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From a "Velvet" Transition to the Challenges of EU Accession

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Food and Agriculture in the Czech Republic

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Csaba Csaki
Michel Debatisse
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The World Bank
Washington, D.C.
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FOREWORD

Becoming a member of the European Union is one of the most important objectives of the Czech Republic for the coming years, both for the government, and for the Czech society as a whole. Accession to the European Union is an unprecedented challenge which requires tremendous structural changes in the entire Czech economy, and for the food and agricultural sector in particular. Appropriate agricultural and rural development strategies will be needed to address the problems of adjustment to EU agricultural policy and to EU rules, regulations, and standards. The integration with western European markets will generate many new opportunities and advantages, but it will also bring with it greater competition, and it will pose considerable challenges for Czech agricultural producers to increase their efficiency.

In agreement with the European Union, the World Bank is assisting its clients in preparing for the accession. To make full use of the World Bank’s comparative advantage in policy analysis and in providing technical assistance for policy formulation, a series of country economic studies (the so-called Country Economic Memorandum (CEM)) were carried out for the first five of the EU accession countries, including the Czech Republic. These studies provide an overall review of the economies of the respective countries and assess the readiness of these economies for EU membership, and identify critical areas and concerns for further government attention in the accession process. Given the importance and sensitivity of the food and agricultural sector in the region, the review of the sector is one of the major components in these studies.

This volume presents an overview of the food and agricultural sector and its status in the preparations for EU accession in the Czech Republic, and was prepared within the structure of the World Bank Country Economic Memorandum for the Czech Republic. Since this study is the first World Bank economic sector work carried out in the food and agricultural sector in the Czech Republic, it therefore provides much broader and comprehensive coverage of the sector than is otherwise required under the EU accession-focussed CEM series.

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ABSTRACT

This report reviews the current state of Czech agriculture and agro-industry. It examines the status of the sectoral reforms introduced after the collapse of the socialist system in 1989 followed by the birth of the Czech Republic of 1993. The report analyzes three categories of institutional reforms and their actual impacts: a) the creation of a macro-framework and incentive system for producers, processors and traders; b) the privatization of the major means of production, both in primary agriculture and in agro-processing and input supply; and c) the changes in institutions and regulations aimed at enhancing the functioning of markets (factors and products). It proposes a series of adjustments for the completion of the reforms in the areas of financial consolidation of farms, privatization of the remaining state-owned land, improvement of competitiveness, and development of a market conforming institutional framework. The analyses are made in the context of the adjustment of the Czech agricultural sector to the institutions of the European Union. The report is intended for agricultural scientists, public officials, agricultural and agro-industrial leaders and researchers interested in the transformation of agriculture in the transition economies and in issues pertaining to accession of Central and East European candidate countries to the European Union.

ACKNOWLEDGMENTS

This study originated as a contribution to the Country Economic Memorandum (CEM) for the Czech Republic. The preparation of the CEM was managed by Carlos Silva-Jauregui (Country Economist, ECSPE). The study was compiled on the basis of the information and findings assembled with the cooperation of the Czech Ministry of Agriculture and Food during a mission to the Czech Republic in September 1998. It was written by Csaba Csaki (Agriculture Adviser, ECSSD), Michel L. Debatisse (Principal Agro-industry Specialist, ECSSD) and Oskar Honisch (Agronomist, Consultant). Alan Zuschlag provided editorial assistance. Tomas Doucha, Director of the Research Institute of Agricultural Economics in Prague served as the main counterpart in collecting basic information on the Czech agricultural sector. Recent studies of OECD, European Commission and the Research Institute of Agricultural Economics were used as major background resources.

This study was discussed at an internal World Bank review meeting on February 25, 1999. The authors would like to thank their numerous counterparts, farmers, private entrepreneurs, managers of banks and directors of various agencies met during the mission, for the time they spent with them in open and friendly discussions.

The ECSSD unit distributes this technical report to disseminate findings of work in progress and to encourage the exchange of ideas among Bank staff and all others interested in development issues. This paper carries the name of the author and should be used and cited accordingly. The findings, interpretations and conclusions are the author's own and should not be attributed to the World Bank, its Board of Directors, its management, or any member countries.
CURRENCY

Czech Korona (CZK)
US $1 = 27 CZK

WEIGHTS AND MEASURES

Metric System

ACRONYMS

BSE  Bovine Spongiform Encephalopathy
CAAS  Czechoslovak Academy of Agricultural Sciences
CAP  Common Agricultural Policy (of the European Union)
CEFTA  Central European Free Trade Agreement
CIS  Commonwealth of Independent States
COSMC  Czech Office for Surveying, Mapping, and Cadastre
CPI  Consumer Price Index
CSO  Central Statistical Office
CZK per ha  Czech Korona per hectare
CZK/t  per ton
CZU  Czech University of Agriculture
DG  (EU) Directorate General
ECU  European Currency Unit
EPPO  European and Mediterranean Plant Protection Organization
EU  European Union
EUROP  EU quality classification and remuneration of carcasses
EUROSTAT  European Union Statistical Office
FAO  UN Food and Agriculture Organization
FDI  Foreign Direct Investment
FSU  Former Soviet Union
GDP  Gross Domestic Product
GDR  German Democratic Republic
KB  Komercni Banks
Kg.  Kilogram
Km  Kilometer
IHGC  International Hops Growing Committee
IPPC  International Plant Protection Convention
IPM  Integrated Pest Management
ISTA  International Seed Testing Association
Kw  Kilowatt
LLC  Limited Liability Company
MOA  Ministry of Agriculture
NPK  Nitrogen, Phosphorus, Potash
OECD Organization of Economic Cooperation and Development
Q/ha Quintal per hectare
PSE Producer Subsidy Equivalent
RI Research Institutes
RIAE Research Institute of Agricultural Economics
SAPARD Social Action Program for Pre-Accession Aid for Agriculture and Rural Development
SFMR State Fund for Market Regulation
SGFFF Support and Guarantee Fund for Farmers and Forestry
SRS State Phytosanitary Administration
SVA State Veterinary Administration
T/ha Ton per hectare
Tons/ha Tons per hectare
UK United Kingdom
UKZUZ Central Institute for Supervision and Testing in Agriculture
UNESCO United Nations Educational and Science Organization
UPOV Universal Protocol of Varieties
UVSH Institute for Scientific Systems in Agriculture
UZPI Institute of Agricultural and Food Information
VAT Value Added Tax
WTO World Trade Organization
EXECUTIVE SUMMARY

Agriculture in the Economy and Sectoral Performance

The Czech Republic was one of the most industrialized countries in Central Europe prior to the second World War. Agriculture played only a marginal role in the Czech economy, largely as a result of the limited natural resources available for agricultural production. Based on family farming, Czech agriculture was solidly grounded in private ownership and private enterprise. In the 1930’s Czech agriculture was well developed, with yields and livestock productivity comparable to those in Western European countries, though, on the whole, the country was a net importer of agricultural products. During the decades of socialism, Czech agriculture was collectivized and managed under the principles of central planning. Although the yields and productivity in Czech agriculture continued to remain higher than the levels of other socialist countries, the country’s agriculture fell behind the advances of Western countries.

The share of agriculture in the economy contracted significantly and without interruption since 1989, down to 2.1% in 1997. This reflects two opposing trends, namely: a) a reduction of the agricultural production; while, b) a recovery in the Gross Domestic Product (GDP) between 1994 and 1996 after a sharp contraction in the first years of transition. With an active population of about 200,000 employed in agriculture, the share of employment in agriculture dropped in half, down to 4% in 1997 (Figure 1). This reduction, facilitated by new opportunities for workers developed in non-agricultural activities, resulted in improved agricultural labor productivity. At world prices, productivity in the Czech Republic is more than two thirds of the EU (15), nearly 60% higher than Austria but about 15% lower than in Germany (1996). General economic recovery followed by steady growth facilitated this transfer of labor from agriculture to other sectors, while the total unemployment rate remained stable between 3.0% and 3.5%.

*The agricultural production has always decreased from the previous year, with the exception of 1995 (+4.3%)*
While the agricultural area has been relatively stable, the agricultural production has experienced two parallel trends: a) a quite drastic reduction, year after year; and b) a slow switch from animal productions to crop productions (Figure 2). These changes reflect in part the structural changes that the agricultural economy has been through. However, their continuation until to date also indicates that these changes have been slow, and primary agricultural production has not benefited from new and more efficient, market-oriented structures. The so-called "velvet revolution" in the political arena appears to have given place to a soft reform policy in agriculture that one could qualify as the "velvet transition" of agriculture. But the downside of this policy is that the impact of the reforms, while milder on the agricultural sector, appears to having been stretched over a longer period and, under the current difficult international market conditions, has not left a breathing space in this continuous decline of Czech agriculture. With the exception of technical crops which benefited from a specific policy in favor of the development of an industrial use of the agricultural raw material, all crops and animal production drastically fell over the past eight years.

The Czech Republic is a net importer of agricultural and food products (Figure 3). The share of agriculture and food products in total exports has decreased by more than 50%, down to 5.4% in 1997, while the share in total imports decreased by about 25% down to 6.9% in 1997. The European Union (EU) is the main partner of the Czech Republic with about 35% of the Czech agricultural and food exports and 50% of its imports. CEFTA countries constitute the second largest client for Czech exporters of agricultural and food products (about 33% of such exports). Prior to the 1998 crisis, countries from the former Soviet Union represented a growing clientèle. Its land-locked position and the relatively poor product
Differentiation developed by the food industry has limited the ability of the Czech Republic to export to countries other than those in its immediate neighborhood, with the exception of a few traditional Czech products (beer, ham, etc). The protection of agricultural markets in the developed countries represents a significant constraint to Czech agricultural exports.

The share of consumer expenditures going to food and beverages has slightly decreased over the past years down to about 28%. Food prices have consistently increased less than the overall consumer price index (CPI). In only a few categories of foods, consumption has quantitatively increased (mainly poultry, vegetables, pulses and tropical fruits). The largest reduction in per capita consumption are for beef and pork, eggs, potatoes, sugar, cereals, and local fruits.

**Status of Sectoral Reforms**

After the collapse of the socialist system at the end of 1989, a new government introduced a program of economic reform, which began in 1991. This program included the transformation of agriculture based on the principles of ownership of land and other agricultural property. The aim was to create a market oriented and internationally competitive agricultural sector. During the first years of transition, the agricultural policy of the Czech Republic focused on the implementation of an ambitious reform program to transform the food and agriculture sector. The most important measures generally fall into three categories:

- The creation of a macro-framework and incentive system for producers, processors, and traders consistent with the requirements of a market based food and agriculture system;
- The privatization of the major means of production, both in primary agricultural production and in agro-processing and input supply; and
- The changes in institutions and regulations to enhance the functioning markets.

**Market Conforming Policy Framework with Increasing Intervention**

The foundation of the current system of government intervention in agriculture was laid down in 1991-92. This framework was originally aimed at providing protection to farmers during the transition process and the period of price liberalization. In recent years, different forms of market interventions were tried, and the harmonization with the CAP has become an additional, but still not major, objective. The main instruments which have remained more or less unchanged since the early 1990s include:

- price support measures with “guaranteed” prices and export subsidies for the main commodities;
- financial support for the establishment of new private farms and for investments in the agro-food sector, in the form of direct subsidies, subsidized credits, and credit guarantees;
• direct payments or compensation to farmers in less favored areas, and areas with special features;

• support for socially and environmentally desirable farming practices, such as the transfer of arable land into meadows and pastures and other production extending practices; and

• support for more general agricultural services such as research, animal and crop breeding, information dissemination, training, and extension services.

In the early years of transition, the level of support, although having declined from the pre-reform period, remained relatively high. By the mid-1990s, agricultural support and protection declined even further, although the objectives and basic instruments of the support system did not change. However, the Law on Agriculture, adopted in 1997, and other recent measures indicate that an increase in the support and protection of agriculture has been brought about by the new legislation with other adjustments of the system. In 1998, the budgetary support to agriculture is expected to increase by 36% in nominal value. On the whole, however, the magnitude of budgetary expenditures related to agriculture, roughly equivalent to ECU 437 million, cannot be considered excessive in comparison with most of the developed market economies (Figure 4).

As in many other countries in Central and Eastern Europe, agriculture in the Czech Republic experienced a cost/price squeeze because input prices increased more sharply than output prices early in the transition process. Input prices quickly rose to international levels – more than doubling between 1990 and 1997. At the same time, prices paid to farmers remained relatively flat, increasing less than 50% over the same period. This is sharply contrasted by the more than 2.5-fold increase in consumer prices during those years. Farmgate prices for practically all products are below those in the EU. Expressed in ECU, the domestic price rises have been, to some extent, mitigated by the depreciation of the Korona (CZK). The price gaps (at the farmgate level) with the EU have declined only modestly over time.

Direct market intervention: a major instrument of the agricultural policy. Direct market intervention is currently the major support instrument, which includes border measures as well as direct and indirect intervention in the market through the State Fund for Market Regulation (SFMR) (Box 1). In 1994-96, SFMR intervention was mainly limited to wheat and dairy products. In 1998, a broader system of intervention was introduced which covered wheat and
Executive Summary

other cereals, milk and other dairy products, and beef. Interest rates subsidies were also introduced for the export of a broad range of agricultural commodities. As a result, the total magnitude of market intervention expenditures is expected to increase 2.3 times in 1998 when compared to 1997 levels. Although actual results for 1998 are not available, it is expected that the effective government purchases will significantly increase in comparison to previous years. Expenditures of cereal market intervention will, most probably, be greatly increased, and domestic prices will be higher than those on world markets. With the change, SFMR together with the Credit Subsidy and Guarantee Schemes, became the dominant components of the agricultural support system. If this trend continues (assuming the constrained availability of all funds available to agriculture), these funds will channel significant resources away from other, more efficiency enhancing support programs.

An elaborate but financially weak system of credit subsidies and guarantees. Credit subsidies and guarantees represent the second largest component of support programs through the Support and Guarantee Fund for Farmers and Forestry (SGFFF) (Box 2), which was established in 1994 to improve the farm sector’s access to short- and longer-term credits. The main function SGFFF is to provide guarantees for loans (at commercial interest rates) already agreed upon between a food and agricultural entrepreneur and a commercial bank. The maximum level of guarantee ranges from 50% to 80%. In specific cases it can be 100%. In addition, the SGFFF provides a subsidy to interest payments. In 1998, the interest payments were subsidized up to about 60%. Interest free loans are also provided to young farmers and for development in less favored regions. The 1998 agricultural budget envisages a decrease of almost 20% in credit-related support. The credit policy shifts away further from providing interest-free loans to farmers towards loan guarantees and interest subsidies and towards increased

Box 1: State Fund for Market Regulation (SFMR)

The main objective of the SFMR is to provide market stabilization by limiting excessive price movements and, as such, it tends to act as a safety net for agricultural producers by supporting guaranteed minimum prices for agricultural products within the budget allocation for a given year. More specifically, the SFMR can take the following steps to regulate markets:

- selecting a list of products to be regulated in any specific year;
- setting a minimum price (guaranteed floor price) at which, given quantities of the specific product are to be purchased by the government;
- stipulating the time period during which specific product markets are to be regulated;
- set the level of export subsidies for the regulated products;
- influencing the licensing of exports and imports of food and agricultural products through proposals in this respect, to the relevant state administrative bodies.

Box 2: Support and Guarantee Fund for Farmers and Forestry (SGFFF)

The SGFFF was established in 1994 to improve the farm sector's access to short- and longer-term credits. The initial capitalization of the fund was about 5 billion CZK, including the shares of food enterprises. The main function SGFFF is to provide guarantees for loans (at commercial interest rates) already agreed upon between a food and agricultural entrepreneur and a commercial bank. The maximum level of guarantee ranges from 50% to 80%. In specific cases it can be 100%. In addition, the SGFFF provides a subsidy to interest payments. In 1998, the average interest rate in the Czech Republic was 15%, and the maximum interest rate subsidy was lowered to 9%. Accordingly, the interest payments were subsidized up to about 60%. Subsidized interest loans (discount of up to 5%) are also provided to young farmers and for farmers in less-favored regions. The 1998 agricultural budget envisages a decrease of almost 20% in credit-related support.
support to larger-scale farming operations. The current situation of SGFFF is causing some concerns for the mid- to longer-term budget outlook. Although the overall amount of outstanding credit guarantees does not seem excessively high (524 million ECU), the significantly increased amount of matured guaranteed loans in the last two years might undermine the financial sustainability of the whole program if this trend continues. At the same time, the value of the counterpart assets of the SGFFF has reportedly decreased to about one sixth of its original, non-market based, value.

**Direct payments to agriculture.** In 1998 a generalized agricultural area payment was introduced, the level depending on the administrative land price, and intended as a support to farming in general (maintenance of the landscape), organic farming and afforestation in particular, and in less favored areas also for livestock activities (beef, cattle, and sheep). The support for farms in less favored areas is conditional on an animal density between 0.1 and 1 livestock unit/ha (with pigs and poultry not making out more than 50% of all livestock units).

**A relatively liberal trade regime.** The Czech Republic has a relatively liberal trading regime, governed by a number of multilateral and bilateral agreements. Border measures are, to a large extent, conditions imposed by the Czech Republic’s WTO commitments. Most Czech tariffs are considerably lower than the EU ad valorem equivalents, with the exception of poultry, potatoes, and oilseeds, which enjoy higher protection, and also pork, which has a similar level of protection. On the export side, the Czech Republic is allowed to subsidize a limited range of products. The actual export subsidies in 1995-97 remained well below the value and quantity ceilings. The indirect export subsidies, introduced in 1997 through the SGFFF, might be breaching the Czech Republic’s WTO commitments, in particular, for sugar, and possibly for vegetable oils and fats. Automatic export and import licensing is applied mainly for registration purposes. Non-automatic export licensing is occasionally applied when world prices are significantly higher than domestic prices (e.g., cereals in 1995/96 when nearly no export licenses were issued).

The EU and CEFTA provide preferential markets for Czech agricultural products, at the same time the domestic Czech market has to cope with increased competition from these countries. In general, Czech agriculture has benefited from these agreements, and the current liberal trading environment with these two groups of countries is a good measure of how Czech agriculture might compete in an enlarged EU. Recently, the increased agricultural trade deficit and overproduction in some areas, resulted in some trade policy measures which are not fully conforming with the existing EU and CEFTA trade agreements.

**Incomplete Transition in the Farming Sector**

The process of reform has been difficult and painful for many enterprises. In 1990, the country had no other alternative than to move to a market-based, privatized, agricultural sector if it wanted to compete in international markets. Due to the specific process used to privatize state assets, and the relative stability of the overall economy, on a regional comparison, however, the first years of transition in the Czech Republic brought less disruption in farming sector than occurred in many neighboring countries. These factors created a relatively favorable
environment for reforms in the agricultural sector and, at the same time, the pressure for radical
transformation of inherited farming structures and other change was reduced. At the end of
1997, about 25% of agricultural land was in the hands of individual farmers, 35% was farmed by
commercial companies, and 39% was still farmed by cooperatives. Czech farms not only differ
in terms of legal status from the traditional EU family-based structure, but they are of a much
larger size, with about 90% of the farms cultivating more than 100 ha (about 40% in the EU). In
addition, about 89% of the land they cultivate is not owned by the farm itself (60% in the
average EU). This specific feature of the Czech farming sector has various implications in terms
of land market and, financially, by the constraints it creates to mortgage lending. It appears that
this farming structure is still not final, and requires further consolidation and restructuring.

The major features of the current farming structure include:

- **Dominance of larger-sized farms.** The average size of farms, using about 75% of agricultural
  land, is around 1,000 ha. The average size of farms larger than three hectares, is over 100 ha;

- **Leasing of land is a major form of tenure.** Incorporated and collective farms use leased land
  almost exclusively. Larger individual farms also lease a significant amount of land. Most
  leases are only short to medium-term in length, inhibiting longer-term investment;

- **Low profitability of farming.** The economic results of farms are showing signs of continued
  low profitability for most agricultural producing enterprises. Economic results are rather
  unfavorable in the cooperative farming sector, which as a whole, operated with significant
  losses for the second consecutive year (1996-97). The economic results of agricultural
  companies also became negative in 1997. In contrast to larger farms, smaller individual
  farms significantly increased their profitability in recent years;

- **Significant indebtedness.** The large-scale farming sector, especially the cooperative farms,
  carry a relatively large debt overhang, estimated at around 50 billion CZK (nearly 1.7 billion
  ECU). The bulk of the collective farm debt (approximately 12 billion CZK) is due to the
  owners of the assets that were left with the cooperative farms by former cooperative
  members who left the farm (transformation shares). This debt is supposed to be settled in
  1999, and represents 20% of the value of the property of the farms concerned. The
  incorporated farms owe the government for non-land privatized property approximately 19
  billion CZK. Farms established in the framework of restitution still owe the government
  about 7 billion CZK, which was provided in the early 1990s. The high indebtedness is a
  rather specific feature of farming in the Czech Republic, compared to many other Central
  European countries where pre-reform debts were settled during the transformation process
  and strictly enforced bankruptcy laws prevented the accumulation of new debt; and

- **Barely restructured collective farms.** Most of the collective farms, which use about 38% of
  the agricultural land, apart from the change in formal ownership relations (of land and assets)
  still operate in the "old-fashioned" way – with limited profitability and increasing financial
difficulties. The majority of collective farms, in general, show a conservative and reluctant
attitude to further restructuring, and are, to a large extent, still run as they were during the
pre-transition period, with limited motivation on the part of the members.
The Unfinished Agenda for Sectoral Reforms: Critical Issues for EU Accession

After a relatively successful launch of economic and sectoral reforms, some negative trends began to surface in 1995. Amidst the worsening macro-economic framework, the importance of completion of the remaining tasks of transition, such as financial consolidation of the farms, privatization of remaining state-owned land, improvement of competitiveness, and developing a market conforming institutional framework, has become more apparent. It is essential that the policy response to the demands of the agricultural sector for more support and attention to rural social problems, take an appropriate form and not one that creates new sources of inefficiencies and further disharmonization with the requirements of EU accession. The current changes in international agricultural markets, the financial difficulties of completing the adjustment of the collective farming sector, as well as the increased social tensions in rural areas seem to lead to increased intervention and protection on the basis of the current set of instruments. This would be a wrong and artificial response to real problems. The intended financial protection would provide a misleading safeguard for an agricultural structure which still needs an overhaul and improvement in competitiveness before EU accession takes place.

Refocusing the Agricultural Policy Framework: Harmonization with the CAP

Up until recently, the completion of the transition to a market consistent agricultural policy environment has been in the focus of government attention, together with the provision of a certain safeguard of farming incomes. In recent years, different forms of market interventions were tried and the harmonization with the CAP has become an additional, but still not major, objective. In general, for the medium-term, the agricultural policy framework and support system needs to focus on the following objectives:

- A more effective use of budgetary support to agriculture requires the revision of support programs to focus on efficiency enhancement rather than price and export subsidies.
- The various instruments of government intervention in the sector, especially the various support programs, need to be integrated into a more consistent, and predictable framework.
- Changes in the Czech agricultural policy framework need to take into account the evolving nature of the instruments and requirements of the CAP as a “moving target.”
- The full adjustment of support to EU levels should be postponed until the time of actual accession.
- Measures to reduce social tensions and provide social protection in the rural areas need to be separated from the major instruments of agricultural policy aimed at improving efficiency and competitiveness.

The current agricultural support system definitely conforms with the principles of a market-based agriculture. However, it does not fully correspond with the level of support and instruments of the CAP. Although there is pressure for immediate increases in support and protection on the farmer’s side, and to converge at EU levels before accession, the level of support and border measures should remain at the current level in order to maintain pressure to
complete reforms, and remain within budgetary constraints and WTO commitments. The level of support should, accordingly, be aligned only after the accession. At the same time, efforts should be concentrated on the adaptation of the same policy instruments as in the EU, but not yet necessarily applying them, or applying them at the same level. Agenda 2000 proposals for the reform of the EU’s CAP should be used as a benchmark in this work. In particular, the following adjustment would need to be considered:

- The SFMR system needs to be adjusted into a transparent CAP-conforming framework incorporating the potential use of quotas in the case of some products, and changes the current intervention which is based on an *ex-ante* system (the intervention is based on short-term forecasts on production and consumption) to an *ex-post* CAP type intervention mechanism when market intervention decisions by private sector are based on the observed evolution of EU market prices. In addition, to be consistent with the principles of the CAP, price support would need to be transferred to the wholesale level instead of the farmgate for most products;

- The current credit guarantee scheme needs to be fully de-linked from government and credit subsidies need to be discontinued in their present format. Credit subsidies might temporarily be replaced by investment grants for a transitory period to improve competitiveness, from national budgetary sources (or financed by the EU, if possible);

- The direct payments and other current structural support measures have to be adapted to the EU format, while new ones, such as an agro-environmental program will have to be introduced. The generalized area payment scheme outside of the less-favored areas could be adapted and fitted into the national envelopes proposed for the dairy and beef sectors under the Agenda 2000;

- A more integrated regional and rural policy and related support programs have to be developed to be able to utilize the EU’s structural fund instruments; and

- The taxation system and the provided tax concessions need to be harmonized with the EU practices and requirements.

**Need For An Integrated Rural Development Approach**

The balanced development of rural areas, as well as preparing for the full utilization of the emerging instruments of the evolving CAP, both require a complex and comprehensive approach which integrates agriculture into an overall rural development framework. Such an approach should include a set of specific measures to support:

- Emergence of competitive agriculture;

- Further development of the rural service sector and related industries to provide off-farm rural employment and additional demand for agricultural and other products;
• Improvement of rural infrastructure, including education and social services; and

• Development of an appropriate social policy to properly address specific social problems affecting rural populations;

Rural development, in particular in less-favored regions of the Czech Republic (mainly mountains) faces several challenges:

• A decentralized approach. In a country of relatively small dimensions and with a strong historical background in terms of central planning, the challenge here is to ascertain that the rural development program is conceived, developed, implemented and, in part, financed by local rural institutions —“the bottom-up approach.” In other words, rural development needs to be driven by local demand as expressed by the ultimate stakeholders in rural development, the rural communities, and their inhabitants;

• A multi-sectoral approach. The various and often complementary aspects of rural development imply the collaboration between various line Ministries (transport and infrastructure, health, education, environment, agriculture, etc.) to assess whether the decentralized programs would fit with the national policies and EU rules and regulations;

• The financial engineering of mostly small to medium-size projects. The challenge here is to ensure the active participation of various financing institutions (Czech and foreign) to mobilize various sources of funds available to the country. These sources vary significantly depending on the type of project the local communities have prepared;

• Fair prioritization for financing based on technical criteria to reduce the risk of preferential treatment given to certain communities rather than others on the basis of political favoritism. A strong technical analysis of priorities by local/regional policy-makers which would screened by central government on the basis of simple technical criteria (e.g., unemployment, level of education in the region, private sector projects waiting for public infrastructure, etc.); and

• Collaboration with private sector (enterprises, NGOs, etc.). This collaboration constitutes a challenge for public sector agencies like municipalities and villages although it also strengthens the sense of ownership in the region and facilitates implementation.

