**
Crops	Wheat	-240,027	-104,389	-127,943	-146,829	-418,832	-158,655	-214,974	-1,411,648
	Maize	-52,802	-402	-8,644	-2,054	-131	-36,964	-20,495	-121,491
	Other grain	-28,581	-34,313	-60,950	-43,961	-207,876	-43,551	-52,336	-471,568
	Sugar beets	-36,914	-68,565	-50,649	-2,193	-374,914	-113,692	-29,785	-676,712
	Oil seeds	-7,989	-441	-5,044	-1,620	-7,163	-4,438	-58,111	-84,805
	Other	-47,290	-9,825	-82,308	-8,448	-68,074	-59,931	-54,301	-330,178
	Total Crops	**-413,603**	**-217,935**	**-335,537**	**-205,104**	**-1,076,989**	**-417,230**	**-430,002**	**-3,096,401**
	%	**-54%**	**-75%**	**-51%**	**-58%**	**-80%**	**-63%**	**-65%**	**-65%**
Livestock	Milk	-68,989	-118,245	-72,178	-44,220	-100,905	-118,085	-95,997	-618,619
	Sheep Meat	-58,237	-36,524	-60,774	-53,430	-55,389	-22,358	-83,209	-369,921
	Cattle Meat	-18,303	-39,390	-88,866	-12,750	-110,937	-57,763	-104,118	-432,127
	Poultry	5,094	-12,435	-39,076	-1,960	-29,759	-57,068	-86,473	-221,678
	Hen Eggs	-625	-1,453	-6,282	-386	-28,814	-6,268	-19,485	-63,314
	Total Livestock	**-141,061**	**-208,047**	**-267,176**	**-112,746**	**-325,805**	**-261,541**	**-389,282**	**-1,705,659**
	%	**-60%**	**-61%**	**-60%**	**-77%**	**-61%**	**-54%**	**-61%**	**-60%**
Total	**Change**	**-554,663**	**-425,983**	**-602,713**	**-317,850**	**-1,402,794**	**-678,772**	**-819,284**	**-4,802,059**
	%	**-56%**	**-68%**	**-54%**	**-64%**	**-75%**	**-59%**	**-63%**	**-63%**

Source: OECD and own calculations.

2.22 Given the large reductions in PSEs across all sectors, no region has been able to escape the impact of reduced MPS. As the last row of Table 2.6 indicates, the PSE reductions by region as measured from the 1999 base level have all been on the order of 55-75 percent. As can be seen from a comparison of the slopes of the trend lines in Figure 2.2, Central Anatolia has had the greatest proportional reduction and the largest absolute drop in aggregate regional PSEs. The least affected in proportional terms have been the Mediterranean and the Aegean regions, and the absolute reductions in their total PSEs have been below average. Unfortunately, the two regions traditionally considered the weakest, Eastern Anatolia and Southeast Anatolia, have suffered more than average, partially because of their greater specialization in livestock production.



Source: OECD and own calculations.

3. Availability and Use of Agricultural Inputs and Credit

A. General Trends in the Availability and Use of Agricultural Inputs

3.1 During the last decade, the trends in the use of the main agricultural inputs analyzed in this chapter, fertilizer and agro-chemicals, have been fairly similar. The use of both fertilizer and agro-chemicals hit lows in 1994, falling by 20 to 25 percent below their peak levels of the early 1990s. In the late 1990s, they both increased steadily to new peak usage levels in 1997-1999. In the reform period of 2000-2002, both fertilizer and agro-chemical usage apparently fell back by 25-30 percent to levels seen in the early to mid-1990s. Annually, Turkish agriculture currently consumes roughly 10 thousand tons of insecticides, 10 thousand tons of pesticides, 5 thousand tons of herbicides, 25 thousand tons of sulfur and sulfates, and 4.5 million tons of chemical fertilizers on an average area of 21.5 million hectares planted to field crops, fruits and vegetables.

3.2 In terms of fuel for agriculture, there are only rough estimates of consumption, based on areas and types of crops planted. In this respect, informal estimates of the Ministry of Agriculture and Rural Affairs (MARA) and the Turkish Chamber of Agricultural Producers (TZOB) differ significantly, the former being 1.9 million tons, and the latter 2.5 million tons. TZOB estimates for 1999-2001 show that fuel consumption fell only about 2 percent.

3.3 Fertilizers and agricultural chemicals are normally readily available in Turkey. However, there tends to be more variety in agricultural chemicals, and their consumption is more concentrated in the better-off regions of Marmara, Aegean and the Mediterranean. It is estimated that while these regions consume 42 percent of total fertilizer, they consume roughly 70 percent of the total agricultural chemicals[9]. There may be, therefore, instances where difficulties may be encountered in obtaining specific agricultural chemicals, especially in the east of Turkey.

B. Specific Case of Availability and Use of Fertilizers

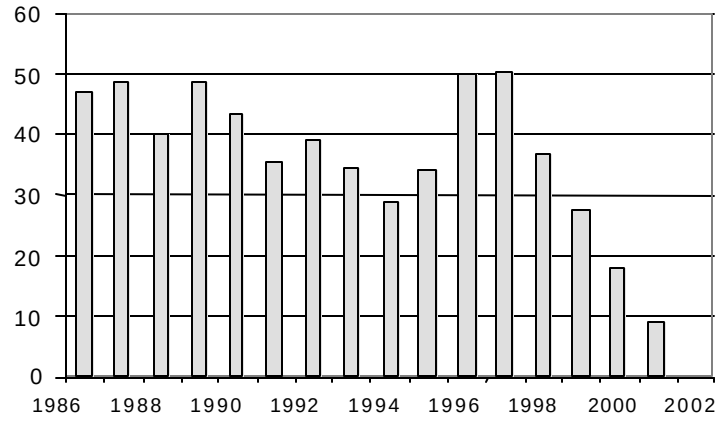
3.4 Fertilizer subsidies were paid to producers and suppliers rather than farmers, except for a brief period between 1994 and 1997. Fertilizer is the most important agricultural input, after fuel, in terms of outlays by farmers in Turkey. Prior to 1986, fertilizer production and distribution was carried out by the Turkish Agricultural Supplies Institute (TZDK) and the Sugar Corporation under state monopoly. After the 1986 reforms, this monopoly was abolished and competition began among private companies. Agricultural Credit Cooperatives were also promoted by government to fill in the resulting gap. Between 1986-1994, the state followed a policy of giving fertilizer subsidies to fertilizer producers and to cooperatives, but not directly to farmers. Between 1994-97, the system was altered to one of direct price subsidies to farmers. However,

[9] While we do not have detailed regional consumption figures for agricultural chemicals, we do have figures for ACC sales. For the ACCs, fertilizer consumption in the better-off regions of Marmara, Aegean and Mediterranean were 42 percent for the total of ACC fertilizer sales, corresponding with the same ratio of total regional fertilizer sales to Turkey as a whole. Regarding agricultural chemicals, ACC consumption in the better-off regions of Marmara, Aegean and Mediterranean were 73 percent for the total of ACC agricultural chemical sales. In 1997-2000, these three regions accounted for a stable 47-49 percent share of value added in agriculture.

owing to difficulty in handling subsidy payments that were based on fertilizer sales invoices and periodic fraud in these transactions, the direct payment system was discontinued.

3.5 Starting in 1997, GOT phased out fertilizer subsidy payments. In 1997, the system reverted to indirect support policies of 1986-94, with the use of intermediary institutions. Subsidies and support declined from 1997 onwards as the subsidy amount was fixed in nominal terms (e.g. 30,000 TL/kg of di-ammonium phosphate fertilizer). While the subsidy was about 50 percent of the fertilizer price in 1997, it fell to 10 percent of the price in 2001. The fertilizer subsidy was completely abolished on November 1, 2001.

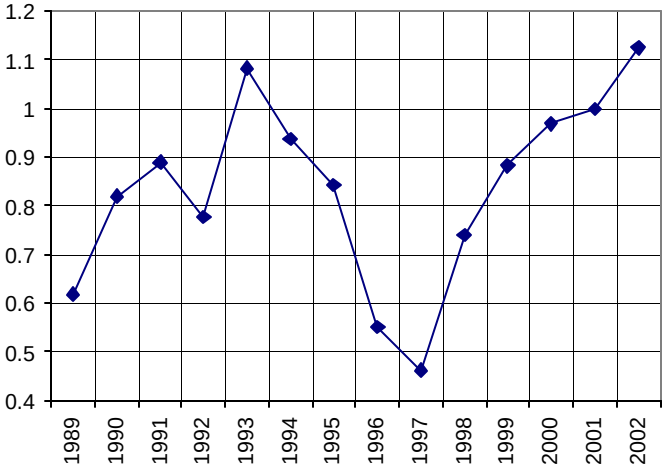
Figure 3.1: Fertilizer Subsidy Paid as Share (%) of Fertilizer Price



Source: SIS and own calculations

3.6 For most of the 1990s, farmers paid below input parity prices for fertilizer. Farm gate fertilizer prices have now adjusted to import prices. Overall, the price subsidy for fertilizer was not uniform over the period 1986-2001 (Figure 3.1). Moreover, the incidence of the subsidy was not always fully with farmers. During 1986-1994, when the state followed a policy of giving fertilizer subsidies directly to fertilizer producers, this approach effectively established an oligopoly[10] in the Turkish fertilizer sector -- four leading fertilizer producers were responsible for 95 percent of the total production. Thus, in spite of the continued high levels of support ranging from 30 to 50 percent of total value, the farmer fertilizer price was not proportionally lower than the import price except for the brief period 1995-1997 (Figure 3.2). This brief period, in fact, coincides with the time when payments were made directly to farmers.

Figure 3.2: Farmer Price/Adjusted Import Price Ratio



Source: SIS and own calculations

3.7 It is also noteworthy that the 1997 system was skewed in favor of fertilizer producing firms rather than the other suppliers. Fertilizer producers received part of the subsidy as advance payment three

[10] Large trading margins along with import duties largely offset the subsidies intended for farmers. In 1994, one expert estimated that trade barriers kept retail prices comparable to border prices despite US $400 million in subsidies, which were "half of the [retail] value of the fertilizers;" Gencaga 1994, p. 3.

months before the actual production of fertilizer, whereas other suppliers, including ACCs, had to furnish proof of their sales before they could receive the subsidy. Therefore, in view of the constantly high levels of inflation, producers were placed in an advantageous position.

3.8 After falling steeply in 2000-2001, domestic fertilizer consumption is starting to recover. This drop was significantly amplified in the less developed regions of Turkey, particularly in the East and the Northeast. In the least developed provinces, fertilizer consumption fell by 45 percent between 1998 and 2002. However, there was little negative impact in South Eastern Turkey, due to increased land use under the Southeast Anatolia Project (GAP).

Table 3.1: Fertilizer Market Shares (percent)

	2000	2001	2002
Cooperatives			
ACCs	30.47	17.91	11.62
ASCUs	3.68	6.26	5.37
Pankobirlik	0.81	9.08	9.566
Total coops	*34.97*	*33.25*	*26.54*
Private sector / SOEs			
TÜGSAS (SOE)	10.49	11.22	11.00
IGSAS (SOE)	5.58	7.23	6.62
GÜBRETAS	3.48	5.78	6.47
BAGFAS	7.71	8.97	9.59
EGE GÜBRE	2.83	3.40	4.90
TOROS	23.40	20.34	23.97
Total 6 biggest	*53.48*	*56.94*	*62.54*
Public sector			
SEKER FAB.	3.85	0.06	0.00
Other	7.70	9.76	10.92
TOTAL	100.00	100.00	100.00

Source: SIS, TZOB, and own calculations

3.9 With the subsidy phase-out, fertilizer producers expanded their market share at the expense of cooperative suppliers. There is increasing concentration in the fertilizer sector. Six main private sector and SOE fertilizer companies have increased their market shares, from 53 percent in 2000 to 63 percent in 2002. Significantly, the market share of the ACCs has plummeted from 30 to 12 percent. On the other hand, market share of two relatively minor players in the cooperative sector, that of Pankobirlik (beet growers) as well as ASCUs have increased, offsetting the decline in the market share of the cooperatives. The share of other suppliers has increased from 7.7 to 10.9 percent over the past three years. Most probably, new firms will start entering the market and some of the smaller players will start to gain significance.

3.10 To investigate the characteristics of fertilizer demand, we have econometrically estimated regional fertilizer consumption in Turkey as a function of agricultural GDP, land used, and real fertilizer price. The results of this analysis (carried out on provincial level annual data from 1997 to 2000) are given in Table 3.2 below.

Table 3.2: Regional Price and Income Elasticities for Fertilizer Demand (1997-2000)

	Real agricultural GDP	Real fertilizer price	Planted area
Eastern Anatolia	0.82**	-1.82**	0.32*
Aegean	0.54**	-0.56**	0.53**
Southeast Anatolia	0.45**	-0.24	0.70**
Black Sea	0.40**	-0.74	0.71**
Mediterranean	-0.15	-0.16	1.82**
Marmara	-0.13	-0.19	1.14**
Central Anatolia	0.35**	-0.85**	0.68**
Turkey	0.48**	-0.66**	0.63**

Source: SIS, TZOB, and own calculations. *Significant at 95 confidence interval ** Significant at 99 confidence interval

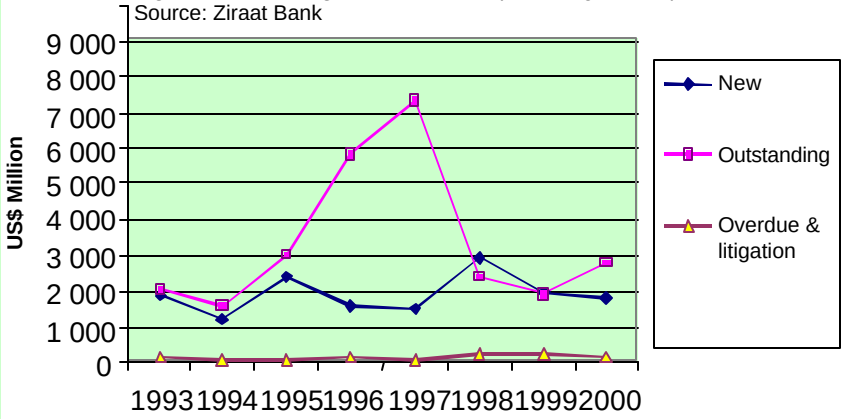
3.11 Eastern Anatolia is the only region which is price elastic, (an elasticity "e" of -1.82), followed by the Black Sea Region (e = - 0.74), and the Aegean (e = -0.56). The most price inelastic regions are the Mediterranean and Marmara. None of the regions in Turkey are income elastic in fertilizer consumption, but the income elasticity of fertilizer consumption in the Eastern Anatolia region is the highest (e=0.82), followed by the Aegean (e=0.54). Again, the most inelastic regions are the Mediterranean and Marmara. The Mediterranean and the Marmara Regions are both land elastic (with elasticities of 1.82 and 1.14 respectively), while Eastern Anatolia is the least land elastic (e=.32), followed by the Aegean (e=.53).

3.12 In sum, the Eastern Anatolia region and eastern parts of the Black Sea region, being some of the least developed areas of Turkey, are the regions in which input usage has been most significantly affected, as demand is both price and income elastic, as well as rather inelastic with respect to expansion of area. The most resilient regions, on the other hand, are the Mediterranean and the Marmara, which are land elastic regions coupled with price and income inelasticity. The Aegean region, which is one of the richer agricultural regions of Turkey, nevertheless seems to demonstrate the same type of elasticity pattern as that of the East Anatolia region. This indicates a certain degree of inherent fragility of input demand there.

3.13 Data available on numbers of registered fertilizer distributors indicates that fertilizer is widely and fairly evenly available across Turkey. There are 6000 registered distributors across Turkey, of which 2,255 are primary level ACCs. In Eastern Anatolia (the most remote region), ACCs represent 39 percent of the total distributors in that region, compared to the ACC average for the whole of Turkey, which is 37 percent.

3.14 Unbalanced fertilizer application remains pervasive, especially among less commercial farmers and regions. In the year 2000, Turkey used 65 percent of what it needs in terms of nitrogenous fertilizers and 45 per cent of the requirements for phosphorous fertilizers.[11] While these figures are definitely below the soil requirements, well-informed anecdotal evidence[12] strongly points towards generalized unbalanced application – serious overuse on commercial farms and very little application on smaller, poorer holdings. In terms of sustainability, therefore, fertilizer use needs to be reviewed with care and further studies and surveys are required to get a clearer picture. In regional terms, the highest rates of application relative to soil requirements for nitrogenous and

Figure 3.3: Total agricultural credit (excluding ASCUs)
Source: Ziraat Bank



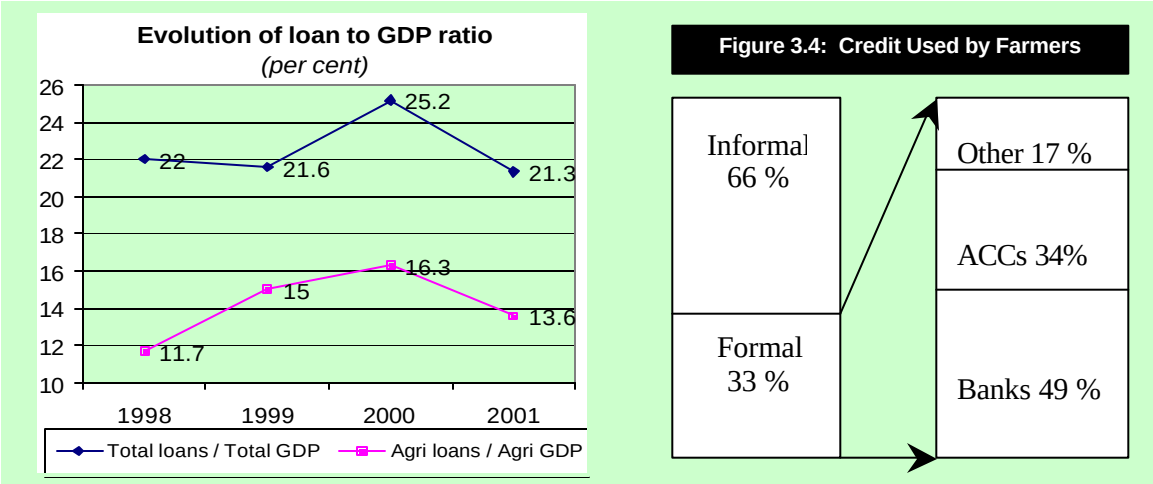
[11] Turkey Fertilizer Requirements, Consumption and its Future, Fikret Eyuboglu, GDRS, MARA Publication, Ankara 2002.
[12] Soil and Fertilizer Research Institute, GDRS – MARA.

phosphorous fertilizers[13] are in Marmara (75.5% and 72.5% respectively) and the Mediterranean (69% and 53.5% respectively).

C. Systems of Credit for Inputs

3.15 Formal agricultural credit expanded rapidly until 1997, however it still remains low by international standards. Through the formal sector Turkey has had an annual average agricultural credit portfolio of US $5.4 billion over the last decade. Out of this, approximately US $2 billion is the annual average of new credits. In 1994-1997, the formal sector agricultural portfolio increased significantly, reaching US $7.3 billion in 1997.[14] In 1998-2001, this loan portfolio dropped to an annual level of only US $2 to 3 billion.

3.16 Over this same period, the ratio of formal agricultural lending to agricultural GDP was about 14 percent, which is below both the Turkish lending average for the economy as a whole (23 percent) and international comparator levels[15] for agricultural credit (30 percent). Formal agricultural credit is low since it is estimated that only a third of the total agricultural credit comes from the formal sector (Figure 3.4).



Source: "Strategic Review of Ziraat Bank in the Provision of Agricultural Finance in Turkey" Rabo International Advisory Services and Boston Consulting Group.

3.17 Directed agricultural credit through Ziraat Bank and the Agricultural Credit Cooperatives (ACC) dominate formal agricultural lending. Until 2002, Ziraat and the ACC had been the principal actors in the agricultural credit field, as they were the main conduits for channeling Treasury-supplied credit to farmers. In 2001, out of the US $2.8 billion of total credit, US $1.8 billion were Treasury-sourced credit, US $0.5 billion of Ziraat's own sources, and US $0.4 billion of ACC's own sources. Other minor players included the ASCU's, (US $85 million of agricultural credit in 2000/1), and Pankobirlik (Sugarbeet Growers Cooperative Union –US $35

[13] Turkey Fertilizer Requirements, Consumption and its Future, Fikret Eyuboglu, GDRS, MARA Publication, Ankara 2002.
[14] These figures, for our purposes, intentionally exclude credits to ASCUs. ASCU credits being the main vehicle for the administration of price subsidy schemes for export commodities, their deficits were covered by credits each year. While ASCUs do also give out production credit to their members (US $66 million in 2001), the actual size of commodity price subsidy confuses the picture.
[15] Agricultural credit to agricultural GDP ratios: average of Brazil, Greece, Malaysia and Thailand is 30 percent.

million of agricultural credit in 2002). Involvement by other banks was negligible.[16] In 2002 the Treasury ceased supplying funds to Ziraat Bank and the ACC system.

3.18 Ziraat Bank focused on larger farmers and SOEs, while the ACCs served smaller-scale farmers. The current restructuring of Ziraat has called into question Ziraat's own specificity and direction, as well as its relationship with the ACCs. Ziraat has tried to reduce its agricultural loans, call back delinquent loans, and re-define its clientele. As well, state-owned enterprises, which were once a major recipient representing 70 percent of Ziraat-sourced loans in 1997, now represent a very minor proportion of Ziraat's loan portfolio.

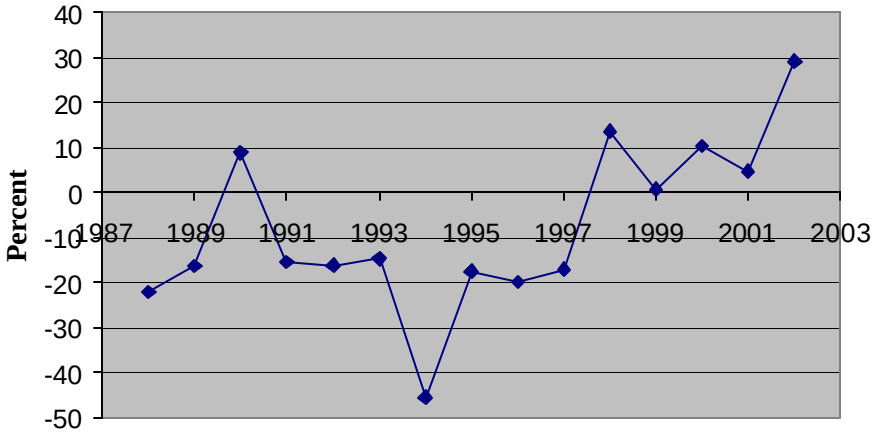
Table 3.3: Ziraat Bank and ACC Loans to Farmers in 2001

	Loans to farmers	Number of farmers	Average size of loan
Ziraat Bank	US$539 million	374,000	US$1441
ACCs	US$502 million (of which US$149 from Ziraat)	800,000	US$627

Source: Ziraat Bank, ACC Central Union

3.19 Originally intended as the retailing arm of the Ziraat Bank for the small scale farming sector in Turkey, ACCs service a larger number of farmers, who are mostly small-scale farmers – 800,000 farmers compared with 374,000 directly serviced by Ziraat. During this period, ACC farmer members had the right to use credit up to a pre-defined ceiling (TL 2.25 billion in 2002 being roughly US $1,500), uniform for all members. Agricultural credit was given 80 percent in kind, and mostly as fertilizers. No such ceilings were in existence in Ziraat, allowing them to service the larger farmers.

Figure 3.5 - Real Rate on Farmers' Agricultural Credit



Source: Ziraat Bank

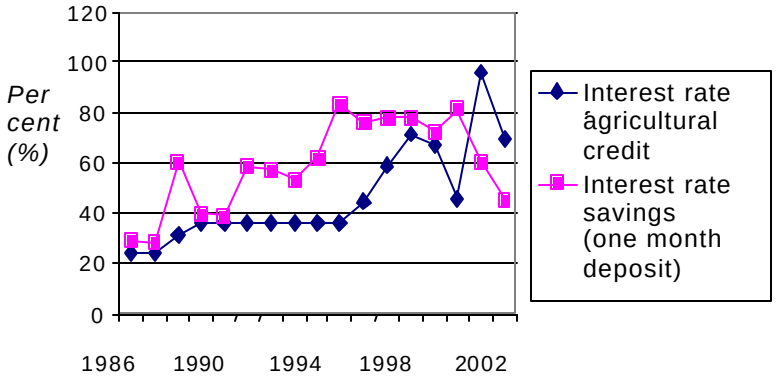
3.20 Prior to the 1999 reforms, interest rates were heavily subsidized. The Government also heavily subsidized the agricultural input sector through the provision of cheap credit. Between 1988 and 2002, real interest rates were negative up to 1998 (Figure 3.5), averaging about -20 percent per year. The subsidy element is also evident in the comparison between interest on

[16] Sekerbank, previously linked to Pankobirlik, reduced its agricultural portfolio from US $8 to $4 million from 2000 to 2001. Is Bankasi, one of the largest commercial banks in Turkey, is running a pilot program for commercial farmers in the Manisa (Aegean) province. Tarisbank encountered problems and was taken over by the Banking Supervisory Authority.

savings accounts and agricultural credit, the latter having been consistently below the former up to the year 2001 (Figure 3.6).

