Agricultural Knowledge Systems in the Transitioning Economies

A Survey of World Bank Experiences

Jitendra P. Srivastava and Christina Reinhard

Agriculture and Natural Resources Department
Agriculture and Forestry Systems
The World Bank

Consultative Group on International Agricultural Research
Agricultural Knowledge Systems in the Transitioning Economies
A Survey of World Bank Experiences

by

Jitendra P. Srivastava and Christina Reinhard

Agriculture and Natural Resources Department
Agriculture and Forestry Systems
The World Bank

Issued by the CGIAR Secretariat

1818 H Street, N.W., Washington, D.C. 20433, U.S.A.
Telephone: 1-202-473-8951 • Fax: 1-202-473-8110
E-Mail: CGIAR@cnet.com or CGIAR@worldbank.org

August 1996
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>iv</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>v</td>
</tr>
<tr>
<td><strong>I. Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td>Definition of Agricultural Knowledge System</td>
<td>1</td>
</tr>
<tr>
<td>Objectives and Scope of Work</td>
<td>2</td>
</tr>
<tr>
<td><strong>II. Research and Extension in Transitioning Agriculture Sectors</strong></td>
<td>3</td>
</tr>
<tr>
<td>Strategies for Competitive Agriculture</td>
<td>3</td>
</tr>
<tr>
<td><strong>III. Regional Trends in the ECA</strong></td>
<td>7</td>
</tr>
<tr>
<td>Group I</td>
<td>7</td>
</tr>
<tr>
<td>Group II</td>
<td>7</td>
</tr>
<tr>
<td>Group III</td>
<td>9</td>
</tr>
<tr>
<td>Group IV</td>
<td>9</td>
</tr>
<tr>
<td><strong>IV. Group I Country Profiles</strong></td>
<td>11</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>11</td>
</tr>
<tr>
<td>Hungary</td>
<td>16</td>
</tr>
<tr>
<td>Poland</td>
<td>26</td>
</tr>
<tr>
<td>Romania</td>
<td>34</td>
</tr>
<tr>
<td>The Slovak Republic</td>
<td>39</td>
</tr>
<tr>
<td><strong>V. Group II Country Profiles</strong></td>
<td>43</td>
</tr>
<tr>
<td>Albania</td>
<td>43</td>
</tr>
<tr>
<td>Armenia</td>
<td>51</td>
</tr>
<tr>
<td>Belarus</td>
<td>56</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>62</td>
</tr>
<tr>
<td>Croatia</td>
<td>67</td>
</tr>
<tr>
<td>Estonia</td>
<td>74</td>
</tr>
<tr>
<td>Georgia</td>
<td>79</td>
</tr>
<tr>
<td>Latvia</td>
<td>82</td>
</tr>
<tr>
<td>Lithuania</td>
<td>88</td>
</tr>
<tr>
<td>Macedonia</td>
<td>92</td>
</tr>
<tr>
<td>Moldova</td>
<td>98</td>
</tr>
<tr>
<td>Serbia</td>
<td>103</td>
</tr>
<tr>
<td>Slovenia</td>
<td>105</td>
</tr>
<tr>
<td>Ukraine</td>
<td>107</td>
</tr>
</tbody>
</table>
VI. Group III Country Profiles .................................................. 115

Azerbaijan ........................................................................ 115
Kazakhstan ........................................................................ 122
Kyrgyz Republic ............................................................... 126
Tajikistan ........................................................................ 129
Turkmenistan ..................................................................... 130
Uzbekistan .......................................................................... 131

VII. Group IV Country Profiles .............................................. 135

Russian Federation ........................................................... 135
The potential transformation of agriculture in the former Soviet Union (FSU) and in Eastern Europe (EE) is an exciting prospect for global agricultural development. The Consultative Group on International Agricultural Research (CGIAR) is, therefore, particularly interested in how agricultural transformation takes place in the EE/FSU regions. The CGIAR is currently assessing the possibility of participating in this process, through the development of new, research based technologies.

In this context, the CGIAR greatly appreciates the efforts of the Agriculture and Natural Resources Department of the World Bank to prepare this timely and comprehensive compilation. By drawing on the experience of those who have already been active in the EE/FSU regions, the Department has helped to clarify issues and will facilitate decisionmaking by the CGIAR and others with compatible interests.

The CGIAR, which was established in 1971, is an informal association of 52 members, including governments, international and regional organizations, and private foundations, cosponsored by FAO, UNDP, UNEP, and the World Bank. It supports the work of sixteen international agricultural research centers dedicated to promoting sustainable agriculture for food security. Research supported by the CGIAR has helped to increase the supply of basic foods, preserve the heritage of plant genetic resources, reshape food policy, and strengthen research capacity in many developing countries.

As part of a recently concluded renewal program, a CGIAR Ministerial-Level Meeting held in Lucerne (Switzerland) in February 1995 recommended that the CGIAR should consider expanding its mandate to include partnerships with national agricultural research systems in the EE/FSU regions. Key requirements for such a mandate would be the existence of a unique role for CGIAR to assist in sustainable agricultural development in the region, the development of a substantial program of work, and the availability of adequate funding.

To determine if the CGIAR has such a role to play, a Task Force is organizing consultative meetings, and is surveying members and other organizations, such as the World Bank, for background information on Eastern Europe and the former Soviet Union. The Task Force invited the Agriculture and Natural Resources Department of the World Bank to conduct a review of its country reports, project documents, sector reviews, and experiences of its staff in agricultural research and training in the EE/FSU regions.

This document responds to that request, and was presented in draft form at a regional consultation in Prague on May 6-7, 1996. The revised version incorporates additional information provided at the Prague meeting by country representatives and World Bank managers working in the field. It is an invaluable contribution to a process that can have positive and far-reaching results.

Alexander von der Osten
Executive Secretary
CGIAR
ACKNOWLEDGMENTS

The authors wish to acknowledge the encouragement and support they received from the Consultative Group on International Agricultural Research (CGIAR) Secretariat and the Task Force on Potential Collaboration with Eastern Europe and the former Soviet Union and Messrs. Alexander McCalla and Douglas Forno from the Agriculture and Natural Resources Department of the World Bank in the preparation of this report. Additionally, the authors wish to thank Messrs. Cole, Csaki, Gafsi, Goetz, Honische, Janakiram, Kodderitzsch, Lundell, Nadkarni, Nightingale, and Shuker of the World Bank for their comments and insights.

The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the CGIAR or to the World Bank, to their affiliated organizations, or to the members of the World Bank Board of Executive Directors or the countries they represent. The CGIAR and the World Bank accept no responsibility for errors.
EXECUTIVE SUMMARY

The Chairman of Consultative Group on International Agriculture Research (CGIAR) has constituted a Task Force (TF) to explore needs and opportunities for CGIAR involvement in the fields of agricultural research, training, and information dissemination in Eastern Europe and the former Soviet Union (FSU). The TF is focusing on an appropriate program which emphasizes areas of comparative advantage for CGIAR and which provides assistance in areas of priority for the region. The TF has requested the Agriculture Department of the World Bank (AGR) to supplement its analysis with a desk review of the World Bank’s experience and recommendations for improving agricultural research and training in the Europe and Central Asia (ECA) region. In response, this paper summarizes the status of agricultural development in twenty-six countries in the ECA Region, summarizes the importance of agricultural research and extension to their economies, and lists relevant World Bank projects and studies. Information for this document was obtained primarily through agriculture sector studies, working papers, project documents, country task managers, and personal experiences of the first author.

An agricultural knowledge system, also known as a national agricultural research system (NARS), is the combination of public and private institutions, enterprises, and educational organizations responsible for the creation, custody and social application of policy and research information to public and private entities engaged in agricultural activities. Agricultural research and extension are important components of the agriculture knowledge system which can create a competitive and efficient agricultural sector. Research and extension can contribute to the competitiveness of agriculture by reducing unit production costs; improving product quality or creating unique product characteristics; reducing environmental damage or other external costs; adding value to basic commodities; developing primary production technologies which are not easily transferred to competitors; and developing utilization technologies that add value to or enhance demand for agricultural products. Thus, the agricultural knowledge system has an important role in the agriculture sectors of Eastern Europe and the former Soviet Union (FSU). If these countries are significantly underinvesting in appropriate agricultural research and support services, they are in danger not only of spending scarce research budget resources inefficiently, but also of missing an opportunity to increase the competitiveness and productivity of their rural and agriculture sectors.

The paper makes a preliminary assessment of the World Bank’s involvement with agricultural knowledge systems in the ECA Region and in each country specifically, and treats agricultural research and extension as components of these systems. Where information is available, it has been presented in a country profile. World Bank lending in Eastern Europe began as early as 1985 and as early as 1992 in some countries of the FSU. In other FSU countries, lending has not yet commenced. Given this short history of involvement in the region, and the pressing macroeconomic, policy, and structural conditions which these countries must address, the World Bank began to focus attention on agricultural research and extension systems only in the past four years.

The inventory of World Bank sources revealed that, while conditions vary in each country, agricultural knowledge systems in ECA countries have the following general characteristics: emphasis on basic science over applied research; emphasis on output quotas over efficient production; large production units; high quality of scientists and research; lack of
‘client orientation’; professional isolation; public-sector dominance; financial unsustainability; and crisis management. The sources also suggest that the ECA countries can be categorized into four groups according to their progress in economic transition and the effectiveness of their agricultural knowledge systems.

In Group I countries, such as Hungary and Poland, agriculture sectors have been somewhat market- and export-oriented since the mid to late 1980s. In these countries, the World Bank has been involved in agricultural research and extension largely through the support and/or provision of services to new private agricultural enterprises to assist them in qualifying for Bank subloans. Some examples of these services are business planning and product marketing strategies. In Group II countries, where economies and institutions require more substantial policy reform and restructuring, the World Bank provides institution-building support for agriculture ministries and academies responsible for providing public sector support services. In Group III countries, whose economies face the greatest fiscal constraints, especially those where lending has only recently commenced, the World Bank is concentrating on policy and structural adjustments, irrigation, and other broad areas, and will explore the research, education, and extension needs of the countries subsequent to these efforts. In Group IV (Russia), the World Bank has given recent attention to the agriculture knowledge system. In addition to a review of the Russian research and extension system, the Bank is engaged in a number of activities which strengthen public and private capabilities in extension and focus on priority areas for research and extension within the context of other agriculture projects.
I. INTRODUCTION

The Chairman of the Consultative Group on International Agriculture Research (CGIAR) has constituted a Task Force (TF) to explore needs and opportunities for CGIAR involvement in Eastern Europe and the former Soviet Union (FSU). The TF may recommend an appropriate program which emphasizes areas of comparative advantage for CGIAR and which provides assistance in areas of priority for the region. Toward this purpose, the TF is surveying CGIAR member centers and other organizations, such as the World Bank for background information, experiences, and on-going activities in the Eastern Europe and the FSU. Specifically, the TF has requested the Agriculture Department of the World Bank (AGR) to supplement its analysis with a desk review of the World Bank’s strategies and recommendations for improving agricultural research and training in specific countries of its Europe and Central Asia (ECA) Region.1 The following paper responds to this request. The paper attempts to give a general explanation of the importance of agricultural research and extension to the transitioning economies. Next, it identifies the broad regional trends which have become apparent in the course of the World Bank’s experience in these countries. Following this, the paper presents country profiles which detail the specific activities of the World Bank in twenty-six countries in Eastern Europe and the former Soviet Union (FSU).

Definition of Agricultural Knowledge System

The paper makes a preliminary assessment of the agricultural knowledge systems in the ECA region and in each country specifically, and treats agricultural research and extension as components of these systems. An agricultural knowledge system is the combination of public and private institutions, enterprises, and educational organizations responsible for the creation and implementation of agricultural policy, and the creation, custody, and social application of basic and applied agricultural research information to public and private entities engaging in agricultural activities. An agricultural knowledge system has the following functions: generation and discovery of research, applied information and technology; custody and preservation of genetic material, knowledge embodied in human resources, and libraries and databases; transfer and transmission to scientists, educators, extension agents, farmers, and agricultural technicians; and implementation and exploitation of applied research, new technologies, and policies (Roling and Niels, 1991; Srivastava, et al, 1994).

---

1 The ECA Region is a World Bank term referring to that organization's institutional division which contains (among others) the Country Departments for most of the Central European, Eastern European, and Central Asian countries which formerly comprised the Soviet Bloc. ‘Eastern Europe and the FSU’ is the terminology used by the CGIAR to refer to the twenty-six countries which are discussed in this paper. For the purposes of this paper, however, the terms ‘ECA’ and ‘Eastern Europe and the FSU’ will be used synonymously.
Objectives and Scope of Work

The purpose of this document is to provide an inventory of World Bank experience in agricultural research and extension in twenty-six ECA countries. These are: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, the Former Yugoslav Republic of Macedonia (Macedonia), Moldova, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Federal Republic of Yugoslavia (Serbia), Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.¹

World Bank experience in this subsector of agriculture is comprised of analysis in specific country agriculture strategies, analysis in project appraisal and completion reports, analysis in informal documents and working papers, and the knowledge and experience of task managers. Thus, the information contained within this inventory is compiled from these sources. The amount of information reflects the Bank's level of involvement in each country. In some countries, work is in initial phases and no documents are available from which to draw conclusions. Other countries have not borrowed from the World Bank. Consequently, complete information is not available for every country.³

The country-specific information is organized into country profiles. Section A of the country profiles gives a brief background of the status of agriculture in the country. This is followed by a summary of World Bank experiences with agricultural knowledge systems in Section B. Whenever possible, the interpretation of country task managers was obtained for this section. Finally, the profile presents a listing of completed, ongoing, and pipeline projects with agricultural research and extension components in Section C, followed by a listing of World Bank documents which discuss agricultural research and extension in Section D.⁴ Where information is available, descriptions of relevant projects and analyses are given. Finally, some countries which attended the CGIAR Regional Consultation in Prague (May 6 and 7, 1996) supplied specific contact information for major agricultural research institutions. Where this information is available, it is included in Section E of the country profiles.

With the exception of a few forestry projects, this document limits itself to the crop and livestock subsectors of agriculture. Forestry and fisheries were not examined in depth.

² The World Bank has not completed an agriculture sector study for the Czech Republic, Serbia, the Slovak Republic, or Slovenia. Additionally, the Bank currently has no completed, ongoing, or pipeline agriculture projects in these countries. (There is a GEF-funded Biodiversity Conservation Project currently ongoing in the Czech Republic.) Consequently, all information regarding agriculture, research, and extension for these countries is compiled from personal communication with Bank personnel, external sources, and country representatives to the May 1996 CGIAR Regional Consultation in Prague.

³ The World Bank recognizes the importance of agricultural research and technology in reforming the agriculture and rural sectors in these countries and would like to work with the national governments and CGIAR to support this subsector.

⁴ World Bank computer listings of projects and documents may not include all recently finished, ongoing, or pipeline work. For this reason, it is possible that some of the recently finished, on-going, or pipeline work may have been omitted.
II. RESEARCH AND EXTENSION IN TRANSITIONING AGRICULTURE SECTORS

In all twenty-six countries included in this report, agriculture was a major contributor to the economy. Agriculture's contribution to total GDP in these countries ranges from 14 percent to 30 percent (Nightingale, 1995). In his Survey of Agriculture in Eastern Europe and Central Asian Countries, Nightingale compared the impact of constraints on the agriculture sectors of twenty-one ECA countries. Although priorities vary between countries, his survey indicated that for all twenty-one countries 'institutional weaknesses particularly regarding organization of agricultural support services' were among the top five constraints for 'instituting sustainable, market-based agricultural development. (1995).’ Why is agricultural research and extension so important for the newly independent countries of Central and Eastern Europe?

A World Bank report under preparation asserts that agricultural research and extension comprise most important tools for creating a competitive and efficient agricultural sector, not only in countries where market conditions already prevail, but also for countries wishing to transform their economies. Appropriate agricultural research and extension helps direct agricultural resources toward their most efficient use. The paper concludes that countries of Eastern Europe and the FSU are in danger of significant underinvestment in appropriate agricultural research and support services. Actually, the situation can be doubly harmful: countries continue to spend scarce research and extension funds inefficiently, while missing an opportunity to hasten the transition of their agricultural economies by using an appropriate agricultural knowledge system as a competitive strategy. This presents a quandary for transitioning economies of Central and Eastern Europe: without markets, the demand which normally signals an opportunity for private sector investment in new technologies, services, or products or the need for publicly-financed research or extension, is absent. How do the countries of Central and Eastern Europe develop market-oriented agricultural knowledge systems without markets?

Strategies for Competitive Agriculture

According to the same World Bank report, the major objectives of a competitive strategy for agriculture include:

- Reducing unit production costs.
- Improving product quality or creating unique product characteristics.
- Reducing environmental damage or other external costs.
- Adding value to basic commodities.
- Developing primary production technologies which confer a comparative advantage over competitors.

3
- Developing utilization technologies that are easily transferable, and add value to, or enhance demand for agricultural products.

Agricultural research and extension can begin to provide these components of a competitive strategy for agriculture, even in the absence of markets. An agriculture knowledge system should be viewed as a public investment. Reduced food costs, reallocation of physical and human capital to higher value uses, or increased economic activity, such as trade, are some of the returns on investment. Economic analysis shows high returns on investment for agricultural research in many countries, including the US and Western Europe. The current inefficiencies in the economies of Eastern Europe and the FSU imply even greater possible returns in those countries. Thus, agricultural research should be viewed as a key component in a strategy for ECA countries to become efficient and competitive in domestic and international markets.

These objectives imply a vastly different role for the agricultural knowledge systems in ECA countries. Currently, agricultural knowledge systems in ECA countries are characterized by high quality but narrowly focused research, professional isolation, public-sector dominance, centralized commands and quotas, unclear responsibilities, financial unsustainability, crisis management, and focus on primary production and crop commodities (Srivastava et al, 1994). In the future, in addition to production, these institutions should emphasize production efficiency, product quality, and value-added and environmentally-sound technologies. Instead of a sole emphasis on self-sufficiency in food production, agricultural economies - and the research which supports them - should focus on areas of comparative advantage and on joining international markets. Where it is more efficient, the private sector should provide support services. Finally, the training and expertise of scientists and technicians will reflect these new priorities. The final structure of these new systems cannot be prescribed and will not be static. Their main characteristic will be adaptability; they will be one of the countries’ most important tools for adapting to changing markets and future conditions.

In order for the countries of Eastern Europe and the FSU to create agricultural knowledge systems which serve market-based agricultural economies (that is, achieve the goals described above), they must transform their existing public systems and redirect resources already invested. They all, to some degree, must undertake the following difficult actions:

- Increase efficiency - rightszie staff, eliminate duplicative efforts, reduce bureaucracies, integrate institutions, and privatize whenever possible.

- Commit resources based on anticipated applied outcomes and link well-being of scientists/extension professionals to performance.

- Become client oriented and demand-driven.

- Develop more efficient dissemination mechanisms to implement research results at the farm and factory level.

- Improve linkages between research, higher education, and extension institutions.
- Decentralize management authority - provide autonomy in research, eliminate centralized research directives.

- Diversify funding sources.

- Balance emphasis on basic science and applied, multidisciplinary research.

- Give more attention to small, private farms.

- End professional isolation - provide national and international linkages and exposure for agricultural research institutions and mainstream local research with global research networks.

- Encourage induction of young scientists.

These difficult activities will lead to agricultural knowledge systems which are financially sustainable, effective in producing high-quality research and impacting the agricultural sector; effective in supporting efficient agricultural activities; and effective in producing scientists and technicians who have relevant skills.

While painful, these adjustments are preferable to the alternative: continuation of current policies will likely lead to the disintegration of agricultural research capabilities in these countries. Budgets which are already insufficient to support the current system promise to further tighten. This will endanger the upkeep of facilities and equipment, and further contract capabilities to provide research, extension, and education. Already, some institutions supplement their budgets by engaging in non-research activities, such as commercial production, leasing of facilities and equipment, and even renting out living quarters. If budgets constraints continue to be prohibitive, a potential conflict of interest could develop for research institutions: in order to obtain financial benefit from new ideas, research institutions may be tempted to retain important information or technologies from the public. Scientists in Ukraine point to another dangerous effect: they complain that poor remuneration and benefits have resulted in a loss of prestige associated with research, education, and extension professions (Personal communication). The scientific community faces not only the short-term loss of its human resources to more lucrative activities but also a potential long-term decrease in new entrants to the profession.

World Bank agricultural experts postulate serious impacts on the agriculture sector which could result from the disintegration of agricultural knowledge systems in the ECA. For example, cancellation of diagnostic services and genetic research could decrease a country's ability to respond to epidemics or to decreases in output and quality. Secondly, delay or cancellation of research in product development could preclude ECA countries from meeting new quality and market standards and joining EC or other international markets in the near future. Third, cancellation of research in farming systems, especially in mechanization technologies and livestock production for small-scale operations, could seriously handicap the growth of the sector (Nightingale, personal communication).

Thus, regarding agricultural knowledge systems, ECA countries have choices. They can take actions to transform their agricultural knowledge systems so that they are financially sustainable, focus on priority areas, encourage a private sector involvement, and develop
linkages with regional and international agricultural research centers. In doing so, countries will not only ensure the integrity and longevity of the system, but also transform it into a powerful tool for agricultural competitiveness. Or, ECA countries can continue current policies and risk the impacts described above.
III. REGIONAL TRENDS IN THE ECA

The results of this inventory indicate some broad regional trends in the ECA region. In classifying the transition economies of Eastern Europe and the FSU, we faced two constraints: we have little information for some of the transitioning economies; and additionally, the political climates and policies which partially determine the status and classification of the agriculture sectors is in a state of constant flux in some countries. Nevertheless, the countries fell into four groups according to similar general characteristics.

Group I

The first group consists of the Czech Republic, Hungary, Poland, the Slovak Republic, and Romania. These countries have shown the most success in transitioning from a command-based to a market-based agricultural sector. There are many reasons for their success. Generally, they have good infrastructure, well trained labor forces, skilled scientists and specialists. Further, these countries have committed to the idea of a market-based economy, have made many of the prerequisite policy changes to promote free markets, and have implemented many structural changes. Not surprisingly, these countries instituted command economies only after W.W.II and spent the shortest amount of time operating under this structure. Even during the Soviet era, these countries retained autonomy with respect to national policies including agriculture and trade. For example, the World Bank began assisting Hungary and Poland to enter international markets as early as 1985. The agricultural product development, quality improvement, export marketing, and other activities under these projects indicate the early orientation of Hungary's agriculture sector toward exports and competitive markets. The Czech Republic's agriculture sector is similarly advanced.

Generally, these countries are proceeding rapidly on structural and policy reform. They are improving product quality and competitiveness, seeking international markets, and building exports. Thus, these countries would benefit primarily from assistance in structuring an agriculture knowledge system which supports private farming, competitive markets, and product development. Consequently they will benefit greatly from mainstreaming their scientists into the global scientific community. There is potential opportunity for CGIAR to assist these countries in developing networks between national and international research institutions and their libraries, scientist/research exchanges, joint research programs, and other linkages. CGIAR could also assist in providing technical assistance and/or consultancy work on specific agricultural research questions or topics. Germplasm exchange is an area of particular importance (Nightingale and Srivastava, personal communication).

Group II

Group II countries are Albania, Armenia, Belarus, Bulgaria, Croatia, Estonia, Georgia, Latvia, Lithuania, Macedonia, Moldova, Serbia, Slovenia, and Ukraine. Generally, this group is made up of former members of the USSR and Soviet Bloc countries which have relatively more adjustments to make in transforming their economies. Some characteristics of these countries are a continued reliance on policies and institutions of the prior communist or socialist economy. In other cases, countries may have partially implemented policy and structural
changes, but progress towards free-market conditions may be hindered by civil unrest, current political climate, or lack of real commitment. For example, the advantages that Croatia may have inherited from the relatively liberalized agriculture sector of its parent-country, Yugoslavia, have been masked by war.

Armenia is another good example of the constraints in Group II countries. Armenia’s potential for growth in the agriculture sector is mixed. Armenia has implemented one of the most comprehensive land reform programs of the FSU Republics. In addition, the Armenian state order system for agricultural products was almost fully dismantled. Some of the producer prices and most input prices were liberalized, and almost all producer and consumer subsidies were eliminated. The Government of Armenia (GOA), in addition to the Ministry of Food and Agriculture (MOFA), seem to be committed to changing its role in agriculture and reorienting its services. These achievements, however, are limited in effect by the lack of competition in input and output marketing, and by the delay in restructuring and privatizing of agricultural industries. Additionally, Armenia’s primary constraint in the short-term is the blockade which has halted trade on most borders. If the current political situation and the resulting trade constraints in the region resolve soon, Armenia’s agriculture sector may have good potential for recovery (Lundell, personal communication).

According to several agricultural experts and task managers in the World Bank’s ECA Country Department, the situation in many Group II countries is recovering, especially in the Baltic and Balkan countries (Nightingale, personal communication). For example, while Ukraine requires additional work to complete structural adjustments (land reform and privatization), the country has made significant progress in policy reform, especially pricing and trade policies, since the Agricultural Sector Adjustment Loan (Shuker, personal communication).

The situation in other Group II countries may be worsening. Some countries are experiencing a resurgence of communist politics and policies. Due to the economic hardship of transition, the disappointing results of half-hearted reform efforts, and the reluctance to alter the power structure supported by the state and collective entities, some countries, such as Bulgaria, have shored up old command-economy institutions and policies in recent legislation and elections. These countries will likely experience slowed growth of agricultural markets, slowed reallocation of assets and labor toward efficiently-sized production units and competitive products, and delayed entry into international markets.

In these countries, there is potential for CGIAR to provide assistance in implementing policy and structural reforms within agricultural institutions, with specific attention to eliminating duplicative research efforts. CGIAR could provide crucial assistance in planning efficient or cost effective research programs, specifically, assistance in developing output-oriented program planning methods, performance-based accountability mechanisms, client-oriented and demand-driven research programs. A second area for CGIAR involvement could be in mainstreaming the scientific communities of the countries into the global scientific community by establishing communication links and providing access to its research networks. A third area of potential assistance to Group II countries might be in establishing information management systems. Finally, CGIAR could provide scientific expertise which is unavailable in country for collaboration on specific research questions.
Group III

Group III countries include Azerbaijan, Tajikistan, Turkmenistan, Kazakhstan, the Kyrgyz Republic, and Uzbekistan. The Central Asian Republics which comprise Group III have the greatest fiscal constraints (Nightingale, 1995). In addition, they may have many policy and structural reforms yet to make, or they may face formidable challenges in transforming their agricultural economies. Their agricultural economies may have been largely dependent on the former Soviet Union, through quotas and subsidies, or they may have been engaged in prescribed production activities which were inefficient and/or destructive to the agriculture resource base. As a result, the agriculture labor forces of these countries may be less well trained in the diverse agricultural activities required for an efficient agriculture sector and may have little concept of private enterprise and entrepreneurship. This situation may be complicated by agricultural infrastructure which is inappropriate for efficient agricultural activities. While governments of these countries may be committed to change, they may not be committed to the specific adjustments required to create a market economy. Uzbekistan exemplifies the challenges to countries in this group. Uzbekistan's vast deserts are of little productive use. Despite its meager resources, agriculture has played a dominant role in the economy due to massive irrigation works financed by the former Soviet Union to increase cotton production. The rapid increase in irrigated areas lead to over-utilization of the Aral sea water resources and serious environmental problems.

Due to the cessation of subsidies from the former Soviet Union, and the breakdown of domestic centralized systems, these countries are adapting by default, rather than by design (Nightingale, 1995). Since agriculture and other policy and structural reform must be the first priority of these countries, measures are urgently needed to preserve existing agricultural infrastructure and research and extension capabilities in the interim. As these countries will require considerable technical assistance, CGIAR could play an important role in this capacity. Further, in some countries, additional emergency measures may be required to develop new capabilities in the agricultural labor force, such as development projects for specific crops or areas. Some external assistance likely to be needed includes building and maintenance of agriculture and irrigation infrastructure; reorganization and restructuring of the agriculture sector; and eventually, reorganization of agriculture institutions, research priority-setting, and local and regional training of extension agents and other agricultural officials.

Group IV

Because of its size, varied agroclimatic regions, and political/economic conditions, the Russian Federation combines characteristics of the three groups described above. For this reason, it is categorized as a separate group. Like the Group I and Group II countries, Russian agriculture is endowed with good potential: it possesses excellent agricultural and natural resources. In addition, the nation has a well-educated labor force, and a pool of highly skilled scientists and technicians.

However, like the Group II and III countries, Russia's agricultural sector faces many constraints which limit efficiency and growth in the sector despite its potential. Overall agricultural production and distribution remain inefficient. The prevailing macroeconomic imbalances off-set any benefits which could be expected from reforms. In addition, reforms
are also undercut by deteriorating terms-of-trade; inefficient farm structure; lack of adequate incentives, competitive markets, and technical and market information; and lack of a well-functioning credit system.

Most international donors and financial agencies have supported a patchwork of small-scale farm privatization and extension projects. Little effort has been expended on transforming Russia's agricultural research or higher education system. Assistance needs to be focused into two parallel efforts: stabilizing and protecting targeted agricultural assets and developing and piloting models of institutional change and human capital. Further, in order to build the political and economic support for the new models, assistance must create a meaningful linkage between the farmers and the agribusiness industry.

Srivastava, et al suggest that immediate efforts toward building an agriculture knowledge system should be focused on the following activities: a) maintenance of existing facilities; b) creating incentives for institutions to adapt to new market circumstances; c) focus on applied and basic sciences; d) retention of scientists; e) importing of key technology (1994).
IV. GROUP I COUNTRY PROFILES

Czech Republic

A. Background and Current Status of Agriculture Sector

While no World Bank agriculture sector report has been completed for the Czech Republic, the following agriculture sector statistics have been supplied by the representative from the Czech Republic's Ministry of Agriculture to the CGIAR Regional Consultation in Prague (May 6 and 7, 1996).

According to these figures, agriculture currently represents 3 percent of GDP and employs 5.1 percent of total employment for the Czech Republic. The structure of agriculture enterprises in the Czech is dominated by small private farms. 96.6 percent of agricultural land is in private holdings. Small agricultural enterprises (1 ha or less) make up 52 percent (28,000 units) of all farms; farms of one to ten hectares make up 28 percent (15,000 units); farms of 10 to 100 units comprise 28 percent (8,000 units); and farms greater than 100 hectares make up 5 percent of all agricultural enterprises in the Czech Republic.

Crop production is dominated by cereals, maize, and oilseed which cover a combined 2.0 million hectares of land (64 percent of all arable land). Fruits and vegetables (mainly potatoes) cover 4.7 percent of arable land or 149,000 ha. Production of cereals in 1994 (7.2 million tons) was roughly equivalent to the 1989 level, while production of oil crops increased from 339,000 tons to 512 million tons. Sugarbeet and potato production decreased from 4.5 million tons and 2.4 million tons to 3.2 and 1.3 million tons respectively. Animal production in the Czech Republic underwent a significant declines since 1989, with the total number of cattle dropping from 3.5 million to 2.0 million head, the number of pigs dropping from 4.7 million to 3.7 million head, and the number of poultry dropping from 32.5 million to 26.7 million head.

B. Agricultural Research and Extension

The following information has also been supplied by the Czech Republic's Ministry of Agriculture.

The Czech Republic has established a Research and Development Council with representatives from both state and private research institutes, universities, the Agricultural Chamber of the Czech Republic, and other private research entities to function as the highest advisory body for research and education in the country. The council advises the Ministry of Agriculture on national research and development programs and assesses program performance for the previous year. Nationally funded agricultural research in the Czech Republic is directed by the Ministry of Agriculture's Education and Research Department, which sets research and development priorities and directs the research institutes of the Ministry of Agriculture.

Priority programs which will receive funding in 1996 include: adapting Czech agriculture to WTO and EU standards; genetic plant protection, breeding, and seed programs;
livestock breeding technologies and health protection; processing and engineering technologies; food and nutrition; quality improvement; industrial crops; land productivity and soil conservation; biodiversity conservation and utilization; water management; information and expert systems, forest and game management. New research priorities are problem and issue oriented rather than crop oriented, and will require integration and cooperation between numerous institutions.

Agricultural research in the Czech Republic is undergoing a transformation. Previous to 1989, the Ministry of Agriculture presided over 44 state-owned research institutes and centers. Some of these were funded directly from the state budget, while others were funded through the state-owned enterprises to which they were connected. After the dissolution of Czechoslovakia, the federal research institutes within the Czech Republic were first transferred to the Ministry of Agriculture. Some were subsequently dissolved, while others, especially the single-crop institutes connected with state enterprises, were privatized.

Currently, there are approximately twenty-six research entities in the Czech Republic: twelve remain under the Ministry of Agriculture with five slated for privatization, one is undergoing privatization, and thirteen are private. The Ministry of Agriculture which is instituting a new system of grant-financing is no longer the sole source of funding for any of these research centers. Under the Ministry of Agriculture three research institutes, the Research Institute of Crop Production, the Research Institute of Animal Production and the Veterinary Research Institute, which receive 50-60 percent of their budget from the state; four service workplaces the Research Institute of Agricultural Economics, the Institute of Agricultural and Food Information, the Forestry and Game Management Research Institute, the Research Institute for Soil and Water Management; and the five institutes under privatization, the Research and Development Institute for Ecology in Agriculture, the Agricultural Engineering Research Institute, the Apicultural Research Institute, the Research Institute of Animal Nutrition, and the Food Research Institute in Prague. The above research structure does not include agricultural universities, which do not fall under the Ministry of Agriculture.