Another important objective of a program for rural development in the Czech Republic would be to support the government’s efforts toward EU accession. By linking with the EU pre-accession (and accession) initiatives for rural development, environment, employment and agriculture, rural development program should also enable the government to use available resources (credits, grants, human capital) with maximum efficiency. In keeping with recent trends in the EU member countries, such a program would need to assist The Czech Republic in making the fundamental shift from purely agricultural to mixed use of the countryside, reflecting new attitudes and needs of rural, urban and suburban communities. One of the important features to be incorporated in the program would be the special focus on less-favored regions.
Consolidation of the Farming Sector

While the initial issues of land privatization and restitution have been largely resolved, and the new farming organizations are consistent with the principles of a market economy, the consolidation of ownership and settlement of outstanding financial issues has yet to be achieved. This must be done in order to create a viable farming structure under EU conditions. The critical areas for action are:

- Further transformation of collective farms. There are many indications that cooperative farms in their current state would hardly be able to cope with the increased competitive pressure of the EU environment. Their methods of operation and management, and handling of current resources need to be further adjusted to the principles of market economy. A small number of cooperative farms have already entered the so-called “second transformation” which has often resulted in joint-stock companies or limited liability companies. This process involves the restructuring of ownership, management, and labor force, and often the splitting of activities and diversifying into downstream activities as well. The “second transformation” results in more viable and profit motivated operations. Often, however, this leaves empty, skeleton cooperatives behind with most of the debt, and the transparency of such transformations is also often questionable. It is also important that the further transformation of collective farms take place with adequate attention to the social consequences of the reduction in the labor force and streamlining of production;

- Settlement of farm debts. The huge debt overhang is a significant constraint on further consolidation of farming and would be an handicap inside the EU. The so-called “transformation shares” represent a special case. It is obvious that the majority of collective farms are not able to settle this debt. Owners of these shares press for quick and full settlement, while the collective farms would prefer to have a settlement which involves long-term payment duration based on special bonds issued by the cooperatives to the owners of the transformation shares. The speedy resolution of this issue remains critical to the further consolidation and restructuring of collective farms;

- Sale of remaining state owned land: the large amount of state-owned land waiting for privatization is an impediment to the emerging land market, as well as for the recapitalization of the sector. There is a draft law currently before parliament, which would initiate the privatization of most of the state-owned land, providing preferences to current users. The individual farming sector, however, would prefer to restrict the right of purchase of state owned land only to physical persons, in order to enhance the further development of the individual private farming sector. Since legally incorporated farms are genuinely privately owned, it is hard to find other justification for preferences toward individual farmers other than to boost the development of individual private farms which represent the most efficient part of the Czech agriculture sector; and

- Access to foreign investors of agricultural land. In principle, membership in the EU would require that agricultural land markets be opened to competitive forces from anywhere within the Union. Right now foreign ownership of agricultural land is not allowed in the Czech Republic and foreign agricultural land ownership is a rather sensitive issue, similar to other EU accession countries.
**Strengthening of Factor Markets**

Well functioning factor markets would constitute the basis for a good market-based structural adjustment of Czech agriculture. This would imply less distortive interventions from the state or from outdated laws, and the development of modern instruments of exchange of land, labor, finance, and an element often forgotten in economies in transition: risks. At a time when Czech agriculture is faced with new challenges resulting from the accession to the EU, factors markets clearly constitute a significant constraint to be addressed by the Czech Republic to ensure reasonable chances to adjust to the new challenges with the proper instruments. It would be appropriate to:

- review the main legal reasons that prevent land market and mortgage lending based on agricultural land, from functioning;

- adjust and, if needed, create or improve the private and state institutions that can ensure a well functioning land market;

- review and adjust as needed the legal foundations of the warehouse receipts system, ensure that the private sector can operate properly under these laws, and assess the effectiveness of the performance guarantee given by the warehouses to deliver the product to their owner;

- reverse the recent tendency to promote credit guarantees and subsidies by SGFFF to cooperatives, a financially less-performing category in the farming sector;

- nominate financial auditors (Czech and foreign) to review the evolution of the risks taken by the state through its activities in SGFFF, and assess whether and how this interest rate subsidy and guarantee by state would be acceptable at the time of accession to the EU; and

- regarding labor transfers from agriculture, assess the social impact of the economic reforms in the rural areas on poverty, migration to urban areas, and social services in less-favored rural regions and develop, accordingly, a program for facilitating the development of off-farm employment in rural regions. Such a program would need to be prepared in close coordination with foreign donors and, in particular, with the European Commission as part of its support programs to the Czech Republic.

**Improvement of Wholesale Marketing Institutions**

The review of the main agricultural services reflects a quite advanced system of private and state services. The network of private suppliers to mechanical equipment, fertilizers and pesticides, seeds is reportedly well-developed and its main constraints in terms of actual access to such inputs remains access to working capital, albeit in the form of various support schemes developed by SGFFF. In some sub-sectors, significant financing is provided by non-financial institutions, the warehouses and trading enterprises - in particular those of the former state monopoly. This pre-financing is quite an elaborate system in which the State Fund for Market Regulation (SFMR) plays a significant role. This partial pre-financing of the crop is provided at no financial cost to participating farmers unless these farmers fail to deliver at harvest the
quantities contracted under the SFMR scheme. The SFMR operates through the local warehouses - mostly those from the previous state monopoly - and this creates an elaborate cross-support to participating intermediaries and farmers.

The network of wholesale agriculture marketing enterprises remains weak in several sub-sectors of agriculture. This poor development of competitive agricultural markets at the wholesale level creates a significant impediment in terms of installation of the institutions of the CAP in the Czech Republic.

With regard to agriculture services, the following actions are recommended:

- A review of the legal framework of cooperatives to assess the impediment it creates in the formation of marketing and processing cooperatives and to their effective management. In this regard, the analysis of the cooperative laws should be performed from the viewpoint of the agency theory;

- for fresh produce and livestock, the strengthening of a network of private regional exchanges with or without the support of local municipality, should be undertaken. Their role in terms of facilitating price information and development of a competitive market intermediation should be developed. Such commodity exchanges could become elements of the information network that the CAP needs for products in the livestock, fruit and vegetable sub-sectors;

- a review of the level of competition at the sub-sectoral level and the implications of the market support policy on competition would be important to launch, with the ultimate goal of alleviating this major constraint observed on the future development of agriculture;

- the development of an analysis of price related risks taken by entrepreneurs in the agricultural and food marketing chain, their costs, and the transfer to private sector from the SFMR of the management of such risks; and

- the launching of training programs on agricultural marketing and price/risk management in agriculture.

**Accelerated Technical and Technological Development of Agroprocessing**

The food industry is well diversified with no evident major sub-sector emerging as a leading outlet to agriculture. Considering the geo-climatic characteristics of the country, it would seem that the fruit and vegetables processing and dairy sub-sectors are less-developed than what one would expect. Small-scale food processing appears relatively under-developed in terms of absolute numbers and contribution to the economy. Foreign direct investment (FDI) in food processing remains mainly limited to a few large enterprises. FDI is not playing a significant role in the transformation of the agri-food sector by bringing new technology, new savoir-faire and substantial capital (including working capital) as part of the privatization process. The general problem that emerged in the Czech Republic in 1997 regarding the ownership by the banking sector (directly or via investment funds) of enterprises might also be
observed in the food industry. The so-called "passive shareholder" syndrome and the informal or formal coordination of enterprise strategies at the sub-sector level could affect also the food industry. The restructuring of the industry in sub-sectors like dairy or meat processing has not, as a result, been accelerated. Most of the agroprocessing in its current form, would likely have limited competitiveness under EU conditions. The accelerated development of this subsector is an essential precondition to coping with the challenge of EU accession.

Establishment of New Standards for Agricultural and Food Products

At each stage in the agricultural and food marketing chain, farmers and entrepreneurs have the important responsibility of ascertaining the quality of the products delivered to their clients, in particular, in relation to potential health hazards, environmental impacts, and other services attached to the product. The Government of the Czech Republic is fully aware of the pending problems of harmonization with the EU system, of the legislation on these matters and of its enforcement. Among the decisions that have not benefited from a similar level of attention, one could list the transfer to the private sector of a rather large number of tasks currently undertaken by numerous state agencies, and a parallel reduction in the number and a substantial reassignment of the roles of implementing state agencies on standards, quality control, health safety. This new approach would exercise a significant change in the incentives given to food processing enterprises while adjusting to this new set of responsibilities transferred to them. While a great effort appears to have been made, in particular by the concerned departments of the MoA in adjusting the whole set of legislation concerning food quality, standards, etc., it appears that the enterprises themselves have not benefited from the information, training and assistance to adjust to this new concept of quality management. One would recommend the following program of actions:

- A program of public information - awareness and data banks in real time open to scientists and lawyers, and in coordination with private trade association (see below). In addition, information to the rural population about the EU would need to be developed and/or strengthened;

- A program of collaboration between the private sector and state agencies, including the outsourcing of some of the activities of the public sector that could be easily implemented either by the private sector or in collaboration with foreign state agencies;

- The completion of the restructuring of state agencies involved in consumer protection, animal and plant protection, agricultural research and extension, border control, farm registration, market information, market organization by sub-sector, and market intervention;

- A review and adjustment of the salaries and benefits paid to civil servants in agriculture so that they can remain competitive with private sector;

- A detailed training program for existing staff in the various specialties concerned and an exchange program of staff between Czech and EU institutions. This training program should
not only be done for civil servants but should be designed, in collaboration with the concerned trade associations, to address the needs of private sector in the various sub-sectors;

- A program of recruitment and adjustment of skills by the restructured state agencies (in particular in areas where the acquis communautaire imposes new types of activities on the country); and

- An investment program to strengthen technology related to quality control and new food processing techniques incorporating technologies related to quality enhancement and environmental protection. The program could have two major components that would have to be consistent with each other: one for the financing of private sector (e.g., five-year loans for priority actions for the implementation of the new legal framework); and one for the financing of the restructured state agencies (see above) in office technology, information networks, laboratory building and equipment, etc.

**Strengthening Private Sector Representation in the Sub-Sectors of the Agriculture and Food Economy**

Finally, the representation of private interests for each profession in the various agricultural and food subsectors constitutes an important missing element. This is a strikingly common feature in Eastern and Central European Countries, with the exception of Hungary, where such representation is highly developed in a large majority of agri-food sub-sectors. In the EU, such representation is a crucial element of the implementation of the CAP. It contributes to a better understanding of private interests by the European Commission and the governments in the EU, and of government policies by the concerned private sector. In addition, many decisions related to trade, research, and technology, market information, training could be taken in common by operators belonging to the same profession or to the same marketing chain (the so-called inter-professional associations, or, in Hungary, the "product councils"). The development of such organizations should be promoted and facilitated. Technical cooperation with similar foreign organizations could be explored to develop a good understanding of the role of such organizations. When created, they should be sufficiently scrutinized in the light of the competition laws to avoid possible sub-sectoral collusions. Among the services of general interest to be offered and performed along the various sub-sectoral marketing chains - services currently mostly lacking to agriculture and agro-industries - one can list the following elements: a) consultation with state agencies intervening in the sub-sector; b) analysis and information on markets and regulations (domestic and foreign); c) organization of technical and commercial training programs; d) contracting for research on issues of common interest with domestic or foreign institutions; e) organization of first instance arbitration of trade conflicts; and f) development of facilitating procedures and instruments for the exchange of products.
1. AGRICULTURE AND FOOD IN THE ECONOMY

AND SECTORAL PERFORMANCE

The Czech Republic was one of the most industrialized countries in Central Europe prior to the second World War. Agriculture played only a marginal role in the Czech economy, largely as a result of the limited natural resources available for agricultural production. Based on family farming, Czech agriculture was solidly grounded in private ownership and private enterprise. In the 1930's Czech agriculture was well developed, with yields and livestock productivity comparable to that in Western European countries, though, on the whole, the country was a net importer of agricultural products.

During the decades of socialism, Czech agriculture was collectivized and managed under the principles of central planning. Although the yields and productivity in Czech agriculture continued to remain higher than the levels of other socialist countries, the country's agriculture fell behind the advances of Western countries. This disparity increased throughout the socialist period. The sectoral legacy, however, is mixed. Czech agriculture suffered under the well known short-comings of socialist agriculture. Quantity became the major production goal, while quality and efficiency played only a secondary role. The entire sector required an expensive system of subsidies to keep consumer prices low. Incentives to stimulate the improvement of technology and product development, as required in competitive market economies, were non-existent.

Contribution of Agriculture to the Economy

The share of agriculture in the economy contracted significantly, and without interruption, since 1989 until it was only 2.1% in 1997 (Figure 1.1). This reflects two opposite trends, namely: a) a nearly constant reduction in agricultural

Figure 1.1: Changes in the share of agriculture in GDP and in employment

Source: CSO
Food and Agriculture in the Czech Republic

production\(^2\); and, b) the recovery of the Gross Domestic Product (GDP) between 1994 and 1996 (Figure 1.2), after a sharp contraction in the first years of transition. With about an active population of 200,000 employed in agriculture, the share of employment in agriculture diminished by more than 50% (Figure 1.1) down to 4% in 1997. This reduction is in part due to an artificial statistical adjustment resulting from the classification of numerous workers of the former state farms and cooperatives into the service industry.

While the agricultural area has been relatively stable, agricultural production has experienced two parallel trends: a) a quite drastic reduction, year after year (Figures 1.2 and 1.3); and b) a slow switch from animal production to crop production (Figure 1.4). These changes reflect, in part, the structural changes that the agricultural economy has been through. However, their continuation to date also indicates that these changes have been slow and that primary agricultural production has not benefited, as in several neighboring countries of Central Europe, from new and more efficient, market-oriented structures. The so-called "velvet revolution" in the political arena appears to have led to a soft reform policy in agriculture that one could qualify as the "velvet transition" of agriculture. But the downside of this policy is that the impact of the reforms, while milder on the

\(^2\) The agricultural production has always decreased from the previous year, with the exception of 1995 (+4.3%)
agricultural sector, appears to having been stretched over a longer period and, under the current difficult international market conditions, has not left a breathing space in the continuous decline of Czech agriculture. With the exception of technical crops, which benefited from a specific policy in favor of the development of an industrial use of the agricultural raw material, all the crops and animal production fell drastically over the past eight years (Figure 1.5).

Simultaneously, the active population in agriculture decreased by nearly 60% over the past eight years. This fast reduction resulted in a slow improvement in labor productivity in agriculture. At world prices, labor productivity in the Czech Republic (Figure 1.6) is more than two thirds of the EU (15), nearly 60% higher than Austria but about 15% lower than in Germany (1996). The recovery followed by steady growth in the rest of the economy facilitated this transfer of labor from agriculture to other sectors while the total unemployment rate remained stable between 3% and 3.5%. The tensions in the overall economy of 1997 however, resulted in a sudden increase of the unemployment rate in the Czech Republic to 5.2%.

Figure 1.4: Changes in the composition of total agricultural production: 1989-97

Figure 1.5: Total change in agricultural production between 1989 and 1997 (percent of 1989)
Primary Agriculture

Agricultural production in Socialist Czechoslovakia until 1989 was, from a quantitative point of view, able to achieve self-sufficiency up to about 98% (93% in crops and 100% in livestock production). Yields and production of almost all major crop and animal categories increased for about three decades. The level of education of managerial and technical staff in the cooperative and state farms was high. Services and input supply were satisfactory, though biological, chemical, as well as mechanical technology lacked behind the advanced western neighbors.

As everywhere else in the former socialist countries undergoing transformation, purely from the production point of view, the process disrupted the large degree of specialization and interdependence within the large farms, and also the long established upstream and downstream procurement and market relations. Nevertheless, agricultural land decreased in the period of 1989-97 by 0.4%, while arable land area decreased by 4.4%. This, however, does not necessarily constitute a bad thing since, under the socialist era, many marginal areas were forced into annual cultivation. In parallel, meadows and pastures increased by 11.5%. Uncultivated agricultural land has been continuously increasing and reached an estimated 100,000 ha in 1997. The very high share of 75.2% of arable land in 1989 decreased to 72.2% of agricultural land in 1997. This is still rather high. It would be between 50%-60% in comparable EU countries.

The cropping structure changed considerably between 1989-97. The share of cereals increased by about 10% (to almost 56% of arable land), mainly due to higher bread wheat and barley areas, while rye and oats cultivation decreased. The sugar beet area was reduced by 26%, potatoes by more than 36%, and the flax area decreased by over 90%. On the other hand, the rapeseed area increased 2.5 times, in response to consumer demand and to policy-induced non-food industrial demand.

The development of yields was mostly unfavorable. A comparison of three year means, 1988-90 and 1995-97, shows a decrease of the yields of essential cereals such as wheat (from 5.2 down to 4.6 t/ha), barley (from 4.9 to 3.8), rye (from 4.2 to 3.3), and oats (from 3.8 to 3.2). Nevertheless, wheat yields in the Czech Republic compare well with the Hungarian achievements, and it is likely that the Common Agricultural Policy (CAP) continues to give some incentives to produce soft wheat rather than hard wheat in the EU, and this is reflected in
the higher yields displayed by the EU statistics (Figure 1.7). Oilseeds went down from 2.7 to 2.2 t/ha, hay on permanent meadows from 5.0 to 3.7 t/ha, and, to a lesser degree, grain legumes and potato yields also declined. A positive trend in terms of yields per ha was experienced in the cultivation of sugar beets, mostly through elimination of cultivation from marginal areas and better technology, and of grain maize as well. Among the reasons for this mostly general decline in yields one can list the impact of market prices for agricultural inputs and output and the increased need for working capital. The use of fertilizers declined drastically, pesticides use is much reduced, and the excellent biological, chemical and mechanical technology available on the market is used only by the economically more successful and mostly restructured farm enterprises.

Livestock numbers also registered a substantial decline between 1990 and 98. The cattle herd decreased by more than half, of which dairy cows by almost a half. Sheep numbers dropped by almost 80%. Only pigs decreased less, by 17%, while the number of sows remained stable. On average, Czech farms remain with a much larger number of animals per farm than the average EU farm in this field of production (Figure 1.8). The intensity of animal husbandry, expressed in numbers of animals per 100 ha agricultural land declined in proportion with the decrease in numbers. It is substantially lower than in the EU countries. The decrease in animal numbers was partially compensated by productivity. The milk yield per cow, for instance, increased by almost 10%. However, the mean yield in the EU-15 is still about 30% higher. Egg production went up from 252 to 284 per layer/year. However, other qualitative parameters have worsened. In

Figure 1.7: Wheat yields in the Czech Republic, Hungary and the EU (15) (in quintals/ha)

<table>
<thead>
<tr>
<th>Year</th>
<th>EU15</th>
<th>Hungary</th>
<th>Czech Rep</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>60</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>1994</td>
<td>55</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>1995</td>
<td>50</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>1996</td>
<td>45</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>1997</td>
<td>40</td>
<td>25</td>
<td>10</td>
</tr>
</tbody>
</table>

Sources: EUROSTAT, RIAE, MoA Hungary

Figure 1.8: Number of animals per average farm operating in cattle and pigs production

<table>
<thead>
<tr>
<th></th>
<th>Cattle</th>
<th>Pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Rep.</td>
<td>109</td>
<td>249</td>
</tr>
<tr>
<td>EU-15</td>
<td>45</td>
<td>95</td>
</tr>
<tr>
<td>Denmark</td>
<td>69</td>
<td>518</td>
</tr>
<tr>
<td>Germany</td>
<td>55</td>
<td>118</td>
</tr>
<tr>
<td>Austria</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Great Britain</td>
<td>87</td>
<td>593</td>
</tr>
</tbody>
</table>

Source: RIAE
particular, the fertility rate per 100 cows decreased from 102 in 1989 to 89 in 1997, and the mortality rate of calves went from 4.8% up to 10.1%.

There is still a sizable yield gap between Czech agriculture and advanced western countries. For instance, the three year mean wheat yield in 1995-97 in Germany was 50% higher than in the Czech Republic (62.9 q/ha against 42.0 q/ha). Similarly, in the same three year period the average annual milk yield in the Czech Republic was 4,470 liters/cow, while it was 5,488 liters (23% higher) in Germany and 6,485 liters (45% higher) in Denmark. Yet, averages do not give a full-Enough picture of the achievements of Czech agriculture. A number of farms have developed yields similar to their western neighbors: e.g., 5.5 to more than 6 tons/ha for wheat, and more than 6,000 liters/cow. On the other hand, this means of course, that at the lower end of Czech agriculture, wheat yields are still hovering around 25-30 q/ha, and milk yields around 2,500-3,000 liters/cow. Under the current circumstances, with reduced livestock numbers, a stable purchasing power of the population, and smaller demand from world markets, the impact of these relatively poor technical achievements appears small. Though one might argue that there is still a 30%-50% gap in Czech agricultural productivity with the EU, the issue arises if under the prevailing market conditions it is worthwhile to develop new non-market incentives to strive for higher production.

Food Industry

The food industry is well diversified, with no evident major sub-sector emerging as a leading outlet to agriculture (Figure 1.9). Considering the geo-climatic characteristics of the country, it would seem that the fruit and vegetables processing and dairy sub-sectors are less-developed than what one would expect. Small-scale food processing appears relatively under-developed in terms of absolute number and contribution to the economy, as well as in terms of production technologies and quality.

As a result of privatization, the number of food processing enterprises jumped from 69 large state-owned companies in 1989 to many hundreds of private companies currently operating. After the break-up of state owned conglomerates, the re-establishment of market-based links in the food chain has been relatively slow. Although ownership has changed, many enterprises are still struggling with over-capacity and unable to implement required technical and technological improvements.
Foreign trade

The foreign trade balance in agriculture has deteriorated between 1993 and 1997 (Figure 1.10). Agriculture has contributed to the overall deterioration of the total trade balance of the country. The European Union (EU) is the main trading partner of the Czech Republic, taking about 35% of the Czech agricultural and food exports, and accounting for 50% of the imports. The share of agriculture and food products in total exports has decreased by more than 50%, down to 5.4% in 1997, while the share in total imports was decreasing by about 25%, down to 6.9% in 1997. The second client of Czech agriculture is the CEFTA countries and the Commonwealth of Independent States (CIS). CEFTA countries constitute the second largest client for Czech exporters of agricultural and food products (about 33% of such exports). Prior to the 1998 crisis, countries from the former Soviet Union represented a growing clientèle. After the EU, the Czech economy is supplied with agricultural and food products from developing countries (tropical fruits, feed products), followed by CEFTA countries. Its land-locked position and the relatively poor product differentiation developed by the food industry has limited the ability of the Czech Republic to export to countries other than those in its immediate neighborhood. The overall trade balance in agricultural and food products is positive with CEFTA and NIS countries (Figure 1.11): a quite difficult position for the coming times with the recent financial crisis in the Russian Federation.

Figure 1.10: Balance of agriculture and food trade (Mio. USS): 1993-97

![Graph showing balance of agriculture and food trade (1993-1997)]

Source: CSO

Figure 1.11: Agricultural and food trade balance by regions: 1993-97

![Graph showing agricultural and food trade balance by regions (1993-1997)]

Source: CSO
Food Consumption

The share of consumer expenditures going to food and beverages has slightly decreased over the past years down to a little less than 28% (Table 1.1). This comes as a result of: a) a rather drastic adjustment of the basket of foods purchased by Czech households, and; b) a consistently lower increase of food prices (Figure 1.12), than the overall consumer price index (CPI). The surveys of households expenditures show an overall reduction in terms of quantities of per capita food consumption (Figure 1.13). In only a handful number of categories of foods, consumption has quantitatively increased. They include mainly poultry, vegetables, pulses and tropical fruits. The categories of foods with the largest reduction in per capita consumption are: beef and pork, eggs, potatoes, sugar and cereals, and local fruits. Agriculture has not benefited from the full transfer of food price increases. Changes in farmgate prices remain consistently smaller than those for the food industry. Agriculture and food prices have less contributed to inflation than non-food consumer products and services.

Table 1.1: Changes in share of food and beverages expenditures in total consumer expenditures: 1989-97

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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods, bev. and tobacco</td>
<td>32.9</td>
<td>31.7</td>
<td>34.0</td>
<td>32.8</td>
<td>32.1</td>
<td>32.0</td>
<td>31.2</td>
<td>30.5</td>
<td>29.2</td>
</tr>
<tr>
<td>of which - foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- beverages</td>
<td>26.9</td>
<td>26.0</td>
<td>28.1</td>
<td>27.0</td>
<td>26.3</td>
<td>26.2</td>
<td>25.6</td>
<td>25.0</td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td>4.6</td>
<td>4.3</td>
<td>4.3</td>
<td>4.3</td>
<td>4.1</td>
<td>4.1</td>
<td>4.0</td>
<td>4.0</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Source: CSO (*) estimates
Figure 1.13: Change in per capita food consumption: 1989-97

Nb. of kg. or pieces consumed per capita in 1997
and change since 1989

Source: CSO
2. Agriculture and Food Policy Framework

Sectoral Reforms in Aggregate: Process and Perspectives

During the first years of transition, the agricultural policy of the Czech Republic has focused on the implementation of a rather ambitious reform program to transform the food and agriculture sector. The most important measures generally fall into three categories:

(a) creation of a macro-framework and incentive system for producers, processors, and traders consistent with the requirements of a market-based food and agriculture system;

(b) privatization of the major means of production, both in primary agricultural production and in agro-processing and input supply; and

(c) changes in institutions and regulations to enhance the functioning markets.

The process of reform has been difficult and painful for many enterprises. In 1990, the country had no other alternative than to move to a market-based, privatized, agricultural sector if it wanted to compete in international markets. The shift from large-scale socialized farming to private farming -- in particular family farming -- is a process, not only of building, but also dismantling. The loss of part of the stock of fixed assets, and other setbacks, are unavoidable consequences of such processes. Due to the specific process used to privatize state assets, and the relative stability of the overall economy, on a regional comparison, however, the first years of transition in the Czech Republic brought less disruption than occurred in many neighboring countries. These factors created a relatively favorable environment for reforms in the agricultural sector and, at the same time, the pressure for radical transformation and change was reduced. As a result, though the country has completed most of the major tasks of creating a functioning market economy based on private ownership, much remains to be done to finalize transition and, in particular, to cope with the challenge of preparing the sector for successful integration into the EU.

In the transition period, the development of agricultural policies has gone through several phases. During the first half of the 1990s, domestic markets were liberalized and the level of support and protection declined significantly. This change is reflected in the producer subsidy equivalent (PSE) of 14% in 1996. Since 1997, the Czech agricultural policy and the Czech economy in general began a new phase. After a relatively successful launch of economic and sectoral reforms, some negative trends began to surface in 1995. Amidst the worsening macro-economic framework, the importance of completion of the remaining tasks of transition, such as financial consolidation of the farms, privatization of remaining state-owned land, improvement of competitiveness, and developing a market conforming institutional framework, has become more apparent. There are additional concerns that need to be addressed, such as the social
problems associated with the transition, and the eventual EU membership. These new challenges to agricultural policies require an adequate response.

It is essential that the policy response to the demands of the agricultural sector for more support and attention to rural social problems, take an appropriate form and not one that creates new sources of inefficiencies and further disharmonization with the requirements of EU accession. The current changes in international agricultural markets, the financial difficulties of completing the adjustment of the collective farming sector, as well as the increased social tensions in rural areas seem to lead to increased intervention and protection on the basis of the current set of instruments. This would be a wrong, artificial, response to real problems. The intended financial protection would provide a misleading safeguard for an agricultural structure which still needs an overhaul and improvement in competitiveness before EU accession takes place. Therefore, the agricultural policy framework and support system would need to focus on the following objectives:

- A more effective use of budgetary support to agriculture requires the revision of support programs to focus on efficiency enhancement rather than price and export subsidies.
- The various instruments of government intervention in the sector, especially the various support programs, need to be integrated into a more consistent, and predictable framework.
- Changes in the Czech agricultural policy framework need to take into account the evolving nature of the instruments and requirements of the CAP as a “moving target.”
- The full adjustment of support to EU levels should be postponed until the time of actual accession.
- Measures to reduce social tensions and provide social protection in the rural areas need to be separated from the major instruments of agricultural policy aimed at improving efficiency and competitiveness.

Macro Environment – The Agricultural Policy Framework

As a result of overall macro-economic reforms, the agricultural sector now operates in a macro-economic and trade environment with direct links to world markets. Current support programs, especially in their present form, however, represent some distortions. It is officially stated by the Ministry of Agriculture that the agricultural policy framework is gradually evolving toward CAP-type instruments. In reality, however, the agricultural policy instruments used in the Czech republic, as of late 1998, are far from conforming to the CAP. They would need significant further adjustment to fully conform with current EU practices.