3.21 Real interest rates became positive in 1998 and have continued to be positive since then. During 2001-2002, they reached unviable levels of over 100 percent in nominal terms, and 30 percent in real terms.

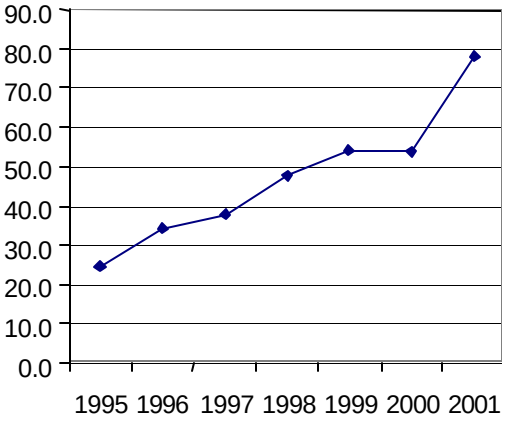
Figure 3.6: Comparison of Interest Rates for Agricultural Credit and Savings Accounts, 1986-2002



Source: Central Bank, Ziraat Bank

3.22 Cheap and abundant credit discouraged credit discipline in the agricultural sector and contributed greatly to unprofitability of farm lending and Ziraat Bank and ACC insolvency. It is also worthwhile to note that there has been a growing tendency towards credit delinquency since 1994-5, both in the credits given out by Ziraat and the ACC system. In fact, the increase in credit delinquency corresponds to another recent trend in the rural credit market, namely that of frequent debt rescheduling schemes involving implicit debt write-offs to farmers. The pursuit of support ("vote getting") by active political parties has consistently increased farmer expectations during election periods, and played a major role in building up the growing scale of overdue credit in the system, and required the debt re-scheduling as a fulfillment of campaign promises by past government collation parties.

Figure 3.7: ACCs - Credits Overdue and in Litigation *(percentage of total credit)*

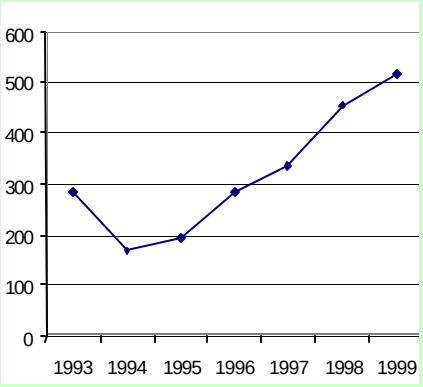


Source: Ziraat Bank

3.23 High real interest rates and lower agricultural profitability prompted by the 2000 reforms worsened the financial viability of Ziraat Bank and the ACCs. However, the possibility of other economic factors being at work must not be overlooked. First, higher real interest rates have clearly reduced the debt carrying capacity of farmers. Given the uncertainty of the timing of debt forgiveness, farmers have often taken on excessive debt and delayed repayment, then incurred penalties and capitalization of outstanding interest into their debt balances. With increasing real interest rates the cycle of reduced creditworthiness and inability to repay was further accelerated. The decreasing terms of trade of agriculture in the 2000-2002 period have also reduced debt carrying capacity and increased the pressure by farmers on the Government for debt-rescheduling.

3.24 Ziraat's credits overdue and under litigation increased from TL 169 trillion to TL 516 trillion in real terms between 1994 and 1999 -- a three-fold increase over five years. Equally, on the ACC side, credits overdue and under litigation increased from 25 percent in 1995 to the dramatic 78 percent in 2001, which finally blocked the ability of the system to extend new credits in 2002.

Figure 3.8: ZIRAAT: Credits overdue and in Litigation (real 2002 Trillion TL, exc. ACCs)



Source: Ziraat Bank

3.25 Two points also need to be raised in this regard. First, one cannot overlook the possibility that a properly re-structured and independent ACC system would become a serious rival to Ziraat. While Ziraat would ideally like to leave farms with annual revenues of less than US $7,500 to the ACCs, and focus on the better-off farmers, about half of Ziraat's present clientele is within this low-income segment. The next income bracket of US $7,500 to 15,000 is also small-scale farmers, well within the reach of the ACCs. These two segments together represent 90 percent of the current Ziraat portfolio.

3.26 Second, it is highly probable that small- and medium-scale farmers have used the available agricultural credit more as a low-interest credit line both for agriculture and for their general purposes, indirectly and partly as a substitute for rural credit especially in the eastern parts of the country, due to the fungible nature of money. There is some evidence in this respect[17], linking the ACC market share in fertilizers to the availability of the ACC credit (standard credit ceiling per farmer, as well as rates of credit overdue and under litigation) and to some extent to the real rate of interest. In other words, farmers have ideally tried to use their credit line to the fullest, unless the interest rates became truly unattractive.

3.27 In sum, the formal sector agricultural lending portfolio contracted quickly in the reform period from the time real interest rates were introduced. Both main lenders, Ziraat Bank and the ACCs, have reduced their exposure as flows of credit resources from the Treasury have been discontinued. Delinquency by agricultural borrowers has increased for three main reasons: (a) reductions in agricultural income; (b) high real interest rates; and (c) an expectation by some farmers for partial debt forgiveness.[18] Given the increasing problems with delinquency in the farming sector, Ziraat Bank is attempting to diversify its lending out of agriculture. The impact of loan delinquency on the ACCs has been to reduce loanable funds. This proceeded to the point in 2002 where the ACC system was unable to extend virtually any new credits at all.

[17] Regression of ACC market share in fertilizer from 1990-2001: Correlated with real credit limit (P-value 2 percent), and with Credit delinquency rate (P-value 1 percent), weakly correlated with real interest rate (P-value 7 percent). Overall regression significant at 2.6 percent level, with R2=67 percent, with a total of 12 observations and 9 degrees of freedom. More data, however, is required to verify this preliminary result.

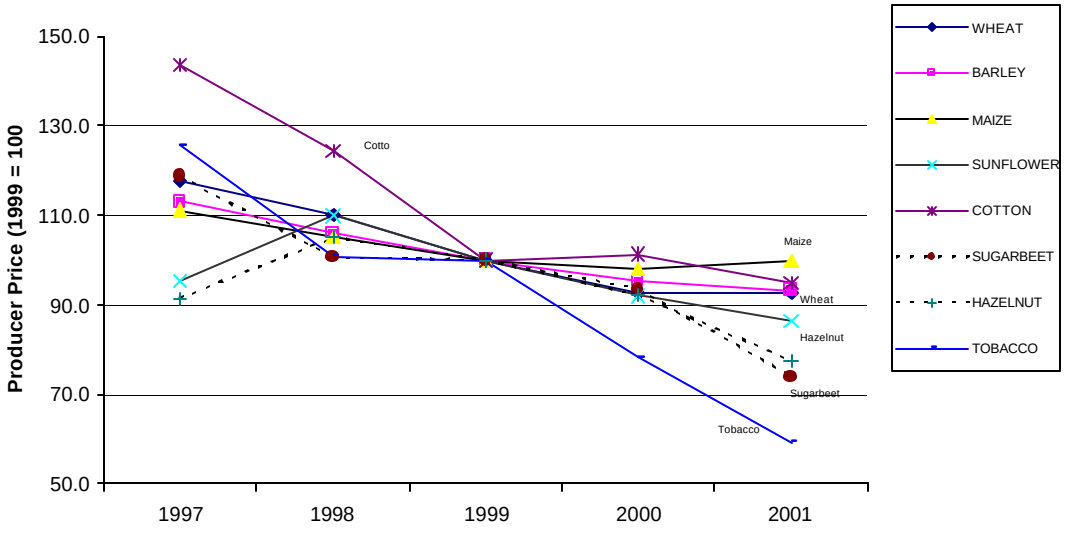
[18] In early June 2002, the Government announced a farmers' debt reduction package worth about US $1.15 billion, reducing the value of farmer' outstanding loans and interest to Ziraat Bank and the ACCs by US $550 million and US $600 million, respectively.

4. Changes in Output Structure and Foreign Trade Flows

A. Producer Price Trends

4.1 As a starting point for this chapter's analysis, the trends in producer prices for Turkey's major crops are examined. Figure 4.1 shows the trends in real prices relative to the base year 1999. The trends for all major crop prices are down in this period, with the largest decreases (25-50 percent) in tobacco, sugarbeet, and hazelnut. Grains also declined about 5-10 percent. These trends are similar to the findings in Chapter 2, which demonstrated that the largest reductions in PSEs were for sugarbeet and grains, while those for oilseeds and other crops were much more mediated. Thus, one can construct a range of commodities ordered by the degree to which their prices have been the most deregulated and fallen the most. Tobacco, sugarbeet, hazelnut, and wheat are in the first group.[19] Maize and barley have seen the next largest reductions in support and prices, and cotton and sunflower seed prices have declined the least. Cotton is not highly supported, but sunflower seed continues to enjoy a high level of PSE, the highest for all sub-sectors, including livestock.

Figure 4.1: Real Crop Prices, 1997-2001 (Index of Prices in Real 2001 TL)



Source: "Agricultural Structure," *2002* SIS.

B. Price and Output Decomposition

4.2 In order to ascertain clearly the impact of price change on outputs, we first must examine this at an aggregate production level. As Table 4.1 shows below, between 1999 and 2001, real prices fell much more (13 percent) than aggregate farm output (4 percent). As a result, the value of production declined by 16 percent in real terms, with a larger decline derived from livestock (30 percent), than crops (12 percent). Falling real prices have been responsible for three-quarters

[19] The series for hazelnut was not available through 2002, and no PSEs are routinely calculated for hazelnut, but other sources (cited in Annex 1 on the Review of the Turkish Hazelnut Sector) demonstrate that the trend in 2002 was further downward.

of the 16 percent reduction in real terms of gross agricultural value. This is true for both the crops and livestock sub-sectors. However, not all of the fall in prices has been due to reduced subsidization of agricultural product prices. The fact that the financial crisis of 2001 caused a real devaluation on the order of 20 percent meant that the prices in domestic currency of some of Turkey's agricultural products may have fallen even further in real TL terms. This is a result of the fact that the prices of agricultural tradeables take some time to adjust to devaluations and may have increased more slowly in 2001 than the prices of non-agricultural tradeables.

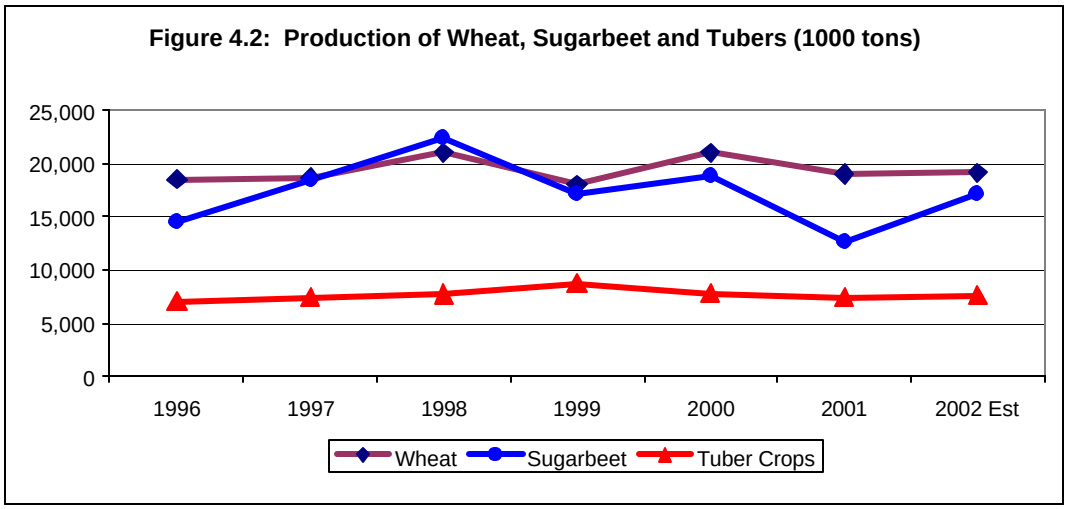
Table 4.1 – Indices of Real Prices, Production, and Gross Value, Real 2001 TL

	1997	1998	1999	2000	2001
Real Price Index, 1999=100	102.6	108.6	100.0	95.7	87.3
Crops	106.0	109.5	100.0	96.1	90.6
Livestock	93.6	106.9	100.0	95.6	78.8
Quantity Indices, 1999=100	95.1	105.0	100.0	104.4	95.7
Crops	94.8	107.1	100.0	106.6	97.7
Livestock	95.8	98.4	100.0	97.5	89.8
Gross Value Index, 1999=100	97.6	113.9	100.0	99.9	83.6
Crops	100.6	117.3	100.0	102.4	88.5
Livestock	89.7	105.2	100.0	93.2	70.7

4.3 In addition, overall GDP fell in 1999-2001 and reduced aggregate demand for food and agricultural products by 2 percent. A full quarter of the 24 percent decline in agricultural income (in real 2001 TL) over this period was due to the lag in the response of agricultural prices to the large devaluation of early 2001. In 2002, agricultural income recovered by 11 percent as the devaluation passed through to agricultural prices. Overall GDP grew by 8 percent, and preliminary data indicate that transfers to agriculture rose by almost 5 percent (as measured by the NAC in Chapter 2) as the DIS program accelerated. Thus, in the first two years of the reform period, subsidy reform (as expressed by decline in the NAC and TSE) was responsible for about two thirds of the loss in agricultural income, while over the whole period 1999-2002, subsidy reform was responsible for about 80 percent of the cumulative (16 percent) fall in agricultural income.

C. Changes in Output Structure

4.4 Between 1999 and 2001, the production volumes of cereals, pulses, nuts, and fodder crops increased (in ascending order) by 2 to 16 percent. Tubers (mainly potatoes), industrial crops (mainly tobacco, sugarbeet, and cotton), and oilseeds have seen their volumes fall by 15 to 30 percent. In other words, the declines in individual outputs was most pronounced among the previously most protected crops: sugar, tobacco, and sunflower, while little change has been noticed in the production of fruits and vegetables, which has been stable.



Source: MARA.

4.5 The most significant changes in individual crops production were for: (a) tobacco (a fall of 40 percent); (b) sugarbeets (down by 26 percent; (c) oilseeds (down by 29 percent); (d) the expansion of cotton production (by 16 percent); and (e) the increase of hazelnut output (by 13 percent). In the livestock sector, milk production and cattle meat output have fallen by 5 percent, but the more serious declines have come in the sheep meat and egg sub-sectors (**Table 4.2**).

Table 4.2 – Indices of Crop and Livestock Production Volumes, 1999=100

	1997	1998	1999	2000	2001
Cereals	103.1	115.0	100.0	111.7	102.4
Pulses	124.9	117.6	100.0	96.7	106.9
Industrial Crops	107.2	128.1	100.0	109.7	78.1
Tobacco	117.6	102.9	100.0	82.3	59.5
Sugarbeet	107.6	130.3	100.0	110.0	73.9
Cotton (raw)	103.9	113.8	100.0	111.6	116.4
Oil seeds	92.2	93.2	100.0	83.3	71.0
Tuber crops	85.0	88.7	100.0	89.5	84.8
Vegetables	85.1	95.8	100.0	101.2	99.3
Fruits and Nuts	91.0	106.6	100.0	108.5	100.1
Cows milk	99.4	98.5	100.0	97.4	94.7
Sheep Meat	87.6	109.2	100.0	83.9	64.7
Cattle Meat	108.5	102.7	100.0	101.4	94.8
Poultry	79.0	81.5	100.0	107.8	103.0
Eggs	85.8	98.6	100.0	95.9	75.1

Source: MARA and own calculations

4.6 In gross value terms, the changes from 1999 to 2001 have been almost all downward, with only cotton and pulses showing increases, of 10 and 8 percent respectively. The largest declines in value terms amplify those of the production declines: tobacco (-65 percent); sugarbeet (-45 percent); oilseeds (-36 percent); tea (-41 percent); and tubers (-28 percent). The fall in the largest product group by value, fruits and nuts, was also substantial (-11 percent). For livestock,

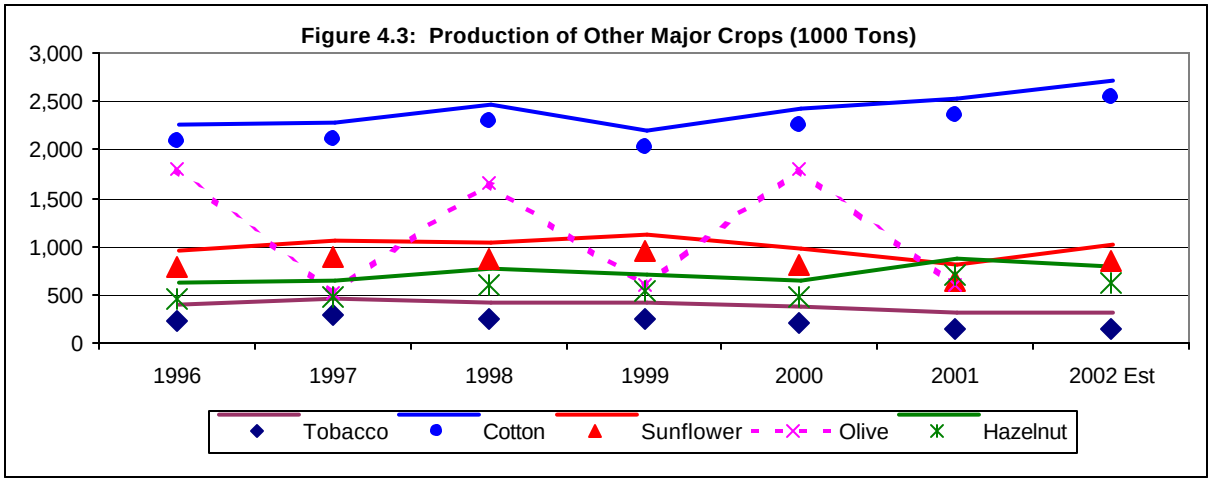
the greatest declines came in the sheep meat and cattle meat sectors, but the poultry and dairy sub-sectors were hard hit as well, with reductions of 25-35 percent (**Table 4.3**).

Table 4.3 – Indices of Gross Value of Crop Production (Real 2001 TL) and Crop Value Shares

1999=100	1997	1998	1999	2000	2001
Cereals	121.4	126.4	100.0	105.7	96.6
Pulses	98.2	111.0	100.0	108.1	107.5
Industrial Crops	138.2	125.3	100.0	93.3	65.9
Tobacco	147.7	103.8	100.0	64.3	35.2
Sugarbeet	127.8	131.1	100.0	103.0	54.7
Cotton (raw)	149.2	141.6	100.0	113.1	110.3
Oilseeds	90.7	104.2	100.0	79.4	63.9
Tuber Crops	78.6	107.4	100.0	74.3	71.5
Vegetables	98.9	115.5	100.0	105.6	99.0
Fruits and Nuts	78.8	113.8	100.0	111.8	89.4
Cows milk	87.6	102.2	100.0	91.2	76.3
Sheep Meat	75.6	112.9	100.0	76.9	47.1
Cattle Meat	91.6	111.2	100.0	89.6	63.1
Poultry	88.1	98.9	100.0	98.2	63.9
Eggs	112.1	109.5	100.0	114.4	85.8

Source: MARA and own calculations

4.7 The main changes in terms of the shares of gross value in the crops sector are consistent with the fact that the market intervention levels and support prices for tobacco, sugarbeet, and hazelnuts were reduced substantially. These are manifest as the fall in the shares of industrial crops from 13 to 9 percent, the stable share of fruits and nuts (growth of other fruits being offset by hazelnuts), and the rise in the share of vegetables from 23 to 27 percent. The cereals share has risen slightly as prices fell less here than for tobacco, sugarbeet, and hazelnuts. The livestock share in total gross value in agriculture has contracted from 28 to 23 percent.



Source: MARA.

D. Changes in Foreign Trade Flows for Agricultural and Food Products

4.8 Agricultural trade balances have improved as agricultural exports have stabilized at lower levels and imports have declined. This section examines trends in agricultural and food[20] exports and imports over the period 1996-2002, with special emphasis on the 1999-2002 period. While both Turkish exports and imports of all commodities together have increased over 1997-2002 period, the share of agricultural and food products within total exports and imports have both decreased. Agricultural and food exports have fallen steadily over this period, from a 20 percent export share in 1997 to just 11 percent in 2002. Agricultural and food product imports show a very small and declining share in Turkey's overall imports: 6 percent in 1997 and only 4 percent in 2002. Thus, Turkey maintains a trade surplus in agricultural and food products. Indeed, the foreign trade surplus of agricultural and food products recovered in 2001 to the US $2.5 billion level of 1997, after bottoming out at US $1.4 billion in 2000. In 2002, it has apparently fallen to about US $1.7 billion.

Table 4.4: Total Exports and Imports and Agricultural and Food Shares

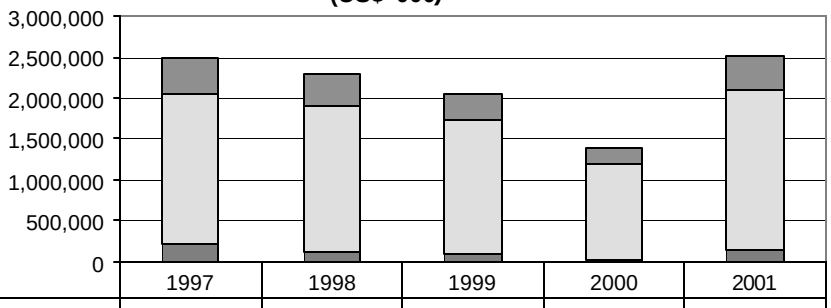
	1997	1998	1999	2000	2001	2002
Total Exports (US$ '000)	26,261,100	26,973,000	26,587,500	27,775,000	31,340,000	35,081,000
Agricultural and food exports	5,231,844	4,711,255	4,172,659	3,596,865	4,071,018	3,701,845
Share of agriculture and food within total exports	19.9%	17.5%	15.7%	13.0%	13.0%	10.6%
Total Imports (US$ '000)	48,558,700	45,921,392	40,671,272	54,502,821	41,399,000	50,832,000
Agricultural and food imports	2,731,662	2,411,242	2,123,955	2,218,476	1,552,191	1,997,131
Share of agriculture and food within total imports	5.6%	5.3%	5.2%	4.1%	3.7%	3.9%

Source: Undersecretariat of Foreign Trade.

4.9 Net Trade in Agricultural and Food Products Continues Positive. Examining the three main categories of crop products (edible crops including cereals, pulses, fruits, vegetables, etc.), livestock products, and other agricultural products, the following main trends are evident. First, Turkey consistently maintains a positive net trade position in all three categories throughout the 1997-2002 period (and indeed prior to this for many years). Net exports of crop products (both processed and raw) are both the largest and most stable. Fully US $1.2 billion annually of these net crop product exports are fruits and nuts, with hazelnuts about half to three quarters of this value. Net exports of "other" food and agricultural products (mainly tobacco and sugar and confectionary products) are also consistently high at around US $400 million. Trade in livestock products (both unprocessed and processed) is low for both exports (US $250 million) and imports (US $125 million) and declining, even though these also include fish and dairy product categories.

[20] Agricultural and food products involve both unprocessed and processed agricultural products included in five sections and 24 chapters of the tariff classifications. They are comprised mainly of animal products, crop products, animal and vegetable fats, prepared foods, and beverages. Agricultural raw materials such as cotton fiber leather, timber, rubber etc. are not considered under the agricultural and food products group. There are considerable agricultural raw materials imports; however agricultural raw materials after being imported are exported back under industrial products. As our analysis focuses only on agricultural and food products trade, we do not include agricultural raw materials in this study.

