

Technical Cooperation Programme

**A MEDIUM-TERM AGRICULTURE
SECTOR STRATEGY FOR THE
FEDERATION OF BOSNIA AND
HERZEGOVINA**

Prepared Jointly
by

Ministry of Agriculture Water Management and Forestry
and
Food and Agriculture Organization of the United Nations



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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FOREWORD

The 1995 Dayton Peace Accord, following three and a half years of war, laid the foundation for peace in Bosnia and Herzegovina. The international community supported a reconstruction programme, which initially addressed emergency needs across all sectors. The return of economic and political stability in the subsequent years provided the basis for a recovery phase to be initiated. In this context, the Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina requested technical assistance from FAO in the formulation of a medium-term agriculture sector strategy. FAO, while evaluating the request positively, recognized the need for participation of the Republika Srpska, the second entity of Bosnia and Herzegovina, in the exercise. By end 1997, the Republika Srpska indicated that it was agreeing to participate in any technical projects implemented by FAO. A general change in the political climate in Bosnia and Herzegovina entailing a considerable degree of political and economic stability and cooperation between the two entities indicated that the time had come to undertake measures to enhance sector productivity and efficiency as a means to support overall recovery of the country.

FAO fielded a mission in early 1998 to formulate a technical assistance project for the elaboration of a medium-term development strategy for the agriculture sector in Bosnia and Herzegovina. In the formulation of the project, particular emphasis was given to the active involvement of national expertise. The objectives of the project were:

- to identify measures for the medium term which would help overcome structural problems in the agricultural and rural sectors of the Federation of Bosnia and Herzegovina and Republika Srpska, making them more competitive and market oriented in the European context; and
- to promote economic integration of the two entities by enhancing the complementarity of their strategies.

The project was approved in early May 1998 and by the middle of the same month a team of specialists consisting of international consultants and FAO staff visited Sarajevo and Bijeljina to participate in two project inception workshops during which national working groups were established, Terms of Reference discussed and agreed upon and working methodologies elaborated. Six groups in both the Federation of Bosnia and Herzegovina and the Republika Srpska were entrusted with the preparation of technical papers providing background material in their respective fields, identifying issues and constraints impeding development and proposing measures for their resolution or removal within current budgetary limitations. The six working groups covered the following areas:

- Macroeconomic framework for agriculture policy;
- Land use and natural resource management;
- Crop production (including fruit and vegetables);
- Livestock production;
- Agricultural marketing and agro-processing;
- Agricultural institutions (research, extension, education and farmer/producer associations and cooperatives).

The national working groups completed the papers by mid-July 1998. These papers were discussed in two workshops with broad based participation of stakeholders from government and the private sector and with the participation of the FAO team. The purpose of these discussions was to

agree on appropriate policy response to issues identified and formulate recommendations for inclusion in the strategy to be proposed. On the basis of these discussions and analyses two strategy documents were formulated by mid-March 1999 and were circulated to the group coordinators of the national working groups, to policy makers in the Ministries of Agriculture and representatives of other ministries for comments in preparation for a concluding workshop. During the latter, the recommendations contained in the draft documents were discussed and consensus on strategic elements reached. Subsequently the strategy documents were presented to a larger audience comprising representatives of concerned ministries, academia, interest groups and the donor community.

While agriculture sector strategies were developed for each entity the entire work, was carried out in clear recognition that these strategies were established for one state and complementarities were stressed. In order to formalize this understanding and define areas of cooperation between the two entities a meeting was held on 11 August 1999 in Banja Luka chaired by the Minister of Foreign Trade and Economic Relations and with participation of representatives of the respective entity Ministries of Agriculture, representatives of the Ministry of Foreign Trade and Economic Relations and representatives of the donor community. Mr M. Arias, the representative in Banja Luka of the Office of the High Representative, acted as moderator. The meeting was concluded with the signing of a declaration of intent outlining those areas of collaboration for which a consensus was reached during the inter-entity consultation. The full text of this declaration is attached to this foreword.

M. Lindau
Regional Representative for Europe

BOSNIAN AND HERZEGOVINA – INTER-ENTITY CONSULTATION

DECLARATION OF INTENT

Under project TCP/BIH/7821 “Medium-term Strategy for Sustainable Agriculture Development for Bosnia and Herzegovina” agriculture sector strategies were developed for each entity. However, this work was undertaken in clear recognition that these strategies are for one state and complementarities were established between them. For development of the agriculture sector to take place, co-operation and joint efforts in key areas by both entities will be a crucial condition for success.

Prospective areas of collaboration were discussed with representatives of the respective entity Ministries of Agriculture, representatives of the Ministry of Foreign Trade and Economic Relations and representatives of the donor community. Agreement was reached that both entities would undertake to actively collaborate in the areas described in the attached addendum.

We, the undersigned undertake to facilitate and implement the recommendations described in the attached addendum.

Banja Luka, 11 August 1999

H.E. A. Smajic
Minister for Agriculture,
Management
and Forestry
Federation of Bosnia and
Herzegovina

H.E. M. Kurtovic
Minister for Foreign Trade
and Economic Relations
Bosnia and Herzegovina

H.E. M. Savic
Minister for Agriculture,
Forestry and Water
Management
Republika Srpska

Note: The original document was signed by H.E. M. Kurtovic. For H.E. A. Smajic, Mr M. Ribic, Assistant Minister, MAWMF and for H.E. M. Savic, Mr N. Kesic, Deputy Minister, MAFWM signed.

BOSNIAN AND HERZEGOVINA AGRICULTURE SECTOR DEVELOPMENT

AGREED AREAS OF INTER-ENTITY COLLABORATION

- (a) To develop a market information system which provides daily information on all major agricultural markets in Bosnia and Herzegovina for users in both entities; and which provides for the regular dissemination of information on agricultural imports and exports and the characteristics of agricultural trade between the two entities.
- (b) To avoid the spread of infectious livestock and plant diseases in Bosnia and Herzegovina by establishing systems which ensure that all relevant national and international institutions and organizations are fully informed of actual and potential plant and animal health problems.
- (c) To actively support the task forces established by the Ministry of Foreign Trade and Economic Relations, including those for:
 - WTO accession;
 - Adoption of the *Acquis Communautaire* of the the European Union; and
 - Compliance with European Standards for livestock exports.
- (d) To rationalize the development of public institutions for education, research and extension; and to avoid duplication of these institutions.

ACKNOWLEDGEMENTS

This report is the outcome of close collaboration between the Ministry of Agriculture, Water Management and Forestry and FAO. For the formulation of the strategy six working groups were established to deal with specific subsectorial issues. The themes and the composition of the national working groups was the following:

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The FAO Team Leader was G.N. Christensen and the FAO specialists and international consultants included P. Finlayson (Livestock specialist), R. Keith (Rural Finance specialist), S. Keith (Land Tenure specialist/FAO), W. Lindley (Institutions specialist/FAO), J. Macartney (Agronomist), W. Sachers (Marketing and Agro-processing specialist) and B. d’Avis (FAO Coordinator).

FAO is grateful to the Ministry of Agriculture, Water Management and Forestry and the numerous specialist of the Federation of Bosnia and Herzegovina for the technical and logistical support it received at all stages of the preparation of the strategy. In particular, sincere thanks are due to H.E. A. Smakic, Minister for Agriculture, Water Management and Forestry of FBiH and Mr. M. Ribic, National Project Coordinator for their keen interest, guidance and continuing support of the project. FAO is also grateful for the significant contribution of the national working groups and representatives of the academic community of the Federation of Bosnia and Herzegovina to the formulation of the strategy. In addition, the FAO team appreciated and benefited greatly from numerous contacts and constructive discussions with different representatives of Government agencies, business establishments and the farming community. The team is also very grateful for the frank and productive collaboration with representatives of the Office of the High Representative, of the EU Phare ASPU project and the entire donor community.

The generous support of the FAO Technical Cooperation Programme (TCP) in funding the project is gratefully acknowledged as are the inputs provided by concerned Technical Units/Division at FAO.

ACRONYMS AND ABBREVIATIONS

AI	Artificial Insemination
ARC	Agriculture Research Council
asl	Above sea level
BiH	The State of Bosnia and Herzegovina
CBBH	Central Bank of Bosnia and Herzegovina
CRPC	Commission for Real Property Claims
CSO	Central Statistics Office
FBiH	Federation of Bosnia and Herzegovina
FIB	Federation Investment Bank
DM	Deutsche mark
DP	Displaced Person
EU	European Union
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GSP	Gross Social Product
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit (Germany)
HEP	Hydro-electric power
IEBL	Inter-Entity Boundary Line
IPTF	International Police Task Force
ISTA	International Seed Testing Association
LIBOR	London Inter Bank Offering Rate
MAWMF	Ministry of Agriculture, Water Management and Forestry (FBiH)
OHR	Office of the High Representative
NGO	Non-governmental Organization
RRTF	Reconstruction and Return Task Force
RS	Republika Srpska
UHT	Ultra-high temperature
UNHCR	United Nations High Commission for Refugees
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

The agriculture sector of the Federation of Bosnia and Herzegovina (FBiH) is now recovering steadily from the effects of war. Economic and political stability form the base of this recovery, together with the reconstruction programme supported by the international community. The challenge now is to obtain sustainable growth in agriculture production, productivity and competitiveness. Together with the Ministry of Agriculture, Water Management and Forestry, FAO has responded to this challenge by formulating a medium-term strategy for agriculture sector development.

The *global objective* of the strategy addresses the basic constraints to sector development, and reflects the Federation's aim to develop a market-oriented economy.

To increase agricultural output through measures which improve the efficiency, profitability and competitiveness of production, processing and marketing; to promote rural development and increase the opportunities for non-farm rural employment; to optimize land use and preserve the natural resource base; to strengthen agriculture sector institutions; and through these measures to achieve sustainable agriculture sector development.

A further set of *supplementary objectives* address the major consequences of war:

To further the reconstruction process;
To support the resettlement of refugees and displaced persons in rural areas;
To strengthen economic relations and cooperation with the Republika Srpska.

To focus and structure the strategy, these objectives will be applied to six areas of action: the efficiency and profitability of agriculture production, the marketing and processing of agricultural products, rural development, land use and natural resource management, agriculture policy and institutions, and inter-entity trade and cooperation.

These areas of action are linked by the following common themes:

- (1) The importance of small and large-scale commercial farmers as the group most likely to adopt improved management practices, and to obtain significant increases in agriculture production and marketed surplus;
- (2) The widespread establishment of producer associations to facilitate the dissemination and adoption of new technology, reduce the diseconomies of small, fragmented farms, and to link producers to market outlets;
- (3) The need to increase rural non-farm employment as the basis for improving the welfare of rural households and strengthening rural communities;
- (4) A significant allocation of resources to support the development of competitive agro-processing and agri-business enterprises and to strengthen marketing institutions;
- (5) Definition of the role of central and local government and the responsibilities of public and private institutions, support for the development of public and private institutions, and the decentralization of public institutions and associated responsibilities.

Continued strong support from the donor community will be essential for strategy implementation, especially in the areas of institutional development and support for private investment. The total cost of sector recovery and development far exceeds donor capacity however. Given the limited resources of government, the consequent reality is that most of this cost will inevitably be borne by rural people. For this reason the strategy places considerable emphasis on measures to increase farm and non-farm incomes and to stimulate farm investment.

A ten year time frame has been designated for strategy implementation. Strategy action is based on short-term measures to be initiated over the next one to two years, and medium-term measures to be initiated within two to five years. Progress will be reviewed at the end of five years to determine the need for new approaches to strategy implementation.

Efficiency and Profitability of Agriculture Production

Agriculture production in FBiH is well below its potential, and productivity is less than half of the levels achieved in western Europe. To address these issues the strategy will promote the adoption of improved management systems as the basis for increasing the efficiency and profitability of production, and so farm output and farm income. The primary vehicles for supporting adoption of these management systems will be the establishment of an effective, gender-sensitive extension system, and the wide-spread development of producer associations (cooperatives, partnerships or companies).

Specific measures include programmes to expand the improved varieties of certified seed and seedlings to which farmers have access; development of low-cost extension packages to enable small-scale commercial farmers to increase crop yields and reduce production costs; further extension packages to encourage these farmers to diversify into more profitable crops (particularly high return, labour intensive crops); modernization of fruit production systems and orchard management; promotion of low-cost irrigation systems; identification of more cost-effective cultivation techniques and associated farm machinery requirements and programmes to increase the availability of modern farm machinery and to give small-scale commercial farmers cost-effective access to this machinery. Where it is profitable, the strategy will also promote the production of organically grown, chemical-free fruit and vegetables.

Consistent with its importance to the agriculture sector, and its potential for growth a wide range of measures will be introduced to increase livestock production. High priority will be given to programmes to improve the quality and quantity of pasture and hay production, and the use of mountain grazing resources. Low-cost feeding systems suited to small-scale commercial farms will be developed as the basis for improving the growth rates of young stock, reducing the age of first parturition, and shortening the breeding interval. At the institutional level a research centre for animal production will be established to investigate nutrition, health and breeding for all animals, plus pasture and forage production, conservation and utilization, and the introduction of alternative forage crops. This research will reflect primarily the interests of small-scale commercial farmers. The pre-war performance recording scheme will be re-established within the new research centre, but as a self-financing entity. Programmes will also be developed to support fish and honey production.

Farmers will assume most of the responsibility for increasing livestock numbers. Budget restrictions permitting, this will be supported by a modest subsidy programme to encourage farmers to retain young dairy stock. Legal and administrative reforms will be introduced to facilitate the private sector import of livestock and animal semen, and import tariffs on breeding cattle will be reduced to zero. Continued donor support for the import of breeding stock will also be sought, but as a means to improve the genetic base of the national herd and to assist small-scale commercial farmers to increase herd size.

Marketing and Processing of Agricultural Products

Effective development of marketing, processing and agri-business is the basis for building competitive, demand-driven commercial agriculture. This infrastructure will be established by developing strong marketing institutions, agri-business enterprises and agro-processors; and by

promoting the formation of producer associations to link producers to market outlets and increase marketed surplus.

Rapid privatization of state-owned marketing agencies and agro-processors, in a viable form, is the starting point for this process. This will be supported by donor-financed credit lines for investment and working capital. Training in business management, marketing and accounting is also required to assist managers in increasing production efficiency, and to adapt output to the post-war level and characteristics of consumer demand. A market information system will be developed and supplemented with monitoring and analysis of trends in the prices of agricultural commodities on international markets. Product standards will be adjusted to EU standards. As a means of improving inter-entity trade and cooperation, the programmes to establish a market information system and to adopt EU standards will be implemented jointly by the two entities.

Additional more focused initiatives include: support for the re-establishment and restructuring of agricultural cooperatives; the re-establishment of milk assembly systems; reduction of the current import tariffs on maize and sugar to zero percent as a means of improving the competitiveness of local animal feed and fruit and vegetable processors; and the promotion of domestically produced agricultural commodities on international markets by the chamber of commerce. Working with canton governments, the system of wholesale markets will be improved and expanded along with facilities in local green markets.

Rural Development

Strong rural communities are essential for future political and economic stability and will not emerge without balanced support for both farm and non-farm income generation and full access to high quality health and education. Rural development programmes will be initiated to achieve these objectives, with particular attention to measures that increase non-farm rural employment. By reducing reliance on farm income, increased access to non-farm employment will also allow an increase in the sale or lease of rural land and so facilitate an increase in farm size. Working with the MAWMF and other ministries, canton governments and municipalities will be responsible for these programmes.

Strategy implementation will begin with the preparation of canton and municipality- level rural development plans that reflect the needs and aspirations of local people and the nature of the local resource base. Local government, NGO's and donors will then use these plans as the basis for designing job and business training programmes and to establish micro-credit lines suited to small enterprise development. Resources will also be provided to cantons and municipalities to strengthen their capacity to develop and implement rural development programmes. Medium-term activities will focus on improving the quality and availability of rural health and education services.

Land Use and Natural Resource Management

Given the limited availability of agricultural land in FBiH, effective use of this land is essential for sector development. Within this context, the aim is to optimize land use and preserve the natural resource base by developing policies and institutions which balance public and private interests in land use and ownership and ensure effective stewardship of FBiH's natural resources.

War-related issues are the immediate concern. The de-mining of agriculture land will be accelerated by establishing an administrative unit to identify and prioritize land for de-mining, obtain requisite donor finance, and coordinate and monitor de-mining. Following the guidelines and programmes developed by the RRTF, the resettlement of rural land will be supported by ensuring that the returnees, re-locating families and residents in resettlement areas have full access to available

credit, extension facilities and to rural development programmes to create opportunities for non-farm employment.

Land market activity will be increased as a means to address the problem of small farm size and fragmentation. Leasing will be encouraged by developing legally recognized, standard lease contracts that protect both lessee and lessor. Land sales will be promoted by removing the tax on land transactions, by making more information available on rural property available for sale, lease or exchange and on the support services available to effect land transactions. The efficiency and probity of land transactions will be improved by training valuers and property agents and establishing professional associations and codes of conduct for their activities. Land consolidation programmes will be continued, but land owners and/or donors will fund part of the cost of associated infrastructure.

In association with the privatization programme, the strategy recommends that land occupied by state farms be used by private enterprise and for agriculture research. In the medium-term, a comprehensive review will be conducted on the need for full privatization and sale of this land, the extent to which it could be subdivided into smaller commercial farms and its use to enlarge and consolidate neighbouring small-scale farms.

Institutional reforms include continued international community support for the process of updating and reconciling the land book and the land registry, computerizing land records and amendments to inheritance law to prevent further land fragmentation and the establishment of Land Development Boards for land use projects that require cooperative action (drainage, irrigation and land consolidation programmes, and the management of communal grazing areas). On a broader level the strategy will review the current legislation and institutional base for natural resource management and land use as the basis for developing a comprehensive framework for land policy and strengthening the institutions responsible for policy implementation.

Agriculture Policy and Institutions

The strategy will effect wide-ranging reform of public policies to make them consistent with the operation of a market economy and the limited availability of public resources. It will also define the respective roles of the public and private sector institutions responsible for these policies and strengthen their capacity. Longer term plans to join the WTO and accede to the EU will be fully supported. As there is a natural distrust of change, the strategy provides for key sector people to travel outside BiH to learn about agriculture policies and institutions in central European and EU countries and in the USA.

Support to the Federal Ministry of Agriculture, Water Management and Forestry will focus on strengthening capacity in its main future areas of responsibility: policy analysis, monitoring and enforcement of plant and animal health regulations, market information and the stewardship of natural resources. While the agriculture budget is perceived as inadequate the strategy recognizes that there is limited scope to increase it in the medium term. Emphasis is thus given to increasing the impact of existing resources by restricting direct price support to wheat and milk production and increasing public support for agriculture research. The guaranteed price for wheat and the minimum price for milk and the subsidy on milk will be maintained at their current levels. Direct budget support for tobacco prices will be replaced by canton-level initiatives to develop more effective support programmes for tobacco producers. The current system of official minimum prices for all other commodities will be phased out as this role is now performed by the new state-level tariff regime. The strategy endorses this tariff system but will seek a reduction of the tariffs on imported maize and on breeding stock to zero percent as a means of improving the viability of domestic animal feed production and of promoting rebuilding of livestock numbers. Working with the Strategic

Reserves Agency, a more cost-effective basis will be developed for the management of public wheat stocks and protection of the wheat floor price once economic and political conditions stabilize.