Prices

As in many other countries in Central and Eastern Europe, agriculture in the Czech Republic experienced a cost-price squeeze because input prices increased more sharply than output prices early in the transition process. Input prices quickly rose to international levels – more than doubling between 1990 and 1997. At the same time, prices paid to farmers remained
relatively flat, increasing less than 50% over the same period. This is sharply contrasted by the more than 2.5 fold increase in consumer prices during those years (Figure 2.1). Farmgate prices for practically all products are below those in the EU. Grain prices in 1997 were about 80% to 90% of EU levels, while the prices of livestock products, with the exception of pork and poultry, were more than 30% lower than comparable EU prices. Czech pork prices are close to what could be considered as “normal” EU prices, while poultry meat prices, are 70% to 80% of EU levels, which, more or less, reflects the differences in feed costs. In general, producer prices moved up in recent years, somewhat more for crop than animal products, but have not kept up with the general inflation in the Czech economy.Expressed in ECU, the domestic price rises have been, to some extent, mitigated by the depreciation of the Korona (CZK). The price gaps (at the farmgate level) with the EU have declined only modestly over time (Figures 2.2 and 2.3).
Agricultural Support System

The foundation of the current system of government intervention in agriculture was laid down in 1991-92. This framework was originally aimed at providing protection to farmers during the transition process and the period of price liberalization. The main instruments which have remained more or less unchanged since the early 1990s include:

- price support measures with "guaranteed" prices and export subsidies for the main commodities;

- financial support for the establishment of new private farms and for investments in the agro-food sector, in the form of direct subsidies, subsidized credits, and credit guarantees;

- direct payments or compensation to farmers in less favored areas, and areas with special features;

- support for socially desirable farming practices, such as the transfer of arable land into meadows and pastures and other production extending practices; and

- support for more general agricultural services such as research, animal and crop breeding, information dissemination, training, and extension services.

In the early years of transition, the level of support, although having declined from the pre-reform period, remained relatively high. By the mid-1990s, agricultural support and protection declined even further, although the objectives and basic instruments of the support system did not change. However, the Law on Agriculture, adopted in 1997, and other recent measures

<table>
<thead>
<tr>
<th>Table 2.1: Budget expenditures on agriculture and food</th>
</tr>
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<tbody>
<tr>
<td><strong>in million CZK</strong></td>
</tr>
<tr>
<td>Market (price) Support</td>
</tr>
<tr>
<td>Credit Subsidies</td>
</tr>
<tr>
<td>Direct Payments</td>
</tr>
<tr>
<td>Disaster Payments</td>
</tr>
<tr>
<td>General Services</td>
</tr>
<tr>
<td>Tax Concessions</td>
</tr>
<tr>
<td>Total (CZK)</td>
</tr>
</tbody>
</table>

Source: RIAE, OECD
indicate that an increase in the support and protection of agriculture have been brought by the new legislation together with other adjustments of the system. In 1998, the budgetary support to agriculture is expected to increase by 36% in nominal value. On the whole, however, the magnitude of budgetary expenditures related to agriculture, roughly equivalent to ECU 437 million, cannot be considered excessive in comparison with most of the developed market economies (see the overall support to producers provided by various countries, summarized by their respective PSEs in Figure 2.4). Table 2.1 provides an overview of government expenditures in agriculture and indicates the evolution of support programs, based on the information provided by the Research Institute of Agricultural Economics (RIAE). Annex Table 1 includes the official government budget information which corresponds to RIAE analysis, however with a somewhat different breakdown.

The current agricultural support framework includes four major components: market intervention, credit policy, direct payments (including disaster payments), and preferential taxation (Figure 2.5). From 1997 to 1998, not only has the magnitude of support increased, but the composition changed. In 1998, market support (36% of total agriculture budget), and direct payments (30%, including disaster payments) became the major means of government support for agriculture, while the share of credit related support decreased from 38% in 1997 to 29% in 1998. According to the analysis of RIAE, almost two-thirds of benefits from the agricultural support budget accrued to the farming sector in 1997, while processors only received 13% (Figure 2.6).
Market (price) Intervention

Direct market intervention is currently the major support instrument, which includes border measures as well as direct and indirect intervention in the market through the State Fund for Market Regulation (SFMR). The main objective of the SFMR is to provide market stabilization by limiting excessive price movements and, as such, it tends to act as a safety net for agricultural producers by supporting guaranteed minimum prices for agricultural products within the budget allocation for a given year. More specifically, the SFMR can take the following steps to regulate markets:

- selecting a list of products to be regulated in any specific year;
- setting a minimum price (guaranteed floor price) at which, given quantities of the specific product are to be purchased by the government;
- stipulating the time period during which specific product markets are to be regulated;
- set the level of export subsidies for the regulated products;
- influencing the licensing of exports and imports of food and agricultural products through proposals in this respect, to the relevant state administrative bodies.

In 1994-96, SFMR intervention was mainly limited to wheat and dairy products. In 1998, following the new market situation, a broader system of intervention was introduced which occasionally covered rye, starch, sugar, and beef. Interest rates subsidies were also introduced for the export of a broad range of agricultural commodities¹ (Table 2.2). As a result, the total magnitude of market intervention expenditures is expected to increase 2.3 times in 1998 when compared to 1997 levels. The target minimum price bread (wheat) was set in 1998 at 3,900 to 4,140 CZK per ton (Figure 2.7). Although actual

¹ these subsidies are provided by SGGFFF
results for 1998 are not available, it is expected that the effective government purchases will significantly increase in comparison to previous years. Expenditures of cereal market intervention will, most probably, be greatly increased, and domestic prices will be higher than those on world markets (Tables 2.3 and 2.4).

Credit subsidies and guarantees

Credit subsidies and guarantees represent the second largest component of support programs through the Support and Guarantee Fund for Farmers and Forestry (SGFFF), which was established in 1994 to improve the farm sector’s access to short- and longer-term credits. The initial capitalization of the fund was about 5 billion CZK, including the shares of food enterprises. The main function SGFFF is to provide guarantees for loans (at commercial interest rates) already agreed upon between a food and agricultural entrepreneur and a commercial bank. The maximum level of guarantee ranges from 50% to 80%. In specific cases it can be 100%. In addition, the SGFFF provides a subsidy to interest payments. In 1998, the average interest rate in the Czech Republic was 15%, and the maximum interest rate subsidy was lowered to 9%. Accordingly, the interest payments were subsidized up to about 60%. Subsidized interest loans (discount of up to 5%) are also provided to young farmers and for farmers in less-favored regions. The 1998 agricultural budget envisages a decrease of almost 20% in credit-related support. The credit policy seems to shift away further from providing interest-free loans to farmers towards loan guarantees and interest subsidies and towards increased support to larger-scale farming operations.

Table 2.2: Budget Expenditures on Market Support: 1994-98

<table>
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<tbody>
<tr>
<td>SFMR total</td>
<td>3,782</td>
<td>3,740</td>
<td>3,047</td>
<td>2,078</td>
<td>5,115</td>
</tr>
<tr>
<td>Export subsidies</td>
<td>1,238</td>
<td>1,064</td>
<td>1,126</td>
<td>1,274</td>
<td>1,311</td>
</tr>
<tr>
<td>o.w. for dairy</td>
<td>1,050</td>
<td>1,064</td>
<td>1,126</td>
<td>1,112</td>
<td>1,200</td>
</tr>
<tr>
<td>Beef</td>
<td>27</td>
<td>129</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potatoes (Starch)</td>
<td>117</td>
<td>33</td>
<td>44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malt/Hop</td>
<td>44</td>
<td>67</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Intervention</td>
<td>2,516</td>
<td>1,230</td>
<td>1,310</td>
<td>763</td>
<td>3,625</td>
</tr>
<tr>
<td>o.w. for cereals</td>
<td>2,417</td>
<td>1,230</td>
<td>1,310</td>
<td>763</td>
<td>3,625</td>
</tr>
<tr>
<td>Dairy</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>28</td>
<td>1,446</td>
<td>611</td>
<td>41</td>
<td>179</td>
</tr>
<tr>
<td>SGFFF</td>
<td>326</td>
<td>450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export (interest subs.)</td>
<td>124</td>
<td>450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed Grains</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Market Support</td>
<td>3,782</td>
<td>3,740</td>
<td>3,047</td>
<td>2,404</td>
<td>5,565</td>
</tr>
</tbody>
</table>

Source: RIAE

Table 2.3: State Fund for Market Regulation Interventions for (bread) Wheat

<table>
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<tr>
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<tbody>
<tr>
<td>Minimum Price</td>
<td>CZK/t</td>
<td>3,240/2,700</td>
<td>2,700</td>
<td>3,500/4,000</td>
</tr>
<tr>
<td>Advance Payment</td>
<td>CZK/t</td>
<td>1,620</td>
<td>1,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Market Price (farm)</td>
<td>CZK/t</td>
<td>2,983</td>
<td>2,780</td>
<td>3,980</td>
</tr>
<tr>
<td>Announced Purchase</td>
<td>000 t</td>
<td>500+300</td>
<td>500</td>
<td>500+150</td>
</tr>
<tr>
<td>Effective Purchase</td>
<td>000 t</td>
<td>424+232</td>
<td>354</td>
<td>74.5+6</td>
</tr>
</tbody>
</table>

Source: RIAE. The 1997/1998 market price is a RIAE forecast
Table 2.4: State Fund for Market Regulation intervention in dairy

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</thead>
<tbody>
<tr>
<td>Minimum Milk price (CZK/l)</td>
<td>5.70</td>
<td>6.00</td>
<td>6.30</td>
<td>6.80</td>
<td>7.50</td>
</tr>
<tr>
<td>Market Price (farm) (CZK/l)</td>
<td>5.87</td>
<td>6.48</td>
<td>6.90</td>
<td>7.15</td>
<td>8.10</td>
</tr>
<tr>
<td>Av. Export Subsidy (CZK/l)</td>
<td>1.43</td>
<td>1.35</td>
<td>1.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidized Exports of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butter (000 t)</td>
<td>18.00</td>
<td></td>
<td>26.80</td>
<td>21.60</td>
<td></td>
</tr>
<tr>
<td>Milk Powder (000 t)</td>
<td>22.10</td>
<td></td>
<td>15.20</td>
<td>15.50</td>
<td></td>
</tr>
<tr>
<td>Cheese (000 t)</td>
<td>0.00</td>
<td></td>
<td>13.60</td>
<td>13.50</td>
<td></td>
</tr>
</tbody>
</table>

Source: RIAE. The 1998 market price is a RIAE forecast.

Since 1994, the establishment of the SGFFF provided a credit guarantee of 21.3 billion CZK (Table 2.5). Out of this, 19 billion CZK are still outstanding, in relation to the 37.8 billion CZK total credit amount. The amount of total credit subsidies distributed was 5.4 billion CZK. The SGFFF during the initial period of operation provided the bulk of the support to individual farmers and cooperative farms, while in the later period, the share of large farms (cooperatives and corporate farms) has started to increase significantly in SGFFF's support activities (Figures 2.8 and 2.9). Nevertheless, it should be noted that the smaller, non-incorporated farms continue to be more profitable. The current situation of SGFFF is causing some concerns for the mid- to longer-term budget outlook. Although the overall amount of outstanding credit guarantees does not seem excessively high (524 million ECU), the significantly increased amount of matured guaranteed loans in the last two years might undermine the financial

Figure 2.8: Distribution of credit guarantees by legal categories of farms and directions of change in recent months: 1994-98

Figure 2.9: Distribution of interest rate subsidies by legal categories of farms, and directions of change in recent months: 1994-98

Source: own calculations after Agriculture and Forestry Support and Guarantee Fund
sustainability of the whole program if this trend continues. At the same time, the value of the counterpart assets of the SGFFF has reportedly decreased to about one sixth of its original, non-market based, value.

**Direct Headage and Area Payments**

Direct payments were introduced in 1995 in the form of headage and area payments, which were introduced to encourage specialized beef production. Farmers in less favored areas, which for this purpose are defined as areas where the “official” land prices are below certain limits, could receive 4,000 CZK per cow for conversion to suckler cows and 3,000 CZK per calf of a beef breed. For grassland, the hectare payment amounted to 3,300 CZK (on condition of a stocking density not exceeding 1 livestock unit/ha and in 1997 for farms with at least 0.15 livestock units).

**Table 2.5: Budget Expenditures on Structural Policy: 1994-98**

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</thead>
<tbody>
<tr>
<td>Credit Subsidies</td>
<td>1529</td>
<td>1977</td>
<td>2958</td>
<td>4181</td>
<td>3500</td>
</tr>
<tr>
<td>o.w. Interest Subsidies (SGFFF)</td>
<td>722</td>
<td>1819</td>
<td>2702</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Subsidies Processing Ind.</td>
<td>136</td>
<td>175</td>
<td>310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Free Loans (Agriculture)</td>
<td>927</td>
<td>727</td>
<td>725</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest free loans (proc. Ind)</td>
<td>32</td>
<td>82</td>
<td>88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision for loan default (guaranteed by the State)</td>
<td></td>
<td></td>
<td></td>
<td>164</td>
<td></td>
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<tr>
<td>Grants*</td>
<td>160</td>
<td>119</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (interest subs. Old debts)</td>
<td>36</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Payments</td>
<td>473</td>
<td>1431</td>
<td>1891</td>
<td>2059</td>
<td>4463</td>
</tr>
<tr>
<td>o.w. beef</td>
<td>265</td>
<td>355</td>
<td>278</td>
<td></td>
<td></td>
</tr>
<tr>
<td>milk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bee keeping</td>
<td>35</td>
<td>75</td>
<td>64</td>
<td>76</td>
<td>80</td>
</tr>
<tr>
<td>Flax</td>
<td></td>
<td>6</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grassland</td>
<td>438</td>
<td>1091</td>
<td>1452</td>
<td>1669</td>
<td>3518</td>
</tr>
<tr>
<td>General Area payments</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Other (e.g. Min. of Environment)</td>
<td>20</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Rent Concessions</td>
<td>92</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loan Defaults (mature guarantees)</td>
<td>21</td>
<td>90</td>
<td>262</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Vineyards, Afforestation, Restoration, Anti-Erosion, Ponds, etc.
Source: European Commission

In 1998, the latter measures were discounted and taken up in a new scheme. A generalized agricultural area payment was introduced, the level depending on the administrative land price and intended as a support to farming in general (maintenance of the landscape), organic farming and afforestation in particular, dairy cattle farming, and in less favored areas also for livestock activities (beef, and sheep). The support for farms in less favored areas is conditional on an animal density between 0.1 and 1 livestock unit/ha (with pigs and poultry not making out more than 50% of all livestock units). In addition to an annual headage payment for dairy cows in less favored areas producing more than 4,500 liters per year of up to 2,500 CZK was introduced (on the condition of a maximum stocking density of 1 livestock unit per ha and a
minimum of five cows per holding. Direct payments are also available for bee keeping and flax production. The total budget for payments based on area more than doubled in the 1998 budget, and the magnitude of total direct payment programs increased 2.2 times (Figure 2.5 and Table 2.1).

Disaster payments represent a specific form of direct support to agricultural producers. In 1997, 7% of the total support fell under this category, due to significant flooding. In 1998, the estimated requests for disaster payments amounted only to 1% of the agricultural support programs (Table 2.5).

Tax Preferences

Tax preferences represent another important component of support to agriculture. Farmers who operate as physical persons are subject to land and property taxes, and pay personal income tax as well. In addition to land and property tax, incorporated farms are taxed according to the general system of corporate taxation. The land tax equals 0.25 to 0.75% of official land prices (about 8.6 ECU per ha on average), while the average tax on buildings is about 0.6 ECU per square meter. The land and income-based taxation structure provides significant preferences for agricultural producers. Farmers do not pay road taxes for their agricultural machines. The total amount of tax concessions to agriculture is estimated at 900 million CZK for 1998, including the tax preferences provided to the production of bio-fuel. In addition, due to the low profitability of farming operations, only a relatively small portion of physical persons and corporate farms report profit, and accordingly pay relatively low amounts of income tax.

Harmonization Issues with the Common Agricultural Policy

Up to recently, the completion of the transition to a market consistent agricultural policy environment has been in the focus of government attention, together with the provision of a certain safeguard of farming incomes. In recent years, different forms of market interventions were tried, and the harmonization with the CAP has become an additional, but still not major, objective. The current agricultural support system definitely conforms with the principles of a market-based agriculture. However, it does not fully correspond with the level of support and instruments of the CAP. Although there is pressure for immediate increases of support and protection on the farmer's side, and to converge at EU levels before accession, the level of support and border measures should remain at the current level, in order to maintain pressure to complete reforms, and remain within budgetary constraints and WTO commitments. The level of support should, accordingly, be aligned only after the accession. At the same time, efforts should be concentrated on the adaptation of the same policy instruments as in the EU, but not yet necessarily applying them, or applying them at the same level. Agenda 2000 proposals for the reform of the EU's CAP should be used as a bench-mark in this work. In particular, the following adjustment would need to be considered:

(a) The SFMR system needs to be adjusted to a transparent CAP-conforming framework incorporating the potential use of quotas in the case of some products.

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2 The tax concession for bio-fuel are on the excise tax and on the VAT.
Changes should be made in the current intervention which is based on an *ex-ante* system (the intervention is based on short-term forecasts on production and consumption) to an *ex-post* CAP type intervention mechanism when market intervention decisions by private sector are based on the observed evolution of EU market prices. In addition, to be consistent with the principles of the CAP, price support would need to be transferred to the wholesale level instead of the farmgate for most products;

(b) The current credit guarantee scheme needs to be fully de-linked from government and credit subsidies need to be discontinued in their present format. Credit subsidies might temporarily be replaced by investment grants for a transitory period to improve competitiveness, from national budgetary sources (or financed by the EU, if possible);

(c) The direct payments and other current structural support measures have to be adapted to the EU format, while new ones, such as an agro-environmental program will have to be introduced. The generalized area payment scheme outside of the less-favored areas could be adapted and fitted into the national envelopes proposed for the dairy and beef sectors under the Agenda 2000;

(d) A more integrated regional and rural policy and related support programs have to be developed to be able to utilize the EU’s structural fund instruments; and

(e) The taxation system and the provided tax concessions need to be harmonized with the EU practices and requirements.

**Selected Impacts of Introducing the Common Agricultural Policy in the Czech Agriculture**

It is rather difficult to forecast the economic impacts of introducing CAP in the agriculture of the Czech Republic, since both the agriculture sector and the CAP represent moving targets. The RIAE made a detailed calculation based on two scenarios: A) the instruments of CAP will be introduced gradually before the estimated time of accession (January 1, 2005) and the level of PSE will be increased to 30% from current levels; B) current levels of support and liberal trade policies will be maintained until the estimated time of accession, when the actual CAP is fully introduced. In both cases price compensation introduced by the 1992 CAP was not taken into account (*Table 2.6*). According to RIAE calculations, in the case of scenario “A” the total benefits of agricultural producers would increase only approximately 25% in real terms between 2004 and 2005, while the expected increase in farmers’ benefits in the case of scenario “B” would be almost 140%. In the case of scenario “B” the significant domestic price adjustment would probably create additional difficulties for consumers at the time of accession. About three fourths of increased farmers benefits would need to be carried by the consumers in both cases, and the expected transfer from the EU budget is about 11 to 12 billion CZK (roughly 342 million ECU). This is about 25% of the expected Czech contribution to the EU budget. Obviously if compensation payments will be applied in the case of the Czech Republic, the total benefits to farmers would increase by roughly 30% to 33% (about 70 billion CZK).
This calculation seems to endorse a statement previously made in this paper which suggests the postponement of implementation of the CAP until the time of actual accession. As envisaged in scenario “A”, the Czech agriculture would already receive significant support prior to accession. The increased support would most likely delay the required adjustment of farms and reduce the pressure to improve efficiency and competitiveness in terms of production. At the same time, the increased support in the pre-accession period would increase pressure on the budget and consumers as well. The delay in adjustment to CAP-level support (scenario “B”) probably is the most appropriate way to prepare the sector for accession since it maintains significant incentives for consolidation and efficiency improvements, even if it is not the favored strategy of the major farming lobbies today.

Table 2.6: Costs & benefits from the accession of the Czech agriculture into the EU (real prices 1996, without EU compensation payments)

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<td>Incomes from public goods &amp; agricultural production (CZK billion)</td>
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<td>Expenditures of the Czech taxpayers (CZK billion)</td>
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<td>Contributions of Czech Republic to EU Budget</td>
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<td>44.0</td>
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Source: RIAE
Agricultural Trade and Trade Policy

The country traditionally has been a net importer of food and agricultural products and food and agriculture’s shares in both exports and imports are continuously declining. The negative balance of agricultural trade, however, is a significant element of the trade deficit of the country (14.6% in 1997, which was roughly 513 million ECU), the largest part of which, was with the EU. The dynamics of agricultural trade development has been slower than the growth in trade overall. It is worth mentioning that exports increased somewhat faster than imports since 1989. EU (37%) and CEFTA countries, especially Slovakia (36%), are the major destinations of Czech agricultural exports.

The Czech Republic has a relatively liberal trading regime, governed by a number of multilateral and bilateral agreements. Border measures are, to a large extent, conditions imposed by the Czech Republic’s WTO commitments. Most Czech tariffs are considerably lower than the EU (15) ad valorem equivalents, with the exception of poultry, potatoes, and oilseeds, which enjoy higher protection, and also pork, which has a similar level of protection. On the export side, the Czech Republic is allowed to subsidize a limited range of products. The actual export subsidies in 1995-97 remained well below the value and quantity ceilings. The indirect export subsidies, introduced in 1997 through the SGFFF, might be breaching the Czech Republic’s WTO commitments, in particular, for sugar, and possibly for vegetable oils and fats. Export licensing is applied mainly for registration purposes.

The EU and CEFTA provide preferential markets for Czech agricultural products, at the same time the domestic Czech market has to cope with increased competition from these countries. In general, Czech agriculture has benefited from these agreements, and the current liberal trading environment with these two groups of countries is a good measure of how Czech agriculture might compete in an enlarged EU. Recently, the increased agricultural trade deficit and overproduction in some areas, resulted in some trade policy measures which do not fully conform with the existing EU and CEFTA trade agreements. In March 1998, the EU decided to partially suspend the Czech Republic’s trade preferences in reaction to an unilateral measure taken on the Czech side to considerably limit imports of apples. An import deposit scheme introduced by the Czech Republic in the Spring of 1997 resulted in significant protests, both from the EU and CEFTA, and was suspended in August 1997. These developments indicate that the level of competitiveness of domestic production is not always strong enough, even under limited liberalization, and currently would be much less so inside an enlarged EU.

Need for an Integrated Rural Development Approach

The balanced development of rural areas, as well as preparing for the full utilization of the emerging instruments of the evolving CAP, both require a complex and comprehensive approach which integrates agriculture into an overall rural development framework. Such an approach should include a set of specific measures to support:

- Emergence of competitive agriculture;
• Further development of the rural service sector and related industries to provide off-farm rural employment and additional demand for agricultural and other products;

• Improvement of rural infrastructure, including education and social services; and

• Development of an appropriate social policy to properly address specific social problems affecting rural populations;

Rural development, in particular in less-favored regions of the Czech Republic (mainly mountains) faces several challenges:

• A decentralized approach. In a country of relatively small dimensions and with a strong historical background in terms of central planning, the challenge here is to ascertain that the rural development program is conceived, developed, implemented and, in part, financed by local rural institutions -"the bottom-up approach." In other words, rural development needs to be driven by local demand as expressed by the ultimate stakeholders in rural development, the rural communities, and their inhabitants;

• A multi-sectoral approach. The various and often complementary aspects of rural development imply the collaboration between various line Ministries (transport and infrastructure, health, education, environment, agriculture, etc.) to assess whether the decentralized programs would fit with the national policies and EU rules and regulations;

• The financial engineering of mostly small to medium-size projects. The challenge here is to ensure the active participation of various financing institutions (Czech and foreign) to mobilize various sources of funds available to the country. These sources vary significantly depending on the type of project the local communities have prepared;

• Fair prioritization for financing based on technical criteria to reduce the risk of preferential treatment given to certain communities rather than others on the basis of political favoritism. A strong technical analysis of priorities by local/regional policy-makers which would screened by central government on the basis of simple technical criteria (e.g., unemployment, level of education in the region, private sector projects waiting for public infrastructure, etc.); and

• Collaboration with private sector (enterprises, NGOs, etc.). This collaboration constitutes a challenge for public sector agencies like municipalities and villages although it also strengthens the sense of ownership in the region and facilitates implementation.

Another important objective of a program for rural development in the Czech Republic would be to support the government’s efforts toward EU accession. By linking with the EU pre-accession (and accession) initiatives for rural development, environment, employment and agriculture, rural development program should also enable the government to use available resources (credits, grants, human capital) with maximum efficiency. In keeping with recent trends in the EU member countries, such a program would need to assist The Czech Republic in
making the fundamental shift from purely agricultural to mixed use of the countryside, reflecting new attitudes and needs of rural, urban and suburban communities. One of the important features to be incorporated in the program would be the special focus on less-favored regions.

It is anticipated that investments for rural development will be directed to projects that are identified by local governments, working when appropriate in partnership with businesses, NGOs and foreign similar institutions (e.g., twinning arrangements as supported by the EU). Based on the government’s (an Inter-ministerial Committee would be appropriate to collaborate and harmonize programs), and particularly local government’s, priorities as reflected in their program objectives, the following major components could be included:

(a) **Private Sector Development**, in particular with a special focus on:
   (i) small and medium size agro-industrial and agro-marketing enterprises (including genuine service cooperatives) and adjustment to EU standards;
   (ii) access to financial services from rural areas;
   (iii) support to the development of micro-enterprises;

(b) **Human Capital Development and Health**;

(c) **Infrastructure** (facilitating private sector development and improving living conditions and environment). This component could also provide assistance to land consolidation programs since they also imply substantial adjustment in terms of rural roads and water management (drainage);

(d) **Rural/regional Development Program Management and Technical Assistance to local administrations**.

The forthcoming enlargement of the European Union is clearly providing a strong incentive to review and adjust structural policies in the candidate countries. The integration will take place in several stages:

- **Between now and 2000**: continuation of the financial and technical cooperation with the CEECs that began with the EU-Phare program in 1989. The aims of EU-Phare have just been reworked to take account of the forthcoming accession (see below). This program is already providing special assistance to the CEECs in 1997-99 for legal and administrative preparation for the introduction of structural policies.

- **From 2000 to the date of the accession**: in each case the pre-accession structural assistance proposed by the Commission will support various projects in the applicant countries while familiarizing their responsible authorities and economic and social actors with the methods used to implement Community assistance.

- **After accession**: countries will start to implement the Structural Funds and the Cohesion Fund.
In accordance with the orientations of Agenda 2000 and with the conclusions of the European Council in Luxembourg, financial aid for the agricultural and rural development sector will be granted to Central and Eastern European applicant countries. The EU’s Social Action Program for Pre-Accession Aid for Agriculture and Rural Development (SAPARD) structure is similar to the European Agricultural Guidance and Guarantee Fund (EAGGF) Guarantee section. The main concern of SAPARD is to support measures for the improvement of farms (including producer groups), as well as: processing and distribution; promotion of quality products; veterinary and phytosanitary control; improvements in land quality; land reparation and registration; water resource management; vocational training; diversification of economic activities in rural areas; agri-environmental and forestry measures; improvement of rural infrastructure and rural villages (including the maintenance of rural heritage); as well as technical assistance. The list can be extended if additional priority needs should emerge. SAPARD as well as other programs presume national co-financing of the program. This is an area where joint approaches between the local and national budgets, the EU and International Financial Institutions (IFIs) could be envisaged to co-finance certain elements of the regional development programs. To this very purpose, a memorandum of understanding for such collaboration has been signed between the European Commission and the IFIs. By linking with the EU pre-accession and accession initiatives for rural development, environment, employment, and agriculture, the World Bank, as well as other IFIs, would enable the government and the local administrations to use available resources (credits, grants, human capital) with maximum efficiency.
3. AGRICULTURE FROM FACTORS MARKETS TO PRODUCT MARKETS

FACTOR MARKETS

Farming Structure and Land Reform

The Czech Republic began the transformation of the agricultural sector early on in the reform process. The country opted for physical restitution of expropriated property, including agricultural land. The initial phase of restitution, restructuring, and privatization of large-scale state and collective farms is nearly completed. The outcome of this process has been a relatively fragmented structure of land ownership with a mixed, and still evolving, farming structure, dominated by relatively large farming operations which have pieced together holdings through land leases. While the initial issues of land privatization and restitution have been largely resolved, and the new farming organizations are consistent with the principles of a market economy, the consolidation of ownership and settlement of outstanding financial issues has yet to be achieved. This must be done in order to create a viable farming structure under EU conditions.