Figure 4.4: Foreign Trade Balance of Agricultural and Food Products (US$ '000)

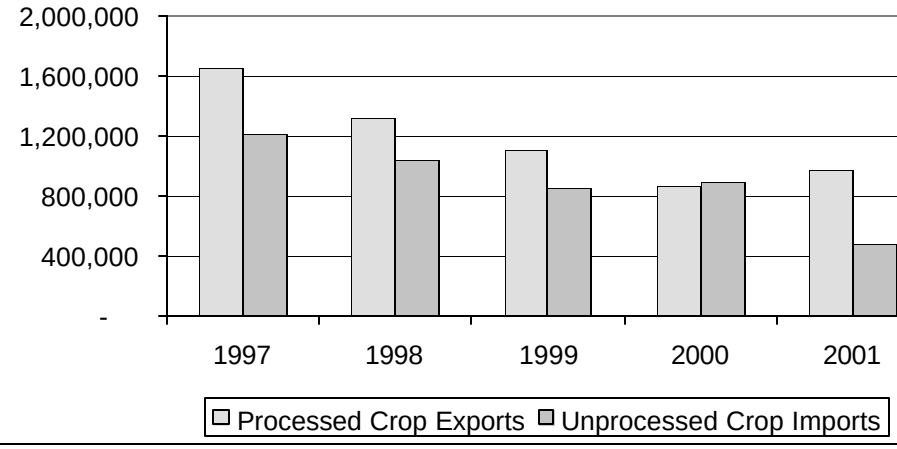


	1997	1998	1999	2000	2001
Other Products	442,638	393,832	305,839	181,547	409,246
Crop Products	1,831,189	1,795,652	1,641,352	1,164,003	1,977,077
Animal Products	226,355	110,529	101,513	32,839	132,504

Source: Undersecretariat of Foreign Trade.

4.10 Exports of Unprocessed Products More Resilient Than for Processed Products. Examining the structure of trade in processed versus unprocessed agricultural and food products reveals the following. First, the volume of processed product exports has fallen by a third to about US $2 billion, while unprocessed exports have fallen by only 10 percent (also to roughly US $2 billion). This falling trend came to an end in 2000 and reversed in 2001-2002. The biggest contributor to the decline in agricultural and food exports has been processed crop exports, with a US $800 million decline comprised mainly of declines (in diminishing order of magnitude) in milling products, oils and fats, and flour and starch. Other large declines were noted for tobacco ($250 million) and unprocessed crop products ($120 million).

Figure 4.5: Major Changes in Agricultural and Food Products Trade (US$ '000)

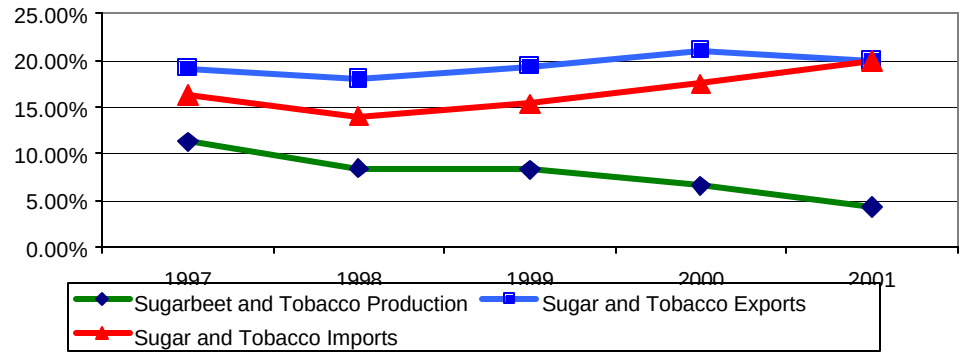


Source: Undersecretariat of Foreign Trade

4.11 Unprocessed Imports Fall the Most. On the imports side, flows of agricultural and food products declined by about 30 percent between 1997 to 2002. Unlike agricultural and food exports, for which the lowest level was reached in 2000, agricultural imports continued to decline in 2001 as well. This is likely associated with the large devaluation in early 2001. Since then, as the real exchange rate has appreciated, agricultural and food imports have recovered by about 25 percent. The decrease in 2001 can be mainly attributed to reductions in unprocessed vegetable product imports, mainly cereals (over US $500 million reduction), and oil seeds and fodder (down from US $300 to $160 million). Vegetable fats and oils and tobacco imports also declined significantly, by US $250 million and US $100 million respectively.

4.12 As can be seen from Figure 4.6, the previously heavily supported sugarbeet and tobacco crops have likely been the areas where the most marked linkage between reduced support and trade outcomes is present. Production of both were down sharply in the reform period (their share of production values dropped from 8 percent to below 5 percent) and the consequent impact of trade is clear. The share of tobacco and sugar imports have increased by one-third between 1991 and 2001, and even in 2001 tobacco and sugar exports declined.

Figure 4.6: Sugarbeet, Sugar and Tobacco -- Production, Exports and Imports within Total Agricultural and Food Products Excluding Animal Products



Source: Undersecretariat of Foreign Trade.

4.13 Summarizing the specific trends that occurred in the reform period, we see that exports of agricultural and food products declined in 2000 but quickly recovered in 2001, while imports rose in 2000 but declined substantially in 2001. Thus, it appears that the reductions in agricultural support in 2000 led to erosion of net agricultural exports. This is in line with the production trends noted above, which left lower crop surpluses on the domestic market in 2000, reduced both unprocessed and processed crops' exports, and allowed greater scope for competitive imports of unprocessed agricultural imports (mainly crops, rather than livestock). In 2001, the production trends for cereals, cotton and hazelnut were up, with other crops largely down. The significant devaluation in 2001 helped to amplify the export of these commodities with production growth and was the most important factor affecting the decline in unprocessed crop product imports.

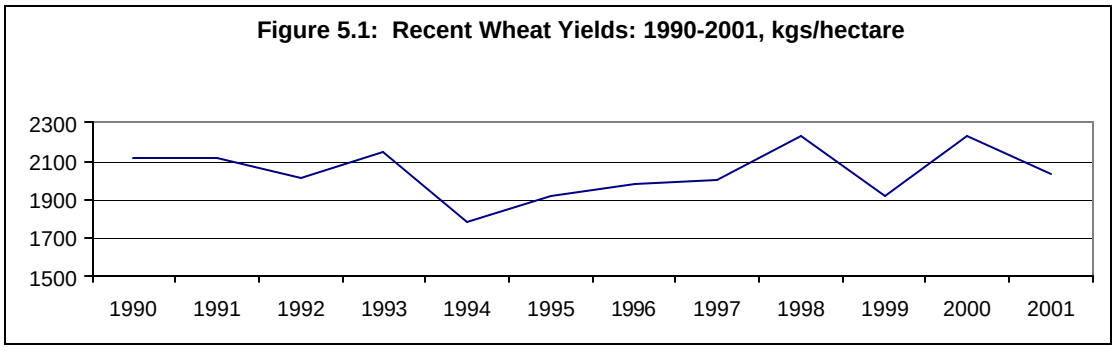
5. National and Regional Dimensions of Agricultural Sector Productivity

5.1 As the DIS payments which started in 2001 are made according to farm size, basic productivity analysis may be helpful in at least two respects. First, the value of gross output per hectare and value added per hectare are useful references for comparison with the magnitude of direct payments aimed at cushioning the impact of reduced subsidies. Second, it is instructive for measuring the ultimate effect of the new policy of decoupling support from the promotion of a more favorable cropping pattern. Though the DIS system is new and only two seasons of direct payments have been made, one can compare the situation before the decoupling (1999) with the situation in 2001 (the most recent year for which all necessary data is available). Thus, this chapter will focus on crop areas and value measures per hectare for the period 1997-2001.

A. Trends at the National Level

5.2 Analysis of productivity usually often focuses on "physical" yields, that is, kilograms of output per hectare. Though the movement of physical yields (for example that of wheat yields provided below in Figure 5.1) embodies the impact of production decisions taken by farmers, it also reflects the impact of weather conditions and technological change in agriculture over the longer run. More importantly, physical yields do not directly show the impact of crop prices, or changes in input prices or technological change in a given year. For this reason, the measures of productivity examined here focus more on land and labor productivity, ie. the values of crop output (in gross and net terms) per hectare or per employed. In this way, the analysis implicitly includes the impact of agricultural producer prices and input prices and allows for more meaningful comparisons across time and crops.

Figure 5.1: Recent Wheat Yields: 1990-2001, kgs/hectare



Source: SIS (2001) Agricultural Indicators, Publication No. 2407, Ankara.

5.3 **Agricultural Land.** Total agricultural land used for crop production has decreased by 450,000 ha between 1999 and 2001. The decrease is observed only in some types of land use. The decrease in field crop area (360,000 ha) is responsible for most of the decline, but the area covered by vineyards and olive trees has also decreased. In contrast to the overall trend, the area covered by fruit trees (including nuts) and vegetables is increasing, though only slightly.

Table 5.1: Agricultural Land (1000 hectares)

	Field area	Fallow land	Vegetables	Vineyards	Fruit trees	Olive Trees	Total land
1997	18.605	4.917	775	545	1.364	658	26.864
1998	18.751	4.905	783	541	1.389	600	26.969
1999	18.450	5.039	790	535	1.393	595	26.802
2000	18.207	4.826	793	535	1.418	600	26.379
2001	18.088	4.914	799	525	1.425	600	26.351

Source: SIS.

5.4 An important variable here is "fallow land," for which there is no disaggregated "fallow land" data by different field crops. Since fallow land may only be considered for field crop totals, individual field crops' productivity measures exclude the impact of fallow land on yields. In addition, "total land" includes the area for fodder crops, whereas the crop value of hay and straw is not included in the total crop values available (from the "Agricultural Structure" statistics[21]). For these reasons, the productivity of total field crops may be lower than that implied by the productivity of the individual field crops. This also explains the differences the total crop values presented in this chapter as compared with Table 2.3.

5.5 Gross Crop Values Per Hectare fell by 11 percent in real terms. A comparison of the gross crop values across years in current TL is problematic owing to high and varying inflation. Thus, we have chosen here to convert these values into real 2001 TL or US dollars with the annual GDP deflators and Central Bank exchange rates, respectively. The change over time in these two measures can be significantly different. As a result, the real TL values have been chosen as the main basis of comparison across years, and dollar valued are provided in some cases to provide a frame of reference for international comparisons. As can be seen from the first two columns of Table 5.2, the value of crop production has fallen by 11 percent in real TL terms, but 29 percent in US dollar terms.

5.6 The interpretation of the last 2 columns in Table 5.2 reveals a similar divergence. The per hectare gross value of crop production on all agricultural land has fallen by 10 percent in real TL terms, but 28 percent in US dollar terms. The drop in real 2001 TL of 85 million per hectare is actually less than the 100 million TL payment per hectare afforded under the DIS Program in 2001. However, this average loss of gross crop value understates the loss of revenue to farmers and the value added per hectare to farmers, as it does not take into consideration loss rates for output produced nor the higher input costs. These loss rates can be large for some crops, and as was seen in Chapter 2, input costs have risen sharply in 1999-2001. The impact of these factors are examined in the "Net Crop Value" and "Input Costs and Value Added" sections of the chapter below.

5.7 The variation of crop values per hectare by type of crop between 1999 and 2001 (Table 5.3) show a similar pattern as the aggregate results for the crop sub-sectors (Table 5.2). Again, the trends are universally down, except for pulses (up 9 percent). Cereals showed the next best outcome, with a fall of only 4 percent. The highest reduction is for "other field crops (- 22 percent)," which includes tobacco, sugarbeet, oilseeds, and cotton, among other crops. For field

[21]The main source of data for production, price and value are the annual publication of State Institute of Statistics (SIS) "Agricultural Structure (production, price, value)." Production quantities of field crops, fruits and vegetables and prices received by farmers are obtained from this publication.

crops as a whole, the decline was 15 percent. The value of fruits and nuts per hectare declined by 12 percent, while those of vegetables declined by only 2 percent.

Table 5.2: Gross Value of Crop Production (1997-2001)

	Gross Value of Crop Production (Real 2001 trillion TL)	Gross Value of Crop Production (US$ millions)	Per hectare Gross Value of Crop Production (Real 2001 million TL/ha)	Per hectare Gross Value of Crop Production (US$/ha)
1997	22,746	23,496	847	875
1998	26,528	27,962	984	1,037
1999	22,620	23,158	844	864
2000	23,171	23,931	878	907
2001	20,017	16,377	759	621

Source: SIS and own calculations.

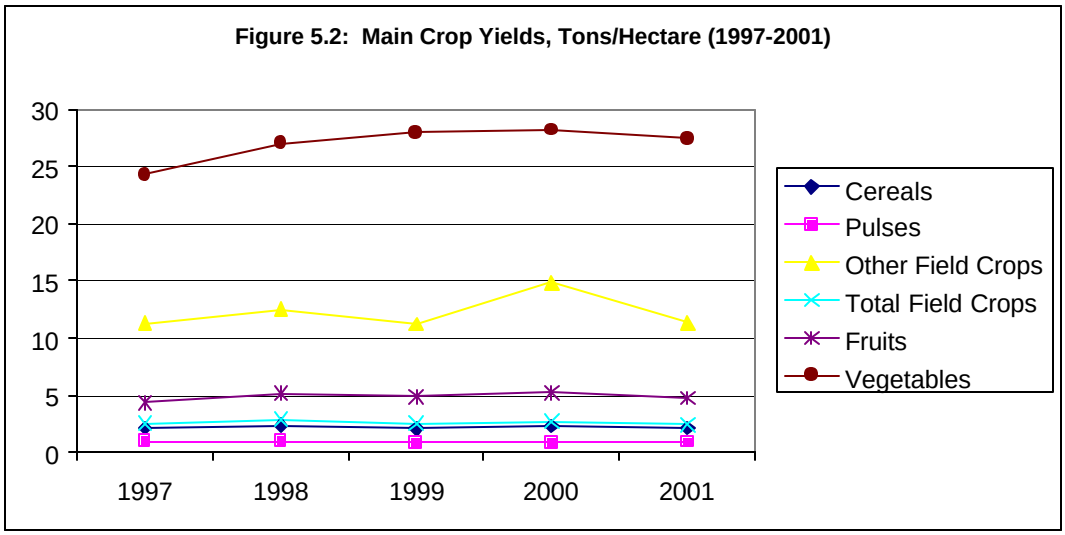
5.8 The DIS payment of 100 million TL per hectare was able to compensate average farmers and average cereal farmers more than fully to replace lost production value on average for field crops and on average for all crops taken together (as seen in the "Total" row). However, within this wide category, this has likely not been the case for farmers specializing in tobacco and sugarbeet. For fruits and nuts this has not been the case, nor has it been for vegetables.

Table 5.3. Gross Crop Values per Hectare by Crop (Real 2001 Million TL/ha)

	1997	1998	1999	2000	2001	Loss or Gain 1999-2001
Cereals	395	408	326	344	315	80
Pulses	422	504	476	528	518	-38
Other Field Crops	2,349	2,361	2,103	2,288	1,637	466
Total Field Crops	524	547	458	445	387	71
Fruits and Nuts	1,980	2,903	2,557	2,825	2,261	296
Vegetables	6,901	7,973	6,844	7,195	6,695	189
Total	847	984	844	878	759	85

Source: SIS and own calculations.

5.9 When examining the reasons behind this large fall in gross crop values per hectare across the range of crops produced in Turkey, the first factor to examine is physical yields. However, despite the variability of individual crop yields in this period (particularly wheat and sugarbeet) overall, the various groups of crops have shown remarkably stable physical yields per hectare over the 1999-2001 period. Physical yields for cereals and pulses actually increased, while those for fruits and vegetables were stable. Thus, clearly agricultural price reductions are the main reason behind the fall in gross crop values. This has been seen in Table 2.2 in Chapter 2 and in the section on Price and Output Decomposition in Chapter 4.



Source: SIS.

5.10 Crops value added per hectare fell by 30% in real terms between 1999 and 2001. Inclusion of input costs into the calculation of productivity is crucial since the gross value added figures are calculated by deducting the input costs from net crop value. Input costs in real 2001 TL are presented below (Table 5.5) in aggregate terms and on a per hectare basis. First, it should be noted that the ratio of input costs to value added in constant prices is an indicator of overall intensity of input usage over time. Calculated in 1987 constant prices for the period 1997-2001, this ratio (ranging 22-24 percent) shows that input intensity was quite stable. This corresponds to the finding in Chapter 2 (Table 2.2) that the quantity index of inputs declined only marginally in 1999-2001. The same ratio at current prices has increased from 30 percent to 49 percent, which confirms the real increase in input prices and inelastic demand for inputs overall.

5.11 Since input costs have risen by 13 percent while the gross value of agricultural production has declined, gross value added has declined sharply. As Table 5.5 shows, gross valued added in the crop sector has declined by 30 percent. On a per hectare basis, the increase has been only slightly less. This measure declined between 1999-2001 by almost 200 million TL per hectare. This was twice the magnitude of the DIS per hectare payment in 2001, and illustrates that even on average the replacement rate of reduced agricultural input and output subsidies in on the order of 50%. For farmers specializing in crops which saw the greatest declines in subsidies, i.e., sugarbeet, tobacco, and hazelnut, the DIS has replaced even less of the income lost.

Table 5.5: Aggregate Input Costs and Value Added of Crop Production

	Input costs (Real trillion 2001 TL)	Input cost per hectare (Real million 2001 TL/ha)	Gross Value Added (Real trillion 2001 TL)	Million TL/ha (constant 2001 prices)
1997	5,433	202	18,176	677
1998	4,955	184	23,486	871
1999	5,593	209	18,302	683
2000	5,948	225	17,488	663
2001	6,299	239	12,771	485

Source: SIS and own calculations.

B. Regional Variations in Agricultural Sector Productivity

5.12 Changes in Regional Crop Areas. As indicated earlier the major trend in the reform period is a reduction in the overall cultivated area, which decreased from 1999 to 2001 by about 450,000 hectares (1.7 percent). The decline in cultivated area in fact is the continuation of a longer term trend. However, the directions of change are not uniform in all regions. Table 5.6 presents these developments.

Table 5.6: Changes in Cultivated Area by Region (Hectares)

1999	TOTAL	Area sown	Fallow	Vegetables	Fruits
Marmara	2.637.724	2.088.949	77.238	156.914	314.623
Black Sea	3.150.570	2.074.248	394.672	98.812	582.838
Central A.	9.244.476	5.779.257	3.127.729	117.131	220.359
Southeast	3.447.229	2.720.129	252.560	77.696	396.844
East Anatolia	2.613.099	1.783.699	695.516	24.964	108.920
Aegean	3.025.656	1.993.070	260.041	152.312	620.233
Mediterranean	2.682.428	2.010.330	231.386	161.873	278.839
TURKEY	26.801.182	18.449.682	5.039.142	789.702	2.522.656
2001	**TOTAL**	**Area sown**	**Fallow**	**Vegetables**	**Fruits**
Marmara	2.594.223	2.041.026	77.104	156.650	319.443
Black Sea	3.106.731	2.024.519	376.867	105.750	599.595
Central A.	8.930.662	5.622.736	2.976.070	115.987	215.869
Southeast	3.422.220	2.696.958	258.676	82.730	383.856
East Anatolia	2.593.217	1.776.541	680.657	26.836	109.183
Aegean	3.014.642	1.955.938	273.235	154.723	630.746
Mediterranean	2.688.780	1.969.826	271.025	156.168	291.761
TURKEY	26.350.475	18.087.544	4.913.634	798.844	2.550.453
2001-1999	**TOTAL**	**Area sown**	**Fallow**	**Vegetables**	**Fruits**
Marmara	-43.501	-47.923	-134	-264	4.820
Black Sea	-43.839	-49.729	-17.805	6.938	16.757
Central A.	-313.814	-156.521	-151.659	-1.144	-4.490
Southeast	-25.009	-23.171	6.116	5.034	-12.988
East Anatolia	-19.882	-7.158	-14.859	1.872	263
Aegean	-11.014	-37.132	13.194	2.411	10.513
Mediterranean	6.352	-40.504	39.639	-5.705	12.922
TURKEY	-450.707	-362.138	-125.508	9.142	27.797

Source: SIS and own calculations.

5.13 Total cultivated area has declined in all regions, except the Mediterranean (where the increase was only 0.2 percent). The declines have ranged from 3.5 percent in the Central Anatolia region to 0.3 percent in the Aegean region. Area sown (field crops) has declined in all regions without exception. The largest decline in sown area was in Central Anatolia followed by the Black Sea region and Marmara region. Fallow land has increased (i.e., land which went out of production entirely) in the Mediterranean, East Anatolia, Southeast Anatolia, Black Sea and Marmara regions. Vegetable cultivated area has increased in all areas except in the Marmara and the Mediterranean regions, but this increase has been small, only 1.1 percent in all regions combined. Fruit area has also increased by 1.1 percent nationally, but declined in the Southeast and Central Anatolia regions.

5.14 The most significant decrease in area has happened in Central Anatolia, where sown area to field crops (mainly grains) has fallen by over 150,000 hectares (2.8 percent). The next largest reduction was also in Central Anatolia, again almost 150,000 hectares, and came in fallow land (by 5 percent). The next largest decreases are observed in the Marmara and Black Sea regions. The largest part of these decreases are in area sown (down by 2.5 percent in each case), yet in both regions there is a significant increase in area under fruit trees (by 1.5 and 2.8 percent respectively). The declines in total cultivated area in the Southeast, East Anatolia and Aegean regions have all been less than 1 percent in each case. The increase in total cultivated area in the Mediterranean region has been mainly in fruit production (by 4.5 percent).

5.15 Changes in Regional Gross Crop Values - Largest Absolute Declines in Marmara, Aegean, and Black Sea, but Largest Relative Declines in Central Anatolia. When examining per hectare gross crop values by region, all provinces and regions should be compared to Turkey averages for the years 1999 and 2001. These overall reference magnitudes are repeated from Table 5.3 in Table 5.7 below. (Net crop values and value added per crop type by region cannot be calculated with accuracy as the crop loss parameters, transportation costs, and input costs were not available for the provincial nor regional levels.) Each province may also be compared to its regional averages. (These results are reserved for presentation in the detailed tables in the Statistical Annex to this Review.)

5.16 The gross crop value measure of productivity (in real 2001 TL per hectare) has decreased in all regions except the Southeast from 1999 to 2001. As discussed before this measure understates the loss in value added, and Tables 5.3 and 5.5 showed that the loss in value added was on average more than twice the loss in gross value per hectare nationally. The main findings of the regional examination are that Central Anatolia experienced smaller absolute but larger relative declines in land productivity compared to the more commercial provinces (Aegean, Black Sea, Marmara) which had the highest gross values per hectare in 1999 and have seen the greatest losses in the reform period. These commercial regions are also those which show the lowest elasticity of demand for inputs (as seen in Chapter 3) and therefore have likely experienced the greatest losses in value added per hectare. The exception to this characterization is the Mediterranean province (the most productive province), which witnessed one of the smallest relative drops in land productivity, as compared to its base year 1999 levels.

5.17 These results differ from the findings in Chapter 2, where the largest declines in regional crop PSEs (see Table 2.6) were in Central Anatolia and Eastern Anatolia. This result is understandable for Central Anatolia, as the fall in the aggregate PSE was partly due to the large decline in cereals area. On a per hectare basis, Central Anatolia has suffered a lower loss, but still above the national average. The same pattern is evident in Eastern Anatolia, and the decline in gross crop value per hectare there is well below the national average. (Here crop productivities were at very low levels to start, as these areas are comparatively extensively cultivated.) In the Black Sea region, the overall drop in gross crop values is similar to the fall in the region's crop PSE: in both cases they are in the middle of the range of declines.

Table 5.7: Gross Crop Values by Crop Type and Region (Real 2001 million TL//ha)

2001	Total	Field crops	Vegetables	Fruits
Aegean	1,178	585	7,146	1,810
Black Sea	917	428	6,036	1,968
Central Anatolia	370	247	4,749	2,934
East Anatolia	365	220	5,102	2,478
Marmara	1,118	548	6,504	2,269
Mediterranean	1,545	573	9,200	3,805
Southeast Asia	675	495	5,571	997
TURKEY	759	387	6,695	2,261

1999	Total	Field crops	Vegetables	Fruits
Aegean	1,364	764	6,896	2,180
Black Sea	1,068	551	6,275	2,374
Central Anatolia.	479	354	4,763	3,226
East Anatolia	386	253	5,185	2,308
Marmara	1,273	631	7,111	2,781
Mediterranean	1,638	613	9,552	5,279
South East	567	391	4,955	1,023
TURKEY	844	458	6,844	2,557

2001-1999	Total	Field crops	Vegetables	Fruits
Aegean	-185	-178	250	-370
Black Sea	-151	-123	-239	-406
Central Anatolia.	-108	-107	-14	-293
East Anatolia	-20	-33	-83	169
Marmara	-154	-83	-607	-512
Mediterranean	-93	-40	-352	-1,473
South East	108	104	616	-25
TURKEY	-85	-71	-150	-296

Source: SIS and own calculations.