Consistent with experience elsewhere in western economies, the strategy recommends that future financial support for the sector should derive from a diverse system of private sector financial institutions rather than a single state-owned financial institution. Measures to establish this system include programmes to privatize and strengthen the capital base and institutional capacity of the Federation Investment Bank which is the principal source of medium and long-term finance for agro-processors, agri-business enterprises and large-scale commercial agriculture. The presence of financial institutions that have special expertise in agriculture credit, such as the Raiffeisen Bank, will be encouraged, as well as the establishment of Village Credit Unions to provide affordable financial services to small-scale farmers.

The strategy also recognizes that establishment of this financial system is a long-term objective. Pending reform and recovery of the banking sector, agriculture sector development will rely heavily on the continued provision of credit lines for working capital and investment by the donor community. These will be administered by commercial banks, in conjunction with programmes of financial sector reform. Donors will also be asked to modify the loan repayment period for credit to agriculture enterprises, in order to improve borrower cash flow during the critical first 12 months of business operation.

The future extension system will consist of private extension agents employed by agriculture cooperatives, agri-business enterprises and agro-processors, plus a small, canton-based public extension service. Funded initially by the donor community, the aim is to fund this service from canton budgets and user fees by 2002 and to make it self-financing by 2005. An Agriculture Research Council (ARC) will be formed to define the agriculture research agenda and allocate research funds, with its operation and research fund to be donor-financed for the first three years of operation. In addition to academia and government, ARC membership will include small and large-scale farmers and agri-business managers. Funding will be directed to the pre-war institutions responsible for research on temperate and Mediterranean crops and to the new research centre for animal production. To support education, the international community will be asked to continue support for re-establishment of the Agriculture Faculty at the University of Sarajevo, to reform its curricula and replace teaching and research materials and to provide similar support for the pre-war university programmes in Mostar. A more appropriate institutional framework will be developed to rationalize the current highly fragmented system of research, extension and education centres and to ensure more effective communication between them. International support will also be sought to improve the curricula and teaching capacity of the institutions responsible for training agriculture and veterinary technicians and to assist them in obtaining new teaching materials.

Direct public involvement in animal health will be limited to: licensing of veterinarians; monitoring and enforcement of regulations on animal products, the import and export of live animals and animal semen, and funding and management of the veterinary institutes and diagnostic laboratories. Refurbishment of the pre-war veterinary institutes and diagnostic laboratories will also be completed. Most other aspects of livestock production will be transferred to the private sector. The veterinarian service will be privatized. Its monopoly over the acquisition and sale of animal semen and artificial insemination will be removed and technicians will be trained and licensed to perform artificial insemination (AI) on a commercial basis. Responsibility for breed improvement will also be transferred to the private sector. Those state-owned animal reproduction centres which have the potential to operate as commercial enterprises will be privatized and given access to credit to develop as commercial stud farms, as found in western countries.

Public sector involvement in plant breeding and plant protection will be limited to preparation of the national seed list, seed testing, selection and certification, and the monitoring and

enforcement of regulations for seed, plant materials and agriculture chemicals. Donor support for the development of modern seed certification facilities will continue and support will be sought for the testing and selection procedures associated with expansion of the national seed list. Within the private sector, commercial seed multiplication and sales will be encouraged, and the involvement of agricultural research institutes in these activities discontinued. Private sector input suppliers will also be supported through access to credit and more efficient import procedures.

Inter-Entity Trade and Cooperation

While the economic benefits of inter-entity trade and cooperation are manifest, the strategy recognizes that realization of these benefits will require the agreement of both entities and the support of the Office of the High Representative (OHR), and will take time.

Measures to improve inter-entity trade are the immediate priority. To this end, the strategy will establish a system for collecting and disseminating information collected in major markets throughout Bosnia and Herzegovina. As there are no internal border controls the resumption of trade will need to be accompanied by inter-entity cooperation in the monitoring and control of plant and animal health. The basis for such cooperation is the installation of equivalent facilities in each entity and the regular exchange of information between entity governments. To this end, the donor community will be asked to refurbish the relevant facilities in each entity to identical standards, and to work with the respective entity governments to establish procedures for sharing relevant information.

Both entities should also participate more actively in the task forces which have been established by the Ministry of Foreign Trade and Economic Relations to formulate state level policy. Current issues under review include membership of WTO, customs policy, adoption of the *Acquis Communautaire* as a pre-condition for accession to the European Union and subsequent programmes to apply the product standards and trade, health and safety regulations applied in the European Union.

The need to rationalize development of public institutions for education, research and extension is a more controversial issue but must also be addressed. While the strategy respects the right of each entity to develop public institutions independently of the other, it does not endorse the current proliferation and duplication of institutional resources. At a minimum, there is a need to establish mechanisms for sharing research information, coordinating research programmes and to ensure that all people have full access to the services provided by these institutions. There is also a role for the establishment of state-level institutions, such as a programme to train extension agents from both entities. Finally, with assistance from the OHR, donors must coordinate their support for institutional development to ensure that it does not facilitate the current fragmentation and duplication of institutional resources.

I. INTRODUCTION

The agriculture sector of Bosnia and Herzegovina (BiH) is gradually recovering from the impact of war. Crop and livestock production are increasing, agro-processors are re-starting production and markets for agricultural outputs and inputs are becoming more active. Increased economic and political stability have provided the foundation for this recovery, together with the reconstruction and recovery programme supported by the international community. Full recovery is a long-term objective, however. The remaining cost of replacing capital and regenerating incomes is immense and recovery must be accompanied by the economic transition occurring elsewhere in central Europe.

Post-war policies and support for the agriculture sector have thus far focused largely on reconstruction and resettlement - goals towards which there has been substantial progress. The challenge now is to build on this progress and achieve sustainable growth. A more forward-looking approach to agriculture sector policy is thus needed: to support continued recovery in the short-term, to guide growth and development in the medium to long term, and to make best use of the resources provided by government and the international community. This demands a comprehensive but realistic plan for agriculture sector development, based on clear objectives and priorities. It will also require a strong commitment to the creation of a market-oriented agricultural economy and eschewal of efforts to re-establish pre-war socialist policies and institutions.

Recognizing these issues, the entity governments of BiH each requested technical assistance from FAO during 1997, to help with the preparation of a medium-term strategy for sustainable, market-led development of the agriculture sector. FAO responded to these requests in February 1998 by formulating the project "A Medium-term Strategy for Sustainable Agriculture Development in Bosnia and Herzegovina - TCP/BIH/7821(A)," which was approved in May 1998 and initiated the same month.

Project implementation has been based on the Dayton Peace Accord which aims to promote inter-entity relationships while respecting the right of each entity to formulate and implement its own internal policies. Consistent with this theme, FAO has assisted the entity governments in preparing separate strategies for agriculture sector development, however, the two strategies have been prepared in parallel and complementarity has been sought wherever possible. Special attention has been given to inter-entity trade and cooperation.

The ensuing document presents a framework for agriculture sector development in the Federation of Bosnia and Herzegovina, based on analysis by local and international experts. It begins by identifying relevant conditions and constraints within the sector and then considers how they might be addressed. Due consideration is given to both war-related issues and more fundamental issues and problems extant before the war. A strategy for development is then presented which outlines the objectives and priorities for the sector, and the measures needed to realize these objectives.

In addition to its role as a planning device for the Ministry of Agriculture, Water Management and Forestry, this document also provides a comprehensive source of information for international organizations and for potential investors and donors in agriculture.

II. WAR AND RECONSTRUCTION

2.1 Losses and Dislocation

Three and a half years of war, from 1992-1995, devastated human and physical resources and shattered the economy. Approximately 1.2 million people left the country and up to 200,000 are dead or missing, equivalent to thirty percent of the pre-war population of 4.38 million. Among the people who remained, more than one million were displaced by the war.

The current (resident) population of Bosnia and Herzegovina is estimated at 3.7 million of which 1.45 million are in Republika Srpska (RS) and 2.25 million in the Federation of Bosnia and Herzegovina (FBiH)¹. This total includes an estimated 759,000 displaced persons (DP's) - almost one fifth of the population - of which 400,000 are in FBiH and 359,000 in RS. As of June 1999, some 538,000 of the refugees outside BiH had found durable solutions abroad and 332,000 had returned. Of the 330,000 refugees who remain outside the country it is estimated that 120,000 will be repatriated in 1999 (OHR, 1999). The international community has pledged their support for repatriation of the remaining refugees, although many are seeking permanent residence in other countries. Irrespective of future repatriation, the reality is a 15 percent fall in the total population and widespread dislocation of those who remain.

There is also growing evidence that the war will result in long-term demographic shifts which could have a major impact on the rural economy (RRTF, 1998). Many of the rural people who moved to the cities during the war are now reluctant to return to their farms, accentuating the high pre-war level of urban migration. Younger rural people looking for employment, and rural people from more isolated or less productive agricultural areas are most affected by this trend. Resettlement of rural areas that were heavily damaged by war is also proving slow and difficult, particularly where it involves minority returns and poor land. These factors, together with the 15 percent fall in overall population, suggest that the population of many rural areas will fall substantially. The nature and location of agricultural production will change accordingly.

War has also affected the economic transition that began before 1991 by accelerating the decline of state enterprises and so allowing more opportunities for the growth of private enterprise. The nature and distribution of employment opportunities throughout the country is thus changing, which will in turn lead to migration of the labour force. In future, even more of the population is likely to be concentrated in Sarajevo, Tuzla, Bihac and Banja Luka and the region of Herzegovina (RRTF, 1998). The size and nature of local domestic markets for agricultural products will change accordingly.

In pure economic terms, government authorities estimate overall damage from the war at US\$50-70 billion, and estimates of destroyed productive capacity range from US\$ 15-20 billion (World Bank, 1997). High unemployment, the disruption of trade and supply channels and the loss of exports were equally important consequences. Together they led to a massive, war-time economic collapse. By 1994 GDP had shrunk to 20 percent of its level in 1991 and per capita GDP had fallen from US\$1,980 to US\$560.

Total damage to the agriculture sector was estimated at US\$4.54 billion, of which US\$2.95 billion occurred in FBiH and US\$1.59 billion in RS. In some areas up to 70 percent of farm equipment and 60 percent of livestock were lost, farm buildings and irrigation systems were destroyed, orchards and vineyards burnt and food marketing systems were disrupted. Some 15

¹ Current population estimates vary from 3.7 million (CSO) to 4.05 million (OHR).

percent of farm land and 20 percent of forest land remains inaccessible because of minefields. By the end of the war the agro-processing sector was operating at less than 10 percent of its pre-war capacity, owing to heavy damage to buildings and equipment, the fall of farm output and disruption of supply channels.

2.2 The Dayton Accord

The Dayton Accord of December 1995 marked the end of conflict. Under this Accord, Bosnia and Herzegovina has been divided into two political entities - the Federation of Bosnia and Herzegovina and the Republika Srpska. These entities report to a joint parliamentary assembly and are governed under a single presidency. The two entities are subject to common policies and institutions for monetary management, external borrowing and debt management, and customs and trade. Within their respective territories each entity government has exclusive responsibility for defence, internal affairs, economic and social sector policies, justice and tax and customs administration. All internal borders and customs posts have been dismantled to facilitate a free flow of trade between the two entities. This framework has the following consequences for agriculture policy:

- (1) External trade policy is the prerogative of the State, with a common system of customs taxes and tariffs on imports and exports. But each entity collects and administers these taxes on the commodities it trades.
- (2) Each entity government sets its own agricultural policies, deciding on the form and level of direct support for agriculture (floor prices, subsidies etc.), the level of state involvement in the sector and the nature and organization of public institutions.

Allocation of land under the Dayton Accord has created significant differences in the agriculture resource base of the two entities (Table 1). The Republika Srpska received more (57 percent) of the arable land, including most of the high quality land around Banja Luka; while FBiH received more (56 percent) of the meadows and pastures. As RS has a lower population, the area of arable land per person is also much higher than in FBiH. Thus, FBiH is more suited to livestock production and is likely to have a structural deficit for many agricultural products, while RS is more suited to crop production and is likely to be a surplus producer of many agricultural products.

2.3 The Reconstruction and Recovery Programme

Following confirmation of the Dayton Accord the international community endorsed a medium-term priority reconstruction and recovery programme of US\$5.1 billion to be spent over four years. Of this amount some US\$4.2 billion had been pledged by the end of 1998, most on highly concessional terms, of which US\$ 2.8 billion has been disbursed (World Bank, 1999). Seventy-three percent of disbursements were effected in FBiH, 14 percent were used for inter-entity activities, and 13 percent was disbursed in RS. The low disbursement in RS is due to an international embargo during the first part of 1996 and a consequent late start to reconstruction investment, and a political environment that was less conducive to donor activity. The installation of a new government in RS in mid-1997 created a more favourable political environment and aid flows to RS are now increasing.

The four year reconstruction programme planned for the agriculture sector for all BiH was valued at approximately US\$300 million, to be used as follows:

Imported seasonal farm inputs	US\$20 million
Livestock and farm equipment	US\$85 million
Seed multiplication development	US\$ 7 million

Fruit trees and vineyard rehabilitation	US\$30 million
Forestry rehabilitation	US\$40 million
Rural financial markets development	US\$20 million
Rural industries and services	US\$40 million
Farmer support services development	US\$30 million
Agricultural policy development/TA	US\$ 7 million
Incremental recurrent costs	US\$21 million

Of this programme, US\$191 million had been secured by the end of 1998, of which US\$101 million had been disbursed. Approximately 70 percent of disbursements were effected in FBiH. Initial priority was given to providing key inputs and equipment to small-scale farmers as a means of increasing food production and reduce dependency on food aid. This included importation and distribution of seed, fertilizer and pesticides to provide seasonal farm inputs, provision of livestock and machinery to recapitalize farms and re-equipment of veterinary stations. Beginning in 1997, donors began shifting their emphasis to support for programmes to increase and sustain the capacity for agricultural production. In FBiH the reconstruction programme has now provided: 12,387 cows, 16,250 sheep, 1,372 goats, 669 two-wheel tractors, 3,983 motor cultivators, 14 combine harvestors, 695 farm implements and spare parts to the value of DM1 million.

The US\$50 million sought for 1999, the final year of the reconstruction and recovery programme, will be allocated as follows: US\$10 million to continue the recapitalization of small farms, US\$10 million for rural credit lines, US\$17 million for agro-processing and marketing, US\$10 million for forestry sector development and US\$3 million for institutional development. This would bring total donor support for reconstruction and recovery of the agricultural sector to approximately US\$240 million.

The entity governments estimate that a further US\$600 million is needed to complete agriculture sector reconstruction in RS and US\$1 billion for FBiH, representing requirements which vastly exceed donor capacity. Given the limited resources of government, the reality is that rural people will ultimately bear most of this cost. Recognizing this, both donors and government stress the need for a strategic framework for sector development that will lead to increased farm and non-farm incomes and stimulate investment, rather than continuing to place emphasis on physical reconstruction. This view, the associated need for continued strong support from the donor community and the importance of using donor resources to best effect, were major factors in the formulation of the agricultural strategy.

III. THE MACRO-ECONOMIC FRAMEWORK

3.1 Pre-war Economic Conditions in BiH

Before the war BiH's economy was fairly diversified, with a large industrial sector and a capable entrepreneurial class. More than half of its export products were sold to western markets for hard currency. The industrial sector was built on substantial reserves of energy, minerals and forestry and accounted for about half of GDP and employment. But this concentration of economic activity in heavy industry, all of it state owned, meant that BiH was one of the lower income republics of former Yugoslavia with GDP/capita of US\$1,980 in 1990. Agricultural production and processing accounted for approximately 10 percent of GDP and 18 percent of employment.

The economy was stagnant from 1980 to 1986 and then contracted. GSP fell by an average of 2.9 percent per annum from 1986-1990 due to restricted access to external financing, a result of debt servicing problems and a deep recession among BiH's trading partners. The agriculture sector also contracted, although at a lower annual rate of 1.1 percent. Failure to implement structural adjustment measures compounded these problems, notably the reform of incentive and ownership structures and the financial system. This unfinished agenda continues to affect post-war macroeconomic conditions.

3.2 The Post-war Recovery of FBiH

The economic recovery of FBiH began in 1995, facilitated by a macroeconomic stabilization programme initiated in 1994, substantial international assistance and improved access to imports. Initial recovery has been very strong. GDP in 1998 was more than two and a half times GDP in 1995, and a further 10-15 percent increase is projected for 1999 (Table 2). Generally stable macroeconomic conditions have accompanied and sustained this recovery, with low levels of inflation, fiscal moderation and a stable exchange rate.

Despite this progress, recovery is still largely aid driven and economic activity and living standards remain very low relative to pre-war conditions. Current wages are 55 percent of pre-war levels, and official unemployment is approximately 40 percent. Slow progress with economic reform constrains investment and government has yet to fully establish the institutional structures needed to implement new laws on foreign trade, fiscal management and monetary policy. Even with an optimistic outlook for strong external assistance and good progress with institution building and economic reform, GDP is unlikely to exceed 60 percent of its pre-war level by 2000. Full recovery is unlikely before 2005, even with subsequent (post-2000) GDP growth rates of 10 percent per annum.

3.3 Monetary Policy and the Banking System

A new, state-level Central Bank (the Central Bank of Bosnia and Herzegovina - CBBH) was established in April 1997 to effect monetary policy. In order to promote economic stability it will function as a currency board for its first six years of operation. Hence, domestic currency can only be issued in exchange for purchases of foreign exchange, at a fixed exchange rate. As currency board operations also preclude lending by the Central Bank to any part of the economy, government will not be able to borrow from the CBBH to finance public expenditure. This policy became operational in July 1998 with the issue of the new domestic currency for BiH, the convertible marka (KM), which is pegged to the Deutsche Mark at an exchange rate of 1:1. The new currency is now widely used and accepted in most parts of FBiH and its use is increasing in RS.

The banking sector is extremely weak and credit is scarce, short-term and very expensive (15-30 percent interest). Of the fifty banks in FBiH, seventeen are majority-owned by the state and the seven largest of these state-owned banks control 80 percent of banking assets. All of the state banks are deeply insolvent, the result of unpaid claims on pre-war foreign exchange deposits and non-performing loans to state enterprises. The private banks, although solvent, are very small and under-capitalized. All of these banks - public and private - face a crisis of public confidence that has decimated their deposit base. They thus rely largely on donor credit lines for their main source of capital and fees for most of their income.

The reform programme developed to address this situation is based on the “carve-out” of foreign exchange liabilities owed by the state banks and subsequent privatization, improved bank supervision and management, increased bank competition and measures to increase public confidence. The restructuring and privatization of state banks must be completed by August 2000. Any state banks which have not been privatized by this date, or state and private banks that fail to meet new capital requirements, will be liquidated or amalgamated. Bank numbers are expected to fall by half as a consequence. The remaining banks will be subject to increased supervision but will continue to receive technical assistance to improve management. Measures to boost public confidence and so increase deposit mobilization include a deposit guarantee scheme (for deposits of up to 3000 DM) and efforts to promote the entry of foreign commercial banks.