Land and Property Restitution and Compensation

The settlement of land ownership issues was done within the restitution process and the privatization of state farms. There was no specific land reform process in the Czech Republic outside of these processes. Former owners of expropriated land, and other properties were able to re-claim their lost land or assets, either in kind, or through financial compensation. By the end of 1993, about 250,000 claims were submitted for restitution in agriculture. All restitutions were made from state property, and limits were set on the area of land that an individual could claim. In 1991 the Land Fund of the Czech Republic was established to govern the process of restitution of state owned land and other property in agriculture and forestry. By 1998, more than 90% of restitution cases had been resolved, covering about 9 million parcels (1.25 million ha or about 29% of agricultural land). The only exceptions are claims with respect to church property. Decisions on this issue are still awaiting parliamentary action since current legislation only addresses claims presented by physical persons. The land used by collective farms did not require any transfer of ownership, as this land had individual legal owners throughout the period of collectivized farming. There was, therefore, no need to change the land ownership status, and the main concern was to re-establish the primacy of ownership rights over users rights. As a result, about 80% of agricultural area in the Czech Republic is already in full private ownership. The rest of the agricultural land, nearly 800,000 ha, remains state-owned, is leased out, and 500,000 ha are prepared for privatization and are awaiting final decision.
Transformation of Collective Farms

The transformation of agricultural cooperatives was a key part of the reform process, as it affected the ownership of more than 60% of the land and related property in agriculture. The principal goal of the transformation process was to establish real and clear ownership rights for all the property of these collective farms. The process did not favor any one type of farming. In principle, three options were available: a) becoming a member of the new cooperative farm and lease land to the farm; b) cancel membership and leaving with land and assets to establish a new farming enterprise; and c) cancel membership, cease to engage in farming, and lease or sell the land. In the latter case, the individual must wait until 1999 to receive any property shares or assets from the collective farms. By 1993, the initial transformation was completed. By 1998, about 700,000 ha (16% of the total agricultural area) was physically removed from the collective farms by the new owners and transferred to other farming organizations. Recently, a small number of producer cooperatives have entered a second phase of reorganization, by restructuring ownership, management, and the labor force.

Privatization of State Farms. More than 50% of the land and other property of state farms was privatized under the restitution and compensation process. The privatization of the remaining property (land not included) was executed mainly under special procedures. The large number and scale of restitution claims and the time required for their settlement prevented the use of the general voucher privatization scheme in the case of state farms. Actually, only two state farms were privatized through this process. The majority of the state farms were privatized through direct sales of assets or shares (frequently in combination with restitution), public auctions, and tenders, between 1994 and 1995. Payments for the sale of these assets were scheduled over a twenty year period without interest in most cases. By the end of 1997, with the exception of some "non-privatizable" assets still in the hands of the Land Fund, all the state farms’ non-land assets were privatized, and operated as private joint-stock, or limited liability companies, based mainly on land leases obtained from the state.

The New Farming Structure. As a result of the collective farm restructuring and state farm privatization, a new farming structure was created (Figure 3.1). These new farms include: a) cooperatives operating in various forms, based on fully privately owned land leased mainly from cooperative members

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1 "non privatized assets due to the fact that there had been non demand for them."
(38.7% of agricultural land in 1997); b) incorporated privately owned larger farms operating mainly on leased private and state owned land (35.4% of agricultural land in 1997); and c) individual private farms (registered by physical persons) also using leased land for the most part (25.1% of agricultural land in 1997). The latter category includes about 25,000 private farmers farming on more than three hectares (with an average farm size of 36 ha). In addition to the farms included in the agricultural survey, about 635,000 ha of agricultural land (about 15% of total agricultural land) is used by farms operating on very small plots of less than three hectares. Out of the 4.28 million ha total agricultural area, about 100,000 ha \(^2\) remain uncultivated in 1998.

The major features of the current farming structure include:

- Dominance of larger-sized farms. The re-establishment of property rights and the restitution titling process led to fragmented ownership of land, reflecting the features of the pre-communist era when, with the exception of expropriations, the titles for land were not abolished. There are about three million land owners who own about 40% of agricultural land, and who are not engaged in any form of agricultural production. Land use, however, has not become as fragmented as in many other transition countries (Table 3.1). Most of the farms operate primarily on leased land. The

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\(^2\) A rough estimate in the absence of official statistics
average size of farms, using about 75% of agricultural land, is around 1,000 ha. The average size of farms larger than three hectares is over 100 ha, and is significantly higher than the average farm size in the EU (Figure 3.2);

- Leasing of land is a major form of tenure. Incorporated and collective farms use leased land almost exclusively. Larger individual farms also lease a significant amount of land. Most leases are only short-term in length (1 year), inhibiting long-term investment;

- Low profitability of farming. The economic results of farms are showing signs of continued low profitability or losses for most agricultural producing enterprises (Figure 3.3). Economic results are rather unfavorable in the cooperative farming sector, which as a whole, operated with significant losses for the second consecutive year (1996-97). The economic results of agricultural companies also became negative in 1997. In contrast to larger farms, smaller individual farms significantly increased their profitability in recent years. The results of farming are especially poor in areas with less favorable conditions for agriculture. About 60% of farms are on land with less than average and low productivity (see Figure 3.4);

- Significant indebtedness. The large-scale farming sector, especially the cooperative farms, carry a relatively large debt overhang, estimated at around 50 billion CZK (nearly 1.7 billion ECU). The bulk of the collective farm debt (approximately 12 billion CZK) is due to the owners of the assets that were left with the cooperative farms by former cooperative members who left the farm (transformation shares). This debt is supposed to be settled in 1999, and represents 20% of the value of the property of the farms concerned. The incorporated farms owe approximately 19 billion CZK to the government for non-land privatized property. Farms established in the framework of restitution still owe the government about 7 billion CZK, which was provided in the early 1990s. The high indebtedness is a rather specific feature of farming in the Czech Republic, compared to many other Central European countries where pre-reform debts were settled during the transformation process and strictly enforced bankruptcy laws prevented the accumulation of new debt;

- Barely restructured collective farms. Most of the collective farms, which use about 38% of the agricultural land, apart from the change in formal ownership relations (of
land and assets) still operate in the "old-fashioned" way – with limited profitability and increasing financial difficulties. The majority of collective farms, in general, show a conservative and reluctant attitude to further restructuring, and are, to a large extent, still run as they were during the pre-transition period, with limited motivation on the part of the members.

Table 3.1 Average size and number of farms larger than 3 ha (1997)

<table>
<thead>
<tr>
<th></th>
<th>Number of Farms</th>
<th>Share in Total Agricultural Land (%)</th>
<th>Average Size (Ha of agricultural Land)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Farms</td>
<td>24,710</td>
<td>25.1</td>
<td>36</td>
</tr>
<tr>
<td>Companies</td>
<td>1,869</td>
<td>35.4</td>
<td>666</td>
</tr>
<tr>
<td>Limited liability</td>
<td>1,349</td>
<td>23.5</td>
<td>613</td>
</tr>
<tr>
<td>Joint Stock</td>
<td>484</td>
<td>11.4</td>
<td>833</td>
</tr>
<tr>
<td>Coops</td>
<td>1,011</td>
<td>38.7</td>
<td>1,349</td>
</tr>
<tr>
<td>State Enterprises</td>
<td>22</td>
<td>0.5</td>
<td>864</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
<td>0.3</td>
<td>333</td>
</tr>
<tr>
<td>Total Farms</td>
<td>27,642</td>
<td>100</td>
<td>127</td>
</tr>
</tbody>
</table>

Source: RAIE

Land Titling. The Czech Republic inherited a solid system of cadastre and land titling. This system, however, had to be adjusted to the requirements of a modern land market and market economy. In 1992, a new cadastre law was adopted, creating the Czech Office for Surveying, Mapping, and Cadastre (COSMC), which has its own budgetary allocation (in 1997 about 43 million ECU). The 77 regional cadastre offices under the COSMC are entrusted with both land registration and the management of the cadastre. As a result of significant investments, this new system is functioning relatively well in processing land privatization and restitution. As of the end of 1998, all parcels had been registered.

Land Market. At this moment, land markets are only partially operating. According to an RIAE survey, it is estimated that in the last four or five years, not more than 50,000 ha of agricultural land was bought and sold. This corresponds to slightly more than 1% of the total agricultural land. The average prices are 20 to 50 CZK per square meter (6,000 to 15,000 ECU/ha), while the highest prices in the suburbs of Prague were around 150 to 200 CZK. The prices obviously reflect land quality and location. Land closer to urban agglomerations is in demand, while there is a lack of interest in more remote areas. Many sellers decide to sell agricultural land due to difficult personal circumstances, without a real knowledge of the current land value. The sales are concentrated in relatively small units. Foreign physical and legal persons are not allowed to own agricultural land in the Czech Republic. The large amount of non-privatized state owned land, and the perception that this land will become available for sale in the near future, is also a significant impediment to the land market at present. At the same time, there is a rather active, and quickly developing, lease and rental market. Rental rates are low and typically are less than 1% of the official value of the agricultural land. Lease contracts are relatively short-term (one to five years). In the less favored areas, the rent barely covers the land tax. The highest rents are on the order of 4% of the official value (the average official value of agricultural land is 5 CZK per square meter, i.e., 50,000
CZK per hectare). Rents of 400 to 500 CZK per hectare are normal for meadows and pastures, and for arable land in less productive areas.

Critical Issues for the Future. While the initial issues of land privatization have been resolved, and the new farming organizations are consistent with the conditions of the market economy based on private ownership, the consolidation of ownership and farming structures, and the improvement of competitiveness in primary agriculture, will require further time and appropriate government policies in the farming sector. The critical areas for action are:

- **Further transformation of collective farms.** There are many indications that cooperative farms in their current state would hardly be able to cope with the increased competitive pressure of the EU environment. Their methods of operation and management, and handling of current resources need to be further adjusted to the principles of market economy. Strict profit motivation and hard budget constraints, as well as financial consolidation are essential. A smaller number of cooperative farms have already entered the so-called “second transformation” which has often resulted in joint-stock companies or limited liability companies. This process involves the restructuring of ownership, management, and labor force, and often the splitting of activities and diversifying into downstream activities as well. The “second transformation” results in more viable and profit motivated operations. Often, however, this leaves empty, skeleton cooperatives behind with most of the debt, and the transparency of such transformations is also often questionable;

- **Settlement of farm debts.** The huge debt overhang is a significant constraint on further consolidation of farming and would be a detrimental handicap inside the EU. The government should pay significant attention to this issue, even considering the writing off of some of the debt related to privatization and establishment of private farms. The so-called “transformation shares” represent a special case. It is obvious that the majority of collective farms are not able to settle this debt\(^3\). Owners of these shares press for quick and full settlement, while the collective farms would prefer to have a settlement which involves budgetary support and long-term payment duration. The speedy resolution of this issue is critical to the further consolidation and restructuring of collective farms. It is worth mentioning that in some other EU accession candidate countries, such as Hungary and Lithuania, the financially insolvent collective farms were liquidated in the early phase of transition, settling all debts at that time. The accumulation of a debt overhang has been prevented by the strict implementation of bankruptcy laws;

- **Sale of remaining state-owned land:** the large amount of state-owned land awaiting privatization is an impediment to the emerging land market, as well as for the recapitalization of the sector. Out of roughly 900,000 hectares of state owned agricultural land, at least 500,000 should be privatized before accession, while 400,000 hectare could be kept for further claims (church) and for reserve and special state purposes (e.g., universities). There is a draft law currently before parliament, which would initiate the privatization of most of the state-owned land, providing

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\(^3\) 1999 is the starting year for this settlement of debts
preferences to current users. The individual farming sector, however, would prefer to restrict the right of purchase of state owned land only to physical persons, in order to enhance the further development of the individual private farming sector. Since legally incorporated farms are genuinely privately owned, it is hard to find other justification for preferences toward individual farmers, other than to boost the development of individual private farms which represent the most efficient part of the Czech agriculture sector; and

- Foreign Ownership of Agricultural Land. In principle, membership in the EU would require that agricultural land markets be opened to competitive forces from anywhere within the Union. Right now, foreign ownership of agricultural land is not allowed in the Czech Republic and foreign agricultural land ownership is a rather sensitive issue, as is the case in other EU accession countries. It is feared that the opening of agricultural land markets will have a potentially significant negative impact. Right now agricultural land prices are not much lower in the Czech Republic than within the EU, and it is not certain that opening the market could result in large parts of the countryside turning under foreign ownership. This development, however, could be socially destabilizing and politically disruptive, and would easily outweigh any gains in productivity that the new investment would bring. Unlike many other traded goods, the supply of agricultural land is strictly limited. This should be recognized, and the Czech Republic might want to negotiate a grace period for the full liberalization of the agricultural land market, following the example of neighboring Austria.

**Labor Market**

Employment in agriculture has plummeted from about 533,000 in 1989 down to about 200,000 in 1997. This was, in part, an apparent transfer due to the statistical impact of the transfer of a significant portion of the non-agricultural labor force from collective farms to the service and industrial sector. Nevertheless, this still constituted a net transfer of active population from the agricultural sector to the other sectors of the economy. As a result, the gap between industrial and service sectors and agriculture seems to slowly decrease in relative terms. Thus, labor productivity in agriculture (see **Table 3.2**) was, in 1996, a little less than 70% (54% in 1994) of what it is on average in the other sectors of the economy. In absolute

![Figure 3.5: Labor productivity at current price in agriculture and non-agricultural sectors: 1994-96](image)
terms the difference remains relatively stable: the gap is staying at an equivalent of about US $3,100 to 3,500 per employed person (see Figure 3.5).

Table 3.2: Labor productivity in agriculture and non-agricultural sectors (at current prices): 1994-96

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Non-agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>$4,671</td>
<td>$8,108</td>
</tr>
<tr>
<td>1995</td>
<td>$6,619</td>
<td>$9,751</td>
</tr>
<tr>
<td>1996</td>
<td>$7,465</td>
<td>$10,761</td>
</tr>
</tbody>
</table>

Source: own calculation based on CSO statistics

Although the biggest part of the adjustment in terms of labor force has been accomplished, some further adjustment in employment is to be expected from the remaining structural adjustment, in a relatively large number of cooperative farms and in some agricultural companies (see previous section on land market), in particular. This process has several important consequences in terms of: a) employment opportunities in other sectors of the economy and rural development; and b) the higher level of education expected, on average, from agricultural workers. The social and economic impact of such changes, in terms of migrations from rural to urban areas would need to be assessed thoroughly and, on this basis, a decentralized approach and support to the development of rural regions would need to be strengthened.

Labor productivity in the food industry is only about 20% to 25% higher than in agriculture (see Tables 3.2 and 3.3) and remains on the low end of the range for non-agricultural sectors. The food industry displays a large spectrum of achievements in terms of value added per worker, with, on the low range, the fruit and vegetable processing industry, meat industry and dairy, while the other processed foods (usually further processed), edible oils and fats, and beverages have performed much better. The ratio between agriculture and food in the total value added still shows a relatively poor performance of the food industry which reflects the limited development of market differentiation of Czech products. The good figures for the beverages sub-sector reflect, in part, the excellent image of Czech beers worldwide. The oils and fats case reflects like, in most countries, a larger-scale capital intensive industry.

Table 3.3: Labor productivity in food industry (at current prices): 1993-1997

<table>
<thead>
<tr>
<th></th>
<th>Total food</th>
<th>Meat ind.</th>
<th>Fruit &amp; Veg. Proces.</th>
<th>Oils &amp; Fats</th>
<th>Dairy</th>
<th>Flour mill &amp; Starch</th>
<th>Other food (beverages excl.)</th>
<th>Beverages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>$7,171</td>
<td>$6,308</td>
<td>$3,271</td>
<td>$9,780</td>
<td>$6,175</td>
<td>$7,276</td>
<td>$7,176</td>
<td>$9,546</td>
</tr>
<tr>
<td>1994</td>
<td>$7,096</td>
<td>$5,526</td>
<td>$3,815</td>
<td>$10,980</td>
<td>$5,526</td>
<td>$8,734</td>
<td>$6,916</td>
<td>$9,911</td>
</tr>
<tr>
<td>1995</td>
<td>$9,085</td>
<td>$6,805</td>
<td>$4,173</td>
<td>$14,474</td>
<td>$6,541</td>
<td>$10,451</td>
<td>$8,684</td>
<td>$13,684</td>
</tr>
<tr>
<td>1996</td>
<td>$9,375</td>
<td>$7,245</td>
<td>$5,579</td>
<td>$13,794</td>
<td>$6,842</td>
<td>$8,782</td>
<td>$9,257</td>
<td>$13,685</td>
</tr>
<tr>
<td>1997</td>
<td>$8,591</td>
<td>$7,535</td>
<td>$5,427</td>
<td>$9,122</td>
<td>$7,130</td>
<td>$6,937</td>
<td>$8,516</td>
<td>$11,836</td>
</tr>
</tbody>
</table>

Source: own calculations after RIAE and CSO statistics
Financial market

The financing of the agricultural sector, like in a majority of East and Central European countries, is a rather weak point that could affect negatively the continuation of sectoral adjustment. Its strengthening, as a whole, at a time when it is facing higher competition from EU countries, and neighboring countries like Hungary (crops) and Poland (animal products) is likewise problematic. The strong point of the Czech case, however, is the large number of commercial banks (specialized or not in agriculture) currently involved in the financing of the farming sector. The Support and Guarantee Fund for Farmers and Forestry (SGFFF) is likely to have facilitated the development of the interest by numerous commercial banks in dealing with the farming sector. It is reported that a large number of banks participate in the SGFFF programs. The main intermediary in this regard is Komercni Banka (KB) which handled about 38.5% of the guarantees and 34% of the interest rate subsidies. The reasons why KB handles such a high percentage would need to be reviewed thoroughly. More than forty other banks have also participated (see Table 3.4).

Table 3.4: Banks shares in the distribution of SGFFF credit guarantees and subsidies to agriculture

<table>
<thead>
<tr>
<th>Share of total</th>
<th>Guaranteed loans</th>
<th>Subsidies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Komercni Banka</td>
<td>38.5%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Agrobanka</td>
<td>15.6%</td>
<td></td>
</tr>
<tr>
<td>Ceska Sporitelna</td>
<td>11.7%</td>
<td></td>
</tr>
<tr>
<td>Investicni a Postovni Banka</td>
<td>9.2%</td>
<td></td>
</tr>
<tr>
<td>Credit Lyonnais Bank Praha</td>
<td>2.7%</td>
<td></td>
</tr>
<tr>
<td>Other banks</td>
<td>22.3%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Source: SGFFF

In the total credit distributed to agriculture, about 57.8% has benefited from a guarantee from SGFFF. The total outstanding credit to agriculture and food industry (June 30, 1998) is given in Table 3.5. Although agriculture has large needs in particular with regard to working capital, short-term credit remains relatively small and it is likely that permanent working capital has been more developed in part due to the impact of SGFFF operations. In particular as a rough order of magnitude, Czech agriculture (as a

Table 3.5: Outstanding credit (short-, medium- and long-term) and shares of agriculture and food industry as of end June 1998

<table>
<thead>
<tr>
<th>Mio. CZK</th>
<th>Amounts</th>
<th>Share of total credit to all sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture, hunting and fisheries</td>
<td>Food industry</td>
</tr>
<tr>
<td>Short-term</td>
<td>8,403</td>
<td>32,765</td>
</tr>
<tr>
<td>Medium-term</td>
<td>9,128</td>
<td>10,675</td>
</tr>
<tr>
<td>Long-term</td>
<td>15,373</td>
<td>24,307</td>
</tr>
<tr>
<td>Total</td>
<td>32,903</td>
<td>67,748</td>
</tr>
</tbody>
</table>

Source: after Czech National Bank and banking sector sources
whole) has received approximately a 30% subsidy for its financing in the form of a reduction in interest rates.

Since 1994, the instruments for financing agriculture have been largely made dependent on the system of guarantee provided by SGFFF. This is understandable by the simple fact that banks need guarantees from the borrowers. However, the development of non-state supported guarantee instruments has, by this simple existence of SGFFF, been mostly ignored or postponed. A traditional instrument such as mortgage is not used at the moment in agriculture for things other than buildings and equipment: land is not accepted as a collateral. As a result, the existence of state guarantees through SGFFF clearly became a refuge to worried bankers. As a matter of fact, the ultimate beneficiaries from SGFFF proceeds are the bankers, not the farmers. Bankers know that the obligations are backed by the state (including for reasons such as the poor management of the farm or foreign exchange risks). In addition, the interest subsidy given to farmers attracts more clients while the state pays for their obligations in terms of interest payments. Farmers indirectly benefit from the system on the short-term. The consequence of this whole system is that farmers have become a large constituency for the banking sector when it comes to revendications in terms of interest subsidies and guarantees. At the same time, the development of land and product as collateral - respectively through mortgages and warehouse receipts, remains minimal. Not only is the existence of SGFFF a constraint to the development of these types of collaterals, but its financial foundations have weakened.

The counterpart assets on which the SGFFF is based have, unfortunately, decreased quite drastically to about one sixth of what they were valued at the time of the creation of SGFFF. This means that the de facto guarantor is now the budget of the state. The total risk taken by SGFFF was as of mid-1998, 19 billion CZK (about ECU 558 million) or, the equivalent of 16.5% of the total 1998 budget expenditures on agriculture and food. In addition, the growing share of such support by SGFFF is recently to cooperatives, a category of farms whose performance remains the worse among the various legal forms of farming. This weakening of the cooperative farms is to be linked to the growing tendency to develop, in parallel with a cooperative, a limited liability company which sucks all the good assets from the cooperative while leaving the debt obligations in the cooperative. This dangerous trend would suggest that, without the back-up given by the state to the financing of farm cooperatives, the banking sector would become more reluctant to lend to this generally weakening type of farms. As a matter of fact, during some interviews with managers of cooperatives and limited liability companies, it appeared that the credit subsidies are becoming a way to cross-subsidize other activities of the parallel limited liability company. This intervention by SGFFF could become a major cause of distorted allocation of scarce financial resources toward less effective economic agents.

In summary, a good functioning of factors markets would constitute the basis for a good market-based structural adjustment of the Czech agriculture. This would imply less distortive interventions from the state or from outdated laws, and the development of modern instruments of exchange of land, labor, finance, and an element often forgotten in economies in transition: risks. At a time when Czech agriculture is faced with new challenges resulting from the accession to the EU, factors markets clearly constitute a
significant constraint to be addressed by the Czech Republic to ensure reasonable chances to adjust to the new challenges with the proper instruments. In the absence of such adjustment, in particular in the absence of a more pro-active liquidation and bankruptcy process, it appears that social pressure will continue to grow for more state intervention and support to make-up for the failure of these markets. Therefore, it would be appropriate (knowing that such adjustments take often a long time to become effective) to:

- review the main legal reasons that prevent land market and mortgage lending based on agricultural land, from functioning;
- adjust and, if needed, create or improve the private and state institutions that can ensure a well functioning land market;
- review and adjust as needed the legal foundations of the warehouse receipts system, ensure that the private sector can operate properly under these laws, and assess the effectiveness of the performance guarantee given by the warehouses to deliver the product to their owner;
- activate the legal process for bankruptcy and liquidation, in the farm sector;
- reverse the recent tendency to promote credit guarantees and subsidies by SGFFF to cooperatives, a financially less-performing category in the farming sector;
- nominate financial auditors (Czech and foreign) to review the evolution of the risks taken by the state through its activities in SGFFF, and assess whether and how this interest rate subsidy and guarantee by state would be acceptable at the time of accession to the EU; and
- review labor transfers from agriculture, assess the social impact of the economic reforms in the rural areas on poverty, migration to urban areas, and social services in less-favored rural regions, and develop accordingly a program for facilitating the development of off-farm employment in rural regions. Such program would need to be prepared in close coordination with foreign donors and, in particular, with the European Commission as part of its support programs to the Czech Republic.

PRODUCT MARKETS AND SERVICES

Agriculture Services

The review of the main agricultural services reflects a quite advanced system of private and state services. This study briefly reviewed the following domains of services: seeds multiplication, quality control and variety testing; crop protection and phytosanitary services, animal disease control and veterinary administration, agricultural chemicals and fertilizers, mechanization, water use, education, research and, advisory services. The main findings are given in the annex (Chapter 4). Although, within the
timeframe of the study, only a section of rural Czech Republic was visited, other general services, private and from local governments, in rural areas appear quite effective. Rural financing institutions such as saving and loan banks and commercial banks (mostly branches of large urban banks) are quite developed, but a real rural network for credit (e.g., cooperative banks) remains under-developed.

The network of private suppliers for mechanical equipment, fertilizers and pesticides, and seeds is reportedly well-developed and its main constraints in terms of actual access to such inputs remains the access to working capital, albeit the various support schemes developed by SGFFF.

In some sub-sectors of agriculture, some significant financing is provided by non-financial institutions, the warehouses and trading enterprises - in particular those of the former state monopoly. This pre-financing is quite an elaborate system in which the State Fund for Market Regulation (SFMR) plays a significant role. This partial pre-financing of the crop is provided at no financial cost to participating farmers unless these farmers fail to deliver at harvest the quantities contracted under the SFMR scheme. The SFMR operates through the local warehouses -mostly those from the previous state monopoly- and this creates an elaborate cross-support to participating intermediaries and farmers. The contracting by SFMR with trade intermediaries is not fully transparent and, similarly, the resulting contracting with farmers is not fully transparent. The quantitative limitations of the obligations taken by SFMR at a time when cereal prices are falling have resulted in a generally unfair protection given to the happy selected beneficiaries of the proceeds of the state. By the same token, this creates a distortion in the marketing of cereals that constitutes a significant constraint to entry of new trading companies and an impediment to a competitive marketing system.

Wholesale Marketing

The network of wholesale agriculture marketing enterprises remains weak in several sub-sectors of agriculture. The case of the cereals sub-sector previously described illustrates one of the reasons why a thriving and competitive wholesale industry has not emerged. Another cause for such delays comes from the poor development of agricultural marketing and processing cooperatives in most of the sub-sectors analyzed in this study. The legal definition of cooperatives appears to need a thorough review in the light of best practices in the rest of the world so that legal constraints to their development and their effective management be minimized. In particular, marketing cooperatives play a useful role in maintaining a higher level of competition for agricultural commodities and in helping farmers, by pooling together their products, creating economies of scale, higher leverage in the bargaining for better prices and improved management of price and client related commercial risks.

At first glance, one of the problems faced by Czech farmers is that Czech agriculture is composed mostly of very large farms. These farms clearly have the possibility of storing and marketing their products themselves to the final users. Rarely do they market jointly with other farms, or add value to their products as a wholesaler would do. In addition, it would appear that barriers to entry into this type of operations are strong in some sub-sectors. These barriers appear, in part, to be created by
commercial practices similar to cartels that have developed with the tacit, if not expressed, blessings and support from the state such as trade protection and SFMR activities.

This poor development of competitive agricultural markets at the wholesale level creates quite a significant impediment in terms of installation of the institutions of the Common Agricultural Policy (CAP) in the Czech Republic. One of the main characteristics of the CAP is the fact that price and market support is mostly done at the wholesale level and not at the farmgate. It is often forgotten that, in the CAP, price intervention constitutes only an indirect support to farmers as the intervention agency does not buy directly from farmers, it buys from wholesalers and marketing cooperatives. As a result, farmers in the EU benefit most when wholesale markets are competitive and the commercial margins taken by the wholesale marketing agents remain minimal, thanks to a high degree of competition. If, as is often the case in the Czech Republic, a small number -sometimes one only - buyer is active in a region, there is not much pressure on this buyer to minimize his/her commercial margin nor his/her costs. The rent created by the intervention of the state (CAP) in such a case is likely to remain in the books of the local monopoly rather than being passed on to its suppliers. Similarly, the cartel-like type of practices observed in the grain sector would result not only in limiting the level of competition but also in keeping the benefits of the CAP at the level of the wholesale marketing industry.