5.18 Examining the regional crop productivity results by crop type reveals the following. The only increases have been in field crops productivity in the Southeast, vegetable productivity in Aegean and the Southeast, and fruits productivity increase in East Anatolia. The largest declines have occurred where productivity was already very high. These have been in the Mediterranean region, where fruit and vegetable gross crop values fell by 1,500 million TL and 350 million TL per hectare, respectively. Still, the Mediterranean region has maintained its leading position in both these sectors, with gross crop values 30 percent above the next most productive regions in both these crops.

5.19 The Marmara region remained at or above Turkey's average gross crop values in all sectors, despite the fact that its gross crop values for all these crops fell by more than the average level of decreases nationally. The Black Sea region also experienced severe strong productivity decreases, with decreases in gross crop values for field crops larger than the average reductions for the country as a whole. The Aegean region has also had much greater productivity decreases compared to the national average declines, except for vegetables. The Central Anatolia region saw slightly less than the average reductions in gross crop values for fruits and much less for vegetables.

5.20 It must also be noted that all provinces within a region are not homogenous with respect to the level of productivity and productivity decreases. There were many provinces that achieved productivity increases in several sectors, especially in fruit production, even under such unfavorable economic conditions. Another distinguishing feature is the difference between coastal and inland province results within the same region.

6. Interaction of Subsidy Reduction and Direct Income Support Program

6.1 This chapter summarizes the impact of the agricultural subsidization reform and DIS program on crop area changes, rural productivity and income in 2001-2002. Specifically, it sets out to answer three questions: who participated in the DIS program; was there a shift in production from crops with price supports to crops without price supports; and what has been the impact of cash transfers on agricultural income?

A. Quantitative Household Survey Data

6.2 The data set used to examine changes in the structure in crop areas and in farmer welfare comes from a household survey (known as the ARIP Quantitative Household Survey, or QHS) of 5508 village households conducted in 500 rural Turkish villages in November-December 2002. This survey was designed to be representative of farming households (in all of Turkey's seven regions) which were engaged largely in cultivation of the formerly most highly subsidized crops (tobacco, sugarbeet, hazelnut, and grains).[22] There are three important caveats in the data worth noting for this analysis.

6.3 Poverty measure. For the purposes of this analysis the poor are defined as the bottom third of the per capita consumption expenditure distribution and non-poor as the top two-thirds. This is equivalent to a poverty line of 1.4 billion TL per capita per year in 2002.

6.4 Applied versus received DIS. The QHS included questions on applications for DIS in 2001 and 2002 and whether or not payments were received. Ninety-four percent of households that applied for DIS in 2001 received payments, but only 23 percent that applied in 2002 received payments. This is because DIS disbursements lag several months behind application. Given the very high share of households in 2001 that received payments once they applied, those that "applied" rather than "received" DIS are used to construct the measure of household participation in the 2002 DIS program.

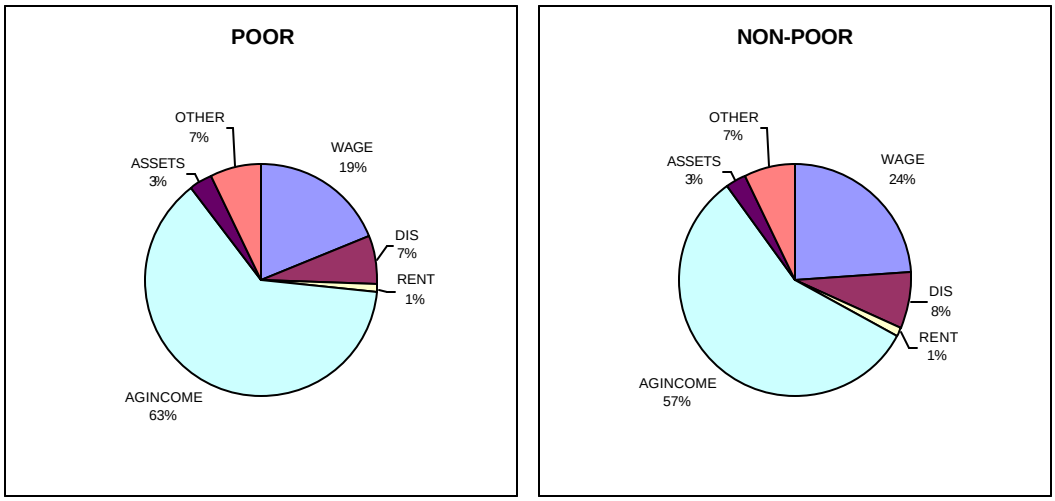
6.5 Reported versus calculated DIS payments. In the questionnaire, households reported the amount of DIS received over the last year. This can be compared with a calculation of the amount they should have received based on their land holdings. Reported and calculated DIS are highly correlated, but the reported DIS payment is consistently higher. A number of explanations are possible for this over-reporting, but the most likely is that the survey was conducted almost a year after the first set of payments was made, and respondents may have had difficulty recalling exactly how much they received. While this difference warrants closer investigation, the remainder of the analysis relies on reported DIS payments.

[22] The sampling method employed was cluster sampling, prepared according to eight project crops: wheat, tobacco hazelnut, sugarbeet, maize, cotton, olives and tea. Four hundred and ninety nine villages were selected by random sampling from the lists of State Institute of Statistics (SIS) that are divided according to regions were crops are grown. The sample has 71 provinces: 11 in Marmara region, 13 in Central Anatolia, 6 in the Aegean, 12 in the Mediterranean, 6 in Southeast Anatolia, 10 in East Anatolia, and 13 in the Black Sea region. Random selection of the farm holders was based on a "village list" generated after an interview with the *muhtar* (village headman). After completion of village *muhtar* questionnaire, 11 households were selected for interviewing. Agricultural business-households were randomly selected from the village household list with a systematic sampling method while implementing the survey.

B. Sources of Household Income

6.6 Households had six major income sources in 2002 (Figure 6.1). The single most important was sale of agricultural products (58 percent), followed by wages (20 percent).[23] Comparing income sources for households across the poor and non-poor, Figure 6.1 suggests that there are significant differences. First, wages made up 24 percent of the total income for the non-poor and only 19 percent for the poor, while agricultural income made up 63 percent of income for the poor and 57 percent for the non-poor. DIS payments accounted for a surprisingly high 7 percent of household income, and this share was virtually the same across poor and non-poor alike.

Figure 6.1 - Sources of Household Income, 2002 Across Poor and Non-Poor



Source: 2002 QHS

C. Familiarity with the Agricultural Reform Program and DIS

6.7 The majority of households (53 percent) indicated they were not familiar with the agricultural reform program. A closer look at the data reveals that there are no systematic differences in knowledge of the reform program between poor and non-poor households, suggesting uniform access to information about the program over the welfare distribution. While households are not familiar with the reform program in general, they are familiar with DIS, and 65 percent view these payments favorably (although 24 percent view them negatively). Again, there are no differences in perception of the program between poor and non-poor households. All land users (owners, renters, and share-croppers) are eligible to apply to DIS, so long as they can demonstrate their land is legally cultivated and is registered in the cadastre or their muhtar (village head) provides an affidavit indicating that they are the legal user of the land. Surprisingly, the survey data (presented in Table 6.1 below) indicate only small, though statistically significant, differences in the land tenure characteristics of the poor and non-poor households.

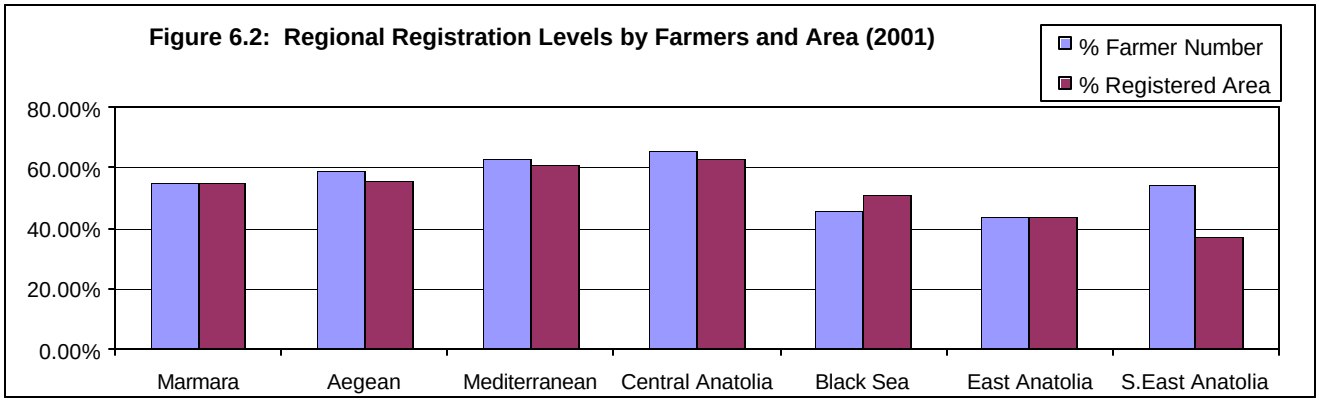
[23] 'Other income' includes income from sources other than agriculture, interest, and aid from family and relatives.

Table 6.1: Shares of Poor and Non-Poor Having Land that Is:	Poor	Non-Poor
Registered in Cadaster	66	72
Not Registered in Cadaster	42	41
Rented	18	24
Share Cropped	6	8

Source: 2002 QHS

D. Participation in DIS

6.8 At the launch of the DIS program in 2001, the target was to register 50 percent of the farming households in Turkey by the end of 2002. An analysis of data from the National Registry of Farmers has been made to rate this progress against the benchmarks set out. By Fall 2001, 2.18 million farmers had been registered for the DIS Program, accounting for 121.0 million decares of agricultural land. This amounted to 54 percent of the expected total number of farmers[24] and 50 percent of the total agricultural area. So at the national level the target set out was reached ahead of schedule. However, these ratios by province varied substantially. Examining share of farmers registered, the range was from a low of 11 percent in Bingol to a high of 105 percent in Edirne[25], while the median share was 51 percent. The registered share of land area varied across provinces almost as much, from only 7 percent in Sirnak to a high of 83 percent in Kirsehir. The median share was 52 percent.



Source: MARA and SIS-1991 Agricultural Census

6.9 Figure 6.2 above demonstrates the regional distribution of registration shares for farmers and land areas. The Central Anatolia region had the highest registration shares for both farmers and land areas (65 and 63 percent respectively). The South East Anatolia region had an above average share of farmers registered (54 percent), but was behind all areas with respect to the registered share of land areas. The Black Sea was the only region where the share of farmers registered was below registered share of land areas (46 and 51 percent respectively).

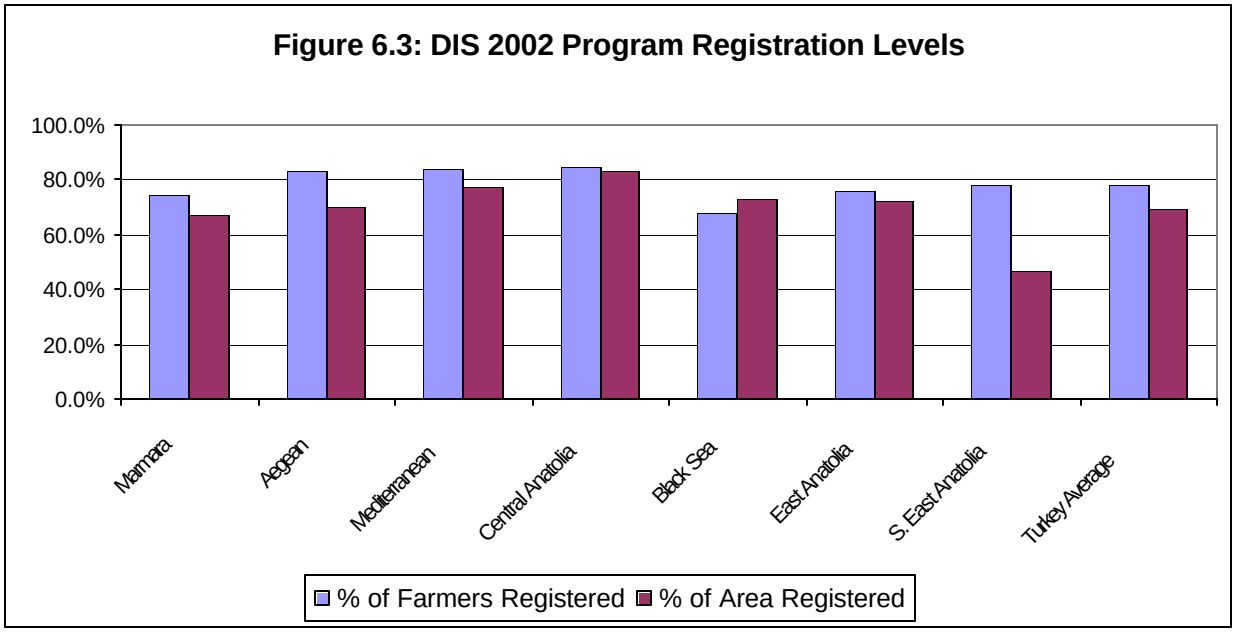
[24] Because of the lack of more recent agricultural census data disaggregated by province on the total number of farmers, 1991 agricultural census data are the source of the denominator (total population of farmers) for the ratio. As a result, this ratio is not entirely accurate, as the farmer population might have changed since 1991. However, the total number of farmers indicated by the 2002 Agricultural Census is roughly constant (4.1 million) as compared to the 1991 Agricultural Census.

[25] It is worth noting that in 4 provinces (Edirne, Gaziantep, Kirsehir and Tekirdag), the ratio of number registered farmers / total farmers is higher than 1, because of the dated nature of the data from the 1991 census and the likelihood that division of farms over time among family members has been unusually frequent in these provinces.

6.10 In 2002, a number of significant differences in the trends of participation in the DIS Program have evolved (see Figure 6.3 below). Using the same base numbers of farmers and land areas, the registered share of farmers rose to 78 percent at the national level, while the registered share of land areas rose to 70 percent. This trend of continued higher shares of registered farmers than land areas was present in each region (except the Black Sea region) and was particularly marked in the South East Anatolia, Aegean, and Marmara regions. In this regard, anecdotal evidence indicate that the frequency of disputed land titles is higher in the South East Anatolia region than average in Turkey. This would mean that many farmers in South East Anatolia could register at least partially in the NRF, without being able to register as much of their land as farmers in other regions manage to register. This would account for the lower registered share for land areas compared to the registered share for farmers.

6.11 Other factors possibly at work influencing the registered area shares' being lower than registered farmer shares are the maximum eligible area cut-off of 500 da for farmers and the fact that corporate farms are ineligible for DIS. The importance of these factors cannot be adequately assessed until the detailed 2002 Agricultural Census results are released by the State Institute of Statistics (SIS), which is expected in 2004.

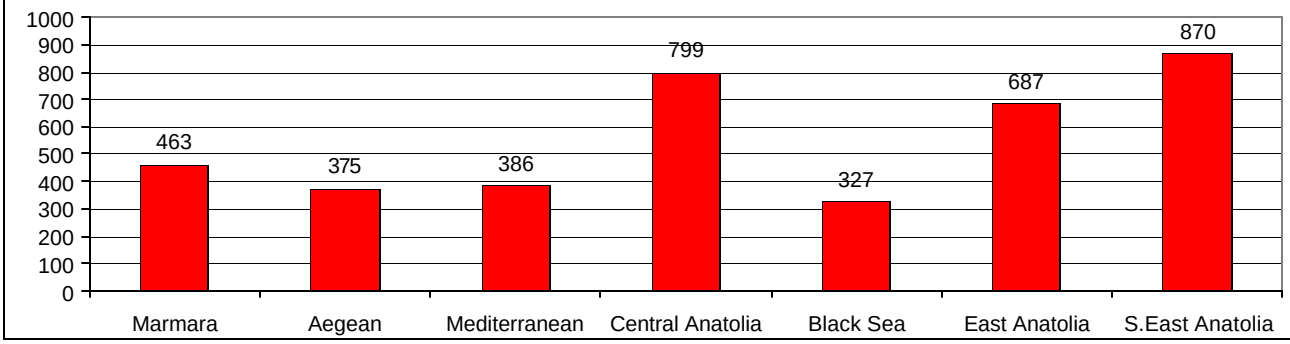
Figure 6.3: DIS 2002 Program Registration Levels



Source: MARA and SIS-1991 Agricultural Census

6.12 Before moving to an analysis of the registered share for farmers and land areas as revealed by the respondents to the QHS, it is worth briefly highlighting the payment levels by region that were reported from the data in the NRF for 2001-2002. Here, we see that the DIS 2001 Program paid out a total of 1.18 quadrillion TL to the 2.18 million registered farmers. Average payment per registered farmer was 539 million TL (USD 379), and this per farmer payment ranged regionally from 327 million TL in the Black Sea region to a high of 870 million TL in South East Anatolia. (This level in Southeast Anatolia would likely have been even higher were land title disputes less of a problem.) Figure 6.4 shows the regional disparities in average DIS payment per farmer.

Figure 6.4: Average DIS Payment Per Registered Farmer, 2001 Program, Million TL



Source: MARA

6.13 Participation Rates Revealed in the QHS. Analyzing the replies of respondents to the QHS, we see similar participation rates by farmers as those present in the NRF. The main differences in 2001 were in Marmara, the East Anatolia, and South East Anatolia regions, where the rates reported from the QHS sample were substantially above those reported in the NRF, by 10-15 percentage points in each case. These differences narrowed substantially in 2002 in the Marmara, Black Sea and Eastern Anatolia regions, but grew in the Aegean, Mediterranean, and Southeast Anatolia. Again, since the 1991 Agricultural Census is the source of the data for the total population of farmers, these differences may be explained by differential trends in the evolution of the actual number of farmers in the various regions.

Table 6.2: DIS Farmer Participation Shares by Region

Region	Poverty incidence	2001 QHS	2001 NRF	2002 QHS	2002 NRF
Marmara	22	67	55	70	75
Aegean	31	59	59	66	83
Mediterranean	50	49	63	56	84
Central Anatolia	29	73	65	77	85
Black Sea	58	52	46	64	68
Eastern Anatolia	60	58	44	70	76
S. E. Anatolia	15	63	54	67	78

Source: 2002 QHS

6.14 The QHS data allow us to investigate the impact of farmers' characteristics on DIS participation. First, on the basis of sub-samples in the QHS data, it is clear that participation rates increased uniformly for the poor and non-poor from 2001 to 2002. Still, regional participation rates and regional poverty incidence are negatively correlated: -0.70 (QHS) or -0.78 (NRF) in 2001, and –0.33 (NRF) or -0.37 (QHS) in 2002, respectively. Literacy does not appear to have been an issue, as participation rates between the literate and illiterate sub-samples were uniform. A cross tabulation of participation rates by eligibility criteria also reveals that there is no systematic difference in the participation rates of farmers with different size land holdings.

6.15 However, there are significant differences in participation rates across the types of land holdings. Fifty-six percent of households with land registered in the cadastre participate in the DIS. Only 16 percent of households with land not registered in the cadastre, 5 percent of

households with rented land, and less than one percent of sharecroppers participated in the program. The most common reason cited by households for not participating in DIS is that they did not believe they were eligible to enter the program. Thus, improving dissemination of information on eligibility criteria, particularly in areas with high numbers of sharecroppers and farmers with land not registered in the cadastre, may help raise the participation rates.

6.16 A multivariate analysis of the determinants of participation in the DIS program reveals that the variables for cadastered land, knowledge of reforms, and access to credit are significant positive determinants of participation (see Table 6.3 below). Indeed, having land registered in the cadaster is the most significant positive determinant of participation. To measure the impact of differential regional propensities to participate, the Mediterranean region is omitted from the regression. The effect of the remaining regions on participation is positive and significant, in line with the results reported in Table 6.2 on the QHS-based participation shares. Surprisingly, size of land holding does not have a substantial impact on participation. Likewise, neither the level of household expenditure nor the "poor" dummy variables have substantial impacts on participation, confirming the weak link between poverty and DIS participation.

Table 6.3: Results from Logistic Regression about DIS participation

Variable Name	Description of Variable	Mean	Odds Ratio
Apply/Not apply	dependent variable	0.56	
Household Income**	in million TL	7098.63	1.000
Household Cultivated Land**	in decares	81.65	1.000
Poor Household	dummy variable = 1 if poor	0.33	0.884
Cadastered Land**	dummy variable = 1 if cadastered	0.71	2.728
Household Literacy	dummy variable = 1 if head is literate	0.91	0.977
Household Size**	number of people in a household	5.85	1.032
Knowledge of Reforms**	dummy variable = 1, if have heard of the reforms	0.07	1.518
Access to credit**	dummy variable	0.32	1.838
Access to technical assistance	dummy variable	0.04	1.075
Central Anatolia**	regional dummy	0.17	2.207
Black Sea*	regional dummy	0.25	1.254
Aegean**	regional dummy	0.19	1.405
Marmara**	regional dummy	0.13	2.552
East Anatolia**	regional dummy	0.06	1.685
SE Anatolia**	regional dummy	0.09	2.029

Source: 2002 QHS and own analysis.
* significant at 5 percent level of significance, ** significant at 1 percent level of significance

6.17 In conclusion, the results from the QHS suggest that participation close to the rates targeted under the Program have been achieved. While there are few differences in participation in the Program by location and welfare status, a potential target area to improve participation is to improve the dissemination of information on eligibility criteria, particularly in areas with farmers whose land is not registered in the cadastre. This may help raise the participation rates.

E. Impact of Shifts in Crop Production Patterns and the DIS Program

6.18 This section addresses the issue of whether or not farmers shifted production from crops with formerly high price supports to those crops without price supports that have consequently

not seen large falls as a result of policies in the agricultural reform period. All else being equal, the expectation is that farmers will decrease the production of crops with formerly high levels of support and increase production of crops without supports. Having only one year of cross sectional household data makes this very difficult to measure. However, it is possible to aggregate the 2002 household data to the regional level and compare this with SIS regional data on the share of the area sown under different crops in 2001.[26] While this is a crude measure, the difference in the shares in 2001 and 2002 provides a preliminary indication of the shift in production patterns at the regional level (Table 6.4).

6.19 The results indicate that the share of agricultural land sown to grains (mainly wheat and barley) have fallen about 2.0 percentage points (a 4 percent reduction), while the shares to sunflower and fruits and vegetables have increased by about 2.4 and 1.2 percentage points, respectively[27]. This is in line with what would be expected as a result of the agricultural reform policies which led to significantly reduced grain support, as well as greater attractiveness of fruits and vegetables (largely unsupported crops in the past and currently) and sunflower seed (which is still accorded high support). These results also represent an acceleration of the shifts reported in para. 5.16 for the period 1999-2001.

Table 6.4: Changes in Crop Area Shares, 2001- 2002, Regionally and Nationally

From QHS Sample– 2002	Marmara	Aegean	Mediterranean	Central Anatolia	Black Sea	East Anatolia	S. East Anatolia	Turkey Total
Tobacco	0.3%	6.6%	0.1%	0.0%	1.7%	0.4%	1.5%	1.5%
Wheat	43.0%	22.3%	53.0%	54.6%	22.7%	51.3%	45.8%	43.0%
Maize	2.1%	4.9%	10.2%	0.5%	7.0%	0.4%	0.7%	3.5%
Barley	5.5%	11.9%	2.4%	27.3%	3.5%	28.5%	13.9%	14.3%
Sunflower	30.2%	0.2%	0.8%	2.3%	1.2%	0.0%	0.0%	4.9%
Sugarbeet	0.5%	7.9%	0.5%	5.4%	2.5%	3.9%	0.0%	3.3%
Fruits and Vegetables	9.5%	16.1%	16.2%	9.2%	57.0%	4.1%	13.6%	17.0%
2001 Base Data								
Tobacco	0.6%	4.1%	0.3%	0.0%	1.2%	0.2%	0.5%	0.9%
Wheat	47.6%	31.8%	51.1%	52.4%	36.5%	54.3%	39.8%	45.0%
Maize	1.9%	1.8%	8.5%	0.1%	10.0%	0.1%	0.3%	2.7%
Barley	6.4%	16.1%	6.1%	25.5%	9.7%	21.0%	24.5%	17.6%
Sunflower	16.5%	0.8%	0.9%	0.9%	0.9%	0.2%	0.1%	2.5%
Sugarbeet	0.5%	1.2%	0.8%	2.9%	2.4%	2.8%	0.0%	1.7%
Fruits and Vegetables	16.9%	29.8%	18.6%	5.6%	25.0%	7.1%	16.2%	15.8%
2002-2001 Difference								
Tobacco	-0.3%	2.5%	-0.2%	0.0%	0.5%	0.2%	1.0%	0.5%
Wheat	-4.6%	-9.6%	2.0%	2.1%	-13.8%	-3.0%	6.0%	-2.0%
Maize	0.2%	3.1%	1.7%	0.4%	-2.9%	0.2%	0.4%	0.9%

[26] Crop Share = $\frac{landincrop_{ik}}{totalland_{k}}$ where i is crop and k is region.