The main challenge to agriculture research, as described by the Ministry of Agriculture, is budgetary shortfall. To combat this constraint, the Ministry of Agriculture has set as a primary goal to transfer the cost of research to its users and beneficiaries via direct payments.

C. Relevant World Bank Agriculture Projects

Not applicable.

D. Agriculture Sector Work and Related Studies

Not applicable.
E. Main Agricultural Institutions

- **Research Institute of Agricultural Economics**
  Manesova 75, 120 58 Praha 2 - Vinohrady
  Ing. Josef Kraus, C.Sc., Director
  Tel: 02-627-55-02/18
  Fax: 02-627-30-20
  E-mail: smejkalova@vl.agrec.cz

- **Institute of Agricultural and Food Information**
  Londynska 55, 120 56 Praha 2 - Vinohrady
  Ing. Ctibor Perlin, C.Sc., Director
  Tel: 02-253-647
  Fax: 02-6631-2812
  E-mail: perlin@uzpi.agrec.cz

- **Research Institute for Soil and Water Conservation**
  Zabovreska 255, 156 27 Praha 5 - Zbraslav
  Ing. Karel Vancura, C.Sc., Director
  Tel: 02-592-331
  02-2591 205-7
  Fax: 02-591 208
  02-592 536

- **Research Institute for Crop Production**
  Drnovska 507, 161 06 Praha 6 - Ruzyne
  Doc. Ing. Vaclav Kudela Dr.Sc., Director
  Tel: 02-36 52 29
  02-36 08 51-9
  Fax: 02-36 52 29
  02-36 52 28

- **Food Research Institute Prague**
  Radiova 7, 102 31 Praha 10 - Hostivar
  Ing. Jiri Celba, C.Sc., Director
  Tel: 02-701 380
  02-702 331
  Fax: 02-701 983
  E-mail: vupp@Vupp.anet.cz

- **Research and Development Institute for Agricultural Ecology**
  Vidov 40, 370 07 Cesje Budejovice
  Ing. Jiri Melichar, Director
  Tel: 0 38-530 50
  0 38-731 26 11
  Fax: 0 38-731 26 11
• Agritec - Research, Breeding and Services. Ltd.
  Zemedelska 16, 787 12 Sumperk - Temenice
  Ing. Miroslav Hochman
  Tel:  0 649-382 124
       0 649-382 111
  Fax:  0 649-382 999

• Agricultural Research Institute Kromeriz, Ltd.
  Havlickova 2787, 767 41 Kromeriz
  Ing. Slavoj Palik, C.Sc., Director
  Tel:  0 634-426 145
       0 643-426 111
  Fax:  0 643-227 25

• Research Institute for Fodder Plants, Ltd.
  Zahradni la, 664 41 Troubsko u Brna
  Ing. Jaromir Prochazka, C.Sc., Director
  Tel:  0 425-4332-230
       0 425-4321-0145-7
  Fax:  0 425-4321 0149

• Potato Research Institute Havlickuv Brod, Ltd
  Dobrovskeho 2366, 580 01 Havlickuv Brod
  Ing. Bohumil Vokal, C.Sc., Director
  Tel:  0 451-323
  Fax:  0 451-215 78
  E-mail: dedic@vubhb.anet.cz

• Oseva Pro, Ltd., Grassland Research Station Roznov - Zubri
  756 54 Zubri 698
  Ing. Bohumir Cagas, C.Sc., Director
  Tel:  0 651 583 195-6
  Fax:  0 651-583 197

• Oseva PRO Ltd., Research Institute of Oilseed Crops at Opava
  Purkynova 6, 746 01 Opava
  Ing. Josef Stribny, Head
  Tel:  0 653-216 560
  Fax:  0 653-216-742

• Czech University of Agriculture, Prague
  Kamycka 129,165 21 Praha 6 - Suchdol
  Prof. Ing. Jan Hron, Dr.Sc., Rector
  Tel:  02-338 4082
  Fax:  02-338 2063
Mendel University of Agriculture and Forestry Brno
Zemedelska 1, 613 00 Brno
Prof. Ing. MV. Dr. Pavel Jelinek, Dr.Sc., Rector
Tel: 05-4513 5004
Fax: 05-4521 1128
Hungary

A. Background and Current Status of Agriculture Sector

The agriculture sector is a major contributor to the Hungarian economy. Over the last 15 years, it largely filled the country's demand for food, generated a surplus for export, and grew at an annual growth rate of 2.9 percent. By 1986, the agriculture sector was already beginning to move away from a centrally-planned system to a more market-based production/investment system. Nevertheless, significant state subsidies, tax incentives, and regulations remained on investments and use of profits. In 1984, crop production accounted for 49 percent of total agricultural output and animal production for 51 percent. Cereals contribute the major share of crop production, with maize dominating. Wheat production is second in importance, followed in order by potatoes, barley, sunflowers, oats, and rye. Cattle comprise the largest portion of livestock production, followed by pigs, and poultry.


B. Agricultural Research and Extension

The World Bank has extensive experience in agricultural research and extension in Hungary. In virtually all of the agriculture sector loans in the last ten years, the Bank has identified institutional development or support services necessary to the subsector and has either provided funding for these services or provided the services directly under the loan. Under the Livestock, the Crop Improvement, and the AgroProcessing Projects (see below), Bank loans included research; new study programs; training; overseas study tours; post graduate training; and development of new public and private support/extension services. Project activities involved and benefited Ministry of Agriculture officials, technicians, senior enterprise managers, extension agents, and farm enterprise owners. Areas of research and training included farm management and economics, business facility and equipment investment, optimal use of farm machinery, marketing, crop breeding and production, soil testing, environmental management.

In other projects, such as the ongoing Integrated Agriculture Export and Product Marketing Development Projects (see below), the Bank provides financing for enterprises borrowing under the loan to procure needed support services. Often, enterprises wishing to borrow need support services in the areas of business planning and market strategy, to enable them to meet onlending requirements as well as economic challenges in the production or agroprocessing industries.

In the Livestock, Crop Improvement, and Agroprocessing Projects, institutional development efforts represented major successes. These technical services also allowed enterprises to reduce their costs of production, improve product quality, and capture market share through better technology, business planning, management methods. The Livestock Project was evaluated as 'innovative in its focus on improvement in export marketing by changing traditional ways of thinking about selling livestock products in foreign markets.' The institution-building component of the Crop Improvement Project was identified as 'one of the
two most important factors contributing to project sustainability and to development in the field of crop production in Hungary.'

The World Bank agriculture sector strategy also examines the agricultural services in Hungary (see below). The comments stress reorganization and reorientation of the subsector toward client orientation and cost recovery.

While the measures described above are necessary, Hungary, in comparison with other transitioning economies, is quite advanced in the overall function and transition of its agriculture sector and development of support services. First, the Ministry of Agriculture has made major accomplishments toward the goals of privatizing former state enterprises, of promoting a market-based system, and of redefining its role and services. Second, the government has reorganized extension services following three principles: 1) the delivery system will be provided primarily by the private sector; 2) the services will be demand-driven; 3) state funding will be targeted to advisory needs of low and middle-income farmers. Third, under the Livestock Project, the Ministry of Agriculture reorganized to place production and marketing activities under one deputy ministry. In addition, private farmers dominate the agricultural production, and private enterprises are making inroads into input supply and processing. Finally, the agricultural knowledge system has a good infrastructure of facilities and scientists and other specialists who have excellent training in basic sciences. In summary, the agriculture sector in Hungary is ready for increased exposure to international markets and investment. Its agriculture knowledge system will greatly benefit from exposure to outside information sources, journals, and scientific research, and its research organizations and scientists are ready to undertake joint research projects and other exchanges.

C. Relevant World Bank Agriculture Projects

- **Grain Storage and Agriculture Mechanization Development Project.**
  
  **Loan:** 2316  
  **Signed:** FY83  
  **Source:** Project Performance Audit Report 7924

  This project contributed to the replacement of obsolete, deteriorated grain storage facilities and on-farm equipment such as combine harvesters, and tractors with modern equipment and other new technology. The project also introduced Hungarians to cost effective storage facilities in terms of both construction and operating costs and helped train operators of storage facilities in efficient storage and handling practices. More information is required to evaluate the relevance of the training activities under this project.

- **Integrated Livestock Development Project.**
  
  **Loan:** 2510  
  **Signed:** FY85  
  **Sources:** Project completion report 12621, and Memorandum to the President

  This project strengthened the livestock industry by rehabilitating and expanding existing facilities which provide inputs or directly produce cattle, pigs and sheep and processed meat
and cheese. It also provided funds for pasture and livestock research, management training for large farms and slaughterhouses, and export marketing services. The project consists of five components: (a) animal feed and livestock input supply; (b) on-farm production; (c) agroindustrial processing; (d) research and training; and (e) export marketing services.

The main objective of the project was to increase foreign exchange earnings in convertible currency through the expansion of exports of raw and processed animal products. The project achieved this in the following ways: a) by increasing productivity by creating more efficient farm units, by purchasing modern machinery and equipment, and by the introduction of improved technologies on the farms and in the agroindustries which process meat, milk, and animal byproducts; b) by reducing unit production costs through labor-saving technologies and more efficient equipment and manufacturing processes; c) by upgrading the quality of meat by improving hygienic conditions of meat processing plants in line with USDA and EEC standards, by rehabilitating outmoded facilities, by expanding cold storage, and by improving their package and handling equipment; and d) by improving livestock yields in the country through better pasture and fodder resource utilization and more efficient conversion of feed into animal products.

Under the institution building component, the project financed research in pig, dairy, and sheep production; grassland improvement; study programs for research workers; training activities for farm and slaughterhouse managers and technicians; and engineering consultancies to assist in agroindustrial design. Other research activities include a study of improved market strategies in world markets for project commodities including specific recommendations for: penetrating new markets; marketing services to enhance market entry; and expansion of market share through sales promotion. Substantial training of Ministry of Agriculture and Food Industry (MEM) staff was accomplished. Many overseas study tours, postgraduate training courses, and training related to institutional investments were developed and completed under this loan. These include the following:

- Agricultural Biotechnology Center at Godollo. This state of the art center became operational in the latter part of 1990. Under this project and the Crop Production Improvement Project, the Bank financed U.S.$4.5 million of equipment. This investment was successfully completed and the center is implementing activities as envisaged in the project design.

- A new computerized tomograph financed at U.S.$1.9 million by the Bank for the Pannon University for Agricultural Sciences to develop capability for analysis of live animal specimens for genetic improvement and grading and qualification of pigs for breeding.

- Equipment purchase and training funds of U.S.$500,000 financed for the Szarvas Irrigation Research Institute for research activities to improve grassland management, grass farming, and research supporting private farmers.

- Strengthening of activities in the areas of animal nutrition through purchase of equipment to establish model feeding units and provision of training funds for Research Farms at Godollo and Herceghalom.

- Meat marketing programs were implemented in Greece, Sweden, and the U.S.
The Livestock project successfully assisted the Hungarians to modernize the production and marketing system for beef, pork, milk products and lamb/mutton, and improved institutions and practices in input supply, on-farm development, slaughterhouse rehabilitation and export marketing. The project was innovative in its focus on improvements in export marketing by changing traditional ways of thinking about selling livestock products in foreign markets. In response to this project, MEM reorganized itself to place production and marketing activities under one deputy minister, where earlier these two functions had been under separate ministries.

- **Crop Production Improvement Project**
  
  Loan: 2738
  Signed: FY88
  Sources: Staff appraisal report 5899-HU, and project completion report 11888

This project, which funded high-efficiency farm machinery and construction for land improvement, also financed a substantial institutional development component as well as training activities. The major research and training goals of the project, which appear to be cofinanced under the Integrated Livestock Industry Project (Loan 2510-HU), included strengthening research and management information systems and training of Hungarian technicians in fields related to crop productions, farm economics and management. The project also introduced a computerized management system at the Papa State farm as a pilot exercise and expanded the training of agricultural extension agents in farm management techniques and practices.

The project research and institutional objectives as defined in the project completion report are strengthening research and support services in the fields of crop breeding, soil testing, and environment protection; and improving managerial capacity in farms and production systems, increasing the skills of Hungarian technicians, promoting optimal use of farm machinery, and expanding extension activities to cover less financially and technically favored production units (p. iii). The specific training and institution-building investments include:

**Agricultural Biotechnology Center at Godollo**

US 4.5 million for equipment was cofinanced for this institution under this project and the Integrated Livestock Development Project. This investment was successfully completed and the Center is currently carrying out activities envisaged in the project design. In addition, the Center's director is pursuing a market-oriented approach to research and is actively seeking grant funding and shared research with foreign partners. The Center is seeking to prevent attrition of its scientists by allowing Hungarian researchers to return home from overseas to continue their research.

**Agricultural Research Institute of the Hungarian Academy of the Sciences, Martonvasar**

This project provided U.S. 1.1 million for the rehabilitation of a phytotron and associated laboratory and testing equipment. These funds purchased research equipment to strengthen cereal breeding as a basis for future crop improvement and to increase the efficiency.
of crop production, including equipment for soil and chemical analysis, plant growth chambers and other items. The new phytotron became fully operational in June of 1990. The phytotron is suffering from the economic adjustment process and the general recession. Currently, the facility receives a third of its operating budget from the Academy, a third from government funds, and a third from revenues earned in license fees from new varieties.

**Agro-Environment Protection Plant and Hygiene Department**

Equipment valued at U.S. 2.8 million for soil and water testing for chemical residues for the former Crop Protection and Soil Conservation Service was financed under the loan. The equipment modernized and expanded the capacity of the main laboratories which performed soil testing on farms. The capacity for soil analysis now exceeds the demand and about half of the equipment procured under the loan will be sold. Government testing laboratories, including this one, are reducing their services, assuming a regulatory role, and reorienting their efforts toward monitoring and environmental protection. The move to rationalize the service and for private provision of testing services is considered to be a positive action.

**Management Information Systems for Farms Were Established**

A system to improve the management and accounting systems of production units was developed. Consultants were engaged to develop the system and improve the management and accounting in production units. The pilot system was designed and implemented at the large Papa state farm in northwest Hungary. The system proved to be a successful one, as indicated by the fact that the local codevelopers of the product left the state farm and formed their own software company. The system has been disseminated to other farms.

The project experience in institution building was described in the completion report as extremely successful and one of the two most important factors contributing to project sustainability and to development in the field of crop production in Hungary.

**Agriculture Processing and Modernization Project**

- **Loan:** 2936
- **Signed:** 6/2/88
- **Closing date:** 6/30/94
- **Sources:** Staff appraisal report 7091-HU, and completion report 14729
- **Task Manager:** Kishore Nadkarni.

This project allocated US 5.5 million of the loan for (a) improvement in training of senior enterprise managers in management and marketing; (b) establishment of an agromarketing office to assist enterprises in gathering market information, to identify barriers to market entry, to update practices in packaging, labeling, and advertising; (c) implementing a grading system and standards for a raw materials and final products in order to improve their quality in line with consumers preferences; and (d) establishing a research and development facility for product development and improved technology including a center for improving the packaging of final products.

The project targeted the poultry, processed fruits and vegetables, wine and fruit juices, and wood processing subsectors. In the poultry subsectors, the project addressed plant and
equipment modernization, improvement of processing operations, and improvement of capacity to produce higher value products such as cut chicken, turkey, and other products suitable for exports.

The project sought to reorient agroprocessing managers towards efficiency, exports, and profitability by internalizing the commitment of managers of enterprises to improved product quality and to direct marketing activities. The specific markets targeted under this project were large supermarket chains and other large buyers in Western Europe and other selected parts of the world.

Individual enterprises wishing to borrow funds under the project were expected to: a) develop clear product and market strategies, b) to reduce costs of production, c) to improve product quality through better and more efficient technologies in product processing, and d) to impose methods of enterprise management which fulfill modern standards such as those practiced in Denmark and Holland. All participating firms were required to meet a series of lending criteria which would include, in addition to the financial analysis of the project investment, assessment and improvement of the financial structure of the enterprise, its organization and management, its technology, and its country specific marketing strategy.

To enable enterprises to meet project onlending requirements as well as economic challenges to the agroprocessing industry, the project sought upgrade support services to enterprises in: a) export trade promotion and marketing; b) training in management and marketing; c) grading and quality control of raw materials and final products; d) research and development.

Improvements in management, marketing and technology were identified by consulting firms which assisted enterprises seeking subloans under the project to prepare complete business plans for the medium term. Based on export market studies and the results of a marketing and technology workshop held in Budapest in June 1987, enterprises would develop product and market strategies to identify the type of investment required over the medium term to increase product quality and to expand market coverage. Most financing arrangements for enterprises provided modern equipment to rehabilitate lines in processing packaging, canning, bottling, chilling, freezing, and cold storage facilities. Computer software and consultant services were financed for those firms which wished to install inventory control systems, cost accounting, management information systems, and other operations requiring automation.

The project completion report states that the project's institutional development goals were largely met. A functional Agromarketing Office was established and successfully assists in the promotion of agroprocessed export, the upgrading of skills and facilities in leading packaging and quality information centers, the modernization of equipment, instrumentation, and facilities in selected product testing and certification centers. Project-supported activities have helped the institutions to enhance their market relevance and to increase the extent of their self-financing. The studies under the project for the modernization of the glass and metal container industries were also completed but could not be implemented due to unfavorable economic conditions in the container manufacturing and consuming industries. Major project accomplishments in training institution building are described in detail below:

- The Agromarketing office, set up under the export promotion and marketing promotion component of the project, has become well established as a focal point
for information for exporters. It is also central in developing trade marks suitable for certifying product quality and origin. The office is also active in organizing trade promotion fairs and seminars, and has had success in acting as a middleman in enabling the establishment of joint ventures. The Office developed a Collective Food Marketing Project.

- **Training of marketing and management instructors.** One of the earliest institution-building activities under the project was training of marketing and management instructors. The programs were well-received and utilized by members of agroprocessing enterprises. Seminars and training courses were regularly held. Feedback from businesspersons and companies on these activities has been positive.

- **Packaging and quality information centers** established under the project have been enabled to significantly upgrade their capabilities and have successfully established networks with counterparts abroad. The centers activities are demand driven, focusing on client/customer needs.

- **Capabilities and equipment for grading and quality control** were significantly upgraded at five major quality control centers, which serve as demonstration sites.

- **Pilot operations.** The project financed pilot operations at leading research industries for testing innovative techniques for quality enhancement of raw materials for the food industry and for goat husbandry, including cheese making. The Szarvas Faculty of the Debrecen University of Agricultural Sciences launched a pilot program to support the development of the profitable production of food industry raw materials which are capable of satisfying quality requirements across a wider variety; and the Research Institute of the University of Veterinary Sciences set up a pilot goat farm which is to develop goat production and cheese production technology to be spread across the country with the assistance of Dutch specialists; study tours were organized for researchers from the Agricultural Biotechnology Research Institute, the Irrigation Research Institute, the Agricultural Research Institute of the Hungarian Academy of Sciences, and the PANNON University of Agricultural Science to study developments of the food industry and the methods and instruments to promote increasingly efficient market entry of food products.

Additionally, this project met the following key performance indicators:

- Government sponsored export promotion program implemented.

- Establishment of an Agromarketing Office to assist enterprises in exporting goods.

- Establishment and maintenance of an interindustry consultative panel to determine the work priorities of UHFI in regard to agroprocessing.

- Preparation and implementation of study recommendations on the restructuring of glass containers and metal containers industries.

With regard to future operations, the completion report states that institutions supported under the project are being encouraged to increase the extent of their self-financing through
direct commercial contacts with potential end-users. Their success in doing so would depend critically upon a revival of the overall economy which would encourage end-users to increase their utilization of such services.

- **Integrated Agricultural Export Project**
  
  Loan: 32290  
  Signed: FY90  
  Status/closing: 12/31/95  
  PCR date: 6/15/97  
  Source: SAR  

  This project finances $3.0 million of $100 million for training and technical services. Investment funds would finance, for both large-scale agricultural units and small-scale farmers, planting material, breeding and fattening stock, equipment for the improvement of crop and livestock production, non-agricultural activities of agricultural enterprises such as services and manufacturing, and storage and commodity handling facilities and marketing and sales promotion services. Farms and agroprocessing enterprises may retain consultants and services for export marketing. Enterprises seeking project funds may hire consultants to help prepare medium-term business plans which would form part of the documentation for subloan requests from commercial banks. Among the goods and services available under the loan to farms, enterprises, foreign trading organizations, and other trading entities are marketing and marketing development, training, and technical services. More information is required to determine the relevance of these training activities and enterprise services.

- **Product Market Development Project**
  
  Loan: 3509  
  Signed: FY92  
  Closing date: 12/31/98  

  This project addressed current constraints which impede the development of improved produce markets and the flow of goods. Financial assistance is available through commercial banks to private enterprises for marketing, trade, and distribution of consumer products. Subloans will average about U.S.$500,000 and will finance investment and permanent working capital needs of the beneficiaries. Technical assistance will be available to private sector institutions to set up organizational arrangements to promote, enhance, and encourage better coordination in the provision of training and advisory services in a wide range of logistics-related activities including inventory management, cost accounting, and improved business logistics management practices, and to provide training to bank staff in evaluations of projects in the marketing, trade, and distribution sectors. More information is needed to determine the relevance of these project activities to agricultural research and extension.

- **Integrated Agriculture Export Project**
  
  Loan: 3229  
  Sources: Staff appraisal report 8337, and Memorandum of the President P5232  

23
D. Agriculture Sector Work and Related Studies


This paper gives a brief discussion (1.5 pages) of agricultural services and states that a thorough review of the subsector was not possible during the mission. The comments stress the reorganization and reorientation of agriculture support services in Hungary toward client oriented services and cost recovery.

Government funding to research institutes has shrunk to 40-45 percent. 30 percent of research costs are financed by research grants from the Ministry of Agriculture and the Hungarian Academy of Sciences. The remaining funds are obtained through other non-research commercial activities, such as renting of institute facilities, agriculture production, hotel operations, and logging. Potentially serious conflicts of interest may occur if the institutions are forced to rely more heavily on commercial activities, namely, the conflict between releasing basic research results for public use versus retaining property rights to the output if it supports profit-generating technologies. The paper warns that basic and managerial research should remain a public responsibility.

Government extension and advisory services were previously centralized and provided by state and cooperative production units. Advisory services relating to commercial activities were provided by input supply companies and processors. The privatization of major agriculture production units and the agriculture sector as a whole has altered the structure and composition of demand for extension services. The government has reorganized the extension service following three principles: 1) the delivery system will be provided primarily by the private sector with limited government involvement; 2) the services will be demand-driven; and 3) state funding will be targeted to advisory needs of low and middle-income farmers. The Ministry of Agriculture developed a new program to subcontract extension services to eligible agents or groups. The program includes a schedule of varying subsidies for extension services depending on the client.


- **Agricultural Sector Strategy For Policy And Structural Change.** Sector report 7320.

- **Agriculture Trade Policy Issues.** An informal paper.

- **Agroprocessing Modernization Project.** Implementation completion report 14729. Discussed above.

- **Crop Production Improvement Project.** Project completion report 11888. Discussed above.

- **Grain Storage and Agriculture Mechanization Development Project.** Project Performance Audit Report 7924. Discussed above.
• **Integrated Livestock Development Project.** Project completion report 12621. Discussed above.

**E. Main Agricultural Institutions**

• Research institutes supported by public financing through the Hungarian Ministry of Agriculture:
  
  —Agroeconomic Research and Informatics Institute
  —Livestock Production and Feeding Research Institute
  —Forestry Scientific Institute
  —Technical Institute of the Ministry of Agriculture
  —Grape and Vine Production Research Institute of the Ministry of Agriculture
  —Grain Production Research Institute
  —Fish Production Institute
  —Small Animal Production and Feeding Research Institute
  —Central Food and Industry Research Institute
  —Agricultural Biotechnology Research Center
  —Irrigation Research Institute

• Research institutes supported by public financing through the Hungarian Academy of Sciences (MTA):
  
  —Veterinary Research Institute of MTA
  —Agricultural Research Institute of MTA
  —Plant Protection Research Institute of MTA
  —Soil Science and Agrochemical Institute of MTA

• Parastatal business associations belonging to the Ministry of Agriculture
  
  —Woodprocessing Industry Research Institute Kft.
  —Fruit and Ornamental Plant Production Research and Development Institute, Rt.
  —Canning Industry Research, Development, and Quality Control Institute, Kft.
  —Hungarian Dairy Research Institute Kft.
  —Million Industry Research and Development Kft
  —National Meat Processing Industry Research Institute, Kft.
  —Vegetable Production Research Institute Rt.
Poland

A. Background and Current Status of Agriculture Sector

Agricultural development is a high priority and the small-scale farm is of particular concern. In 1990, agriculture in Poland accounted for 13 percent of GDP. More than 25 percent of the population lives on farms. Crop yields are lower and costs of production are higher on small farms than on large farms. Unit costs decrease substantially at farm sizes exceeding 15 ha; however, the average small farm size is about 7 hectares. It will be important to allow the structure of a farm size to evolve in response to market forces. Therefore, lifting restraints to an active land market, such as approval requirement for land sales, should be a high priority.

Private sector production (80 percent of the total) is hindered by a lack of inputs: fertilizers, plant protection chemicals, animal feed, machinery, spare parts, and certified seeds. An undue proportion of these inputs are allocated to socialized sector farms. Reducing non-market allocations of these inputs will be necessary for increased efficiency. Market pricing is also important. While farm product markets were freed from price controls in August of 1988, many monopolies still remain.

The marketing and processing of agriculture output is highly monopolized by Government and socialized sector agents. This situation severely diminishes the benefit of free prices. Institutional reasons for this abound. Socialized sector farms are required to use these services. Because no substitutes exist, private sector farms, too, must use these services to procure allocations of inputs. In addition, it is through only through these services that farmers receive social security benefits. Access to credit is also skewed to the state-provided services. Further, these monopolistic services have no incentive to be efficient. Abolishing these services is a high priority for encouraging private ownership and market-based trisections.

Improved research and extension services are important. Research is generally of high quality, but is not sufficiently oriented to small farms. Currently, the system is overloaded with too many agencies which are engaged in duplicative activities and have overlapping responsibilities. Gaps in research are not clearly identified, and specific priority research areas have yet to be identified. Extension services have had an important impact, but shortcomings exist. These are related to the emphasis on increased output rather than profit maximization. Further, they do not sufficiently service small farmers.


B. Agricultural Research and Extension

World Bank analysis of the Polish agriculture sector which was completed for the Agriculture Sector Study (and used for the above summary) is over six years old and should not be taken as the current status of agriculture in Poland.

Nevertheless, the World Bank has undertaken numerous institution-building activities in the past and has several relevant projects on-going. The World Bank's project experiences in
agricultural research and extension began as early as 1990. Under the AgroIndustry Export Development Project, the World Bank provided marketing services for agroprocessing industries participating in the project to assist these enterprises to operate in convertible currency markets. Under the Agriculture Development I Project, the World Bank supported institution-building activities to support private farmers, primarily through restructuring private rural cooperatives, such as cooperative banks and marketing, dairy, and horticulture cooperatives. The World Bank is also supporting the restructuring of the Ministry of Agriculture and the reorganization of agriculture support services (research, extension, and education) under the Agriculture Sector Adjustment Loan.

C. Relevant World Bank Agriculture Projects

- **AgroIndustry Export Development**
  
  Loan: 3166  
  Signed: FY90  
  Status/closing: 6/30/96  
  Sources: Staff appraisal report 7112, and Memorandum of the President P5150

  The main objectives of this project are to remedy constraints to rapidly increasing Poland’s exports of processed agricultural products to convertible currency countries; to promote further involvement of the private sector in food processing activities which are export-oriented; to assist state enterprises financed under the project to operate in a market system, and to help maintain supplies of livestock to processors and thereby sustain meat exports. Under the project, agroprocessing equipment upgrades are being financed in order to increase the quality of processed agricultural products to meet the standards of Western markets. The project also includes support for marketing activities of agroprocessors and would meet part of the shortage in livestock feed to maintain adequate supply to the subsector. This project does not contain any research components.

- **Agriculture Development - Private Enterprise Development**
  
  Loan: 3343  
  Signed: FY91  
  Status/closing: 6/30/99  
  Sources: Staff appraisal report 9436, and Memorandum of the President P5531

  This project supports private farmers and promotes other private sector activities in rural areas, primarily through the restructuring of high priority rural cooperatives, such as banking, marketing, dairy, and horticulture cooperatives. Specifically, the project seeks to transform existing rural cooperatives from social sector organizations to member-controlled, market-oriented business enterprises; to help develop rural commercial enterprises by improving access to credit; and to provide investment funds for business and institutional development in rural communities.

  The project includes (a) institution building activities for 2,400 rural cooperatives and cooperative banks through technical assistance and through the establishment of a Capital Fund
for cooperative banks; and (b) a credit program to provide medium and long term credit for investments in agriculture, agroindustry, and other rural production sectors. Eligible borrowers include individual entrepreneurs, private cooperatives, private enterprises, and privatized former state enterprises.

- **Agriculture Sector Adjustment Loan**
  
  Loan: 3600  
  Signed: FY93  
  Source: President’s report P5685

This loan supports the Medium-Term Sector Program being undertaken by the Government of Poland. The loan is designed to support implementation of policy actions over a period of 18 months. These policy actions are included in the three-year MTSAP developed by the Government in collaboration with the Bank.

The MTSAP redefines the nature and role of the Government in relation to the agricultural sector and supports adjustment toward a competitive market-oriented economy. To address the constraints impeding adjustment of the sector, the MTSAP contains monitorable actions to achieve three sets of complementary objectives:

This loan has three components: (a) maintaining an appropriate macroeconomic framework; (b) carrying out urgent structural reforms; and (c) implementing institutional reforms and institution-building measures. The goals under the institutional reform component include:

- Improve the enabling environment for private sector development in the agriculture and processing sector. Within the project, measures are being implemented to ensure environmentally safe use of inputs in agroindustrial plants, encourage better waste water treatment and disposal of food processing wastes, and improve compliance with environmental standards. This will substantially reduce damage to the environment caused by agricultural processing industries. These measures are supported by technical assistance programs which assisting in completing environmental efficiency reviews in polluting enterprises.

- Create a new institutional framework for the development of the rural market economy.

- Reorganize support services provided to private farmers (research, extension, and education). The reorganized agricultural research and extension system is developing and disseminating, among other things, an integrated pest management extension package to farmers to reduce and better management applications of farm chemicals.

- Improve the administration of the sector and restructure the Ministry of Agriculture.

- Improve project selection and evaluation and management of public investment in the agriculture sector.
- Services for priority technical assistance are equal to U.S.$10 million.

- **Forestry Development Project**
  
  Loan: 3641  
  Signed: FY94  
  Sources: Staff appraisal report 11318, and Memorandum of the President P5953  

  The primary objective of this project is to achieve sustainable development of the forest sector through sound forest management. The project assists the Government of Poland in executing selected new forestry programs and protection of ecosystems in its national parks, thereby insuring the protection of Poland's forest resources as capital, providing social benefit, and promoting sustainable forestry practices.

  Polish forest management activities are intrusive and adversely impact wildland systems. This project mitigates these impacts. The increased mixed forest cover on previously forested sites and the restoration of areas affected by pollution which result from this project will support forest biodiversity. Silvicultural practices indicated for this project, particularly thinning of pine plantations, will also improve biodiversity by increasing the understory vegetation. New forest prescriptions designed to increase forest vitality are more sustainable than previously. The increase harvest level is within the current projection of an annual allowable cut and will bring increased revenue from the sector.

  The project consists of seven components grouped into four categories. The fourth category is institutional development. Under this component, technical support, equipment, and related investments are being funded to assist the GDSF and the Board of Polish National Parks in the complete reorganization of the GDSF.

  Funding is also provided to develop strategies for forest utilization which balance economic and ecological requirements. In addition, an information system, including an integrated planning-GIS system will be expanded to analyze and integrate market information, operational procedures, logistical requirements. This capability will improve management and planning capabilities.

  A division for Privatization of Forestry Services is being established within the Office of Project Implementation in the GDSF. The existing Divisions of Trade and Marketing at the GDSF regional level are being strengthening. Financial management capabilities of the GDSF as well as forest research capabilities are also being strengthened.

**D. Agriculture Sector Work and Related Studies**


  This study gives an in-depth, 8-page analysis of the agricultural research system in Poland. Annex 10 is solely concerned with the agricultural research system. It begins with an
inventory of research institutions, their organization, their funding sources, and hierarchies. The report identifies their main research foci, and explains research dissemination methods, and linkages between institutions. The report then gives strategic recommendations for the agricultural research system for the short term. These include:

- Shift the emphasis of research policy to efficiency.
- Reinforce existing procedures at MAFE for policy formulation and resource allocation to research.
- Establish an improve procedure for evaluating research proposals from institutes.
- Develop a blueprint for a more rational structure of agricultural research.

Medium to long-term recommendations include:

- Establish a new regional research organization.
- Strengthen technology transfer procedures.
- Update scientific and management competence.

These recommendations are described in detail in the text. Implications of the recommendations are also explained. Finally, three tables give detailed and specific statistics for all agricultural research and education institutions.