The role of agricultural markets in the Czech Republic is limited, and it is in particular confined to the exchange of products and the exchange of information. In a market economy, markets can also be used to develop the exchange of price-related risks. Price instability in agriculture is traditionally a major impediment to the development of the sector. Price fluctuations often become a great incentive for governments to intervene and reduce, or stop through administrative measure, such fluctuations. When prices fall, this is usually the traditional price intervention measure to protect farmers at the expense of consumers and taxpayers; when prices increase, this is used to protect consumers at the expense of farmers and taxpayers. In the EU, the resulting price stabilization of the CAP also prevented such risk management instruments to really develop further beyond their initial level of forward contracting (i.e., contracts in which prices are set but delivery and payment are deferred to a later date). With the opening of a wide range of possible price fluctuation (intervention prices having been decreased after the McSharry reforms of 1992, while threshold prices for imports were being kept mostly at the same level), the need to further develop such risk management instruments started to be felt, and a few new futures contracts were created in Great Britain, France, Holland, Germany, and Spain. In Hungary, the Budapest Commodity Exchange started to trade again in December 1989, after about a fifty year interruption. In the Czech Republic, commodities exchanges have not strongly emerged during the 90s.

With regard to such instruments there is a temptation to develop a new modern futures market in each country. Another approach at a time of market globalization and, regional free trade zones, would be to assess how Czech farmers and entrepreneurs could access existing risk management instruments either locally or in foreign countries, or even, by using the off-shore approach of electronic trading. At the time of this study, no mention of any substantial effort in this regard has been made and this might indicate a
real need in terms of training and information about these techniques: e.g., forward trading, over-the-counter trading and swaps, futures and options.

Finally, the poor development of private wholesale marketing institutions creates a significant constraint to the further development of the food industry. It is already quite clear that medium- to large-scale food processing enterprises will be attracted by the cost-effective services and guaranteed sorting and quality standards provided by foreign suppliers. For instance, it is already attractive to use imported pig carcasses and other frozen meat to further process them into Czech sausages and other cold cut meat products. Similarly, in a competitive environment (like the EU), wheat millers will have to secure their raw material (wheat) at the lowest cost possible. Being part of a cartel will not guarantee survival since their output (wheat flour) will also compete with the EU milling industry. Czech millers will then be more open to foreign suppliers - e.g., from Hungary or France -- to buy a full train of wheat of a certain type/standard than to please comparatively ineffective local suppliers. In the absence of adjustment of the constraints to its development, the weaknesses of the wholesale marketing industry could become a main weakness of the agricultural sector as a whole when the Czech Republic will enter the EU.

With regard to agriculture services, the following actions are recommended:

- a review by specialized experts of the legal framework of cooperative to assess the impediment it creates to the creation of marketing and processing cooperatives and to their effective management. In this regard, the analysis of the cooperative laws should be performed from the view point of the agency theory;

- for fresh produce and livestock, the analysis and the strengthening of a network of private regional exchanges\(^4\), with or without the support of local municipality, should be undertaken. Their role in terms of facilitating price information and development of a competitive market intermediation should be developed. Such commodity exchanges could become elements of the information network that the CAP needs for products in the livestock, fruit and vegetable sub-sectors;

- a review of the level of competition at the sub-sectoral level and the implications of the market support policy on competition would be important to launch with the ultimate goal of alleviating this major constraint observed on the future development of agriculture (in particular in the context on an enlarged EU); and

- the development of a program of analysis of price related risks taken by entrepreneurs in the agricultural and food marketing chain, their costs, and the transfer to private sector from the SFMR of the management of such risks; and education and training on agricultural marketing and price/risk management in agriculture.

\(^4\) in production areas.
Food Industry

The agroprocessing industry is dominated by large-scale units inherited from the pre-reform period. In terms of size, out of the 2,400 food, beverages and tobacco processing enterprises, small-scale food processing appears rather under-developed in terms of absolute numbers and contribution to the economy (Figure 3.6). Foreign direct investment (FDI) in food processing remains mainly limited to a few large enterprises - a common feature of the Czech industrial sector. Total FDI in the food industry represented an equivalent of about ECU 64 million in 1996 (about 5% of all foreign direct investment, see Table 3.6). With a total average of total inflow of FDI of less than 3.5% of the GDP between 1994-97, these figures show that FDI does not play a significant role in the development of the sector, while in Hungary the massive inflow of FDI, in particular in the food industry, has been a key feature in the transformation of the agri-food sector. It brought new technology, new savoir-faire, and substantial capital (including working capital) as part of the privatization process. More specifically, this process incorporated Hungary in the worldwide or regional development strategy of most of the major foreign food companies. Nothing similar happened in the Czech Republic.

Table 3.6: Foreign direct investment in food industry (in USS equivalent)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>552.5</td>
<td>884.8</td>
<td>2,552.4</td>
<td>1,457.7</td>
</tr>
<tr>
<td>Food industry</td>
<td>34.3</td>
<td>73.0</td>
<td>121.2</td>
<td>74.7</td>
</tr>
<tr>
<td>Share of food industry</td>
<td>6.2%</td>
<td>8.3%</td>
<td>4.7%</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Source: Czech National Bank

Figure 3.6: Distribution of total sales, value added and by number of employees in the food industry

Source: RIAE

The general problem that emerged in the Czech Republic in 1997 regarding the ownership by the banking sector (directly or via investment funds) of enterprises might also be observed in the food industry. The so-called "passive shareholder" syndrome and the informal or formal coordination of enterprise strategies at the sub-sector level could also affect the food industry. The restructuring of the industry in sub-sectors like dairy or meat processing has not, as a result, been accelerated. The study did not, however, have the opportunity to fully review this issue.
The Management of Quality of Agricultural and Food Products

At each stage in the agricultural and food marketing chain, farmers and entrepreneurs have the important responsibility of ascertaining the quality of the products delivered to their clients, in particular, in relation to potential health hazards, environmental impact, and other services attached to the product. The Government of the Czech Republic is fully aware of the pending problems of harmonization with the EU system, of the legislation on these matters and of its enforcement. Among the decisions that have not benefited from a similar level of attention, one could list the transfer to private sector of a rather large number of tasks currently undertaken by numerous state agencies, and a parallel reduction in the number and a substantial reassignment of the roles of implementing state agencies on standards, quality control, health safety. This new approach would exercise a significant change in the incentives given to food processing enterprises while adjusting to this new set of responsibilities transferred to them. During negotiation for accession to the EU, the Czech Republic will have to demonstrate that the food legislation and the ability of the enforcement agencies are fully compatible with the EU directives on food hygiene, inspection and certification, and legal responsibilities of producers. Not only such ability is crucial in joining the single market (to avoid non-tariff barriers within the single market) but also to control the products imported in the EU from third countries through Czech borders if the accession of the Slovak Republic in the EU is delayed.

While a great effort appears to have been made, in particular by the concerned departments of the MOA in adjusting the whole set of laws concerning food quality, standards, etc., it appears that the enterprises themselves have not benefited from the information, training and assistance to adjust to this new concept of quality management. A substantial educational effort is needed in reference to the implementation of the new legal environment. In the Czech Republic as well as in all the other countries of the region (in particular candidates to accession to the EU), one would recommend the following program of actions:

- a program of public information - awareness and data banks in real time open to scientists and lawyers, and in coordination with private trade association (see below). In addition, information to the rural population about the EU would need to be developed and/or strengthened;

- a program of collaboration between the private sector and state agencies, including the outsourcing of some of the activities of the public sector that could be easily implemented either by the private sector or in collaboration with foreign state agencies operating in the same field in other EU countries or in countries negotiating the accession to the EU;

- a plan for the completion of the restructuring of state agencies involved in consumer protection, animal and plant protection, agricultural research and extension, border control, farm registration, market information, market organization by sub-sector, and market intervention. The restructuring plan should address issues pertaining to the adjustment of the locations of various offices and laboratories (including creations, mergers and closures);
• a review and adjustment of the salaries and benefits paid to civil servants in agriculture so that they can remain competitive with the private sector. The government will need to strengthen its staff in view of the need to keep high standards of professional expertise, particularly in various areas related to the EU;

• a detailed training program for existing staff in the various specialties concerned and an exchange program of staff between Czech and EU institutions. This training program should not only be undertaken for civil servants but should be designed, in collaboration with the concerned trade associations to address the needs of private sector in the various sub-sectors;

• a recruitment program by the restructured state agencies (in particular in areas where the *acquis communautaire* imposes new types of activities on the country); and

• an investment program to strengthen technology related to quality control and new food processing techniques incorporating technologies related to quality enhancement and environmental protection. The program could have two major components that would have to be consistent with each other: one for the financing of private sector (e.g., five-year loans for priority actions for the implementation of the new legal framework) activities; and one for the financing of the restructured state agencies (see above) in office technology, information networks, laboratory building and equipment, etc.

**Marketing Strategies (Differentiation of Consumer Products)**

There is significant scope for a larger contribution of agro-industry to the economic growth of the country. Although adapted to the specificities of the domestic market, unavoidably, technological choices in the sector will be re-shaped by the new market incentives created by the accession to the EU single market. Among them:

• the new market environment -- in particular the new competition for markets shares in a highly concentrated retail industry (large retailing enterprises based on super- or hypermarkets in the suburbs of the largest cities, mostly owned by foreign investors, have started to emerge);

• the new set of incentives that will result from the harmonization of laws regarding food quality; and

• the new opportunities that could result from a second set of reforms of the CAP for agricultural commodities. Under this new set of incentives, technologies will be shaped by the alternative marketing methods that will be used by agro-industrial enterprises. In other words, poor product differentiation will result in investment in rather unsophisticated technologies for which cost reduction strategies are crucial. At the same time, high value-adding technologies could be expected for the production of food ingredients and semi-processed products, or for differentiated consumer products.
Representation of the Private Sector

The representation of private interests for each profession in the various agricultural and food subsectors constitutes an important missing element. This is a strikingly common feature in Eastern and Central European countries, with the exception of Hungary, where such representation is highly developed in a large majority of agri-food sub-sectors. In the EU, such representation is a crucial element of the implementation of the CAP. It contributes to a better understanding of private interests by the European Commission and the governments in the EU, and of government policies by the concerned private sector. In addition, many decisions related to trade, research and technology, market information, training could be taken in common by operators belonging to the same profession or to the same marketing chain (the so-called inter-professional associations, or, like in Hungary, the "product councils"). In the Czech Republic, these private professional associations and inter-professional associations, independent from government, are mostly missing, or when they exist (e.g., dairy industry), they are weak. The development of such organizations should be promoted and facilitated. Technical cooperation with similar foreign organizations could be explored to develop a good understanding of the role of such organizations. However, when created they should be sufficiently scrutinized in the light of the competition laws to avoid any risk of sub-sectoral collusion.

Among the services of general interest to be offered and performed along the various sub-sectoral marketing chains -services currently mostly lacking to agriculture and agro-industries- one can list the following elements:

- Consultation with state agencies intervening in the sub-sector;
- Analysis and information on markets and regulations (domestic and foreign);
- Organization of technical and commercial training programs;
- Contracting for research on issues of common interest with domestic or foreign institutions;
- Organization of first instance arbitration of trade conflicts (this can be done also in coordination with the Chambers of Industry and Commerce); and
- Development of facilitating procedures and instruments for the exchange of products.
4. AGRICULTURAL PRODUCTION AND SERVICES

Natural Resources

The Czech Republic is a landlocked country, situated in the central part of Europe, in the middle of the temperate zone of the northern hemisphere. A major European watershed passes through the territory of the Czech Republic and separates the basins of the North, Baltic, and Black Seas. The divide point of the three seas is the mountain Kralicky Sneznik (1,423 m above sea level), in the north of the country, at the Czech-Polish border. The principal rivers are the Labe (370 km) and the Vltava (433 km) in Bohemia, the Morava (246 km) and the Dyje (306 km) in Moravia, and the Odra (135 km) and the Opava (131 km) in Silesia and Northern Moravia.

Topography

The topography is rather varied, with uplands in the western and central part of the country, and hills and mountain ranges along the western and northern borders. As a consequence, about half of the agricultural land is situated on milder (3 to 7°) or steeper (8 to 17°) slopes. It is estimated that about one third of agricultural land, and about 54% of arable land is subject to erosion. About 67% of the country’s territory (52.8 mio. ha) is located at an altitude of up to 500 m a.s.l., some 32% (25.2 mio. ha) are between 501 and 1,000 m, and only 827,000 ha are above 1,000 m. The average altitude of the Czech Republic is 430 m a.s.l.

Soils and Fertility

The soil cover displays quite a wide variety in terms of both, soil particle size, as well as occurrence of individual soil types. Brown soils are the most prevalent soil types in the country. As for physical composition, about 9% of soils are loamy sands, 83% are loams, and 8% are clays. Almost half of the soils have a light (29%), medium (14%) or heavy (6%) content of stones. More than half of arable land is of moderate (37%) or stronger (15%) acidity (data are based on a three year survey - 1991 to 93). Almost 60%
of the agricultural land is of lesser, or even low natural fertility. For practical judgmental purposes, the productivity of Czech agricultural land is expressed in five quality groups (Table 4.1).

With regard to maintenance of soil fertility, a substantial decrease in the use of fertilizer began in the season of 1990/91. Compared to the mean of the past twenty years, overall fertilizer use dropped by half, and the decline has been continuing until 1996/97, when only about 30% of earlier levels of fertilizer were used. The situation is becoming particularly worrisome in the supply of phosphorus and potassium in soils. Concerning soil contamination with heavy metals (cadmium, mercury, lead and chromium) the latest data indicate low contents and no danger of transfer into the food chain.

Table 4.1: Productivity of agricultural land

<table>
<thead>
<tr>
<th>Quality Group</th>
<th>Productivity potential</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>very high</td>
<td>12.7</td>
</tr>
<tr>
<td>II</td>
<td>high</td>
<td>7.6</td>
</tr>
<tr>
<td>III</td>
<td>average</td>
<td>20.5</td>
</tr>
<tr>
<td>IV</td>
<td>low</td>
<td>35.5</td>
</tr>
<tr>
<td>V</td>
<td>very low</td>
<td>23.9</td>
</tr>
</tbody>
</table>

Source: Res.Institute of Agric.Economics (RIAE)

Land Area and its Utilization

Overall land area of the Czech Republic is 7,886,000 ha, of which 4,280,000 ha (54%) represents agricultural land (01-01-1998). Of this 3,091,000 ha is arable land; 11,000 ha hops plantations; 16,000 ha vineyards; 50,000 ha orchards; 159,000 ha gardens; 668,000 ha meadows; and 285,000 ha pastures (Figure 4.1). The share of agricultural land per capita is 0.40 ha, which is about the European average. Arable land comprises more than 72% of agricultural land (it was over 75% in 1989), a share which is among the highest in Europe. In comparable countries of the EU this share comprises between 50%-60%.

Dynamics of Land Structure

Over the past 27 years, declines in agricultural (-4%) and arable land (-7%) are noticeable, while forestry area remains stable, and non-agricultural land area has increased (Table 4.2). There was also a small increase in hops and vineyard area; an increase in meadows, after a decline in the eighties; pasture land, after a decrease in the
eighties, regained the level of the seventies; and there was a sizable increase in ponds due
to construction of new ones. After the collapse of the socialist system, between 1989 and
1997, agricultural land decreased by only 0.2%, but arable land area appears to have
accelerated and was reduced by 4%, most likely due to some of it being reverted to
permanent grassland.

Table 4.2: Changes in the utilization of agricultural land (1970-97) ('000 ha)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>4,374</td>
<td>3,294</td>
<td>11</td>
<td>15</td>
<td>578</td>
<td>273</td>
<td>3,516</td>
<td>2,624</td>
<td>51</td>
</tr>
<tr>
<td>1985</td>
<td>4,327</td>
<td>3,269</td>
<td>11</td>
<td>16</td>
<td>567</td>
<td>256</td>
<td>3,563</td>
<td>2,627</td>
<td>51</td>
</tr>
<tr>
<td>1990</td>
<td>4,288</td>
<td>3,219</td>
<td>11</td>
<td>16</td>
<td>577</td>
<td>256</td>
<td>3,599</td>
<td>2,630</td>
<td>51</td>
</tr>
<tr>
<td>1995</td>
<td>4,280</td>
<td>3,143</td>
<td>11</td>
<td>16</td>
<td>630</td>
<td>272</td>
<td>3,607</td>
<td>2,630</td>
<td>159</td>
</tr>
<tr>
<td>1997</td>
<td>4,280</td>
<td>3,091</td>
<td>11</td>
<td>16</td>
<td>668</td>
<td>285</td>
<td>3,607</td>
<td>2,632</td>
<td>159</td>
</tr>
</tbody>
</table>

% chng  -4.1  -6.8  +22.2  +60  +4.5  -1.4  +5.3  +1.0  +306

Source: Czech Statistical Office (CSO)

**Hydrology**

The soil, climatic and morphologic conditions of the Czech Republic are such, that, without management of soil hydrology, a profitable and economically justified utilization of the agricultural land would be difficult. In particular, the country has a dense network of natural rivers and smaller streams, with a total length of more than 86,000 km, which call for regulation and management. Thus, by the end of 1995, more than a quarter of agricultural land (1,087,000 ha) had to be under drainage, and irrigation works were established on some 130,000 ha. Additionally, some 24,000 small water reservoirs and ponds, with a total area of about 52,000 ha, were established to complement drainage and irrigation perimeters.

**Climate**

The climate in the Czech Republic is influenced by mutual penetration and interaction of oceanic and continental effects. The climate is characterized by prevailing western winds, intensive cyclonal activities causing frequent interchange of air masses, and comparatively adequate precipitation. The maritime effect is mainly felt in Bohemia, whereas continental climate effects start having a bigger impact in Moravia and Silesia. To a large extent, the climate is influenced by altitude and topography. Due to the complex topography consisting in a number of areas of hilly ranges and valleys, and diverse expositions, the country experiences a number of microclimates which can be advantageously utilized for otherwise atypical production, e.g. growing of grapes and other more thermophile crops even in some parts of central Bohemia. Maximum temperatures can reach into the mid thirties and minimum below twenty degrees C. The mean relative humidity is usually between 65 and 75%. Data for 1975 to 1996 show that Prague can experience between 100 and 200 days with precipitation per year, of which 20 to 60 days with snowfall, 16 to 35 days with storms, 6 to 54 icy days, and between 51 and 108 days with frost. Comparable data for Brno are: 105 to 161 days, 19 to 60, 13 to 41, 12 to 59, and 79 to 129.
Crop Production

Czech crop production is typical of the temperate European climate. The cropping structure in 1997 is indicative of the orientation of cultivated areas at the given stage of transformation and market development. In 1997, over half of the area of arable land sown to annual crops was devoted to cereals (54.9%), and about one quarter (25.4%) to forage crops (Figure 4.2 shows the situation in 1996). Other annually sown crops of major importance were rape seed (7.4%), sugar beet (3.1%) and potatoes (2.4%), followed by grain legumes (1.7%) and vegetables (1.2% in 1996). Some 2.7% was left fallow in 1996. In essence, the cropping structure shows an effort to achieve balance in supply and demand.

Cereals

Despite high attention paid by the former socialist authorities to cereal production, it was not until 1990 that production surpassed domestic consumption for the first time, thanks to an exceptionally high national average yield of 5.5 t/ha. Since then, area and production was dependent on climatic conditions, but, increasingly, it also responded to market forces. An important step was the price liberalization in 1991. The increase in consumer prices of meat and milk, followed by their decreased consumption and declining livestock numbers, caused a drop in demand for fodder grain by about 1 million tons. Suddenly, there was an oversupply of cereals. The SFMR started intervention procurement and export of cereals. In 1992 there was a lower harvest and imports were necessary. But 1993 and 94 saw overproduction again. This was followed by two mediocre years where domestic consumption surpassed production, until a good harvest in 1997 in which production exceeded consumption again by almost 200,000 t. Those fluctuations clearly demonstrate the decisive impact of climate on production in the temperate agricultural zone of central Europe. In 1997 cereals were sown on an area of 1,696,325 ha (see shares by kind in Figure 4.3).
The overall domestic consumption of cereals is between 6.8 and 7.0 mill. tons, of which about 30%-33% is for human consumption, some 6% serves as seed, and the rest - about 62%-63% - is utilized as livestock feed. Mean yield for the three year period 1995-97 was 4.2 t/ha in the Czech Republic. A comparison with neighboring countries shows for the same period a mean yield of 5.4 t/ha in Austria, and 6.3 t/ha in Germany.

As seen above, by far the most important cereal is winter wheat, with usually just under 50% of the total cereal area (in 1997 over 27% of arable land). From the early sixties to the mid seventies and on, the wheat area practically doubled from some 400,000 ha to about 800,000 ha. Yields rose from 3 - 3.5 t/ha in the seventies to well over 4 t/ha, and even over 5 t/ha in about one third of the past 15 years. Since 1990, production fluctuated between 4.6 million tons (1990) to 3.3 million tons (1993). In 1997, sown area was 834,137 ha (harvested area of cereals is usually 1%-2% lower), and 3.6 million tons were produced with a mean yield of 4.4 t/ha. The average yield in Austria in 1997 was 5.2 t/ha and in Germany 7.3 t/ha. Since agroclimatic conditions in these two countries are largely similar to the Czech ones, this gives an indication of the potential production reserves of the Czech agriculture.

Although statistical data usually do not give a breakdown, the predominant type is (bread) winter wheat (Triticum aestivum). Spring wheat is usually sown only as replacement in cases of serious winter kill of the winter crop. Thus, spring wheat area may vary from 15,000 to over 50,000 ha. In 1995, for instance, the total wheat area was 832,000 ha, of which spring wheat was 36,000 ha (4.3%). Whereas yields are not bad by former socialist standards, there is room for improvement, as demonstrated by better farms which are harvesting over 6 t/ha and more (see area, yield and production development over the past two and a half decades, on Figure 4.4).

Next in importance among the cereals is barley. Two main types of barley are being cultivated - six row winter barley, which is usually considered to be a fodder crop, and two row spring barley, used for human consumption, fodder, and to which also belongs malt barley, for whose high quality the Czech Republic is well known. Since general statistics usually do not differentiate between the types, the figures given in this report represent barley as a whole. However, as a rule of thumb, it can be said that spring barley area is usually more important and represents about 2/3 of total barley area. Traditionally, barley occupied between 500,000 and somewhat over 700,000 ha (1979 and 1982) in the past quarter century. In 1997 it was grown on 653,000 ha, with a rather low mean yield of 3.8 t/ha and a total production of 2.5 million tons (Figure 4.5).
mean yield is disappointing, particularly in comparison with 1990, when it was 5.7 t/ha, and also in comparison with some of the neighboring producers, such as Germany with 5.9 t/ha, and Austria 4.8 t/ha in 1997.

Other important cereals are rye, oats and grain maize. Rye and oats have lost quite a lot in importance lately, the former mainly because of change in consumer taste to more wheat products, and the latter because of reduced livestock herds and fodder demands. Rye area was reduced, in comparison to the late sixties and early seventies, by more than 60%, and oat areas by almost 80%. Although yields have been improving and almost doubled in some of the past years, production, naturally, declined quite substantially (Figure 4.6). In 1997, rye was grown on about 76,000 ha, mean yield was 3.4 t/ha, and production about 259,000 tons. Oats was harvested from about 78,000 ha and produced, at a yield of 3.2 t/ha, a total of some 247,000 tons. Rye and oats yields were in Germany 1.5 times higher in 1997.

The story of grain maize is different. In 1997 the area rose more than three times compared to 1970, yields almost doubled and production more than quintupled. Although conditions are less than ideal for grain maize in most parts of the republic, quality hybrid seed and other improvements in technology appear to be the main cause for maize gradually making inroads on other cereals as an important fodder crop. Results on good farms indicate that there is room for improvement in grain maize production. It should be noted, however, that growing areas for rye and oats, and maize, are not replaceable since the former two are predominantly crops of poorer soils and colder highland conditions, while maize requires the opposite. Figure 4.7 shows the evolution since 1970 of the maize crop. The yield of 6.9 t/ha in 1997 was extremely good for Czech
conditions, though it should be noted that in the same year Austria harvested 8.6 t/ha and Germany 8.3 t/ha.

Triticale, contrary to neighboring Poland where it is grown on a large area, in the Czech Republic is still more or less a curiosity crop, though there are farms, particularly in less favorable areas, which have started appreciating its reliable, high yield potential, and good value as fodder grain or green forage. Over the past eight years or so, its area has been fluctuating between 15,000 and 25,000 ha, with mean yields around 4 t/ha, though the yield potential is substantially higher, as proven by some of the progressive farms in an area south of Prague, known as the “Bohemian Siberia. The value and potential of Triticale is widely underestimated in Czech agriculture and an awareness and demonstration campaign could place it into a more prominent position.

Oilseeds

Oilseeds have developed as a source not only of edible oil but also of raw material for the chemical, pharmaceutical and cosmetic industry. Oilseed extraction cakes are an irreplaceable, high protein ingredient into animal feed mixes. Lately, oilseeds are increasingly being considered as a source of renewable energy in the form of biodiesel. Economically important oilseeds in Czech agriculture are, in decreasing order of area for 1998, rape seed, white mustard, poppy seed, and sunflower. Total oilseeds area in 1997 represented 270,000 ha, and a qualified estimate put the area for 1998 at 345,000 ha (over 11% of arable land). Linseed did have some importance in the early 90s when area reached almost 4700 ha, but it decreased to mere 310 ha in 1997, and 730 ha in 1998. Linseed still does, however, have economic importance in food and feed stuff industry. About 4,000 tons of linseed oil is being imported annually. Latest estimates for 1998 show an increase in rapeseed to 266,000 ha, mustard to 33,000 ha, poppy seed to 25,000 ha, and sunflower to 17,000 ha, while corresponding figures for 1997 were 227,000; 14,000; 17,000; and 11,000 respectively (Figure 4.8).

As is evident, rapeseed is by far the most important of the oilseeds. The crop registered a gradual, but steep increase since 1970 when its area was mere 31,000 ha (Figure 4.9). Until 1975, low yielding (1-2 t/ha), traditional varieties with a high content of erucic acid were cultivated, which grossly limited utilization for human consumption, as well as animal feed. At the beginning of the 80s, improved germplasm became available and the “0” varieties with substantially reduced erucic acid started to be cultivated. Further progress was made in the second half of the 80s when “00” varieties (very low erucic acid and glucosinolate content) started to be grown. In addition, government introduced in 1983 a “Rapeseed Production Program” which united research,
extension, primary production, marketing and processing into one association, to ensure adequate domestic production. In 1990 was established the “Association of Oilseeds Growers and Processors”, which, together with interesting market prospects, further boosted cultivation. Production reached over 600,000 tons in 1998, but mean yields still leave much to be desired, reaching barely over 2.5 t/ha in the best of years, compared e.g. to Germany, France and the U.K. where yields are almost consistently well over 3t/ha. Because of a shortage of domestic processing capacity, an increasing amount of rapeseed, reaching almost 140,000 tons in 1996, is being exported. Rapeseed is traditionally grown as a winter crop and is, actually, the crop with the earliest recommended sowing time, already in August. Spring rapeseed is also known in Czech agriculture, but it is generally lower yielding and is only occasionally used to replace the winter crop in case of winter kill.

**Mustard, poppy seed, and sunflower** are, as far as area is concerned, minor crops but they all have an economic importance far beyond the area grown. Mustard is the raw material used for processing of a delicious condiment of the same name. Mustard oil is also used in food, pharmaceutical, chemical and cosmetic industry. An interesting export opportunity in 1997 led to more than doubling of the growing area for 1998. Total harvest is estimated to be around 40,000 tons, while domestic consumption is around 5,000 tons. However, yields are low, fluctuating between 1.2-1.4 t/ha. Mustard, as well as poppy seed, is rather demanding on post-harvest handling, which has to be done professionally and timely to maintain good seed quality. To maintain and expand the export possibilities, mustard was included in 1997 into the SGFFF program “Export.” Poppy seed is in Central Europe a favorite ingredient into bakery products and in household cooking. Similar to mustard, it appears to have a good potential for export and has also been included into the SGFFF program “Export.” However, export price fluctuations have been large over the past six years, and farmers reacted with adjustments of sown area, which oscillated between 14,000 and 34,000 ha. Domestic consumption is estimated at about 3,000 tons, while 1998 production could reach 17,000 tons. Yields are relatively low, and fluctuate between 0.6-0.8 t/ha, although over 1.1 t/ha was achieved in 1990.