Although appropriate and essential, this strategy will not provide an immediate solution to the problem of tight credit supplies and high interest rates. The experience throughout eastern and central Europe has been that there are no “quick-fixes” to reform of the banking sector. Continued access to donor credit-lines will thus be critical for investment and working capital in the short and medium-term.

3.4 External Trade

Trade policy is a state-level responsibility. Import duties are levied at state boundaries by state customs authorities and then assigned to the relevant entity government according to the origin of the importer. A country-wide trade law introduced in March 1998 replaces the former system of unit tariffs, levies, quotas and licences with a four-tier system of *ad valorem* tariffs (0 percent, 5 percent, 10 percent, 15 percent). To comply with this law all other trade protection measures, including the current system of temporary duties, must be removed by December 1999. Post-war trade agreements between RS-Serbia and FBiH-Croatia must also be discontinued. Combined with improved border control and better customs procedures, these reforms will provide the most appropriate basis for future trade policy.

Loss of export markets and a high reliance on imports, due to the post-war collapse of domestic production, have resulted in a very high trade deficit for BiH (Table 2). This deficit continues to increase, despite a strong recovery of exports. Until domestic production recovers sufficiently to reduce imports, continued external assistance will be essential to offset the impact of this trade deficit on BiH’s balance of payments.

The recent decision to apply for membership of WTO further strengthens the commitment of BiH to establish a market-oriented economy. This process will be coordinated by the state level Ministry of Foreign Trade and Economic Relations. Membership in the European Union has also been accepted as a medium to long-term objective for BiH and preparation for this should be an integral part of the general process of economic reform.

3.5 Fiscal Policy

Fiscal policy is an entity-level responsibility, discharged in FBiH by a three-tier fiscal system: the Federation Government, cantons and municipalities. Cantons are the major instrument of government and receive approximately 60 percent of public revenues, including all revenue from sales, profit and wage taxes. Municipalities are assigned about 20 percent of canton revenue and serve largely as implementing agencies for the cantons. Together, cantons and municipalities deliver most of the public services associated with education, health, social protection, housing and local development. All customs and excise taxes are assigned to the Federation Government which is responsible for most of the expenditure on defence, agriculture and contributions to the state budget. Delivery of services such as public order, communication, transport and reconstruction is shared between the Federation and canton governments.

Consolidated public expenditure in FBiH was DM2.05 billion in 1998, equivalent to 38 percent of GDP. Current budget projections allow for a 15 percent increase in consolidated public expenditure for 1999, which would represent approximately 40 percent of GDP. A combination of increasing tax revenue and strong donor support has facilitated this level of expenditure to date, and kept the official budget deficit low, although arrears continue to accumulate in many public sector institutions.

Experience from other middle-income countries shows that it is difficult to sustain public expenditure levels of more than 30-40 percent of GDP. Consistent with this experience, government is now working closely with the international community to establish a more appropriate and sustainable level of public revenue and expenditure. These improvements to fiscal management will become especially critical as donor support declines and the ban on public borrowing from the CBBH imposed by the Currency Board begins to bite.

There is scope to increase nominal public expenditure levels, nevertheless, as the economy expands. In the short term most of this increase will be absorbed by high social outlays for refugees, war invalids and pensions, by the need to re-establish and strengthen public programmes for health, education and public order, and by debt-servicing and defence. These commitments largely preclude a significant immediate increase in public expenditure on programmes such as agriculture, forestry and water management. Government recognizes the need to increase public expenditure on agriculture, however, and will do so once the requirements for defence expenditure and social outlays diminish. But the restrictions imposed by the Currency Board preclude a significant public outlay on sectors such as agriculture, even under more favourable economic circumstances.

3.6 Enterprise Privatization

The legislative basis for enterprise privatization was completed in October 1998, and privatization began in June 1999. State enterprises with less than 50 employees and/or DM500,000 in assets will be privatized first, with completion forecast for December 2000. Privatization of the larger, non-strategic enterprises² is scheduled for the period 2000-2003. Both state-issued vouchers and direct capital injections can be used to effect privatization; with the vouchers to be issued as compensation for unpaid wages, the loss of bank deposits, pensions and outstanding claims on public institutions. Prospective purchasers have the right to acquire part of a state enterprise, rather than being obliged to acquire it all. The process will be managed on a decentralized basis by cantonal privatization agencies, with support from USAID (except for bank privatization which will be managed centrally by the Ministry of Finance).

Within the agriculture sector all state-owned assets of public sector agro-processors, agricultural trading enterprises and agricultural cooperatives will be included in the normal

² "Strategic" enterprises excluded from privatization include those engaged in power, roads, water supply, mining, forestry, gambling and military activities.

privatization process. For state farms, privatization will apply only to non-land assets and agricultural land will remain under government ownership.

3.7 Implications for Agriculture

These macroeconomic influences have the following implications for agriculture:

- The substantial fall in income, to levels well below those which prevailed before the war, the loss of traditional markets and the 15 percent fall in population have combined to significantly reduce aggregate demand for agricultural products;
- The shortage of credit and high interest rates limit the ability of farmers to finance recovery through investment in capital stock (livestock and machinery) and the ability to re-establish agro-processing activity;
- Current fiscal and monetary policies limit government's capacity to provide significant levels of direct public support for agriculture.

For these reasons, farmers and agro-processors will continue to rely on support provided by the international community in the short to medium term. Donors cannot finance the entire cost of economic recovery, however. Hence the emphasis must be on measures which improve the ability of rural people to finance recovery themselves, based on economic and institutional reforms which lead to increased incomes and improved access to credit for investment.

IV. AGRICULTURAL PRODUCTION

4.1 The Natural Resource Base

FBiH covers 2,605,579 ha, of which 1,258,796 ha is classified as agricultural land, an area equivalent to only 0.56 ha/capita. Forty-five percent of agricultural land is medium quality hill country (300-700 m asl), well-suited to semi-intensive livestock production. Mountain areas (> 700 m asl) account for a further 35 percent of agricultural land but high altitude, steep contour and lower fertility soils limit use of this land to livestock grazing during spring and summer. Less than 20 percent of agricultural land (half of all arable land) is suited to intensive agriculture, most of it in lowland river valleys. The land base for agriculture is thus very limited in both quantity and quality. Natural water resources are more abundant, with many unpolluted rivers and readily accessible groundwater. Despite this abundance of water only 4000 - 5000 ha (0.1 percent of arable land) was irrigated before the war, an area which could be increased significantly.

The inland mountain areas experience a continental climate, with harsh winters of 3-4 months at higher altitudes. Rainfall in these areas averages 800-1,000 mm per year with an even distribution, although much of the winter precipitation is snow. Temperatures range from 22 °C in July to 0 °C in January. Moving towards the coast the climate becomes more Mediterranean with wet winters, dry summers and higher temperatures. Mostar has an annual average rainfall of 1,500 mm (of which less than 200 mm falls from June-September), summer temperatures of 25-30 °C, and winter temperatures of 5 °C. These agro-climatic conditions allow most forms of crop and livestock production.

4.2 Farm and Household Characteristics

A dual farming structure characterized pre-war production in BiH (Table 3). Around 300 large, modern state farms cultivated 6 percent of agricultural land and accounted for 10 percent of production. A further 570,000 small-scale private farms accounted for the remaining resource use and production. Agricultural policy emphasized support for the state farms, despite their limited contribution to aggregate production. A large and growing disparity thus characterized the crop and livestock performance of the two groups.

State farms achieved moderate production levels relative to western Europe before the war (Table 6), but socialist management practices made them heavily dependent on public subsidies and protection. Most of them are now dysfunctional due to the breakdown of government support mechanisms, damage suffered during the war and the reluctance of donors to provide support until privatization is effected. There is a wide-spread view among public officials that these farms should be privatized and operated in their pre-war form but change will need to go beyond this if they are to be commercially viable. Furthermore, as privatization will exclude the land that the state farms occupy, future use of this land should be based on medium- to long-term lease agreements at market rentals.

Among the small-scale private farms three broad groups are apparent (Table 4). *Commercial farmers* (> 5 ha) rely wholly on farm income and account for 16 percent of rural households and 50 percent of farm land. *Part-time farmers* (2-5 ha) represent 30 percent of rural households and use 35 percent of farm land. Their incomes derive from farm production and sales and from non-farm wage employment. *Rural residents* (< 2 ha) represent 54 percent of all rural households but use only 15 percent of farm land. These people, many of whom are elderly, rely heavily on non-farm income sources.

Household income and expenditure surveys for pre-war BiH indicate that per-capita incomes were similar for agriculture, mixed and urban households³. Income composition differed markedly however. Farm sales and remittances were the most important sources of cash income in agriculture households, while wage income and pensions were more important in mixed and urban households. As wages accounted for 45 percent of household income in mixed households (CSO, Sarajevo, 1998), these households have suffered heavily from the post-war loss of wage employment. Per capita expenditure was slightly higher in agriculture and mixed households but food accounted for 45-50 percent of total household expenditure (both cash and in-kind) in all groups.

Family farms typically average 2-5 ha, spread over five to seven plots. Mixed livestock and cropping systems predominate and output is low. Maize (for livestock) and wheat are the main crops, supplemented by a few livestock. Most households consume a large proportion of what they produce. Animal products, fruit and vegetables are the main sources of cash income from agriculture. While the small size and high fragmentation of these farms are major constraints to production, there is also little use of modern farm technology and crop and animal husbandry practices are poor. The traditional emphasis on food self-sufficiency also leads farmers to grow crops that are not always well suited to local conditions. Low crop yields, poor animal performance (Table 6) and low profitability characterize these farms as a consequence.

Given the diverse income base of rural households, future support must include measures to increase both farm and non-farm incomes. Adverse, war-related changes in the level and composition of rural household incomes strengthen this imperative. Commercial farmers are most likely to respond to measures to improve crop and livestock management practices, and as a consequence, to increase agriculture production and marketed surplus. In contrast, part-time farmers and rural residents may respond more readily to measures designed to increase opportunities for rural non-farm employment. Both sets of initiatives will improve household food security, a major consideration, given that food is now an even higher proportion of household expenditure than it was before the war.

4.3 Crop Production

Following a rapid initial increase, post-war crop production has been fairly stable since 1996/97 and the total area harvested is now 55-65 percent of pre-war levels (Table 5). Only the areas planted to fodder and industrial crops continue to increase, while the area in vegetable production is relatively stable and the area of maize and wheat has declined since 1996/97. This halt in the recovery process is of considerable concern.

Cereals

Cereal crops account for half of the total area cultivated (Table 7). Maize grown for livestock feed is the most important, followed by wheat. Average cereal yields increased significantly from 1955-1990 due to less production in marginal upland areas and the use of higher yielding varieties and improved crop husbandry practices. Average yields were still very low by western European standards, as 60 percent of wheat was still produced in upland areas where agro-climatic conditions limited both actual and potential yields. Inadequate use of certified seed, outmoded cultivation and seeding practices and poor weed control and fertilizer use also reduced yields and lowered the profitability of wheat production in more fertile areas. Farmers choose to produce wheat rather than more profitable crops nevertheless, in order to be food self-sufficient.

³ These categories do not correspond exactly to the preceding classification in that mixed households include both part-time farmers and rural residents.

Forage and Fodder Crops

A significant area is planted to forage and fodder crops to support livestock production. In addition to maize, large areas are planted to clover, alfalfa and legume mixes; these areas have increased steadily since the war (Table 12). Much could be done to increase the contribution that these crops make to livestock production through the introduction of new varieties and improved utilization and conservation techniques. A wider range of fodder crops is also needed, such as brassica and root crops that are suited to more intensive livestock production systems in the lowland areas.

Industrial Crops

Industrial crops were never a major component of crop production in FBiH, with only 2 percent of the area cultivated before the war (Table 8). Tobacco, soybean and sugar beet were the main crops and yields were low by western European standards. Current production is negligible due to the lack of processing facilities, most of which either collapsed after the war or are located in RS. Tobacco, which is grown in three of the ten cantons, is now the only industrial crop. There is considerable scope to expand production of oilseed crops for livestock feed, but post-war output will depend on access to processing facilities and the on-farm profitability of oilseed crops.

Vegetables

Vegetables are an important component of the production system (Table 9), accounting for approximately 20 percent of the total area cultivated. Potatoes grown in the hilly-mountainous areas are the third most important crop (after maize and wheat) in FBiH. Other vegetable crops are grown in the lowland areas close to urban markets and/or processors, with beans, cabbage, onions, tomatoes and green pepper most prominent. Yields are very low by western European standards, particularly for potatoes (Table 6).

General conditions favour vegetable production, especially in those lowland areas where the land/labour ratio is very high. Varied agro-climatic conditions and the potential for low-cost irrigation allow production of a wide range of crops. Rural labour is abundant, wage rates are low and there is a strong domestic demand for local produce. The relatively low demand for working capital, ready cash income and the limited need for farm machinery also make vegetable production well suited to those farmers who are trying to re-establish after the war. Post-war recovery has thus been strong, except for potato production that is constrained by a shortage of improved seed. Further growth in production will require a significant increase in competitiveness, based on higher yields and efficiency and the introduction of improved varieties. Attention should also be given to the introduction of "ecological" production systems to exploit the clean soils of FBiH.

Berry Fruits

A profitable berry fruit industry operated before the war, producing 10,000 mt annually (Table 10). Twenty percent of this crop was exported to high-value markets in Europe. Some 60 percent of the pre-war area of 600-700 ha was damaged during the war.

Berry fruit production is ideally suited to the agro-climatic and economic conditions in FBiH. It generates high returns, has a high demand for seasonal labour, creates rural employment and is export-oriented. On-farm investment requirements are moderate and returns begin in the first year of investment. But significant associated investment is needed in processing facilities and cool-stores

and a considerable effort is required to develop exports, both to re-establish former export outlets and to increase added value (pre-war exports were mostly chilled raw fruit sold to European distributors).

Fruit

Pre-war fruit production was dominated by plums which accounted for two-thirds of all trees and half of output (excluding grapes and walnuts). Apples and pears accounted for a further 23 percent of trees and 33 percent of fruit production (Table 11). Pre-war yields were low by western European standards due to inadequate use of plant protection and fertilizer. Market competitiveness was also low owing to high production costs and outdated varieties. Lack of maintenance led to heavy losses during the war but the orchards are now being rehabilitated and production is recovering.

Long-term prospects for fruit production are favourable. Agro-climatic conditions are reasonable (despite occasional frost and hail), there is good potential for low-cost irrigation, a ready supply of low-cost labour and a strong demand for fresh and processed fruit on local markets. However, competitiveness will need to be improved significantly. This will require modern, more intensive management systems with better varieties and higher yields, and a change in the composition of output, with less emphasis on plums and more on pip fruit production. As with vegetable production, attention should also be given to the introduction of "ecological" production systems to exploit the clean soils of FBiH.

Medicinal Plants

Medicinal plants -- which are used for medicines, cosmetics and food additives -- are a high value crop with a growing world market. The geography and climate of BiH are ideal for these plants which are found only in regions within the 43°-46° latitude where the climate is moderately continental and/or partly Mediterranean. Over 400 varieties have been identified in BiH, of which 76 are recognized internationally. As the areas where they grow are free of agricultural chemicals, plant quality and value are particularly high. Currently these plants are harvested in their natural habitat, but there is also potential for commercial production. Most of the output is exported, typically as raw plant material to processing plants in Croatia and Slovenia.

Viticulture

Most of the vineyards of BiH are in the Mostar region on an area of 5,000 ha beside the Neretva river. The pre-war industry was controlled by HEPOK, an agrokombinat which owned 40 percent of the vineyards, produced about 96 percent of commercial wine and was the sole marketing agent for domestically produced wine. Around 80 percent of this wine was sold on the domestic market and the balance was exported to Croatia. A small group of privately owned cellars, with a combined area of 30 ha, were also allowed to sell directly. The remaining 3,000 ha consisted of small (0.3-0.4 ha) private-sector vineyards which produced wine for their own consumption. War damage halved the total area under production; trellis systems were damaged, vines were left untended and died, and most of the irrigation systems were destroyed. Most of the nurseries and rootstocks were also destroyed.

Approximately 3,000 ha is needed to meet future domestic requirements. The associated cost of replacing and upgrading vineyards, nurseries, laboratories and wine-making equipment is estimated at US\$100 million. Substantial donor and government support for this investment is unlikely given the limited public resources available and the relatively small contribution that the

sector makes to production, employment and exports. Modest donor support could be given to nurseries but most of the investment will need to be financed by producers and processors.

Farm Mechanization

The farm machinery complement in pre-war BiH included some 60,000 tractors and 32,000 cultivators, equivalent to 17 ha/tractor. Although this is a high level of mechanization by modern standards, farmers consider it inadequate. Their point of reference is the number of farms with adequate machinery not the number of machines per hectare. About 80 percent of tractors and implements were of the IMT brand, produced under licence in Belgrade. This near monopoly led to a high level of standardization that in turn helped farmers and service outlets develop a strong body of skills for operation and maintenance. It also inhibited the introduction of alternative cultivation technologies.

More than sixty percent of all tractors and equipment were lost during the war, either directly or due to progressive deterioration and lack of replacement. The emergency reconstruction programme has replaced around 12 percent of cultivators and 1 percent of tractors. But the real need is to improve the efficiency of farm mechanization. Outmoded, pre-war equipment should be replaced and cost-effective systems established for sharing and hiring farm machinery.

4.4 Livestock Production

Conditions in FBiH are well-suited to semi-extensive livestock production. Some 250,000 ha of improved pastures and meadows provide grazing and hay for winter feed and a further 500,000 ha of natural pastures in high altitude areas provide seasonal grazing in the summer months (Table 1). Most of the natural pastures are state-owned, with grazing rights allocated according to local custom. Traditional management practices markedly reduce the quantity and quality of the hay and grazing from meadows and improved pastures, to the detriment of animal nutrition and production. Forage and fodder crops (mostly maize, alfalfa and clover) supplement the pasture resources (Table 12). An important livestock industry has been built on this resource base, with dairy production as the dominant enterprise.

Pre-war livestock policy emphasized measures to increase production on the large state farms. Animal breeding programmes were thus the main policy focus and the modern, intensive production systems used were viewed as the model for all livestock production. This approach was of limited value to the low input, small-scale farms that dominate livestock production. Poor animal nutrition rather than poor genetics was their basic constraint. Per animal performance on these farms thus remained very low (Table 6).

Restoration of the pre-war herds of cattle, sheep and pigs is also a major issue for the livestock sector, as war-related livestock losses were very high (Table 5). Although donors have allocated significant resources to this need already, the expensive, high quality animals imported for reconstruction projects have had a limited impact on production. Most were distributed to poorer, non-commercial farmers for humanitarian reasons and the numbers are small relative to total needs. They represent a significant addition to the genetic base nevertheless, particularly given the heavy war-related losses of high-performing exotic breeds.

Cattle

Small-farm cattle production is characterized by small herds and seasonal milk supply. Of the farmers who owned cattle before the war, 60 percent had only one cow, 30 percent had two and less

than one percent had five or more cows. Most cows are a mix of the local Busha breed with Grey Tyrol, Brown Swiss or Simmental. Performance is very low (Table 6) due to poor nutrition, especially during the winter, late weaning of calves and slow rates of genetic improvement (only 32 percent of farmers use AI). Nevertheless, gross-margin analysis indicates that small-farm cattle production is profitable and the milk income improves household cash-flow. The 10 state-owned dairy farms had herds of 400-1,700 cows, mostly imported Holsteins and achieved production levels close to those obtained in western Europe (Table 6). Animals were housed all year round and fed on green-cut in the summer and hay or silage in the winter. War damage to these state farms was severe. Half of the livestock were lost and buildings and plant were heavily damaged.