Annex 11, Seed Production and Distribution, is relevant because it is an important area for both research and extension. The paper notes that the use of well-adapted seed varieties may be the cheapest insurance against catastrophic loss in the agriculture sector and may provide a reasonable assurance of adequate yield to risk averse farmers who are reluctant to purchase fertilizers or pesticides. The report states that satisfactory arrangements to develop, test, and maintain ecologically well-adapted varieties of the major crops, with good yield potential, genetic resistance to the main pests and diseases, and good consumer acceptability, and an efficient organization to multiply and distribute high-quality seed to farmers, are therefore basic components of a sound agricultural development strategy. Seed production and distribution are therefore important to consider in the development of agricultural research and extension.

Annex 12, Agriculture Extension, sets the rationale and framework for the reorganization and new approach to extension in Poland. The new approach is presented in the form of a strategic program with short and medium term actions to support the approach. The annex analyzes Poland’s need for an extension service, appropriate functions and mandate for an extension service, public and private sector involvement, client identification, structure and ownership of the extension system, and strategic steps toward a rational extension system. The analysis is 10 pages in length.
Livestock Sector Review: Constraints and Opportunities. Sector report 12961, Cornelis de Haan, X30347.

This study includes a five-page discussion of research, extension, and other support services in the Livestock subsector, beginning with a general overview of each, examining constraints to successful operation, and suggesting solutions. In livestock research, the report lists the main constraints as: (a) too much emphasis on basic research and too little emphasis on small-farm technology and problems; (b) extensive fragmentation of research over different institutes and experimental stations resulting in duplication of efforts; and (c) poor coordination in overall resource allocation between the National Research Committee, the Ministry of Agriculture, and the university research funded by the Ministry of Education.

In extension, the main constraint is inappropriate public involvement and insufficient private sector provision of services. The report also notes that extension workers lack sufficient specialty expertise and/or support in farm management and animal production and nutrition. Currently, the cost of animal feed analysis services provided by Poland’s 30 laboratory centers is unaffordable to small farmers.

In veterinary services, Poland is faced with ‘second-generation’ problems. First is that veterinary meat inspection is insufficient, with a large number of slaughterhouses lacking permanent production line inspection. The current number of state veterinarians is insufficient to meet industry inspection requirements. Second, the supervision of subcontracts to private practitioners should be strengthened to avoid a conflict of interest for private veterinarians employed directly by slaughterhouses. Finally, funding and activities in disease control has become dangerously low.

In breeding services, the report notes that the services are under considerable financial pressure from decreasing government subsidies, decreasing numbers of cattle and pigs, virtual cessation of dairy production on state farms, and resulting decrease in demand for inseminations. Interventions should include: (a) increasing the financial and organizational participation of the farmers; (b) improving the efficiency of artificial insemination services; and (c) reassessing the organization of breed improvement and AI, with emphasis on privatization.


Agricultural Development Project. Staff appraisal report 9436. Memorandum of the President P5531. Discussed above.

Agriculture Sector Adjustment Loan Project. President’s report P5685. Discussed above.

AgroIndustries Export Development Project. Staff appraisal report 7112. Memorandum of the President P5150. Discussed above.

E. Main Agricultural Institutions

Food and agriculture research in Poland occurs in 23 research and development units
controlled by the Ministry of Agriculture and Food Economy, 9 universities of agriculture
under the Ministry of Education, and 10 scientific institutions, under the Policy Academy of
Sciences and other federal entities. Some major institutions under the Ministry of Agriculture
and Food Economy are listed below.

- **The Ministry of Agriculture and Food Economy,**
  Department of Science, Education and Extension Service
  ul. Wspolna 30, 00-930 Warszawa, Poland
  Eugeniusz Karol Chylek, M.Sc.Eng., Director
  Tel: 022-628-18-44, 623-24-21

- **Institute of Agricultural and Food Biotechnology**
  ul. Rakowiecka 36, 02-523 Warszawa, Poland
  Dr. Roman A. Grzybowski, Director
  Tel: 022-49-02-24
  Fax: 022-49-04-26

- **Institute for Building, Mechanization and Electrification of Agriculture**
  ul. Rakowiecka 32, 02-532 Warszawa, Poland
  Aleksander Szeptycki, Dr.Eng., Director
  Tel: 022-49-17-36, ext. 170
  Fax: 022-49-17-37

- **Institute of Agricultural and Food Economics**
  ul. Swietokryska 20
  00-002 Warszawa, Poland
  Dr. Wojciech Jozwiak, Director
  Tel: 022-26-61-17
  Fax: 022-27-19-60

- **Plant Breeding and Acclimatization Institute**
  Radzikow, 05-870 Blonie, Poland
  Dr. Henryk J. Czembor, Director
  Tel: 022-725-45-36
  Fax: 022-725-47-14

- **Institute of Land Reclamation and Grassland Farming**
  Falenty, 05-090 Raszyn, Poland
  Dr. Edmund Kaca, Director
  Tel: 022-628-37-63
  Fax: 022-628-37-63
• **Plant Protection Institute**
  ul. Miczurina 20, 60-318 Poznan, Poland
  Dr. Stefan Pruszynski
  Tel: 061-67-92-22
  Fax: 061-67-63-01

• **Institute of Meat and Meat Products Industry**
  ul. Rakowiecka 36, 02-532 Warszawa
  Dr. Andrzej Borys, Director
  Tel: 022-48-56-18
  Fax: 022-49-44-19

• **Research Institute of Medicinal Plants**
  ul. Libelta 27, 61-707 Poznan
  Dr. Jerzy Lutomski, Director
  Tel: 061-52-56-16
  Fax: 061-52-74-63

• **Institute of Soil Science and Plant Cultivation**
  ul. Czartoryskich 8, 24-100 Pulawy
  Dr. Seweryn Kukula, Director
  Tel: 081-86-49-60
  Fax: 081-86-45-47

• **Research Institute of Vegetable Crops**
  ul. Konstytucji 3 Maja 1/3, 96-100 Skierniewice, Poland
  Dr. Stanislaw Kaniszewski, Director
  Tel: 046-33-34-34
  Fax: 046-33-31-86
Romania

A. Background and Current Status of Agriculture Sector

The agriculture sector in Romania is of great importance to the rural economy and to the economic welfare of the country. Recent declines in agricultural production have impacted adversely on the availability of food and fiber for domestic consumption and foreign exchange earnings.

All recent declines in output value in the agriculture sector are related to the crop subsector. Grains have typically accounted for more than 60 percent of the cropped area. Total grain production increased from 18.4 million tons in 1989 to 19.3 million tons in 1991. Due to a severe drought in 1992, grain production dropped to 12.2 million tons, or 34 percent below the 1989 level. Also during 1989 to 1992, oat production tripled, maize production remained stable, and wheat and rye production declined about 60 percent. Among the other major crops, pulse production declined 70 percent, sugarbeet 57 percent, potatoes 41 percent, and oilseeds 11 percent. Despite a decrease in cropped area and an increase in fodder area, fodder production also declined.

There are many reasons for the drastic decline. Pricing and availability of modern inputs are major causes. The turmoil of the Revolution accounts for the major part of the decline in 1990. In 1992, a severe drought and further drop in utilization of modern inputs (fertilizer, irrigation water, pesticides, and machinery services) contributed. Uncertain land tenure may also have contributed.

The contraction in crop output between 1989 and 1992 can be explained by a persistent decline in yields. Grain yields declined at an average rate of 11.3 percent during 1989 and 1992. Average annual yield decline was 13.4 percent for wheat/rye and 6.1 percent for maize. The majority of other crops also experienced yield declines during the same period with the exception of rice (+18.6 percent), oats (+1.7 percent), pulses (+9.6 percent), oilseeds (+5.6 percent), natural fibers and tobacco. In comparison with neighboring countries, major Western European, and US producers, Romania ranked the lowest for wheat and maize yields and among the lowest for potatoes, sugarbeets, sunflower, soybeans, and tomatoes. At such low levels, yields could be considerably improved with modest improvements in the distribution of modern inputs, such as fertilizer and pesticides.

The composition of crop output remained stable between 1989 and 1992. Four major commodities, cereals, potatoes, vegetables, and fruits, accounted for 85 percent of crop output in 1989 and 89 percent in 1992. The share of cereal output in crops is similar in 1989 and 1992 (45 percent). There was a sharp drop in the share of wheat corresponding with an increase in the share of maize due to the predominance of maize cultivation on newly privatized lands. The share of animal products increased from about 38 percent in 1989 to 48 percent in 1992. Nominal farmgate prices of crops increased 180 percent during 1989 to 1992 and 125 percent for livestock products.

Livestock populations in Romania have also declined substantially since the end of the 1980s. Since 1989, the number of cattle have fallen by 43 percent, pigs and poultry by 31 percent, and sheep and goats by 12 percent. Total meat output, however, dropped
insignificantly due to heavy culling of breeding stock in 1991 and 1992. The future size of the livestock subsector, and its optimum species composition should be determined by market forces. In the immediate future, ruminant production seems likely to stabilize at present levels due to strong domestic demand for milk and dairy products.

Source: A Strategy for the Transition in Agriculture, 1993

B Agricultural Research and Extension

Significant changes in the system of government have occurred in Romania since 1989. Since agriculture is a major contributor to Romania’s economy, this sector should lead the transition to a market economy. Three major policy constraints limit the successful transformation of agriculture. These include: (1) pricing policies, foreign trade and exchange policies, the legal framework, and monetary and financial sector policies; (2) restructuring, demonopolization, privatization of the agriculture sector; and (3) completion of land reform. Once these policies have been adjusted, Romania’s agriculture will substantially benefit from exposure to international sources of funding, technology, scientific research, and investment. Technology transfer should be encouraged to increase the efficiency of production, trade, and processing. Agricultural products will benefit from modern processing and packaging through increases in quality, effective grades and standards, and international market information. These products will be better positioned to enter international markets.

The agricultural knowledge system in Romania has made substantial contribution to agricultural research, and Romanian scientists have been world leaders in soil science. However, recent low production levels in Romanian agriculture signal the importance of investing in the Romanian agriculture, research, education, and extension. The limits on government resources, and the expected growth in private sector input suppliers and processors also highlight the need to make institutional changes and investments in an appropriate agricultural knowledge system. These factors imply that in the new system, many services will be provided by the private sector. The government system will downsize, eliminate duplication, and focus on basic research and extension in areas excluded from private sector services. Research exchanges between Romanian and international scientists, sabbaticals overseas, and joint research projects are methods of stretching scarce research funds and ending the professional isolation of Romanian scientists.

C. Relevant World Bank Agriculture Projects

- Agriculture Support Services Project
  Loan: Appraisal
  Signed: n/a
  Source: Chuck Antholt, X35471

The Government of Romania intends to upgrade agricultural support services. A project to this effect is being developed for which financing has been requested from the World Bank (U.S.$12-14 million) and from PHARE (ECU0.5 million). The project will provide support for high-priority agricultural research and extension activities directed toward the
immediate technology needs of private farmers. At the same time, a comprehensive strategic action plan for strengthening agricultural support services will be formulated for future implementation.

Romania has approximately 14.8 million ha of good agricultural land. Until 1990, most of the land was farmed by state or collective farms. Today, some 8.5 million ha are farmed by about 3.0 million private farmers, about half of whom are members of some 11,000 family associations and 4,100 agricultural societies in an evolving market economy.

During the 1960's, Romania made substantial investments in institutions for agricultural research. In 1993, there were 38 Central Research Institutes, 98 large regional stations, and 5 agricultural universities with varying degrees of responsibility for agricultural research. These institutions were largely organized on a commodity or factor basis with their clients being the collective and state farms. Emphasis was placed on increasing total output, rather than increasing production efficiency. Little of this research was directly applicable to the needs of small, mixed private farming systems. Since the mid-1970s, there has been little new investment in agricultural research and more recently there has been attrition in staff.

Technology transfer to the state and collective farms was direct from research institutes to the managers and technicians employed by the state and collective farms. There were no extension or advisory services for private farmers. Today the Ministry of Agriculture and Food (MAF) has several thousand technically trained agriculturists assigned to the 41 Judets. The MAF's capacity to ensure that these actually respond to the client needs should be strengthened. Available staff have specialized technical training, but they have limited diagnostic, farm management, and demonstration/training skills that are relevant to assessing and serving the needs of small, private farmers. Furthermore, they have very limited economic training to assess what support would yield the highest benefits, and lack experience working in a client-oriented service.

The objective of this project is to support private sector development in rural areas and thereby raise agricultural output, increase efficiency of production, generate employment, and improve standards of living. The project aims to achieve this through financing credit to private farmers and other private businesses for (a) the improvement input supply, food processing, marketing and distribution services, and (b) on-farm investment in order to increase production and productivity.

The project design is envisioned as a modest, three- to four- year effort addressing medium-term needs for agricultural research and advisory services. It is seen as an interim effort that will in part 'set the stage' for more substantial restructuring and development of the support services sector. This project will have three components: i) a strategic review of agricultural support services; ii) a competitive, matching research grants program that will fund applied agricultural research on priority problems facing private farmers; and iii) support for innovative, pilot initiatives whose purpose will be to test alternative approaches for organizing advisory services for private farmers, and to strengthen MAF's capacity to provide advisory services to private farmers.
• Orchards Project
  Loan: 1876 (completed)
  Sources: Project completion report 8508, and Project performance audit report 13830

The Orchards Project is a credit scheme which includes a component of technical assistance to help improve fruit handling, storage, and processing and improve applied research for mechanization of fruit harvesting.

D. Agriculture Sector Work and Related Studies

• Romania: A strategy for the Transition in Agriculture. 1993 Sector report 12432.

Research

The long-term issues facing agricultural research in Romania are structural and organizational issues. While the current research system represents an impressive amount of human and physical capital, the system is isolated and fragmented and needs to be concerned with cost-effectiveness and financial sustainability. In the context of tight budgets, there is an acute need to rationalize the resources allocated to agricultural resources. This implies the challenge of downsizing the system while maintaining or improving its effectiveness. Good opportunities to eliminate duplicative efforts and create better integrated research between institutions exists in the fact that to better serve its new client-base of private farmers, agricultural research must become multidisciplinary in nature and focus on the needs of smaller-scale agricultural enterprises and farming systems.

In a privatized agricultural sector, market forces will determine optimal crop and livestock choices for farmers and thereby shape the support systems for agriculture. New areas of importance will be farm management and economics, marketing, processing, and distribution in a market economy. The new research system will require mechanisms through which farmers and agribusiness concerns influence research agendas and evaluation of research performance. Further, the research system must aggressively pursue adaptive research, using models present in northern Europe, Canada, and the US. Opportunities for sabbaticals for Romanian scientists to research abroad and for expatriate scientists to visit Romania will significantly advance this goal. Also, libraries must be updated with subscriptions to scientific journals and electronic communications must be established.

Education

Given the privatization of agriculture and the newly emerging market economy, education systems must also be reoriented. In Romania, teaching and research institutions have traditionally been administratively separate functions and institutions. Teaching faculty have little time for research or for sabbaticals to further their professional learning. Educational curricula is narrowly focused on technical and engineering-based subjects, such as crop production or soil science. Agricultural economics is weak, and multidisciplinary curricula, including farm management topics, do not exist. Admittance of excessive numbers of students
lead to overcrowding, while budgetary limitations restrict maintenance, repair, or upgrading of equipment and facilities. Curricula must be modernized, teaching and research functions must be integrated, and teaching posts must be evaluated based on performance.

Extension

Romania has not had a service analogous to the Western concept of extension. Research information on centrally-mandated topics was transferred to managers and technical staff of state and cooperative farms. The centrally mandated research areas focused on production and excluded topics such as farm economics and natural resource management. Television programs and a weekly publication by the MAF have little relevance for small private farmers. Both national and local radio programs broadcast agriculture information on a daily basis, but are also oriented toward large-scale state farms. Currently, about 9,000 staff are employed by the MAF in the communes’ Agricultural Centers (AC).

Principles upon which extension services should be based include: (a) advice to farmers must respond to their needs, constraints, and opportunities; (b) extension services must be held accountable to farmers by having AC staff elected by farmers to ensure meaningful farmer representation on the AC board; (c) farmers must have a choice of advisory services; (d) farmers must carry at least part of the cost of extension; (e) the choice of a channel for information transfer must be based on the most efficient match between demand for information and its supply; and (f) commitment to farmers must be reflected in staff incentives. Government role in extension should be to set conditions for different extension services to operate competitively; ensure availability, access, and affordability of information; and implement extension programs where public benefits exist but private sector involvement is unlikely.

- **Agricultural Prices, Subsidies, and Marketing Review.** Economic report 11350.


- **Private Farmer and Enterprise Support Project.** Staff appraisal report 10458. Discussed above.

**E. Main Agricultural Institutions**

- **Academy for Agricultural And Forest Sciences “Gheorghe Ionescu-Sisesti”**
  Bd. Marasti 61, Bucuresti, 71331, Romania
  Dr. Corneliu Rauta, President
  Tel: 40 1 2229139
  Fax: 40 1 2229139

  Research areas: comprehensive development of sustainable agriculture in Romania, especially market-oriented agriculture systems.
The Slovak Republic

A. Background and Current Status of Agriculture Sector

The World Bank has not completed an agriculture sector study for the Slovak Republic. The following information has been provided to the CGIAR by the Slovak representative to the May 6 and 7 Regional Consultation in Prague.

The agriculture sector in the Slovak Republic contributes 6.2 percent to the GDP, and employs 5.6 percent of the labor force. The country contains 1.5 million ha of arable land. The structure of agricultural enterprises in the country is dominated by small to medium-sized farms. Farms of 100 hectares or more make up 16 percent of all farms; farms of 10-100 hectares comprise 19 percent; farms of 1 to 10 hectares make up 46 percent; and farms under one hectare make up 19 percent.

In the Slovak Republic, 58 percent of arable land is devoted to cereal crops; 9 percent is devoted to maize; 6 percent to oilseed crops; 2 percent to sugarbeet; 2 percent to vegetables; 1 percent to fruit; and 3 percent to potatoes.

B. Agricultural Research and Extension

At the present, there are eleven research institutes and one Institute of Scientific and Technical Information which are under the authority of the Ministry of Agriculture. Ten of these institutes are engaged in commercial activities and are being gradually privatized. Within the Ministry of Agriculture, the Slovak Academy of Agricultural Sciences (SAAS) acts as an executive body for all research institutes and directs research and agendas and programs. Research programs in the Slovak Republic are directed toward state orders, state scientific and technical projects, specific tasks for the Ministry of Agriculture, research activities contracted by private-sector companies, and consultancies. State orders and state scientific and technical projects are the highest priority research activities, and must be devised and approved by the SAAS and the Office for Science and Technology in the Agency for Development. In institutes which are directly controlled by the Ministry of Agriculture, research budgets are make up of the following proportions: special tasks for the Ministry of Agriculture - 50 percent; state orders and state scientific and technical projects - 30-40 percent; commercial activities and consultancies - 10-20 percent.

The most important area of research in the Slovak Republic is soil productivity and plant production. Other major areas of research are animal production and veterinary medicine, technology development, and agricultural economics and policy.

The Ministry of Agriculture describes the following issues as the main constraints to the national research systems (NARS): shrinking state resources available for research; inability or limited ability of research beneficiaries to purchase services; current transition of the national agricultural research system, including research topics and funding mechanisms, to support a market economy; insufficient international cooperation in scientific research; and inability to modernize and maintain research facilities.
C. Relevant World Bank Agriculture Projects

Not applicable.

D. Agriculture Sector Work and Related Studies

Not applicable.

E. Main Agricultural Institutions

- **Research Institute of Irrigation**  
  Cesta 29, 823 65 Bratislava  
  RN.Dr. Stefan Rehak, C.Sc., Director  
  Tel: 07/293 528  
  Fax: 07/248 946

  Research areas: hydropedology and hydrodynamics, water regime, water retention, irrigation technology, land improvement, certification.

- **Research Institute of Plan Production**  
  Bratislavska cesta 122, 921 68 Piešťany  
  Ing. Timotej Mistina, C.Sc., Director  
  Tel: 0838/722 330  
  Fax: 0838/263 06

  Research areas: genetics, breeding, plant physiology, basic agrotechnics, growing technology, plant nutrition, mechanization.

- **Grassland and Mountain Agriculture Research Institute**  
  Mladeznicka 36, 974 21 Banská Bystrica  
  Ing. Stansilav Knotek, C.Sc., Director  
  Tel: 088/734 523  
  Fax: 088/732 544

  Research areas: biotypology of grasses, grassland production and yield intensification, ecology, environmental science, harvest and conservation, grass seed production.

- **Regional Research Institute of Agroecology**  
  Spitalska 1273, 071 48 Michalovce  
  Ing. Rastislav Mati, C.Sc., Director  
  Tel/Fax: 0946/244 29

  Research areas: plant production technology, yield intensification in specific conditions of East Slovak lowlands, ecology, environmental monitoring, research and development of crop production systems.
• **Research Institute of Animal Production**
  Hlohovska 2, 949 92 Nitra
  Doc. Ing Ladislav Hetenyi, C.Sc., Director
  Tel: 087/526 4622
  Fax: 087/526 1417

  Research areas: animal genetics, reproduction, animal nutrition, technology, farm animal products, product quality improvement, ecology, and environmental science.

• **Research Institute for Economics of Agriculture and Food**
  Trencianska 55, 824 80 Bratislava
  Tel: 07/521 7428
  Fax: 07/215 224

  Research areas: economic development and trend analysis, agrarian and nutrition policy, international and economic cooperation, prognosis and programs, information management.
V. GROUP II COUNTRY PROFILES

Albania

A. Background and Current Status of Agriculture Sector

Albania rejoined the international community in July, 1991 and held the country's first democratic elections in March of 1992. During the political interregnum from July to March, the agriculture sector was crippled by severe input and foreign exchange shortages, social upheavals linked to the privatization of cooperative land and assets, and disruptions caused by the absence of alternative distribution and allocation mechanisms to replace collapsing centrally planned systems. This breakdown, coupled with the extreme import scarcity, resulted in a 60 percent decline in total economic output between 1990 and 1992. By the spring of 1992, 50 percent of the urban population was not working. The 1992 agriculture sector report states that Albania has a good potential for escaping poverty and reaching higher levels of productivity and income, despite the fact that the country faces unprecedented challenges.

Albania is predominantly an agricultural country, with most of its population living in rural areas. With the sharp decline in industrial and service sectors in 1992, the contribution of agriculture to the GDP has risen from 35 percent in the 1980s to 50 percent in 1992. Currently the sector accounts for 20 percent of exports and 50 percent of employment. Agriculture production is comprised almost 50 percent by livestock. The remainder of production is in crops, the most important field crops being wheat and maize. Of the 700,000 ha of arable land, 423,000 ha are irrigated. There is approximately 430,000 ha of pasture land in Albania. Wheat and cotton production are expected to be 30 percent less than in 1991, and egg production will fall by 14 percent. Other commodities have maintained or exceeded their 1991 levels. The most important increases are in maize, vegetables, sunflower, and tobacco production.

New private farmers dominate production, cultivating 75 percent of arable land and providing more than 70 percent of the agricultural labor force. In 1992, the majority of farmers became subsistence oriented and unwilling to specialize or grow agroindustrial crops that require marketing. As a result, 90 percent of cultivated land was allocated toward food crops or livestock feed. Farmers concentrated on crops that are easily consumed, processed and stored on the farm and whose prices are liberalized, such as beans, potatoes, and vegetables.

Declines in output and subsistence orientation have reduced private and state farm deliveries to official marketing channels. In total, wheat, flour, meat, and milk flows through public processing and distribution channels were 70-80 percent lower in 1991 than in 1990. For example, in 1992, private farmers kept the majority of their wheat harvests for household bread making, and few sold their wheat to the official collection centers. Albanian private farmers provided only 20 percent of the wheat deliveries to collection centers, even though they account for 70 percent of wheat production. Indeed, the total amount private farmers sold to collection centers equals only 5 percent of the amount they produced. As a result, wheat imports during the first eight months of 1992 exceeded the years harvest by 20 percent. State farms, which have traditionally supplied urban areas with vegetables, meat, and dairy products have also been undermined. Early liberalization of vegetable prices and the ease of vegetable
processing and distribution (no packaging, low bulk) have allowed private vegetable markets to
develop in urban areas and begin to fill demand. Nevertheless, domestic production of
vegetable oil and sugar are estimated to cover only 6 to 15 percent of domestic needs, and
supplies of fresh meat and milk products, however, are still far below demand in urban areas.
In 1992, Albania was heavily dependent on food aid.

In the four years since the Agriculture Strategy was written, the agriculture sector has
undergone some significant changes. Currently, there are no more state farms and practically
all land except pastures is privately used. More than two-thirds of agroprocessing and
marketing entities are now privatized. In food crops, subsistence production is still very
dominant due to the small farm size and lack of organized processing facilities, domestic
marketing, and exporting. Nevertheless, since 1992, domestic grain production has increased
greatly as a result of privatization and price liberalization - 480,000 tons in 1994 and 400,000
tons in 1995. Except for some wheat and sunflower oil, food aid has been almost eliminated
and replaced by commercial imports. The urban centers depend nearly exclusively on wheat
and flour imports (Goetz, personal communication).


B Agricultural Research and Extension

At the current time, World Bank is focusing in Albania is on macroeconomic issues,
land distribution, legal frameworks, privatization, and the provision of critical inputs to
agricultural production. It currently has no pipeline projects with crop or livestock research or
extension components. The World Bank engaged in institution-building activities under
several past projects, not all strictly concerned with agriculture support services. The Albanian
Development Fund (under the Rural Development Project) was a successful effort which
provided matching grants for infrastructure development in rural areas and organizational
assistance for 'Village Credit Funds.' Institution building was also included under the
Agriculture Sector Adjustment operation for the Rural Commercial Bank (a state bank which is
soon to be privatized) to serve the private sector rural economy (Goetz, personal
communication). A Forestry Development Project, approved just recently, will also have a
major institution-building component for the forest and environmental administration in
Albania. It will also support research, training and involvement of stakeholders in forest
management (Goetz, personal communication).

The World Bank also supports extension-type activities under the Institution Building
component of the Irrigation Rehabilitation Project and the Agroprocessing Development
Project, both currently ongoing. Under the Irrigation project, the training and technical
assistance activities are aimed at transferring the skills necessary for irrigation management to
local-level Water Users Associations. The Agroprocessing Project includes an entrepreneurs
support component, which includes technical assistance, training, and study tours for
agroprocessing enterprises.

The Staff Appraisal Report for the AgroProcessing Project gives a brief description of
the Agricultural research and Extension entities in Albania. With respect to extension, each
district in Albania now has a Department of Agriculture and Food with responsibilities in the
agriculture policy development at district levels and development of extension services in communes. Each commune has a group of specialists, including an agronomist, a zoo technician, a veterinary inspector, an economist, and a statistician, who are responsible for the collection of data from farmers and for the delivery of extension services. Although a field service structure is in place, actual delivery of extension services has yet to be implemented. The extension specialists were originally trained and deployed on large state farms and need experience and knowledge to advise small farmers. In this respect, development of applied research for appropriate extension services is needed. Initial steps in defining the needs of small farmers and developing response mechanisms are being undertaken by the British and the Netherlands. These projects focus on an integrated approach to farm development, including simultaneous improvement of crop and livestock production (horizontal integration) and improvement of input supply and marketing of agricultural produce (vertical integration). Presently there is no public sector involvement in extension.

The agricultural research structure under the Ministry of Agriculture and Food consists of several institutes and stations covering all major subsectors in production, such as cereals, vegetables, livestock, and forestry. This system needs major adjustments to become responsive to a market economy and small-farmer production system. The institutes are poorly equipped, and staff are insufficiently trained to cope with the changing agricultural sector. An efficiently restructured research system and program would most likely require downsizing the current staff and facilities and refocusing on fewer priority areas.

The agriculture sector study for Albania does not describe the agriculture knowledge system in detail. The sector study does give attention to improvement of support services to farmers, and places this as a priority under its medium term measures. The study suggests that system restructuring will be appropriate in a second phase of development activities in Albania, after urgent price and land reforms are accomplished, prerequisite policy changes are set into effect, and new private farm enterprises begin to develop areas of competitive advantage. However, given the recent reorganization efforts of the Ministry of Agriculture and Food, and the emergence of private farmers which dominate agriculture production, the sector study suggests that an appropriate first step would be to review the possibility of reorienting the existing system.

In summary, careful thought should be given toward the development of an appropriate agriculture knowledge system. Both branches need retraining to be responsive to the current situation. Given the small size of the country and the severe fiscal limitations, there is question whether the country needs a self-standing national research organization of the current size. Regarding extension, roles for the public sector should be explored. Lessons and models may be taken from Greece, Italy and the Balkan countries which have similar agroecological environments. Potential for future growth in Albania’s agriculture sector is likely to be dependent on close links with the European Union. This could be especially true for grant funding for research and technical assistance (Goetz, personal communication).
C. Relevant World Bank Agriculture Projects

- **Irrigation Rehabilitation Project**
  
  Loan/Credit: 2652  
  Signed: FY95  
  Sources: Staff appraisal report 12609, and Memorandum of the President P6307

  This project will: (a) increase agricultural production by raising farm productivity through rapid rehabilitation of the existing irrigation and drainage infrastructure; (b) alleviate poverty by increasing income of small private farmers and creating employment opportunities for dependent farm labor in rural areas; and (c) ensure the long-term sustainability of irrigation and drainage investments through farmer participation in operation and maintenance, efficient system management and adequate cost recovery. In order to achieve the above, the project will specifically focus on (a) system rehabilitation; (b) institution development; (c) policy support; and (d) implementation support.

  **System Rehabilitation**

  The project is rehabilitating 21 irrigation schemes serving an area of 73,500 ha and 56,800 families. Rehabilitation works include earthworks and canal cleaning, canal lining, replacement of pumping equipment, repair of control structures and gates, and installation of flow measuring devices. A demonstration scheme for canal flow control, covering an area of 1,000 ha is being built for training of Albanian irrigation system designers and operators.

  **Institutional Development**

  Technical assistance, comprehensive training programs and related office, laboratory and maintenance equipment are provided by the project for improving system operation and maintenance, enhancing local engineering design capacity, and establishing successful Water User Associations in the project area, and implementing and On-Farm Water Management Program.

  **Policy Support**

  Studies are underway to finalize the regulatory framework for irrigation and drainage, to prepare the turnover of small systems to water users, to consolidate initially small Water User Associations into larger water boards, to develop a financial model for determining cost-covering water charges, and to promote private surface pumping and groundwater development.

- **AgroProcessing Development Project**
  
  Credit: 2795  
  Signed: FY95  
  Sources: Staff appraisal report 13079, and Memorandum of the President P6358
The main objective of the project is to support the development of the agroprocessing sector in Albania and to help improve the conditions for financing its restructuring and to improve marketing of farms outputs (thereby improving rural incomes) and availability of food products to urban population. The project has two main components: 1) an entrepreneurs support component which includes technical assistance, equipment and vehicles, and training and study tours; and 2) an investment credit component.

The Entrepreneurs Support component assists agroprocessing enterprises but also focuses on the dairy industry and includes relevant assistance to the Rural Credit Bank (RCB) for the appraisal and supervision of sub-projects. The project provides funds for experts and related expenses for: (i) long and short term technical assistance in various fields; (ii) direct technical assistance and training/study tours to entrepreneurs in agroprocessing, organization of private farmers associations, processing, quality assurance, management, marketing, and other business support; and (iii) limited technical assistance to local institutions to strengthen their technical services and quality control law enforcement capabilities.

- **Agriculture Sector Adjustment Credit Project**
  Credit: 2524
  Signed: FY93
  Source: Presidents Report P6065

The project addresses four key areas of policy and institutional reform: (a) creating an appropriate agricultural price and incentive framework; (b) providing rural entrepreneurs with access to credit and restructuring of the rural financial system; (c) liquidate state farms, distribute their land and develop the legal and policy framework in order to accelerate consolidation and develop the market for land; and (d) to improve the performance of the currently state owned enterprises in the agricultural and processing sector.

**D. Agriculture Sector Work and Related Studies**


This volume presents both short-term and medium-term recommendations on actions required to achieve the objectives of restoring food security, providing income and employment for the rural population, contributing to rapid economic recovery and managing the transition from a highly centralized command economy to a market economy in agriculture. The volume also presents a technical assistance program to strengthen government administrative capability during this transition period and supports the implementation of the program of actions. Eleven annexes and a statistical appendix offer detailed information on various aspects of the sector.

The study addresses research and support services for farmers under medium-term measures, stating that the research system must be progressively adapted, but that reorganization of the system must be implemented once areas in which Albania develops comparative advantage begin to emerge. Support services for private farms must be adapted to the market economy in order to increase on-farm productivity. Both research and support services must develop market-oriented programs and training programs for its staff. A priority
for foreign assistance in the short to medium term would be to study the technical needs in agricultural research which would support recommendations for restructuring the sector.

Advisory services for crop and animal production, including extension and business advice, are required to provide farmers with new research results, technology, and marketing and business practices. Services remaining under public mandate should be based on cost recovery mechanisms, while other services should be privatized. The first stage will require reorienting the present extension system toward the newly reorganized Ministry of Agriculture and Food and the new private farmer associations. The second stage requires provision of technical assistance and training programs for extension employees, implemented along with pilot/test programs with demonstration farmers. Next, technical assistance and training programs should be developed to help former state cooperative employees, such as agronomists, agricultural economists. The purpose of such technical assistance would be to help the unemployed specialists adapt their skills to the technology, marketing, and business practices of the new market. Support services for livestock, such as veterinary services and artificial insemination, should be similarly restructured. Artificial insemination (AI) services should be privatized with the full cost of services charged to the clients.