**Sunflower** is an oilseed whose chances for wider introduction have increased with the availability of high quality hybrid genetic material of a shorter vegetation period, more suitable for the typical temperate zone of Czech agriculture. In the period between 1989 to date, the area fluctuated between some 3,000 and 19,000 ha. Yields have been relatively good, reaching up to 2.5 t/ha. Sunflower also demands careful post-harvest
treatment. Domestic production does by far not cover requirements of domestic crushers and other users, and government is taking steps to increase imports up to 25,000 tons in 1998.

**Grain Legumes**

Grain legumes play a major role in many countries as a source of high quality vegetable protein for human and animal consumption. From the agronomic point of view, they are an excellent crop because of the ability of their root nodes to extract nitrogen from the air, thus increasing soil fertility and saving on chemical fertilizer. In the Czech Republic grain legumes never occupied a place of major importance, reaching a maximum share on arable land of around 3% in the early sixties, and once again in 1993. Since then the share fluctuated between 1.7 (1997) and 2.3% (1994). They are grown mostly for feed, less for human consumption. Most important are peas, lately reaching up to 90% of legume area. Peas for livestock feed have also become an interesting export article, mainly into EU countries. A limitation to greater inroads into domestic production and exports is the relatively low yield, rarely above 2.5 t/ha, while in the EU yields of up to 4 t/ha and more are not uncommon.

The agro-ecological conditions for beans and lentils are not favorable in the Czech Republic, and they are being grown on a few hundred ha each in the best of years. The highest recorded area in recent years was 300 ha for lentils and 900 ha for beans in 1992. Yields are generally low, around 1t/ha at best for lentils, and 1.3 t/ha maximum for beans, compared to more than twice that amount in Germany.

**Sugar Beet**

Sugar beet and sugar production has always been one of the most traditional and most important branches in the Czech agriculture. Even before WWI the Czech lands produced over 9 million tons of sugar beet which was processed in 173 sugar mills for a total production of almost 1.3 million tons of sugar. At that time, the Czech sugar industry produced 7%-8% of the world’s sugar. In the mid-twenties cultivated area reached over 240,000 ha, with mean yields of up to 35 t/ha and more in good years (42.7 t/ha on more than 146,000 ha in 1968). Since the early seventies until 1990 area mostly fluctuated between about 120,000 and not quite 160,000 ha. (Figure 4.10).

![Figure 4.10: Changes in sugarbeet production: 1970-97](image)

Source: Ministry of agriculture

Until 1989 the main aim of the sugar policy was self-sufficiency and low consumer prices, supported by direct subsidy payments to producers.
Apart from own production, large quantities of raw cane sugar from Cuba were also processed in Czech refineries. Excess production was exported for hard currency with the help of subsidies. After 1990, consumer price liberalization resulted in decreased consumption. In response to market conditions, area from 1991 to-date fluctuated between 85,000 ha (1998) and 124,000 ha (1992).

Genetic material used these days is mostly imported, hybrid, monogerm, and of first class quality. Although yields are generally growing, particularly over the past six years, there are still large seasonal variations, and a wide gap exists in comparison with western producers. In Germany and Austria yields are almost consistently over 50 t/ha, and in France they oscillate between 65 and 70 t/ha. The MOA believes that, under present conditions, the break-even point for sugar beet production is around 42 t/ha. There is little doubt that Czech sugar beet yields could become perfectly competitive with its immediate western neighbors, particularly if production in more marginal areas, imposed under the earlier socialist system, could now be abandoned. It is not the know-how that is lacking, but it is better management - timeliness of operations, improved technology - particularly precision drilling and harvesting, and much better crop nutrition and weed control that must improve. It is clear that only a high quantity of sugar produced per ha, coupled with reasonable production cost, would ensure competitiveness of Czech sugar beet production on the European market.

Domestic sugar consumption is estimated at 450,000 tons. Excess production has, so far, been exported with assistance of the SGFFF program “Export.” While Czech agriculture could come up with higher sugar production, it will be prudent to monitor the supply and demand situation and adjust production accordingly. In the ultimate analysis, much will also depend on the quota the Czech Republic will be allocated after entry into the EU.

**Potatoes**

Potatoes are an irreplaceable part of central European culinary culture. Next to bread and dumplings, and in many regions even before dumplings, they are also the staple of Czech food. They are used in a wide variety of preparations in domestic and restaurant cuisine, as well as in industrial processing. Lower quality potatoes can be also easily utilized as animal feed, predominantly for pigs. Currently there are over 90 potato varieties entered into the Czech Register of Varieties of 1998. For practical purposes potatoes are divided into three categories – early, industrial (mainly for starch production) and (other) consumer potatoes (Figure 4.11). Consumption per capita was 83 kg in 1989, but has decreased somewhat to 76 kg in 1997, mainly due to price increases of quality potatoes and competition from rice and pasta. Since 1970 the potato area dropped by two thirds. Mean yields have never been impressive in Czech farming. In the whole decade of the
seventies, national yield rose only once a little over 20 t/ha, in the rest of the years it was below that figure. Yields improved somewhat in the eighties when they surpassed the 20 t/ha barrier, by a bit, six times. The situation did not improve at all in the nineties when 20 t/ha were overcome only twice (Figure 4.12).

Clearly, yield is a big problem in the Czech Republic not only because it is low, but also because it suffers from sizable seasonal fluctuations (a difference of almost 50% between the low and high of the past 9 years). In the three year period of 1995-97 the mean Czech yield was 19 t/ha. In the same period, yield of the two most comparable western neighbors, was almost 29 t/ha in Austria and over 35 t/ha in Germany, not to mention the Netherlands where it was almost 43 t/ha, and in the EU-15 it was 33.5 t/ha. Yet, there are Czech farms that consistently produce 30 t/ha and more on quite large areas. This indicates that there are more than objective reasons that are responsible for the low yields.

Except for high quality seed, which is more expensive and much more difficult to handle than with sugar beet, the rest of the reasons for this disappointing performance in the two crops are quite comparable. What is lacking is basic agricultural technique and management, such as respecting the timetable of operations, proper crop nutrition (including organic manure), adequate weed and pest control, proper mechanization for seeding and harvesting, and professional and responsible post-harvest handling. A major issue, turning up in the examination of below average performance again and again, is the lack of working and investment capital. The genetic material, mostly imported from the west, as well as fertilizer, chemical means of weed and pest control, and modern machines are simply very expensive. However, without these seasonal and investment inputs Czech potato growers can never hope to become competitive with western growers.

**Flax**

Flax cultivation has an old tradition in the Czech Republic. It is a typical crop for the humid conditions of sub-mountainous and mountainous areas and lighter, less fertile soils. As a natural fiber, it is attractive for its strength, durability, low specific weight, ability to absorb moisture, and other useful properties not only of the fiber itself, but also of its by-products (flock, dust). It is not only the textile industry but increasingly also the automobile, construction and paper industries, which show growing interest in flax fiber and by-products.
Flax was grown on more than 40,000 ha in the fifties and early sixties, when highest production of retted fiber reached over 100,000 tons (Table 4.3). Until 1989 flax production and processing was supported by the state. After 1990, with ongoing transformation and introduction of market principles, flax production decreased sharply, mainly due to its high cost, technical and labor demand, and low or negative profitability of growing and processing.

Table 4.3: Changes in flax production: 1980/81-1998/99

<table>
<thead>
<tr>
<th>Year</th>
<th>Sown area (ha)</th>
<th>Harvested (ha)</th>
<th>Yield t/ha (retted)</th>
<th>Production (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980/81</td>
<td>24,412</td>
<td>24,144</td>
<td>3.47</td>
<td>83,770</td>
</tr>
<tr>
<td>1990/91</td>
<td>23,243</td>
<td>22,242</td>
<td>3.97</td>
<td>88,410</td>
</tr>
<tr>
<td>1991/92</td>
<td>17,875</td>
<td>15,199</td>
<td>2.09</td>
<td>31,723</td>
</tr>
<tr>
<td>1992/93</td>
<td>9,859</td>
<td>9,333</td>
<td>2.45</td>
<td>22,875</td>
</tr>
<tr>
<td>1994/95</td>
<td>11,046</td>
<td>10,118</td>
<td>2.69</td>
<td>27,187</td>
</tr>
<tr>
<td>1996/97</td>
<td>5,950</td>
<td>5,899</td>
<td>3.10</td>
<td>18,272</td>
</tr>
<tr>
<td>1997/98</td>
<td>2,191</td>
<td>2,017</td>
<td>3.19</td>
<td>6,439</td>
</tr>
<tr>
<td>1998/99</td>
<td>4,744</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Yields of long fiber in the Czech Republic represents about 10%-11% of retted fiber. In 1997 a historic low of only 840 tons of long fiber was produced and over 1,600 tons had to be imported. Government, seeing the debilitating decline in domestic flax growing, introduced, in 1997 a subsidy under the title of non-food usage of land, but it came too late and was considered too low anyway. In 1998 flax was included into the SGFF program “Export” and the subsidy doubled to 6,000 CZK/ha, with a resulting more than twofold increase in area and an anticipated at least doubling of production. The requirement of domestic factories for long fiber is estimated at 4,800 tons in 1998. It is evident that substantial imports of long fiber will be necessary again. In order to satisfy basic domestic demand of long fiber at around 5,000 tons, and taking into account mean yield of the past ten years at 3.16 t/ha of retted fiber, Czech farming would have to devote about 16,000 ha to flax growing. This means that less than one half of past maximum area would have to be put back in production. But, of course, market conditions alone will decide if farmers will attempt to do so.

Flax quality and yields of the main western producers are superior to Czech production. However, production conditions for flax are adequate, if not favorable in the Czech lands, and there is a lot of experience with its cultivation. Processing capacity also appears to be ample. Since flax also appears to be an article with good export potential, it is only correct that MOA pays increased attention to its production. However, management and biological, as well as mechanical technology will have to improve substantially to make Czech flax competitive with the main western producers.

**Hops**

Hops production in the Czech lands is concentrated into three clearly defined areas with specifically suitable climatic and soil conditions. The cultivation of high quality hops is a traditional activity and has been historically the pride of Czech agriculture. Since the early seventies until 1996 hops area has hovered around 10,000 ha,
and annual production of dry cones was around 10,000 tons. According to the International Hops Growing Committee (IHGC), in 1995 the Czech Republic occupied, with 10,115 ha, the third place in the world in hops area, behind Germany's 21,885 ha and USA's 17,749 ha. Because of the very fine aromatic varieties grown in the country, mean yields have been substantially lower (around 1 t/ha of dry cones) than in the other two major producers, i.e. Germany (1.5-1.7 t/ha) and the US (around 2 t/ha), where less fine but higher yielding varieties are being produced. Until 1993 there was considerable neglect in renewal of hops plantations and they were getting old. Therefore, in 1993 MOA introduced a subsidy title for renewal of plantations. With this assistance were in 1997 renewed 1148 ha with predominantly new varieties.

In 1996 hops area decreased to 9,436 ha, and in 1997 even to 7,475 ha. This happened in response to worsened demand in domestic and foreign markets for very fine aromatic varieties. On the home front, higher beer prices resulted in increased consumption of lower degree beers whose brewing requires less hops. Also, domestically and internationally, breweries started using alternative technologies and preferred granulated hops, and hops extracts. For these reasons supply outstripped demand, producer prices did not cover production cost, and as a consequence some plantations were uprooted.

It became evident that varietal composition of Czech hops plantations has to change in order to keep pace with world’s brewery trend towards hops with higher content of alpha bitter acids in dry matter, which are more suitable for granules and extracts. A certain change of face has already started with introduction of newly developed, high yielding Czech hybrids with good disease resistance, and discussion also continues regarding the possibility of introducing some high performance foreign varieties. The general global business trend in brewing goes, much to the chagrin of true beer connoisseurs, in the direction of cheaper beers using smaller amounts of less fine hops.

<table>
<thead>
<tr>
<th>Year</th>
<th>Harvest area (ha)</th>
<th>Production (t)</th>
<th>Dry cones (t) Import</th>
<th>Export</th>
<th>Extract (t) Import</th>
<th>Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>10468</td>
<td>10794</td>
<td>312</td>
<td>8400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1991</td>
<td>10385</td>
<td>9827</td>
<td>967</td>
<td>8984</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>1992</td>
<td>10522</td>
<td>8536</td>
<td>1587</td>
<td>10965</td>
<td>120</td>
<td>34</td>
</tr>
<tr>
<td>1993</td>
<td>10574</td>
<td>9417</td>
<td>1339</td>
<td>8090</td>
<td>70</td>
<td>32</td>
</tr>
<tr>
<td>1994</td>
<td>10687</td>
<td>9489</td>
<td>453</td>
<td>7492</td>
<td>165</td>
<td>14</td>
</tr>
<tr>
<td>1995</td>
<td>10115</td>
<td>9889</td>
<td>698</td>
<td>6723</td>
<td>123</td>
<td>34</td>
</tr>
<tr>
<td>1996</td>
<td>9436</td>
<td>10125</td>
<td>656</td>
<td>7285</td>
<td>145</td>
<td>11</td>
</tr>
<tr>
<td>1997</td>
<td>7475</td>
<td>7415</td>
<td>547</td>
<td>6039</td>
<td>193</td>
<td>38</td>
</tr>
</tbody>
</table>

Source: Ministry of agriculture

Czech domestic consumption varies between 1,000-1,300 tons of granulated hops annually. Excess production has to be exported. Given the ideal agroclimatic conditions in the main Czech hops producing areas and the vast professional experience of scientists, growers and processors, hops production has a continued good potential. The trend, which has already started, of modernizing the Czech varietal collection to higher yielding
strains with technological properties currently desired by major breweries should continue. Table 4.4 shows area, production and international trade since 1989.

Vegetables

Under the socialist system about five or six large scale agricultural enterprise groups produced about 70%, and procured some 90% of vegetables grown on Czech farms. The market was typically seasonal with major sales in the early fall. About 27 kg of fresh vegetables per capita moved through these marketing channels. In winter the offer was limited mostly to potatoes, onions, garlic, cabbage and root vegetables. Gradually, smallholder production and marketing was gaining in importance. The small producers supplied markets directly, their produce was fresh and attractive, and they usually could fetch better prices than official stores. In the eighties the average annual vegetable consumption was estimated at around 700,000 tons per year (about 47 kg/head).

In 1984 there were about 220 ha of greenhouses and close to 400 ha of plasticulture for production of vegetables, seedlings and flowers. However, greenhouse technology was outdated and highly energy inefficient. In 1989, there were still about 64 ha of greenhouse area left, but presently only about 20 ha are in operation. Modern, energy efficient greenhouses in warmer EU countries, and in North Africa, just do not seem to allow room for Czech competition. After 1990 vegetable processing decreased three times, from 150,000 tons to less than 50,000 tons. The main reasons were privatization of processing plants, coupled with disruption in management and supply channels, and increasing consumer preference for fresh vegetables.

After the dissolution of the socialist production and marketing chains, the Czech vegetable sector went through a crisis period. About 500 inexperienced and financially weak wholesale fruit and vegetable organizations were registered in 1992. However, due to their inefficiency, the Czech fresh produce market was to a large degree still supplied through imports. Although the Czech vegetable sector later adjusted somewhat better to market requirements in terms of a wider offer of produce, better packaging and storage, with the exception of a few specialized enterprises it still limps behind world standards. Particularly packaging and market presentation leaves to be desired. This creates suitable conditions for imports of even such produce which otherwise could be supplied from domestic production. Although fresh vegetable consumption is rising and reached 81 kg per capita in 1997, it is still considerably lower than in the EU where it is around 115 kg per capita.

The foreign trade balance in fresh vegetables is highly negative. In the period 1995-97 around 240,000 tons worth 2.5-3 billion CZK were imported annually, while exports lingered around 1,500 to 5,000 tons and had a value of 15-48 million CZK only. Major imports were onion, cauliflower, carrots, cucumbers, peppers, tomatoes, melons, and cabbage. The MOA included vegetables (and fruits) for 1997 and 1998 into the SGFFF program “Export.”

Production areas in the Czech Republic remained quite stable over the past six years, at around 35,000 ha. Cultivation includes 18 main vegetables, whose area was
greater than 400 ha, and about 1,600 ha of other, minor vegetables. Production oscillated between 481,000 (1992) and 613,000 tons (1996). In 1997 about 541,000 tons were produced. Yields of open field production were relatively mediocre in comparison with advanced western neighbors, and there were huge seasonal variations in some crops – e.g. the high for tomatoes was almost 26 t/ha (1991) and the low was not quite 12 t/ha (in 1997), and a similar difference was evident in cucumbers. Yield performance in the other kinds of vegetables was somewhat more stable. Figure 4.13 shows the range of yields of the main vegetables whose area surpassed 1,500 ha in 1997. For comparison are given German yields in 1997 (except for tomatoes where the yield is the three years mean of 1989-91).²

Growing conditions for vegetables are quite favorable in selected parts of the country, particularly in the lower river valleys in both Bohemia and Moravia. Supplementary irrigation, if and when needed, is generally available. It is quite realistic to increase competitiveness with open field western producers, particularly as long as the country will have a comparative advantage in cost of labor, for which vegetables have a high demand. Attention must be concentrated on improved genetic material, particularly hybrid seed in many of the crops, improved crop nutrition including organic materials where appropriate, adequate weed and pest control, timeliness of harvest and quality post-harvest handling.

Fruits

Fruits occupy an important place in Czech agriculture not only by the volume of their production but also by their possible export potential. The fruits grown in the country belong to the temperate group and consist mainly of apples, pears, cherries, sour cherries, prunes, apricots and peaches. Berries are also important, mainly red and black current, and gooseberries. Agroclimatic conditions for temperate fruit growing are favorable in many areas, and where supplementary irrigation is available, farms could be

² In 1997 the German tomato yield was 180 t/ha which, firstly, would not fit into the graph, and secondly there must have been a substantial share of greenhouse production which is not comparable to Czech conditions.
achieving satisfactory yields. However, the problems of fruit growing have been increasing in the past years and presently the sector is in a difficult situation.

Until 1989 the fruit market was mainly supplied from domestic production. After 1990 large, foreign commercial companies entered the market. For them the non-organized domestic producers were not suitable partners, because they could not guarantee a high quality fruit supply all the year over, and they also lacked market conditioning (e.g., sorting, calibration, packaging etc.). As a result, domestic wholesale and consumers concentrated on better sorted and presented temperate fruits from foreign suppliers. Simultaneously, there was a huge, backed-up demand for subtropical fruits hitherto rarely available on the market. Between 1990 and 1995 consumption of subtropical fruits increased by 220%, while demand for temperate fruits, mainly apples, dropped by 27%. This ratio was later slightly corrected, when apple prices declined due to high production, while subtropical fruit prices remained relatively high. Nevertheless, in 1996 almost 20 times more fruit was imported than was exported; the ratio dropped to 5 times more imports in 1997. As mentioned already in the case of vegetables, MOA included fruits (and vegetables) for 1997 and 98 into the SGFFF program “Export.”

It is estimated that at present more than 600 legal persons (cooperatives, commercial companies) are engaged in fruit production. Many of them are in dire financial difficulty, are reported to have an inadequate labor force, have outdated machinery fleets and obsolete cooling facilities. The average fruit producing farm has between 35-50 ha orchards. The mean area in the EU appears to be between 2-5 ha. Main managerial and financial problems in the Czech Republic seem to have the large, non-specialized farms, with sometimes several hundred hectares of orchards, which also engage in crops and livestock, with an apparent neglect of the orchards. It is estimated that cooperatives manage about 35% of intensive orchards; other legal persons, such as JSC and LLC 57%; and only 8% is in the hands of smallholders. It is hoped that the situation of fruit growers will improve with the establishment of the Association of Fruit and Vegetable Producers, for which MOA also prepared in 1997 a SGFFF program. The program is mainly aimed at procurement of modern harvesting, post-harvest handling, storage and market preparation technology. However, without better management and care for the orchards there will be little chance of improvement.

Total orchard area in the republic in 1998 is given by the Czech Statistic Office as 49,580 ha. Of this slightly over 19,000 ha (about 38%) are intensive plantations, which contribute most decisively to the supply of the market. Their area decreased since 1989 by 4,000 ha. Some 62% are smaller family plot and garden type orchards producing mostly for own consumption and limited localized market supply. Apples are the major type of fruits produced, they represent about 40% of all fruit trees, whose number is estimated at 49.5 million. Current annual fruit consumption is about 74 kg per capita, lower than in Germany and France but higher than in the UK and Denmark. This translates into an annual consumption of about 750,000 tons.

Since 1989 a major problem has been the aging of orchards. The cost of renewal of one ha orchard is estimated at 0.2-0.5 million CZK (about ECU 6,000-16,000), depending on kind and density of plantation. MOA estimates that an annual replanting of
at least 800-1,000 ha would be required to regain the orchard area of 1990. In view of the high cost of replanting MOA introduced in 1995 a subsidy title for renewal of orchards. The intention is to speed up rehabilitation of orchards before entry into the EU, when replanting and possible extension might become more difficult. Average yields are very low when compared to the EU. The main reason is precisely the old age of orchards, but also inadequate management and technology. It is estimated that some 35% of apple orchards, 67% of pears, 36% of apricots, and 17% of sour cherries are older than 24 years, generally considered to be the economically productive life of a fruit tree. This unfavorable situation is compounded by the neglect of many orchards due to the transformation process.

Overall production declined from 594,000 tons in 1989 to 414,000 tons in 1997, but it was well below 400,000 tons in 1994-96. Clearly, productivity is a major problem in Czech fruit growing and a whole range of actions will be necessary to increase competitiveness. Among them surely belong rejuvenation of plantations with high quality, high yielding, pest resistant genetic material, much improved management, including first class pruning, crop nutrition, pest control, supplementary irrigation as and when necessary, timely and careful harvesting, professional post-harvest handling and storage, sorting, calibration and attractive packaging for the market. Without these interventions there is little hope for competition with advanced fruit growing countries, east or west.

**Viticulture**

Grape and wine production has an old tradition and occupies an important place in Czech agriculture, though neither area grown nor quantity of wine produced is very large. In 1997 total vineyard area was 11,183 ha. The majority of vineyards are in southern Moravia, only 412 ha were grown in 1997 in Bohemia. About 24 wine varieties are registered and grown, of them 16 white and 8 red. The number of cultivated table varieties is six. Major varieties in 1998, i.e. those occupying at least 5% of area, are among the white: Mueller-Thurgau, Rulandske, Rhine Riesling, Walachian Riesling, Veltlin green; and among the red: Frankovka and Svatovavrinecke. Since the seventies, yields have been fluctuating between 3.2 t/ha (1997) and 7.8 t/ha (1975). These large seasonal fluctuations (Figure 4.14) would indicate that there might be room for improvement in pruning, trellising, crop maintenance nutrition and protection, and weed control. The 1997 yield was the lowest in a long time and was caused by frost, hail and a strong attack of Perenospora. However, quality was well above average.
About 79% of vineyards were in private hands in 1997, 19% belonged to cooperatives and the rest belonged to state enterprises and/or other forms of ownership. Table 4.5 shows the structure of ownership by size.

Domestic wine production fluctuated over the past seven years between 250,000 hectoliters (1997/98) and 687,000 hectoliters (1991/92). Annual domestic wine consumption stands at almost 16 liters per capita. Due to the abnormally low production, it is estimated that some 900,000 hectoliters will have to be imported in 1997/98.

Table 4.5: Structure of ownership of vineyards (Feb. 1998)

<table>
<thead>
<tr>
<th>Size (ha)</th>
<th>Registered owners</th>
<th>Area planted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nr.</td>
<td>%</td>
</tr>
<tr>
<td>0.03-0.05</td>
<td>1888</td>
<td>11.3</td>
</tr>
<tr>
<td>0.05-0.1</td>
<td>6250</td>
<td>37.4</td>
</tr>
<tr>
<td>0.1-1</td>
<td>8104</td>
<td>48.5</td>
</tr>
<tr>
<td>1-2</td>
<td>184</td>
<td>1.1</td>
</tr>
<tr>
<td>2-5</td>
<td>100</td>
<td>0.6</td>
</tr>
<tr>
<td>&gt;5</td>
<td>184</td>
<td>1.1</td>
</tr>
<tr>
<td>Total</td>
<td>16710</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Ministry of agriculture

Similarly as in orchards, a major problem for Czech vineyards is the increasing age structure. The average age in 1998 stands at 16.4 years. The actual vineyard area is able to supply in a normal year about 50% of grapes for domestic consumption of wine. However, recent vineyard rejuvenation does not even cover simple replacement. During the years 1990-97 a replacement deficit of 3,100 ha was accumulated, almost a quarter of total vineyard area. A subsidy title for vineyard replacement was introduced in 1994, but replanting is still seriously lacking. MOA estimates that for simple replacement it would be necessary to replant 600 ha annually, but in 1997 were replanted only 300 ha, and not more than 200 ha is expected in 1998. The principal reasons for the lack of interest in replanting may be assumed to be the high cost of replanting, the long delay in gaining full productivity, and the relatively low return on production. Further, some areas suitable for replanting still constitute state land. A hesitant land market and slow progress in land consolidation might be additional reasons. Yet MOA estimates that before the entry into the EU the Czech Republic should increase area to some 15,000 to 16,000 ha. As the actual situation indicates, without some extraordinary measures this is unlikely to happen.

Forage Crops and Meadows

Forage crops on arable land comprise mainly alfalfa in the more favorable areas with deeper fertile soils, and clover in less favorable areas. Both are usually undersown into a winter cereal, mostly wheat or barley. From the late seventies throughout the early nineties their area was more than 1 million hectares (well over 30% of arable land), however with the decline in livestock numbers their area decreased to some 786,000 ha (about one quarter of the arable area) in 1997.
The area of permanent meadows decreased from well over 700,000 ha in the fifties to under 500,000 ha throughout the eighties, as more marginal land was forced into annual cultivation by the then authorities. Since 1990, as a result of decreased animal numbers, and with sounder agricultural environmental policy, meadow area is on the increase again, reaching 641,000 ha in 1997. Reseeding of permanent meadows in marginal areas is also supported as a SGFFF program. Mean yields of hay fluctuate between 3.5 to 5 t/ha.

**Livestock Production**

The most striking feature of developments in the animal husbandry sector after 1990 was a quite profound change in livestock numbers. This change was preconditioned by the unrealistic price and support policy of the socialist system. Before 1990 consumer prices of livestock products were kept way below production costs of a majority of farms, and were supported by the state through direct subsidies and the so called “negative turnover tax.” An inevitable consequence of this policy was low productivity, when compared to western countries. For instance, mean milk yield per cow in 1989 was 3,980 liters, while the average of the EU was about 1,000 liters higher. However, the lower milk yield can be at least partially explained by the fact that cattle breeds kept were mostly dual purpose ones (for milk and meat), which traditionally milk less.

Registration of animals is not being carried out on a universal basis. Only breeding stock of cattle, pigs and sheep which are being tested for productivity, are entered into breeding books. Similarly, only poultry in breeding farms are being registered. Changes to universal animal registration are expected to occur with the approval of the Law on Veterinary Care, and the Law on Animal Breeding. The former might be still approved in 1998, the latter most likely in 1999.

The change in animal numbers (Figure 4.15) was most dramatic in cattle and sheep production, but pigs and poultry were also affected to a degree. Between 1990 and 98 cattle numbers decreased by 52% (from more than 3.4 million to less than 1.7 million), cows by 51% (from 1.3 to 0.6 million), pigs by 17% (from 4.8 to 4 million), sows remained stable (318,000), sheep went down by almost 80% (from 290,000 to 94,000), and poultry by almost 10% (from almost 32 million to 29 million), and hens by 20% (14.6 million to 12.3 million).

**Figure 4.15: Changes in number of animals: 1980-98**

Source: CSO
The Cattle Sector - Milk Production

The importance of cattle for the human society is irreplaceable. The main contribution is production of food and raw materials, mainly meat and milk. Production of farmyard manure closes neatly the cycle with crop production, for which cattle is an important client. The by-product of hides is the source for several other industries with considerable employment.