[27] The QHS data indicate that sugarbeet in the Aegean has increased significantly while the area in fruits and vegetables has fallen significantly relative to 2001 base levels. This is implausible and indicates a respondent problem (mis-coding of answers) or a sampling problem in the Aegean region. If these two share were more in line with those observed in 2001 at the province level, then the national sugarbeet area would have been stable nationally, and fruits and vegetables would have showed a large increase. These issues are being investigated in tandem with the firm executing the multi-year QHS.

Barley	-0.9%	-4.1%	-3.7%	1.9%	-6.2%	7.5%	-10.6%	-3.3%
Sunflower	13.7%	-0.6%	-0.1%	1.4%	0.3%	-0.2%	-0.1%	2.4%
Sugarbeet	0.0%	6.7%	-0.3%	2.5%	0.1%	1.2%	0.0%	1.6%
Fruits and Vegetables	-7.5%	-13.7%	-2.4%	3.6%	32.0%	-3.0%	-2.6%	1.2%

Source: SIS and 2002 QHS.

6.20 An alternative strategy to identify shifting crop production patterns is to try and determine how specialized a farmer is in a given crop and then determine whether he/she is becoming more or less specialized over the course of the reform. This can be done by taking a ratio of the share of area sown in a given crop for a household and the share of area sown in a given crop for the region.[28] The interpretation is that if this ratio is greater than 1 then the household is more specialized in the crop than the average household in the region. If it is less than one then they are less specialized[29].

6.21 These variables were constructed for a number of crops (tobacco, wheat, maize, barley, sunflower, sugarbeet, and fruits and vegetables and used in a model designed to explain the impacts of area shifts observed in the reform period and the DIS Program on agricultural income levels (among the QHS respondents). Given the implausible crop area shifts revealed by the QHS data (discussed above for the Aegean region in footnote 27), and the need to make the model results more readily interpretable, the cross specialization variables were used in the model as dummies: where an individual's crop specialization (area share) for a given crop exceeded that of the area average, the value of that crop specialization dummy for that household assumed a value of 1. Agricultural income was measured using gross agricultural revenue (as adequate information on input costs could not be compiled yet from the QHS), and the full model was specified as follows:

$$\text{Gross Agricultural Income} = b_1 \text{Amount of DIS Received in 2001} + b_2 \text{Crop Specialization Dummies} + b_3 \text{Cultivated Land} + b_4 \text{Knowledge of Reforms} + b_5 \text{Literacy} + b6 \text{Cadastered Land} + b_7 \text{Household Size} + b_8 \text{Credit} + b_9 \text{Access to Technical Assistance} + b_{10} \text{Region Dummies} + \text{error term}$$

6.22 In deriving the estimates for the impact of crop specialization dummies, the full model was run (using the OLS estimator). The results indicate that that those households with greater relative wheat specialization, tobacco specialization, and barley specialization all experience a significantly negative impact on agricultural income. These findings are in accordance with the expected results since tobacco prices have fallen the most of all crops, and the PSEs for wheat and other grains (mainly barley) fell from over 40 percent in 1999 to near zero for both in 2001. The other specialization variables with significant coefficients are those for sunflower, maize, and sugarbeet. For sunflower the variable is significantly positive as expected, as the PSE has been consistently over 25 percent. For fruits and vegetables, there is likely to much

[28] The formula takes the following form: (land under cultivation under crop i by household j/total land cultivated by household j in 2002) / (land under cultivation under crop i in region k/ total land under cultivation in region k in 2002)

[29] A potential problem is that this variable likely suffers from aggregation bias – it may not be possible to make an accurate inference about individual behavior based on a regional aggregate. Ideally, in order to examine the shift in crop specialization we would examine the household level crop pattern in 2001 and 2002. It would then be possible to construct crop specialization measure for both years and compare the shifts in crop specialization.

contradictory price movement within the group, as it contains hazelnuts (the price of which has come down significantly in 1999-2001 as a result of reduced state support purchases), while other fruit and vegetable prices are largely deregulated and stable.

Table 6.5: Impact of Crop Specialization on Gross Agricultural Revenue

Variable	Description of Variable	Mean	Coefficient
Agricultural revenue	in million TL	4111.88	
Amount of DIS**	in million TL	425.72	2.94
Tobacco_spec**	specialization dummy for tobacco	0.25	-790.41
Wheat_spec**	specialization dummy for wheat	0.44	-1158.70
Maize-Spec**	specialization dummy for maize	0.12	628.97
Barley_spec**	specialization dummy for barley	0.21	-1037.86
Sunflower_spec	specialization dummy for sunflower	0.12	2041.90
Sugarbeet_spec**	specialization dummy for sugarbeet	0.18	1806.95
Fruits&Veg_Spec	specialization dummy for fruits and vegetables	0.36	-178.56
Cultivated Area**	in decares	81.65	4.19
Cadastered land	dummy variable = 1 if cadastered	0.71	311.02
Literacy**	dummy variable = 1 if head of household is literate	0.91	1034.87
Household Size**	number of people in a household	5.85	124.25
Knowledge of reforms	dummy variable = 1, if they had heard of the reforms	0.07	36.68
Access to Credit**	dummy variable	0.32	1363.56
Access to technical assistance**	dummy variable	0.04	2399.28
Aegean	regional dummy	0.19	443.33
East Anatolia**	regional dummy	0.06	-4603.70
Central Anatolia**	regional dummy	0.17	-1129.01
Black Sea**	regional dummy	0.25	-1757.46
Marmara**	regional dummy	0.13	-61.25
SE Anatolia**	regional dummy	0.09	-1497.85
Intercept			1396.66

significant at 5 percent level of significance, ** significant at 1 percent level of significance
Source: 2002 QHS and own analysis.

6.23 The main contradictory findings concerns sugarbeet and maize specialization. The PSEs for sugarbeet prices and maize have been both fallen substantially, but the corresponding specialization variables have significantly positive impacts on agricultural income. Other variables that have a significantly positive impact on income are cultivated area, literacy, household size, access to credit, and access to technical assistance. The regional dummies are all significant (except those for the Aegean and Marmara).

Table 6.6: Impact of DIS Participation on Gross Agricultural Revenue

Variable	Description of Variable	Mean	Coefficient
Agricultural revenue	in million TL	4915.988	
Amount of DIS**	in million TL	740.102	4.08
Tobacco_spec**	specialization dummy for tobacco	0.277	-1,303.32
Wheat_spec**	specialization dummy for wheat	0.488	-1,409.51
Maize-Spec	specialization dummy for maize	0.109	280.54
Barley_spec**	specialization dummy for barley	0.244	-1,467.87
Sunflower_spec	specialization dummy for sunflower	0.137	708.71

Sugarbeet_spec**	specialization dummy for sugarbeet	0.202	1,454.92
Fruits&Veg_Spec	specialization dummy for fruits and vegetables	0.342	-331.86
Cultivated Area**	in decares	98.298	3.73
Cadastered land **	dummy variable = 1 if cadastered	0.813	1,022.64
Literacy**	dummy variable = 1 if head of household is literate	0.916	1,364.58
Household Size**	number of people in a household	6.014	121.42
Knowledge of reforms	dummy variable = 1, if they had heard of the reforms	0.072	-10.55
Access to Credit**	dummy variable	0.391	1,385.26
Access to technical assistance**	dummy variable	0.047	2,297.42
Aegean	regional dummy	0.191	955.77
East Anatolia	regional dummy	0.057	-3,948.62
Central Anatolia	regional dummy	0.210	-1,461.61
Black Sea**	regional dummy	0.205	-1,292.79
Marmara	regional dummy	0.146	703.31
SE Anatolia	regional dummy	0.100	-1,193.95
Intercept			-202.07

significant at 5 percent level of significance, ** significant at 1 percent level of significance
Source: 2002 QHS and own analysis.

6.24 To examine the impact of the DIS Program on the impact of farmer' welfare, we have run the above model with the dependent variable (gross agricultural income in 2002) for the sub-sample of farmers who actually received DIS. Cash transfer programs such as the DIS are usually associated with income effects that are multiples of the amounts transferred. Ideally the multiplier effect would be estimated using a two-stage model where the first stage represents the household decision to participate in the program and the second stage represents the impact of DIS on income or expenditure. Only the second stage of the model is presented here (i.e. a regression for only those households receiving DIS). The specification is fairly robust and passes the appropriate diagnostic tests. The results indicate that receiving DIS payments has a significant and highly positive effect on agricultural income. One million TL paid in DIS generates approximately 4 million TL in gross agricultural income.

6.25 Given the ratio of gross agricultural value added to gross agricultural value (in national statistics for 2002, equal to 0.6), the net impact of one million TL paid in DIS on agricultural income is roughly 2.5 million TL. The finding of a this two and a half-fold multiplier effect is slightly larger than that found in a study of a similar cash transfer program in Mexico[30]. Since DIS is, in effect, serving to replace a large share of the reduction in credit availability which has occurred as a result of the agricultural reforms, it may be that credit availability is so tight that those without access to DIS are particularly negatively impacted. This is indeed what the difference of magnitude of the coefficient on DIS received is indicating (comparing the results of Tables 6.5 and 6.6).

6.26 Testing of alternative models indicates that the multiplier effect did not rise when the model incorporated interaction terms between participation in DIS and literacy, access to credit, and technical assistance. However, the interaction between DIS and credit and technical assistance was positive and significant indicating that participation in DIS when a household has access to credit and/or technical assistance has a positive multiplier effect on household income.

[30] An analysis of the PROCAMPO cash transfer program in Mexico found a multiplier effect on the order of 2.1 (World Development Vol. 29, No. 6, pp. 10043-1056, "Cash Transfer programs with Income Multipliers: PROCAMPO in Mexico", Elisabeth Sadoulet, Alain de Janvry, and Benjamin Davis.

When the model was run with the gross agricultural income of only the poorest third of households as the dependent variable, the multiplier effect of DIS was not significantly different for the whole sample of DIS recipients. This indicates that there is no significantly differential impact on the poor as opposed to non-poor farming families. However, further examination of this hypothesis using alternative methods is still warranted.

Annex 1

Review of the Turkish Hazelnut Sector

Summary

Turkey is the world's largest hazelnut producer and has been so over the past thirty years, during which it doubled both production area and output. This has occurred as a result of strong government incentives to production over this period, which have expanded the cultivation area into regions which historically did not cultivate the crop on a large scale. Over the period 1993-1998, excessively high support prices spurred very rapid output growth, which has become a problem in the past five years since it has put significant downward pressure on world market prices. This increased the political pressure to maintain high support prices and significant state purchases (roughly 150,000 tons annually which are never released into the market), which have cost the government over $2 billion over the past ten years.

By disposing of state purchases off the market (through unprofitable crushing for oil), the government's measures have worked in tandem with inelastic demand[31] to keep international prices from falling to levels which would have otherwise been induced by the growth of domestic production. In some ways, the policy of state support purchases appears to have been successful, as it increased export revenue and farmer income, but since the cost of support purchases grew quickly over the past ten years, the efficiency of this policy has been greatly reduced.

Currently the government's move to reduce support purchases has the aim of reducing the comparative profitability of hazelnut, inducing farmers to switch to other crops, thereby reducing the oversupply in the market, and forcing inelastic world market demand to be the source of increased hazelnut sales revenue to farmers, rather than that of government subsidies through support purchases. This policy inevitably involves short term income losses to producers (on the order of $500 million annually) but should bring increased returns to producers in the medium term once annual output is reduced by 100,000 tons. At the same time, it will save the national budget $150-200 million annually.

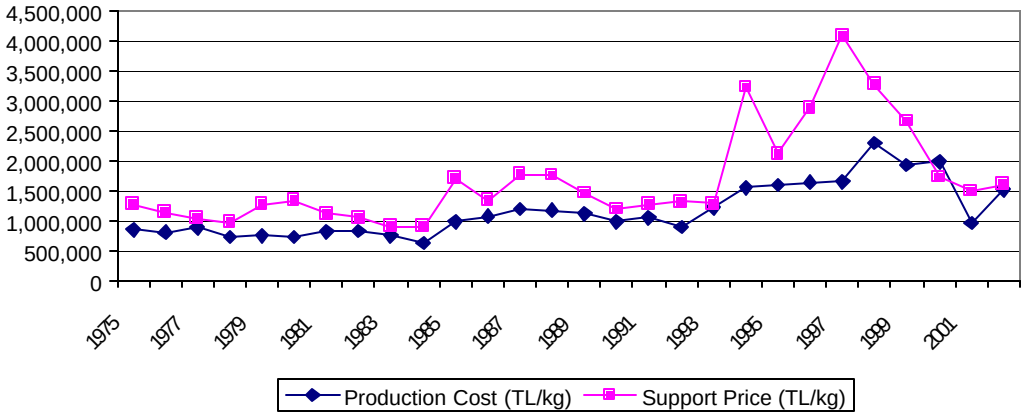
Support Policy

Turkey has provided support for hazelnut in terms of price support and guaranteed purchases since 1964. Support prices, determined through consideration of production costs, have been announced prior to each marketing season. Various inflationary adjustment methods such as increasing the price fixed in TL price or announcing a dollar equivalent price paid in TL, have been used within each purchasing period. During the 1975-2002 period, government subsidized hazelnut producers with an average margin of 44 percent over production costs, even in some years profit margin have been 100 and 150 percent over the costs.[32]

[31] Our preliminary analysis of world market demand for hazelnut shows that it has been very price inelastic, in the range of -0.2-0.3 over the last ten years.

[32] The formula used for price subsidies overstates production cost by addition of not only non-cash expenditures like depreciation and opportunity cost of capital used for fixed investment, but also inclusion of some other expenditures which are not incurred at the rates set, such as management, input and tending expenditures. This increases the margins over costs further.

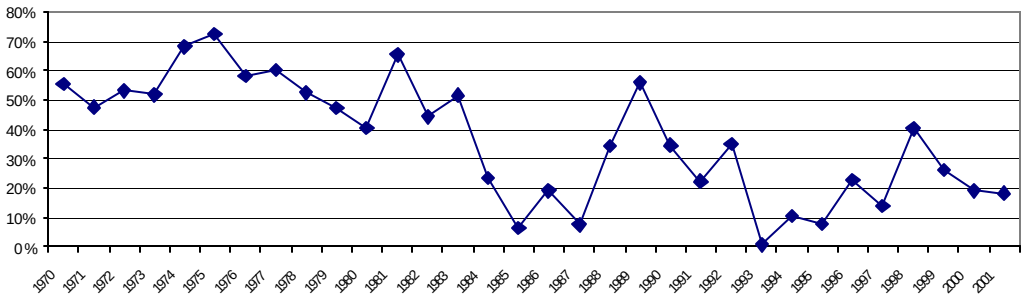
Figure A1.1: Support Prices and Production Cost (constant 2002 TL/kg)



Source: Paper presented for the Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:10

The Agricultural Sales Cooperative for Hazelnut (Fiskobirlik) is the body that has been used extensively by the government for support purchases. When the purchases were made on behalf of the government, they were financed by Treasury and/or the Agricultural Bank. When Fiskobirlik supposedly made "independent purchases", a revolving fund called the Support Price Stability Fund (DFIF) was used as the main source of finance. As a result of increasing stocks and deteriorating financial situation, Fiskobirlik purchases as a share of total production have decreased over time.

Figure A1.2: Ratio of Fiskobirlik's Purchases to Total Production



Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:11

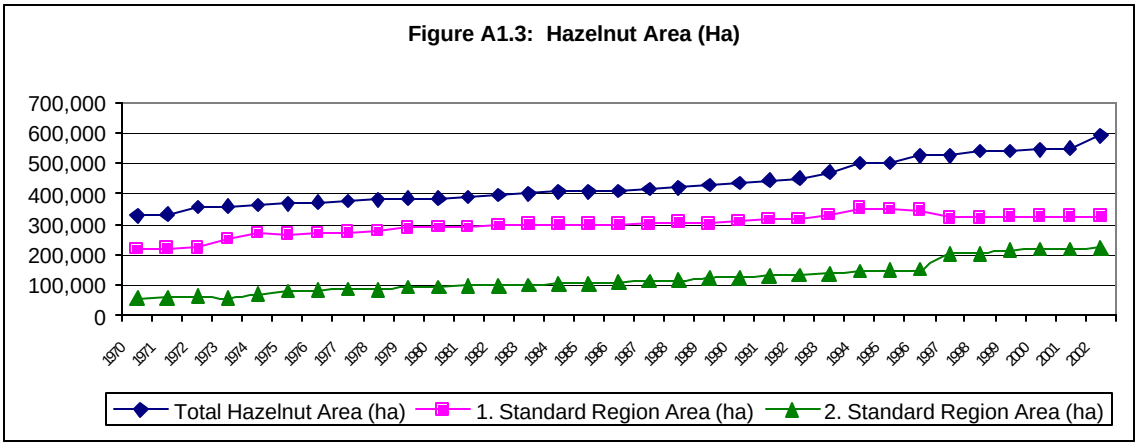
Hazelnut Area

Hazelnut area has expanded considerably over the years, from 253,000 ha in 1964 to 550,000-600,000 ha in 2002. The expansion within the "2nd Standard Region" has been greater than in the "1st Standard Region" (65 percent of the increase in hazelnut area is observed in the 2nd Standard Region[33]).

The expansion has been both in terms of horizontal expansion of the traditional cropping area toward the west and inland as well as vertical expansion toward the forest zone in high elevations and fertile plains in low elevations. Expansion has had a negative impact on the quality of hazelnut and the production of other crops in demand, and caused excessive production of hazelnut.

The reasons for expansion have been the following: high state-set support prices, relative ease of production which allows absentee landlords to stay in production, higher yields in the 2nd Standard Region which allowed these farmers to benefit from price subsidies even more, lack of suitable crops to replace hazelnut on steep slopes, and forest regulation that allows horticultural production in areas that lost forestry characteristics.

Figure A1.3: Hazelnut Area (Ha)



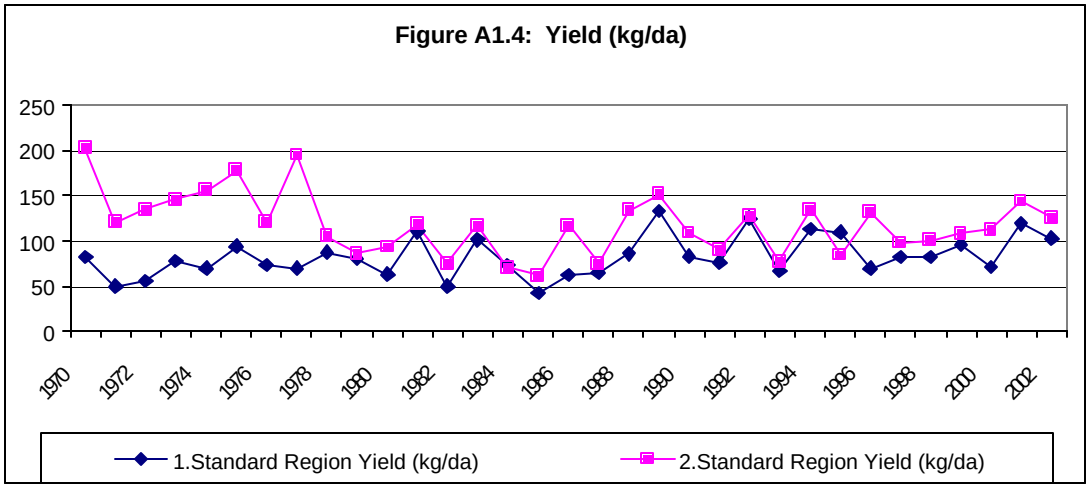
Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:12

[33] The 1st Standard Region is the traditional region, on hills and slopes where ecology generally does not allow economic production of other crops, i.e. provinces in the eastern Black Sea region: Artvin, Rize, Trabzon, Giresun and Ordu. The 2nd Standard Region covers the area other than the traditional cropping area, towards the western part of the Black Sea region and inland to more fertile and flatter lowlands of the provinces of Samsun, Sinop, Kastamonu, Zonguldak, Bolu, Duzce, Sakarya, Kocaeli. There is also the 3rd Standard Region which is scattered around the country and has developed for local consumption. It covers only % 0.6-%0.9 of the total hazelnut area.

Yield and Production

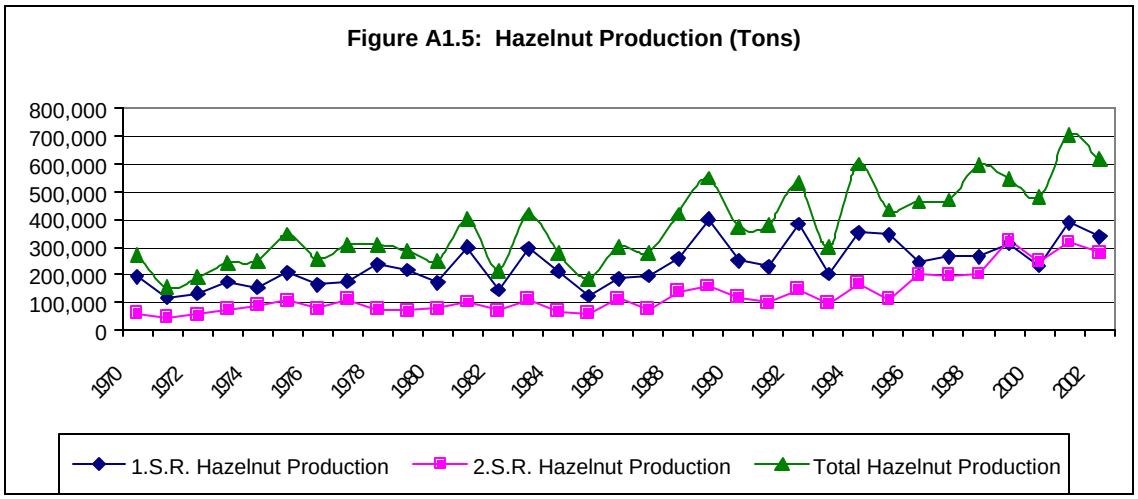
Yield of hazelnut production in Turkey is considerably lower than major exporting countries. Turkey's hazelnut yield is slightly higher than 1.0 ton/ha, which is 40 percent of the average yield in the United States, and 50 percent of Italy's average yield. The reasons for low yields include: the large number of old hazelnut trees that require renewal, very tight planting of bushes, bare soil and high surface runoff (especially in the eastern Black Sea region) and lack of input usage and other necessary caring activities.

Turkey's total yield has shown a slightly increasing trend over the years. Prior to 1980, yields in the 2nd Standard Region were significantly higher than in the 1st Standard Region, but the yield of the 2nd Standard region has decreased with expansion of the area. Consequently, the yield differential between the 1st and 2nd Standard Regions has decreased and has recently been on the order of 30 percent.



Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:12

Production in tons has increased over the last 40 years from 147,000 tons in 1964-66 to 600,000 tons in 2000-2002 and 57 percent of this increase results from increase in production within the 2nd Standard Region.