**E. Main Agricultural Institutions**

- **Soil Research Institute**
  Instituti i Studimit te Tokave, Rruga ‘Durresit’ Laprake, Tirane
  Perparim Laze, Director
  Tel/Fax: 355 42 28367

  Research areas: soil topography, cartography, chemistry, and physics.

- **Vegetable and Potato Research Institute**
  Instituti i Perimeve dhe Patates, Rruga ‘Skender Kosturi’ Tirane, Albania
  Skender Tola, Director
  Tel: 355 42 28422

  Research areas: vegetable and potato research, breeding, genetics, hybridization.

- **Fruit Tree Research Institute**
  Instituti Pemtarise, Vlore, Albania
  Hajri Ismaili, Director
  Tel: 355 63 25623
  Fax: 355 63 24012

  Research areas: preservation, study and propagation of genetic materials on citrus, olive, and grape vines.
- **Plant Protection Institute**  
  Instituti Mbrojtjes se Bimeve, Shkozet, Durres, Albania  
  Fadil Gjata, Director  
  Tel: 355 52 22182  
  
  Research areas: diagnosis of plant pests, quality control of pesticides.

- **Forestry and Pasture Research Institute**  
  Instituti Pyjeve dhe Kullotave, Rruga ‘alil Bego’ L.23, Tirane, Albania  
  Spiro Karaduni, Director  
  Tel/Fax: 355 42 33343  
  
  Research areas: researchers for development of the forest economy and rational exploitation of the forest resources and pastures.

- **Veterinary Research Institute**  
  Instituti Kerkimeve Veterinare Rruga “Aleksander Moisiu” L.10, Tirane, Albania  
  Bamir Topi, Director  
  
  Research areas: production of biopreparate and other pharmaceutical products.

- **Zootechnical Research Institute**  
  Instituti Kerkimeve Zootecknike, Laprake, Tirane, Albania  
  Kristaq Kume, Director  
  Tel/Fax: 355 42 23135  
  
  Research areas: research and experimentation in animal science, genetic improvement, and animal husbandry.

- **Fisheries Research Institute**  
  Instituti Kerkimit te Peshkut, Rruga ‘Skenderbeg’ L ‘Teuta’, Durres, Albania  
  Tel/Fax: 355 52 22552  
  
  Research areas: researching, testing, and information in fisheries.

- **Food Research Institute**  
  Instituti I Kerkimit te Ushqimit, Rruga ‘Muhamet Gjollesha’ Tirane, Albania  
  Rustem Zenelaj, Director  
  Tel/Fax: 355 42 26770  
  
  Research areas: food biochemistry and analysis, food technology, biotechnology, and microbiology.

- **Field Crops Research Institute**  
  No information.
\begin{itemize}
\item \textbf{Agricultural Research Station}
  
  Stacioni Kerkimit Bujqesor, Lushnje, Albania
  
  Agim Canko, Director
  
  Research areas: agrotechnology and breeding of wheat, bean crops, sunflowers, and cotton.

\item \textbf{Maize and Rice Station}
  
  Stacioni Misrit dhe Orizit, Shkoder, Albania
  
  Lazer Capaliku, Director
  
  Tel: 355 224 2507
  
  Research areas: development of maize hybrids, agrotechnology and breeding work for maize and rice.

\item \textbf{Sugar Beet Station}
  
  Stacioni Panzharit, Korce, Albania
  
  Gjergji Qafko, Director
  
  Research areas: agronomy of sugarbeets, barley, and rye.
\end{itemize}
Armenia

A. Background and Current Status of Agriculture Sector

The gross agricultural production in Armenia is split between crops, which accounted for 66.3 percent, and livestock, which accounted for 33.7 percent of production in 1993. From 1988 to 1993, the relative importance of agriculture to the national economy in Armenia increased. Despite the fact that total agricultural production fell 17.5 percent, other sectors declined even more significantly. By 1993, agriculture accounted for 46 percent of the net material product (NMP)\(^5\) and over 25 percent of total employment.

The country's cropping structure underwent a dramatic shift in the years from 1991 to 1993. The proportion of annual food crops increased substantially at the expense of forage crops, perennial and industrial crops. The cultivation of grain (mainly wheat, the most important crop) increased by 49 percent between 1990 and 1993, while the area fodder decreased by the same percentage. Almost half of the food output by volume consists of fruits and vegetables. Currently, these are the only crops where production is self-sufficient and exporting occurs. The livestock sub-sector is in a deep and unprecedented crisis due to the combined impacts of reduced livestock populations, lower production intensities, and collapse of the command order system. Production efficiency and crop yields are below those of developed countries with similar climates. Most crops are believed to be barely 50-60 percent of potential. Availability and use of fertilizers is suboptimal and declining. Livestock performance is only a third of Western standards for milk and meet production. Losses in storage and distribution are substantial.

Armenia has traditionally been a net importer of food and agriculture products. In 1990, prior to independence, the country produced only 20 percent of its grain and 30-35 percent of its dairy and meet product requirements. The nation remains a net importer of food, even though consumption levels are substantially lower than before independence. For example, it produced only 30 percent of its flour requirements and only 75 percent of the livestock products consumed in the country.

It will not be economically efficient for Armenia to produce all of the food required for domestic needs. Increasing the level of cereal, sugar, milk, and meet self-sufficiency, as planned by the Government, is not supported by the natural endowment of the country and can not be economically justified. Domestic endowments and traditions favor labor intensive horticulture, production of vegetables, viticulture, and livestock production suited to domestic feed resources grown on higher altitude pastures and meadows. Longer-term adjustments for field and horticulture crops should include rehabilitation of irrigation systems compatible with private farming; privatization and modernization of processing; and introduction of techniques to improve product quality both in private agriculture and processing. Armenia's best export products include vegetables, grapes and fruits in the form of produce, wines, and brandies.

---

\(^5\) The net material product is a concept within the material product system (MPS), the main macroeconomic accounting system used by the former Soviet Union and other centrally planned economies. It is the total amount of material good and services associated with production supplied by the national economy, defined as the industrial, trade, transportation, agriculture, construction, catering, and communication sectors. It differs from the system used in the United States to calculate GDP in that it excludes depreciation and nonpaid services.
The livestock market is likely to remain solely a domestic supplier. Local feed availability provides a basis for recovery in cattle, sheep, and goat husbandry.

Armenia has implemented one of the most comprehensive land reform programs of the FSU republics. At the same time, state order system for agricultural products was almost fully dismantled. Some of the producer prices and most input prices were liberalized, and almost all producer and consumer subsidies were eliminated. These achievements, however, were compromised and limited in effect by the lack of competition in input and output marketing, and by the delay in restructuring and privatizing of agricultural industries.


B. Agricultural Research and Extension

Beginning in 1995, the World Bank began giving considerable attention to the agriculture knowledge system in Armenia. In the agriculture sector study for Armenia, restructuring the agriculture service systems is identified as a priority area for the Government in its new role of providing an enabling environment for new enterprises and farms to create growth. The sector study gives a table of the existing education, research and extension institutions, describes the system in some detail, and lists the major constraints and areas for development in the system. The analysis suggests how a new system should be oriented, but stops short of suggesting a new structure for the system.

Chapter 5 of the sector study examines extension services in Armenia, which are in their infancy. Due to the demand for technical advice (which was formerly provided by specialists from state and collective farms), the Ministry of Food and Agriculture (MOFA) established an Extension Division (ED). The MOFA is piloting this service in about 12 districts. Chapter 6 describes the recent reforms and advancements that Armenia has made in higher education and research. It seems that many well trained specialists exist in the country to provide the base for an efficient system.

As of 1996, the Ministry intends to proceed with a major reform of the research system, which the World Bank strongly supports. A joint World Bank - MOFA project preparation unit is currently working with the Academy of Agricultural Sciences to examine which institutes can feasibly be commercialized and which are more appropriate for public funding. It will formulate a restructuring plan. Potential support under this loan may include credits under the Agriculture Reform Support Project for the restructuring of agroprocessing enterprises. Currently, the World Bank is also exploring the possibility for investments in the new Extension Division of Ministry of Food and Agriculture to strengthen the capabilities of the ED media-based agriculture information system.

Armenia’s potential for growth in the agriculture sector is mixed. While it has good potential for primary production of fruits and vegetables, its processing industry cannot now compete with higher quality products in international markets. In addition, Armenia’s infrastructure and processing facilities are crumbling due to poor maintenance. The agroindustries also suffer from unreliable sources of power. In the short-run, Armenia’s primary constraint is the current blockade which has halted trade on most borders. On the
other hand, the GOA, in addition to the MOFA, seem to be committed to changing its role in agriculture and reorienting its services. If the current political situation and the resulting trade constraints in the region resolve soon, Armenia’s agriculture sector may have good potential for recovery (Lundell, personal communication).

C. Relevant World Bank Agriculture Projects

- **Irrigation Rehabilitation Project**
  
  Credit: 2667  
  Signed: 1995  
  Sources: Staff appraisal report 12811, and Memorandum of the President P6279

The objective of the project is to assist Armenia in maintaining the level of irrigated agricultural production and improve the country’s water resource management. The project is comprised of four main components: (a) rehabilitation of 12 irrigation schemes; (b) establishment of pilot projects for improved water distribution and establishment of water users associations; (c) financing incremental operation and maintenance costs of irrigation infrastructure until effective water users associations are in place; and (d) technical assistance, including establishment of a project implementation unit, assistance to update the water master plan, training, preparation of the next irrigation project, and assistance to improve irrigated crop production.

- **Agriculture Reform Support Project (ARSP)**
  
  Loan: Preparation  
  Signed: n/a  
  Sources: Preparation Mission Aide Memoir, March 1996  
  Task Manager: Mark Lundell

This project is in preparation. The project preparation unit (PPU) is now working on a strategy for growth of financial institutions; an information base to be used to attract post-privatization investment in agroindustry; and possible areas of intervention where investments could be made to form agricultural institutions capable of promoting private sector activity in agriculture. Project loans for agroindustrial enterprises are anticipated to be onlent through the Agricultural Cooperative Bank of Armenia (ACBA). A catalogue of information for the best 10-15 agricultural processing enterprises will be compiled for circulation to potential investors. Joint ventures are hoped to bring to Armenian industries infusions of new equity, access to essential inputs for the processing sector, and expertise in international marketing. To support reforms underway in the agricultural institutions, the PPU should assist in the design of reforms not yet finalized and examine the critical investments needed to implement them. The project is also anticipated to provide a minimum amount of public extension services. The PPU specialists will examine what investments are needed to bolster the provision of services by the new Armenian Extension Service. It will also examine the role of the existing Information and Press Unit in the MOFA, how it can be upgraded to provide mass media-based information, and what this information should be. In education, potential investments will be examined in both retraining the teaching staff and the provision of teaching materials available in Armenian.
Improvements in access to international sources of library information through publications and computer-based linkages will also be considered.

D. Agriculture Sector Work and Related Studies

- Armenia - The Challenge of Reform in the Agricultural Sector / Agriculture and Food Sector Review. Sector report 13034. See also publication 14521. FY95.

This study provides a status report on the food and agriculture sector and assesses the progress of ongoing sectoral reform. In addition to giving an account of the reforms in private agriculture, it recommends a set of policies to complete the transition to a sector based private ownership and market control. Chapters 5 and 6 are relevant to research and extension.

Priorities for the Government of Armenia are to provide an enabling environment for private enterprises and farms to create growth themselves. The Government should focus on the following actions: creating an improved incentive system for agriculture to replace the command system; completion of land reform to support commercial and family farming; demonopolization and privatization of agroprocessing; redefining the role of Government in agriculture and restructuring public administration of the sector; and restructuring the agriculture supply distribution and service systems. Development of an appropriate and well-functioning agriculture service system will require privatization and reorientation of extension and advisory services toward client needs.

Chapter 5 'Competitive Linkages for Privatized Agriculture' discusses the need for extension services. With the move to a privatized market economy and the breakdown of the state ordering system, old ways for managing agricultural information are not workable or financially sustainable. The absence of these old systems combined with the new types of agricultural activities have created a new demand for agricultural information. Thus, following the land reform and creation of private farms, Armenia introduced an Extension Division (ED) in 1992. The Government is still finalizing extension concepts and design. Cost effectiveness and minimization of recruitment costs are main concerns. Desirable size and location are being determined on the basis of closeness to existing research and training facilities, access to mass media, and ability to service several rayons. Currently, the ED provides soil testing, seeding norms, pest management, fertilization and fruit tree management services. The division uses direct farmer meetings and mass media to reach and educate farmers. The ED attempts to operate with severe constraints caused by insufficient vehicles, operating funds, office and audio equipment, and other materials. There is an ample pool of qualified staff in the country from which agents can be recruited. Armenia has requested assistance in implementation of the proposed extension services, specifically in (a) strengthening of MOA's capacity to facilitate the implementation of the service; and in (b) assistance to farmers associations and cooperatives which are potential agencies for the delivery of extension services.

Chapter 6, 'Improving Agricultural Efficiency and Sustainability' discusses modernizing higher education, research and extension. The chapter begins with a listing of the agricultural research and education institutions in Armenia. The chapter describes the major
constraints to the system and major areas for development. Among its list of investment priorities, priority number 5 is the development of education, research and extension potentials.


  This paper covers agricultural policy developments in Armenia since the Armenian Food and Security Sector Review and gives a brief assessment of the performance of agriculture and food processing in 1995 based on the preliminary estimate provided by the Ministry of Agriculture and Food Industry.

- **Introduction To The Agriculture Sector.** Sector report 10814. FY92.

- **Irrigation Rehabilitation Project.** Staff appraisal report 12811. Memorandum of the President P6279. Discussed above.

**E. Main Agricultural Institutions**

- **Ministry of Food and Agriculture, Department of Scientific Education**
  Yerevan, Noragavit Street 3, av. 1, home 13
  Dr. Avetisian Samwel Sergey, Director
  Tel: 524860 (home), 482579 (office)
Belarus

A. Background and Current Status of Agriculture Sector

The Republic of Belarus has a limited natural resource base. It has few indigenous sources of primary energy or raw materials for industrial processing. Its agricultural resources are relatively weak: soils tend to be of low fertility, light, or marshy. Its economy was built on its strong human resource base - a healthy, literate, and well-trained labor force with excellent scientific capability. The agriculture sector accounts for nearly a quarter of the net material product (NMP) and employs about 20 percent of the labor force in Belarus. The sector traditionally produced an exportable surplus of livestock products delivered to the other Republics of the FSU. Formerly, the country produced about 6 percent of the total livestock products in the FSU. Overall, however, Belarus has been a net importer of food and agriculture products.

Most agricultural production is still organized into the social sector, with two centrally controlled types of large scale production. The Kolkhozes are collective farms in which output and assets are jointly owned by the members. Sovkhozes are state farms in which the output and assets are owned by the state, and the laborers are state employees. The state and collective farm system is augmented by the mekhkozes, which provide agriculture services or process agricultural products and which are owned jointly by several farms. In 1993, the social sector accounted for 7.8 million ha or 83 percent if all agricultural land and 67 percent of production. The state and collective farm system also provided many social and municipal services (kindergartens, schools, medical care, housing, clubs, and sports facilities). These enterprises are diversified, mechanized, and large in size. Their operation frequently integrates upstream and downstream activities, such as agroprocessing and provision of inputs. Livestock production is the dominant orientation of agriculture, and much of the crop production is focused on providing the inputs for the livestock industry. Large scale socialized farms accounted for 72 percent of all livestock production and practically all of the grain produced in Belarus.

This system has traditionally coexisted with quasi-private subsistence household agriculture. Household farming is based on plots ranging in size from 0.1 to 0.5 ha. They are used by members of social-sector farms and by urban workers to cultivate garden plots. Because of their sized, family plots mainly concentrated on livestock production. At one time, 1.4 million families used about 650,000 ha (or 7 percent) of the total agricultural land to produce more than a quarter of total agricultural output in the second half of the 1980's.

Independent private farming has only recently emerged. The first private farms were established in 1991. By 1993, there were 2,700 private farms in Belarus averaging about 20 ha per farm. The private sectors share of agricultural land increased in 1993 to 15.9 percent, and its share of output rose to almost 40 percent in the same year.

In 1993, the production of crops rose to 50 percent of gross agricultural product. Livestock contributed the remaining percentage. Agricultural production declines in the early 1990s have been less severe than in other FSU countries.
Dairy production is the mainstay of the livestock sector. Meat and milk production continued growing until 1990, with the livestock subsector registering impressive increases in productivity. Beef production has been increasing more rapidly than cattle numbers since 1970, indicating efficiency gains. The number of eggs per hen has also increased by 25 percent between 1970 and 1990. After 1990, increasing prices and decreasing per capita incomes drove consumption down and forced a downward adjustment of livestock production. Although Belarus’ natural resource endowment appears to favor livestock rather than crop production, the livestock industry is oversized, inefficient, and environmentally unsustainable. The industry grew artificially through heavy subsidies to producers and consumers. By Western standards, the livestock sector has never been efficient, despite increases in productivity in the 1980s.

Profitability of livestock operations has fallen drastically after 1990 because of increasing costs resulting from reduced subsidies on inputs; declining sales on domestic markets as a result of rising consumer prices and falling real incomes; and collapsing markets for exports to the newly independent republics for the former Soviet Union.

Crop production in Belarus is concentrated on production of forage and feed. 80 percent of crop land is used to produce feed grains and fodder. The main grain crop is winter rye, which accounts for 35 percent of the total cropped area. Other important grains include spring barley, oats, and wheat. Production of grains rose from 4.1 million tons in 1980 to 7.8 million tons in 1987. 1991 and 1992 are not characterized by a significant drop in production. The main nongrain crops are potatoes, flax, and sugar beets. Other major crops in Belarus are potatoes, vegetables, sugar beets, and rapeseed. Fruit production is undeveloped. Belarus’ soils are well-suited for potatoes, and this crop along with flax has significant export potential for Belarus.

Source: Forestry and Agriculture Sector Review, 1994.

B. Agricultural Research and Extension

Little information is available for Belarus. The country has had only three World Bank projects in its history, all signed in 1994. The only natural resource project is in the forestry subsector. This subsector show the greatest potential for growth. The project includes institution-building, training, and extension activities.

The agriculture sector study does not give a detailed description of agricultural research and training in Belarus. The sector study focuses quite a bit on forestry, which comprises a major area of potential growth for the agriculture sector in Belarus. For this reason, it is difficult to make any conclusions regarding the agricultural support service of the country, other than that they reflect the complex and inefficient characteristics of centrally-planned systems. The sector study states that agricultural research in Belarus is similar to that in the other FSU countries: that reorganization is incomplete and poorly understood by the affected institutes. The level of basic research meets international standards in most areas, although the minimum level of resources needed for meaningful research is no longer available. Salaries are barely covered, but repair and maintenance, along with all research travel and exchanges have
ceased. The sector study notes that like other FSU countries, the most needed technical assistance is in the area of farm management, marketing, and policy analysis.

C. Relevant World Bank Agriculture Projects

- **Institution-Building Project**  
  Loan: 36400

- **Rehabilitation Project**  
  Loan: 36600

- **Forestry Development Project**  
  Loan: L3741  
  Signed: 8/25/94  
  Sources: Staff appraisal report 12511, and Memorandum of the President P6202

This project supports development objectives in the following areas:

**Sector Policy Reform**

The project seeks to effect price increases in stumpage fees, introduce open market pricing, liberalize international trade and the domestic market for wood and wood products, and prepare the MinFor enterprises for future privatization.

**Production Support**

The project promotes the implementation of intensified silviculture, creation of seed facilities, provision of harvesting equipment and spare parts, and the introduction of efficient harvesting practices. Intensive silvicultural maintenance of existing forest will be carried out by MinFor through its district level enterprises.

**Forest Fire Protection**

The project provides adequate protection against forest fires and prevention of the spread of radionuclide contamination through forest fires. The project will help implement a newly developed fire protection program which addresses the requirements for the radionuclide contaminated zones and addresses the technological and management improvements in fire protection service nationwide. Investments include improved fire fighting equipment, such as fire engine rehabilitation, new pumps, hoses, hand tools, and water tanks for aerial firefighting. The project will also finance an improved communications network, protective clothing for smoke and radiation, and personal radionuclide dosimeters for firefighters. Fire management will be improved through the introduction of fire-information and forecasting systems, integration of meteorological data, and manpower training.
Forest Ecology

The project will develop a policy for the preservation of biodiversity and species mix, monitoring of air pollution and radionuclide contamination, monitoring of fuelwood utilization, assessment of the ecological impact of harvest and maintenance systems, improved MinFor regulatory functions and enforcement, and planning of wetlands, drained wetlands, and Chernobyl-contaminated forest resources.

Air Pollution Monitoring

Belarus must improve the scientific basis of forest air pollution monitoring so as to better diagnose the causes of defoliation, to prepare and implement remedial actions for local source emissions, and to document the evidence of transboundary air pollution. Six field-installed 'Forest Climate Centers' and a central laboratory are provided under the project. The centers sample and monitor air, soil, water, and foliage. The central laboratory will provide sample analyses and maintain the database. TA for staff training is also provided under the project.

Radiation Monitoring Systems, Workers’ and Public Health, Product Safety and Quality Control

This component finances equipment and system development to enhance MinFor’s existing forestry and wood-processing workers’ radiation-health monitoring system in the Gomel and Mogliev oblasts. This component will also assist in strengthening the radioactive contamination monitoring and quality control of wood products through an international audit and certification of Belarus wood output. This will establish and build the international public’s confidence in the safety of Belarus’ wood products.

Wetlands Forestry Monitoring, Protection, and Inventory (U.S.$0.5 million)

Among other activities and outputs, this component will provide training in forestry on wetlands and drained wetlands, establishment of regulations for protection and conservation of the lands, and training in enforcement (wardening). Gomel, Kirov, the Belarus Academy of Sciences and other state technical institutes will provide contract technical services.

TA and Institution Building for the Forestry Strategic Plan (FSP)

Under this component, the project provides professional training in forestry and business, preparation for operations within an open market economy, forestry research, and planning of forestry higher education reforms. The project will finance the development of the FSP to provide adequate basis for the future utilization of and investment in the forestry sector and wood industry. This will be accomplished with the assistance of international consultants. The FSP team would initially address short term planning for project implementation. Next, the team will address medium term issues, such as market assessments of future opportunities for Belarus’ wood and wood products, resource management alternatives, ecological assessments of proposed changes in forestry management, research priorities, manpower planning, regulatory requirements, the organizational structure of MinFor, preprivatization work for rayon-level enterprises, and other topics.
Forestry Management Information System (FMIS)

The project finances the completion of the FMIS on the basis of the system developed in a small-scale version piloted by the Belgosles and a team from the Minsk University Software Laboratory. The project will support the transfer of a forestry inventory data to a new FMIS on modern personal computers. It will also permit the transfer of computer-based information to individual enterprises for use by oblast and rayon-level staff.

Technical Assistance

The project will support engineering and testing of manufacturing prototypes, computerized planning systems for forestry resource management, and upgrading of forestry resource planning, staff training, project management, and audit.

D. Agriculture Sector Work and Related Studies

- **Agriculture and Food Sector Review.** 1995. Sector report 12576.

Since attention has been focused on the livestock sector, most crops produced have been feed grains, although several other marketable crops such as potatoes, flax, oilseed and sugar beets are also included in annual production. A new focus in the Belarus agricultural sector has been forestry development, especially for timber harvesting. The forest sector, though still very young, has produced good quality timber and the large areas of sandy soil comprising a good deal of Belarus’ landscape will provide for forestry expansion. The fundamental conclusion of this report is that the present agricultural system, even with some reforms already completed, requires further adjustment to become a working, market-oriented economy. Successful implementation of the required adjustment necessitates a comprehensive and consistent program of actions. A comprehensive overall reform strategy needs to be developed and agreed upon by the government as soon as possible.

- **Forestry Development Project.** Staff appraisal report 12511. Memorandum of the President P6202. Discussed above.


E. Main Agricultural Institutions

- **Belarus Academy of Agricultural Sciences**
  1 Knorrin Street, 220049 Minsk, Belarus
  V.S. Antonyuk, President, and V.A. Shcherbakov
  Tel: (375-0172) 66-06-17, 66-52-36
  Fax: (375-0172) 68-80-83

  Research areas: agroindustrial complex, economics, farming and crop production, livestock, veterinary medicine, mechanization, processing.
• **Belarus Research Institute of Arable Farming and Fodders**  
  1 Timiryazev Street  
  Zhodino, Smolevichi District  
  222160 Minsk Region, Belarus  
  Vladimir P. Samsonov, Director  
  Tel:  275 34010  
  Fax:  275 37066  

  Research areas: farming, selection and seed production, technology, heterosis, landscape, biotechnology, fodder production.

• **Belarus Institute for Potato Growing**  
  Samokhvalovichi vil  
  Minsk District  
  223013 Minsk Region, Belarus  
  Aleksandr F. Bogdanovski, Director  
  Tel:  0172 901145  
  Fax:  0172 901408  

  Research areas: selection, seed-farming, technology, immunity.

• **Belarus Institute of Plant Protection**  
  Priluki vil., Minsk District  
  2203011 Minsk Region, Belarus  
  Vilor F. Samersov, Director  
  Tel:  0172 255 004, 992 338  
  Fax:  0172 992 338  

  Research areas: phytopathology, immunity, pesticides, biopreparations, herbology.

• **Belarus Research Institute for Land Reclamation and Grassland**  
  153 Bogdanovich Street  
  220040 Minsk, Belarus  
  Vladimir F. Karlovski, Director  
  Tel:  0172 324 714  
  Fax:  0172 326 496  

  Research areas: amelioration, grass farming, agroecology, hydrotechnology, fertility.
Bulgaria

A. Background and Current Status of Agriculture Sector

After years of gradual decline under control-based agricultural policies, agriculture in Bulgaria entered a severe depression induced by the collapse of the central planning system in 1990. The specific causes of the depression include (i) sharp shift in terms of trade on major agricultural commodities; (ii) unclear property rights to land and other assets; (iii) decapitalized productive base; (iv) collapse of food exports and domestic demand; (v) elimination of most subsidies; (vi) high nominal and effective interest rates.

After the reforms of 1990 and 1991, one stated policy objective in Bulgaria was to create a fully decentralized agriculture based on private ownership of land and privatized and competitive input, supply, processing and marketing sectors. The Ministry of Agriculture Development, Land Use, and Land Restitution made initial efforts to reorganize to support this objective. The main elements of a sound reform strategy were formulated, based on measures to eventually restore private property rights and greater reliance on market mechanisms.

Most recently, however, there have been major problems in implementing a sound strategy. The issues are particularly complex and subject to strong political pressure and constraints. In practice, the Ministry of Agriculture has shown reluctance to privatize and decentralize its large production units. Additionally, reforms are being introduced simultaneously with a painful, but unavoidable, attempt to stabilize the macroeconomy.

Crop production is dominated by grains and pulses (36 percent), fodder (15 percent), industrial crops and tobacco (7 percent), vegetables (3 percent), and perennials (5 percent). Cash crops account for 23 percent of cultivated area. Although crop yields have been declining for the last ten years, they are still comparable to those in Greece and Portugal. Wheat yields average 3.9 t/ha, maize 3.4 t/ha, and soya beans 0.7 t/ha. Under the previous system, most vegetables and fruit were grown privately on the 0.5 auxiliary plots of collective farmers. They accounted for 80 percent of table grapes, 50 percent of peppers and potatoes, and 40 percent of tomatoes and tobacco. The private sector also supplied about 45 percent of meat, 25 percent of milk, 50 percent of eggs, and a number of other high value added products. Estimates indicate that the share of production by the private sector increased from 29 percent in 1989 to 35 percent in 1991, and 50 percent in 1992. This formerly unacknowledged production base is beneficial to Bulgaria in two ways: first, this production was indispensable in meeting Bulgaria’s food supply requirements after 1990, and second, this private sector orientation has allowed Bulgaria to transition more quickly toward a market-oriented agriculture system.


B. Agricultural Research and Extension

World Bank experience in agriculture in Bulgaria is limited to a sector study of the important strategic development issues and key short to medium term policy actions needed to
establish a market-oriented agricultural sector. To date, the Bank has not engaged in research
or extension activities in Bulgaria.

Bulgaria initially illustrated some advantages which the Eastern European States have
had in making the transition to a market economy: private ownership and entrepreneurship.
Under the previous system in Bulgaria, most vegetables and fruit and half of all livestock were
produced privately on the 0.5 auxiliary plots of collective farmers. Estimates indicate that the
share of production by the private sector increased from 29 percent in 1989 to 35 percent in
1991, and 50 percent in 1992. This formerly unacknowledged production base was and is
beneficial to Bulgaria in two ways: first, this production was indispensable in meeting
Bulgaria’s food supply requirements after 1990, and second, this private sector orientation
allows Bulgaria to adapt to new economic conditions.

The Ministry of Agricultural Development initially showed commitment towards its
new goal of managing the transition to the new economic system, creating an environment for
competition and efficiency, and refocusing its resources on narrower areas of responsibility.
Specifically, it worked to promote competition in input supply, processing, and marketing,
improving the commercial infrastructure, and developing an education, research, and extension
service appropriate for private agriculture. Most recently, however, the Ministry of
Agriculture has shown reluctance to privatize and decentralize the large state-owned farms and
processing units. It successfully lobbied to consolidate and retain its authority in production,
reversing some of the earlier reforms. Due to the relapse toward communist policies, Bulgaria
has not shown as much progress as its former Soviet Bloc neighbors Poland and Hungary.
While the contribution of small, private farmers persists, the agriculture sector as a whole
remains largely dominated by large and inefficient incarnations of the original state farms. For
this reason, Bulgaria is categorized as a Group II country.

The former Academy of Agricultural Sciences (AAS) has an infrastructure of research
and educational institutions and a large pool of trained specialists. The system, however, is
currently oversized, duplicative, isolated, and still unfamiliar with client-based services, the
elements for appropriate and efficient public research and education system.

A recent EC-PHARE-sponsored review identified the following major constraints to
research: (i) resources barely cover salaries and are spread too thinly over an excessive
number of centers, staff, and projects; (ii) little real innovative research is in progress; (iii)
research and development efforts suffer from considerable duplication and are not responsive to
emerging needs; and (iv) technology and equipment are outdated.

C. Relevant World Bank Agriculture Projects

- Agricultural Development Project
  Loan: 37710
  Signed: FY94
  Sources: Staff appraisal report 12674, and Memorandum of the
           President P6240
The project consists of two major components: 1) The credit component will finance medium and long term subloans exclusively to private investors for eligible investments such as fixed and movable assets for agriculture, agribusiness, and related activities such as transport, trade, handicrafts, rural tourism, and associated services. 2) The project will also finance institutional development assistance to the participating rural financial intermediaries.

D. Agriculture Sector Work and Related Studies


Economic reform in Bulgaria implies a fundamental change in institutional responsibilities within the agricultural sector. Many functions previously dominated by ministries, state agencies, SOEs and collectives are expected to be increasingly assumed by private sector institutions, firms, and farms. As part of its responsibility for managing the transition to the new economic system, the Ministry of Agricultural Development should create the proper environment for a competitive and efficient sector and refocus on narrower areas of responsibility.

Support systems of research, education, and extension have been increasingly out of touch with the farming community. Most research has been concentrated in the Academy of Agricultural Sciences (AAS) which was a large organization of 6,500 permanent staff in 46 research institutes and 48 experiment stations. Traditionally, education and extension efforts focused on maximizing output, while ignoring farm economics and finance. Recently the AAS was abolished and the entire agriculture knowledge system is being restructured. As a first step, a thorough performance review of these key support services was initiated by PHARE.


- **Danube River Grain And Feed Trade Infrastructure And Equipment In Romania, Bulgaria And Hungary.** See also sector report 13319. Avail Michel Debatisse, X37016.

The purpose of this report is to assess: (i) the state of trade over the Danube river with regard to grain and feed products; and (ii) the constraints and prospects for use of the Danube in shipping such products. This report makes a series of recommendations on areas for potential investments and adjustment in the management of the shipping operations, and (ii) rough orders of magnitude are provided for investments and benefits to expect from such investments. Unpublished paper 13937.

- **Bulgaria - Introduction to the Agriculture Sector.** July 9, 1990.
E. Main Agricultural Institutions

- **Institute of Genetic Engineering**  
  2230 Kostinbrod  
  Dr. Atanas Atanassov  
  Tel: 0721 25 52  
  Fax: 0721 49 85  

  Research areas: genetic engineering in cereals, forage crops, and tobacco.

- **Institute for Introduction and Plant Genetic Resources**  
  4122-Sadovo  
  Dr. Rada Koeva, Director  
  Tel: 22 21  
  Telex: 44 444

  Research areas: plant genetics (research and preservation), especially wheat.

- **N. Poushkarov Soil Science and Agroecology Institute**  
  1731 Sofia 5, Shousse Bankya Street  
  Dr. Valyo Valev, Director

  Research areas: soil resources study and control systems, technologies.