Re-establishment of the dairy herd will depend largely on livestock retention and private sector imports, as donor support will not meet the full cost of herd replacement. Hence, it could take more than 10 years to rebuild the herd to 225,000 cows, the level which FBiH policy makers consider as a minimum. Future livestock policy should thus ensure that farmers have adequate incentives to retain young heifers, the resources to retain or buy them and the ability to import breeding stock free of tariffs and without unnecessary bureaucracy. Support measures should also be directed only to those farmers who have larger herds and a commercial orientation.

Sheep and Goats

The local "Pramenka" breed accounts for 80 percent of the sheep flock, supplemented by Pramenka-Merino cross-breeds and the small Humnjacka sheep of southern Herzegovina. Ninety-five percent of production takes place on small, private farms and low-input management systems predominate. Ninety-three percent of pre-war farms had flocks of less than 20 sheep and less than 1 percent had flocks of more than 100. Most income is derived from meat (80 percent) and high-quality cheese (15 percent), for which there is a strong demand on local markets and long-term export potential. The coarse Pramenka wool is typically heavily cotted due to poor (winter) animal nutrition and consequently is of little value.

Sheep production has long been falling in BiH. Total sheep numbers fell from 4.0 million in 1939 to 1.3 million in 1990 as the marginal hill and mountain areas that were the traditional domain of sheep production were steadily abandoned. There was also little concomitant improvement in the historically low levels of animal performance. War then accelerated this decline and sheep numbers in FBiH fell from 650,000 in 1990 to 236,000 in 1996. As profitability is low, sheep production is unlikely to recover to even pre-war levels unless performance and returns improve significantly. This will only come through major changes to production systems and better marketing of meat, cheese and wool.

Goat production was traditionally practised by poorer farm households, which grazed small flocks (15-50 animals) on unused land. The pre-war population is estimated at 40,000 head, most of which were in Herzegovina. These were typically a cross between the domestic Balkan goat and milking Saanens and were used for milk and meat production. The post-war population of 30,000 goats has been the focus of renewed interest in FBiH as these animals thrive in more marginal areas and have lower capital requirements.

Pigs and Poultry

As pig and poultry production is well-suited to large-scale, intensive management systems a higher proportion of pre-war production occurred on state farms. Of the 10.6 million poultry in BiH in 1991, 44 percent were owned by four large state production and breeding centres. However, their average production was well below western European standards (Table 6). Four large state farms also accounted for 20 percent of pre-war pig production, with production levels comparable to those

obtained in western Europe (Table 6). Among the small-scale farmers, some 50,000 households owned pigs before the war, typically with two sows producing 10-15 weaners/sow/year. Most small farms have poultry but production is also very low.

Marked differences have already emerged in the pattern of post-war recovery for non-ruminants in FBiH. Poultry production has grown quickly in response to strong local demand and numbers already exceed pre-war levels (Table 5). Pig production continues to decline, due to the low demand for pork in post-war FBiH. Poultry will dominate non-ruminant livestock production in the future but further growth will depend on the price and availability of animal feed, most of which is imported.

Fish and Honey Production

The pre-war resource base for fish production in BiH comprised 20,000 km of rivers and streams, 18,200 ha of reservoirs, 400 ha of natural lakes and 18 km of coastline on the Adriatic Sea. There are 160 fresh-water species, of which 10 percent are harvested. The fresh-water catch of 4,620 tonnes, 76 percent of which came from state enterprises, was sufficient to meet 39 percent of domestic consumption of 2.6 kg/capita. Little is known about the post-war status of fish production in FBiH. Pre-war experience suggests that much can be done to improve output however, through the introduction of modern feeding systems, improved health protection for fish stocks and better processing technology.

Apiculture is most commonly practised on a small-scale, with 80 percent of apiarists owning less than 5 hives. Production in BiH in 1991 was 594 tonnes honey from 69,000 hives (8.6 kg/hive), which was insufficient to meet domestic demand. The industry has largely recovered from the war with production in FBiH in 1998 of 791 tonnes honey from 69,500 hives (11.4 kg/hive). Further support is needed to sustain and boost this recovery.

4.5 On-Farm Constraints to Increased Production and Profitability

A wide range of on-and off-farm constraints cause the low levels of farm production and profitability in FBiH. The core on-farm constraints identified below are among the most tractable of these problems, especially on small-scale farms.

Crop Production

- Management systems emphasize food self-sufficiency rather than comparative advantage. This leads to production of food crops that are not suited to local agro-climatic conditions and so generate very low returns. Production of more profitable cash crops, which are well suited to local conditions, is thus minimal.
- Inadequate use of improved varieties and certified seed, particularly for cereals, potatoes and fruit.
- Where improved varieties are used, they are not always suited to local agro-climatic conditions (cereals) or consumer tastes (fruit).
- Inadequate use of the potential for producing a more diverse range of crops.
- Sub-optimal use of fertilizer and plant protection.
- Outmoded cultivation practices (based on deep-ploughing) and excess seeding rates (especially for wheat) which raise production costs and reduce profitability.
- Inadequate access to low-cost mechanisms for hiring or sharing farm machinery.
- Inadequate use of low-cost irrigation systems.

Livestock Production

- Poor use of available pasture and meadow resources. Hay is harvested late (in order to increase bulk), which reduces digestibility and protein content, fertilizer is never used to boost pasture production and there is inadequate livestock water in mountain pasture areas.
- Inadequate use of protein supplements, especially during winter and for young stock.
- Late first calving (> 30 months) and long subsequent calving intervals (18-24 months).
- Late weaning of calves, which reduces income from milk sales.
- Limited use of AI or improved sires.
- Low per animal performance for poultry and pigs.

Many of the technical solutions to these problems are straightforward and are well-known to national experts. Yet, widespread implementation of these solutions will not be easy to achieve, especially in the short-term. Technical progress will be minimal unless it is preceded by fundamental changes to the pre-war approach to agriculture policy and to the institutional base for extension, research, and plant and animal improvement and selection.

V. AGRICULTURAL POLICY

5.1 Public Expenditure on Agriculture, Forestry and Water Systems

Total public expenditure on agriculture in 1998 was DM19.7 million, of which DM14.3 million was from the central budget for the MAWMF and DM5.4 million from the canton budgets. Projections for 1999 are for a decline in the central budget allocation to the MAWMF, to DM9.1 million and an increase in the canton budget. The increase in canton expenditure demonstrates their desire to play a greater role in agriculture sector development, in addition to their responsibility for regulation and monitoring. Much of the entity-level MAWMF budget is used for producer subsidies for milk and tobacco and for crop insurance payments. In the 1999 MAWMF budget milk subsidies will account for an estimated 57 percent of expenditure (DM5.2 million), and tobacco subsidies for an estimated 24 percent (DM2.2 million). There is no provision in the MAWMF budget for expenditure on agriculture research or extension. In addition to direct public expenditure on agriculture by the MAWMF and canton governments, a further DM2-4 million is spent each year by the public agency responsible for strategic reserves, to purchase wheat.

Consolidated public expenditure on agriculture is low, in both absolute terms and as a proportion of total public expenditure (one to two percent). In comparison, the agriculture sector accounts for approximately 11 percent of GDP and 10 percent of the economically active population. However, tight budget restrictions and the focus of public expenditure on defence, support for war victims, and the re-establishment of health and education systems preclude any significant increase in the proportion of public expenditure allocated to agriculture in the medium-term. Nominal expenditure on agriculture should be increased nevertheless. If economic growth meets current projections, total expenditure on agriculture from the MAWMF and canton budgets could be increased to DM50 million by the year 2006 without exceeding 2 percent of total public expenditure and allowing for total public expenditure to fall to 30 percent of GDP. Support for agriculture extension and research should have priority for any such increase in the agriculture budget, plus continued support for milk production.

5.2 Post-war Recovery, Re-integration and De-mining

As with all parts of the economy, the agriculture sector has a responsibility to support post-war recovery. However, the cost of recovery far exceeds the means of both donors and government. Agriculture policy can best assist this process by initiating and supporting measures that help farmers increase incomes. In this context, support for the replacement of physical losses (livestock, farm machinery, buildings, equipment) is best effected through credit and extension programmes - measures which apply with or without the effect of war. Opportunities for non-farm employment should also be created as a means to increase non-farm incomes.

Support for the return and re-integration of rural people should be implemented jointly with other ministries, not by the agriculture sector alone. The total cost of this process for all BiH is estimated at US\$3-4 billion, of which donors are now seeking to raise US\$520 million. Implementation is being coordinated by the OHR-chaired Reconstruction and Return Task Force (RRTF), with the support of the entity governments. As of May 1999, there were an estimated 400,000 displaced people and 250,000 refugees who had yet to return to their homes in FBiH (UNHCR, 1999). Although a high proportion of these people are from rural areas, the agricultural sector has yet to evolve a clear set of policies for contributing to their return and re-integration. Definition of these policies should be based on the following lessons learned by the RRTF to date:

- Approximately half of all returning people have re-located to areas other than their original place of residence. Their decision to re-locate is in keeping with the Dayton Accord which stipulates that each citizen of BiH has the right to choose his/her place of residence in a free and informal manner.
- The decision to re-locate is driven by both war-related factors and longer-term demographic trends, including the pre-war movement of rural people to urban areas. Continuing this trend, a large number of displaced people and refugees from rural areas will probably re-locate to urban areas - particularly younger people and people from more isolated, low productivity farming areas.
- Economic assistance is crucial for re-integration but has little influence on the choice of people to re-locate or return to their place of origin. Hence, economic assistance should generally follow rather than precede the movement of people.
- Political environment and security are the main factors that influence where people choose to live. Where these are satisfactory, employment opportunities and accommodation become the main obstacles to successful return and re-integration. But people are not returning to areas that have limited economic prospects.
- Support should be directed to all people involved in the re-integration process, including residents who remained in their homes during the war, in order to minimize the widespread resentment of residents against returnees.

These insights suggest that rural credit, farm extension and employment creation programmes are the most appropriate means to support return and re-integration. These measures are basically demand driven and so follow rather than lead the movement of people. Demand is highest where land is productive and economic opportunities are strong and these programmes are equally accessible to all people involved in the re-integration process (residents, returnees and re-locating families).

In its current “Action Plan”, the RRTF also recognizes the importance of measures to ensure that returnees have secure ownership or use rights to the land they occupy, that these rights are recognized and respected by law, and that returnees are able to buy and sell land freely and fairly throughout BiH. Such measures have particular relevance to rural land in that they help create an appropriate incentive structure for farmers to use their land productively and sustainably and encourage long-term investment.

Currently, land abandoned during the war is leased to both resident and re-locating farmers by municipal authorities. These leases typically give the lessee a temporary use right at a nominal rental and are a valuable means of keeping land in production and preventing it from deteriorating. A longer term solution is now needed, based on returning this land to its former owners or transferring it to new owners. The Dayton Accord provides for a Commission for Real Property Claims (CRPC) administered Property Fund to assume this role, but it has yet to be established. Hence the onus is on the international community to either set this fund up or to identify and establish alternative mechanisms for effecting these land transactions.

A clear agriculture policy response to the tragic problem of land mines in rural areas has yet to be developed. It is estimated that there are 17,000 mine fields and some 750,000 land mines remaining in BiH. Approximately 75 percent of these mines are in F BiH, causing 30-35 accidents per month, mostly to rural people. They also render 237,000 ha (27 percent) of prime agricultural land in F BiH unusable. As urban areas and infrastructure have priority for current de-mining activities, only 1,645 ha of rural land had been de-mined by the end of 1998. At this rate of progress, and with

current de-mining costs of US\$2.5-3.0 million/100 ha⁴, it would take another 240 years and US\$6-7 billion to de-mine rural land in FBiH.

The immediate need is to prioritize areas of agriculture land to be de-mined and to secure better access to available funding. A recent FAO study has prepared a workable mechanism for identifying high priority agricultural areas for de-mining based on land quality, population density, the importance of agriculture as a source of income to local people and the extent to which de-mining will facilitate the return and re-integration of DP's and refugees. These criteria were reviewed and accepted by all relevant levels of government and donor agencies and were used to identify an initial 400 ha of agricultural land for future de-mining. The study recommends that a permanent unit be set-up within the MAWMF to effect land prioritization, secure funding and monitor de-mining activities.

While the establishment of this structure will address the current lack of progress, it will not overcome the fundamental problem - inadequate financial resources available for de-mining. Even a relatively modest programme to de-mine 2000 ha per year would cost US\$50 million annually at current prices, as compared to the US\$30 million which will be spent on all de-mining operations (urban and rural), during 1999. The difficulty of obtaining even this level of financial support means that land mines will remain a risk to human life and a constraint to agricultural production for a long time.

5.3 Land Policy

In a country where agricultural land is scarce, policies that promote optimal land use are fundamental to the future of the agricultural sector. Current policy remains largely as it was before the war, with a strong emphasis on private land ownership - an emphasis that is well suited to the operation of a market economy. Approximately 90 percent of agricultural land in pre-war BiH was owned by individual farmers, six percent by state farms and four percent was managed by farm cooperatives. Unimproved pasture land, although typically state-owned, is mainly used by private farmers. Current policies pertaining to land use are less well suited to a market economy, particularly those policies that affect farm structure, land taxation and land conservation.

The over-riding land policy issue is a farming structure characterized by small, fragmented farms, which contributes to the low level of farm productivity and limits the ability of farmers to adopt modern management systems. The pre-war policy response to this issue was based on land consolidation programmes to reduce land fragmentation and support for farm cooperatives as a means of creating larger farming entities. But these policies have had limited impact. Land consolidation programmes, although well designed and executed, led to the consolidation of only 31,826 ha of land in FBiH (2.5 percent of farm land) by 1990. Moreover, such programmes do not increase farm size. Farm cooperatives accounted for only four percent of farm land use in BiH in 1990, 85 years after they were introduced. The high level of unused agriculture land (22 percent of arable land, 220,000 ha, was left uncultivated in 1990) is a further constraint to optimal land use, a result of the migration of rural people to urban centres and their abandonment of farming.

Minimal use has been made of land markets to address these issues. Land sales and leasing were permitted but not encouraged in pre-war BiH. Indeed, prior to 1980 it was illegal for farmers to own more than 10 hectares of land. Land sales were also subject to a high tax of 15 percent of sales value, which inhibited land market activity. Inheritance rather than land sale was thus the main mechanism for transferring land. Unfortunately, this tends to increase land fragmentation due to inheritance laws and customs which facilitate the division of land between beneficiaries rather than encouraging its transfer to one person. As a result, less than four percent of all land changed hands

⁴ Current de-mining costs range from US\$2.5-3.0/m² depending on terrain, density of vegetation, residual metal content in the ground, and the number of land mines discovered.

annually before the war, most of it by inheritance, with little consequent scope of improving farm structure through land market mechanisms.

Farm structure is difficult to change quickly, especially in countries such as FBiH where land ownership has strong social connotations. Experience in western Europe suggests that it will take at least a generation to double average farm size. But public policy can do more to improve farm structure than it has in the past. Active land sale and rental markets should be promoted as a means of increasing farm size and farm consolidation, in addition to land consolidation programmes and the formation of producer associations. Inheritance laws should also be modified to prevent further land fragmentation.

The current system of cadastral taxation, in which land taxes are assessed on the basis of land quality, should also be reviewed. Cadastral taxes were introduced in Europe to raise tax revenue at a time when agriculture was a major part of the economy and land quality was the major determinant of agricultural output. But agriculture now accounts for only 11 percent of the economy, modern management techniques (fertilizer, irrigation, drainage etc.) allow farmers to adjust for deficiencies in land quality and location relative to roads and markets can be more important to agricultural output than land quality. Cadastral taxes as the basis for raising local government revenue thus focus on a relatively small component of the overall tax base. A broader system of property taxation based on either rental values or capital values may be more appropriate in post-war FBiH.

Land and water conservation are the major environmental issues for land use policy. There is a strong awareness of this imperative in FBiH as around 538,500 ha (20 percent) of agricultural land has suffered some environmental damage. Of this area, around 90,000 ha is agricultural land taken out of production before the war for mining, roads, human settlement, industry etc. War damage (trenches, fortifications etc.) accounts for a further 10,000 ha and 180,000 ha has been polluted by the impact of roads and power stations. The cost of recovering these areas is probably prohibitive. Much more can be done to restore the remaining 258,500 ha which has suffered a combination of erosion and fertility loss as a result of poor management. Guidance on management techniques such as deep ploughing, green manuring, liming and crop rotations would assist this restoration.

Approximately 75 percent of the river catchments for former Yugoslavia are in FBiH, providing not only the basis for the hydro-electric power (HEP) industry but also a source of very high quality water. These catchments, as with much of the area of FBiH, are vulnerable to erosion as a result of high rainfall and the steep slopes which characterize most of the country's topography (80 percent of the total area has a slope > 13 percent). Past management of these areas has been good, with careful attention to the maintenance of forests and the management of hill and mountain pastures. Unfortunately, indiscriminate logging now threatens these areas. New legislation to control forest off-take rates is proving difficult to enforce given limited public resources and the risk of land mines in many forest areas.

This broad agenda, plus the issues of de-mining and resettlement, suggests the need for a comprehensive review of all aspects of land policy and the institutions responsible for land policy implementation. Priority issues include the management of abandoned and de-mined land, the strengthening of land markets, and the preservation of rural land, forest and water resources.

5.4 Agricultural Trade

Most agricultural products fall within the five percent and 10 percent tariff bands specified by new trade laws (Table 13). These are modest levels of protection by any standards and will do much to facilitate the recent application for membership of WTO by the government of BiH. Leaky borders and the consequent inability to enforce these tariffs are the major trade issues and donors are working actively with government to address these problems.

Beyond these general imperatives, there are two anomalies in the existing tariff structure which prejudice growth of the agriculture sector and which need review. Of these, the five percent tariff on breeding cattle is the most important as it will raise the cost of re-building the national herd, which is a key element of sector development. This tariff should be reduced to zero. The system of tariffs applied to livestock feed further prejudices both livestock production and domestic livestock feed manufacturers. Livestock production costs are increased significantly by the 10 percent tariff on maize grain (the major component of livestock feed), which reduces the ability of domestic beef and veal to compete on domestic and export markets. This anomaly also reduces the ability of domestic animal feed manufacturers to compete with imported feed, which is subject to zero or five percent tariffs. For these reasons the tariff on maize grain should also be reduced to zero.

Official foreign trade data suggest that agricultural products accounted for approximately 20 percent of total imports and 10 percent of total exports in 1998 (Table 14). In line with other sectors of the economy, agricultural imports and exports have both increased relative to 1997, with export growth especially strong. Sugar, fresh fruit, processed milk, poultry meat and wheat are the major agricultural imports by value; fresh and processed fruit and vegetables and meat are the major exports. Most current foreign trade is with Croatia, Hungary and Slovenia.

Inter-entity trade is still weak despite the introduction of new vehicle licence plates and widespread use of the convertible marka (KM). Official data for the period April-June 1999 suggest that food products are the most important single component of inter-entity trade however, with 15-20 percent of the total value. Both entities recognize the need for additional, more specific measures to strengthen inter-entity trade.