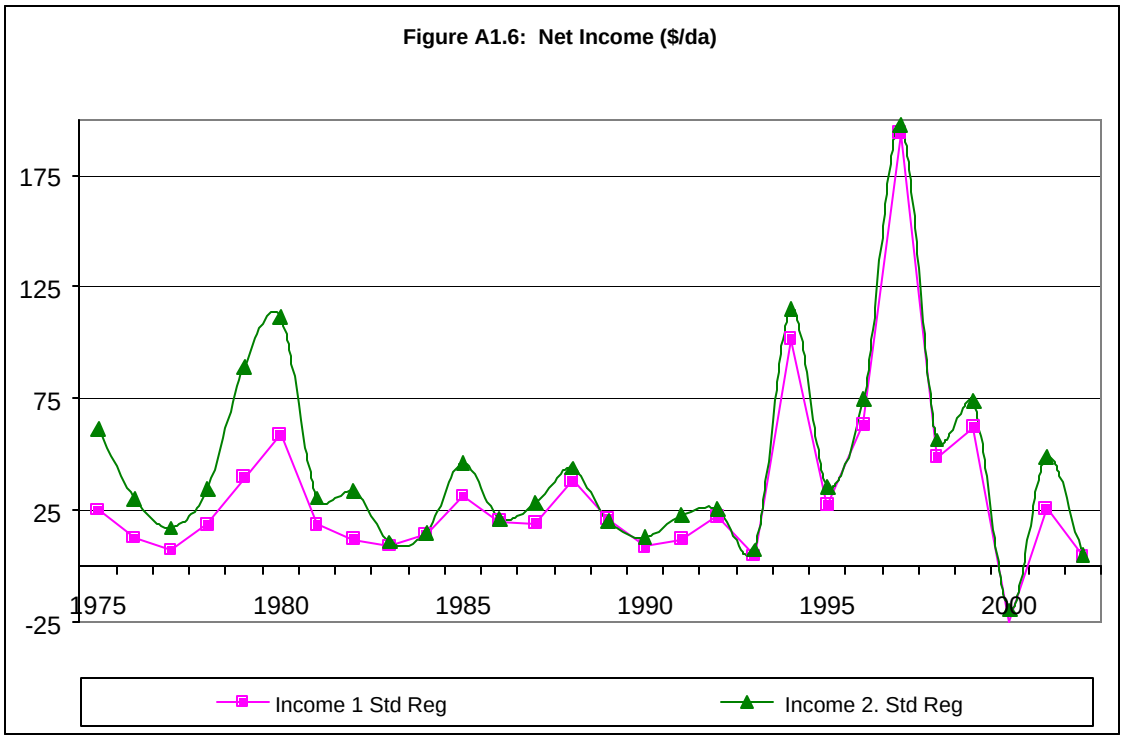
Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:13

Turkey is the biggest hazelnut producer in the world. It produced 71 percent of total world hazelnut supply in 1998-2001, which averaged 780,000 tons (raw unshelled equivalent). Italy comes next with 16 percent, the United States has a 3 percent share, and Spain has a 2.5 percent share. China, Azerbaijan, Georgia and Iran are the other producer countries.

Net Income

When net income is calculated using support price data and Hazelnut Committee cost estimates, we see that during the 1975-2001 period hazelnut producers earned an average net income of 48 million TL/da (in 2002 constant TL terms) or 32.14 $/da. The 2nd Standard Region's net income is higher due to higher yield (64 Million TL/da or 44.60 $/da). Average income per decare in the 2nd Standard Region in 1993-2001 has been about $65/da, or roughly 20 percent higher than in the 1st Standard Zone.[34]

[34] Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:14.



Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:14 and Own Calculations

However, the net income estimates are low to the degree that they use cost figures which are exaggerated: as discussed earlier, the imputed input, tending, financial and even general management expenditures are not actually incurred at such high levels in most of the cases. On the other hand, the price used in the calculation of net income is Fiskobirlik's purchase price which is slightly higher than private purchasers' price. Fiskobirlik purchased only 18 percent of the total production in 2002, so using this support price series overvalues net income to some degree.

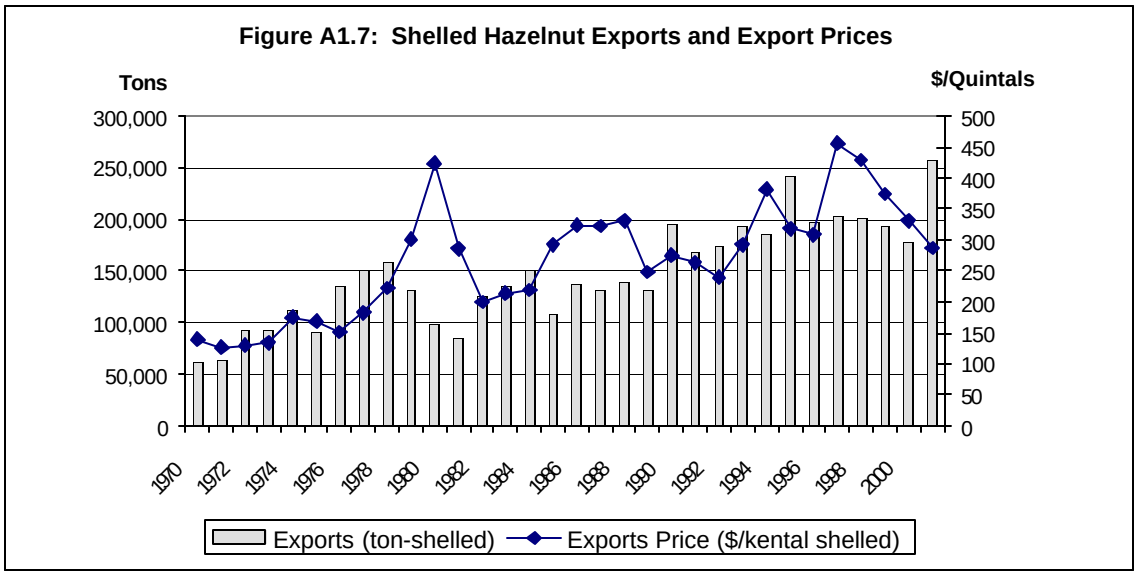
When non-cash costs as well as financial and management expenditures are not included, production costs decrease by 40 to 50 percent. The net income values generated with 40 percent cost reduction are: $61/da on average for the period 1975-2001 and $100/da for the period 1993-2001.

Domestic Consumption and Exports

Turkey's hazelnut consumption is approximately 70,000 tons/year (raw). There has been an effort to promote consumption by advertising to boost commercial (private) demand, as well as through grants and very low priced sales of Fiskobirlik's stocks to the armed forces and Ministry of Education.

Exports of hazelnut, especially the processed product, is being supported by export subsidies ($ 68/ton). In addition, however, there is an export tax of $80/ton to generate flows to the DFIF, and a second ad valorem tax (0.4 percent of export value) charged on exports which goes to the Promotion Fund.

Hazelnut exports in terms of shelled product have increased from 63,000 tons to 258,000 tons between 1970-2001. Export price has also shown an increasing trend from $140 to 287 per quintal (100 kg.).

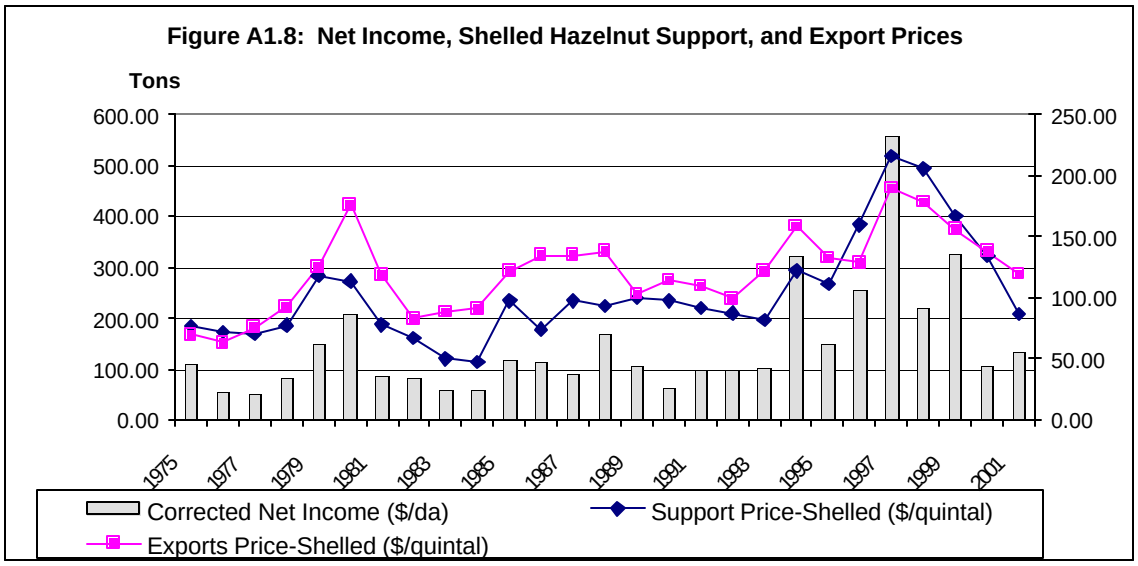


Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" p:18 and www.fao.org

Since Turkey has 70 to 75 percent share of world hazelnut exports[35], it is largely the market maker. Still, excessive production weakens Turkey's position in the hazelnut market. Eighty six percent of its hazelnut exports go to the European Union, and most of the export is shelled hazelnuts (70 percent). The share of roasted hazelnut exports is almost 30 percent, and exports of unshelled nuts are a negligible share. Many countries which are not hazelnut producers (such as Germany, Austria and Belgium) import shelled nuts, roast it or process it otherwise (mainly in chocolate), and then export it.

Hazelnut support prices and export prices display a similar trend. Their correlation is quite high at 0.79. Export prices are generally higher than support prices, by an average of $42/quintal (for shelled nuts) over the past 25 years. But in some periods (1997-2000), support prices exceeded export prices. In 1997, both the export price and support price reached their peaks, and net income of producers reached $ 232 per decare.

[35] Figures for Turkey's exports of roasted hazelnut are available, but these are not compiled for world exports of roasted hazelnuts.



Source: Paper presented for Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi" by Bozoglu, M. "Turkiye'nin Findik Politikasi ve Reform Arayislari" , ARIP Project Implementation Plan and Own Calculations

Average over production[36] of hazelnut in the period 1970-2001 was 29,000 tons (raw), and during the last ten years it averaged 48,000 tons. Due to the state's support policies, Fiskobirlik's hazelnut stocks increased to levels of 100,000 – 200,000 tons in some years. These stocks have either been sent/sold to other government organizations or processed into oil. Processing, warehousing, general administrative and financial expenditures for these hazelnut stocks are high compared to the sales revenue from oil production. It is estimated that $150-200 million is being wasted each year for hazelnut oil production.

Turkey has high import taxes on hazelnut (between 46-65 percent). Nevertheless, very cheap hazelnut is imported form Georgia and Azerbaijan in very small quantities (350 tons annually), and these imports are on the rise.

Efforts to Limit Hazelnut Area

As a result of the undesired increase in hazelnut plantations particularly in the fertile flat lowlands of Carsamba, Bafra, Terme, and Sakarya during the early 1980s, the Hazelnut Law (No. 2844) was enacted in 1983. The purpose of the law was to ensure that production of hazelnut is carried out mainly in the 1st Standard Zone, with new plantation areas to be introduced only with government permission. However, this regulation did not prevent hazelnut areas from expanding further within into illegal areas. In 2001 a ministerial decree that lists the legal provinces and districts as well as permissible land slope and elevation for hazelnut production was passed. Another decree that allows payment to farmers for uprooting existing hazelnut trees in illegal areas and switching to alternative crops was also passed in the same year. However, hazelnut farmers' applications for this Alternative Crop Program have been very limited to date.

[36] Over production is calculated by subtracting domestic consumption and exports from total production.

Annex 2

Evolving Farmers Organizations

Introduction

In most countries, farmers' cooperatives and farmers' (or producers) unions are the two principal types of private farmers' organizations. Cooperatives are business organizations, fully owned by farmers, providing a variety of commercial services to farmers, such as input supply (mostly on credit), purchasing, processing and selling farmers' crops. Farmers' (or producers) unions, on the other hand, are more like associations, are often organized both by geographical and major commodity basis, and represent farmers in dealing with government and other sectors. They also maintain contacts with agricultural research bodies, the agricultural input industry, and the food industry. Apart from private farmers' organizations, public chambers of agriculture exist in some countries for facilitating the state's contacts and dialogue with farmers. Run by boards of elected farmer representatives, they can respond to government's inquiries on agricultural issues and can assist farmers through bureaucratic procedures.

It is important to keep a clear division of labor among these three types of organizations. Cooperatives, for instance, cannot take over farmer representation function of producers unions, as they would then go bankrupt by offering too high purchase prices to farmers. Chambers of agriculture, on the other hand, cannot really lobby or put pressure on government on behalf of farmers, since they are a public or semi-public body. In Turkey, all three types of farmers' organizations exist, and are at different levels of development. There are many types of agricultural and rural cooperatives[37], a network of semi-public chambers of agriculture and a few private farmers' associations. A new law is also being drafted to introduce agricultural producers unions.[38]

This Annex analyses the current state of development of cooperatives, farmers' associations or unions and chambers of agriculture in Turkey. The information available on these organizations, especially in terms of relevant facts and figures is limited[39]. However, the picture is clearer for agricultural sales and agricultural credit cooperatives since they were analyzed within the context of World Bank operations. In addition to the agricultural sales and credit cooperatives, Turkey's rural areas have cooperatives for agricultural development irrigation and forestry village development and farmers issues.

---

[37] Cooperatives in Turkey include (i) agricultural sales cooperatives (including the sugar beet cooperatives), (ii) agricultural credit cooperatives, (iii) irrigation cooperatives, (iv) village development cooperatives, and (v) forestry cooperatives.

[38] In 1999-2000, the *FAO-IFAP Technical Cooperation Project* analyzed farmers' organizations in Turkey and compared them with existing farmer institutions and structures in Europe. A three-legged system was recommended for Turkey, based on cooperatives, producers' unions and chambers of agriculture. Comprehensive restructuring / development of each leg was deemed necessary. These recommendations are now fully integrated into the current MARA Action Plan.

[39] For example, membership numbers given usually refer to a large number of farmers who once became members at a symbolic fee. However, data on active membership is rarely reported. Similarly, for cooperatives, there are rarely figures available on equity, turnover, profits and losses or other quantitative and qualitative performance indicators.

For the present government, it is a priority to strengthen farmers' organizations. The "Action Plan" of MARA recognizes the need for urgent reforms, including (i) the drafting of a single cooperative law replacing the three different existing laws and aiming for the independence of cooperatives by firmly integrating them into the private sector; (ii) the development of a program which would facilitate the consolidation of rural cooperatives by merging many small and narrowly-focused units with the aim of developing larger units capable of providing comprehensive services to farmer members; and (iii) a new law on farmers' unions as well as amendments to the law on chambers of agriculture, both of which would strengthen the representation of farmers and improve non-commercial farmer services.

Rural Cooperatives[40]

Rural cooperatives in Turkey are mostly splintered and in need of urgent consolidation and restructuring. The Turkish legal framework, over time, has often pushed for increased and sometimes unnecessary specialization, while not allowing any mechanism for farmers for consolidating different types of cooperatives on demand. The result is a multiplicity of relatively weak cooperatives and a significant degree of inefficiency in this sector. In general, acquiring greater independence from government, rationalization of operations and improvement of farmer services especially at primary level, recruitment of qualified and able staff, membership education and training remain priority issues for most cooperatives, while more government-dependent cooperatives need to downsize and divest non-productive and idle assets.

Agricultural Sales Cooperatives (ASCs)

The ASC sector includes 16 unions (ASCUs), 330 ASCs and around 750,000 farmer members. Established in selected regions for strategic export crops such as cotton, sunflower, figs, raisins, and olives, these cooperatives tend to serve farmers only in certain regions and for specific crops.

In the 1960s, ASCs / ASCUs were given a major role in the implementation of the government program to bolster producer prices through subsidies and market intervention. Government financing was provided not only for crop purchases, but also for investments in industrial installations, storage facilities and administrative buildings. In this process, farmer members lost control over their institutions, and the state took over. This control was further tightened in 1984 when the Ministry of Industry and Trade (MIT) obtained extensive powers to direct the operations of the ASCs/ASCUs. The system was also used for employment purposes by successive governments, which resulted in overstaffing. The large financial losses incurred by the ASCs/ASCUs were routinely covered by subsidies from the national budget.

As part of its economic reform program, the Government of Turkey committed itself to privatization of the ASCs and ASCUs, and to removal of state subsidy in this context, and passed a new law to this effect in June 2000. Technical and financial assistance was obtained from the

[40] Turkey's most important cooperatives in terms of membership (2.5 million members) and assets are the almost 40,000-strong housing cooperatives. Furthermore, there are transport, consumer, artisan and several other but smaller cooperative groups. Many of the more urban-based cooperatives also operate in rural areas. For instance, many towns have housing, consumer and especially artisan cooperatives. This chapter, however, focuses on the cooperatives which have direct relevance for agriculture and related activities. In this paper, when referring to all the relevant cooperatives the term "rural cooperatives" will be used.

Bank for ASCs/ASCUs within the context of ARIP, especially in the form of partial funding of the severance payments. Support was also obtained for primary ASCs, to enable them to become independent, financially autonomous and self-managed organizations serving their farmer members.

After more than two years of ARIP support, ASCUs and ASCs are making progress in their restructuring. Most of the initial attention was on the ASCUs' introduction of basic business principles. For example, the management of several ASCUs found it difficult to give up their previous service role to the state which involved the purchase of a maximum amount of agricultural produce with the aim of maintaining high prices for these products. The new realities require to apply the simple business principle of purchasing only as much as can be sold and at a price which covers all the costs of ASCs/ASCUs. Part of this change process is also the urgent need to reduce costs, well beyond the retrenching of excess labor.

Many important restructuring steps still need to be undertaken, e.g. turning the unions into efficient service organizations for the primary cooperatives. This turn-around is linked to the biggest challenge facing all government-dominated cooperatives, i.e. making village-level cooperatives the real owners and masters of their powerful unions. So far, and with the help of ARIP, farmers have made significant progress in taking control of their ASCs. However, the great majority of ASCs still feel over-powered by their unions, even though ASCs are formally well presented through elected delegates at the general meetings and management boards of the ASCUs.

However, so far this system has been much more form than substance because major decisions were taken by the government-appointed management. Since government has now largely withdrawn from the ASCUs, and the Restructuring Board established under the amended ASC/ASCU law has more of an advisory position, the ASCU management is rather independent in making the substantive decisions. *This situation where government has withdrawn but where farmers and their cooperatives are not yet in a position to exercise their ownership rights is very dangerous because it creates a serious governance vacuum.* The danger is that decisions made in such a vacuum are not adequately based on the rights and interests of farmers and their ASCs, and/or decisions are poorly implemented because of inadequate supervision. In extreme cases of a governance vacuum, managers take irresponsible decisions or even use the opportunity to enrich themselves at the expense of the owners. Because of the significant risks created by the governance issues, it is very urgent and important to quickly and comprehensively train the delegates representing the ASCs at the ASCUs. This also requires educating the members of ASCs to elect representatives who have the integrity and intellectual capacity to well represent farmer members' interest.

A special group of cooperatives, similar to the ASCs/ASCU type, is constituted by the 31 *sugar beet cooperatives* (SBCs) and their central union, *Pankobirlik*[41]. Some 1.5 million sugar beet farmers are registered as members with the SBCs. These cooperatives and their union operate like the ASCs/ASCUs and face some similar issues, such as the top-down control through Pankobirlik and farmer members not exercising their ownership rights over their cooperatives and union. SBCs and Pankobirlik have not been included under the ARIP or any other major project because this group is not facing any major financial crisis. However, if the intention is to turn SBCs and Pankobirlik into a more efficient and democratic organization a major restructuring of this important and powerful group has to be undertaken

Box A: Applying Franchising to Cooperatives

For cooperatives to succeed it is not only necessary to have democracy through bottom up control. Equally important are quality standards set by the top for the performance of each unit in the entire cooperative system. These standards are set and enforced by the professional management of the central union. The **franchising model** for cooperatives means that the central union directly, or through their regional unions, would have the mandate to ensure that the primary cooperatives follow system standards and procedures in their activities. Deviations would be reported to the management board and if necessary to the general assembly of the cooperative concerned. The ultimate sanction would be exclusion from the cooperative system including losing the right to continue using the name "cooperative."

Agricultural Credit Cooperatives (ACCs)

The most extensive cooperative network is provided by the ACCs. Almost every village in Turkey is served by an ACC whose main activity is to provide farmers with agricultural inputs, in most cases on a credit basis. Some ACCs are also involved in simple agro-processing activities and marketing of agricultural products. In spite of their name, ACCs are real sector and not financial sector organizations.

ACCs operate through a three-tier structure consisting of the Central Union (CU), 16 regional unions (RUs) and the more than 2,500 primary societies with over 1.5 million registered members[42]. With financing through the government-owned Ziraat Bank, the ACC system was the main instrument for the distribution of input and credit subsidies to the small-scale farming sector. The system stayed afloat as long as it was supported with concessionary financing through Ziraat. Credit recovery deficits, caused by repayment defaults from farmers or by government directives on write-off of interest and loans, were absorbed by Ziraat Bank through additional concessionary financing it received from government.

At present, the main source of revenues for ACCs is the sale of fertilizer. As pointed out in Chapter 3 of this Review, the extensive network of ACCs represent 38 percent of the registered fertilizer distributors in Turkey and their market share is about 35 percent. However, unlike many of their competitors, ACCs had a competitive edge by having been able to provide most of

[41] Pankobirlik operates under the general cooperative law, not the ASCU law, and is linked to MARA, not MIT.
[42] These primary cooperatives service over 30,000 villages and 770 districts in 65 provinces.

the inputs on credit. So far, this advantage allowed ACCs to charge farmers prices for the inputs which were slightly above market prices. Without the access to concessionary funds ACCs will lose this advantage and will face a much tougher competition in the market for inputs.

The ACC system also faces many of the recent and current issues the ASCs/ASCUs face, i.e. government intervention, unsustainable cost structures mainly due to excessive overstaffing, inadequate revenue structure due to poor loan repayments and narrow focus on the input business, top-down management and highly inadequate legal framework. In addition, ACC system faces some sector-specific issues. Until 2001, government subsidized agricultural credit and the ACC system mainly through Ziraat Bank. However, the new banking law prevents Ziraat Bank from providing funds to those ACCs with outstanding debts. This will cut off some 1000 ACCs from Ziraat financing.

Furthermore, the repayment performance of ACC farmer members to all ACCs has been severely undermined by government-initiated and politically motivated debt rescheduling and interest rates reduction schemes. As a result, additional ASCs will be disqualified for bank lending. An informal Bank report made available in September, 2002, analyzed the ACC system and developed proposals for its comprehensive restructuring. There is a strong will by the present management of the Central Union, supported by the new leadership of MARA, to undertake such restructuring of the ACC system.

Agricultural Development Cooperatives

Whereas ASCs and ACCs are governed each by special laws, the roughly 5,000 ADCs with some 500,000 members operate under the general cooperative law. ADCs tend to focus on activities not covered by the ASCs and ACCs, e.g. dairy and livestock, handicrafts, consumer articles and the marketing of fruits and vegetables. ADCs claim that 50 percent of all milk and rice produced for the market in Turkey is being marketed by them. However, ADCs are mainly located in the Western and Central parts of Turkey and not as much in the Eastern and South Eastern regions where there are higher poverty levels and a greater need of basic services for farmers. It is possible that ADCs there still suffer from the after-effects of previous political problems[43].

ADCs have become increasingly popular in Turkey as one of the options for farmers to address themselves to issues of marketing and also extension services. Farmers who are not organized as a group have little negotiation powers vis-à-vis traders. The public extension services are often of a mixed quality, and for remote areas, for special crops or for livestock are simply not available. The increasing popularity of ADCs is evidenced by the increasing numbers of newly established cooperatives and the expansion of the business volume of existing ADCs. However, a number of ADCs lack a long-term business strategy and will not be sustainable.

[43] In the 1970's, a national union of ADCs (the Koykoop) was deemed by the government to be a socialist organization and closed down in 1980. Since the early 1990s, Koykoop has been able to operate more openly and establish small regional offices and a national office.

Box B: Generic Cooperative Issues

The main issue facing all cooperatives in rural areas (except ADCs) is their extremely narrow focus in their services provided to farmers. This narrow focus was once introduced by government with the aim to support through cooperatives specific crops or activities. However, with government eliminating subsidies and facilitating the integration of cooperatives into the private sector, the narrow service focus of rural cooperatives has become redundant if not highly counterproductive. This can be demonstrated by the following example: Assuming a Turkish farmer in an average village grows sunflowers, sugar beets and some fruits and vegetables on some irrigated land, and also has a few milk cows. In order to get comprehensive services from cooperatives operating in his area, this farmer would have to be a member of and work together with five different cooperatives, i.e.

- *ASC for sunflower input and marketing*
- *SBC for the sugar beet inputs and marketing*
- *ACC for the fruit/vegetable inputs*
- *IC for the irrigated plot, and*
- *ADC for the veterinary services and animal feed and the collection of the milk.*

It is in the interest of farmers to merge several of these cooperatives with the aim of obtaining more comprehensive ("one-step") services.