- **Institute for Irrigation, Drainage, and Hydraulic Engineering**  
  1618 Sofia, 136 Tzar Boris III Blvd  
  Assistant Professor Plamen Petkov  
  Tel: 563 001  
  Fax: 554 158

  Research areas: Irrigation, drainage, hydraulic engineering technologies.

- **Institute of Barley**  
  8400 Karnobat  
  Assistant Professor Ivan Mihov  
  Tel: 0559 27 31  
  Fax: 0559 58 47

  Research areas: breeding and technology of barley and oat production, biotechnology.
• **Dobroukja Institute of Wheat and Sunflower**
  9500 General Toshevo  
  Dr. Petar Ivanov  
  Tel: 058 274 54  
  Fax: 057 314 448  
  Research areas: genetics, breeding, and technology of wheat, sunflower, and legumes.

• **Sugarbeet Research Institute**
  Tzarev Brod, Shoumen District  
  9747 Shoumen  
  Assistant Professor Simeon Krastev  
  Tel: 054 55102  
  Telex: 73 525  
  Research areas: breeding, production, and technology of sugarbeets.

• **Obraztsov Tchiflik Institute of Agriculture and Seed Science**
  7000 Rousse  
  Dr. Dimitar Roussev  
  Tel: 082 225 898  
  Fax: 082 225 898  
  Research areas: seed production regimes, pre-sowing treatments, preservation.

• **Maize Research Institute**
  3230 Kneja  
  Assistant Professor Kiril Anguelov  
  Tel: 09132 27 11  
  Fax: 09132 27 11  
  Research areas: maize genetics, breeding, and technology.

• **Institute of Soya-Beans**
  5200 Pavlikeni  
  Assistant Professor Gueorgi Tonchev  
  Tel: 0610 22 75  
  Telex: 0610 66 506  
  Research areas: genetic selection, production, and technology for soya beans.

• **Cotton and Durum Wheat Research Institute**
  6200 Tchirpan  
  Assistant Professor Tzotcho Lalev  
  Tel: 0416 31 33  
  Fax: 0416 31 33  
  Research areas: cotton and durum wheat selection and growing technologies.
Croatia

A. Background and Current Status of Agriculture Sector

Agriculture is an important sector of the economy in Croatia. As a result of the fall in industrial production, its share in GDP increased from 10.0 in 1990 to 14.6 in 1992. When food processing is included, the sector accounts for 24 percent of GDP. Exports of agricultural and fisheries products have increased in absolute and relative terms. Agriculture exports increase by 44 percent between 1991 and 1994. As a share of the country's total exports, it increased from 9 percent to 12 percent during the same period. Levels of employment in agriculture have been more stable than in other sectors of the economy. When employment in the overall economy fell by 50 percent between 1990 to 1993, employment fell in the agricultural economy by only 25 percent. Currently, the agriculture sector employs about 15 percent of the active population. Croatia has potential to develop a comparative advantage in the animal production, especially forage-based livestock (Kodderitzsch, personal communication).

Farm structure in Croatia is dominated by two types. Croatia has about 500 large, vertically integrated agrokombinats (AKs), the traditional state farm which dominated the sector during the socialist period. These farms account for 37 percent of total agricultural land. These farms were set up for production, product procurement, storage, and processing bases, and often own processing and marketing industries, as well as about 86 agriculture cooperatives. In the era of the new market economy and withdrawal of government subsidies, this system has come under severe operational and financial pressures. In order to increase efficiency and productivity in the agriculture sector, this land and assets must be returned to profitable farming systems.

The second type of farm structure in Croatia is the small, private family farm. Private farmers now own 63 percent of all agricultural land and 78 percent of arable land. Private farms and farmers can be grouped into two types. Part-time farmers who operate on a subsistence unit of less than 3 ha or who rent out their land if they are too aged to farm it themselves. In such cases, the land acts as social 'safety net', and the part-time farmer is unlikely to sell it. The second type of private farmer is the full-time farmer who owns and farms 3 - 10 has and rents extra land for production. These farms are generally profitable and often have 3 generations working. Mixed livestock/arable farming predominates, with farm sales mostly from grain, horticulture, and livestock products.

Maize is the dominant crop in terms of area, followed by wheat which is the second most important crop. Barley is a distant third among cereals, and smaller areas of rye and other cereals are cultivated. Potatoes predominate the non-cereal crops, averaging 60,000-80,000 ha per year and are followed in importance by sugar beet, soybeans, and sunflower. Orchards occupy about 70,000 ha, while vineyards cover almost 75,000 ha. Fodder crops are grown on about 172,000 ha and there are just over 400,000 ha of meadows. Crop yields in the ex-social sector often surpassed those of the private sector. Better access to credit and hence inputs favored social production, but the social sector orientation of maximizing production rather than profit was an important contributory factor.
Animal output currently provides 40 percent of agricultural output. Nevertheless, livestock numbers decreased between 1961 and 1990. The population decrease has been accompanied by a generally progressive improvement in productivity per head in most sectors. Livestock are predominantly privately owned, and census data show that half of private farmers own cattle, but only 4 percent own more than five cows, 52 percent keep pigs with only 5 percent owning five or more sows, and 8 percent own sheep with 3 percent owning more than 20 head. Most livestock are kept on farms with an average size of about 3 ha, but increasing numbers of commercially viable livestock farming units are emerging in the private sector.

Source: Staff appraisal report 14398-HR, February 1996.

B. Agricultural Research and Extension

Currently, there is no agriculture sector study specifically for Croatia. In February 1996, however, the World Bank completed a detailed exploration of agricultural research and extension in Croatia for the staff appraisal report (SAR) for the Farmer Support Services Project. (This project was subsequently signed in April 1996.) The SAR gives an lengthy analysis of research under the Ministry of Science and Technology, and veterinary and extension services provided under the Ministry of Agriculture and Forestry and the National Veterinary Institute. The national agricultural knowledge system in Croatia is adequate to fill the country’s needs. The main constraints to the successful provision of research and services are limited budgets and its current focus on basic research which has little relevance to emerging farming systems. On the other hand, it has the benefits of a good institutional framework, excellent staff, and existing facilities. It is significant that the Farmer Support Services Project seeks not to reorganize the system, but to introduce a new research management approach and extension delivery mechanism. Some project approaches which are new to Croatia include competitive research grants, focus on applied research, integration of research and extension, and incorporation of end-users into programming and funding decisions (Kodderitzsch, personal communication).

This project will represent a major activity in agricultural research and extension (see below). The project will change the delivery of technical services to the private farming community and strengthen institutions to meet the needs of small private farmers in a market economy. Specifically, the project will modernize agriculture practices and farm management through private and public agriculture extension involving farmers in the services; improve the applied agricultural research management system by ensuring farmers’ participation in the formulation of the research agenda; strengthen the private and public veterinary services and, in particular, the epidemiological services; and assist in the development of the country’s grassland and pasture potential. The specific research and extension activities the project will undertake to achieve these goals include providing training programs and materials, courses and study tours; supplying vehicles and equipment; initiating Zupanija Extension Service Centers and Zupanija Extension Service Centers; implementing pilot farmer associations to demonstrate employing private extension services; establishing a research fund and competitive grant system; formulating rational research agendas; conducting resource assessments; and providing assistance in legal framework and regulatory policy.
C. Relevant World Bank Agriculture Projects

- **Farmer Support Services Project**
  
  Loan: Appraised  
  Signed: April 1996  
  Source: Staff appraisal report 14398-HR  
  Task Manager: Severin Kodderitzsch

This project will support the transition of the agriculture sector by providing technology-related support services that are relevant to the private farmers. The aim is to improve the income of the private farming community and increase its productivity and hence the competitiveness of the sector. The project will (i) change the delivery of technical services to the private farming community and (ii) restructure and strengthen institutions to meet the needs of a market economy. Private farmers will be the principal beneficiaries of the project, gaining advantage from improved production technology and animal health services, a strengthened regulatory framework for the seed industry, and government policies and services more conducive to the development of a vigorous private agricultural sector. The project will contribute to improving living standards in rural areas in which small-scale agriculture is a major employer and source of income. The project will also generate substantial public benefits: disease control and livestock product sanitary inspection will reduce losses; and improved agriculture production and policy will foster better resource utilization. The proposed project consists of six components:

**Extension**

Under the project the existing public Zupanija (district) extension offices (21 offices with a total staff of 110) would develop into community supervised Zupanija Extension Service Centers (ZESC). These would provide the impetus to farmer group formation (see below) and act as a source of information and specialized guidance to private advisers directly serving the farmers. Relevance of the public extension services would be ensured through Zupanija Extension Service Centers representing the local farming community and agribusiness which would allow for a flexible reorientation of extension services in line with changing local priorities. Over the course of project implementation, the extension component would be supported through international and national technical assistance amounting to 23 person months of assistance (extension specialists, training specialists, herd recording advisors).

The project would develop the required skills, provide means of mass media communication, and establish the necessary infrastructure for the 21 ZESCs and MAF's Extension Department to ensure effective dissemination of relevant information to the private farming community. Through the project the public extension services would be provided with 44, 21 sets of basic office infrastructure, 67 computers, 23 sets of audio-visual equipment, and 21 kits of extension field. Each ZESC would also be provided with a basic reference library and annual subscriptions to farm production journals. Each ZESC would carry out a one-time, farm community based diagnostic survey in order to develop a thorough understanding of the constraints and potential of the areas they are servicing, and to give the extension services the opportunity to inform farmers in their area of the new extension approach. The diagnostic survey exercise would help define the annual working program of the Zupanija extension service.
The project would implement a substantial extension training program amounting to a total of some 462 months, phased over project implementation, including: (i) a trainers of trainer program; (ii) a one-time general orientation course for each extension staff; (iii) regular and (iv) specialized in-service training. In addition, study tours and post-graduate fellowships would be carried out by selected extension experts to get a better understanding of extension issues and operations in other countries. The project would provide for the development of some 25 thematic training packages for the ZESCs and other advisers for incorporation within an extension program for farmers. The training packages would also form the basis of mass media activities which would be developed on a contractual basis involving the extension, research and broadcasting (radio and television) services. The project would also develop a Farm Management Handbook for farmers which would include, inter alia, agriculture price schedules, and farm enterprise budgets across agriculture zones. Subjects would include farm business management, financial and marketing skills, group formation skills, environmental awareness, preparation of mass media and training packages, information management, and technical items such as crop and integrated pest management.

The project would also support an on-farm trial and demonstration program consisting of some 2,200 field demonstrations over the life of the project which would be carried out through the ZESCs in coordination with agricultural researchers pursuing competitive grant-based applied research also supported through the project (see agricultural research component, below).

The project would develop private advisory services which currently are practically non-existent in Croatia outside of the agrokombinats. Under the project, the formation of a limited number of farmer associations (some 45 associations, roughly 2 associations in each Zupanija) on a pilot basis would be supported in view of farmer associations employing private advisors in agricultural production, farm business management; and marketing associations management on a matching grant basis. Each association would directly employ its own adviser who would be funded by MAF during the first four years on a cost sharing-basis and receive some basic training equipment, also on a grant basis. The public extension service would develop standard contracts and provide the newly established farmer associations with legal advice during the process of hiring private advisors. Private advisors working under the farmer association pilot scheme would also participate in the above extension training program.

Also on a pilot basis, farmer herd recording groups (some 45 in three Zupanijas) would be supported through the Croatian Livestock Selection Center (CLSC) in close collaboration with the ZESC to promote farmer-based milk recording. Project support would include the establishment of small recording groups, the provision of milk recording and testing equipment, limited number of computers for data processing at the Zupanija level, and industry staff training including a study tour to selected European animal breeding programs.

Research

The project would support an applied agricultural research management system to produce relevant and timely information for the private family farmers through research contracts on the basis of competitive research grants. Under the project an independent Agricultural research Council (ARC) with a majority of farmer representation, and a small secretariat would be established for defining policy, and allocating resources under an Agricultural research Fund for applied research contracts on a competitive grant basis. The research agenda would be (i) open-ended and determined by the ARC, and (ii) would allow for a broad scope of topics to be
researched ranging from production technology to market research and development. The ARC would administer an Agricultural research Fund (ARF) established under the project providing roughly U.S.$1.3 million during each year of project implementation (i.e., a total of U.S.$5.2 million over four years) to finance applied research contracts on a competitive grant basis. In order to ensure that both regional and national research priorities are being addressed a funding formula would be agreed upon by the ARC prior to project implementation, and acceptable to the Bank, for a period not shorter than three years, which would allocate funds to the main agriculture regions (based, for instance, on the relative contribution to agriculture GDP) and to overall national research.

Under the project a substantial research management training program amounting to some 168 months of training for applied research staff and the ARC (and its secretariat) would be carried out. This training program would include a visiting scientist program, research staff orientation courses, research management training, research management study tours for ARC members, and research reporting seminars. Training would be provided in particular for researchers who have obtained research contracts from the ARC. Computer networking of the Agriculture Faculty, University of Zagreb, with international agriculture data bases would be provided, as would be subscriptions to journals and books.

Four Zonal Research Extension Coordination Units (ZRECU) would be phased in during project implementation as the ARC becomes operational and each ZRECU would be provided with office and computer equipment; each ZRECU would have incremental staff consisting of one economist and one research/extension specialist. The ZRECU would (i) serve as backstopping service to the district extension services by providing specialized advice, (ii) would create a formal link between research, extension and the farming community and (iii) would be current on research results and provide guidance to the ARC.


The project will strengthen the private and public veterinary services and, in particular, the epidemiological services. This component will supply the National Veterinary Institute (NVI) with vehicles and a comprehensive range of equipment to intensify the national disease surveillance. NVI and regional animal health data bases will be linked to MAF's epidemiological and disease reporting division which will also receive computer equipment and technical assistance. Training will be provided to strengthen skills of private and public veterinarians in management. Under the Pasture and Fodder Development component, the project will assist in the development of the country's grassland and pasture potential. To do so, the project will provide for a systematic evaluation of the national grassland resources, improvement of the laboratory and training facilities of a pasture research station, local and overseas training, laboratory and field experimental equipment for pasture trials and demonstration, and the establishment of a modest seed bank. The project will also provide the regulatory and institutional framework for the seed industry. Under the project the National Seed Authority will receive laboratory and field equipment for seed variety trials and certification, plant pathology, and chemical registration; and NSA staff will receive overseas training. Finally, the project will improve the Ministry of Agriculture and Forestry policy analysis and formulation capabilities, and strengthen the agriculture data base available to policy decision-makers. To do so, the project will provide overseas training, long-term TA, selected policy studies, and computer equipment; and the agriculture database will be
strengthened through a farm baseline survey, a farm monitoring program, and a simple market information system.

D. Agriculture Sector Work And Related Studies

- **Farmer Support Services Project Staff Appraisal.** Report 14398-HR. February 1996.

  Discussed above.

E. Main Agricultural Institutions

- **University of Zagreb, Faculty of Agriculture**
  Svetosimunska 25, 10000, Zagreb
  Dr. Frane Tomic, Director
  Tel: 385 1 2335 777
  Fax: 385 1 215 300
  E-mail: office@agr.hr

  Research areas: plant breeding, agroecology, soil science, plant nutrition, plant protection, livestock science, animal nutrition, dairy, horticulture, fruit science, enology, agricultural economics, farm management, agricultural engineering and mechanization, and farming systems.

- **University of Osijek, Faculty of Agriculture**
  Trg Svetog trojstva 3, 31000 Osijek
  Dr. Zdenko Steiner, Director
  Tel: 385 31 331 541
  Fax: 385 31 128 017
  E-mail: office@agros.hr

  Research areas: crop production, plant protection, livestock science, agricultural technology, farm management.

- **University of Osijek, Faculty of Food Technology**
  Pirotnjela 6, 1000 Zagreb
  Dr. Slobodan Grba, Director
  Tel: 385 1 440 051
  Fax: 385 1 418 230
  E-mail: office@pbf.hr

  Research areas: biotechnology, food technology, biochemical engineering.
• **Agricultural Institute, Krizevci**  
  Milislava Demerca 1, 48260 Krizevci  
  Dr. Mirko Ggro  
  Tel: 385 48 681 597  
  Fax: 385 48 681 597  

  Research areas: agronomy, animal husbandry.

• **Osijek Agricultural Institute**  
  Juzno predgrade 17, 31000 Osijek  
  Dr. Antun Novoselovic  
  Tel: 385 31 122 458  
  Fax: 385 31 126 553  

  Research areas: biotechnology, chemistry, tobacco plant breeding and production technology.

• **BC Institute for Plant Breeding and Crop Production**  
  Marulicev trg 5/1  
  Dr. Petar Javor, Director  
  Tel: 385 1 455 9200  
  Fax: 385 1 446 654  

  Research areas: breeding and seed production for maize and other crops.

• **Belje - Scientific and Research Development Section**  
  Gunduliceva 5, 31000 Osijek  
  Dr. Miranda Seput, Director  
  Tel: 385 31 123 050  
  Fax: 385 31 123 248  

  Research areas: applied agricultural research.

• **Agricultural Scientific Center, Osijek**  
  Vinkovacka cesta 63, 31000 Osijek  
  Bozena Domacinovic M.Sc., Director  
  Tel: 385 31 25 522  
  Fax: 385 31 25 485  

  Research areas: applied and development research in crop and livestock production.
Estonia

A. Background and Current Status of Agriculture Sector

Since regaining independence in 1991, Estonia has followed an economic reform based on establishing a sound currency and macro-economic environment, developing competitive markets with minimal barriers to entry, establishing free internal and external trade, privatizing the ownership and management of productive enterprises and land, and developing a commercially viable financial system.

Within the FSU Estonia was assigned the role of a specialized livestock producer supplying dairy products, pork, and beef to neighboring republics, which in turn provided most of the feed grain and other inputs. Animal production based on high levels of imported grain, accounted for more than two-thirds of the total value of agricultural production. Due to these relatively cheap imports (about 1 million tons per year), crop production was mainly oriented towards roughage (on more than 50 percent of arable land). While agriculture trade produced large export surpluses, the figures are deceptive because of the heavily subsidized imports of inputs and feed for production of exportable commodities. If evaluated without subsidies, much of this activity generated losses rather than surpluses for the economy. Currently, crop production focuses on feed grains and fodder crops for the livestock sector. In 1994, the sector accounted for 9 percent of GDP, 15 percent of exports, and employed 6 percent of the Estonian labor force. It is estimated that agricultural production decreased by about 40 percent from 1991 to 1993.

Like other countries of the FSU, Estonia experienced sharp declines in production following independence and collapse of the former regime. In contrast to some of these countries, however, Estonia's reform program has led to definite signs of economic recovery. Estonia's success in establishing a convertible currency and in maintaining relatively open trade and investment policies have led to rapid and broadly-based recovery. Foreign investment has become an important factor in the industrial and agroprocessing-processing sector, and has provided Estonian products entry into Western markets. A range of previously prohibited service sector activities are thriving. Estimates of real GDP growth for 1994 and 1995 are as high as 5 or 6 percent per annum.

In agriculture, the sector faced severe initial adjustment problems, with recorded 20-30 percent declines in agricultural GDP just after independence. The sector was particularly crippled by the collapse of trade between FSU countries. This trade was based on production of livestock products for guaranteed markets in the East using heavily subsidized feed grains, energy, and agricultural inputs from the East. The severe contraction in these markets was compounded by a curtailment in domestic demand for meat and milk products due to the contraction in the domestic economy. While there has been further real GDP decline recorded in the sector, these data may fail to represent poorly-recorded developments in the private sector where, for example, direct farmer-to-market transactions or new small intermediaries are bypassing formally recorded processing and distribution channels.

There are many positive signs in the agriculture sector. Traders have displayed an impressive capacity to secure inputs and machinery supplies from traditional and new trade partners. Private entities have been successful in entering the markets at the retail level. Small
farmers and processors near urban centers have succeeded in supplying retail shops and consumers directly, thus competing with large-scale processing plants. Some larger private enterprises, which have formed joint ventures, shareholding companies, invested in new equipment, or rented or purchased state-owned land, are doing well. Trade has diversified. Finally, cost effective technologies are being adopted in the rural areas and credit is becoming more available.

As Estonia’s market reform efforts continue, the role of agriculture in the overall economy is constrained by several external factors and internal agricultural policies. Climate and natural resources are not particularly favorable for agriculture, but low wages, low land costs, and the existing stock of skills, equipment, and infrastructure indicate potential for internationally competitive production in a number of key commodity areas. Many food processing enterprises have already made inroads into Western markets. Increased domestic consumption brought about by overall economic recovery will further improve prospects for agricultural industries. Finally, prospects are good for reestablishing trade with the FSU countries, as long as those countries do not revert to protectionist policies.


B. Agricultural Research and Extension

The sector study states that there is considerable scope for the sector to make a positive contribution to economic recovery and well-being of Estonian people. Although Estonia’s natural resources and agroclimate is not ideal, Estonia has created many opportunities for growth in agriculture through its aggressive pursuit of open trade, liberalized pricing policies, and privatization. The Estonian agriculture sector has already developed a class of profitable private farms in addition to the subsistence level farms.

From the agriculture sector study and the staff appraisal report for the Agriculture Project, it is evident that the agriculture support services in Estonia are currently on-track toward becoming efficient and effective suppliers of agriculture support services. While the public sector funding for both research and extension is currently severely constrained, there are several encouraging aspects. First, it has made progress toward servicing small private farms, by becoming user-oriented and by using participatory methods in program development. Second, it is instituting a fee structure to recover costs from its more profitable clients. Third, the private sector has already made inroads into the provision of extension services. Many domestic and international suppliers of inputs, equipment, and technology have assumed extension functions.

The staff appraisal report and project descriptions therein, focus not on restructuring the services, but augmenting the capabilities of the existing organizations. Estonia’s current research and education systems are appropriate in size and scope for its new market-based, privately-owned agriculture sector. Training and technical assistance, as well as international cooperation, is needed in increasing staff capabilities in business management and commercial aspects of agriculture.
C. Relevant World Bank Agriculture Projects

- **Agriculture Development Project**
  
  **Loan:** Appraisal  
  **Signed:** Anticipated 1996  
  **Sources:** Memorandum of the President P6761, and Staff appraisal report 14954

This SAR gives a good description of the macroeconomic conditions and the need for agriculture support services in Estonia. In the context of the country’s liberal economic and trade policy, agricultural strategy has aimed at creating an open and competitive agricultural sector based on private ownership of land, a private agroprocessing-processing sector, liberal agricultural trade, fully market-determined agricultural prices, and minimal budget support for the agricultural and rural sector. Although proceeding slowly and with difficulty, Estonia has continued to restitute rural land. The privatization of agroprocessing enterprises is nearly complete, and these companies are in the process of adapting to the market economy. Since 1992, agricultural prices have been completely market-determined. There are no import or export tariffs regulating agricultural trade, and Estonia has entered into trade agreements with the EU and EFTA countries and is moving toward accession into the WTO.

**Agriculture Extension Services**

About 700 full and part-time agricultural advisors are employed in the private sector (veterinarians, advisors from processing industries, private consultants, input suppliers); the public sector (staff from universities, colleges, research stations, and county-based MOA staff); the media; and by farmers themselves (e.g. Farmers Union with about 150 advisors, Producers’ Union, and farmers’ circles). The present level of public funding is low, representing 0.05 percent of the agricultural GDP (many countries invest at 1.2 percent of agricultural GDP). The MOA had decided to provide extension services to the more profitable farmers on a cost recovery bases, while maintaining a small public advisory service available for low-income farmers. Rural information centers have been created in many areas to assist in rural entrepreneurship.

**Research**

Research is now being conducted at three levels. Universities undertake academic research, while applied research is the responsibility of the Academy of Science and of independent State research institutes and laboratories. Research at all levels is severely constrained by a shortage of funds, and requires reorientation to market-responsive production systems based on economic priorities.

This project aims to increase rural incomes and stimulate the rural economy through rural entrepreneurship. Project objectives are: privatization of rural lands; privatization and rehabilitation of select rural infrastructure; improvement of human resource skills for entrepreneurship in rural areas; introduction of new farming technologies consistent with transformed private agriculture; and improvement in food quality. Components include: i) land reform; ii) farm drainage rehabilitation; iii) land use management; iv) agricultural advisory services; v) food quality control and veterinary laboratory; and iv) project management.
Under the Agriculture Advisory Services, the project will: establish a Private Advisory Services Development Fund (PADSF); strengthen the public extension services; and support rural information centers. The MOA has created a National Agriculture Extension Task Force to formulate the future extension strategy. This task force will expand to include stakeholders and will be supported by assistance from the EU-PHARE. It will train and certify new public and private agriculture advisors in economics, farm management, extension methods, and new technologies.

The PASDF will, on a demand basis, provide farmers with an annual grant to partially fund contracts with agricultural advisors. The funding is planned to serve about 2,800 farmers in 1996, equivalent to about 100 part-time and 170 full time advisors.

The public extension service will be strengthened through donor-funded training and technical assistance to develop educational programs on improved agricultural practices adapted to private and small farms. This support is aimed at the 150 agricultural extension agents in the Farmers’ Union. The project also support the development of training materials

The Rural Information Centers will be strengthened with equipment from the project and donor-funded technical assistance to assist the rural population in finding alternative farm and non-farm employment.

The other components of the project also include various research and training activities. The Food Quality Control and Veterinary Laboratories component includes training of staff, technicians, and scientists of the National Veterinary Control Laboratory in the operation, management, and maintenance of new equipment. The Land Use Management component will fund a research study to develop a national strategy for wetlands. The project also supports drainage research, development of Land and Water Associations, and institutional strengthening of the Estonian National Land Board in land registry management, land assessment methods, land and real estate regulation, survey training, and training of cadastral specialists.

D. Agriculture Sector Work and Related Studies

- **Agriculture Project.** Memorandum of the President P6761. Staff appraisal report 14954. Discussed above.

- **Agriculture and Forestry Sector Review.** Sector report 13316.

This document gives an eight page examination of agriculture support services in Estonia. The sector study states that the successful transition to a market economy requires a fundamental redefinition of the role of Government. Instead of directly planning and managing production and trading activities in the sector, Government’s role is now to facilitate the transition to a market system managed and operated by many private and independent agents. A second role for Government is to ensure that the policy, legal, and incentive environment within which commercial decisions are made, encourages efficient and competitive behavior. A third task is to ensure that human welfare problems, especially acute during times of transition or major economic adjustment are adequately addressed in a well-managed and
financially feasible fashion. Finally, adequate and financially sustainable services and infrastructure (e.g. roads, basin drainage, systems, information, and education) that have 'public good' characteristics need to be built or maintained. The Government actions needed for the successful redefinition of the role of Government are set out in Chapters 6 - 8 of this report.

Agriculture extension and advisory services in Estonia are provided by three main sources: (a) public organizations, including the Ministry of Agriculture, research stations, and universities; (b) private extension and advisory services where producers hire the expertise they need; and (c) external assistance programs focused on restructuring particular subsectors or initiating activities that are expected to become self-sustaining. Initially, the government and external assistance programs should rapidly disseminate pertinent technical, management, and business skills to new producers. In the long run, all costs should be assumed by the users, except where there are clearly defined benefits that do not accrue to those paying for the services. This is often the case with information that easily spreads from one producer to another. Information that prevents the spread of pests, pollution, or contagious disease, however, should be continued under Government programs.

Research should be re-oriented toward applied areas of improving agricultural and livestock productivity and efficiency at the farm level. This work must interact with and use the research activities of other countries as a base. It must also be integrally linked with extension, advisory, and information services available to local producers.

Education in agricultural schools is generally very good in technical areas (despite an apparent lag with regard to grazing and legume intensive livestock systems which may be more economically appropriate for Estonia). There is urgent need, however, for a more widespread understanding of the basic commercial and economic principles of a market economy. The appropriate roles for Government and the private sector in a market economy also require more attention in curricula, along with business and commercial skills, especially in management, accounting, and business planning.

E. Main Agricultural Institutions

- **Ministry of Agriculture, Department of Economy**
  EE 0100 Tallinn Lai Street 39/41 Estonia
  Tel: 6 256 117, 6 256 186
  Fax: 64 111 60
Georgia

A. Background and Current Status of Agriculture Sector

Georgia is largely an agriculture-based economy. According to IMF estimates, the contribution of agriculture to net material product (NMP) was 68 percent in 1993 and 87 percent in 1994. Traditionally, Georgia was a net exporter of food products and one of the major suppliers of fruits, vegetables, tea, wine, and brandy to the rest of the former Soviet Union. The agriculture and food production system experienced a sharp decline in output from the peak levels of 1987. In 1993 and 1994, agriculture production was only about one-third of the 1987 level. Output of food processing in 1995 was less than 10 percent of the late 1980s level. Despite this domestic contraction, primary agriculture remains the only viable and functioning production sector in the Georgian economy at the current time. Production efficiency and yields have always been below those of developed countries with similar agroecological conditions. Production efficiency further declined in recent years, due to the lack of inputs and overall economic difficulties.

Ongoing reforms in food and agriculture in Georgia suggest that the government is committed to continuing reforms in the economy of the country, and more specifically, in food and agriculture, to complete the transition to a market system based on private ownership. Reforms in agriculture have been more spontaneous in Georgia than elsewhere in the FSU. The lack of macro-economic stability was a very serious impediment to overall reform in agriculture. In the absence of a functioning domestic currency in the sector, relationships between producers and processors were difficult to re-establish, and further growth in private agriculture remained constrained. Rampant inflation, a very weak fiscal position, corruption, and limited availability of credit, all combined to create an economic environment in which a legal agricultural economy could not fully function. In addition to the overall macroeconomic stabilization, a recovery of an export-oriented agriculture requires a reliable supply of energy and an efficient transportation system.

Government policies in the agriculture subsectors are also slowing down the recovery of the sector. In general, the government has preserved some of the remaining elements of the central planning system, in the form of Soviet-style institutions and some price controls. The Government’s inability to finalize land legislation and to implement a clear and effective privatization strategy in processing and marketing have also had adverse effects. The agriculture administration is still focused on the traditional state and collective farming organizations, while the private sector, which provides the bulk of the production receives insufficient support.

The crop and horticulture sector dominates primary production in Georgia. Traditionally, this subsector provided about two-thirds of agriculture output. The contribution of livestock to the sector production total increased recently to 40-45 percent. These shares have not significantly changed in the last three years. Overall crop production has been variable. The production of most major crops declined in recent years. The major crops, in order of importance, are grains (wheat and maize), legumes, sunflower, soybeans, potatoes, sugarbeet, and tobacco. In the Soviet era, Georgia was the main producer of fruits, nuts, citrus, wine, and tea. Consequently, the independent nation is now overendowed with orchards and plantations, and the horticulture industry suffered a major collapse in recent years.
Additionally, the comparative advantage which Georgia has in citrus, tea, and wine was obscured by central planning.

Since 1989, the production of all major livestock products has declined. Grain-based livestock, poultry and pig production declined the most. In the short term, production increases in grains, cattle, and milk are essential for improving domestic food supply. Increases in prices at the farm level are already providing incentives, and producers are responding by increasing production. Conversely, current conditions are disincentives to traditional horticultural supply, and will continue to limit the number of products available for export.

Source: Georgia Agriculture And Food Sector Review, 1996.

B. Agricultural Research and Extension

The agriculture sector study discusses agricultural research and extension in some detail and offers the following observations. It notes that the agriculture university, institutes, and research institutes are undergoing an unprecedented period of budgetary stress that threatens their core. Their most important asset, human capital, is rapidly being lost. As a quick response, to forestall irreversible damage to the institutions, as well as initiate some of the more immediate modernizing requirements, the immediate repair and maintenance of instrumentation, and ending the professional isolation of the universities and research institutes from their international peers are needed. Resources need to be augmented to support collaborative research and attendance at international professional meetings, to provide access to and modernization of information systems, and to develop new course offerings.

Georgia has far more research institutes, colleges, and employees than warranted by the size and diversity of the agriculture and food industry, and far more than it can support on present budgets. Overall institutional and policy reforms are also necessary to modernize the educational research system. This would require a comprehensive study of alternative models for modernizing higher education, research, and extension. Given the importance of integrating research and higher education, special attention should be given to this issue. Associated with this is the need to rationalize the allocation and utilization of resources available for research and in the agricultural university system. The respective roles of public and private research should be defined to encourage the most cost effective use of limited resources. Ultimately, this process must lead to difficult decisions with respect to the reallocation of research resources, including large scale downsizing, privatization, and allocation faculty time.

C. Relevant World Bank Agriculture Projects

Currently, there are no agriculture projects ongoing or in the pipeline for Georgia.
D. Agriculture Sector Work and Related Studies

  
  Discussed above.


B. Agricultural Research and Extension

World Bank experience in agricultural research and extension in Latvia is comprised of analysis in the agriculture sector review and the new Agriculture Sector Project, which was signed in 1994.

With the decollectivization and continued implementation of land reform, Latvia's research infrastructure needs substantial strengthening and reorientation to respond to the needs of new private farmers. Most pressing needs include improved access to research results and transfer of technology from other parts of the world as well as concentration on adaptive
research. The system also requires training of Latvian scientists, support for expatriate visiting professors in Latvia, establishment of an up-to-date agricultural library, including up to date subscriptions to scientific journals and literature, and continuation of varietal field testing and demonstration work on individual farms and farmer’s fields.