5.5 Agricultural Prices

Producer price policy consists of a guaranteed floor price for wheat, supported by public purchases, official "minimum prices" for 12 other commodities, which are not supported by direct market intervention (Table 15) and some producer subsidies. There are no input subsidies. The wheat floor price was reduced from DM450/tonne to DM300/tonne in 1999. Most of the official "minimum prices" were also reduced, with the exception of those for tobacco, beans, and broilers. Producer subsidies are currently set at DM0.13/litre for milk and DM0.88/kg for tobacco, but the milk subsidy is likely to be reduced for 1999. There are no direct controls on consumer prices although the Reserves Agency has the power to intervene in markets to "stabilize" prices as it deems necessary.

Ostensibly, current price policy provides additional incentives to maize, wheat and dairy producers, in that official prices for these commodities are above import parity (Table 15). In fact, very low marketed surpluses for maize and wheat, both before and after the war, suggest that the impact on production is minimal. Milk production appears to be more responsive to price incentives, although the immediate constraints to increased output and sales are inadequate collection systems and the inability of dairy companies to pay for milk in a timely manner. Current producer prices exceed official minimum prices for all other "protected" commodities - often by a substantial margin.

Although the level of intervention in agricultural markets is relatively low, there is a need to reform agriculture price policy. The floor price for wheat and official minimum price for maize have had no impact on marketed surplus and the official minimum prices for other commodities are no longer necessary. Import tariffs provide a more effective mechanism for protecting producer prices. Tariffs also transmit price signals in a more transparent way and allow prices to vary between regions and over time in a manner which facilitates private sector storage and trade. Their use as the principal means of supporting producer prices is also more consistent with budgetary limits.

The allocation of such a large portion of the total MAWMF budget to price support for tobacco is also difficult to justify given that tobacco production is a small part of the agriculture sector. These budget resources should be used to benefit a much larger group of producers by allocating them to activities such as research and extension. Future support for tobacco producers should come from the canton governments where tobacco is produced, preferably through the use of extension and marketing services.

Future agriculture price support policy should focus on the key commodities of wheat and milk. Import protection should be the basis for supporting all other agriculture commodities and additional price controls should be phased out.

As there is minimal control of consumer prices, retail price trends are indicative of underlying market conditions. Consumer prices for food and agricultural products fell significantly after the war and have been relatively stable since 1996 - in contrast to a gradual increase in the overall retail price index from 1996-1999. However this apparent stability masks some significant shifts in relative prices. Retail prices for animal products have generally increased during the period 1996-1999 and, with the exception of lamb and eggs, are now at or above pre-war prices in 1990 (Table 16). In contrast, most current fruit and vegetable prices are well below 1990 prices and have been constant or declining slightly since 1996. These trends send two important messages to producers: first that there is a strong demand for moderately priced animal products and second, that post-war fruit and vegetable production will need to become more efficient to be competitive with imports.

5.6 Public Reserves

Continuing pre-war policy, the public sector is responsible for the acquisition, storage and disposition of strategic commodities, including wheat, flour, edible oils and sugar. This involves the purchase of wheat in order to support the wheat floor price. The public sector also has the power to intervene in non-strategic commodity markets in order to stabilize retail prices. To this end, it monitors domestic and international prices and intervenes whenever domestic prices depart significantly from "normal" retail prices (i.e. border price plus import protection). Post-war use of this mechanism has been limited.

An entity-level Reserves Agency was set up to continue these activities after the war. Its facilities include commodity storage for 500,000 tonnes, of which 300,000 tonnes is silo space for cereals⁵. The acquisition and storage of most strategic stocks was financed by the Ministry of Finance, but MAWMF also provided some funds for canton level activities. Although the underlying institutional structure was well articulated, a lack of funds limited the agency's level of activity. Beginning in July 1998 these responsibilities were decentralized and transferred to the canton governments, although a small entity-level operation continues. Total purchases in 1998 were 7,600 tonnes, of which 6,000 tonnes were purchased by the canton agencies, with approximately 6,000 tonnes to be purchased in 1999. Lack of finance thus continues to constrain the agency's level of activity.

Once political stability returns to the region there will be a need to review and rationalize the responsibilities and activities of the Reserves Agency. For instance, given that imported wheat can be at the border within 10 days, a smaller strategic reserve of 40-45,000 tonnes of wheat (one month's consumption) would be more than sufficient to meet FBiH's reserve requirements under stable political conditions. The post-war improvement of marketing efficiency and the free flow of imports and exports will also reduce the need for market intervention to stabilize prices. Indeed the pronounced stability of consumer prices during the last three years indicates that this role may

⁵ Part of this silo space is owned by state flour mills, with which the Reserves Agency works closely.

already be redundant. The relative merits of centralized versus decentralized reserve systems should also be considered in the medium-term.

VI. INSTITUTIONAL SUPPORT TO AGRICULTURE

Weakened by the war and preoccupied with the immediate concerns of survival, many public institutions have yet to change significantly.

6.1 Ministry of Agriculture, Water Management and Forestry

A separate Ministry of Agriculture, Water Management and Forestry (MAWMF) was established in 1996. Structurally it consists of four departments (agriculture, veterinary, water resources, and forestry), each with its own inspectorate, plus a legal and administration section. This structure is not well suited to implementation of its main future areas of responsibility: policy analysis, market information, monitoring and enforcement of plant and animal regulations, and stewardship of the natural resource base. The Ministry also needs to increase its capacity for the type of policy analysis necessary in a market-oriented economy. Currently it has an establishment of 90 people and a staff of 76 employees

6.2 Canton Government

The decentralisation of government in post-war FBiH has resulted in considerable autonomy for canton governments. Each of the ten cantons has its own agriculture department that is responsible for monitoring, regulation and the collection of agricultural statistics. These activities are administered by a canton minister for agriculture, supported by inspectors for agriculture, veterinary, water resources and forestry and a small administrative staff. As before the war, most of the 89 municipalities employ an agricultural officer, an agricultural inspector, a veterinary inspector and a veterinarian. Approximately 350 people are currently employed within this system.

Canton governments will have an important role in agriculture sector development, particularly in the establishment of services such as agriculture extension and the management of rural development programmes to increase rural employment. However considerable support is needed to strengthen their capacity to fulfil these responsibilities.

6.3 Rural Finance

Pre-war (public) rural finance consisted of primary emissions from the Central Bank for working capital, plus investment funds for agricultural development which were financed by special taxes. Most of this finance was distributed through the state-owned (Belgrade-based) Agrobank of former Yugoslavia, based on "credit needs" estimated by government ministries. State-owned farms and agro-processors were the main beneficiaries of this system of rural finance and, to a lesser extent, agricultural cooperatives. Small-scale private farmers had minimal access to either public or private sources of finance.

The post-war collapse of these state institutions and the commercial banking system has made rural credit very scarce and expensive. Donor programmes are thus the major current source of rural finance and will remain so for the medium term. These programmes operate at two levels: loans of DM40,000 to DM1 million for small-medium scale enterprise provided by the World Bank and USAID, and micro-enterprise loans of DM2,000 to DM50,000 provided by the World-Bank, the EBRD-backed Micro-Enterprise Bank and NGOs.

There is a need for review of the terms on which donor credit is provided. The large loan programmes provide credit for two to three years, with a six to 12 month grace period, and interest at nine to 11 percent (LIBOR plus four to six percent). The micro-credit programmes offer loans for up to three years at 10-30 percent interest, with no grace period. To improve cash flow during the first 12 months of operation and so improve the viability of investments, donors should either allow for a grace period of 12 months or extend the loan term.

A comprehensive policy on rural finance in FBiH has yet to be articulated. It is clear from experience elsewhere in Europe however that no single financial institution can meet all the needs for agriculture. Sustainable agriculture sector development requires a broad-based system of rural financial institutions which has the capacity of meeting the differing needs of small and large-scale farmers, agri-business and agro-processors. Pursuit of this objective should be based on strengthening the capital base and institutional capacity of domestic financial institutions such as the FIB (Box 1) and the commercial banks, promoting the entry of foreign financial institutions, such as the Raiffeisen Bank, which have expertise in rural credit, and establishing village credit unions to provide credit for small-scale farmers. It should also complement the reform of the banking system and its emphasis on restoring public confidence and creating viable, private-sector financial institutions. The system of rural financial institutions to be established through this process is presented in Figure 1.

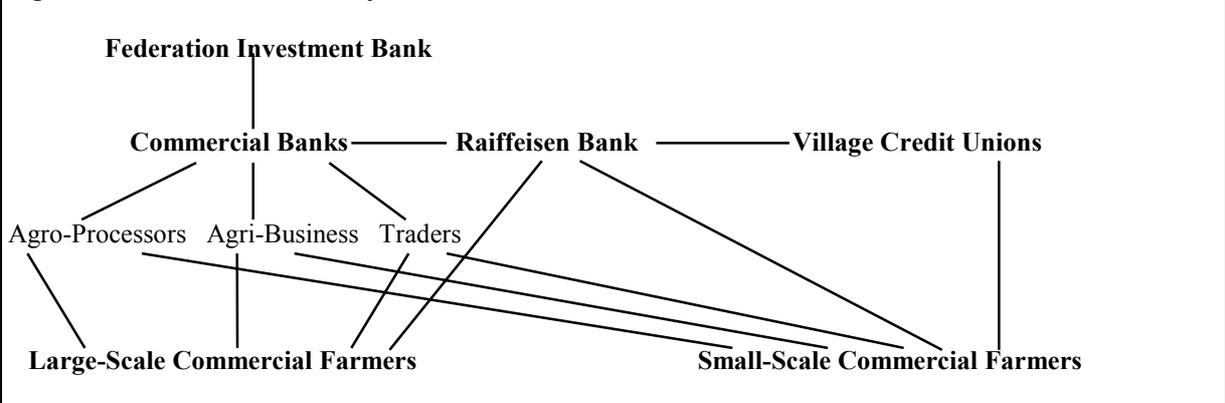
Box 1.

The Federation Investment Bank (FIB)

The FIB was established in January 1998 to provide long-term finance for investment. Seed finance was provided by the Ministry of Finance and the World Bank, but it is now attracting other sources of donor and commercial capital. Total capital had risen to DM130 million by mid 1998. Loans are made to selected commercial banks for on-lending to manufacturing, processing and agriculture. These loans range from DM10,000 to DM500,000 and are for two to seven years at an interest rate of around 10 percent (LIBOR + six percent). The commercial bank receives half of this interest (FIB the rest) and assumes the entire lending risk. With appropriate support from donors the FIB could become a vital source of medium and long-term credit for the agricultural sector and a key institution in the future system of rural finance. To fulfil this potential however the FIB will need to be fully privatized as soon as possible.

As restoration and reform of the commercial banking system will be slow, the establishment of a viable rural financial system will inevitably be a long-term process. Thus, demand for agricultural credit will inevitably exceed supply in the short to medium term and donor credit lines will remain critical to sector development.

Figure 1. *Framework for Rural Finance - Institutions and Financial Flows*



6.4 Land Use

Land is administered by the Office of Land Registration and Geodetics which is responsible for the surveying and registration of all immovable property, public and private. In principle, administration is based on two recording systems: the *Land Registry* which is the repository of all geodetic and legal information for each plot (location, area, use rights etc.) and the *Land Book* which records ownership, encumbrances etc. Both recording systems must be complete in order to have full information on any land plot, a requirement that was not met in the past. To improve administrative efficiency an attempt to combine the two systems into a single register was begun in 1984. But given the difficulty of reconciling the two systems and the problems created by war this could take a further ten years.

Current land administration is based on the Land Register, and a separate certificate of title is issued if a change of ownership cannot be reconciled with Land Book records. There are nevertheless many parts of BiH where individuals find it impossible to obtain proof of ownership, or are unable to register property transactions. Donor support has been mobilized to address these problems but more support is needed. In the long-term, the land administration system should also become self-funding based on revenue from fees for registration and the sale of information on land transactions and registration.

Further significant institutional problems associated with land use, as discussed below, include:

- Inadequate support for war-related land transfers and property compensation.
- The lack of institutional support for land market activity.
- The need for grassroots institutions which allow farmers to initiate and manage land development and maintenance at local levels.

The Commission for Real Property Claims (CRPC) was established under the Dayton Accord to help restore property rights and resolve the legal problems that obstruct return and reconstruction. It reports to the OHR and is funded largely by donors. Claimants must first prove ownership, upon which they receive a CRPC certificate that guarantees their property rights. This certificate provides a legal basis for all transactions should claimants wish to sell, exchange or mortgage their property. Thus far the CRPC has registered some 155,000 claims of an expected 250,000, of which 50,000 claims have been processed. Most of these claims apply to urban land. No compensation has been paid out and the CRPC has yet to become active in the process of property exchange.

Land markets have yet to play a major role in the post-war economy of BiH, whether or not people have CRPC certificates. In part this is a result of administrative and legal obstacles to land transactions, such as the current land registry system, the tax on property transactions and the refusal of courts in each entity to recognize public documents issued in the other. But it also reflects fundamental institutional constraints in the private sector: notably the lack of accurate, readily available information on land market transactions and the paucity of lawyers, valuers and property agents in whom people have confidence. Inter-entity land market transactions are especially difficult as a result of these institutional deficiencies. A well coordinated inter-entity approach is thus needed for all future measures designed to facilitate and regulate land market transactions.

The change to a market economy will create a role for many new private sector institutions, including those which allow groups of farmers to initiate and manage land development and maintenance projects that require cooperative action. Many land programmes currently implemented by local government could be transferred to such grassroots institutions, including drainage, irrigation and land consolidation schemes, and the management of common grazing areas. These institutions would operate at the municipality or canton level, subject to the control of canton and Federation ministries.

6.5 Agricultural Extension, Research and Education

The pre-war system of education, extension and research provided an adequate stream of academics, researchers and extension agents for government, state farms and cooperatives. A diverse set of public institutions (Table 17) ensured that these people were trained in temperate and Mediterranean production systems and supported a broad-based research programme. But this training and research was oriented towards the needs of state farms, which led to an emphasis on training specialists rather than general agriculturists and to research on the problems of modern, large-scale production systems. Measures to increase production were also given a higher priority than measures to increase profits. The small-scale mixed farms, which dominated agriculture in BiH, were thus poorly served. This highly fragmented institutional structure also impeded communication between education, research and extension and reduced operational efficiency.

War decimated this system, with significant losses to facilities and staff. The pre-war system of institutions has also been further fragmented along ethnic and political lines. Even worse, despite the limited availability of public finance, each entity has begun an *ad hoc* process of expansion and duplication of existing institutions. An independent university has been established in the Serbian part of Sarajevo to serve the eastern region of RS, university level training in agriculture has begun in Banja Luka and research stations are being established or expanded by FBiH in Tuzla and Bihac. This wasteful use of scarce resources weakens the entire education and research structure and will dissipate donor interest and support.

Renewal of this vital institutional resource will be difficult. New approaches to extension, research and education are needed to redress pre-war problems; and a more rational institutional structure is needed to make better use of the limited available human and physical resources.

Extension

As the state farms and cooperatives, which were the basis of pre-war extension services, have collapsed there is no current extension system. There is also no public finance for extension and, despite widespread agreement on the need for an effective extension service, an acceptable institutional framework has yet to be developed.

Future extension services should focus on the needs of small-scale farmers, while recognizing their limited ability to pay for extension. They should thus take two forms: low-cost private systems operated by producer associations and agri-business enterprises, or modestly-scaled, fee-based public services run by canton governments. Farmers will need to be involved in programme design but the general emphasis should be on crop and animal husbandry, marketing and profit maximization. Extension programmes must also be gender-sensitive and recognize the need to allocate household resources between farm and non-farm sources of income. Given the lack of public finance and institutional resources, farmer groups will be the most cost-effective form of service delivery. But even with this approach the short-term reality will be a modestly scaled extension service able to meet the needs of a relatively small proportion of rural households. A high priority should thus be given to those farmers most likely to respond to new management systems and to increase production, incomes and marketable surpluses.

Research

The diverse system of research centres in pre-war BiH ensured good coverage of all major ecological zones and cropping systems in temperate and Mediterranean conditions. Most were involved in animal research to some degree but it was strongest in Sarajevo. Links between these centres were weak, as the institutions in the Mostar region were affiliated more closely with Croatia

and those in RS with Serbia. Research publications and informal exchanges were the main forums for sharing information within BiH. Research focused on plant and animal breeding, even though crop and animal husbandry were the major constraints to production, a focus that was reinforced by state farm support for the research budgets of the Agriculture Institutes. Public funds and commercial seed multiplication and sales were the other sources of institute revenue.

There has been no public funding for research since the war began and no formal links between institutions. The main institutions continue to operate nevertheless, despite destruction of the Agriculture Faculty in Sarajevo and heavy damage in Mostar.

In order to serve small-scale commercial farmers, future research in FBiH should focus on crop and animal husbandry and constraints to increased farm profitability. Public resources for research must also be increased. Both these goals could be achieved by the establishment of an Agriculture Research Council to set research agendas and allocate research finance. This Council would be donor-financed initially and would include representatives of producers, agri-business, academia, extension and government. A new research centre for animal production should also be established as the basis for broadening and strengthening support to the livestock sector. This centre would also coordinate the dairy performance recording scheme, although research on animal husbandry would be given a higher priority than animal breeding.

Education

Responsibility for agricultural education is shared between the Ministry of Education, Science, Culture and Sports and canton and municipality governments (which finance and administer the schools). Some 20 percent of rural primary schools included agriculture in their curricula before the war but this has now stopped. The pre-war system of secondary and professional schools of agriculture continues to operate in FBiH, with a current capacity for 360 students. These schools have differing specializations, and train students for employment as farmers or agricultural technicians. A comparable system of veterinary schools provides training for 180 veterinary technicians. As all of the secondary and professional schools are constrained by inadequate materials and facilities these needs, together with teacher training, should be the immediate priority for support.

The University of Sarajevo established the faculties of agriculture and veterinary science shortly after World War II. By 1991, the Agriculture Faculty employed 210 staff and was attended by 1000 students. Undergraduate programmes were taught in crop production, animal production, fruit and wine production and food technology. Post-graduate study was available in numerous fields. The Veterinary Faculty employed 190 staff by 1991 and was attended by over 700 students. Elsewhere in pre-war BiH, approximately 100 students attended the Faculty of Agriculture at the University of Mostar. Many students also studied in Serbia and Croatia.

Anticipating the new direction of agriculture sector development, the Agriculture Faculty in Sarajevo has begun a far-reaching series of reforms. Three of the four technical specializations which were the basis for pre-war undergraduate education have now been combined into a general programme in agriculture. Business management and marketing are given a higher profile in the revised curriculum. Most specializations now begin at post-graduate level. These changes reflect the faculty's view that small-scale, mixed farms should be the target of future programmes and that students need a general training in all aspects of agriculture to respond effectively to this clientele. To implement these reforms the faculty has sought the guidance and support of numerous European universities. Further donor support is needed to continue this initiative.

Linking Education, Research and Extension

As measures to create strong links between education, research and extension must be an integral part of the institutional reforms described above, representatives of all three areas of interest should be involved in all stages of reform. Numerous measures must then be used to sustain these linkages: the extension service should be involved in the setting of research agendas and university curricula, research publications should be widely circulated to universities and extension personnel and extension agents should involve researchers and teachers in their meetings with producers whenever possible.