The introduction of market economy in the Czech Republic in the early nineties was followed by a substantial decrease of domestic milk consumption due to consumer price increases caused mainly by the abolition of the "negative turnover tax." This got milk producers into a difficult economic position with which they still struggle. The fact that input prices rose much faster than producer prices, coupled with a lack of financial discipline and delayed payments by milk processors, aggravates the situation of milk producing farms. The dairy cow herd continued its decline, and milk yields were declining as well. This was a quite unusual situation, since culling usually selects less productive animals. The problem was the transformation process and restitution, in which even some highly productive cows were slaughtered by their new owners who did not want to farm.

The price liberalization, coupled with the introduction of VAT, and the dissolution of the Czechoslovak federation limited domestic consumption of milk and its products. There was also increasing competition from EU importers. While in the eighties imports accounted for barely 1%, they rose up to 7% of consumption in the nineties. The difficulties in domestic milk sales led to overproduction which had to be exported. Subsidized exports materialized with the assistance of the SFMR, whose main aim it was to ensure a relatively balanced supply and demand. Table 4.6 shows the supply and demand situation in 1995-98.

Table 4.6: Supply and demand of milk: 1995-98 (million liters)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial stock</td>
<td>57</td>
<td>50</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>Production</td>
<td>3,031</td>
<td>3,039</td>
<td>2,703</td>
<td>2,645</td>
</tr>
<tr>
<td>Offer for processing</td>
<td>2564</td>
<td>2534</td>
<td>2419</td>
<td>2380</td>
</tr>
<tr>
<td>Imports</td>
<td>102</td>
<td>140</td>
<td>105</td>
<td>100</td>
</tr>
<tr>
<td>Total supply</td>
<td>2,723</td>
<td>2,724</td>
<td>2,564</td>
<td>2,516</td>
</tr>
<tr>
<td>Domestic consumption</td>
<td>1,840</td>
<td>1,909</td>
<td>1,881</td>
<td>1,850</td>
</tr>
<tr>
<td>Exports</td>
<td>833</td>
<td>775</td>
<td>647</td>
<td>626</td>
</tr>
<tr>
<td>Final stock</td>
<td>50</td>
<td>40</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>Imports (% of consumpt.)</td>
<td>5.5</td>
<td>7.3</td>
<td>5.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Exports (% of dom.offer)</td>
<td>32.5</td>
<td>30.6</td>
<td>26.7</td>
<td>26.3</td>
</tr>
</tbody>
</table>

Source: CSO

The economics of the cattle sector worsened in 1996. The disproportion between input and producer prices increased. A number of farms decided to liquidate their milk herds during 1966 and 97 because of the slow rise in milk prices and stagnation of beef prices. The number of pure milk cows dropped further and was only some 600,000 by the end of 1997. Milk producers have realized their unhealthy dispersion and started forming marketing associations in order to strengthen their position towards milk plants.
Government also realized the difficult position of the milk sector and introduced measures towards stabilization of the dairy herd and economic improvement of producers. Government is supporting a guaranteed price for first class milk and further assists in subsidized milk exports. A new subsidy has been introduced to support dairy cows with a milk yield of over 4,500 liters. There is also a title in the SGFFF aimed at encouraging construction of modern stables equipped with advanced technology.

The first quarter of 1998 indicated the beginning of a possible halt in the decrease of milk production. Though the number of dairy cows dropped to a mere 577,000 (a further 11% decrease from 1997), daily milk yields were satisfactory (10% higher than in 1997) and appeared to compensate for the smaller herd (Figure 4.16). The profitability of raw milk and beef increased. There is an adequate forage base thanks to a good harvest in 1997.

From the technical point of view, the main issue in the Czech dairy industry still appears to be comparatively low output, despite the fact that yields are showing consistent growth. The 1995-97 three year mean in the Czech Republic was a quite respectable 4,470 liters per cow, but in Hungary during the same period it was 5,197, in Germany 5,488, and in Holland even 6,513 liters. Better dairy farms, which have already adjusted the genetic composition of their herd to milk breeds, from the earlier dual purpose cows, are also achieving yields of around 6,000 liters/cow and more. There appears to be a case for specialization of farms into dairy, which have a comparative advantage through proximity to markets, ability of cheap forage supply, an appropriate genetic composition of the herd, modern housing for the animals, including advanced milking and cooling technology, and knowledgeable management.

**The Cattle Sector - Beef Production**

Until 1989 most beef production originated in large scale socialist enterprises. The main goal put in front of managers was the largest possible volume of production. Little was thought about cost and labor productivity. This careless approach to economy had to change fundamentally with the advent of the market system. After 1990, apart from serious problems which were created with transformation and restitution in the primary cattle rearing itself, complications arose also with the unsuitable structure of meat processing industries. Problems started appearing with the geographic distribution of plants, with new ownership issues, and also to a degree with unsuitable technology. This all brought the cattle sector into a very difficult situation.
Another problem in cattle rearing is the slow and inflexible turnover of the herd. The use, until 1990, of dual purpose breeds proved disadvantageous for both milk and beef production. A typical characteristic of cattle rearing, in comparison with other domestic animals, is a higher demand for investment and labor, and a lower conversion of feed stuff, which makes beef relatively more expensive. However, with the rapidly declining cattle numbers and fast slaughtering in the early nineties, there was suddenly an oversupply of beef. Interventions by the SFMR for meat procurement and subsidized exports became necessary. The situation was compounded by wide-scale slaughter of dairy cows, whose meat is difficult to sell to more demanding consumers. The interventions of SFMR ceased in 1993, but were resumed again in 1997.

Government oriented its support to cattle rearing in poorer, mountainous and sub-mountainous areas. The year 1994 saw the introduction of subsidies for meat breeds in these areas. The result was (Figure 4.17) an increase in the number of cows “without market production of milk” which rose from 38,400 tons 48,400 over the period 1996-98. However, a constraint to the more prominent expansion of purely meat breeds and to quality production of beef is, for the time being, the fact that aparative classification of carcasses (measuring the proportion of meat and fat) has not yet been introduced, which clearly puts the producers of quality beef at a disadvantage. Czech beef production should introduce the CAP propagated system of classification (SEUROP) which is precisely aimed at a fair remuneration of quality carcasses.

In recent years, the global beef industry suffered by the occurrence of the “mad cow disease,” or BSE (bovine spongiform encephalopathy). Most likely thanks to strict sanitary and veterinary regulations, the Czech Republic is one of the unaffected countries. This rather facilitated Czech exports of live animals and beef. In general, supply of beef always outstripped demand in the past years. This has also to do with the changing taste of the consumers, who are turning more to poultry and fish, but in the Czech Republic consumption of pork remains high. Despite a further reduction in cattle numbers, the oversupply continued and in 1997 the SFMR again assisted with exports.
Cattle numbers decreased (Figure 4.18) from almost 3.5 million to less than 1.7 million (-53%), sales of beef from 519,000 tons to 294,000 tons (-43%), consumption of beef from 483,000 tons to 271,000 tons (-44%), annual consumption per capita of meat on the bone from 30 to 17 kg (-43%), while weight gains in cattle fattening increased only marginally, from 0.75 kg/day in 1989 to 0.79 kg/day in 1996 and 0.77 kg/day in 1997. Consequently, the fattening time up to the slaughter weight of 540 kg is quite long. Between 3-4 kg of concentrate are required to produce 1 kg live weight. For comparison, weight gains in Germany are estimated at about 1 kg/day.

The reproduction results of the national herd have also become quite alarming. According to CSO data, in the whole decade of the eighties birth rates per 100 cows were between 105 and 107 and mortality rates were around 4%, resulting in more than 100 calves weaned. This was an extraordinary achievement for which sanitary conditions, zootechnical and veterinary services deserve high marks. Starting 1990 the situation worsened abruptly, with birth rates dropping below 100 and calf mortality rates shooting up into the low double digits, 12.3% in 1993, but still 10.1% in 1997. No doubt, the main reason is the disruptive transformation process, privatization of animals, and disruption of the earlier qualified care. Improvement of the reproduction statistics is one of the areas the cattle sector should pay attention to.

The Hog Sector - Pork Production

This sector characterized by certain features, different from the cattle sector which, after 1989, have assisted in a less problematic transformation. The main reason which has contributed to a relative stability in the sector is the faster reproduction cycle of the pig herd. The production of pork (Figure 4.19) is substantially more

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3 In Figure 4.18, weight gain has been multiplied by 10 for better graph clarity.
flexible than that of beef. It is possible in a shorter time to increase or decrease herd numbers, planning becomes generally more elastic and, dealing with shorter time intervals, also more precise. Although pork producers were not without problems, compared to beef there was no drop in consumption. Reasons which determined the stable consumer interest were threefold: first, in comparison with competitive meats, prices remained relatively low; second, quality was on the increase and became comparable to western imports; and third, pork has always been, and remains, a Czech favorite. Average annual consumption of pork (on the bone) per capita is estimated close to 50 kg, one of the highest in the world. For comparison, in the EU-15 it is just under 40 kg, and in the US and Canada around 25 kg. A relative overproduction of pork occurred only in 1992-94, when it came to some intervention procurement and subsidized exports with the help of the SFMR. Apart from that, the supply and demand situation was pretty balanced. A mitigating factor in the transformation process for the pig industry has been the fact that production is carried out in relatively recently constructed, modern, specialized large-scale enterprises, which were not subject to restitution.

A clear and constant threat in pig rearing relates to diseases. From this point of view, pig production is one of the most threatened among the livestock branches. Professional qualification of people in the pig industry should be high because protection of the herd is most demanding. So far, the Czech sanitary and veterinary system has succeeded in protecting the national herd from widespread infections, particularly from classical swine fever (hog cholera), which is one of the most devastating diseases. This has not been the case even in some of the most developed pig industries in the EU, which recorded in the second half of the nineties massive outbreaks. The situation facilitated exports of Czech swine and pork into EU countries.

Breeding and multiplication of quality genetic material, used for commercial production, was always well advanced in the Czech Republic. However, since quality genetic material is expensive, with the advent of market economy and in the quest for fast profits, some pig farms tried to replace quality breeding sows with animals of their own production. This had an impact on productivity, as documented by the stagnating weight gains in fattening, which at about 0.6 kg/day are estimated to be a good 10-15% behind gains in the EU. Birth rates of piglets fluctuated from 1990 to 97 between 18.15 (1992) to 19.50 (1994). Historically, birth rates came close to 20 in the eighties (19.82 in 1989) but they never exceeded 20 per sow. Mortality rates in the nineties were about 1-2% lower than in cattle, varying from 6.8% in 1990 to 10.5% in 1993. On the average they were, however, 2-3% higher than in the whole decade of the eighties.

An overview of the pig sector from 1989 to 97 is given in Figure 4.20 (weight gain multiplied by 10 for better chart clarity). It shows a decrease in pig numbers from 4.7 to 4.1 million; a modest increase in sows, after an initial decrease, from 312,000 to 322,000; an almost stable annual consumption per capita (46-50 kg) and relatively low, moderately fluctuating fattening weight gains (0.56-0.64 kg/day). The amount of feed concentrate required per 1 kg weight gain is estimated at 4-4.2 kg which is not satisfactory. Consequently, the time needed to reach the average slaughter weight of 116 kg is also too long and should be shortened.
Although pork quality appears to be improving, a system of classification and remuneration of carcasses based on quality, similar to or identical with the EUROP system in the EU, has not yet been introduced. It would be advisable to do so speedily.

In order to support maintenance and improvement of genetic material state subsidies have been available already since 1993. Apart from that, pig producers have also access to programs of the SGFFF. The swine sector is in relatively good shape in the Czech Republic. However, as indicated above, some improvements in genetics, weight gains, conversion ratios, fattening time, and carcass classification, as well as overall consolidation of the sector should be achieved before entry into the EU.

**Poultry and Egg Production**

In the mid sixties the poultry sector was transformed to large-scale production. It became the most dynamic sector in livestock husbandry whose production steadily increased until 1990. After 1990, with the ongoing transformation process, chicken, turkey, duck and goose numbers declined and production of poultry meat decreased. Most reduced were the numbers of ducks and geese. In the early nineties government assisted with subsidized exports of excesses of poultry which became available due to lower pork prices. After 1992, the SFMR never intervened again, because the poultry flock and meat production decreased, mainly due to high prices of inputs, but partially also due to an outbreak of salmonella. In 1995 numbers in all categories, except geese, started increasing again and chicken numbers in 1998, for instance, are almost approaching levels of the eighties (29 million compared to 32 million in 1989 and 1990). Poultry meat production is based on imports of day old hybrid chicks from EU countries (Holland, UK, France). Domestic breeding of layers and broilers is rather limited. Also turkey chicks are being imported. Contrary to that, fattening of ducks and geese is based entirely on domestic genetic material. Government is actually supporting maintenance and performance testing of the genetic bank, which is reportedly perfectly comparable to UK or French material.

Annual consumption of poultry meat in the Czech Republic is at about 15 kg per head, comparable to Austria and Germany, but is somewhat lower than the average of the EU which stands at around 20 kg. For comparison, in the US it is estimated at 45 kg per capita. Domestic cost of production is reportedly quite high, at 51.5 CZK/kg, which is
quite a bit more than in Germany, Italy and the UK. Only the production in France is some 6% more expensive. The quality of Czech production is comparable to the EU. However, with the entry into the EU poultry farmers will have to adjust to EU housing standards (an increase in rearing area per bird by almost 100%) and decrease cost of production to be competitive.

The number of layers decreased between 1989 and 1996 by 3.7 million. Egg production (Figure 4.21) declined up to 1995 by over 19% and consumption per capita went down as well. Despite that, the Czech Republic ranked very high in annual egg consumption in 1997 with just under 300 eggs per person. In the US the consumption is under 250 and in Germany around 220 per capita.

Figure 4.21: Changes in number of layers and production of eggs: 1970-97

Services

Seeds, Quality Control, Variety Testing

Official seed multiplication, quality control and variety testing has a long history in the country. In 1997 Prague celebrated the 120th anniversary of the establishment of a Seed Control Station, only the eighth of its kind in Europe. Under the socialist system until 1989, seed multiplication was essentially carried out by two large socialist enterprises. “Oseva” was responsible for production of field crops, including hops and grapes, while “Sempra” organized multiplication of vegetable seeds, fruit trees, medicinal plants, flowers, and decorative trees. Both organizations had regional branches and a number of seed producing farms comprising enormous land areas. In addition, they had seed production contracts with hundreds of other farms. They also owned seed processing plants. Under socialism, a 100% seed replacement, even of open-pollinated crops, such as most cereals, was obligatory. Most of the seed used was produced domestically, imports were minimal.

After 1990, the seed producing industry very quickly privatized and the above two seed and planting material producing giants split into about 300 seed multiplication companies, and some 600 nurseries, of whom many have tenths of further contract growers. Domestic breeding is continuing in some of these companies, as well as in
research establishments. However, there seems to be a much greater tendency for screening and subsequent growing of imported genetic material. While domestic breeding should most definitely not be discouraged, it should only continue where it has comparative advantages, and where in the harsh reality of life it can prove its economic justification. Otherwise, for a small country it is often more profitable to import high quality material and reproduce it where possible, than to spend lots of funds and time on breeding facilities in the country.

Foreign capital has entered into some of the seed firms, such as Danish capital in multiplication of grass seeds, and German capital in sugar beet and potato seed production. While privatization and the emerging competition was without doubt a positive development, it also led to spontaneous overproduction and some decrease in seed quality. Domestic seed multiplication had also to face new challenges, such as financial weakness of primary producers, the growing amount of high quality imported seed and agricultural produce in general. Use of home grown seed has become much more widespread, and it is estimated that nowadays only about 40% of seed is being annually replaced.

Seed producers are trying to by-pass obstacles by taking some steps toward integration and consolidation. They established a Czech-Moravian Association of Breeders and Seed Producers which should coordinate the seed industry activities. As a partial indication of actual production, Table 4.7 below shows amounts of certified seed produced in 1997 for a few selected crops. According to mission estimates, the quantities of wheat, for example, would be adequate to cover some 65% of grown area, barley some 45%, maize 80%, rapeseed 100% +, and potatoes 30%. The difference is presumably either provided from home grown seed or imports. The total seed multiplication area decreased from about 282,000 ha in 1990 to 157,000 ha in 1997 (fruit trees, grapevine and hops not included).

Table 4.7: Seed production (1997)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Tons</th>
<th>For area %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>104,939</td>
<td>65</td>
</tr>
<tr>
<td>Barley</td>
<td>58,605</td>
<td>45</td>
</tr>
<tr>
<td>Maize</td>
<td>657</td>
<td>80</td>
</tr>
<tr>
<td>Rape seed</td>
<td>1,571</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Potatoes</td>
<td>48,998</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: UKZUZ

After a number of mostly developmental changes, the whole seed overview business was entrusted to the Central Institute for Supervision and Testing in Agriculture (UKZUZ), established in 1951. The institute is responsible for seed quality, among other responsibilities. The institute has seven departments: 1. Agrochemistry, Soils and Crop Nutrition; 2. Variety Testing; 3. Seed and Planting Materials; 4. Feed Stuffs; 5. Hops; 6. Laboratories; and 7. Economics and Administration. UKZUZ (department 2 and 3 mainly), research institutes, and the many private seed and planting material producing firms, as well as foreign seed importers and their variety demonstrations, are a very useful source of advice and information for farmers on properties of new genetic materials.
The Variety Testing Department is responsible for evaluating and approving new genetic material. As in the EU, all entries are judged by the DUS method (distinctiveness, uniformity, stability). The economic usefulness is judged only with cereals, root crops, grain legumes, oilseeds, and forage crops. The department is responsible for annual issuing of a Register of Varieties, entered into the State Book of Varieties of the Czech Republic. The latest issue is dated August 1, 1998. In 1997 the department received over 500 applications for registration of new varieties, over 1800 entries are under observation and almost 300 varieties were registered. The department is quite active in extension through lectures, seminars and a busy publication activity. It is an active member of UPOV, participating in about five working groups, as well as in management. The department works closely with the State Phytosanitary Service in an early warning system of pest occurrence.

The Seed and Planting Material Department is responsible for the registration of seed and planting material producers and in general for seed quality control. It has 62 seed inspectors who controlled the 157,000 ha of multiplication area in 1997. It issued almost 27,000 seed certificates, of which about 2,500 for export, in accordance with OECD and ISTA rules. The department is a member station of ISTA (International Seed Testing Association) and represents the Czech Republic in the OECD.

An issue appears to be production of “black” seed (illegal production without license) of open pollinated crops mainly, and weak enforcement in protection of breeders’ rights; and further the low seed replacement rate. These issues should draw attention of authorities to their solution.

The Czech Republic has passed recent seed legislation – the Law on Varieties, Seeds and Planting Materials of Cultivated Crops (law Nr.92 of 1996). The law has been drawn up in compliance with EU guidelines. The law is detailed, appears to be exhaustive and satisfactory. Given the active participation in the respective committees in the OECD, the close cooperation with ISTA and UPOV, and the up to date legislation, the actual status of the seed industry should pose no problem for the anticipated entry of the Czech Republic into the EU.

Pest Management and Phytoquarantine

The area of crop pest management has been vested into the State Phytosanitary Administration (SRS), a budgetary body statutorily established in 1996. It builds widely on the organization of the earlier system of crop protection managed by UKZUZ. The pest management system under socialism was, however, considered rather vague in determining and enforcing the rules of phytosanitary care. Contrary to that, the SRS has been given enhanced professional and legal enforcement powers embodied in modern legislation. In line with the International Plant Protection Convention (IPPC) of 1951, which was signed by Czechoslovakia in 1981, the SRS thus represents government’s official authority in plant protection care and control. The Czech Law on Phytosanitary Care (Nr.147 of 1996), complemented by several ministerial rules on implementation, is a thorough and serious document, already drawn up with respect to compatibility with EU legislation and with the anticipated entry of the country into the EU in mind. The SRS is responsible for testing of all imported means of crop protection, either directly or
on contract basis with selected institutes or farms. Testing is usually done for three years, exceptionally two, before the pesticide gets registered. A further obligation of the SRS is the issue of a Register of Pesticides. The most recent issue is dated April 1998. It is a comprehensive publication giving all the required and necessary information, such as brand name, chemical name, content of active ingredient, formulation, toxicity to men, bees, fish, registering company, recommended concentration, time and method of application for the control of diverse pests, description and recommended operation of approved sprayers, recommended protective clothing and other gear, and a number of other data useful to farmers.

The SRS is also very active in the advisory and extension field. Apart from professional advice from headquarter staff, farmers get frequent advice from regional and district field staff, as well as from laboratories. Apart from that, the SRS published in 1997 a very detailed Handbook of Methodology in Crop Protection in two volumes, which gives symptoms of pest occurrence, economic importance, biology including host plants, reproductive cycle, ecology, detailed description of pests, and best protection methods.

The Administration has seven regional departments, 72 district divisions, and 25 border and/or point of entry quarantine inspections. It has 3 departments and 5 divisions in headquarters, three of which report directly to the Director. They include the Legal and Foreign Relations Department, the Department of Pesticide Registration, and the Economics and Administrative Division. The Deputy Director manages the Department of Informatics and Education, the Division of Quarantine and Phytosanitary Supervision, Division of Monitoring and Regulation of Harmful Organisms and Disorders, Division of Diagnostics and Plant Protection Systems (including IPM - the Integrated Pest Management, and a network of early warning systems), Division of Plant Protection Products and Means of Application, and the regional and district units, laboratories and point of entry quarantine services. Total staff is estimated at about 500 people.

IPM is more widely used in orchards and vineyards, in greenhouses, and to a lesser degree in annual field crops. There is an Association of Integrated Fruit Producers, and an IPM Association of Grape Growers, who practice IPM on several thousand hectares. There are three larger producers of biopesticides.

The SRS works in close collaboration with the FAO and the European and Mediterranean Plant Protection Organization (EPPO). By all accounts, pest management in the Czech Republic appears to be well organized, competently legally funded, and geared and ready for the Czech entry into the EU.

**Agrochemicals**

Just as in advanced western markets, the most modern agrochemicals are readily available anywhere in the Czech Republic. Suppliers are many and competition is fierce. Many of the suppliers also provide a good source of advisory services in their field.

Fertilizers have to be registered. UKZUZ issued a comprehensive Register of Fertilizer in 1998, which gives nutrient content, form, producer and registration number
of the fertilizer. As can be seen below, despite the ready availability use of both, fertilizer and plant protection chemicals, has decreased substantially since the second half of the eighties. Main reasons for this are the financial weakness of farms, and the much faster growth of input than producer prices, which to a great degree is responsible for the farmers' insolvency.

Of significant concern is the enormous drop in the use of fertilizer. The average Czech soil is not very fertile, and without appropriate rates of fertilizer the natural soil fertility is being mined. The result is a declining ability to produce crops. The lack of fertility maintenance and enhancement is responsible to a great degree for the general stagnation of Czech yields, and also helps to explain the often very significant difference between Czech and EU yields, which can be up to 50% and more.

**Figure 4.22** shows that the average application of 260 kg/ha of pure nutrients in 1981-85 dropped to an alarming 77 kg/ha in 1997. Moreover, while the NPK ratio in the Eighties was the recommended 1:0.8:0.8, it decreased now to 1:0.2:0.2, showing a drastic imbalance of nutrients. Equally negative is the much decreased use of lime and increasing acidification of soils. While 2.8 million tons of lime were used in 1989, in 1997 it was only 300,000 tons. Unless the Czech farming community starts appreciating the importance of fertilizer very quickly, productivity will sink even further and the gap with the EU will widen even more. In the EU the fertilizer application rates per ha are at least 2-3 times higher than in the Czech Republic.

The situation in terms of plant protection is similar to fertilizer. In 1985 the application of active ingredients (a.i.) was 10,575 tons; in 1997 it went down to 3,908 tons. At the same time, the use of active ingredient per ha declined from 2.42 to 0.91 kg. In the EU use of 2 kg/ha a.i., and often substantially more, is frequent. While this low use in the Czech Republic is not necessarily a bad sign it is, at this low development stage of IPM, a strong contributory factor to lower yields. **Figure 4.23** shows this trend. The main issues are: the low rates of applied fertilizer; and acidification of soils, mainly in northern Bohemia due a high impact of acid rains. The second issue might merit a subsidy for procurement and application of lime.


**Agricultural Mechanization**

Until 1989 almost all machines were of socialist country origin. Ninety percent of tractors were Czech made (Zetor and Skoda/Liaz), the rest were imports from the GDR and the FSU. The majority of auxiliary equipment was also of domestic origin. Grain combines were 90% from the GDR, the rest mostly from the FSU. Statistics show a decrease in almost all machine numbers from their height in the second half of the eighties to the status in 1993, the last year for which official data are available. At the same time, due to slower replacements of machines, their age structure was increasing, in some cases well beyond their anticipated economic life. However, the agricultural survey (Agrocensus) carried out by the RIAE in 1995 indicates an increase in numbers again, in many machine types close to the level of the Eighties.

The new machines bought were mostly technically modern products of domestic and western provenience. In tractors the trend is towards more powerful machines, in the over 100 kW category, which can replace, particularly in the time-critical soil preparation period, several smaller tractors. They also can pull multi-operation combinators, decreasing the number of seedbed operations often from 5-6 to 2, thus saving time, energy, manpower, and reducing soil compaction. The trend is similar in grain combinators. Modern machines with powerful engines and wider swaths are replacing the GDR Fortschritt combinators, though those were among the best machines ever made in
socialist factories. Farms have quickly recognized that one modern western grain harvester can replace several Fortschritts, even those of the latest series. The fleet of sugar beet, potato and forage harvesting machines, as well as auxiliary equipment, such as ploughs, drills, mowers, etc. is being modernized, but slowly. As in other inputs, competition of suppliers and dealers is great. Farmers are perfectly aware of the advantages of modern mechanization and know very well what they want and need. The only obstacle to faster pace in modernization is the weak financial situation of most farms. Until mid 1997 the SGFFF supported procurement of new tractors and combines, but since then for self-propelled machines that assistance was discontinued. This was immediately reflected by a visibly lower inflow of new machines into farming. As a partial way out, leasing of machines appears to be on the increase.

The Research Institute of Agricultural Mechanization carried out a survey of tractor and grain harvester makes sold in the period 1994-97. Twenty different makes of tractors and eight makes of combines were identified in the survey. Table 4.8 shows the total numbers of new machines purchased. Among combines, Class had the largest share (23%-32%), followed by New Holland, John Deere and Massey Ferguson. In tractors, quite obviously the lion’s share belongs to the pretty good and reliable domestic Zetor.

Table 4.8: Purchases of new tractors and combines: 1994-97

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractors</td>
<td>1,065</td>
<td>1,077</td>
<td>1,308</td>
<td>1,224</td>
</tr>
<tr>
<td>Combines</td>
<td>213</td>
<td>300</td>
<td>539</td>
<td>327</td>
</tr>
</tbody>
</table>

Source: RI of Agric. Mechanization

As for the upkeep of machines, the dealers can usually provide very good and fast after sale service, such as more complex maintenance, repairs, spare parts, and they are also considered a good source of information and advice on technical and economic machine performance. Besides, each farm in the Czech Republic has a workshop and the larger farms, coops and commercial companies, usually have several skillful and experienced mechanics. Apart from that, for more complex repairs of mainly domestic machinery, there are privatized, specialized workshops which often work on an "exchange system" whose introduction meant a substantial drop in repair costs. This system is useful mainly in general overhauls of engines and other aggregates, such as front axles, gear boxes, starter motors, heating systems, fuel injectors, etc. The Czech Republic also has a State Testing Station for agricultural, food industry, and forestry machines. The State Testing Station was awarded an OECD accreditation for testing of tractors. Until 1997 all new machines had to be tested. Since then, the testing requirement of new machines is backed by the Law Nr.22 of 1997 on Technical Requirements of Machines, which has been adjusted to EU regulations. Accordingly, with advancing technology improvements and increasing confidence in the quality of machines, many new ones are not tested any more but are rather sold by importers on the basis of a "Declaration of Agreement."