Other key issues include:

- *the restructuring of ASCs has still to be completed and the restructuring of ACCs has to gain momentum. ICs and FCs also require urgent restructuring. Considering the high levels of poverty in many mountain villages, the development of forestry cooperatives is especially urgent.*

- *The ADCs are the only cooperative group fully independent from government, and they seem to have the biggest development potential. However, ADCs need access to business support services and international cooperative experience to fully and quickly make use of their potential.*

Irrigation Cooperatives (ICs)

Some 2000 ICs with some 250,000 members are operating in Turkey. ICs are an important group in the large family of Water Users Organizations (WUOs). However, the most important WUOs are the Water Users Associations (WUAs) which are described in Box C. The main function of ICs consist of managing the irrigation infrastructure (mainly canals and pumping stations) provided by government, organizing the distribution of water and collecting the fees for water and electricity. Only a few ICs provide additional services like the bulk purchase of inputs or the collection and sale of farmers' products.

In comparison to WUAs, the average IC is very small with a total irrigated area of about 150 ha. However, the size of ICs ranges from some several thousand ha. in the European part of Turkey to less than 100 ha. in the rest of the country. ICs operate under the general cooperative law (law # 1143) and are being supervised by MARA and its General Directorate of Rural Services (GDRS). Because of their small average size, ICs usually cannot afford full time staff or any significant irrigation equipment (e.g. machines for cleaning canals). However, the biggest

handicap of ICs is their difficulties to collect fees for water and electricity. Unlike the WUAs which are considered public organizations, ICs are private organizations and subjected to lengthy and expensive court procedures in enforcing their claims vis-à-vis farmer members. As a result of their weaknesses and handicaps, most ICs do have a mixed reputation. The few well-performing ICs tend to have the decisive advantage of operating under an exceptional leadership.

Box C: Success Story Water Users Associations (WUAs)

Up to the early nineties, DSI (State Hydraulic and Water Works Organization) transferred to users only small and isolated schemes. Starting in 1993, however, after study tours to Mexico and other countries with successful WUAs, and with support from the World Bank, DSI launched a major transfer program. At the end of 2000, more than 1.6 million ha of irrigated land had been handed to different water user organizations (WUOs) of which WUAs received almost 1.5 million ha. The transfer to WUAs includes the management of the irrigation infrastructure, the collection of fees for water use, electricity and similar services, and the use of these revenues for the maintenance of the infrastructure under WUA management. The main achievements of the transfers from DSI to WUAs are:

(i) reduction of about 40 percent of the operation and maintenance costs, and
(ii) increase in the yields from irrigated areas estimated at about 60 percent.

WUAs are established under the Municipality Law and, therefore, have a semi-public status. As a result municipality officials become "natural" members of the WUA's leadership in addition to elected representatives. The semi-public status give the charges of the WUAs for water, electricity, etc. the quality of public dues. Thus, it is relatively easy for WUAs to enforce the prompt payment of these charges by farmers. Other WUOs such as cooperatives which are registered under private law have to engage in lengthy and costly court procedures to be able to pressure delinquent farmers for the payment of charges. In order to make all WUOs benefit from the advantages WUAs are enjoying but also to have a tailor-made legal framework (instead of being accommodated by the municipality law which is not fully suited for the needs of semi-public associations), government should urgently present to Parliament the draft law on WUOs.

The relatively easy process of generating a constant stream of revenues is only one reason for the general success of WUA. The other, even more important reason is that most of the WUAs are well managed. As a result, the revenues received are spent for the maintenance of the irrigation infrastructure and for additional investments in machinery and equipment for improved operations, or in expansions of the irrigation schemes. The good management is mainly a result of high member participation in WUAs, i.e. farmers elect competent and serious representatives into the management positions and monitor their activities. Obviously, in most regions, farmers learned quickly from the mistakes made in many WUAs established immediately after 1993. At that time, mostly politicians were elected as representatives, many of whom mismanaged the associations or even misappropriated funds.

There is still room for improvements in WUAs. First, more than 20 percent of WUAs are not well managed and there is very little external oversight or help to improve this situation. Secondly, even the well-managed WUAs could benefit from management support, legal advice, training courses, etc. Especially those WUAs which would like to improve their operations or expand their activities, e.g. by also providing inputs to or to start marketing activities on behalf of farmers request guidance and support.

Forest Cooperatives

About 2,000 Forest Cooperatives (FCs) with some 200,000 members operate under the general cooperative law. Forest Cooperatives operate like employment agencies or labor unions by offering their members' labour to the forest authorities. According to the Forest Law, Forest Cooperatives have to be given priority for the jobs related to wood harvesting, skidding and transporting. In addition, FC's get some share of the revenues generated by the sale of wood.

Forests cover about 25 percent of Turkey's land area and about 15 percent of Turkey's population lives in forest villages and forest-neighboring villages. Forest villages are often very remote, and tend to be far poorer than the national average.

At present, Turkey is revising the legislation related to forest issues and is considering the privatization of wood harvesting. The FCs and their national union are afraid that these measures could negatively effect their operations and substantially reduce the income of its members.

Chambers of Agriculture

Within the Turkish legal framework, government's consultations and contacts with different professions take place through the French-inspired system of chambers. These are public bodies run by general assemblies and boards of elected representatives of the profession in question. Governed by Law 6964, there are 604 chambers of agriculture in Turkey, located at provincial and district levels, and a Union of Chambers of Agriculture (TZOB) as the national apex. Membership is compulsory. There are approximately 4.8 million registered farmer members, of which 9.5 percent are women.

Chambers of agriculture has a broad mandate, including providing agricultural services, representing farmers and assisting the government in the formulation and implementation of agricultural policies. In practice, main functions of the chambers are mainly farmer registration[44] and sales of agricultural inputs[45].

There is a felt need to improve chambers' services to farmers, by taking on agricultural extension, education and farmer advisory services. Qualifications of the existing personnel may however be one of the constraints, as 82 percent of the 1350 provincial and district level employees are of primary or secondary level education. For the total of 604 chambers, there are only 210 agricultural engineers, and 41 agricultural technicians[46].

At the apex level, TZOB has good working links with government and has at times been outspoken in conveying farmer problems to authorities. In addition, chambers are represented on

[44] Chambers of Agriculture are authorized to issue farmer registration certificates, which are an official pre-requisite especially for DIS payments.
[45] As an estimate, 85 percent of chambers sell insecticides, herbicides and pesticides, 23 percent sell seeds, 11 percent sell agricultural machinery and equipment, and 8 percent sell fertilizers.
[46] Figures given are estimates.

a number of relevant national committees. They also represent Turkish farmers at the European[47] and international[48] levels with varying degrees of effectiveness.

It is necessary that the current revision of the Law on Chambers of Agriculture does not limit itself to the adjustment of the membership fee[49], as well as a few minor changes in election procedures and addresses the more fundamental development and service needs by increasingly take on agricultural extension, education and farmer advisory services.

Farmers Associations and Producers Unions

There are a few private farmers' associations in Turkey, mostly localized or product-specific, operating under the Association Law 2908. The Adana Farmers Union, for instance, represents large-scale commercial farmers in the Cukurova plain. Similarly, the Aegean Farmers' Association is composed of farmers concentrated in certain districts of the Aegean region. On the other hand, in Tekirdag Farmer Associations, farmers group together to employ their own agricultural extension personnel, partly subsidized by government and the TZOB.

Cattle Breeders Association of Turkey (CBAT), specializing in dairy cattle, is one of the more advanced among farmers' associations. Operating under a special regulation of Animal Breeding Law 4631, CBAT is now organized in 35 provinces, almost exclusively in the West[50], with an apex body in Ankara. CBAT keeps pedigree registers, implements breeding and artificial insemination programs, provides inputs, training, advisory and animal health services[51].

Since 1999, initially supported by an FAO Technical Cooperation Project[52], MARA is working on a new law for agricultural producers unions. However, the draft available in the spring of 2003 is being criticized by farmers' organizations and cooperatives.

Conclusions

After more than two years of support by ARIP, ASCs and ASCUs are making progress in their restructuring by reducing costs and developing a business approach. However, many important restructuring steps still remain, e.g. turning the unions into efficient service providers for the village-level cooperatives. The positive and negative experiences gained under the

[47] TZOB is a member of European Confederation of Agriculture, participate actively in the Economic and Social Committee of the European Union, and have good working links with the main European farmer body COPA-Cogeca.

[48] TZOB is a member of the International Federation of Agricultural Producers (IFAP)

[49] Membership fee of the Chambers is fixed by law, and its value has long been eroded by inflation. Fees charged for issuing farmer registration certificates as well as commercial sales are the two most significant sources of income at present.

[50] With the exception of the newly active province of Kars in Eastern Anatolia.

[51] CBAT is increasingly interested in taking over part of the public animal health services, and in investing in dairy processing and sales.

[52] FAO TCP was implemented by IFAP during 1999-2000. During 1999-2000, an FAO-IFAP Technical Cooperation Project assisted the Turkish Government in analyzing the farming sector in Turkey in light of farm organization structures in Europe and in drafting a law on producers unions. The project, which was carried out in a participative manner, with the inclusion of farmer and government representatives, was concluded in February 2000. The project was carried out in a participative manner, with the inclusion of farmer and government representatives. Report may be appended.

ASC/ASCU component of the ARIP project are increasingly serving as reference cases for the urgent restructuring of the ACCs which is gaining momentum. While implementing its Action Plan, MARA intends to use the ARIP lessons also in its efforts to facilitate the restructuring of FCs and ICs, as well as for the accelerated development of ADCs. The development of farmers associations and producers' unions, as well as the strengthening of the chambers of agriculture are also high on MARA's agenda.

Annex 3

RURAL POPULATION AND GROSS DOMESTIC PRODUCT

1. Summary

Turkey's rural population is still high and displays dissimilar patterns among regions with the East Anatolia and South Eastern Anatolia regions being much more rural than the western regions. Rural population has been declining due to migration from villages to cities.

Rural GDP has an increasing trend, but the urban economy grows at a higher rate than the rural economy, therefore the relative share of rural value added has been declining. At the same time, the share of agriculture sector in GDP has been decreasing and other sectors' shares, especially that of the services sector, has been increasing. However, the less developed regions are still heavily dependent on agriculture. Still, the share of agriculture within rural GDP nationally has been declining, and the share of off farm activities has been increasing in general.

2. Population - A New Definition for Rural and Urban

According to the 2000 population census 35% of Turkey's total population lives in villages. Although still high compared to many developing countries[53] the figure has been decreasing rapidly[54]. The proportion of the population living in villages also varies greatly among provinces, ranging from 74 % (Bartin) to 9 % (Istanbul). (*See Appendix 1*).

The population has grown at an annual average rate of 1.83 % over the last 10 years in Turkey, with urban population growth higher than of villages. In some regions, like the Black Sea and East Anatolia regions, village population has even declined. The major reason, migration from villages to cities, is continuing and is expected to decrease village population further in the near future.

Table 1 - Annual Population Growth

	Total	City	Village
Marmara	2.66%	2.83%	2.04%
Aegean	1.65%	2.39%	0.55%
Mediterranean	2.16%	2.57%	1.58%
Central Anatolia	1.59%	2.27%	0.22%
Black Sea	0.37%	2.16%	-1.11%
East Anatolia	1.39%	3.57%	-0.62%
S.East Anatolia	2.47%	3.69%	0.70%
Total	1.83%	2.70%	0.40%

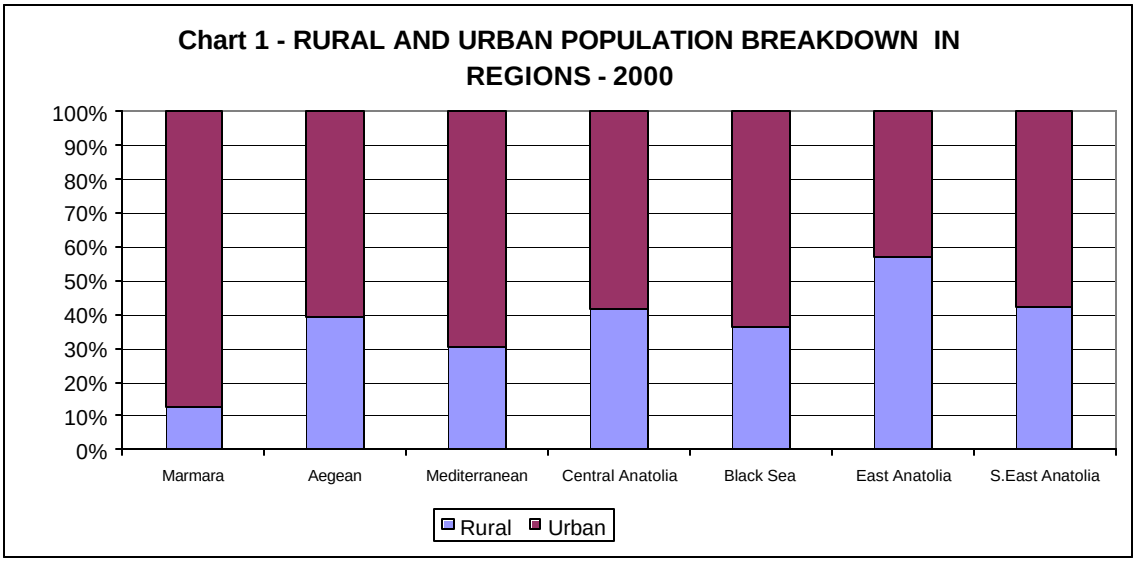
Source: Population Census 2000, State Statistics Institute.

[53] Europe and Central Asia Region's average is 25 %.
[54] 1990 census for rural population was 40 %.

In Turkey, rural population has been considered the same as village population, with all those not resident in a city center considered part of the rural population. However, such an approach neglects population density which is also a very important criterion in describing rural and urban populations. The OECD defines administrative units as rural if their population density is less than 150 inhabitants / sq km.

In this study a more thorough rural definition is made by combining these two approaches. Accordingly, districts are urban if: (i) they are city centers; and (ii) they have a population density more than 100 inhabitants/ sq. km.[55] The remaining districts are the classified as rural. With this method rural population on average becomes 34 % and the variation among provinces increases. Bitlis has the highest rural population with 83 % and Istanbul the lowest with only 1 %. Median is 46.6 %. *(See Appendix 1)*

The rural and urban population breakdown in regions displays a substantial disparity throughout the country. East Anatolia has the highest rural population (57%) followed by South East Anatolia (42%), Central Anatolia (42%), Aegean (39%), Black Sea (36%) and Mediterranean (30%). Marmara has the lowest rural population share with only 13 % of total population.



Source: Own Calculations

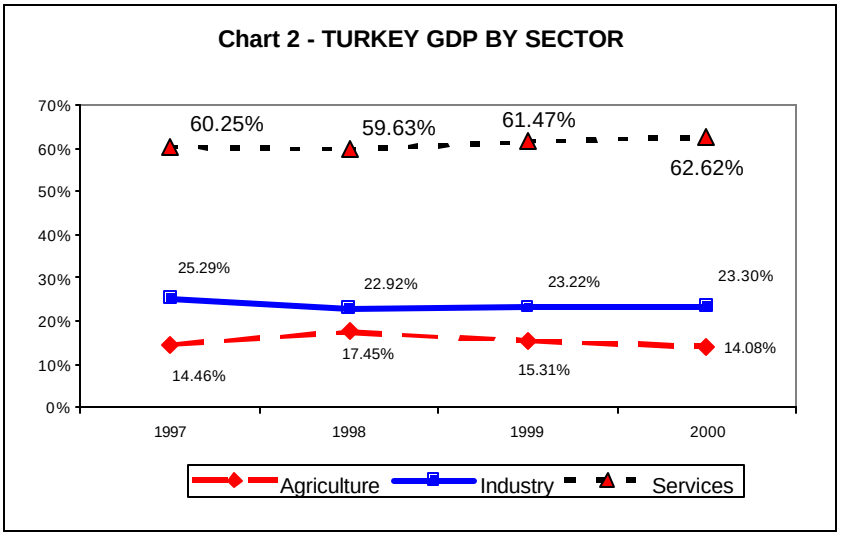
3. Sectoral Gross Domestic Product

In 2000 (the most recent year for which full regional breakdowns are available), Turkey's value added was dominated by the service sector with 63% of total GDP, followed by the industrial sector with 23%, and agriculture at 14%. During the 1997-2000 period the share of agriculture in GDP first increased in 1998, then started to decline again, ultimately experiencing a slight overall decrease. The industrial sector's share decreased

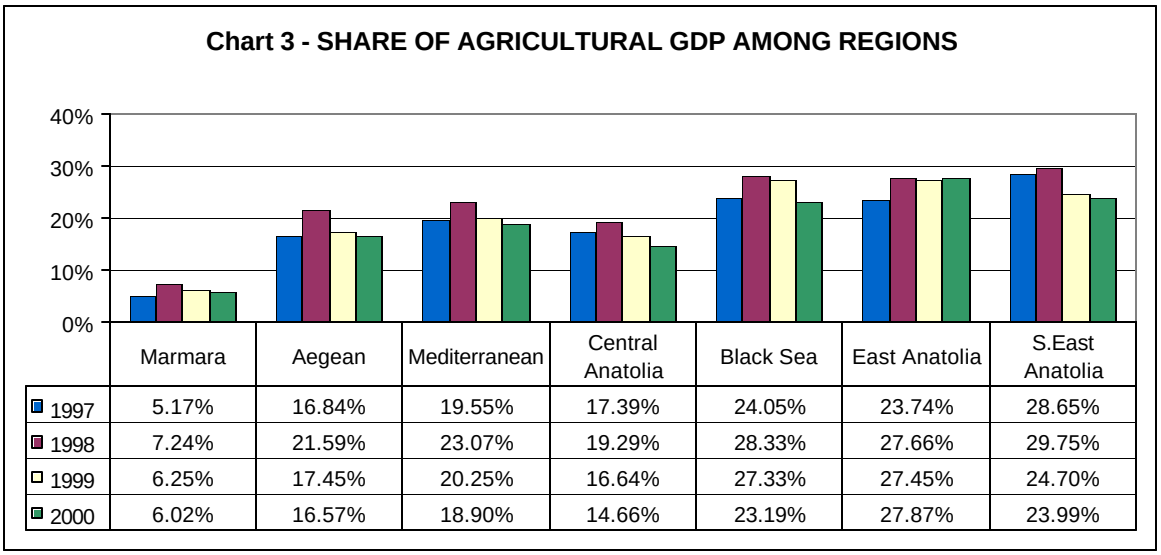
[55] OECD population density of more than 150 inhabitants/ sq.km. is a very high standard for urbanization in Turkey as average population density is quite low with 88 inhabitants / sq.km.

slightly overall as well during the same period, while the service sector followed an opposite slightly upward trend.

Source: State Statistics Institute, Turkey



The Central Anatolia region has the highest share of GDP from the service sector (70 %). Marmara Region is the most industrialized region with more than 30 % of its total GDP from the industrial sector. It also has the smallest share of agriculture. The South Eastern Anatolia, East Anatolia and Black Sea regions on the other hand are more dependent on agriculture.



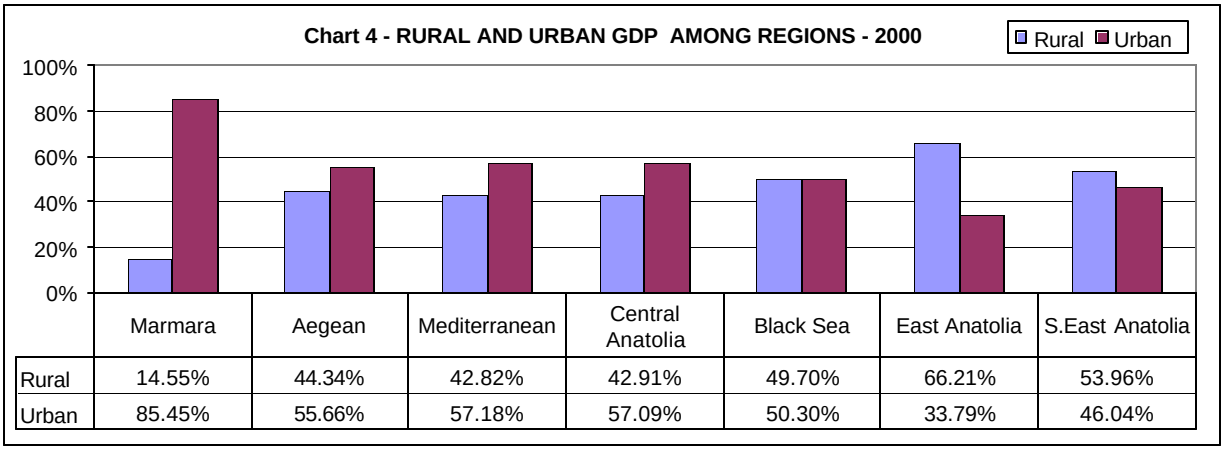
	Marmara	Aegean	Mediterranean	Central Anatolia	Black Sea	East Anatolia	S.East Anatolia
1997	5.17%	16.84%	19.55%	17.39%	24.05%	23.74%	28.65%
1998	7.24%	21.59%	23.07%	19.29%	28.33%	27.66%	29.75%
1999	6.25%	17.45%	20.25%	16.64%	27.33%	27.45%	24.70%
2000	6.02%	16.57%	18.90%	14.66%	23.19%	27.87%	23.99%

Source: State Statistics Institute, Turkey

The decline of the share of agriculture in GDP after 1998 has been significant for all regions, especially for the South East Anatolia, Black Sea and Aegean regions, but not for the Marmara and East Anatolia regions. In contrast, the share of GDP from services has increased uniformly, particularly in the Central Anatolia, South East Anatolia, Mediterranean and Aegean regions. The share of industrial GDP shows a mixed trend: increasing in the South Eastern, Aegean and Mediterranean regions, and decreasing in other regions during the 1998-2000 period.

4. GDP – Rural and Urban[56]

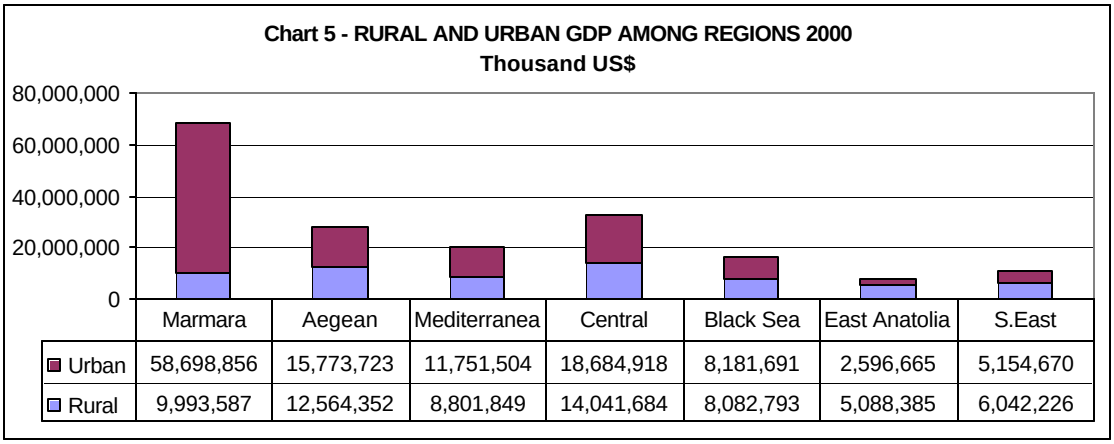
Rural GDP is on average 35% of total GDP in Turkey. Fifty four provinces out of 81 have rural GDP higher than 50 % of their total GDP. Bitlis, Agri, Gumushane and Yozgat's rural GDPs are approximately 90 % of total GDPs. Kocaeli has less than 10 % and Istanbul has only 2 % of rural GDP out of total GDPs (*See Appendix1*). Rural GDP within total GDP is highest in the East Anatolia region, followed by the South East Anatolia region, and lowest in the Marmara region.