In 1992, Latvia established an independent agricultural extension service, the Latvian Agricultural Advisory Service (LAAS). By the beginning of 1994, LAAS had a two-tier organizational structure; the National Advisory Center and 18 local Advisory Centers with a total of 260 advisors. The advisory service plans to increase total staff to 670 by 1998, which would permit at least one advisor for each of the 500 districts plus regional advisors and specialists. It is well-suited to Latvia’s relatively well developed infrastructure and agriculture technology levels. LAAS has been receiving substantial TA assistance from bilateral and multilateral sources. These TA projects still need to be better coordinated and adjusted to meet the critical needs of the country.

Effective and far-reaching extension services would be critical to the success of the private agricultural sector in Latvia as many farming practices evolve and change with sector transformation. New private farmers do not yet comprehend the dynamics of a market economy. Training in record keeping, marketing, agriculture finance, and in other areas of farm management would be essential. New farmers with little previous experience require more technical advice.

In response to the needs identified in the agriculture sector study, the World Bank is embarking on a project which provides substantial support for the sector reform program in the area of institutional and human resource development. Under the Agriculture Sector Project, which runs from 1994 to 1997, the Bank provides financing for TA support for the development of human and institutional skills necessary for a market economy through support for agricultural advisory services, training of technicians, managers, and workers/farmers. Other support includes strengthening of market information, land survey, registration, and titling services.

In summary, the World Bank has identified several constraints and potential strengths in the agriculture sector in Latvia. The agriculture sector is hindered by unfinished land reforms, lack of competition in the newly privatized processing and marketing subsectors, and continued government controls in many areas, such as packaging and marketing of products. On the other hand, Latvia has taken steps to reorganize and downsize its agricultural institutions, and it has well-developed infrastructure and technology levels. At this point, the systems still requires much restructuring; however, it can nevertheless benefit from exposure international companies, investments, markets, and research institutions.

C. Relevant World Bank Agriculture Projects

- Agriculture Sector Project
  Loan: 36950
  Signed: FY94
  Status/closing date: 12/31/97
  Source: SAR 15120-MD
The main components of this project are: (a) Farm credit for on-farm production and
development through the Agriculture Finance Company (AFC); (b) Support for private small
and medium scale agro and forest industries through long-term investment funds; and (c) TA
support for the sector reform program, including development of human and institutional skills
necessary for a market economy through support for agricultural advisory services, training of
technicians, managers, and workers/farmers and strengthening of market information, land
survey, registration and titling services. Key TA activities include support for land reform and
creation of a land market, strengthening of Agricultural Advisory Services, applied research,
training of technicians and farmers, improvement of the agricultural information basis including
market and price information, establishment of an up-to-date agricultural library with
subscriptions to trade journals, varietal field testing and demonstration work on private
farmers’ fields, and increasing competition among marketing, transportation, and distribution
system.

Funds for agriculture support services and research are provided under various parallel
support agreements. The first, an EC-PHARE parallel support arrangement, is a three-year TA
program for agriculture implemented by the EC-PHARE. Total technical assistance (TA)
support between 1993 and 1995 was approximately U.S. $0.82 million. Main elements include:

- Immediate and long-term support for AFC management (1993-1995).
- Support in defining research priorities and directions for agricultural research.
- Training, field support, information technology and statistical analysis to support
  agriculture extension.
- Assessment of systematic constraints, development of wholesale markets, and
  establishment of a competition unit in the Ministry of Agriculture (MOA) to
  support the agriculture marketing and distribution system.

A second agreement with the Swedish BITS supports parallel agriculture projects with a
total of about U.S. $0.9 million. The main focus of these projects is land privatization, cadastre
and registration.

In addition voluntary services such as Volunteers for Overseas Cooperation (VOCA),
the International Executive Service Corps, the Enterprise Support Center, and the Peace Corps
are providing on-site TA support in farm business management, financial accounting, and
marketing to beneficiaries of the project.

The TA coordinating mechanism is managed by the EC-PHARE and is responsible for
the design, management, and implementation of all TA work in the agricultural sector.
D. Agriculture Sector Work And Related Studies

- **Agriculture Sector Review.** December 1994.

This document gives a detailed discussion (approximately 4 pages) of the agriculture education, research, and extension services in Latvia. The study states that to increase effectiveness and efficiency of support services, particular attention should be given to the linkages between research, teaching, and extension. Education, research, and training should also be refocused toward small-scale private farmer support instead of the former large-scale state operations. Similarly, research goals should reflect Latvia’s small-scale agriculture, and concentrate on the transfer of existing technology, applied research, and field trials. Training in business management, financing, and risk management is also essential. Some technical assistance has already been provided in this area by bilateral and multilateral sources.

Another important area for attention in agriculture support services is marketing, transportation, and distribution. Latvia’s marketing system was previously based on a central planning system, and little attention was given to consumer preferences and alternative products. The market transformation has left distributors ill prepared in procurement and wholesaling. Their lack of specific trading expertise, support systems, financing, and management impair their ability to function in a market-based economy. While most state-owned distributors have been privatized, the main domestic distributors remain concentrated among former state trading companies and effectively control the market. Increased competition should be encourage through new entry into marketing, transport, and distribution. The Government should remove all controls on packaging and marketing of products except those which focus on consumer health, safety, or environmental concerns.

At the retail level, privatization and entry of shops have increased the variety and quality of food products available. Producer owned retail markets are growing, as producers attempt direct marketing. These shops tend to be specialized and limited in growth potential due to reliance on one supplier and a limited number of products. These new entities represent one of the most important clientele for education, training, and extension services.

- **Agriculture Trade Policy Note**

- **Country Assistance Strategy**

E. Main Agricultural Institutions

- **Academy of Agriculture and Forestry Science of Latvia**
  1 Instituta iela, Sigulda LV-2150, Latvia
  Voldemar Strikis, Director
  Tel: 371 702 7343  
  Fax: 371 783 0272  
  Contact: Aleksandrs Jemeljanovs  
  Tel: 371 790-1654  
  Fax: 371 790-1655

- **Latvia University of Agriculture**
  2 Liela iela, Jelgava VL-3001, Latvia
  Voldemars Strikis, Rector
  Tel: 371 30 22584  
  Fax: 371 30 27238

  Research areas: research, extension, and continuing education in agriculture, food industry, and forestry.

- **Latvian State Research Institute of Agriculture ‘Agra’**
  Skriveri-1, Aizkraukles raj. LV-5126, Latvia
  Gedimins Silins, Director
  Tel: 371 51 95712  
  Fax: 371 51 23306

  Research areas: growing technologies of main crops, seed production, soil management.

- **Latvian State Research Institute of Animal Husbandry and Veterinary Science, ‘Sigra’**
  1 Instituta iela, Sigulda LV-2150, Latvia
  Aleksandrs Jemeljanovs, Director
  Tel: 371 790 1654  
  Fax: 371 790 1655

  Research areas: genetic and breeding programs, technology of forage production, animal feeding, ecological aspects of food production, infectious and non-infectious diseases.

- **Latvian State Research Institute of Agricultural Engineering and Energetics**
  1 Instituta iela, Ulbroka, Rigas raj. LV-2130, Latvia
  Eduards Matisans, Director
  Tel: 371 2 910879

  Research areas: mechanized technologies and machines for field crop cultivation and agricultural energetics.
• Latvian State Institute of Agrarian Economics
  14 Struktoru eila, Riga LV-1039, Latvia
  Andris Miglavs, Director
  Tel:  371 755 2909
  Fax:  371 782 8127

  Research areas: agricultural and food policy, agricultural optimization systems, environmental protection.
Lithuania

A. Background and Current Status of Agriculture Sector

Agriculture is a dominant contributor to the economy in Lithuania, accounting for about 25 percent of national income and employing 18 percent of the labor force. Beginning in 1989, the Government initiated numerous reforms designed to reestablish private ownership and management of the food and agriculture sector, to eliminate government subsidies, and to free both producer and consumer prices. So far, reforms have focused on ownership rights, privatization, and gradual price reform. The legal framework and the implementation mechanisms are still incomplete, but the transition process is well under way, gaining speed after the full restoration and recognition of the Lithuanian independence in August 1991.

Currently, the agriculture sector is in flux. Central planning and distribution systems have broken down. Reforms of price and agriculture credit systems are changing the basic financial parameters of agricultural decision-making. Lithuania's trading relationships in the FSU countries are also changing. While this imposes large adjustment costs on the sector, the transition also provides an opportunity for Lithuania to develop a significantly more efficient, productive, and commercially viable agriculture sector which is internationally competitive.

Lithuania has 33.5 million hectares of agricultural land, of which 2.3 million is arable and 1.2 is meadow and pasture. Of the arable land, 41 percent is used for forage crops, 5 percent for potatoes, and 3 percent for flax and sugar beet. In a normal year, 75 percent of grain supplies and more than half the potato crop are used for livestock feed. In 1989, crops accounted for 34 percent and livestock for 66 percent of the aggregate value of agriculture production. Within the livestock subsector, cattle, particularly dairy cattle, were the largest component (44 percent), followed by hogs (15 percent) and poultry (6 percent). Lithuania had a net trade deficit in its FSU trade for crop products and a surplus for livestock products.

In the livestock industry, the number of cattle and pigs on state and collective farms declined by 7 to 15 percent from 1990 to 1991. The largest declines were for pigs. There was virtually no decline in poultry numbers, and a small decline in dairy cows. The major cause of this declines was the shortage of feed. Meat production declined by 15 percent in 1991, as a consequence of the contraction of livestock numbers. Milk products and eggs also declined by 8 percent and 3 percent respectively.

The landholding and production structure in Lithuania still closely parallels that of the Soviet era. A network of state and collective farms controls most of the agricultural land and appropriates most agricultural inputs and other resources. As a result, state and collective farms are still responsible for the overwhelming share of agricultural production. In 1989, there were 835 collective farms and 275 state farms.

Individual household plots on the large state and collective farms have contributed to the production system. Small producers have been interdependent with the large farms on which they were located and employed. Inputs and services were often acquired or diverted from the host farm. These farms have contributed livestock and vegetables at a higher yield than the state farms. They have also allowed farmers to maintain technical and entrepreneurial skills. Most of the successful new private farmers held household plots.
B. Agricultural Research and Extension

There is currently one agriculture project in the appraisal stage for Lithuania; however, no information is currently available.

The description of agricultural research and education in the sector study indicates that Lithuania’s research system is fairly progressive. Research institutes and educational universities are separate entities; however, they have a great deal of autonomy and receive their budgets directly from the Ministry of Finance. Consequently, they have been successful at slowly changing the emphasis of research toward support for emerging private farms and new products. The universities are also changing their curricula to better reflect the perceived future needs. One difficulty is that these needs are not yet very clear. The universities are attempting to address this concern by inviting foreign teachers and visiting scholars; however, funding is extremely limiting to this effort.

With respect to extension, Lithuania seems to be advanced in its concept, but limited by budgetary constraints. The system is currently comprised of rayon-level extension agents, whose numbers have been reduced, as well as two major agricultural journals, which serve the farmer/rural community. These journals are exceptional because both existed before and survived the communist period, and devote at least 20 percent of their copy to technical aspects of agriculture and consumer prices. The Ministry of Agriculture also publishes various extension leaflets and instruction books. In addition, some professional societies also publish information.

Present budget limitations are a major constraint for the research and education system, and the agriculture sector is eager to receive guidance on new directions. Options to consider are:

- to integrate the activities of the Institute of Agrarian Economy into the Economics section of the Ministry of Agriculture as well as into the existing crop and livestock research institutes;

- to consider better cooperation or even integration of the animal production, animal health, and crop production institutes with the activities of these institutes and the agricultural universities; and

- to carry out a review of the costs and benefits of a smaller but less dispersed agricultural research infrastructure and facilities.
C. Relevant World Bank Agriculture Projects

- **Agriculture Development Project**
  Loan: Appraised
  Signed: Anticipated 1996
  Source: No information

D. Agriculture Sector Work and Related Studies

- **Agriculture and Food Sector Review.** Sector Report 13111. 1995. Volume Two provides additional detailed information in the form of annexes regarding privatization, financing, marketing and trade reforms, forestry, crop, and livestock production, and the environmental aspects of agriculture.


E. Main Agricultural Institutions

- **Ministry of Agriculture**
  Gedimino pr. 19, 2025 Vilnius, Lithuania
  Tel: 3702 62 25 32
  Fax: 3702 62 25 32 / 22 44 40

- **Lithuanian Institute of Agriculture**
  Dotnuva-Akademija, LT-5051 Kedainiur
  Dr. Rimantas Dapkus, Director
  Tel: 370 57 52657
  Fax: 370 57 56996

  Research areas: soil science, soil cultivation, agrochemistry, selection, plant protection, grassland husbandry.

- **Lithuanian Food Institute**
  Taikos pr 92, LT-3031 Kaunas
  Dr. Habil. Donatas Kacerauskis, Director
  Tel: 370 7 719393
  Fax: 370 7 719393

  Research areas: investigation and development of environmentally clean and resource-saving food production technologies, control methods and equipment; certification; and distribution systems for raw and processed products.
Lithuanian Institute of Veterinary Studies
Instituto g.2, LT-4230 Kaisiadorys
Dr. Raimundas Mockeliunas, Director
Tel: 370 56 52580, 51936
Fax: 370 56 51440

Research areas: development of veterinary preparations, vaccine sera and diagnostic kits; methods of cattle and poultry disease diagnostics, treatment and prevention; development of veterinary and sanitary technologies, instruments, and equipment.
Macedonia

A. Background and Current Status of Agriculture Sector

Given that the welfare and income of the 45 percent of Macedonia's population which lives in rural areas are closely related to agriculture, agriculture is one of the most important sectors of the economy. Its importance is expected to increase, as the industrial and other sectors contract. Agricultural production currently accounts for 15 percent of employment. Agriculture sector grew by nearly 8 percent in 1994, the only sector to do so. In the past, Macedonia was an important supplier of fruit and vegetables, and lamb and beef to Greece, Italy, and the other Republics of Yugoslavia. Declines in exports are related to the Greek blockade and UN sanctions on Serbia, disruption of old marketing channels, lack of export financing, and a dearth of working capital.

In contrast to other sectors of the Macedonian economy, agriculture has traditionally been predominantly a private sector activity. Private farmers own about 70 percent of arable land. Farms average 2.6 ha each. Private farms are often highly diversified, although some farmers specialize in vegetables and/or fruit production, or livestock fattening and dairy production. Despite the fact that farming populations are seen as risk-averse and conservative and have lower levels of education than urban dwellers, small private farmers have been the most agile at adapting to the changing market. Farms are reasonably well mechanized, averaging one tractor for every 9.7 ha. 93 percent if the country's 51,000 tractors are privately owned.

Agri-kombinats (AKs) account for 25 percent of primary production and for 60 percent of processing and marketing services. As of 1996, 217 AKs exist, holding an average of 950 ha each. The AKs follow the typical command-style vertically integrated production and processing structure, including input supply, farming, out-grower production contracts, primary production processing, and commodity retailing and trading. Under the Special Restructuring Program, three of the largest AKs were put into receivership and would be broken up and privatized. The proposed Structural Adjustment Loan would support continued privatization of AKs.

Agricultural marketing continues to be dominated by the AK, and this situation inhibits competition and limits option of farmers. No commodity exchange exists. Farmers' market access is provided through informal local green markets and sale to social sector enterprises. For high-value products for exports, such as off-season vegetables and fruit, a system to replace the AKs and provide a wholesale services to many small vegetable producers and new private traders is an immediate priority. There is no formal market research or information service. Near real time market information is needed on prices, volumes, and quantities of products.

Input supply is increasing due to private trading companies which are moving into the input supply market at the encouragement of government policies. Given the ease of market entry, small private businesses have developed and become important in the new upstream and downstream agricultural service sectors. Competition in the supply of services to the private farmer exists where it did not before. International agribusinesses are largely absent from the market. This lack of private sector investment is one constraint to growth. New investment is
needed in private agribusiness to supply tractors and equipment, seed and fertilizer, and custom services for specialized equipment.

The institutional structure of the agriculture knowledge system in Macedonia is comprised of the Ministry of Agriculture, Forestry, and Water Economy (MAFWE) and the Ministry of Science (MOS). MAFWE consist of three departments (Agriculture, Forestry, and Administration) and four Republic Agencies (Water Economy, Veterinary, and Agriculture and Forestry Inspectorate, and Extension Services). MAFWE has 420 employees, of which 80 percent are regionally-based.

The Republic Extension Service (RES) was established in 1975 to promote private agriculture and now has 140 professionals in 30 opstina extension centers. Extension staff are technically well-qualified. The RES is currently funded from the national budget and is focused on production. Consequently, there is little orientation on farm management and participatory methods of reaching farmers. Staff have limited transport, equipment, and operating funds. MAFWE recognized the current constraints to the RES as being: (i) lack of client accountability; (ii) lack of effective applied research; (iii) inadequate attention to production economies and farm management; (iv) insufficient knowledge of farmers’ resources and difficulties; and (v) inadequate operational budget.

The Ministry of Science is responsible for all research. The research system has six institutes, and the faculty of the Agriculture University of Cyril and Methodius. The system is larger than the country can sustain or afford.

Source: Staff appraisal report 14913-MK.

B. Agricultural Research and Extension

World Bank experience in agricultural research and extension in Macedonia is comprised of preparation activities for the upcoming Macedonia Private Farmer Support Project which is anticipated to be signed in FY 1996. There has been no agriculture sector study on Macedonia.

The Government of Macedonia has made encouraging progress in macroeconomic adjustment and structural reforms. In 1994 the Government implemented a set of comprehensive reform measures including strict budgetary discipline and monetary reforms which brought greater price stability. Significant progress has been made in normalizing the external debt situation, in enacting basic laws to restructure and privatized the inefficient, socially-owned enterprise and financial sectors, and in reforming the social safety net. Most foreign trade barriers have been removed. Tariffs are low, and restrictions that remain apply mainly to metal and a limited number of agricultural products. A source of price distortion in agriculture is the variable levies which exist mainly for wheat, milk, and sugar.

From the former Yugoslavia, Macedonia inherited an agricultural research and education system and extension service. The system is currently unsustainable in size and largely irrelevant to the small, private farmer. Technicians and scientists are well trained, good
physical and administrative structures are present, and the government is committed to a new role for public services.

The World Bank is committed to assisting Macedonia in completing its economic transformation. Some of the World Bank's objectives for Macedonia include enhancing private sector development through privatization and complementary measures to enhance the business environment; stabilizing the economy through macroeconomic policy; improving environmental management; and building on private sector capabilities to increase agricultural production. The World Bank is supporting the possibility for a Private Farmer Support Project which will finance participatory and accountable extension services through cost-sharing with farmer organizations; on-farm adaptive research; privatization of veterinary services; and establishment of a market news service. In addition, a Sector Adjustment Loan, focusing on liberalizing trade policies, reforming agricultural price policies, and privatizing AKs is possible for FY 1997. In combination with these activities, exposure to international investment, agro-industry, markets, and research institutions would greatly benefit the agriculture sector of Macedonia.

C. Relevant World Bank Agriculture Projects

- **Macedonia Agriculture Development Project**
  
  Loan: 2039  
  Source: Project completion report 9255

  The project's main objectives are: (a) increasing agricultural and forestry production; (b) increasing capacity utilization of existing processing facilities; (c) improving rural incomes, productivity, and employment opportunities, particularly in the individual farm sector; (d) increasing agricultural exports; (e) assisting in the development of alternative energy sources of agricultural production; and (f) contributing to institution building by strengthening the appraisal and supervision capacity of the borrower. The project objectives were achieved by providing finance for: (a) horticulture and livestock development; (b) cold stores; (c) small-scale irrigation schemes; (d) feasibility study for geothermal water development.

- **Private Farmer Support Project**
  
  Loan: In negotiation  
  Signed: Anticipated for FY96  
  Source: Staff appraisal report 14913-MK

  This project will fund technical specialists, training and equipment that will be used to: (a) develop participatory and accountable extension services through cost sharing with farmer organizations and reorientation of government extension; (b) carry out on-farm adaptive research; (c) privatize the veterinary service and enhance government's epidemiology and border quarantine abilities; and (d) establish a market news service and design a horticulture wholesale market system. The project will also support the institutional development of financial institutions involved in rural finance, including the Participating Financial Institutions under the Private Sector Development Project (PSDP).
Private farmers will be the principal beneficiaries, deriving benefits from improved support services. Agricultural research and extension is expected to lead to reduced production costs and increased farm incomes and to provide a basis for a more rational agro-chemical use and consequent improvement in the environment. Better enzootic disease control and livestock product sanitary inspection will enhance consumer safety and enable domestic livestock products to compete in European Union markets. Project benefits will be supported and enhanced by the parallel PSD project.

The project will be implemented over 3.5 years. Specific project activities are described below.

**Agriculture Advisory Service**

U.S.$3.32 million will be provided to finance farmer's groups as pilot initiatives to develop cost-sharing arrangements with farmer associations, to decentralize extension management and responsibility for support to farmers, and to strengthen the Republic Extension Services’ (RES) extension capacity. This component will help identify solutions for more effective provision of advisory services and support pilot initiatives for improvements in the provision of these services to private farmers. This initiative will not replace the RES, but rather is an effort to pilot the shifting of some costs to the beneficiaries of the services. The RES will establish an Agricultural Advisory Service Fund (U.S.$5.5 million) to use in cost-sharing agreements with interested farmer groups. The RES will provide 75 percent of funding in the first year, declining to 65 percent in the second and third years, and 50 percent in the fourth year. Thereafter, the RES will provide a mutually agreed ration not more than U.S.$6,000 per year to any one group. The RES will provide a one-time, start-up matching grant for materials such as office equipment, advisors, handbooks, special training programs, and other items on the basis of a 33 percent farmer group input and a 67 percent RES input. Financing will expand from six pilot initiatives to about 40.

Thirty RES extension centers would be strengthened through training, demonstration materials, and the provision of office, audio-visual and electronic mail facilities. The main objective is to assist the RES in achieving a client-oriented approach and support for farmer association advisory services. The RES would also be eligible for vehicle loans and reimbursements for field use. 90 person months of training and six overseas short courses will be provided. Six extension centers will be strengthened by the addition of two MAFWE staff. The first, an agronomist, will serve as the research extension coordinator to improve linkages between the RES, the regional centers, and applied research activities. The second would be an agricultural economist to analyze development constraints at the farm level, develop representative models and appraise results of the applied research.

The project will strengthen RES capacity in provision of mass-media materials and organization of national and regional training programs. Trainers, taught under the PPF with assistance by an RES advisory services coordinator, will implement a program of reorientation courses for selected extension staff. Support will be provided for: six person months of international and 48 person months of national specialist assistance; two short courses, fellowships abroad in extension management; national technical seminars; office equipment, vehicles, and audiovisual equipment; commercial preparation of a series of mass-media extension packages; and funding for impact studies to be conducted by a commercial firm.
Adaptive Research

This component will provide support applied research by setting up a competitive research support fund of U.S.$0.5 million. Research grants will be awarded for up to U.S.$25,000 directed to priority subjects such as integrated pest management, animal husbandry, farm management, soil fertility, conservation tillage, pasture and range management, and evaluation of new horticultural varieties. Other research ideas would be identified in cooperation with farmers during the project implementation.

Private Veterinary Services

This component will support measures to improve the provision of veterinary services by funding a Veterinary Development Fund (U.S.$0.3 million). This fund will provide matching grants to state veterinary staff who are switching to private practice. It will also support the Veterinary Chamber in the preparation of national veterinary protocols through the provision of office facilities and technical specialist assistance. It will also provide funding for the services of local institutions such as the Faculty of Veterinary Science in the training of private veterinarians supported by limited international specialist assistance.

Animal Health Services

This component will strengthen the essential public animal health services of the MAFWE Epidemiology Department. It includes: (a) recruitment of two additional staff and their specialized overseas training in disease epidemiology and data management; (b) international specialist assistance (6 pm) and national specialist assistance (48 pm) to support the development of a public animal health program; (c) provision of essential office and transport equipment; (d) animal health studies and strengthening of the Veterinary Institute's analytic capability; (e) upgrading of Animal Quarantine Services at ten border posts through the provision of sampling equipment and vehicles; and (f) funding of incremental staffing, vehicles, and equipment operating and maintenance costs.

Agriculture Market Information

This component will support the development of a market new service with 12 person months of international specialist assistance, and 48 person months of national specialist assistance, office equipment, subscription services, and training. It will support the planning and design of a private, wholesale horticulture market for Skopje. The daily news service will publish daily agricultural prices on national radio and TV. Following market evaluation of its initial impact, SOM will review opportunities for selling near real-time market information to commodity traders and mass media outlets. The SOM will also complete the agriculture portion of the 1994 census to provide benchmark information about farmer income and productivity levels. The SOM will be assisted by specialists to redefine its methodology for agricultural statistical data generation and provided with the hardware and software for a computer-based compilation and analytic process.

Rural Financial Services

This component will help improve access of private farmers to credit.
D. Agriculture Sector Work and Related Studies


- **Private Farmer Support Services Project. Staff Appraisal Report 14398.** Memorandum of the President P6605. Available Severin Kodderitzsch x82164. Discussed above.

- **Macedonia Agriculture Development Project. Project Completion Report 9255.** There are no research or extension components in this project.
Moldova

A. Background and Current Status of Agriculture Sector

Since its independence in August of 1991, Moldovan agriculture and food industries have faced a series of shocks, including: a large unfavorable adjustment in terms of trade; civil unrest; severe droughts in 1992 and 1994; and economic disruption associated with the break-up of the USSR. Agricultural output is estimated to have declined by 33 percent between 1989 and 1993. Output fell an additional 26 percent in 1994, due to severe drought and other natural disasters. Moldovan GDP fell by over 50 percent between 1990 and 1993, and the additional decline in 1994 is estimated at 30 percent. Agriculture and food processing make up more than half of the Moldovan economy.

Land reform and restructuring of farms are proceeding only slowly. By early 1994, approximately 15 percent of Moldovan agricultural land was privately managed - 13 percent in expanded household plots and 2 percent in private farms. The remainder of agricultural land was managed by collective and state farms, new producer cooperatives, joint stock companies, and other forms of shareholding farms. In July of 1994, approximately 10,000 private farms were registered, occupying less than 1 percent of agricultural land, with an average size of one to two hectares. Approximately 30,000 additional private farms were reported to be functioning, but not yet registered.

Privatization of processing and marketing is also proceeding slowly. Restructuring and privatization of the parastatal monopolies in agriculture chemicals, machinery, and grain are under preparation, and privatization will be undertaken in the 1995/1996 reform program of the Moldovan Government. Trade policy is largely liberalized; however, export quotas amounting to an effective ban on exports remain in effect for grain and hides. Producer and consumer prices are unregulated and controls on marketing margins are scheduled to be removed in two stages in early 1995. The state no longer requires mandatory deliveries under procurement quotas. The state remains a significant purchaser of agricultural products, primarily in order to meet export commitments under bilateral trading agreements.

Moldova is a small, densely populated country which is primarily agricultural. Agriculture accounts for 40 percent of the net material product (NMP) and employs one-third of the labor force. In addition, the processing of agricultural products accounts for 40 percent of industrial output and 20 percent of industrial employment. Agriculture and food products accounted for over half of Moldova's exports from 1987-1990. Moldova has traditionally been a net exporter. Moldova has essentially no production capacity for inorganic fertilizers, pesticides, mineral or vitamin feed additives, veterinary medicines, or petroleum fuels. It must rely on imports of these inputs. By necessity, the economy must remain relatively open.

In the average year, Moldova grows grain crops on about half of its arable land. Industrial crops (oil seeds, sugar beets, and tobacco) are grown on another 15-17 percent. About 7 percent is under cultivation of potatoes and vegetables, and the remaining arable land is occupied by forage crops. Although Moldova has had some of the highest crop yields of the FSU, yields could be improved with better management and economically appropriate use of inputs. A high yielding crop sector is economically justifiable in Moldova because of the high quality soil and abundance of low cost labor. In recent years, the lack of key imported inputs,
their high prices relative to product prices, and recent droughts have brought depressed yields. Moldova’s strategy should emphasize yield enhancement, through public investment in seed research, free trade in agricultural inputs, rapid restructuring and privatization of input marketing, and price and trade policies that give efficient access to domestic and foreign markets. The key constraints to higher yields at present are poor service of the parastatal input suppliers, and lack of financing for high quality inputs.


B. Agricultural Research and Extension

World Bank lending in Moldova commenced in 1993 with the Emergency Drought Recovery Loan, followed by the Rehabilitation Loan, the Sectoral Adjustment Loan, and the Pre-Export Guarantee Loan.

The World Bank’s experience in agricultural research and extension in Moldova is likely to begin with the Agriculture I - Agroprocessing and Research Project. This proposed project begins a series of three Bank-supported investments. The First Agricultural Project concentrates on supporting agricultural research for key export commodities, both established and emerging, as well as the related research institutions’ farmer outreach programs; promoting agro-enterprise restructuring and investment planning; and assisting the GOM on sectoral strategic planning, analysis of sector reforms, and the preparation of further public investments in the sector. The choice of agriculture research as the first funding priority for the sector reflects both the critical nature of technology transfers and development to the future of the sector. Also, it is necessary to commence these activities early because of the long gestation period. The project will build the capacity of existing institutions which will form the base of a rationalized agriculture knowledge system in Moldova. The agriculture sector review states that priorities for the agriculture research and extension system include revising the system to focus on priority areas and to advise small-scale producers and processors. As well, the sector study notes that agriculture exports are crucial to the Moldovan economy. This project combines these requirements by providing training and experience to processing enterprise managers and research in several important areas: horticulture, viticulture, animal breeding, and integrated pest management.

The GOM has requested that the Second Agriculture Project focus on farm production support, rural entrepreneurship, farming services, and agro-processing development. The GOM proposes to achieve these goals through a rural financing facility. The proposed Third Agricultural Project would focus on selected rural water supply and irrigation schemes. The latter would reduce the risk of drought impact (occurring with varying severity every 6-7 in every 10 years in southern Moldova), thereby stabilizing export and domestic food supplies. The preparation process for this loan would establish a national water policy and the related environmental safeguards for the expansion of the irrigation system (Source: First Agriculture Project SAR No. 15120-MD).
C. Relevant World Bank Agriculture Projects

- **Agriculture I - Agroprocessing and Research**
  Loan: Preappraisal stage
  Signed: Anticipated 1996

  The growth and sustained recovery of Moldova’s economy will greatly depend on agricultural exports. Through this project, the Government of Moldova seeks to promote agriculture exports, strengthen sector institutions, and increase incomes of the rural agricultural population. The project consists of the following components:

  **Agrotechnology Development and Transfer**

  *Viticulture Improvement.* This subcomponent will support the existing research program to develop and distribute improved vine varieties in Moldova, and to improve wine-making. The component will concentrate on: research and development at the National Institute of Viticulture and Analogy, including equipment and technical assistance; quality improvement of vine plants produced in nurseries, and protection of vines.

  *Horticulture Improvement.* This subcomponent supports the Research Institute for Fruit Production and the Research Institute for Maize and Sorghum for their horticulture research programs, the production of elite planting material, and the establishment of farming technology demonstrations on selected farms.

  *Animal Breeding.* This component would promote better utilization of Artificial Insemination resources at the Veterinary and Animal Breeding Research Institute through provision of modern laboratory, semen processing, and storage equipment.

  *Integrated Pest Management.* The proposed component would promote sustainable agriculture production by supporting IPM applications on Moldovan farms.

  **Institutional Strengthening**

  *Studies and Training.* This project would finance study trips abroad, and possibly visits by selected trainers as complements for the following two activities: (a) the agriculture knowledge system study; and (b) the agroindustry management and staff training, which includes study trips and work experience overseas for managers.

- **Agriculture II**
  Loan: Proposed
  Signed: Anticipated 1996

- **Agriculture III**
  Loan: Proposed
  Signed: Anticipated 1996
D. Agriculture Sector Work and Related Studies

- **Agriculture Trade Review.** 1995. Formal.


This report gives a discussion of agriculture services in Moldova. The discussion is split between marketing and public research and extension services.

At the present, marketing constitutes a major constraint in Moldovan agriculture. Marketing of inputs is still dominated by the state-owned monopolies Fertilitatea (chemicals) and Arca Moldova (machinery). Grain marketing is presently dominated by Cereale, another state-owned monopoly. Marketing of processed fruits and vegetables has traditionally been managed by the processing firms. These are individual firms, and many have been included in the privatization program. Due to financial difficulties, processors have increasingly withdrawn from participation in marketing and instead return the processed products to the farms for further disposition. Moldcoop, the consumer cooperative, dominates rural retail trade. This entity is neither state owned nor cooperative in the Western sense. The organization is currently a major debtor and has an unwieldy structure and suboptimal geographic distribution.

The role of the Ministry of Agriculture in a market economy is to provide essential public support services, such as extension, education, and research; to implement regulations in the areas of phytosanitary controls, health and safety, and veterinary controls; to implement the government's agricultural programs, and to evaluate sectoral performance and the impact of alternative policies. The scientific institutes merit special attention as organizations whose functions will remain useful, and indeed may gain importance as Moldova becomes integrated with the global market economy. These institutes vary in quality. Some also have substantial non-government funding and others have become commercially successful. For example, the Corn and Sorghum Institute has become self-financing by supplying hybrid seeds to the former Soviet Republics, notably Ukraine and Russia. The Wine and Grape Institute is said to be flourishing with about 250 scientists, financed largely with industry funds. These institutes are analogous to the large enterprise-research organizations in industrial economies.