6.6 Plant Breeding and Seed Supply

No significant plant-breeding or seed multiplication capacity existed in FBiH before the war. Pre-war plant breeding programmes in BiH centred on wheat and maize seed at the Agriculture Institute in Banja Luka and potato seed at the Centres in Sokolac and Glamoc. Seed multiplication programmes were implemented jointly by these institutes and state farms. Both breeding programmes operated on a modest scale, however, as most plant breeding and seed multiplication in former Yugoslavia was done in Serbia and Croatia.

These traditional sources of improved, certified seed supply broke down completely during the war. FAO responded to this situation by providing seed early in the recovery process and subsequently by establishing a seed testing laboratory and introducing new laws on seed quality and plant breeders rights. All seed certification tests are now carried out according to ISTA (International Seed Testing Association) rules.

While varietal limitations and seed quality are a major factor in low crop yields, there is no immediate need to establish a plant breeding capacity in post-war FBiH. Seed demand rather than supply-side problems are more fundamental issues. Even before the war small-scale farmers preferred to use their own seed rather than certified, improved varieties. The public institutions responsible for ensuring that farmers have access to high quality, certified seed, need support nevertheless to adjust to post-war conditions.

Accordingly, new policies for seed supply are now being developed with the support of FAO. A broader base for seed supply will be established by importing from a wider range of countries and by encouraging private sector involvement in seed import, multiplication, processing and distribution. The official seed list is also to be upgraded and expanded to include a wider range of modern varieties suited to conditions in FBiH. Future government activity will be limited to seed testing, certification and quality control of domestically produced and imported seed. This approach needs further donor support to ensure that appropriate legal and institutional structures are established and maintained and that the varietal testing needed to expand the national seed list is adequately financed.

6.7 Animal Health and Breeding

Before the war some 600 veterinarians plus support staff were employed in BiH to control animal health, advise farmers on livestock health and husbandry and implement artificial insemination (AI) programmes. Some 110 of these were employed on state livestock farms. A further 150 government veterinary inspectors monitored and controlled the quality of livestock and animal products sold and consumed. Backed by wide-ranging legislative powers this veterinary service supervised most aspects of livestock production. In FBiH, war reduced this service to 400 veterinarians and support staff and 35 veterinary inspectors of MAWMF and the canton governments. Many of the laboratories, veterinary stations and clinics from which they operate are in disrepair and lack equipment, despite substantial support for reconstruction from GTZ.

Rather than recreating the pre-war system, the emphasis should now be on redefining the responsibilities of a public veterinary service and on creating a viable, private sector veterinary service. The privatization of veterinary services is a valuable first step in this process, but it will need to be supported by credit lines for working capital and new equipment. Future public responsibilities should be limited to monitoring and regulation.

Diagnostic and research support for the pre-war veterinary system were provided by three regional diagnostic laboratories (Sarajevo, Zenica, Brcko) and four Veterinary Institutes (Sarajevo, Tuzla, Mostar, Banja Luka) which focused on more serious and/or lesser known problems. The dispersed location of these facilities ensured good coverage of all major livestock producing regions in BiH. Inadequate post-war cooperation between Bosniak, Croatian and Serbian authorities has now compromised this coverage and exposed the livestock sector to increased health risks. Uneven support for post-war refurbishment has further prejudiced the quality and coverage of these services. This situation has led both entity governments to establish additional diagnostic and research facilities in order to be self-sufficient. Given the general adequacy of pre-war services and the shortage of finance for investment this is difficult to justify. Rather than duplicate existing facilities, the emphasis should be on finding ways to use them jointly.

A small cattle breeding centre at Banja Luka is ostensibly still responsible for the production, import and sale of semen for all BiH and for the collation and analysis of performance records for the dairy herd. A ban on commercially imported semen reinforces this role. War damage was minimal and the centre continues to operate but weak public support and lost markets (in FBiH) make survival difficult. Eighty percent of pre-war operating costs were met from public finance and the balance from semen sales. These sales and AI are still controlled by the veterinary service which buy the semen at subsidized prices for sale to farmers.

Farmer use of the dairy breeding service has always been limited, despite laws that made it compulsory. Although the dairy breeding programme and the use of AI began in 1955, only 25.3 percent of breeding cows were inseminated in 1990 and a further four percent covered by licensed bulls. State farms were the main recipients of this service. Current demand is even lower, due to the heavy livestock losses incurred during the war (especially on state farms), and the lack of cooperation between RS and FBiH.

In the short-term it is difficult to justify strong public financial support for this or any artificial insemination service in BiH. Farmer interest is low and national dairy production would increase more by improving animal nutrition. At a minimum, semen and services such as performance recording should be sold to farmers at cost. Once adequate import and quality control measures for semen are in place, the ban on commercial semen imports should also be lifted to broaden the base for genetic improvement. These measures would raise the cost of semen, however, recall that the low (subsidized) pre-war price did not lead to high levels of demand. Farmers should be able to buy animal semen and AI as any other farm input. The monopoly which veterinarians hold over these inputs should thus be removed. Programmes should also be developed to train technicians how to perform AI and qualified trainees should be licensed to provide this service on a commercial basis.

As with other aspects of livestock production, responsibility for breeding programmes and breed improvement will be transferred to the private sector. Within this context the strategy will support the establishment of commercial stud farms, as in western countries. This process will begin with privatization of the animal breeding programmes currently operated by the state farm reproduction centres. Those breeding operations that have the potential to be commercially viable will be given access to credit to help establish their operations. Once complete these changes will further increase farmer choice by giving them access to a range of private stud farms in addition to artificial insemination.

Future public sector involvement in animal breeding will be based on support for the new research centre for animal production and for the operation of the dairy performance recording scheme.

6.8 Agricultural Cooperatives

Agricultural cooperatives have a long history in BiH, although not in the form found in western countries. Prior to the war there were 72 such cooperatives in FBiH and 124 in RS, with approximately 30,000 founder members and 110,000 cooperants. They were promoted by government as a means of creating employment and to link small-scale farmers to the production and marketing operations of state farms. In 1990-91 they accounted for four percent of agricultural land use and seven percent of agricultural production.

These cooperatives were typically established by a small group of “founder members” who provided initial capital in the form of cash or property, often supplemented with land provided by the State. In pure economic terms the cooperative operated as a local agri-business and marketing agency, buying and/or marketing farmers’ products, providing extension advice and selling farm inputs. But any profits were used to create further employment, often by diversifying into retailing and processing activities. The cooperative’s services were available to anyone, with no requirement of becoming a member, and the people who used these services were referred to as “cooperants.”

These cooperatives are now struggling to remain operative. Farmers’ marketed surplus is negligible, market outlets are difficult to find for the limited surplus that is available and many traditional input supply sources are no longer accessible. They are, nevertheless, a potentially valuable core of small-scale agri-business enterprises with a good local knowledge of producers, production systems and experience in the acquisition and marketing of agricultural output and inputs.

Support for cooperatives should begin with restructuring, as their current structure is incompatible with either western cooperative activity or private enterprise. An initial decision will thus have to be made by founder members as to whether to become a western style cooperative or a private business. All options should be accessible and should receive active support from government and donors. Whichever option is chosen, support will be needed to reduce personnel, shed peripheral activities and for training in business management.

More generally, producers should be encouraged to work together on a wide range of production and marketing issues, but without any compulsion to form a cooperative. The only pre-conditions for establishing any form of producer association should be that members work together of their own free will and that they have equal rights.

VII. AGRICULTURE MARKETING AND AGRO-PROCESSING

Pre-war agriculture marketing and processing focused on the domestic market, with exports limited to processed fruits and vegetables and speciality products such as baby-beef, berry fruits and medicinal plants. State enterprises dominated, competing with imports from elsewhere in former Yugoslavia and a small private sector. Domestic markets will remain the focus in post-war FBiH, but demand will change due to lower incomes and different consumer preferences. Competition will also be more intense due to increased private sector activity and a wider array of trading partners.

7.1 Cereal Products

Wheat

Domestic production supplied 375,000-450,000 tonnes of total wheat consumption requirements of 550,000 tonnes in pre-war BiH. Less than one third of output was marketed, usually through agricultural cooperatives working together with state farms. The balance (200,000-300,000 tonnes) was imported from Serbia and Croatia. Pre-war milling capacity was adequate (455,000 tonnes for BiH, operating at 70-80 percent of capacity), most of it derived from 19 large mills owned by the five major agrokombinats (Table 19). A Wheat-Millers Association formed by these mills organized wheat imports to profit from economies of size and discounts on purchases and transport. Sales of flour and bakery products were channelled through the marketing outlets of the respective agrokombinats, which also owned most of the 20 major bakeries. Small private, urban bakeries provided strong competition for the agrokombinat bakeries, due to their more accessible location and consumer-oriented output. Output from the agrokombinat bakeries fell by more than half from 1986-1991 as a result.

This structure collapsed during the war. The marketed surplus disappeared, along with traditional import sources for wheat and flour. The agricultural cooperatives and state farms collapsed, disabling the assembly process and three of the large-scale state mills (all in FBiH) were heavily damaged. Food aid wheat and flour allowed the remaining mills and bakeries to continue operation but capacity utilization was very low.

Post-war wheat production in FBiH is half of the equivalent pre-war level and only six percent of output (5,000 tonnes) was marketed in 1998. Given the low current on-farm returns to wheat neither output nor marketed surplus are likely to increase quickly. A significant processing capacity remains (267,000 tonnes), with four of the eight pre-war mills still in operation and two small new private mills. Four more private mills are under construction. In the absence of local supplies, most wheat is now imported from Hungary and Croatia, with imports arranged by the mills on an individual basis.

Post-war wheat demand for FBiH is difficult to estimate. Although the population has fallen by 15 percent, per capita consumption may rise due to the larger post-war Muslim population. Consumption in Romania, Poland, Croatia and Yugoslavia averages 114 kg/capita for instance, versus an average of 187 kg/capita in middle-income Muslim countries such as Morocco, Tunisia, Jordan and Turkey (Table 18). With consumption of 140 kg/capita, total demand would be around 320,000 tonnes of wheat per year and current processing capacity would be adequate. This suggests that future investment should focus on privatizing and upgrading the operating mills in order to increase their efficiency and capacity utilization, rather than restoring the mills damaged by the war. Within the baking industry, the pre-war growth of small urban bakeries has accelerated in the post-war environment, a trend that should be encouraged. Few of the public-sector bakeries are viable, due

to their poor location (outside urban centres), inappropriate product mix (mostly low value-added products) and lower efficiency.

Maize/Animal Feed

Maize is grown primarily for animal feed, with domestic production of 550,000-800,000 tonnes meeting 75-85 percent of feed requirements in pre-war BiH. Imports from Serbia provided the balance. Less than five percent of output was marketed, most of it through agricultural cooperatives. Two maize mills and 12 animal feed mills with a total capacity of 479,000 tonnes (Table 19) provided adequate processing facilities, although outdated technologies predominated and production costs were high. Output was 250,000-300,000 tonnes of animal feed (65-75 percent of capacity), of which half was poultry feed. Most of this capacity was owned by the major agrokombinats which used a large part of the feed output for their own animal production enterprises. Traders were also active in the import of processed animal feed, either for sale to the *Apotheka* or directly to farmers.

As with wheat, this structure collapsed during the war. Two of the six animal feed mills in FBiH were heavily damaged and all mills lost access to their traditional import sources for raw materials in Serbia and Croatia. Severe livestock losses on commercial pig, poultry and dairy farms also decimated the demand for livestock feed. This combination of supply and demand side shocks forced most mills to stop production.

Although post-war maize production in FBiH is only two-thirds of the equivalent pre-war level, it still meets 75-85 percent of animal feed requirements owing to the fall in livestock numbers. However, the mills operate in a very different market environment. Most raw materials are now imported from Croatia and Hungary. The level and structure of demand have also changed (poultry feed now accounts for 94 percent of output) and there is a huge disparity between current output (22,500 tonnes) and current capacity (212,000 tonnes). The low consequent capacity utilization (11 percent) is a major impediment to profitability at a time when competition from imported feed is very strong. This problem will be exacerbated by the completion of four more private mills. The new trade laws, which impose a 10 percent tariff on imported maize and a five percent tariff on imported animal feed concentrates will make it even harder for local mills to compete.

The animal feed industry is thus at a critical juncture. It is unlikely to survive in its pre-war form and may not survive at all, unless it becomes more competitive with imports. Only a significant restructuring of the industry, consistent with the lower level and different structure of demand for animal feed, will ensure its survival. Not only have livestock numbers fallen, but consumer demand for animal products has also fallen due to the 15 percent fall in population and the 40 percent fall in consumer incomes. Consumer preferences have also switched to lower priced animal products such as chicken, eggs and milk. While poultry numbers are increasing, cattle numbers are unlikely to reach pre-war levels before 2010 and sheep and pig numbers will stabilize at less than pre-war levels.

To be competitive, a re-structured milling industry will need more appropriately scaled mills, in new locations, responding to a different demand structure. The fact that new mills are being built, despite significant existing over-capacity, indicates that this restructuring has already begun. Support for further private sector investment initiated in this context should thus continue. The future of the state mills will depend on their ability to adapt to this new structure and to effect full privatization within the next 12 months.

7.2 The Dairy Industry

State farms (with 1 percent of total cows) accounted for three to four percent of pre-war milk production in BiH and supplied one-third of the milk sold to dairy processors. Small-scale farms

accounted for the remaining cows and production but sold only six to seven percent of their output to dairy processors. While these farmers also sold a significant (but unknown) quantity of milk and dairy products on local markets, the overall marketed surplus of 10-15 percent of total milk production was still very low. It was also highly seasonal, with surplus production in the summer months and pronounced deficits during the winter - which were met with limited imports of raw and processed milk.

Small-farm production destined for the processors was usually sold to agricultural cooperatives, which organized assembly at collection points equipped with lacto-freezers, for delivery to the processors. State farms delivered direct. Pre-war processing capacity of 130 million litres/year was adequate for the 110-120 million litres of milk processed annually, with 95 percent of this capacity owned by state enterprises. Processing efficiency was generally low due to outdated equipment and technology, excess labour and the seasonal fluctuation of milk supply. Most dairy products were produced but the emphasis was on lower priced, less profitable products such as pasteurized milk. The state processors also managed their own distribution and sales to shops and supermarkets but their marketing was weak and product presentation was poor. Local “green markets” provided an important alternative market outlet for both producers and consumers, particularly for higher value farm-processed products such as cheese. Imported dairy products were typically obtained and distributed by state-owned wholesale and marketing enterprises.

The direct and indirect effects of war have hit the dairy industry hard in FBiH. Total milk production was only 230 million litres in 1997 due to livestock losses. Marketed surplus has also fallen, to eight percent of production in 1997. This was due to the breakdown of agricultural cooperatives and consequent loss of the small-farm assembly system, losses of lacto-freezers and trucks and a lack of working capital, which limits the ability of processors to pay producers. As a result processed output was only 13.7 million litres in 1997, creating a high dependence on imported milk and dairy products. Low output in turn reduced capacity utilization to 27 percent in 1997, despite war damage to the processors in Sarajevo and Bihac which reduced FBiH’s capacity from 89 million litres (pre-war) to 70 million litres. Demand also fell heavily in response to both lower population and a drop in per capita consumption (from 190 kg/capita to 132 kg/capita) caused by lower incomes.

Both milk production and processing are now recovering strongly, driven by increasing cow numbers and recovery of the processing sector. Milk production increased by 20 percent in 1998, the output of processed milk increased by 36 percent (Table 20) and that of other dairy products by 41 percent. The fact that processed milk output increased faster than production also indicates that market surplus is growing quickly, despite continuing problems with the assembly process and payments to producers.

Local processors currently dominate the market for low priced, low profit products such as pasteurized milk (86 percent of local milk output in 1998), while most high-value goods such as UHT milk and packaged cheese are imported. This pattern corresponds to current demand, which is dominated by low income consumers who can only afford cheaper products. But as incomes and, concomitantly demand for higher-valued products increase, the industry’s inability to produce competitively priced, attractively presented products will become a more pressing issue. The import of processed milk (most of which is higher-value UHT milk) increased by 53 percent in 1998 (Table 14).

Increased capacity utilization will improve competitiveness by lowering unit production costs, but it will not be enough. New technology is needed to broaden the product base (only 3 of 11 processors have UHT lines), and marketing and management must improve. The private sector is already responding to this challenge. Six newly built, small-scale processors now produce a range of competitively priced high-value dairy products and “Green” markets continue to provide a ready outlet for farm-produced cheeses, cream and butter.

Recovery will take time. Cow numbers and milk production will increase slowly, and incomes and demand are unlikely to return to pre-war levels before 2005. But the dairy industry must move quickly to re-establish and strengthen its position in domestic markets. Rehabilitation of the assembly system is the immediate priority as the basis for increasing milk supply and capacity utilization. Processors should also re-establish links with former suppliers on the other side of the inter-entity border line (IEBL). The consequent increase in supply should be accompanied by measures to improve marketing. However, extensive restructuring and modernization of the processing sector is needed to ensure the long-term future of the industry, beginning with the privatization of viable state-owned dairies. Further investment by private processors should also be actively supported.

7.3 Meat and Wool

The pre-war livestock industry in BiH was characterized by well-developed formal and informal marketing systems and a vigorous private sector. Producer sales outlets included: weekly livestock markets in each municipality, informal sales to local restaurants and butchers, "Green" markets (for the sale of slaughtered animals, eggs etc.) and meat processors. Apart from normal veterinary controls these market outlets operated freely according to supply and demand. Pork and beef dominated meat production and consumption, followed by poultry and sheep meat, but only sheep meat production met most of domestic consumption needs (Table 21).

More than 200 small-scale slaughter houses for cattle, sheep and pigs (of which 60 percent were private) processed most of the meat sold in butcher shops and Green Markets. The meat processors, including all of the poultry slaughter houses, were mostly state-owned. Older technology predominated in the state-owned processors, while the three private meat processors were more modern and able to meet European export standards. Livestock was procured from farms owned by the processors themselves, through contracts with agricultural cooperatives and farmers and from local markets and imports.

High war-related livestock losses have led to substantially reduced meat output in post-war FBiH. Three of the state-owned processors were disabled, including the poultry processors. However, most of the small-scale slaughter houses remain operational and three new, privately-owned meat processors have been built. On the demand side meat consumption has been halved and its structure has altered dramatically (Table 21). Per capita consumption of pig meat has plummeted with the increase in the Muslim population, demand for higher priced beef and sheep meat has fallen due to lower incomes and consumption of low-priced chicken meat has increased by more than 50 percent. The poultry industry has responded rapidly to this shift in demand, with poultry numbers in 1998 being slightly above those in 1990 (Table 5). As a result, poultry meat imports in 1998 were less than half of imports in 1997 (Table 14). Yet current poultry production still falls short of consumption requirements and poultry remains a major component of agricultural imports. There is also a continuing shortage of poultry processing facilities.