	Marmara	Aegean	Mediterranean	Central Anatolia	Black Sea	East Anatolia	S.East Anatolia
Rural	14.55%	44.34%	42.82%	42.91%	49.70%	66.21%	53.96%
Urban	85.45%	55.66%	57.18%	57.09%	50.30%	33.79%	46.04%

Source: Own Calculations

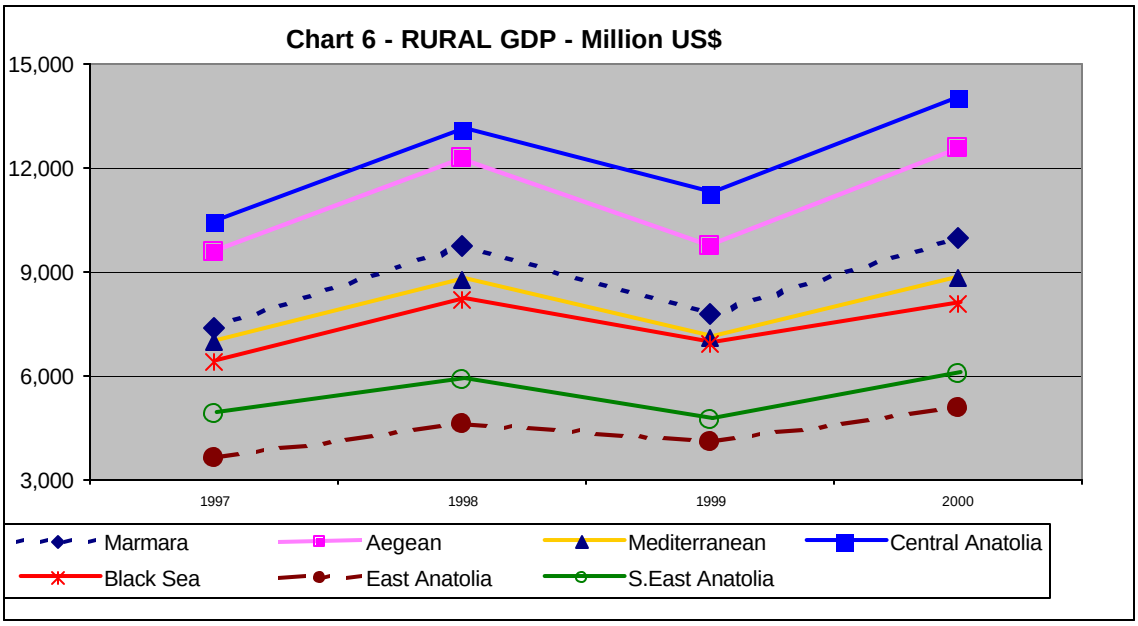
The amount of GDP differs significantly among regions as well. East Anatolia has the lowest rural GDP (US$ 5 billion) as well as urban GDP (US$ 2.6 billion). South East Anatolia comes next in terms of having less rural and urban GDPs compared to other regions. Central Anatolia on the other hand generates the highest rural GDP with 14 billion dollars in 2000.



	Marmara	Aegean	Mediterranea	Central	Black Sea	East Anatolia	S.East
Urban	58,698,856	15,773,723	11,751,504	18,684,918	8,181,691	2,596,665	5,154,670
Rural	9,993,587	12,564,352	8,801,849	14,041,684	8,082,793	5,088,385	6,042,226

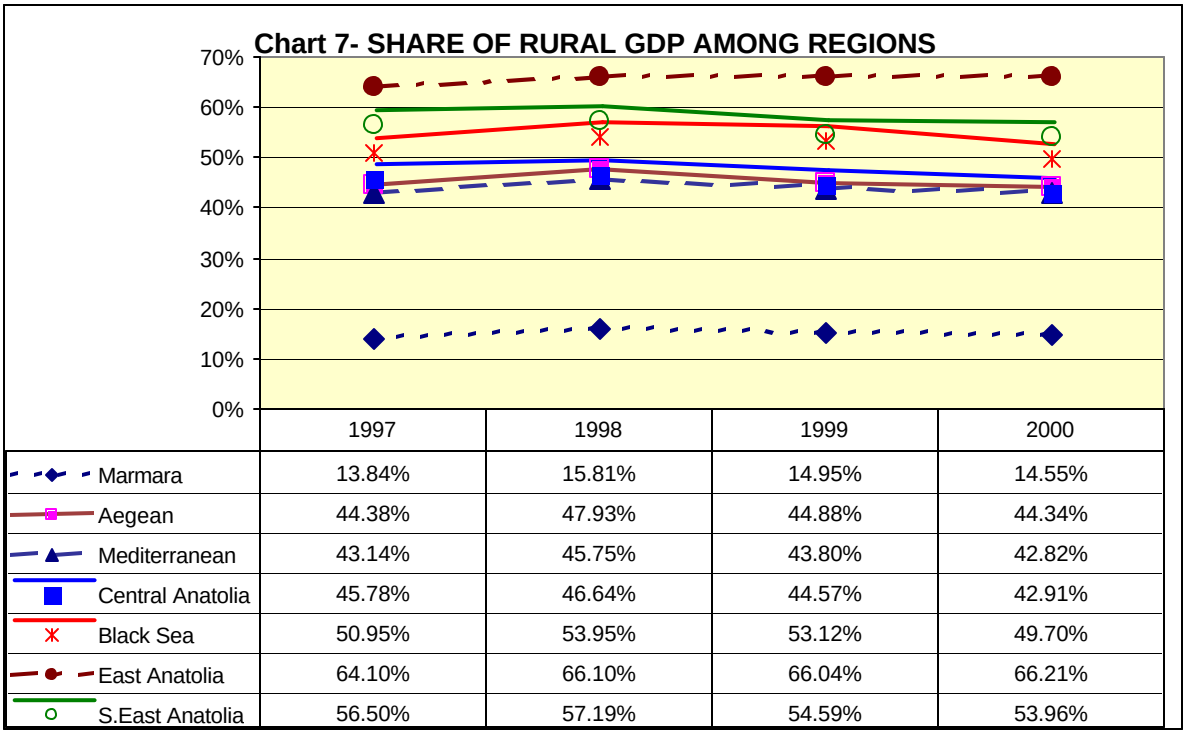
Source: Own Calculations

[56] The method explained above to determine rural-urban population is also used to estimate rural GDP. Urban GDPs are calculated for each province by adding their urban segments of industrial and services GDPs. The non-urban segments of industrial and services GDPs as well as agricultural GDPs are combined under rural GDPs.



Source: Own Calculations

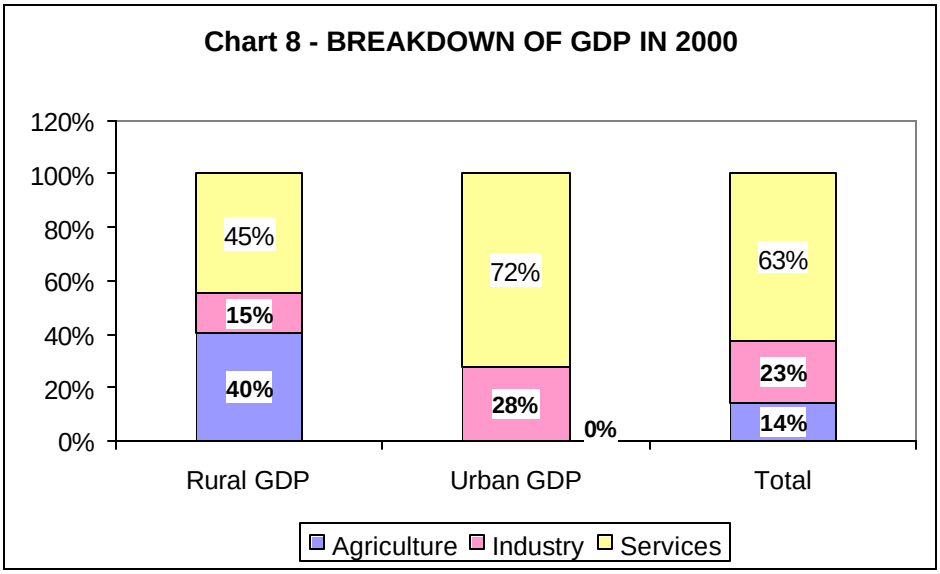
Rural GDP figures has been fluctuating but with an increasing trend over 1997-2000 period. Although the amount of rural GDP has been increasing, the share of rural GDP has declined by 0.45 % over 1997-2000, as annual growth in rural GDP is lower than urban GDP growth (2.63 % and 2.87 % respectively) during this period. Rural GDP within total GDP reached its peak in 1998 mainly due to an increase in agricultural GDP's share which stemmed from particularly high agricultural production in that year.



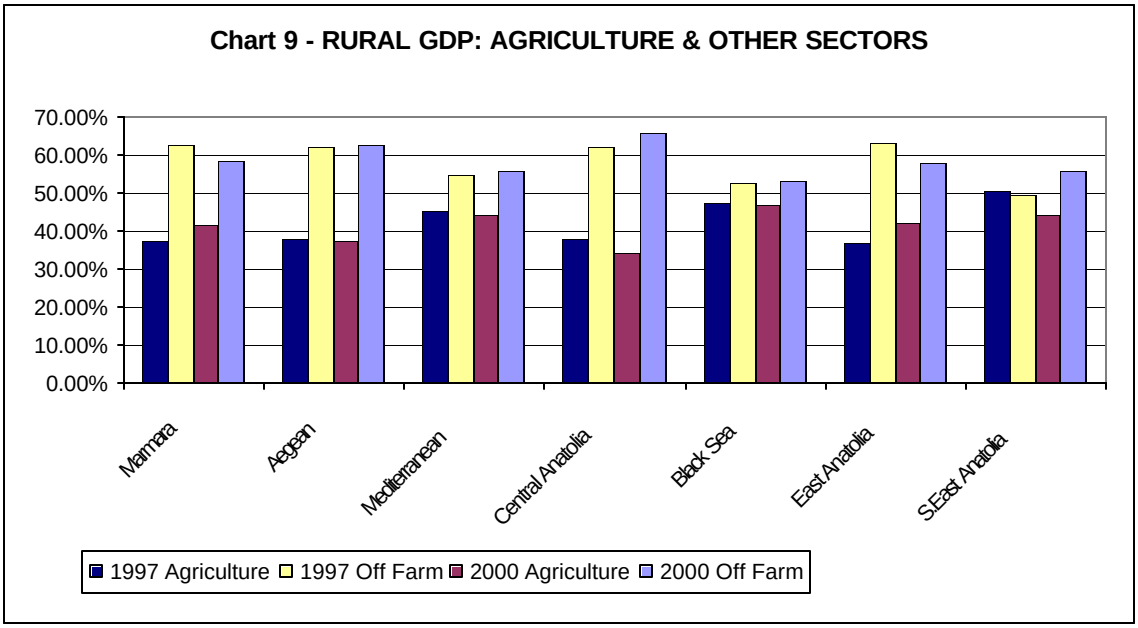
	1997	1998	1999	2000
Marmara	13.84%	15.81%	14.95%	14.55%
Aegean	44.38%	47.93%	44.88%	44.34%
Mediterranean	43.14%	45.75%	43.80%	42.82%
Central Anatolia	45.78%	46.64%	44.57%	42.91%
Black Sea	50.95%	53.95%	53.12%	49.70%
East Anatolia	64.10%	66.10%	66.04%	66.21%
S.East Anatolia	56.50%	57.19%	54.59%	53.96%

Source: Own Calculations

Regionally the share of rural GDP in total GDP has increased in Marmara and East Anatolia during 1997-2000 period, also due to an increase in share of agricultural GDP. In other regions share of rural GDP has declined. The composition of rural GDP shows that agriculture is still an important economic activity in rural regions: in 2000, 40% of rural value added was from agriculture; whereas the shares of industry and services were 15% and 45% respectively. Urban GDP on the other hand is mainly composed of services (72%) and industry (28%).



When we examine the composition of rural GDP, we see that the share of agriculture within rural GDP has increased in Marmara (4 %) and East Anatolia (5 %), and decreased in all five other regions, particularly in South East Anatolia (-6.2 %) and Central Anatolia (-3.8%). In these five regions the services and industry sectors' shares have increased. So one can conclude that off farm activities have grown faster in all regions except Marmara and East Anatolia during 1997-2000.



Source: Own Calculations

Appendix 1.

Sorting By Village Population (2000)			Sorting By Rural Population (2000)			Sorting By Rural GDP (2000)		
Province	Village Population	Rural Population	Province	Rural Population	Village Population	Province	Rural GDP	Agricultural GDP
BARTIN	73.9%	29.1%	BİTLİS	83.2%	43.5%	BİTLİS	90.1%	40.8%
ARDAHAN	70.3%	66.5%	SİNOP	77.9%	56.1%	AĞRI	87.7%	45.5%
MUŞ	64.8%	53.5%	ÇANAKKALE	77.6%	53.6%	GÜMÜŞHANE	85.3%	41.0%
NİĞDE	63.6%	49.0%	AĞRI	77.4%	52.3%	YOZGAT	85.2%	36.5%
MUĞLA	62.5%	69.7%	YOZGAT	76.8%	53.9%	SİNOP	84.2%	28.4%
ZONGULDAK	59.3%	10.8%	AFYON	75.2%	54.2%	ÇANAKKALE	83.3%	25.3%
GÜMÜŞHANE	58.5%	75.0%	GÜMÜŞHANE	75.0%	58.5%	AFYON	82.9%	31.1%
DÜZCE	58.4%	32.7%	BİLECİK	72.8%	36.0%	ARDAHAN	82.6%	49.0%
BAYBURT	57.5%	26.8%	KASTAMONU	71.7%	53.7%	ÇANKIRI	80.5%	32.9%
KARS	56.3%	64.9%	ÇANKIRI	70.9%	47.8%	KASTAMONU	79.4%	27.2%
ARTVİN	56.1%	66.0%	MUĞLA	69.7%	62.5%	NEVŞEHİR	78.5%	36.6%
NEVŞEHİR	55.9%	66.1%	KUTAHYA	68.4%	51.5%	BİLECİK	78.3%	20.2%
SİNOP	55.1%	77.9%	TUNCELİ	67.6%	41.8%	HAKKARİ	77.5%	31.4%
AFYON	54.2%	75.2%	HAKKARİ	67.2%	41.1%	MUĞLA	77.2%	25.0%
YOZGAT	53.9%	76.8%	ISPARTA	66.8%	41.3%	EDİRNE	77.0%	34.1%
KASTAMONU	53.7%	71.7%	ARDAHAN	66.5%	70.3%	ISPARTA	76.5%	29.3%
ÇANAKKALE	53.6%	77.6%	NEVŞEHİR	66.1%	55.9%	KARS	76.4%	32.7%
HATAY	53.6%	10.2%	EDİRNE	65.0%	42.6%	TUNCELİ	76.1%	26.3%
ORDU	53.1%	18.6%	ARTVİN	65.0%	56.1%	MUŞ	75.6%	47.5%
AĞRI	52.3%	77.4%	KARS	64.9%	56.3%	NİĞDE	74.2%	49.3%
IĞDIR	51.6%	39.1%	KONYA	64.0%	40.9%	KUTAHYA	73.4%	16.1%
TOKAT	51.5%	63.1%	TOKAT	63.1%	51.5%	ARTVİN	72.8%	22.4%
KUTAHYA	51.5%	68.4%	ÇORUM	62.9%	47.8%	ŞANLIURFA	72.8%	43.4%
BİNGÖL	51.3%	54.1%	SİVAS	60.3%	44.1%	KONYA	72.4%	23.3%
DENİZLİ	51.3%	52.9%	ADIYAMAN	60.0%	45.7%	TOKAT	72.0%	24.1%
TRABZON	50.9%	12.1%	VAN	59.4%	49.1%	ÇORUM	72.0%	24.5%
AKSARAY	49.5%	40.3%	SİİRT	59.3%	41.8%	KARAMAN	71.4%	54.4%
VAN	49.1%	59.4%	ERZURUM	58.4%	40.2%	BİNGÖL	70.7%	36.2%
AYDIN	48.1%	24.3%	BURDUR	56.6%	45.5%	ADIYAMAN	70.0%	25.0%
ÇANKIRI	47.8%	70.9%	KIRŞEHİR	54.6%	41.8%	SİİRT	69.1%	24.1%
ÇORUM	47.8%	62.9%	BİNGÖL	54.1%	51.3%	VAN	68.9%	23.4%
SAMSUN	47.5%	26.0%	MUŞ	53.5%	64.8%	BOLU	68.7%	37.3%
BOLU	47.3%	50.1%	DENİZLİ	52.9%	51.3%	ERZURUM	68.7%	24.6%
K.MARAŞ	46.5%	47.4%	ŞANLIURFA	51.9%	41.7%	BURDUR	68.0%	26.3%
BALIKESİR	46.3%	43.9%	BOLU	50.1%	47.3%	SİVAS	67.7%	18.6%
AMASYA	46.2%	48.7%	NİĞDE	49.0%	63.6%	KIRŞEHİR	66.7%	26.8%
GİRESUN	45.9%	43.9%	AMASYA	48.7%	46.2%	ERZİNCAN	65.0%	35.1%
ADIYAMAN	45.7%	60.0%	KARABÜK	48.1%	29.9%	AKSARAY	64.3%	40.2%
ERZİNCAN	45.6%	46.1%	K.MARAŞ	47.4%	46.5%	AMASYA	63.7%	29.1%
ANTALYA	45.6%	40.3%	DİYARBAKIR	47.1%	40.0%	IĞDIR	63.3%	39.7%
BURDUR	45.5%	56.6%	MANİSA	46.6%	43.3%	DENİZLİ	61.9%	19.1%
MARDİN	44.6%	37.3%	ERZİNCAN	46.1%	45.6%	BALIKESİR	59.8%	26.3%
SİVAS	44.1%	60.3%	UŞAK	44.3%	43.5%	K.MARAŞ	58.9%	21.9%
RİZE	43.9%	27.0%	BALIKESİR	43.9%	46.3%	UŞAK	58.6%	35.7%
BİTLİS	43.5%	83.2%	GİRESUN	43.9%	45.9%	DİYARBAKIR	58.4%	21.4%
UŞAK	43.5%	44.3%	MALATYA	43.1%	41.5%	MANİSA	58.1%	21.6%
MANİSA	43.3%	46.6%	KIRIKKALE	41.3%	25.6%	GİRESUN	57.6%	24.4%
EDİRNE	42.6%	65.0%	ANTALYA	40.3%	45.6%	MARDİN	54.8%	27.8%
KARAMAN	42.5%	37.3%	AKSARAY	40.3%	49.5%	KARABÜK	53.8%	11.0%
KIRKLARELİ	42.4%	39.6%	BATMAN	40.3%	33.4%	MALATYA	53.3%	17.9%
KIRŞEHİR	41.8%	54.6%	KIRKLARELİ	39.6%	42.4%	ELAZIĞ	53.0%	22.3%
TUNCELİ	41.8%	67.6%	ELAZIĞ	39.5%	36.0%	DÜZCE	52.6%	29.6%
SİİRT	41.6%	59.3%	IĞDIR	39.1%	51.6%	BATMAN	51.9%	19.5%
ŞANLIURFA	41.7%	51.9%	MARDİN	37.3%	44.5%	BAYBURT	50.3%	32.1%
YALOVA	41.5%	4.7%	KARAMAN	37.3%	42.5%	ANTALYA	50.2%	16.6%
MALATYA	41.5%	43.1%	ŞIRNAK	36.7%	40.2%	KİLİS	48.8%	32.6%
ISPARTA	41.3%	66.8%	İÇEL	34.5%	39.5%	İÇEL	48.6%	21.5%
HAKKARİ	41.1%	67.2%	KAYSERİ	33.2%	30.9%	ŞIRNAK	48.3%	19.5%
KONYA	40.9%	64.0%	DÜZCE	32.7%	58.4%	KIRKLARELİ	47.5%	13.1%
ERZURUM	40.2%	58.4%	TEKİRDAĞ	32.0%	36.6%	ORDU	47.3%	35.3%
ŞIRNAK	40.2%	36.7%	BARTIN	29.1%	73.9%	AYDIN	47.2%	30.3%
KOCAELİ	40.1%	4.3%	OSMANİYE	27.5%	32.0%	BARTIN	45.8%	23.5%
DİYARBAKIR	40.0%	47.1%	RİZE	27.0%	43.9%	KIRIKKALE	45.8%	7.6%
İÇEL	39.5%	34.5%	BAYBURT	26.8%	57.5%	OSMANİYE	44.5%	23.4%
SAKARYA	39.2%	19.1%	SAMSUN	26.0%	47.5%	SAMSUN	43.1%	23.1%
TEKİRDAĞ	36.6%	32.0%	ESKİŞEHİR	24.4%	21.1%	TEKİRDAĞ	42.5%	15.5%
ELAZIĞ	36.0%	39.5%	AYDIN	24.3%	48.1%	KAYSERİ	41.4%	12.2%
BİLECİK	36.0%	72.8%	KİLİS	23.8%	34.6%	RİZE	41.3%	19.6%
KİLİS	34.6%	23.8%	SAKARYA	19.1%	39.2%	SAKARYA	40.3%	26.2%
BATMAN	33.4%	40.3%	ORDU	18.6%	53.1%	ESKİŞEHİR	33.7%	12.3%
OSMANİYE	32.0%	27.5%	ANKARA	17.8%	11.7%	HATAY	31.8%	24.1%
KAYSERİ	30.9%	33.2%	ADANA	17.5%	24.4%	GAZİANTEP	28.5%	13.7%
KARABÜK	29.9%	48.1%	GAZİANTEP	17.2%	21.5%	ADANA	28.0%	12.7%
KIRIKKALE	25.6%	41.3%	BURSA	16.6%	23.3%	TRABZON	27.7%	17.7%
ADANA	24.4%	17.5%	İZMİR	16.5%	18.9%	BURSA	26.0%	11.2%
BURSA	23.3%	16.6%	TRABZON	12.1%	50.9%	İZMİR	22.7%	8.5%
GAZİANTEP	21.5%	17.2%	ZONGULDAK	10.8%	59.3%	ANKARA	21.7%	4.7%
ESKİŞEHİR	21.1%	24.4%	HATAY	10.2%	53.6%	ZONGULDAK	16.8%	6.7%
İZMİR	18.9%	16.5%	YALOVA	4.7%	41.5%	YALOVA	11.6%	7.3%
ANKARA	11.7%	17.8%	KOCAELİ	4.3%	40.1%	KOCAELİ	7.5%	3.3%
İSTANBUL	9.3%	1.1%	İSTANBUL	1.1%	9.3%	İSTANBUL	1.7%	0.6%
Total	35.1%	33.5%	Total	35.1%	33.5%	Total	34.8%	14.1%

References

In addition to the references that are listed below, Undersecretariat of Treasury, Ministry of Agriculture and Rural Affairs, State Statistical Institution, Undersecretariat of Foreign Trade, Turkish Chambers of Agriculture and Turkish Fertilizer Producers Association, has provided us with necessary databases and information.

Bozoglu, Mehmet. *Turkiye'nin Findik Politikasi ve Reform Arayislari.* Paper presented for the Conference called "Turkiye'de Uygulanan Findik Politikalari ve Findigin Gelecegi. Samsun.

Eyuboglu, Fikret. 2002. *Turkey Fertilizer Requirements, Consumption and its Future.* GDRS, MARA Publication, Ankara

OECD. 2002. *Agricultural Policies in OECD Countries, Monitoring and Evaluation*. Paris.

Rabo International Advisory Services and Boston Consulting Group. 2002. *Strategic Review of Ziraat Bank in the Provision of Agricultural Finance in Turkey*. Project Number 0204. Utrecht.

Sadoulet, Elisabeth, Alain de Janvry and Benjamin Davis. *Cash Transfer programs with Income Multipliers: PROCAMPO in Mexico.* World Development. Vol. 29, No. 6, pp. 10043-1056.

State Planning Organization. 2002. *Various Indicators Related to Provinces*. Ankara

State Statistical Institute. 1992. *General Agricultural Census 1991*. Publication No. 1550. Ankara,.

State Statistical Institute. 1994. *Gross National Product, Concepts, Methods and Sources*. Publication No. 1710. Ankara,.

State Statistical Institute. 2001. *Labor Statistics*. Publication No. 2405. Ankara,.

State Statistical Institute. 2001. *Agricultural Indicators*. Publication No. 2407. Ankara.

State Statistical Institute. 2001. *Census of Population Provisional Results 2000*. Publication No. 2514. Ankara

State Statistical Institute. 2001. *Gross Domestic Product by Provinces 1998-1999*. Publication No. 2515. Ankara

State Statistical Institute.2001. *Agricultural Structure 2000 (Production, Price, Value)*. Publication No. 2614. Ankara.

State Statistical Institute.2002. *The Summary of Agricultural Statistics*. Publication No. 2719. Ankara.

State Statistical Institute.2002. *Foreign Trade Statistics and Indices.* Publication No. 2729. Ankara.

State Statistical Institute.2002. *Agricultural Structure 2001 (Production, Price, Value).* Publication No. 2758. Ankara.

State Statistical Institute .2002. *Quarterly Gross National Product 1999-2001*. Publication No. 2557. Ankara.

State Statistical Institute .2002. *Monthly Bulletin of Statistics September 2002*. Ankara.

UNDP. 2001. *Turkey 2001 Human Development Report*. Ankara.

www.fao.org

www.OECD.org

2002 Qualitative Household Survey, ARIP

Insert Annex 3 Here