The task of advising agricultural producers on new practices and technology is usually shared by the private and public sectors in market economies. In Moldova, parts of this function is now distributed between and among the Ministry of Agriculture and Food, parastatal input suppliers, the research institutes, and the specialists on the collective and state farms. Moldova’s intensive agriculture will continue to require a high level of skill on the part of farm operators. Support for agricultural education and research is an essential service of government, and one that complements activities of the private sector. Curriculum reform, training, and re-equipment of institutions of higher education is high priority for public investment.

- **Emergency Drought Recovery Project**
  Loan: 3569
  Sources: Memorandum of the President, and Implementation Report P6015
This project finances agricultural inputs. There are no agricultural research or extension components.

- **Agriculture Restructuring Project**  
  Sources: Staff appraisal report 15120 (Available Brian Berman, X37166)

- **Orchards Project; Livestock Project; Moldova Agricultural Credit Project**  
  Sources: Project completion report 8508, and Project performance audit report 13830

**E. Main Agricultural Institutions**

- **Institute for Agrarian Economy**  
  Grenoble Street, 106, 2019, Kishinev, Moldova  
  Contact: Victor Moroz  
  Tel: 72-19-47  
  Fax: 23-23-68

- **ICS pentru culturile de cimp ASP Selectice**  
  279200 or Balti, Street Verde, 1  
  Mihail Dumiru Bronschih, Director  
  Tel: 3-31-51, 3-01-27

  Research areas: field crops, excluding corn and sorghum.

- **ICS pentru proumb si sorg ASP ‘Porumbeni’**  
  278336 raionul Criuleni, s. Pascani, 7  
  Vasile Efim Micu, Director  
  Tel: 22-32-34, 22-24-78

  Research areas: corn and sorghum.

- **Science and Research Department, Agricultural Ministry**  
  2612, Chisinau, bul.Stefan cel Mare, 162  
  Tel: 24-89-00  
  Fax: 24-84-81  
  (For information on all institutes.)
Serbia

A. Background and Current Status of Agriculture Sector

The World Bank has not completed an agriculture sector study for Serbia. The following information was supplied by the Serbian Ministry of Agriculture's representative to the May 6 and 7 CGIAR Regional Consultation in Prague.

The agriculture sector in the Federal Republic of Yugoslavia (Serbia) contributed 21.7 percent to the gross national product in 1994. Approximately 5 percent of the total labor force is employed in agriculture, with a total of 121,000 persons employed in enterprises and cooperatives involved in primary production. Serbia has approximately 4.9 million ha or arable land and 2.9 million ha of forest land. No information on the structure of farms is available for Serbia.

Crop production is dominated by grains and corn which claim 3.3 million ha of land, with potatoes, oliveaceous plants, vegetables, sugar beets, and fruit production claiming just over 149,000 ha.

B. Agricultural Research and Extension

Serbia has approximately institutes dedicated to agriculture research. Some of these are connected to large production enterprises and while others are traditional science and experimental organizations. The main priorities in agriculture research include embryology, cytology, genetics and breeding,

C. Relevant World Bank Agriculture Projects

Not applicable.

D. Agriculture Sector Work and Related Studies

Not applicable.

E. Main Agricultural Institutions

- Ministry of Agriculture of the Federal Republic of Yugoslavia
  11 070 Novi Beograd, Bulevar AVNOJ-a 104
  Mr. Milan Milanovic
  Tel: 381 11/ 602 774
  Fax: 381 11/ 604 028
• **Institute for Plant Protection and Environment**  
  11 000 Beograd, Teodora Drajzera 9  
  Dr. Mirko Draganic, Director  
  Tel/Fax: 381 11 660 049  
  
  Research areas: natural sciences, plant protection, biology, entomology, toxicology.

• **Institute for Soil Science**  
  11000 Beograd, Teodora Drajza 7  
  Dr. Nebojza Protic, Director  
  Tel/Fax: 381 11 677 199  
  
  Research areas: biotechnology, soil science, plant production, plant protection, genetics.

• **Institute for Corn Zemun Polje**  
  11 080 Beograd-Zemun, Slobodana Bajica 1  
  Dr. Mile Ivanovic, Director  
  Tel/Fax: 381 11 617 434  
  
  Research areas: biotechnology, plant protection, genetics, agronomy, seed production.

• **Institute for Applied Agricultural Sciences**  
  11000 Beograd, 29 Novembra 68b  
  Dr. Radenko Radivojevic, Director  
  Tel/Fax: 3811 751 622  
  
  Research areas: biotechnology, agronomy, applied selective breeding in animal husbandry, agriculture production technology.

• **Institute for Field and Vegetable Crops**  
  21 000 Novi Sad, maksima Gorkog 30  
  Dr. Milutin Cirovic, Director  
  Tel/Fax: 381 21 613 894  
  
  Research areas: biotechnology, soil science, plant production, genetics.
Slovenia

A. Background and Current Status of Agriculture Sector

To date, the World Bank has not completed an agriculture review or commenced lending in the country of Slovenia. The following macroeconomic indices were supplied by the Slovenian representative to the CGIAR Regional Consultation in Prague, May 6 and 7, 1996.

In 1994, agriculture contributed 4.3 percent to the total economy of Slovenia and employed 10.7 percent of the labor force. Slovenia is dominated by small farms of 1-10 ha (55 percent) and 10-100 ha (33 percent). The average size of agricultural enterprises (of greater than one hectare) in the country is 6 ha. The most important crops grown in Slovenia include wheat, maize, oilseeds, sugarbeet, fruit, and potatoes. Cattle, cows, and pigs dominate livestock production.

B. Agricultural Research and Extension

The NARS in Slovenia encompasses research and development in the areas of forestry, animal science, plant production and processing, veterinary science, biotechnology, and environmental protection. Slovenian research in crops includes all aspects of plant production and processing; their application to the Slovène agricultural land; production of food, animal fodder, and ornamentals.

Most of the basic research in crop production and animal science is conducted at the University of Ljubljana, Biotechnical Faculty (Department of Zootechnology, Department of Food Science and Technology, Center for Biotechnology); the University of Maribor, School of Agriculture; Agricultural Institute of Slovenia; and R&D groups in industry. Additionally, the Institute for Hop Research and Brewing; and the agricultural centers at Nova Gorica, Celje, Maribor, and Ljubljana develop new technologies for specialized crops.

C. Relevant World Bank Agriculture Projects

Not applicable.

D. Agriculture Sector Work and Related Studies

Not applicable.

E. Main Agricultural Institutions

- Ministry of Agriculture, Forestry and Food
  Parmova 33, 1000 Ljubljana, Slovenia
  Dr. Joze Osterc, Minister
• University of Ljubljana
  Jamnikarjeva 101, 1000 Ljubljana, Slovenia
  Biotechnical Faculty
  Dr. Janiz Hribar, Dean
  Drs. Andrej Salehar and Franc Lobnik, Vice Deans
  Tel: 386 61 123 11 61
  Fax: 386 61 265 782

• Agricultural Institute of Slovenia
  Hacquetova 2, Slovenija
  Slavko Gliha Ing, Director
  Tel: 386 137 53 75
  Fax: 386 137 54 13
Ukraine

A. Background and Current Status of Agriculture Sector

Due to its favorable climate, fertile soils, and adequate rainfall, the agriculture sector in Ukraine has greater potential than in any other region of the former Soviet Union. The most important crops are wheat, sugar, maize, and oilseeds. Animal husbandry is dominated by hog, beef, and chicken farming. The sector traditionally produced a surplus for export. Labor in the agriculture sector is comprised predominantly of the rural population. 66 percent of agricultural laborers work on collective farms, 12 percent on private subsidiary and individual farms, and 14 percent work in agroindustries.

Ukrainian agriculture still exhibits the major hallmarks of the Soviet system. Most of the production is organized in large-scale farms and collectives. These also provide a comprehensive range of social and municipal services. A large bureaucratic administrative structure is still functioning above the farm level, and attempts to provide central focus to farms and other agricultural activities. As late as 1994, the Government influenced production decisions of the farms by connecting input supply with deliveries to the state. Regional administrative structures have been preserved almost without change. The bureaucracy created to implement direct administrative controls continues to exist.

As a result of the adoption of extensive trade restrictions after independence, foreign trade virtually disappeared. For example, Ukraine became a net importer in grain in the early 1990s, where it had once exported 24 percent of its grain output. The performance of Ukrainian agriculture in the 1990s parallels trends in other FSU countries. Output grew by about 2 percent in the 1980s, then fell sharply in the beginning of the 1990s. Total production in 1994 was more than 30 percent below the 1986-1990 average.

Factors contributing to the decline in output include high inflation, erosion of farm working capital, increased real costs of agricultural inputs, breakdown of trade and payment channels with FSU countries, and bad weather in some years. This low factor productivity also reflects the impact of unsustainable agricultural policies pursued in the past. Collectivized agriculture and routine covering of enterprise losses eroded labor incentives and rewards to management for cost containment. High investment in field mechanization and livestock facilities in the 1970s and 1980s did not improve efficiency, and output growth slowed as marginal increases in fuel, fertilizer, feed and other variable inputs declined to very low levels. Moreover, cumbersome mechanisms of central planning and control resulted in monopolistic and inefficient distribution system for agricultural inputs and outputs.

In the 1990s the state supply and purchasing system eroded continuously. In 1992, the GOU ceased to officially set most agricultural output and input prices, but maintained considerable control over prices through state contracts and orders. State trading agencies exerted pressure on farms to sell at low prices by making these sales a condition for supply of otherwise scarce inputs and credits. The uncompetitive nature of state procurement enterprises and export licensing, quotas, and taxes have caused poor transmission of border prices to the farm level. The result is a worsening of terms of trade in agriculture.
There is considerable belief in Ukraine that the problems of the present system are transitory and can be overcome by greater access to advanced technology. Second, there is fear that rapid dismantling of state and collective farms will lead to a collapse of output. Third, there is concern about the effects of rising food prices on living standards. Finally, there is recognition that the physical and institutional infrastructure needed to support a sector of small independent farmers is substantial and not immediately available.

The principle of unrestricted private ownership is slowly being accepted. Privatization of land and establishment of independent private farms is incomplete. As of 1993, 56 percent of land was owned collectively and 27 percent was owned by the state, compared to 100 percent state ownership in 1990. As of April 1994, only 1.5 percent of Ukraine's agricultural land was privately held. Land reform has progressed mainly down the avenue of denationalization, a transfer of state lands to collective ownership. Until recently, there was a clear intention to keep private agriculture as a supplementary component of a farming structure based on large-scale units owned separately. In the early 1990s, policies and legislative framework showed a lack of commitment to privatization. Uncertainty about future legislation, the absence of competitive input/output marketing and credit system, and other risks involved in private farming in the present macroeconomic conditions have substantially limited interest in private farms.

In 1994, it became apparent to the GOU that a faster transition to a free market in the agriculture sector would be required to restore the sector to profitability. Recognition by the GOU that the financing of seasonal peaks in agriculture operations must be market-based represents a key realization in redefining agricultural policy. In October of 1994, the agricultural reform directions announced by President Kuchma signaled the first comprehensive reorientation of agricultural policies. These support the creation of tradable private property rights in agriculture and the rest of the agroindustrial sector to a) motivate farms and other enterprises to pursue profitable activities; and b) to generate competitive mechanisms which indirectly regulate these enterprises' profits and promote efficiency. The specific measures include: a) liberalization of food prices; b) agricultural export liberalization; c) development of agricultural commodity exchanges; d) distribution of land plots to farm workers and other eligible beneficiaries; and d) privatization of agricultural supply, marketing, and processing enterprises. In 1995, the GOU took major steps in implementation of the reform measures emphasized by the President. The GOU removed most food price controls, abolished all export quotas on agriculture products except grain.

Sources: Agriculture and Food Sector Review, 1994.

B. Agricultural Research and Extension

The four priorities which the sector study lists for World Bank and other external assistance include: balance of payments for critical inputs; technical assistance to the Ministry of Agriculture and Food to implement a transition program; technical assistance and capital investment for market institutions; capital investments for development of production, processing, and marketing systems and physical infrastructure.
The World Bank's recent project experience in Ukraine one ongoing project and three pipeline projects. The ongoing Agriculture Seed Development Project contains a substantial research, institution-building, and enterprise support activities, which will strengthen national capabilities in research and development for seeds and germplasm maintenance. The project will supply financial and technical assistance for the Ukrainian Institute for Agro-Ecology and Biotechnology and for new seed enterprises. The Agriculture I: Agribusiness Development Project will also include an institution-building component which has significant research, training, and extension activities. Specific agriculture support activities under the project are: program planning and educational exchanges for the Ukrainian National Agricultural University to improve agriculture education; ten agribusiness centers to provide management support and training to newly privatized agribusiness companies and kolkhozes that are restructuring; and equipment and training, for a low cost market information system. The component is designed to provide direct technical assistance to the restructuring of kolkhozes and agribusiness companies in the short run, and to improve the management capacity in the agribusiness sector in the longer run. It would also improve the quality of information available to traders and agricultural producers. It is likely that the Agriculture II Project will also undertake a component which will assist the Agricultural Academy of Sciences to increase the efficiency of the agricultural research system.

Currently, the situation in the agriculture sector in Ukraine is a mixed-bag of significant advantages and constraints, any of which could propel or cripple Ukrainian agriculture in the next few years. On one hand, the Ukraine has the best agroclimate of any of the FSU countries, which is well-suited for production of grain, oilseed, root and fiber crops, livestock, and temperate fruits and vegetables. However, Ukraine's comparative disadvantage in food processing can offset its absolute advantage in production, especially for sugar refineries and fruit and vegetable processing.

Further, the sector study states that Ukraine has a considerable effort ahead in order to make the transition to an efficient, market-based agricultural sector. Unlike some FSU countries, Ukraine has not yet shown complete commitment to the ideas of a market-based economy or to the land and structural reform required for an economic transition. The sector study states only that the Government of Ukraine has moved cautiously in reforming and restructuring the food and agriculture sector. Great disincentives exist against private farming. The land reform has not focused sufficiently on individual private ownership, and has allowed large collective farms to be perpetuated. Lack of progress in these areas will hinder recovery of the agriculture sector in the Ukraine. In 1995, Ukraine began measures to transfer state farms and enterprises to individual private ownership, to reform pricing and trade policy, and to develop tradable private property rights and commodity exchanges. If these measures are successful, the Ukrainian agriculture sector will be well situated for growth.

With regard to research and extension, Ukraine has a need for increased capabilities in both areas. There is a role for the public sector in supplying basic and applied research, especially in cost effective production. Extension services, however, should be (and are being) assumed by the private sector, especially international equipment supply companies (Lundell, personal communication).
C. Relevant World Bank Agriculture Projects

- **Agriculture Seed Development**
  Loan: 38910  
  Signed: FY95  
  Source: SAR

The principal objective of this project is to improve the national seed systems capacity to efficiently produce high quality seed. In the short term, the project will arrest the decline in the domestic availability and exports of high quality commercial seed using domestic and imported germplasm. The project will facilitate the development of a competitive seed system in the medium term by demonstrating the efficiency and effectiveness of private production, by improving the regulatory framework for the seed system, and by assisting in the establishment of a sustainable and efficient system for germplasm maintenance and plant breeding. With the liberalization of pricing, marketing, and export, domestic seed prices will rise substantially over the medium term reflecting the contribution of quality seed to crop yields, thereby allowing seed production and processing to become financially a self-sustaining activity. The seed enterprises will also enhance their viability by exporting part of their output, mainly to FSU markets where Ukraine has demonstrated ability to sell quality hybrid seed.

The project provides financing, technical assistance and training for: (a) development and initial operation of three private hybrid seed production enterprises; (b) improvements in the regulatory framework of the national seed system; and (c) the strengthening of germplasm maintenance and improvement programs. To meet the projects short term objective of improving the supply of quality seed for the domestic and export market, the project provides financial and technical assistance for: (a) the development of three private enterprises specializing in the multiplication of domestic and imported parent hybrid seed for maize, sunflower, sugarbeet, and their processing and marketing; and (b) the germplasm maintenance and development for three leading domestic suppliers of hybrid maize, sunflower, and sugarbeet seed.

To meet the projects medium-term objective of developing a competitive seed system, the project provides financial and technical assistance for: (a) improving the regulatory framework for the seed system; (b) the development of an agricultural research strategy and plan; and (c) the Ukrainian Institute for Agro-Ecology and Biotechnology. In addition to these specific interventions in the seed system, the liberalization of seed pricing, marketing, and trade implemented within the context of the Governments economics reform program, will establish the enabling policy environment to enhance the efficiency of the national seed system.

- **SECAL Linked to Agriculture Pre-Export Guarantee Facility**
  Loan: Preappraisal stage  
  Signed: Anticipated 1996  
  Task Manager: Mark Lundell

- **Agriculture I - Agribusiness Development**
  Loan: Preappraisal stage  
  Signed: Anticipated 1997  
  Task Manager: Iain Shuker

110
This project will include institutional development, extension, training and education activities. The component is designed to provide direct technical assistance to the restructuring of kolkhozes and agribusiness companies in the short run, and to improve the management capacity in the agribusiness sector in the longer run. It would also improve the quality of information available to traders and agricultural producers. Activities include:

**Agribusiness Education Program**

This program will improve the quality of agribusiness training at the Ukrainian National Agricultural University, focusing on an improvement of the quality of the undergraduate program on the Kiev campus, and an executive training program to provide short courses to farm and agribusiness managers through the University's network of satellite campuses. The program would support a program for training professors and graduate students in the US and Western Europe. These individuals would become the teaching staff of the Agribusiness Education Program at the University. In addition, there would be an exchange program for foreign professors to visit Ukraine for periods of three to six months to contribute to the upgrading of the teaching program. There would also be support for upgrading the computer training facilities and library at the University and satellite campuses.

**Agribusiness Centers**

The project would support the establishment of ten agribusiness centers in Ukraine to provide management support and training to newly privatized agribusiness companies and kolkhozes that are restructuring. The program would begin with intensive training for local staff of these centers, preparation of materials, and the identification of potential candidates for assistance. These agribusiness centers would then provide direct technical assistance to kolkhozes and agribusiness companies, organize workshops of interest to the agricultural community, facilitate meetings of interested investors, and provide training seminars.

**Agricultural Market Information System**

The project would provide support, in the form of equipment and training, for a low cost market information system to supply timely price information to agricultural sector marketing companies, producers, and the general public.

The project will potentially include an additional component which will assist the Agricultural Academy of Sciences. This program would be aimed at increasing the efficiency of the agricultural research system. Improving the ability of the Academy to supply research information to agriculture producers would also be supported. If this component is delayed, it will become part of the Agriculture II Project.

- **Agriculture II: Land Registration**
  
  Loan: Preappraisal stage
  
  Signed: Anticipated 1998
D. Agriculture Sector Work and Related Studies


- **Agriculture and Food Sector Review**. 1994. Formal sector report 11880. See also report 13720 (publication).

- **Ukraine - The Agriculture Sector in Transition**. Same as above. World Bank country study 13720. Avail: Bookstore.


E. Main Agricultural Institutions

- **Institute of Plant Breeding and Genetics**
  3 Ovidiopolska Road, Odessa 270036
  Viatcheslav M. Sokolov, Director
  Tel: 38 0482 65 61 87
  Fax: 38 0482 65 70 84

  Research areas: crop genetics and breeding.

- **The Yuriev V. Ya Institute of Plant Breeding**
  142, Moskovaja Av., Kharkiv 310044
  Leonid V. Bondarenko, Director
  Tel: 38 0572 92 21 63
  Fax: 38 0572 92 03 54

  Research areas: development of crop genetics, selection and technologies.

- **The Institute of Plant Protection**
  33, Vassylkivska Street, Kyiv, 252022
  Mychailo P. Lisovyj, Director
  Tel: 38 044 263 11 24
  Fax: 38044 263 21 85

  Research areas: development and application of plant protection technologies.

- **The Institute of Soil Science and Agrochemistry**
  4 Tchaikovsky Street, Kharkiv, 310024
  Boris S. Nosko, Director
  Tel: 38 0572 47 05 31
  Fax: 38 0572 47 85 63

  Research areas: soil protection and monitoring, soil fertility, soil conservation.
• The Institute for Sugarbeet Research
  Klinichna Street, 25, Kyiv, 252000
  Mykola V. Roik, Director
  Tel: 38 044 277 50 00

  Research areas: breeding and industrial technologies for sugarbeet production.

• The Remeslo V. M. Institute of Wheat
  p/o Centralne, Mironovsky reg., Kyivska obl, 256816
  Leonid O. Givotkov, Director
  Tel: 38 04742 7 41 35

  Research areas: breeding and technology of wheat production.

• The Institute of Fodder
  8-B Leninsky Komsomol Av., Vinnytza, 287100
  Anatoliy O. Babitch, Director
  Tel/Fax: 38 04322 6 41 16

  Research areas: breeding and technology of fodder production.
VI. GROUP III COUNTRY PROFILES

Azerbaijan

A. Background and Current Status of Agriculture Sector

Agriculture has traditionally been a key sector of Azerbaijan's economy. In 1990, the sector contributed 26-30 percent of GDP and 34-38 percent of total employment. Crop production makes up 60 percent of agricultural output. Of the total area cultivated, cereals cover the largest proportion (45 percent), followed by fodder crops, cotton, and grapes. Major crops include grain (mostly wheat), cotton, grapes, vegetables, fruit, and tobacco. Major livestock products include beef, mutton, and dairy products. Agriculture export earnings come mainly from the sale of cotton, wine, fruit, and vegetables. The country usually imports grain, flour, and meat to supplement domestic production.

In the four years since independence, the agriculture sector in Azerbaijan has exhibited declining output and productivity of critical proportions. The sector, once a major contributor to employment, GDP, and trade, experienced a decline in output of 12, 25, and 13 percent in the years 1992, 1993, and 1994, respectively. Yield dropped by 30 percent in 1994 for grain, cotton, grapes, and tobacco. Production of grapes, cotton, tobacco, and vegetables experienced record declines of 50-70 percent in 1994. Agricultural contributions to trade dropped from 30 percent of total exports to 10 percent in 1994, with trade in certain commodities such as wine virtually disappearing. On the domestic front, the contraction has left the country dependent on wheat and flour food aid in order to feed itself. For most crops, the major cause is declining yields which result from lack of inputs and equipment shortage. Deterioration of irrigation infrastructure also decreases yields.

In the livestock sector, drastic changes have occurred since the 1980's. First, economy-wide, livestock populations have decreased by 25 percent for cattle, 85 percent for pigs, 25 percent for sheep and goats, and 67 percent for chickens. Next, where state and collective farms once represented the major ownership and production unit, privately held livestock now account for about 80 percent of all meat and milk, 65 percent of wool, and 90 percent of all eggs. The principal factors affecting productivity are poor nutrition, disease, and parasites. Availability of feed and fodder are insufficient to meet demand.

Azerbaijan faces formidable challenges in reforms related to 1) pricing, government procurement, and trade; 2) restructuring and privatization of state enterprises in marketing, processing, and input supply; and 3) land reform and privatization of state and collective farms. For example, the sector study notes that because the ministry still owns and oversees the operation of many farms and agroenterprises, it has considerable interest in preserving existing structures and maintaining status quo. A thorough reorganization, including privatization of all state enterprises under the Ministry's control, is required to neutralize this conflict of interest. Once new policies and structural reforms are set into effect, the should Ministry of Agriculture turn its efforts toward restructuring its institutions and services to meet the needs of a market-based economy.

Despite these challenges, the 1995 World Bank sector review concludes that given the availability of water resources, developed irrigated areas, and stable agro-ecological systems,
Azerbaijan has considerable production potential in many agricultural commodities, especially cotton, grain, vegetables, fruits and silk production.

Source: Agriculture Sector Review, 1995.

B. Agricultural Research and Extension

The World Bank has not completed any projects in Azerbaijan. The World Bank’s experience with agriculture in Azerbaijan is comprised of the analysis completed for the country assistance strategy and the agriculture sector review (Chapter 4 examines government services for agriculture), as well as analysis completed for the upcoming Irrigation and Drainage Infrastructure Project and Farm Privatization Pilot Project.

The main problems facing the agricultural sector have arisen from: 1) legacies of past policies; 2) transition from a planned agricultural sector to a market economy; and 3) border uncertainties. The centrally planned agricultural system has created an unfavorable framework for agricultural production, and many command-oriented government institutions and agencies continue to exist. The growing fiscal problems of the Government has also resulted in a lack of maintenance of the supporting agricultural infrastructure, leading to severe deterioration of facilities.

Further, Government pricing and public procurement policies during the transition period (late 1991 and 1994) imposed a significant tax on the agricultural sector and resulted in a distorted relative price structure. The state order system of compulsory deliveries to the state at low prices relative to world market levels coupled with removal of subsidies of most inputs imposed a cost-price squeeze on the sector. The overall decline in the macroeconomic situation, distorted input-output prices, and trade monopolies contributed to the weak financial conditions of existing farms.

Severance of transport links with Russia in the northern border created marketing problems, particularly, in export of agricultural products. Also, Azerbaijan has been engaged in an armed conflict over the Nagorno-Karabakh region since 1989. Open hostilities have come to an end and progress has been made in negotiation for a lasting resolution. However, the country now faces a large economic burden as a result of the internally displaced and refugee population of about one million (about 13 percent of the total population).

The GOA has placed high priority on stimulating growth in the agriculture sector. The following are the major initiatives currently being undertaken: (i) assuring security of land tenure and land markets; (ii) price liberalization; trade liberalization and anti-monopoly policies; and (iv) financing the agricultural sector.

World Bank initiatives in the agricultural sector are aimed at assisting the GOA to accelerate the pace of reform and to develop a market-oriented agricultural sector. The previous rehabilitation loan and the forthcoming structural adjustment credit will continue to address broad issues relating to agriculture incentives and ownership. In addition to this proposed farm privatization pilot project, other Bank operations would focus on rehabilitation.
of critical infrastructure, promoting sustainable development of mountainous regions, farm restructuring, and provision of agriculture services.

C. Relevant World Bank Agriculture Projects

World Bank initiatives in the agricultural sector are aimed at assisting the GOA to accelerate the pace of reform and to develop a market-oriented agricultural sector. The previous rehabilitation loan and the forthcoming structural adjustment credit will continue to address broad issues relating to agriculture incentives and ownership. In addition to this proposed farm privatization pilot project, other Bank operations would focus on:

- **Farm Restructuring**
  
  **Loan:** In Preparation
  
  **Signed:** Anticipated FY96
  
  **Source:** SAR

Until 1991, the farming structure in Azerbaijan consisted of 983 collective farms and 820 state farms, cultivating a total of 1.46 million hectares. The state farms were fully owned by the state and the management and workers are employees of the state. Collective farms were owned by their workers who are responsible for electing their managers. The main agricultural production systems are the following: (i) cotton - grain - livestock; (ii) fruit - vegetable - grain - livestock; or (iii) tea - tobacco - vegetable - livestock.

While improvements are noticeable both in the quantities and qualities of vegetables, fruits, and livestock products, farms are unable to exploit the full potential of the available resources, for several reasons. A majority of the farm members have not yet been able to claim individual ownership; to voluntarily determine how to use their newly acquired land and non-land assets; and to reconstitute themselves as individual farms, joint stock companies, holding companies, partnerships, and lease holders or other suitable forms.

The Government intends to privatize 70 percent of the farms and agribusinesses as soon as possible. However, the progress to create the necessary conditions and implementation has been slow due to lack of resources and know-how. In order to accelerate this process, to support alternative transition mechanisms and to determine the levels of resources needed for farm restructuring, a pilot project has been formulated. Five representative farms have been chosen in five raions (Barda, Lenkaran, Selyan, Udjar, and Xachmas). The main criteria used by the Government in selecting these farms are: (i) they are representative of major agro-ecological systems and have different cropping patterns; (ii) the farm sizes are typical for the region concerned; (iii) they include different socioeconomic groups; (iv) the new owner’s wish to follow different methods of farm restructuring; and (v) farm and raion administration are committed to privatize and restructure the farm operations. Main characteristics of the pilot farms are described below:

---

6 A raion, also spelled rayon, is a regional division of state roughly equivalent in area and level of government to a U.S. county.
Farm Resources

All farms have good natural resources, with adequate water supplies to ensure timely irrigation and total area ranging from 715 ha in Lenkaran to 5400 ha in Xachmas consisting of medium and heavy soils. The farms are serviced by public electricity and water services. The labor permanent force on each of the farms range between 300 and 600 people. There are also significant numbers of pensioners and dependents reliant on each farm.

Farm Infrastructure

The irrigation and drainage facilities on three farms (Selyan, Udiyar, and Barda) are open canal systems, while the other two (Xachmas and Lenkeran) have partially piped systems. Each farm has a range of production and administrative buildings and a farm machinery park. The past legacy of centralized planning combined with severe shortage of budgetary resources have resulted in dilapidated infrastructure, non-functioning pipelines and blocked drainage systems. Inadequate maintenance, lack of spare parts and centralized management have reduced the productive use of farm machinery, affecting standards of soil cultivation and efficiency.

Private Allotments of Land

Each farm member retained their traditional private plot, usually surrounding the house. The area of plots varies from 600 sqm in the densely populated raion of Lankaran to about 1200 sqm in the less densely populated raion of Udiyar. The plots are used for producing a range of crops (especially vegetables and fruit), raising small livestock, compost, and forage. Most of these plots are meticulously maintained and quality surpasses that on the collectively managed farms.

The main problems confronting the farms in operation as independent units are: deteriorated on-farm and inter-farm infrastructure; obsolete farm machinery; lack of credit and input availability; and deterioration of social services previously provided by state and collective farms.

The objective of the proposed farm privatization project is to assist the Government to accelerate the farm privatization program of selected state and collective farms in a systematic manner by: (i) creating new systems for important support services for land registration, farm information and advisory, credit, and critical off-farm and on-farm infrastructure necessary to sustain privatized agriculture at the raion and farm level which can become the basis for a national system; (ii) building linkages between key institutions in support of land privatization and farm restructuring; and (iii) restructuring and post privatization assistance for the new farm units.

The project activities are specific to the agro-ecological region and farm-oriented and are designed to be replicable. At the regional level, the project would support the land registration system, farm support services, credit delivery mechanisms, inter-farm irrigation and drainage works, and reorientation of the regional department of agriculture functions to service privatized farms. At the farm level, the project would develop a business-oriented outlook in the privatized farms in a project areas by providing credit support to those activities.
which are financially and economically viable and would initiate new concepts of water management, such as formation of water user’s associations.

- **Irrigation Rehabilitation**
  
  Loan: In preparation  
  Signed: Anticipated FY96  
  Source: Project Brief

Agriculture production in Azerbaijan is dependent on irrigation, which is in urgent need for rehabilitation and improvement. The low rainfall of 300 to 350 mm in most parts of the country makes irrigation imperative. Presently, about 1.45 million hectares (almost 90 percent of the total cropped area) are equipped with some form of irrigation. The major irrigated crops include grain (about 500,000 ha), fruit and vegetable (360,000 ha), cotton (270,000 ha) and fodder (270,000 ha). Approximately 60 percent of the irrigated area is served by gravity intake from rivers and reservoirs and 30 percent from pumping from surface water sources, and the remainder comes from wells or natural springs. The most commonly used application method are flooding, furrow irrigation, and border strips. Most of the irrigation systems lack maintenance. Water conveyance and seepage loss are increasing at a rapid rate and in many places canals are silted and choked. A lack of drainage also results in water logging and increase in soil salinity.

The proposed project, the first in a series of investments for improving the country’s public irrigation and drainage infrastructure, would assist the GOA to: (a) increase agricultural production and incomes on the newly emerging private farms; (b) promote irrigation water savings; (c) improve management of I&D water to prevent a further deterioration of the environment; and also remedy some environmental damage; (d) build capacity of irrigation institutions for implementing the investment plan at the national and grassroots (oblast) level; (e) enhance environmental management capacity; (f) introduce higher technical standards and new technologies/procedures in planning, design, construction, environmental protection and procurement; (g) upgrade major I&D systems operation and management; and (h) improve arrangements for recovery of operation and management costs and sharing a reasonable proportion of investments.

**D. Agriculture Sector Work And Other Relevant Studies**


This report focuses on a number of critical reforms that must be considered to address the crisis in agriculture. The first set of reforms relate to government policies on prices, government procurement, and trade. The second set concerns the restructuring and privatization of state enterprises in marketing, processing, and input supply and land reform and privatization of state and collective farms. The third set relates to the realignment of the state’s role in the agricultural sector. The focus of reform in all these areas is to restore farm profitability by ending the tax on the sector through the Government’s pricing and marketing policy and by creating competitive agricultural markets.
With respect to the realignment of the state’s role in the agriculture sector, the final element in the Government’s reform program for the sector is the restructuring of government institutions and services to meet the needs of a market-based agricultural economy. This report makes several recommendations regarding this effort. First, a review of the functions of the Ministry of Agriculture and associated institutions should be the first step. The state enterprises which perform crop processing, input supply, and distribution of farm equipment should be privatized under the national privatization program and the structures for Ministry control and management of the enterprises should be disbanded. The Ministry should reorient its focus toward: (a) policy analysis; (b) support for farm restructuring; (c) research, extension, and training; and (d) the provision of technical services.