This change in the structure of demand has major implications for development of the livestock industry. A larger, more widely dispersed capacity for poultry slaughter and processing should be established as quickly as possible. In contrast, the processing capacity required for larger animals will fall relative to pre-war needs, both immediately, as a result of lower incomes and in the future, as a result of lower pig meat consumption. Support for large animal processors is needed, nevertheless, to increase access to livestock and so improve the use of existing capacity. Better access to livestock from RS is the most cost-effective basis for achieving this objective and would benefit considerably from an inter-entity market information system. More streamlined and effective veterinary control of livestock imports along the entire BiH border is also needed, based on close cooperation between the veterinary services of each entity. Comparable improvements are needed to

border control measures for imported meat products to ensure that both processors and consumers are protected from unsafe and/or illegal imports.

The wool industry received little attention in pre-war BiH. Systems for assembly and marketing were poor and attempts to establish a processing sector were unsuccessful. Apart from limited home consumption, the wool output was thus largely unused, to the detriment of farm incomes. There is a ready world market for the coarse, carpet-style wool produced by the local Pramenka sheep. However, access to this market will require changes to farm management, fleece preparation and the establishment of a marketing and processing system. Farmers can reduce the high level of coting and vegetable matter, which lowers wool quality, by adjusting their grazing patterns and shearing times and should be trained to class their wool into different categories for sale. An assembly and marketing system should also be developed to sell this wool to local outlets or for export.

7.4 Fruit and Vegetables

Small-scale private farmers produce a wide range of temperate and Mediterranean fruit and vegetable crops, particularly around Tuzla, Mostar and along the Sava river. Potatoes and plums were the only crops for which pre-war production in BiH exceeded domestic demand. Marketed surplus was low, particularly for potatoes and fruit (Table 22), despite access to a range of well-developed market outlets. Approximately 60 percent of sales were direct to “Green” markets, itinerant traders and retail outlets. The remaining output was sold to agricultural cooperatives which assembled it for the state-owned processors. These markets operated freely, with prices set according to supply and demand.

Most of the 18 state-owned processors were located in the Tuzla and Mostar regions, close to the main areas of production. Fruit products (juice, pulp, jams etc.) accounted for 85-90 percent of processed output, followed by processed vegetables. Potato processing was minimal. Processing capacity was generally adequate and there was enough cool storage space to keep capacity use high (70 percent), despite a short (five month) growing season. But older technologies predominated. The state processors in Tuzla, Bihac, Zenica and Sarajevo also served as wholesale market centres. Most output was sold on the domestic market, but a small, well-developed trade with eastern and western Europe made export sales second in importance to livestock and meat products.

The sector has recovered strongly since the war despite the breakdown of state processors and agricultural cooperatives and the consequent disabling of assembly and wholesale marketing systems, damage to processing facilities, orchards and the loss of traditional export markets. This recovery is due to the relative ease with which small-scale farmers can re-establish production, a high demand for (low-priced) fruit and vegetables when consumer incomes are low and the vitality of local market institutions. The private sector is also investing in new wholesale markets and processing plants and processed output is growing very quickly. However, marketed surplus is very low. Competition from imported products is also very strong, particularly for fresh produce, although there are signs that domestic producers are responding to this competition. Imports of fresh fruit and vegetables fell from 180,000 tonnes in 1997 to 78,000 tonnes in 1998 (Table 22).

Continued growth of production, sales and processing should be a high priority for the agriculture sector. Working together with canton governments, initial support should be directed to strengthening the assembly process and the network of wholesale markets in order to increase the marketed surplus of fresh fruit and vegetables. The domestic share of this substantial market is small, at a time when consumer demand for lower-priced fresh produce is very strong. Rapid privatization of the state-owned processors is also critical as this is the pre-condition for access to credit for working capital and investment and for the re-organization needed to improve efficiency and competitiveness. An increased supply of raw materials and more efficient processors in turn provide

the basis for expanding and upgrading processing and cold store facilities. Increased inter-entity trade will further enhance growth, to the benefit of both producers and processors. For the more expensive processed commodities growth in output will need to be consistent with growth in consumer incomes and the re-establishment of export markets.

Box 2.

VEGAFRUIT

The successful establishment of VEGAFRUIT, a private sector fruit and vegetable processor provides many lessons for future agricultural sector development. Located in Central Bosnia, in a high producing area of fruit, berry fruit and vegetables, its initial resources were the technical skills and experience of its agro-processing management and staff, and a credit line from USAID. These resources were used to build a medium-scale processing facility (14,000 tonnes) during 1997 and production contracts were negotiated with four local agricultural cooperatives (representing 1,200 farmers) to supply 500 tonnes of vegetables. VEGAFRUIT provided these farmers with some working capital (seeds) and set up demonstration farms to support the cooperative extension agents. Processed output has increased quickly, accompanied by a diversification of products and market outlets, further investment in plant, facilities and growth in employment to 160 full-time and 120 part-time staff. VEGAFRUIT's success can be attributed to the combination of local agro-processing experience, appropriately scaled processing facilities, ready access to skilled, reasonably-priced labour, favourable agro-climatic conditions for the production of raw material and management's efforts to link farmers to processing and marketing through farmer associations. This framework is applicable to the establishment of private, small-medium scale agro-processing enterprises in other parts of FBiH, producing other commodities.

Producer associations, in the form of agricultural cooperatives or private business entities, are the key to realizing the potential for growth. By improving access to extension and credit and promoting machinery sharing, these associations help to increase on-farm production and efficiency. By facilitating production contracts and marketing links with processors and retailers, they also markedly improve the incentives for both buyers and sellers and provide a framework for improving product quality and presentation.

7.5 Agricultural Inputs

With the exception of nitrogen fertilizer and some wheat and potato seed, most agricultural inputs were imported from other parts of the former Yugoslavia before the war, particularly from Croatia and Serbia. Farmer choice was thus limited largely to the inputs produced by former socialist countries. The state-owned wholesale distributor, POLJOPREMA, held a virtual monopoly over the import and marketing of these inputs, thus dominating sales to the agrokombinats, the agricultural cooperatives and to an extensive network of small retail suppliers (*Apotheka*). Some of these *Apotheka* were also owned by the cooperatives and POLJOPREMA itself, but most were privately owned.

The agrokombinats and cooperatives had ready access to low interest seasonal credit from the Central Bank to finance input purchase, although only the 110,000 small-scale farmers involved in the cooperative system benefited from this credit. This factor, together with the low-input, low-return farming systems practised by most small-scale farmers severely reduced aggregate demand for inputs (total fertilizer use was 95 kg/ha of arable land). Demand rather than supply-side factors were thus the major constraints to agricultural input use in pre-war BiH.

Input demand has fallen further in post-war FBiH due to the fall in livestock numbers and area cultivated, the collapse of the state farms and agricultural cooperatives and the breakdown of the banking system and consequent lack of seasonal credit. POLJOPREMA is still operating but its turnover has fallen substantially. Despite the fall in demand it also faces competition from ten newly established private-sector wholesale traders. As a result, more inputs are imported from western Europe and the USA, although farmer choice is still limited to lower priced products. The *Apotheka* remain in operation, but at a low level as they too are constrained by low demand and lack of seasonal credit. There are no price controls on inputs and most import tariffs are set at zero (Table 13).

Demand-side factors will continue to be the major constraint to agricultural input use for the medium term. Credit constraints will not be overcome quickly and small-scale farmers will be slow to adopt more intensive management systems. But demand could be enhanced by broadening the product base, so as to increase farmer choice and by including a range of low-cost home-processing equipment (for dairy, meat, fruit and vegetables), to encourage farmers to add value to their output. A more competitive farm input marketing system is also evolving, and this will improve further with the privatization of POLJOPREMA - provided that it does not re-establish its monopoly position. The public sector's role should now be limited to the enforcement of appropriate quality standards for farm inputs, particularly seeds, animal semen, fertilizer and chemicals.

7.6 Common Issues and Constraints

A number of common issues and constraints emerge from the preceding review which are important for the marketing and processing of all agricultural commodities and which should be an integral part of the agricultural strategy. They are summarized below.

Credit

Given that the demand for credit will greatly exceed supply for the short-medium term, it is essential to focus available credit on activities and investments that generate rapid returns to the benefit of many. Financial support for restructuring and developing strong agricultural marketing institutions and competitive agro-processors is consistent with this objective, as it will benefit producers and consumers and boost rural employment. The greatest benefit will come from support for production, processing and marketing of fruit and vegetables and poultry and dairy production.

Privatization

Current private sector development is already exposing the inability of state-owned enterprises to compete and eroding their resource base. Rapid privatization of these enterprises is essential if they are to survive. However, privatization by itself does not ensure future viability, it must be implemented with the understanding that many enterprises will not be viable in their present form. Experience from other economies in transition demonstrates that privatization which is slow, inflexible or based on unrealistic asset prices inevitably results in the abandonment of many state enterprises, an outcome which benefits nobody.

Producer Associations

The assembly and marketing activities performed by agricultural cooperatives were, and are, critical to small-farm involvement in agricultural markets and to the growth of agro-industry. A high priority should be given to re-establishing these institutions. However, producers must be free to choose the organizational form which best suits their needs, whether as a cooperative, a partnership or a company.

Market Information

The degree to which producers, processors and consumers benefit from market-oriented reform depends to a large extent on their access to relevant market information. Development of a framework for collecting and disseminating such information will be a major challenge for both public and private sectors and an essential part of the agricultural strategy. This market information system should cover both entities.

Technical assistance should also be sought for more detailed analysis of specific agriculture commodity markets in order to discern current and future patterns of consumer demand and measures to increase the competitiveness of domestic production. These analyses would be used to guide private sector investment in production and processing.

Inter-Entity Trade

The re-establishment of inter-entity trade will benefit producers, processors and consumers in both entities and should be actively promoted by the international community and the two entity governments. Improvements to the main roads and telecommunications linking the two entities, access to information on all markets in BiH and the ability to effect inter-entity bank transfers will all enhance this trade.

State Border Control

The public sector should now concentrate on enforcing the new schedule of import tariffs and establishing and enforcing adequate product quality standards for both imports and exports. This will require effective inter-entity cooperation, not only among customs officials, but also between the veterinary and plant protection services of each entity.

Training in Business Management

While education levels are high in FBiH and managers are generally well-trained, the traditional approach to business management will need to change if enterprises are to be viable and competitive. The socialist emphasis on meeting production targets and maximizing employment will need to be replaced by structures and systems designed to maximize profit and respond to consumer demand. Managers will need to be trained to operate in such an environment.

VIII. A STRATEGY FOR AGRICULTURE SECTOR DEVELOPMENT

The ensuing strategy is designed to guide agriculture sector development in FBiH in a manner consistent with the requirements of a market-oriented economy. It thus departs from the pre-war approach to economic planning. Government ownership of production and processing is precluded and there are no government derived production targets. In a market economy, private-sector producers and processors determine the level and composition of agricultural production in response to consumer demand. The government's role is to ensure that producers, processors and consumers have complete choice as to what they produce or consume, that they have the resources to effect these choices and that they have the information needed to choose according to their preferences.

8.1 General Strategy Objectives

The *global objective* of the strategy addresses the fundamental constraints to sector development, most of which were present before the war:

To increase agricultural output through measures which improve the efficiency, profitability and competitiveness of production, processing and marketing; to promote rural development and increase opportunities for non-farm rural employment; to optimize land use and preserve the natural resource base; to strengthen agriculture sector institutions; and through these measures, to achieve sustainable agriculture sector development.

The following *supplementary objectives* address the major consequences of war:

**To further the reconstruction process;
To support the resettlement of refugees and displaced persons in rural areas;
To strengthen economic relations and cooperation with Republika Srpska.**

8.2 Strategy Design

In order to focus and structure the strategy, these general objectives will be applied to six areas of action:

- The efficiency and profitability of agriculture production;
- The marketing and processing of agricultural products;
- Rural development;
- Land use and natural resource management;
- Agriculture policy and institutions;
- Inter-entity trade and cooperation.

These areas of action are linked by the following common themes:

- (1) The importance of small and large-scale commercial farmers as the group most likely to adopt improved management practices and to obtain significant increases in production and marketed surplus;
- (2) The widespread establishment of producer associations to facilitate the dissemination and adoption of new technology, to reduce the diseconomies of small, fragmented farms and to link producers to market outlets;

- (3) The need to increase rural non-farm employment as the basis for improving the welfare of rural households and strengthening rural communities;
- (4) A significant allocation of resources to support the development of competitive agro-processing and agri-business enterprises and to strengthen marketing institutions;
- (5) Definition of the role of central and local government and the responsibilities of public and private institutions; support for the development of public and private institutions; and the decentralization of public institutions and associated responsibilities.

The ensuing discussion defines relevant objectives for each of the six areas of action and outlines the strategy responses to these objectives⁶. Strategy action is based on short-term measures to be initiated over the next one to two years, and medium-term measures to be initiated within two to five years, with a ten year time frame designated for strategy implementation. Progress will be reviewed at the end of five years to determine the need for new approaches to strategy implementation.

Continued strong support from the donor community will be essential for strategy implementation, especially in the areas of institutional development and support for private investment. The total cost of sector recovery and development far exceeds donor capacity however. And given the limited resources of government, the consequent reality is that most of this cost will inevitably be borne by rural people. For this reason the strategy places considerable emphasis on measures to increase farm and non-farm incomes and to stimulate farm investment.

8.3 Efficiency and Profitability of Agriculture Production

Agriculture production in FBiH is well below its potential. Farm incomes are low as a result, particularly on small-scale farms and the productivity of these small-scale farms has fallen further and further behind the levels achieved on state farms.

Objective

To increase farm output and farm incomes through the adoption of management practices which improve the efficiency and profitability of agriculture production.

Most of the direct strategy responses to this objective involve the transfer of improved management technologies to small-scale commercial farmers. With appropriate support from the international community these technologies can be adapted to local conditions and technology transfer initiated within the next one to two years. A related set of institutional responses (credit, extension, research etc.) are described in the discussion of “agriculture policy and institutions.”

Short-Term Strategy Responses - Crop Production

- (1) Based on standard seed selection and certification procedures, increase the range of seeds and seedlings to which farmers have access by expanding the national seed lists for cereals, potatoes, vegetables, fruit and berry fruits, grapes, forage crops and pasture.
- (2) Encourage the private sector import, multiplication and distribution of improved, certified seeds by increasing the efficiency of relevant administrative procedures.
- (3) Develop recommendations for lower, more cost-effective seeding rates for cereals, as a means of reducing production costs and raise profitability.
- (4) Based on current trends in commodity and input prices and knowledge of soils and fertilizer response, determine the profit-maximizing levels of fertilizer use for all major crops in the main crop producing areas of FBiH.

⁶ Where these responses apply to more than one area of action they are repeated for the sake of completeness.

- (5) Based on current trends in commodity and input prices, and knowledge of crop protection techniques, identify low-cost systems of weed and pest control suitable for small-scale production of cereals, potatoes, vegetables, fruit and berry fruit.
- (6) Based on a realistic assessment of the production responses likely to be achieved by small-scale commercial farmers, determine the returns to adoption of these technologies - for all crops in all major crop production areas. For those crops and those areas where profitability increases significantly, develop management recommendations for farmers and extension agents on varietal choice and input use.
- (7) Encourage commercial farmers to diversify into more profitable crops by developing extension packages which: show the comparative returns to different crops, inform farmers as to the management requirements for new crops (through demonstration farms, farm visits etc.) and inform farmers as to the range of market outlets available for new crop products and the type of product sought on these markets. Give particular attention to high-return, labour-intensive crops such as vegetables, fruit, berry fruits and tobacco.
- (8) Support the establishment of private-sector nurseries for fruit, berry fruit and grapes.
- (9) Promote the widespread establishment of producer associations (in the form of cooperatives, partnerships or companies) as a vehicle for disseminating and supporting the adoption of improved management practices, reducing the diseconomies of small, fragmented farms and diversifying into more profitable crops.

Medium-Term Strategy Responses - Crop Production

- (1) Identify low-cost irrigation systems suited to intensive fruit and vegetable production on small-scale commercial farms, develop management guidelines to assist farmers to install and operate these systems and establish credit lines to finance them.
- (2) Introduce new fruit varieties and modern systems of orchard management as the basis for increasing the efficiency of fruit production and obtaining a more appropriate balance of pip and stone fruit.
- (3) Promote the production of organically grown fruit and vegetables.
- (4) Review the suitability and cost-effectiveness of traditional cultivation systems; develop recommendations as to the most cost-effective cultivation systems for small farms, and the type of farm machinery and equipment which these cultivation systems require.
- (5) Use these recommendations to guide donor and private sector purchase of new agricultural machinery and equipment and to prepare extension messages designed to increase the efficiency of farm machinery use on small-scale farms.
- (6) Increase the access of small-scale farmers to modern farm machinery and equipment by establishing farm machinery rings and credit lines for farm machinery sales outlets (for both new and second hand machines) and machinery contractors.

Short-Term Strategy Responses - Livestock Production

- (1) Develop recommendations for improving the quality of pasture and hay production based on improved grazing management and earlier harvesting times for hay.
- (2) Identify low-cost systems of silage making and the associated requirements for farm machinery as an alternative means of improving the quantity and quality of winter feed.
- (3) Introduce alternative forage and fodder crops as a means of improving livestock production on lowland areas.
- (4) Based on current trends in commodity and input prices, and knowledge of soils and fertilizer response, determine the profit-maximizing levels of fertilizer use for pasture in the main livestock producing areas of FBiH.
- (5) Develop low-cost feeding recommendations suited to small-scale commercial farms as the basis for improving the growth rates of young stock, reducing the age of first parturition and shortening the breeding interval.

- (6) Develop recommendations on grazing management and shearing times as the basis for improving wool quality. Train farmers to class wool as the basis for improving wool quality and marketability and the returns to wool production.
- (7) Promote fish and honey production.
- (8) Promote the widespread establishment of producer associations (in the form of cooperatives, partnerships or companies) as a vehicle for disseminating and supporting the adoption of improved management practices for livestock production.
- (9) Continue donor support for the import of high quality breeding stock as a means of improving the genetic potential of livestock in FBiH, but subject to the following conditions:
 - All stock to be distributed to commercial farmers
 - Donor support to be in the form of low-interest loans to farmers, but farmers to pay a portion of the purchase price.
 - Beneficiary farmers to pay for performance recording as the basis for optimizing the genetic value of these animals and re-establishing pre-war breeding programmes.
- (10) Budget restrictions permitting government to finance a modest subsidy programme to encourage farmers to retain young dairy stock. This programme to be limited to the period 2000-2002 and to cost no more than DM2.5 million per year. Payments to be made for those animals retained **above the minimum requirement for herd replacement** (i.e. not for all young stock) and to be made only after first calving.
- (11) Establish private sector stud farms as the basis for breed improvement, through support for the privatization of state-owned reproduction centres and their subsequent development.

Medium-Term Strategy Responses - Livestock Production

- (1) Increase the use of mountain grazing resources by establishing locally managed Land Development Boards to manage them (see Land Use) and by increasing the number of livestock water points.
- (2) Government to facilitate increased private sector import of livestock and animal semen by improving border controls and the efficiency and accessibility of relevant administrative procedures and removing the current tariff on breeding cattle.
- (3) Train and licence technicians to perform artificial insemination and remove the monopoly control of veterinarians on the provision of animal breeding services.
- (4) With donor support, re-establish the pre-war performance recording scheme, but make it self-financing by the year 2002.
- (5) With donor support, establish a research centre for animal production to conduct research on animal nutrition, pasture and forage management, animal health and animal breeding, and to coordinate the national performance recording programme. This research will cover all animals and address the problems of small-scale commercial farmers.