The country has a developed agricultural machinery producing industry which was able to cover the production of basically any machine required. However, first the Comecon system, and later market economy led to greater specialization with the result that particularly heavier types of machines, such as high powered tractors and complex
harvesters are not being produced. Despite that, the Czech market is unable to sustain most of the producers, who are depending for survival on international cooperation and exports.

Water in Agriculture

The government organizations responsible for water management are defined by law (Nr.122 of 1997 and 458 of 1992) and comprise the Ministry of Agriculture and the Ministry of Environment. Through these laws MOA received a rather wide mandate which includes: management of major waterways; management of minor waterways and forest creeks; management of amelioration of agricultural and forestry land, including drainage and irrigation works and their systems, ponds and small water reservoirs; management of public water supply and public sewage systems. The Ministry of Environment cares for natural water accumulation areas, protects water resources and quality of surface and ground water. Table 4.9 gives an overview of total water resources in the Czech Republic.

Table 4.9: Water resources

<table>
<thead>
<tr>
<th>Precipitation</th>
<th>Evaporation</th>
<th>Inflow</th>
<th>Outflow</th>
<th>Fresh water resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>mill m³</td>
<td>mill m³</td>
<td></td>
<td></td>
<td>000 m³/km²   m³/inhabit.</td>
</tr>
<tr>
<td>54,653</td>
<td>39,416</td>
<td>740</td>
<td>15,997</td>
<td>16,737      212  1,621</td>
</tr>
</tbody>
</table>

Source: MoA

Major waterways (14,910 km) are managed by five River Authorities (Labe, Vltava, Ohre, Odra, Morava) which have been transformed to joint stock companies but with 100% state ownership. Minor watercourses (33,999 km) in agricultural areas, as well as main irrigation and drainage works, are under management of the State Melioration Authority (also called State Land Reclamation Authority). The authority ensures operation and maintenance of irrigation and drainage systems, and prepares materials for resolving water management problems in basins. The Forestry Administration manages another 19,730 km of smaller watercourses.

Privatization of the irrigated perimeters is being managed by the Land Fund and has progressed satisfactorily. By the end of 1997 two thirds of irrigated areas including works were privatized, and privatization has been almost completed. For protection of their interests, the farmers using irrigation have established the Czech Irrigation Association.

Irrigation is only complementary in the Czech Republic, and though it is available on some 132,000 ha of agricultural land it is rarely used on more than half of the potential area. In the period 1991 to 97, for instance, irrigation was used in the various years on 12 to 44% of potential area. Also the relatively low amount of water used indicates the complementary nature of irrigation, it varied from 531 to 954 m³/ha. Thus, the agricultural share of water use is relatively minor; in 1997 agriculture consumed 0.7% of total surface water and 1.3% of groundwater. All irrigation is based on underground pressurized systems with surface valves.
By contrast, drainage is in terms of area much more widespread, the area drained in 1996 was 1,080,111 ha, or about 25% of agricultural land. Districts with most drained land (>30%) are mainly in the southern, northeastern, and eastern part of the country, while supplementary irrigation is mostly used in vegetable and fruit producing areas along river valleys in southern Moravia and central Bohemia.

The main issues identified as of the national scale concern are: (a) the competency areas of the two ministries responsible for water which are thought to be not clearly enough defined in some areas; the monopoly positions of the River Authorities; and (b) the monitoring of irrigation water quality. More localized issues, though of national importance, are the aging irrigation and drainage works, replacement of underground asbestos irrigation pipes (believed still to comprise about 50% of the network), and perhaps the introduction of flowmeters for more precise water use measuring (currently water use is deduced from electric energy consumption).

**Veterinary Services**

Veterinary services are provided by the State Veterinary Administration (SVA) and by a number of licensed private veterinarians. After 1989 the SVA went through a considerable slimming process. From more than 9,700 employees in 1989, by 1995 the number decreased by about 75%, to some 2,267. The principal terms of reference of the SVA are to fight animal diseases, to ascertain the well being of the animal population, and last but certainly not least to ensure the wholesomeness and unadulteration of animal and animal-based food to protect human health.

The SVA is headed by a Director General (Chief Veterinary Officer) who reports directly to the Minister of Agriculture. At headquarters at MOA in Prague the SVA consists of six departments and three divisions. The departments are: 1. Animal health and reproduction; 2. Veterinary hygiene, public health and ecology; 3. International negotiations and veterinary protection of the state territory; 4. Information retrieval systems; 5. Economics; and 6. Legal and personnel. The divisions are: 1. DG’s advisors; 2. Control and laboratory diagnostics; and 3. European integration. In the field there are eight State Veterinary Institutes, roughly coinciding with seats of the earlier provincial administrations, there is an Institute for State Control of Veterinary Drugs (in Brno), and there are 74 District Veterinary Administrations, which include 16 border and inland Veterinary Inspection Posts. For the past five years instant communication between all the veterinary units has been ensured through a dedicated e-mail computer network. After the very substantial decrease in personnel, the SVA gave up the provision of veterinary clinical care to the Czech farming community. The routine veterinary care is now being performed by private veterinary doctors, whose number is estimated at about 2,500. In a majority of the districts have been established Veterinary Chambers, which facilitate interaction of the state and private veterinary establishments.

The epidemiological situation in the Czech Republic is reported as stabilized and favorable. There was recently a brief localized outbreak of classical swine fever in one southern Moravian district in 1997, which was quickly eradicated. Recent national serological surveys are negative. In backyard kept chicken there was a limited outbreak of Newcastle disease in early 1998, again quickly eradicated. The Czech Republic,
compared to other European countries, is also free from a number of bovine Office International de l'Epizootie OIE group B diseases, for which the EU requires official trade guarantees.

Issues to be solved are the finalization of the modern, EU adjusted Law on Veterinary Care, expected to be approved by mid-99 at the very latest; and ensuring continued financing for oral vaccination of forest animals (foxes mainly) against rabies. In general, the SVA appears as being well organized and competent. This is also reflected by the relatively very good sanitary and health situation of the animal population. The SVA is clearly gearing up to ensure a smooth integration of its service into the EU.

Agricultural Education

Universities

There are two full agricultural universities, with a number of faculties (schools), in Prague and in Brno, and there is also an agricultural faculty as part of the Southern Bohemia University in Ceske Budejovice. Further, there is a Veterinary and Pharmaceutical University in Brno. The Czech University of Agriculture (CZU) has four faculties: economics, agriculture (including agronomy, phytopathology, livestock husbandry), technical (mechanization), and forestry. Brno is similar, except that it does not have a technical faculty, but has one specialized in horticulture. The number of students in Prague is about 7,000, in Brno 5,500, Ceske Budejovice 1,500, and the Veterinary University has also about 1,500 students. Contrary to the lower grades of agricultural schools which fall under the MOA, universities are managed by the Ministry of Education.

In the CZU the number of students doubled since 1990. Presently, some 3,500 students study economics, 1,500 agriculture, and 1,000 each the technical and forestry faculty. Interest in studies at the CZU is high; in 1998 there were 10,000 applications, only 1,500 were admitted. Major interest was in economics with 12 times more applicants than were places, followed by agriculture and forestry – 3 times more, and the technical faculty – 2 times more. The interest in the CZU is so great because it has diversified in response to the market, and offers apart from classical agricultural disciplines also specializations such as environment, landscape protection, agroprocessing, agrobusiness, technical services, waste management, foodstuff quality, and lately also European agrarian diplomacy. The CZU has also an Institute of Tropical and Subtropical Agriculture. A recent survey done by the CZU showed that about 10% of graduates enter primary production, the rest is in business and services. Forty to fifty percent of the graduates work in or for agriculture, 30% in related disciplines and 10% completely outside agriculture.

Universities are budgetary organizations, but have also income from contract research, advisory services, and teaching farms. The CZU, for instance, requires from academic staff 1/3 teaching, 1/3 research, and 1/3 advisory and extension services.
Evaluation of academic staff is thus also based on research, advisory and publication results, which are translated into contract salaries. Along this line, the CZU is also running an Education and Advisory Center which is giving short and long (up to 2 years) courses for farmers. The CZU has about 200 professors and 250 lecturers. International contacts are widespread, including visiting professors (3%-5% of all lectures - e.g. Europe, USA, Taiwan), cooperation agreements with Wageningen, Paris, Humboldt, Vienna universities, 300 Ph.D. candidates (Germany, USA, Kenya, Sweden, Spain), hydrology courses for UNESCO, digitalization of soil maps for the EU and FAO, summer schools for Missouri, Ohio universities etc.

Technical Education

In the technical education area under MOA there is an ongoing process of optimization. During 1996 were closed and/or handed over to the Ministry of Education a further two integrated agricultural high schools, nine middle apprentice schools, and one center of practical education. In 1997/98 the attendance in technical and vocational agricultural schools is about 32,700 students. Of these, about 58% study various service subjects, 27% study agricultural subjects, and the rest are forestry, foodstuff, ecology, and family husbandry students.

MOA is also organizing, via its district offices and district units of the Chamber of Agriculture, a number of educational activities for adults. These include seminars on the various laws in agriculture, farmer winter schools, publication of advisory brochures (which are, by the way, excellent and encompassing almost any agricultural field), production of videocassettes, regular TV programs, and participation in a number of agricultural expositions. In 1997 MOA has also issued a very comprehensive Handbook for Farmers and Agricultural Advisors in two volumes, which gives exhaustive information on crop production and technology, animal production and technology, agricultural mechanization and buildings, including investment, operating and maintenance cost.

Agricultural Research

After the communist takeover in 1948 the then authorities introduced in research management the Soviet model in which all research institutes fell under the Czechoslovak Academy of Agricultural Sciences (CAAS). This system worked until 1961 when the CAAS was dissolved, and all more narrowly specialized and commodity institutes were put under the management of the directorate general of their respective branch, e.g. milk research fell under the DG of milk processing plants etc. The more polyvalent and multidisciplinary RI, such as crops, livestock, mechanization, economics were transferred under the MOA. With minor alterations this system worked until 1990.

4.1 After 1990 agricultural research underwent enormous changes. Basically all RI were affected by gradual drastic downsizing, reorganizations, refocusing and diversification of activities, many were privatized and some were even abolished. Out of
some 12,000 personnel only about 2,000 are actually remaining\textsuperscript{4}. All more specialized and commodity RI were privatized and mostly transformed into LLC. Research has generally become a minor part of their work and shrunk usually to contract research, mostly from MOA, for which it was necessary to compete. Therefore, in order to survive, many RI diversified into agribusiness (seed, mechanization, pesticides), advisory services, provision of complex crop services to farms (from soil samples up to harvest); breeding and sale of genetic material, own farming, even renting of real estate.

The more fortunate, multidisciplinary RI and service institutes are still financed to about 70-80\% from the MOA budget, get about 10-20\% from grants, and the rest they earn through own profit making activities (advisory services, specific research contracts from private companies, farming). There are two sources of grants: (a) one is coming from the Grant Agency of the Czech Republic, which is housed in the Academy of Sciences and which provides an estimated 10-12\% of funds for more basic agricultural research (tissue culture, genetic engineering); and (b) the other one originates from the National Agency of Agricultural Research, which is under the auspices of the Institute of Agricultural and Food Information (UZPI), a service institute of MOA, and provides grants for more applied types of research tasks.

As for CAAS, in the early seventies it was reestablished again as an advisory government institution. It stayed in this form until 1992, the time of the dissolution of the Czechoslovak federation. After that it became a research institution of MOA, with the main functions of: (a) advising the minister on research; (b) coordinating 11 main research branches; (c) coordinating the issuing of scientific publications; (d) guaranteeing strategy and priorities of research; and (e) coordinating of international cooperation in the field of agricultural research. Today’s CAAS is a lean body with only three permanent employees.

To conclude, the actual research establishment had to become, partly by design but more by default, a lean and mean sector focused on research priorities in response to the demands of the market, whether the market is provided by the MOA (mostly) or by some other client. In spite of the rather traumatic reorganization and reorientation of research many problems remain. The most pressing of them appear to be the lean financing, demonstrated in aging laboratory and field equipment, inadequate maintenance of infrastructure, material problems with ensuring adequate technology transfer, and last but certainly not least the generation gap. Scientists who survived the multiple downsizing are aging, and young professionals are not coming because the starting salary of a graduate is 7,000 CZK per month (about $230).

**Transfer of Technology**

On the actual Czech agricultural landscape there is no single, national level organization with direct responsibility for transfer of technology, and other extension and advisory work, and the mission believes there is no need for it. The organization

\textsuperscript{4}A small fraction of the 12,000 were actual researchers. For instance the Research Institute Krom had 1,100 employees but only about 100, including supporting personnel were actually working in the field of research while the others were involved solely in production.
originally created for state-wide extension in 1962 under the socialist regime, the Institute for Scientific Systems in Agriculture (UVSH), was disbanded in the second half of the eighties for lack of focus, professionalism, and efficiency. In the latter part of its existence it also became a repository for spent former managers awaiting retirement. The organizational structure of the institute’s field stations, which spanned the entire country, was gradually liquidated. However, some grossly reduced, but vital units of the UVSH are still in existence to date and appear to be continuing their advisory function even in today’s economically difficult climate.

It has to be emphasized that the situation in the Czech Republic is rather different from many other countries requiring a government organized, national extension service. First, the general educational level of the Czech farmer is rather high. Second, the rural areas are full of agricultural graduates from reputable universities. Each former socialist production cooperative, each state farm, and every other rural enterprise, had several tenths of graduates in crop production, crop protection, livestock husbandry, veterinary medicine, agricultural engineering, and accountancy and administration.

Universities produced numbers of graduates not only sufficient to fill the posts of chief officers in the coops and state farms, but in the latter years of the socialist system even farm, production unit, and brigade chiefs were recruited from the ranks of young graduates. The district agricultural offices had a staff of specialists in all relevant disciplines, specifically trained for professional advice. The seed production organizations (Oseva, Šempra), state animal breeding stations (SPP), state veterinary services (SVS), machine and tractor stations (STS), agricultural supply and marketing organizations (ZZNP), district agricultural laboratories (OZL), and agrochemical units (ACHP) disposed of a great number of well qualified and experienced graduates, part of whose terms of reference was providing advice to farms. The generous number of research stations, agricultural vocational and high schools, and academic staff of universities, all had advisory service as part of their terms of reference.

Many, if not most of these people are still working in one way or another in the rural areas. They have become private farmers, work in coops and commercial companies, sell seed and planting material, genetic material and feedstuff for livestock, fertilizer and crop protection agents, tractors and other machines, they have become private vets and pest management advisers. They are complemented by reduced but highly professional staff in district offices of MOA, in banks, in agricultural schools, in agroprocessing plants, in district offices of the Chamber of Agriculture. University and technical school teaching staff, research personnel, state crop protection agents, and state veterinary specialists are also available for consultations.

At present there is no need for additional advisory services. Where there might still be a weakness however, is education in agricultural business planning, market intelligence, accounting and taxation. The RI of agriculture in Kromeriz in Moravia, with the assistance of German specialists, and under the auspices of MOA, is organizing one year courses in training of trainers in these disciplines. The courses in “farm microeconomics,” are now in their third year. Reportedly, about 100 agents have already been trained. In addition, in 1998 MOA started supporting advisory circles according to the German example of “Beratungsringe” which appear to be precisely focusing on the
problems of farm management. These appear to be most valuable knowledge transfers which authorities should strongly support.

To conclude, a wide ranging and thoroughly professional source of technological advise is available all over the country. There might be need, however, for specialized "surgical" interventions in farmer education to keep them on a competitive edge, mostly in the areas of economics, finance, business management and legislation. To have well educated and knowledgeable farmers in the latter disciplines is becoming more necessary with the approaching accession of the country into the EU. Therefore, the above orientation on farm micro-economics is correct and should receive wide support. But also the more macro-economic issues, such as aspects of customs regulation, taxation, protectionism and international trade in general, should be included into teaching curricula.
### ANNEX I: AGRICULTURE BUDGET

#### Approved agriculture budget: 1993-1998

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Budgeting Institutions (BI)</strong></td>
<td>73,000</td>
<td>88,708</td>
<td>89,000</td>
<td>93,000</td>
<td>75,950</td>
<td>76,450</td>
</tr>
<tr>
<td><strong>Total Expenditures</strong></td>
<td>12,181,414</td>
<td>11,595,503</td>
<td>12,608,718</td>
<td>14,611,116</td>
<td>15,678,291</td>
<td>15,859,269</td>
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<tr>
<td><strong>Total Non-Investment (NI)</strong></td>
<td>9,014,314</td>
<td>8,918,903</td>
<td>9,795,318</td>
<td>11,409,616</td>
<td>12,575,291</td>
<td>13,800,454</td>
</tr>
<tr>
<td><strong>NI Expenditures &amp; Related Expenditures of BI</strong></td>
<td>2,139,990</td>
<td>2,259,562</td>
<td>2,400,011</td>
<td>2,306,582</td>
<td>2,385,838</td>
<td>2,326,917</td>
</tr>
<tr>
<td>of which: wages</td>
<td>689,025</td>
<td>714,551</td>
<td>739,923</td>
<td>857,903</td>
<td>964,527</td>
<td>916,807</td>
</tr>
<tr>
<td><strong>NI transfers total</strong></td>
<td>6,874,324</td>
<td>6,659,341</td>
<td>7,395,307</td>
<td>9,103,034</td>
<td>10,189,453</td>
<td>11,473,537</td>
</tr>
<tr>
<td>of which: NI subsidies &amp; loans for entrepreneurial entities, district authorities &amp; municipalities</td>
<td>6,210,000</td>
<td>5,800,000</td>
<td>5,600,000</td>
<td>6,953,500</td>
<td>8,010,000</td>
<td>9,632,830</td>
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<tr>
<td>of which: GF</td>
<td>0</td>
<td>3,500,000</td>
<td>2,100,000</td>
<td>3,154,400</td>
<td>380,000</td>
<td>3,350,000</td>
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<tr>
<td>district subsidies</td>
<td>5,800,000</td>
<td>2,300,000</td>
<td>3,500,000</td>
<td>3,799,100</td>
<td>4,210,000</td>
<td>6,058,000</td>
</tr>
<tr>
<td>of which: agrofood complex</td>
<td>5,100,000</td>
<td>1,600,000</td>
<td>2,700,000</td>
<td>2,495,600</td>
<td>2,910,000</td>
<td>5,128,000</td>
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<tr>
<td>Forestry</td>
<td>500,000</td>
<td>500,000</td>
<td>500,000</td>
<td>903,500</td>
<td>900,000</td>
<td>930,000</td>
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<tr>
<td>Water Economy</td>
<td>200,000</td>
<td>200,000</td>
<td>300,000</td>
<td>400,000</td>
<td>400,000</td>
<td>100,000</td>
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<tr>
<td>Coverage of Water Losses</td>
<td>410,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Flood Control Measures Program</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5,000</td>
</tr>
<tr>
<td>Flood Areas Identification Program</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
</tr>
<tr>
<td>Maintenance of Canals, Operation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>86,576</td>
<td>101,830</td>
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<tr>
<td>Anti-Flood Measures</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>19,554</td>
<td>23,000</td>
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<tr>
<td>Diet- without lipid</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4,000</td>
</tr>
<tr>
<td><strong>NI Subsidies to NGO</strong></td>
<td>77,280</td>
<td>91,000</td>
<td>91,000</td>
<td>93,200</td>
<td>85,200</td>
<td>75,900</td>
</tr>
<tr>
<td>of which: Citizens' Associations</td>
<td>35,000</td>
<td>35,000</td>
<td>35,000</td>
<td>35,200</td>
<td>35,200</td>
<td>38,200</td>
</tr>
<tr>
<td>of which: Other NGO</td>
<td>42,280</td>
<td>56,000</td>
<td>56,000</td>
<td>58,000</td>
<td>50,000</td>
<td>37,700</td>
</tr>
<tr>
<td><strong>NI Payments to BI</strong></td>
<td>587,044</td>
<td>768,341</td>
<td>1,704,307</td>
<td>2,056,334</td>
<td>2,094,253</td>
<td>1,760,807</td>
</tr>
<tr>
<td><strong>Total Capital Expenditures</strong></td>
<td>3,167,100</td>
<td>2,676,600</td>
<td>2,813,400</td>
<td>3,201,500</td>
<td>3,103,000</td>
<td>2,058,815</td>
</tr>
<tr>
<td><strong>Expenditures of the BI</strong></td>
<td>65,100</td>
<td>71,100</td>
<td>85,000</td>
<td>155,000</td>
<td>183,000</td>
<td>167,300</td>
</tr>
<tr>
<td><strong>Contributed on Investments</strong></td>
<td>102,000</td>
<td>106,700</td>
<td>130,000</td>
<td>195,500</td>
<td>210,000</td>
<td>168,115</td>
</tr>
<tr>
<td><strong>Loans to Firms &amp; Municipalities, Water Economy</strong></td>
<td>3,000,000</td>
<td>2,498,800</td>
<td>2,598,400</td>
<td>2,851,000</td>
<td>2,710,000</td>
<td>1,723,400</td>
</tr>
</tbody>
</table>

1) Changes in the competency- to delineation from the Ministry of Environment during the year (it is not included in the amount of the approved budget 8,010,000 CZK)

2) Transfer from the Ministry of Industry and Trade

3) Changes in the finance of apprentice schools

Source: Ministry of Agriculture
## Annex 2: Czech Republic Policy Matrix

<table>
<thead>
<tr>
<th>Total Population</th>
<th>Food and agriculture GDP (1997)</th>
<th>2%</th>
<th>Agricultural output in 1996 as percentage of 1989 average level</th>
<th>72%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Population</td>
<td>Food and agriculture in active labor (1997)</td>
<td>4%</td>
<td>Livestock production in 1997 as percentage of 1989-1990 level</td>
<td>68%</td>
</tr>
<tr>
<td>Total Area</td>
<td>Food and agriculture in exports (1997)</td>
<td>5.4%</td>
<td>Share of livestock in agriculture (1996)</td>
<td>52%</td>
</tr>
<tr>
<td>Agriculture area:</td>
<td>traditionally net importer: animal feed, fruits, and vegetables.</td>
<td>6.9%</td>
<td>Agricultural area privately owned (1997)</td>
<td>81%</td>
</tr>
<tr>
<td>Arable land</td>
<td>Traditionally net exporter: livestock products</td>
<td></td>
<td>Share of independent private farms in total arable area (1997)</td>
<td>25%</td>
</tr>
<tr>
<td>Forested</td>
<td></td>
<td></td>
<td>Share of private sector in total agricultural output (1996)</td>
<td>99%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>STATUS OF REFORMS</th>
<th>OBJECTIVES</th>
<th>PROPOSED ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Macro-economic</td>
<td>Stable macro-economic environment and advanced structural reforms. High growth rate of 7.4%, declining unemployment of 10.9% and inflation of 6% (1996 figures).</td>
<td>Distortion free market and incentive system.</td>
<td></td>
</tr>
<tr>
<td>Framework for Agriculture</td>
<td>A. Prices/Subsidies</td>
<td>SFMR is turning into an obstacle to market development and ways to make its interventions less frequent and more predictable should be considered.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gradual expansion of private sector trade activity is needed to improve efficiency. With greater reliance on private trade, modern market-based risk management techniques (e.g., hedging of price risk) would soon develop.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum prices should be de-linked from production cost and their level should be gradually reduced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dairy quota should be phased out.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Income support payments to marginal areas should be gradually modifies from a per hectare basis to targeted support programs.</td>
</tr>
<tr>
<td>ISSUE</td>
<td>STATUS OF REFORMS</td>
<td>OBJECTIVES PROPOSED ACTIONS</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| B. Trade Policies | - Import protection is limited and gradually phased out following WTO commitments.  
- Most export and import licenses are automatic and for registration purposes only.  
- Export licenses are non-automatic for sensitive products such as cereals and flour, sugar, oilseeds and dry milk.  
- Average weighted import tariff for agricultural products is 6.9% (1992) excluding temporary import surcharge of 10%. Export surcharge phased out on January 1, 1995. | - Export subsidies should be phased out. |
| C. Taxation | - 6% VAT for agricultural and food products, 23% for other products.  
- Agriculture benefits from several exceptions to the Slovak tax code and tax reductions (e.g., 50% fuel tax rebate for farm vehicles). | |
| 2. Land Reform and Farm Restructuring | Transformation of collective farms and the privatization of state farms and most services have been completed. However, it will take more time for the new owners to turn obsolete production facilities into efficient enterprises.  
- Following their legal transformation in January 1993, most cooperatives have remained much the same as before. Cooperatives cultivate 70% of farmland.  
- Land market is dormant because of excessive fragmentation of ownership and high transaction cost. However, land use has not been affected by restitution as most land is leased and remains in large contiguous plots of at least 50 hectares.  
- Administration of land registration has improved considerably.  
- Restructuring and ownership consolidation of cooperatives is forced by poor financial performance either through voluntary reorganization or bankruptcy.  
- Privatization of state farms almost completed. | Efficient, internationally competitive private farms and an active land market.  
- Land ownership in cooperatives is highly fragmented and ways to facilitate consolidation should be considered. One option is to enable active members to swap entitlements for subsidies for payments to buy out land owners.  
- Ownership consolidation is essential for reducing land transaction cost, activation of the land market, and acceptance of land as collateral. |
<table>
<thead>
<tr>
<th>ISSUE</th>
<th>STATUS OF REFORMS</th>
<th>OBJECTIVES PROPOSED ACTIONS</th>
</tr>
</thead>
</table>
| 3. Competitive Agroprocessing and Services for Agriculture. | Privatization of agroprocessing and services has been completed. New owners will have to reduce cost and improve efficiency to maintain their market share against growing foreign competition.  
- Most agro-industries and services struggle with weak management, growing debt, and declining labor productivity.  
- Organized wholesale and retail markets for agricultural commodities and food are yet to develop. Food distribution systems are inefficient, transaction cost are high. For example, gross margins for basic commodities such as wheat are at least twice as high as in developed market economies.  
- Foreign participation in agroprocessing privatization has been modest. | Competitive and privately owned agroprocessing and input supply.  
- Continue to resist pressure by special interest for protection against foreign competition.  
- Continue to improve the enabling environment for business activity. |
| 4. Rural Finance | High risk stemming from undercapitalization, ongoing consolidation of ownership, high debt, and poor credit history, all mitigate against better access and more favorable credit terms in agriculture.  
- About 80% of financial needs in agriculture is covered from own-resources and 20% by commercial credit.  
- State Support Fund for Agriculture and Agro-industries (SSFAA) supports medium- and long-term investment in agriculture and agro-industries by interest rate subsidies (5% annual rate) and credit guarantees.  
- Working capital financing is offered against pledges on future crops guaranteed by commercial banks through forward supply contracts with processors.  
- SFMR is a source of working capital financing as farmers can sign contracts for future delivery against an advance to finance inputs.  
- Preparation of legal amendments and new laws is underway to improve collateral law including land mortgage law. | Access to credit should be improved using market-based instruments and techniques, and an efficient universal banking system.  
- Use of land as collateral is vital for agriculture to obtain better access to long-term investment financed by bank credit.  
- Speed up bankruptcy procedures and improve protection of creditors in cases of credit default.  
- Phase out interest rate subsidies.  
- Promote the emergence of competitive insurance services for agriculture. |
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<th>ISSUE</th>
<th>STATUS OF REFORMS</th>
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<td>5. Institutional Framework</td>
<td>Consolidation and adjustment of main agricultural institutions has been largely completed.</td>
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<td>• Number of staff in agricultural and food industry research establishment declined by 50% between 1990 and 1995.</td>
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<td>• Excessive but inefficient research facilities have been either closed or transformed into consulting services on a commercial basis.</td>
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<td>• Academy of Agricultural Sciences has taken over a coordinating and financing role in research.</td>
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<td>• A new concept for agricultural education is under preparation by a joint effort of the Ministry of Agriculture and the Chamber of Agriculture.</td>
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<td>• Institutions to monitor and enforce quality and health standards have been made more efficient but more needs to be done to meet strict EU requirements.</td>
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<td>Best practices in other countries should be applied, where appropriate, to improve efficiency in the provision of &quot;public goods&quot; to agriculture.</td>
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<td>• No specific recommendations have been made.</td>
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