With regard to research, efforts should be consolidated nationwide. The current proposal to eliminate the commodity-specific focus of a research establishment and to create multi-purpose research facilities at the raion level is impractical given the limited financial resources available to support research. A focused commodity approach should be pursued. The Government should also improve linkages between the researchers and producers to promote client-directed research activities. Establishment of an agriculture information system to serve a larger number of smaller private farms should also be considered. Finally, opportunities to consolidate or privatize plant protection, meat and milk inspection, and disease control should be considered where ever possible.

- **Farm Privatization Pilot Project (FPPP).** Staff Appraisal Report, March 1996.

### E. Main Agricultural Institutions

- **Ministry of Agriculture**  
  Sh. Gurbanov Street  
  4 370079 Baku, Azerbaijan  
  Mustafayev Khalil Mammad  
  Tel: (994-12) 94-33-81  
  Fax: (994-12) 94-53-90

- **SIA “Elit’ (Institute of Agriculture)**  
  370098 Baku Sov. n2  
  Musayev Asad Jannat, Director  
  Tel: 94-35-98

- **Cotton Growing Institute**  
  374788 Ghanja Inst. Settlement  
  Mamedov Fahr addin Halil, Director  
  Tel: 5-56-70
- **SIA (Institute for Vegetables and Seeds)**  
  370987 Baku sov. n2  
  Mamedov Fuad Husein, Director  
  Tel: 24-10-64

- **Institute for Plant Protection**  
  374700 Ghanja Aran st.57  
  Mamedova Siddiga Rza, Director  
  Tel: 3-47-94
Agriculture in Kazakhstan has traditionally been a major contributor to the economy. In 1993 it constituted about 31.4 percent of net material product (NMP), compared to an average of about 35 percent for the period between 1985 and 1990. In 1993, the agriculture sector accounted for 24.4 percent of total employment. Livestock accounts for between 50 and 60 percent of total output, with beef, mutton, dairy products and wool being the major products. The crop sector is dominated by grain, mostly wheat which accounts for 66 percent of total crop output. Other important crops are fodder, potatoes, and vegetables. Agriculture continues to be a major source of export earnings for Kazakhstan, constituting about ten percent of total export revenues in 1993. Major agricultural exports are grain, meat, and wool.

About 75 percent of Kazakhstan’s total land is used for cropping or grazing. This area can be divided into three general agroecological regions. The south is characterized by irrigated agriculture; the north is well-suited to rainfed crops and livestock production; and the central region which is semi-arid steppe suitable mainly for extensive grazing. Kazakhstan does not have particularly good soil resources for agriculture. Only about 7 percent of the area has fertile soils with good water retention. The climate is generally dry; however, it is also given to violent swings between drought, thunderstorms, and hail. This variability from year to year makes it difficult to maintain steady growth in agricultural output.

Total rainfed crop area is about 32 million hectares. 65 percent of this is sown to grain crops, 32 percent to fodder, and the balance to oilseed, sugarbeets, and other crops. Irrigated agricultural areas amount to 2.3 million hectares. Cereal production in this area is largely inefficient; however, continued pressure on farm managers to meet ‘state need’ quotas perpetuates this cropping pattern. Additionally, cereal production practices have contributed to low yields and soil degradation. The use of land for cereal production leaves the soil bare through the winter exposing soils to erosion from wind and water. About 1.2 million of this area seems to perform satisfactorily, while about 970,000 hectares are in need of extensive repair and rehabilitation of irrigation infrastructure. Another 110,000 hectares has been abandoned because of salinity problems. Major crops under irrigation include cereal and fodder. Irrigated agriculture has created serious environmental problems due to reliance on surface water. Excessive diversion of surface water has reduced the Aral Sea to dangerously low levels.

The livestock sector is experiencing falling production levels for all commodities. Meat production dropped by 15 percent between 1991 and 1993. Milk production fell by 4 percent and wool production by 9 percent over the same period. Reduced domestic demand for livestock products, resulting from declining real wages and higher prices, is one factor causing decline. Also, wool and meat traditionally exported to the Soviet Union have significantly declined.

Most production takes place on large state and collective farms or their recently privatized successors. State farms, numbering 2,055, are particularly large, averaging about 80,000 hectares in 1992. Nearly one-third of all state farms specialize in grain production. Another 600 farms are engaged in extensive sheep raising and 380 are intensive dairy and beef
operations. The remainder produce swine, poultry, cotton, sugarbeet, and vegetables and fruits.

The farm sector is currently undergoing privatization. Nearly 500 farms have been privatized. In almost every instance, state ownership passed to workers and managers with the physical infrastructure, management, organizational structures, and trading relations remaining intact. Some individuals, however, have established private farms instead. By September of 1994, about 20,000 individual farms existed. The financial position of farm enterprises deteriorated markedly in 1993, with a sharp increase in the number of farms reporting losses.

B. Agricultural Research and Extension

World Bank lending commenced in Kazakhstan in 1994. Currently, there is one irrigation project being appraised which includes institution-building and support services. In addition to this, the World Bank has completed an agriculture sector study for the country.

According to the sector study, the agriculture sector remains in a crisis of mounting losses and declining output and productivity. The major factor affecting the sector is the incomplete reform agenda. Agriculture, like other sectors of the economy, is caught in the transition between a command and market economy, where old structures cannot function efficiently but new structures have not arisen to assume their roles. Yields are low because farmers are often unable to assemble a complete package of inputs such as seed, fertilizer, agrochemicals, fuel, and spare parts for machinery. Poor producer incentives, continued state involvement in production and marketing, and only cosmetic changes in farm ownership and organization perpetuate old farm management practices and stifle incentives to innovate. Rapid pricing, marketing, and land reform are key to accelerating the transition and improving performance in the sector.

The sector study states that in 1994, the agricultural sector represents both challenges and promise for a productive future in Kazakhstan. The country has abundant and diverse agricultural resources and a well-trained agricultural labor force. The sector will remain a major supplier of raw materials and an important source of export revenues for the economy. Moreover, a recovery in the agricultural sector from its current state to sustained growth would stimulate income growth and future demand for farm services and industrial products. The challenge, however, lies in the difficult task of transforming the sector to a market-based system in the face of continuing economic instability and a decline in the region. Reforms must be implemented in a difficult economic environment marked by shrinking incomes and decreasing demand, disruptions in trading relations, depressed markets for agricultural exports, and shortages of key agricultural inputs. Moreover, the government has had to contend with an imperfect consensus on the reform process and a lack of information and experience in designing and implementing its reform program. The result is reforms that often run counter to the Government's stated objectives and serve to perpetuate existing structures and inefficiencies.

The sector study gives recommendations for the agriculture knowledge system in Kazakhstan. Like other sectors and the macroeconomy as a whole, the priority recommendations are related to structure and organization. The system is currently in danger
of collapse due to unsustainable size and limited financial resources. Given that the agriculture sector has yet to evolve towards more efficient activities or areas of comparable advantage, Kazakhstan may require assistance in identifying priorities for agricultural research and extension, as a first step. Additional assistance may be required to supply needed expertise in the business and commercial aspects of farming. Of course, many structural and policy changes are prerequisite to this: as of yet, disincentives to private farming make the economic climate too difficult to promote the emergence of a market-based, privately owned agriculture sector.

C. Relevant World Bank Agriculture Projects

- **Irrigation and Drainage Improvement Project**
  
  **Loan:** Under Negotiation  
  **Signed:** Anticipated 1996  
  **Source:** SAR 15379-KZ

  This project includes the following components: (a) a lending component for rehabilitation of irrigation and drainage systems; (b) a lending component to support development of mechanisms for improved delivery of basic information, training, and research services to the farm sector; (c) a lending component to support the establishment and operation of a project implementation unit to strengthen the environmental capacity of the MOA, MOEB, and other concerned agencies, and to test the feasibility for operation and maintenance of inter-farm irrigation works; and (d) a lending component to support the establishment of a follow-up irrigation rehabilitation project for possible future funding by the Bank.

D. Agriculture Sector Work and Related Studies

- **Agriculture Sector Review.** 1995. Sector report 13334.

  This report presents an overview of Kazakhstan's agricultural sector and discusses pricing and subsidy policy, marketing and distribution restructuring, land reform and farm restructuring, and external assistance.

  The study gives a brief description of the research and extension system in Kazakhstan. The diverse system of 27 research institutes and 21 experiment stations, is the responsibility of the Kazakh Academy of Agricultural Sciences. The system includes regional and commodity specific centers as well as institutes undertaking research in mechanization, economics, labor and ecology. The research system has traditionally employed a well-trained and highly skilled staff of personnel. Budget cuts and erosion of salaries have recently caused many staff to leave. As a result, research projects and results have declined in number. The Western-style extension service does not exist in Kazakhstan. Nevertheless, there is a system by which farm managers, farm agronomists, and livestock specialists receive information on new varieties and farming techniques. The system uses demonstration sites and refresher courses to disseminate new information; however, this system inadequately fulfills the new requirements of the agriculture sector. Basic agricultural and livestock education and training is the responsibility of the Ministry of Agriculture, which maintains a network of training institutes.
Given the transition of the agricultural sector to a market oriented system and the fact that budget resources will continue to be tight, Kazakhstan should review its research priorities along with the organization and structure of the research system. While these research and education systems may have been adequate a state and collective farm network, they are not suitable for the private sector farms. The Government should review the current system with a view to developing an extension and farmer training system, especially for the promotion of environmentally sound farming practices. Linkages between research, extension, and training should be strengthened, and in all cases, links between this system and the producer should be emphasized. This will be an important strategy for enhancing productivity and developing agriculture practices which are environmentally sustainable.
Kyrgyz Republic

A. Background and Current Status Of Agriculture Sector

The Kyrgyz Republic is a mountainous country at the northern extremity of the Himalayan range. The population is predominantly rural. Kyrgyz agriculture is diverse, with intensive irrigated cropping in the low and level lands and large areas of extensive grazing in the mountains. Primary agriculture employs approximately one-third of the labor force, and generates about one-third of GDP. Another 10 percent of the labor force is employed in industries processing food, fiber, and skins. Wool and woolen products, mutton, beef, fruit and vegetables, honey, tobacco, cotton, and silk are among the major products.

The principal crops in the Kyrgyz Republic include wheat, barley, maize, alfalfa, sugarbeet, cotton, and tobacco. 90 percent of the wheat grown in the Republic is winter wheat. 75 percent of this is irrigated. Losses per hectare due to late harvesting are estimated at approximately 700 kg/ha. Yield levels for wheat match international levels. 85 percent of the barley produced is spring barley, and about 60 percent is unirrigated. All barley is grown for livestock feed. Maize is grown for grain and silage uses. Sugarbeet production fell drastically in the mid 1980s, due to declining yields (10t/ha). Resumption of sugarbeet cropping in recent years has yielded a long-term annual average on some farms of 25 t/ha, significantly below the world average of more than 30 t/ha.

The Kyrgyz Republic, with a total pasture of 8.8 million ha, inherited a large livestock sector dependent in part on imported and underpriced concentrate feed. Productivity of the livestock sector declined in 1993, partly in response to inappropriate pricing and marketing policies, and partly because of the halting implementation of land reform and farm restructuring. Livestock health and nutrition decreased. Sheep and cows were transferred from collective and state farms to the household sector without an increase in household lands or any specification of grazing rights on the land. Soil erosion and severe degradation of pasture land and consequent problems of soil erosion are the consequences of excessive build-up of livestock numbers during the Soviet era. A decline in livestock populations is currently occurring.


B. Agricultural Research and Extension

Within the Central Asian Countries, the Kyrgyz Republic is very advanced with respect to structural (especially, land) and policy reform. Because of its commitment to reform, the Republic is currently the recipient of technical assistance from many international organizations, such as the EC, USAID, the Asian Development Bank, and the Governments of Germany and Switzerland, and may be receiving more assistance than it can absorb (Cole, personal communication). The international organizations which have been involved in research in the Kyrgyz Republic are the FAO and ISNAR (Cole, personal communication).

The Kyrgyz Republic does not have an institution which provides services corresponding to the Western extension services (Cole, personal communication).
agriculture knowledge system in the Kyrgyz Republic is comprised of five institutes which conduct agricultural research. Two of these, the Institute of Crop Farming and the Institute of Pastures and Forage, are under the MOA. The remaining three are the Institutes of Soil and Land Use, the Institute of Agricultural Chemistry, and the Institute of Biochemistry and Physiology. In theory, the MOA acts as a feedback mechanism for the two institutes under its authority: it relays research findings to the chairmen of the state and collective farms, raion agronomists, and others. These individuals then disseminate the information in their raion. The sector study states that the agricultural research and extension system in the Republic is largely theoretical because little research is currently underway. The system has lost many valuable staff who have left for financial reasons. Additionally, remaining staff complain of disillusionment. Staff at the Institute of Farming, for example, know that their research on fertilizers is not followed by farmers because the cost of fertilizer is so high. In early 1993, a State Committee on the Coordination of Research in Science and Technology was formed. A primary objective of the committee should be to focus research on priority tasks and avoid duplication within the system. Recently, the Government took steps toward integrating the publicly-supplied agriculture support services in a decree which folds research and education institutes into one system.

C. Relevant World Bank Agriculture Projects

- **Agriculture Support Services Project**
  
  Loan: Preparation
  
  Signed: Anticipated 1997
  
  Sources: Draft working paper, EPS paper

  This project is in preparation. The FAO/ISNAR are currently in the field working on the preparation. The project will be cofunded by the Bank and others.

- **Sheep Development Project**
  
  Loan: Initiating
  
  Signed: Anticipated 1996
  
  Sources: Staff appraisal report 14701, and Memorandum of the President P6648

  This project has been negotiated as of March 1996. It is currently not signed.

D. Agriculture Sector Work and Related Studies

- **Agriculture sector review.** Sector report 12989.

  This two-volume report offers recommendations on a number of areas, including agricultural research and extension, and marketing and other services.
Research

Volume II gives a short (1 page) overview of the agricultural research and extension system in the Kyrgyz Republic, describing the five institutes which conduct agricultural research and the mechanism for information dissemination, which is still highly centralized. Main areas of research are also identified. The report states that at present, very little agricultural research is being carried out and that many qualified and experienced researchers have left the institutions for financial reasons. The research system is weak due to uncertain funding and organizational status of institutions. The conclusion of this report for the research system can be summarized that public sector should continue to support basic agricultural research, while applied research activities can be assumed by the private sector.

Marketing and Distribution

Volume I identifies six state-owned or controlled organizations that perform marketing of agricultural products and distribution of inputs in the country. The report notes that few state organizations or ministries provide support to the private sector, and that support is urgently needed. Private enterprises require training in accounting, tax preparation, business start-up and management, and domestic and international marketing. The report suggests that these services should be provided publicly until the private sector begins to assume these functions. Much of the needed expertise exists in the Kyrgyz Republic, but is concentrated in the traditional large marketing firms which are now in the process of privatization. These firms should be organized to create units which supply marketing services on a commercial basis to other private sector clients in addition to the large production unit it traditionally served.

Extension and Training

The report links successful transformation of the agriculture sector to privatization and successful entry of smallholder enterprises. At present, many private smallholders receive no formal advice. Small holders need assistance in crop production, livestock production, and farm management. Some overseas training of technical staff in the agricultural support services will be beneficial. In a market economy, these services are provided by the private sector and by public extension services. Because neither the public or the private sector is currently filling this role, the reports states that the organization, mandate, and funding of extension services should be reviewed.

- **Agricultural Privatization and Enterprise Adjustment Credit Project.** President’s report P6583. No research or extension components.
- **Sheep and Wool Improvement Project.** Staff appraisal report 14701. Memorandum of the President P6648. Barnabas Zegge, X35515.
Tajikistan

A. Background and Current Status of Agriculture Sector

No crop information is available.

B. Agricultural Research and Extension

Very little information exists within the World Bank on Tajikistan. The World Bank experience in Tajikistan has only just commenced. The World Bank has completed a Country Economic Memorandum and an informal Agriculture Sector Note. No formal agriculture sector review or strategy has been completed. The World Bank has been discussing two projects for the country, the Rehabilitation Credit Project, which is in appraisal, and the Farm Restructuring Project, which has just been requested.

C. Relevant World Bank Agriculture Projects

As of June 15, 1995, World Bank lending to Tajikistan has not commenced. The following project requests are currently in preliminary investigation or appraisal.

- Rehabilitation Credit. 1996. Appraisal.

D. Agriculture Sector Work and Related Studies

Turkmenistan

A. Background and Current Status of Agriculture Sector

No crop information is available.

B. Agricultural Research and Extension

World Bank experience in Turkmenistan is very limited. Currently, Turkmenistan has one ongoing project, the Technical Assistance Project, which assists the Government in designing and implementing its reform policies. This project has no agricultural components. The World Bank is currently discussing assistance for Farm Restructuring with the Government. An irrigation and drainage project is anticipated to follow. No information is available yet for these projects. The World Bank currently has not completed an agricultural sector review or strategy.

C. Relevant World Bank Agriculture Projects

- **Technical Assistance Project.**
  
  Loan: 37910
  Signed: 1995
  Sources: Staff appraisal report 12959, P6335

  The Institutional Building/Technical Assistance Project will: (a) provide assistance in the design and development of the Government’s reform policies and programs; and (b) help build the institutional capacity and skill base to carry out these reforms. The Loan will finance the following components: (a) privatization and private sector development; (b) financial sector modernization; (c) social sector financing of a living standards measurement survey and development of policies for the design of basic pension systems to cover private sector employees; (d) institutional support and development; and (e) energy sector to include: (1) strengthening joint venture administration in the Ministry of oil and gas; and (2) providing training for the oil and gas subsector in technical and management skills.

- **Farm Privatization Project**
  Loan: Pipeline

- **Irrigation and Drainage Project**
  Loan: Pipeline

D. Agriculture Sector Work and Related Studies


- **Agriculture Sector Review.** Initiating.
Uzbekistan

A. Background and Current Status of Agriculture Sector

Uzbekistan is a major agricultural producer. Despite its meager resources, agriculture has played a dominant role in the economy due to massive irrigation financed by the former Soviet Union to increase cotton production. Approximately 40 percent of the 1992 net material product (NMP) in Uzbekistan was generated in agriculture. It is the world's fourth largest producer of cotton and third largest exporter. Cotton accounts for 40 percent of the gross value of agricultural production in the country. Uzbekistan is also the largest producer of fruits and vegetables within the FSU. Land used for agriculture comprises over 30 million hectares, 67 percent of which is used for livestock production. The rapid increase in agricultural production in recent years came from an expansion in irrigated areas, which led to reduction of the Aral sea and serious environmental problems. At present, the irrigated area is about 4.23 million hectares, about half of which is irrigated by pumping systems.

Uzbekistan's vast deserts are of little productive use. Only 10 percent of its land is cultivated, and 95 percent of this is irrigated. Despite this, agriculture plays a dominant role in the economy. Potential gains in productivity are large, since yields are low and both input use and spoilage rates are high. Realizing these gains will depend on establishing incentives for generating and adopting new technologies in line with Uzbekistan's underlying comparative advantage. Important policy and institutional changes will be required, both in the transition from a planned economy to a market-based economy. In terms of production, cotton is by far the largest crop, followed by grain, vegetables, and fruit. Fruit crops have been the highest yielding crops, followed by grain and cotton.


B. Agricultural Research and Extension

At the current time, little information is available on Uzbekistan. There is an agriculture note under preparation, but as of yet, no sector study has been completed. There are three ongoing projects. The Cotton Improvement Project which supports extension activities for development of the subsector and introduction of technology to avert adverse environmental impacts of irrigation and pest control practices. Specifically, these extension activities include equipment and technical assistance. The project also supports the development of marketing capabilities of Uzbek cotton producers to assist them in meeting international standards.

There are four projects under consideration for the agriculture sector. At least one, the Agriculture Support Services Project, would have agricultural research and extension components. At this time, no information is available on this project.
C. Relevant World Bank Agriculture Projects

- **Cotton Subsector Improvement Project**
  
  Loan: 38940  
  Signed: FY95  
  Sources: Memorandum of the President P6509, and staff appraisal report 13805

  This project supports the development/introduction of technology to help avert negative impacts on the environment and productivity of past irrigation and pest control practices. The project supports five components: 1) the seed industry component; 2) the cotton marketing component supports the introduction of cotton grading technology to determine the characteristics of Uzbek cotton in conformity with internationally recognized standards; 3) the integrated pest management component provides for equipment and technical assistance for the development of insect rearing and dispersal technologies that will allow the country to economically broaden biological control of cotton pests; 4) the irrigation component provides for equipment and training to introduce irrigation scheduling technology and demonstrate effective ways to reduce water use in cotton production, while improving land productivity and avoiding water based damage to the environment; and 5) the project management and program design component.

- **Farm Restructuring**

  Loan: Proposed  
  Signed: 1997

- **Agriculture Support Services**

  Loan: Proposed  
  Signed: 1998  
  Task Manager: Mr. Gafsi

  This project will support research and extension. It is not yet in preparation. No documents are available.

- **Export Promotion**

  Loan: Proposed  
  Signed: 1998

D. Agriculture Sector Work and Related Studies


This report is based on studies conducted in Brazil, China, Egypt, India, Mali, Mexico, Pakistan, Tanzania, and Uzbekistan which systematically address the global problems facing cotton production and the significance of government policies in promoting efficiency and effectiveness in the cotton sub-sector. The most common technical weaknesses revealed in the studies were in seed production and the development of varieties with the fiber attributes required with by modern, high speed rotor and ring spinning mills, combined with high yield potential and ginning outturn and resistance to adversities which differ in different countries. Also, rising costs of inputs, in some cases coupled with import duties on agrochemicals, without a commensurate increase in price has reduced returns on cotton. The use of local, multi-disciplinary teams of consultants, some of whom are directly involved with policy making and cotton research, has been an important feature of the study. This report represents the culmination of this study, incorporating the findings of the country study teams, and the essentials of the discussion and final conclusions of an international workshop at which all study teams were represented. World Bank technical paper.
VII. GROUP IV COUNTRY PROFILES

Russian Federation

A. Background and Current Status of Agriculture Sector

Of the approximate 222 million hectares of land devoted to agriculture in Russia, less than 60 percent are considered arable. Of this, most of the area is subjected to at least one major constraint to yield - inadequate rainfall, excessive salinity or moisture, or difficult terrain. Only about 2 million ha of Russia's black soils have adequate moisture and favorable growing conditions.

Agriculture's total contribution to Russia's economy in 1990 was 17 percent. The sector can be divided into livestock, grain, and nongrain crops. Traditionally, large consumer subsidies have bolstered per capita food consumption, especially in livestock products. From 1992 to 1995, production in the livestock subsector, comprised of meat, milk, and egg decreased annually. Livestock inventories have similarly declined. Yields of crops and livestock are significantly below those in US areas with comparable climates.

Agricultural production has been heavily oriented towards livestock production. However, with land, credit, and market reforms, commodity orientation is slowly moving toward an emphasis on food, forage and other crops. In the livestock sector, milk accounts for 33 percent of livestock production, beef accounts for 27 percent, pork and poultry each contribute 16 percent, and other livestock including sheep and goats contribute 8 percent.

The most important farm enterprise is grain production, which accounts for 54 percent of arable land and 40 percent of crop production. Most grain is used for livestock feed, and annual imports average 20 million tons per year. Total supply of grain in Russia has decreased from 110,196,000 tons in 1991-92 to 71,575,000 tons in 1995-96. This decline is due to a decrease both in production (from 85,581,000 tons to 68,150,000 tons) and imports (25,750,000 tons to 3,925,000 tons) of grain. Production in the livestock subsector, comprised of meat, milk, and egg, has also decreased annually from 1992 to 1995. Livestock inventories have similarly declined.

The prospects for agricultural production are largely dependent on the Government's ability to enhance economic incentives, promote competition, reduce its intervention through directives, and implement agricultural reforms. Significant progress has been made in the privatization of state enterprises in 1993 and 1994. By the end of 1993, about 7000 medium and large enterprises, and 60 to 70 thousand small enterprises were privatized. So far, however, remaining large state and collective farms continue to rely on large subsidies and a high level of Government intervention. The government decrees and agricultural policies pursued since January 1992 indicate significant reduction in Federal Government intervention at all stages of the agricultural production, distribution, marketing, and pricing. However, there exists a wide variation in policies and reform initiatives being pursued by different oblast governments. Building an appropriate institutional foundation for the implementation of agricultural reforms is, therefore, very critical for economic transformation.
There is consensus in World Bank reports that investment and improved performance of the agricultural sector, which accounts for about 25 percent of the net material product (NMP) and employment, will be the most important elements in stabilizing the Russian economy and accelerating the ongoing structural transformation. Despite the sector's potential for higher efficiency and growth, overall agricultural production and distribution remain inefficient. The main reasons for relatively poor agricultural, especially livestock, production performance are:

- Overall deterioration in the macroeconomic environment.
- Lack of appropriate incentives in pricing, terms of trade, and farm structure.
- Disruptions in trade and marketing due to breakdown of traditional linkages in the former USSR and Eastern Europe.
- Inefficiencies, waste, and reduced incentives due to continued dependence on state monopolies for production, distribution, and marketing of agricultural inputs and outputs.
- Reduced financial resources: reduction in available credit and subsidies for production.
- Weak linkages between research and application.

Most international donors and financial agencies have supported a patchwork of small-scale farm privatization and extension projects. Little effort has been expended on transforming Russia's agricultural research or higher education system. Assistance needs to be focused into two parallel efforts: stabilizing and protecting targeted agricultural assets and developing and piloting models of institutional change and human capital.


B. Agricultural Research and Extension

Since the early 1990s, the World Bank has become increasingly involved in agricultural research and extension in Russia. Relative to other countries in the FSU, there has been much recent analysis of the agriculture knowledge system in Russia. The second effort is entitled Russian Federation - Agricultural Research, Higher Education, and Extension Subsectoral Analysis and Project Identification, (Srivastava, et al, 1994). An additional analysis is currently under preparation. Finally, the staff appraisal report for the ARIS project also presents a significant examination agriculture support needs in Russia.

From these analyses, it becomes evident that because of Russia's size, varied agroclimatic regions, and unique macroeconomics, policy, and structural characteristics, the country's circumstances are unlike those in the FSU and Eastern European countries which make up Groups I, II, and III. Like the Group II and III countries, the Russian Federation has
a complicated set of national policies and structural characteristics which remain from the Soviet era. Unlike the Group II and III countries, these policies govern regions much more vast and varied. Further, even where federal policy reforms have been implemented, inappropriate policies and structures are perpetuated at the oblast level, and tend to vary by region. Further, regions within Russia have varying agricultural potentials. Some regions have excellent agricultural climates and resources, while other regions' potential is limited by climatic characteristics and poor infrastructure. Different areas also have varying access to critical support services. Some may lack appropriate institutions and analytical capability to design and implement reforms, and may have been subject to environmentally destructive or inefficient agricultural activities for decades. Finally, all regions suffer, to some degree, of a lack of understanding of how a market-based, privately-owned agricultural sector operates and what benefits it could bring.

The Bank’s planned lending program for agriculture consists of five broad types of lending operations: (i) the agriculture components of Rehabilitation Loans to provide funds for financing imports of critical agricultural inputs; (ii) the ongoing Agricultural Reform Implementation Support (ARIS) project which supports the creation and strengthening of critical agricultural support services to accelerate the implementation of present and future growth of the sector; and which demonstrates the role that private sector can play in promoting a competitive agricultural sector through selected investments in market and seed sub-sectors; (iii) the current Land Reform Implementation Support (LARIS) project, which will support the creation and strengthening of public infrastructure and institutional capacity to implement the ongoing and future land reforms; (iv) the Regional Agricultural Development Project (RADP), which is designed to focus on selected regions to finance critical investments and implementation of specific policy reforms, especially farm restructuring; (v) and the Agricultural Sector Adjustment Loans (ASAL), which will support the national program of agricultural policy reforms.

The ARIS project represents a major activity in agriculture support services. This project will provide critical extension and information services as well as build Russian institutional capacity in supporting an agriculture sector based on markets and private ownership. The support services will provide technical assistance for: formation of policies for seed and market development, creation of a nationwide market information system, establishment of a farmer information and advisory service. This project differs from past World Bank efforts in implementing agricultural projects in Russia and the FSU. First, the project assisted pilot investments will be made in the private sector without the involvement of government parastatals. They will demonstrate the critical role of infrastructure and institutional reform for reorienting operations of existing marketing institutions and for improving incentives for producers, efficiency in marketing services, and benefits to consumers. Secondly, the design of the FIAS component incorporates the use of existing information available from research institutes, land data banks, academies and universities. This effort differs from other efforts in that it will utilize a participatory approach and involve end users in designing the system. It will also employ a multi-media approach to disseminate information cost effectively, and it will redefine the public and private roles in providing these services.

An oblast is a division of state which is roughly equivalent in administrative and governmental level to a U.S. state.
C. Relevant World Bank Agriculture Projects

- **The Agriculture Reform Implementation Support Project (ARIS)**
  Loan: 3757
  Signed: FY94
  Sources: Staff appraisal report 12710, and Memorandum of the President P6255
  Task Manager: Mr. John Cole

  The ARIS project will: (a) create and strengthen the most critical agricultural support services to accelerate the implementation of ongoing and future agricultural reforms; (b) build analytical and institutional capacity to identify, appraise, and implement agricultural and agribusiness project by the private sector on the basis of economic criteria; and (c) demonstrate the role that the private sector can play in promoting efficiency in the agroindustrial sector. The support services will focus on: (i) the creation of an enabling policy environment for private sector participation in seed and market development; (ii) establishment of a nationwide market information system; (iii) establishment of farmer information and advisory services (FIAS).

  The FIAS component is providing extension services in about 30 important agricultural oblasts. This component is being implemented now after a late start. At the present time, it is too early to evaluate the activity, but it is progressing without problem (Sampath, personal communication). However, the design incorporates the lessons learned from other Bank experiences. The FIAS will provide services initially as a public good, since the Russian economy is undergoing a structural transformation and the private sector is still in its infancy. However, the services are based on cost recovery, and the private sector will provide increasingly larger portions of the services.

  The design and implementation of the market infrastructure development component of the proposed project incorporates lessons of Bank experience. Training and technical assistance will support a framework for efficient market operations, develop strategies to restructure existing monopolies and promote new institutions in agricultural marketing. The project assisted pilot investments would be make in the private sector without the involvement of government parastatals. The role of the private sector will be demonstrated by selective pilot investments in hybrid corn and sunflower seed enterprises, fruit and vegetable marketing bases and vegetable storage facilities. The provision of critical support service, the development of an analytical capacity and demonstration of the commercial viability of private enterprises are expected to lay the foundation for an efficient agricultural sector based on private ownership and market principles.

- **Land Reform Implementation Project**
  Loan: 37560
  Signed: FY94
  Source: SAR
  Task Manager: Mr. Cooke
• **Agricultural Research and Training Project**
  Loan: Preparation halted
  Source: Revised EPS (February 9, 1996)

The underlying concept of the this project is the development of an integrated agricultural knowledge system (IAKS) as the basis of future research, higher education investment, and extension system development. This involves integrating university and research institutes as the main centers of activity and also interfacing these activities with extension education and development. Implementation of this concept will require a shift in current policies, management system, institutional integration and restructuring, investments to upgrade facilities and human resources. The challenges identified and the recommendations made in this subsector analysis are relevant to most parts of the country. The concept should therefore be initially implemented as pilot programs in select regions.

The objective of the project is to assist the Russian Federation in making agricultural research, education and extension services respond to new economic and market environments. Specifically, the project would support (i) the development and implementation of suitable policies for agricultural research to meet emerging client needs and promote private sector and foreign participation; (ii) promote integrated higher education, research, and extension institutions in selected regions; (iii) foster integration of staff, facilities, and equipment between research and higher education activities; (iv) introduce extension as a concept through higher education; (v) promote relevant research, education, and extension services to the agricultural processing and marketing base; (vi) preserve critical aspects of higher education and research systems; (vii) provide necessary support for the on-going ARIS and LARIS projects.

Preparation for this project was halted at the request of the Ministry of Finance and Ministry of Economy.

• **Agriculture Sector Adjustment Loan**
  Loan: Preparation
  Signed: Anticipated 1997
  Source: No listings

Under consideration by the Russian Federation.

• **Regional Agricultural Development Project**
  Loan: Preparation
  Signed: Anticipated 1997
  Source: No listings

The status of this project is uncertain. It may be implemented as a series of pilot projects.
D. Agriculture Sector Work and Related Studies

- The Agriculture Reform Implementation Support (ARIS). Staff appraisal report 12710. Memorandum of the President P6255.

Discussed in detail above.


This 58-page paper gives a detailed examination of the agriculture knowledge system (IAKS) in Russia. This is followed by a strategic vision for a future successfully functioning system, short-term and long-term actions toward this vision, and preliminary concepts for a project. Sections A and B above give a detailed discussion of the information in this paper.


This paper, which is in draft form and is not available for distribution, will give an in-depth (about 60 pages) examination of the agricultural knowledge system in Russia.


- Agriculture Sector Review. Planned for FY96.

- CEM. FY93, FY95.

- Country Assistance Strategy. FY95.


- The Russian Federation - The significance of credits and subsidies in Russian agricultural reform. WPS1141. Policy research working paper.

- Food and Agriculture Policy Reforms. FY92. No document number listed in Internal Documents. This report briefly discusses research and extension.