8.4 Marketing and Processing of Agricultural Products

Effective development of marketing, processing and agri-business is the key to future agriculture sector development in FBiH. A wide range of efficient marketing agents (producer associations, traders, agri-business enterprises, agro-processors, green markets, wholesale markets etc.) provide the best platform for transmitting clear price signals to farmers on what they should produce. They also compete among themselves to offer the best prices to farmers and compete with imports to offer the best prices to consumers.

Strong support for this relatively small component of the sector can have enormous sector-wide impact. However, a major transformation of existing marketing institutions and market agents will need to occur for this to happen. Consumer demand must be allowed to drive post-war production and marketing decisions and the pre-war structure of heavily protected state-owned

processors and marketing institutions must be replaced by privately owned processors and marketing agents able to survive with lower levels of protection. A new generation of marketing agents and processors must evolve in response to these changes, with the ability of developing new products and face increased competition.

Objective

To increase the competitiveness of domestically produced agricultural products and their share in domestic and international markets, through the establishment of strong marketing institutions and viable marketing agents and agro-processors.

Short-Term Strategy Responses

- (1) Encourage the rapid privatization of state-owned marketing agencies and agro-processors. With the support of the international community, ensure that these privatized enterprises are appropriately structured, scaled and staffed and reasonably priced.
- (2) Establish donor-financed credit lines for purchase, construction, upgrading of plant and equipment and for working capital, with lending restricted to those agro-processors and agri-business enterprises able to adapt to current market conditions.
- (3) International community to provide training in business management, marketing and accounting and to assist managers to increase production efficiency, assess the level and characteristics of current and future consumer demand and develop suitable products.
- (4) Establish producer associations as a vehicle for linking producers to marketing outlets and improving their incentives to increase output and marketed surplus.
- (5) Support the re-establishment and restructuring of agricultural cooperatives, and where appropriate, their development as privately-owned local agri-business centres.
- (6) Re-establish milk assembly systems by providing finance for lacto-freezers, establishing producer associations to coordinate the collection and sale of milk and encouraging the prompt payment of farmers by dairy processors.
- (7) Reduce the current import tariffs on maize and sugar to zero percent, as a means to lower animal feed costs and improve the competitiveness of local animal feed processors; and to improve the competitiveness of fruit and vegetable processors.
- (8) With the support of the international community, improve the enforcement of border controls and the collection of import taxes.
- (9) Develop systems to provide market information on agriculture commodity prices in all major markets in both entities and supplement this system with regular monitoring and analysis of trends in the prices of agricultural commodities on international markets.

Medium-Term Strategy Responses

- (1) Working with canton governments, construct wholesale markets in the major urban centres and producer areas.
- (2) Working with canton governments, improve the standard of facilities in local green markets.
- (3) Assist the chamber of commerce to promote domestically produced agricultural commodities on international markets.
- (4) With support from the international community implement an inter-entity programme to align product standards and trade, health and safety regulations with those applied by the European Union.

8.5 Rural Development

Strong rural communities are essential for future political and economic stability, and these will not emerge without balanced support for both farm and non-farm income generation and access to high quality rural education and health services. Rural development programmes will be initiated to achieve these objectives, with particular attention to measures that increase non-farm rural

employment. By reducing the reliance on farm income, increased access to non-farm employment will also allow an increase in the sale or lease of rural land, and hence facilitate an increase in farm size. Working with the MAWMF and other ministries, canton governments and municipalities will be responsible for the design and implementation of these programmes.

Objective

To improve the welfare of rural households and strengthen rural communities through measures that increase non-farm rural employment and improve the quality of rural health and education services.

Short-Term Strategy Responses

- (1) Prepare canton- and municipality-level rural development plans that reflect the needs and aspirations of local people and the nature of the local resource base.
- (2) With the support of donors and NGOs, canton and municipality governments to establish job and business training programmes and micro-credit lines as the basis for encouraging small enterprise development in rural areas.
- (3) With donor support, strengthen the institutional capacity of canton and municipality government to design and implement rural development programmes.

Medium-Term Strategy Responses

- (1) Together with other relevant ministries, develop programmes to improve the quality of rural education and rural health services.

8.6 Land Use and Natural Resource Management

Given the limited availability of agricultural land in FBiH, effective use of this land is essential for agriculture sector development. However, the predominance of small, fragmented farms has long obstructed this mandate, an issue made worse by the pre and post-war abandonment of rural land and the problem of land mines. The national tradition of protecting forest, water and air resources must also be continued and supported as the basis for sustainable natural resource management.

Objective

To optimize land use and preserve the natural resource base by developing policies and institutions which balance public and private interests in land use and ownership and ensure effective stewardship of FBiH's natural resources.

Short-Term Strategy Responses

- (1) Establish a unit within the MAWMF to: identify agriculture land for de-mining (based on the system of prioritization developed by FAO), obtain donor finance to effect this de-mining and coordinate and monitor de-mining activities. This unit should effect the de-mining of at least 1000 ha of rural land per year.
- (2) Support the resettlement of rural land according to the guidelines and programmes developed by the RRTF, by ensuring that the returnees, re-locating families and residents in resettlement areas have full access to available credit, extension facilities, and rural development programmes designed to create opportunities for non-farm rural employment.
- (3) Encourage the leasing of rural land as a means of enlarging and consolidating farms, by developing legally recognized, standard lease contracts that provide adequate protection for both lessee and lessor. Amend current land laws to state that in the absence of any formal lease agreement, the conditions of these standard leases will apply.

- (4) Promote increased land market activity through the following measures (see also medium-term responses):
 - Remove the current tax on land transactions.
 - Establish readily accessible information systems that describe the characteristics, location and price of rural property available for sale, lease or exchange.
 - Establish readily accessible registers of lawyers, valuers and property agents who can provide the administrative and technical services needed to effect land transactions.
 - Prepare six monthly reports that indicate the level of activity in the various sectors of the land market in different locations and relevant land market prices.
- (5) Privatize all of the state farms, with the land to be occupied on the basis of medium-term lease agreements at market rentals. Where appropriate, small areas of these state farms will be allocated to public research institutions.
- (6) With the support of the international community, continue the process of updating and reconciling the land book and the land registry and computerizing land records.

Medium-Term Strategy Responses

- (1) Under the auspices of the OHR, the international community to provide financial support and technical assistance to strengthen the legal and institutional basis for effecting land transactions (sales and exchanges) within and between entities. Implementation of this programme will respect the principles that people must have complete freedom of choice as to where they live and whether to sell or otherwise transfer their land, and that land transactions should not be used as a means to achieve political objectives.
- (2) The international community to help improve the efficiency and probity of land transactions by: developing training programmes for valuers and property agents, establishing codes of conduct for their activities and establishing professional associations of trained people who agree to these codes of conduct. Government to establish legal recognition of these professional associations, their expertise, their codes of conduct and procedures for licensing their members.
- (3) With the assistance of the international community, review the policies that determine the ownership of ex-state farm land and the efficiency with which it is used. This review should consider: the need for eventual privatization and sale of this land, the extent to which it could be divided into smaller farms without prejudicing their capacity to practice modern, intensive management systems, and its potential use to enlarge and consolidate neighbouring small-scale farms.
- (4) Review and amend inheritance laws to prevent further land fragmentation.
- (5) Continue the pre-war system of land consolidation programmes, but land owners and/or donors to fund part of the cost of associated infrastructure.
- (6) With donor support, promote the establishment of Land Development Boards to initiate and manage land development and maintenance projects that require cooperative action. Activities to be implemented by these Boards include the drainage, irrigation and land consolidation programmes currently directed by local government authorities and the management of communal grazing areas.
- (7) With support from the international community, review the current legislation on natural resource management and the institutional base responsible for implementing this legislation. Where appropriate, modify this legislation to comply with international standards on acceptable levels of pollution, and strengthen relevant institutions.
- (8) Develop extension programmes that enable farmers to restore the fertility and stability of environmentally damaged land.
- (9) With the support of the international community, review the current policies and institutions relating to land tenure, land administration and land management. On the basis of this review, develop a comprehensive framework for guiding: the operation of land markets, the management of unused land (abandoned, mined etc.), the use of rural land for non-farm purposes, the use of value-based land taxation instead of cadastral taxes, the roles of the institutions which administer land policy and measures to increase their capacity.

8.7 Agriculture Policy and Institutions

The transformation from a socialist to a market-oriented economy will mean new roles for central and local government, less intervention in economic management and the acceptance of a wider role for the private sector. This transformation will not be easy. While policies can be changed quickly, the associated process of institutional change takes much more time as people must learn to think in different ways about institutional roles and acquaint themselves with new approaches to policy analysis and policy formulation.

The human dimension of institutional change is especially pertinent in FBiH. The country lost many capable people during and after the war, and the remainder were isolated from the rest of the world for more than five years. Hence, there is a limited knowledge of the changes resulting from international trade reform, agricultural policy reform in the USA and the European Union and the economic transformation of eastern and central Europe. This isolation has also heightened the natural distrust of change. The strategy thus provides for key sector personnel to learn more about agriculture policies and institutions elsewhere, particularly in situations where resource constraints are severe. The five central European countries that have recently begun accession to the EU should be a major part of this experience, plus visits to the EU and the USA to learn more about their programmes of policy and institutional reform.

Objective

To establish policies which are consistent with the operation of a market economy and available public resources, to establish appropriate roles for the public and private sector institutions responsible for implementing these policies; and to build the requisite capacity to operate these institutions.

As this area of action covers a broad field, the ensuing strategy measures are grouped according to the agricultural policies and institutions concerned.

Short-Term Strategy Responses - MAWMF and Canton Governments

- (1) With the support of the international community, restructure the MAWMF to strengthen its capacity in its main future areas of responsibility: policy analysis, the monitoring and enforcement of plant and animal health regulations, market information, and the stewardship of natural resources. Where pre-war roles will be transferred to the private sector (e.g. veterinary services, plant and animal breeding), the relevant resources should be reallocated within the Ministry.
- (2) The donor community should organize and finance visits to central European and EU countries to inform FBiH policy makers of current agricultural policies in these countries, their management of agricultural policy reform and the organizational structures of their ministries of agriculture.
- (3) In order to further liberalize agriculture markets, phase out the current system of official minimum prices for: rye, barley, maize, beans, tobacco, eggs, beef, veal, lambs, swine and broilers. Retain the system of guaranteed prices for wheat and the official minimum price for milk, and maintain these prices at their current levels.
- (4) Maintain the subsidy on milk production at its current level.
- (5) Budget restrictions permitting, government should finance a modest subsidy programme to encourage farmers to retain young dairy stock. This programme should be limited to the period 2000-2002, and cost no more than DM2.5 million per year. Payments should be made for those animals retained **above the minimum requirement for herd replacement** (i.e. not for all young stock) and be made only after first calving.
- (6) Reduce the current import tariffs on breeding cattle, maize and sugar to zero percent.
- (7) Budget restrictions permitting the MAWMF should begin funding agricultural research on a permanent basis.

- (8) With donor support, canton governments should assume responsibility for the funding and operation of a modest public extension service. This service should be self-financing by 2005.
- (9) Phase out the current MAWMF subsidy on tobacco production (over the next two years). Future support for tobacco production should be provided by those cantons where tobacco is produced, preferably through the use of extension and marketing services.

Medium-Term Strategy Responses - MAWMF and Canton Government

- (1) Once the political and economic situation stabilizes, review the policies and operations of the Strategic Reserves Agency and develop a more cost-effective basis for the management of strategic stocks and protection of the floor price for wheat.
- (2) With donor support, strengthen the institutional capacity of canton and municipality government to design and implement rural development programmes.

Short-Term Strategy Responses - Rural Finance

- (1) The international community should finance further credit lines for working capital and investment to support the establishment and growth of private sector agri-business and marketing agencies, agro-processors and commercial farmers. These credit lines should be administered by commercial banks in conjunction with current programmes of financial sector reform and the improvement of commercial bank management.
- (2) The international community to modify the conditions of donor funded loans to agriculture enterprises in order to improve borrower cash flow during the critical first 12 months of business operation. As the current interest rates are moderate, these modifications should focus on the length of the loan term and any grace period.
- (3) The international community should encourage the presence of financial institutions such as the Raiffeisen Bank, which have special expertise in agriculture credit.
- (4) Initiate a pilot programme to establish Village Credit Unions as the basis for providing affordable financial services to small-scale farmers.

Medium-Term Strategy Responses - Rural Finance

- (1) The international community should continue technical assistance to the Federation Investment Bank with the aim of establishing it as the principal source of medium and long-term finance for agro-processors, agri-business enterprises and large-scale commercial agriculture. Particular emphasis should be given to privatization of the FIB, measures to increase its capital base, the reduction of government involvement in ownership and management, and staff training.

Short-Term Strategy Responses - Agricultural Extension, Research and Education

- (1) With international support, develop gender-sensitive extension packages appropriate for small-scale commercial farmers which emphasize improved farm business management and enterprise profitability, the use of improved crop varieties, the cost-effective use of inputs for crop production, diversification into new crops, the use of irrigation, pasture and forage crop management, and feeding systems for livestock.
- (2) With international support, develop training programmes for extension agents that focus on meeting the needs of small-scale commercial farmers and train them in the use of modern extension methods. This training to be conducted in a new centre for the training of extension agents from both entities.
- (3) Ensure that all public and private sector extension agents have access to these extension messages and training programmes, including the agricultural extension agents employed by producer associations, agri-business enterprises and agro-processors.

- (4) Establish a modestly scaled, canton-based extension service. This service to be funded initially by the donor community, but to be fully funded by canton budgets and user fees by the year 2002, and to be self-financing by 2005.
- (5) Establish an Agriculture Research Council (ARC) to be responsible for defining the agriculture research agenda for FBiH and allocating research funds. This Council and its research fund to be donor-financed for its first three years of operation. Council membership should encompass small and large-scale farmers, the extension service, private sector agro-processors and agri-business enterprises, marketing agencies, academia and government.
- (6) Direct ARC support to the pre-war research institutions working on temperate and Mediterranean crops and to the new centre for research on animal production. As increased funding becomes available for research, the crop research institutions will phase out their involvement in commercial activities such as seed multiplication and sales.
- (7) The international community should provide continued support for re-establishment of the Agriculture Faculty at the University of Sarajevo, the reform of its curricula, the replacement of teaching and research materials damaged during the war and provide similar support for the pre-war university teaching and research institutions in Mostar.
- (8) With international support, improve the curricula and teaching capacity of the institutions responsible for training agriculture and veterinary technicians and assist them in obtaining new teaching materials.
- (9) The donor community should organize and finance visits to central European and EU countries and to the USA to acquaint key personnel involved in agriculture extension, research and education with the policies and public and private institutional structures used in these countries.
- (10) Under the auspices of the OHR, review the current proliferation of research and education institutions in both entities and develop guidelines for donors as to which institutions should have the highest priority for support.

Medium-Term Strategy Responses - Agricultural Extension, Research and Education

- (1) With international support, establish a research centre for animal production to conduct research on animal nutrition, pasture and forage management, animal health, animal breeding and to coordinate the national performance recording programme. This research should respond primarily to the issues effecting small-scale commercial farmers.
- (2) To ensure effective communication between the public and private support services for agriculture, develop an institutional framework that links the agriculture research institutions, public and private extension services and the university and vocational training programmes in agriculture.
- (3) Increase the agricultural research budget (from all sources) to one percent of agriculture GDP by 2009. (Two percent of agriculture GDP is generally considered the minimum for successful agriculture sector development).
- (4) Resources permitting, expand the public extension programme to encompass family issues and measures to generate non-farm income.

Short-Term Strategy Responses - Animal Health and Breeding

- (1) Limit direct government involvement in the management of animal health to: specification of the minimum educational requirements for veterinary practitioners and the licensing of veterinarians and veterinary technicians, the specification of minimum hygiene standards to be observed in enterprises which process animal products, the specification of minimum health and quality standards for domestic and imported animal products, the specification of conditions for the import and export of live animals and animal semen, the monitoring and enforcement of these regulations within FBiH and on national borders and the funding and management of the veterinary institutes and diagnostic laboratories.
- (2) Support full privatization of the veterinarian system with the following measures:

- Ensure that veterinarians have access to credit to acquire necessary facilities, including the purchase of municipal veterinary stations and equipment.
 - Establish a professional association of veterinarians as the basis for representing veterinarians at government level, developing a code of ethics and developing guidelines as to the fees which veterinarians should charge for their services.
- (3) With international support, develop programmes to train technicians to perform artificial insemination and establish procedures for licensing successful trainees to perform these services on a commercial basis.
- (4) Establish administrative procedures that facilitate the commercial import and distribution of animal semen.
- (5) Remove the monopoly control which veterinarians have over the acquisition and sale of animal semen and artificial insemination, and allow these inputs to be provided by approved private sector agents.
- (6) With international support, re-establish the pre-war performance recording scheme, placing initial emphasis on performance recording of high quality breeding stock imported under the reconstruction and recovery programme. Farmers should pay for this service, with the aim of making it self-financing after three years of operation.
- (7) Establish private sector stud farms as the basis for breed improvement, through support for the privatization of state owned reproduction centres and their subsequent development.
- (8) Donor community to organize and finance visits to central European and EU countries and the USA to acquaint key personnel involved in animal health and breeding with the policies and public and private institutional structures used in these countries.

Medium-Term Strategy Responses - Animal Health and Breeding

- (1) With donor support, complete the refurbishment of the veterinary institutes and diagnostic laboratories responsible for monitoring and advising on animal health.

Short-Term Strategy Responses - Plant Breeding and Protection

- (1) Limit public sector involvement in plant breeding and plant protection to:
- Review and updating of the national seed list;
 - Seed testing, selection and certification, in particular the specification, monitoring and enforcement of health and quality standards for domestic and imported seed for multiplication and commercial sale; imports and exports of plant material; and agriculture chemicals and fertilizer.
- (2) Continue donor support for the establishment of modern standards for seed certification and the institutional structures responsible for this activity.
- (3) Increase donor support for the seed testing and selection procedures associated with expansion of the national seed list. Where this testing and selection process is unduly slow, consider allowing the import of seeds approved by EU member countries as a temporary measure.
- (4) Promote private sector commercial seed multiplication and sales and discontinue the involvement of agricultural research institutes in these activities.
- (5) Support private sector input suppliers through access to credit and more efficient import procedures.
- (6) Donor community should organize and finance visits to central European and EU countries and to the USA to acquaint key personnel involved in plant breeding and protection with the policies and public and private institutional structures used in these countries.

Short-Term Strategy Responses - Producer Associations

- (1) With international community support, promote the widespread establishment of all forms of producer associations (partnerships, cooperatives, machinery rings, business enterprises etc.). The

choice of the most appropriate structure to be made by the member producers, according to their preferences and the activities of the association.

(2) Support the privatization and restructuring of existing agricultural cooperatives, and adoption of the changes required by the new legislation on cooperative governance and membership.

(3) Donor community should organize and finance visits to central European and EU countries and the USA to acquaint key personnel with the policies, organizational structures, activities and legal status of producer associations in these countries.

8.8 Inter-Entity Trade and Cooperation

Inter-entity trade has obvious benefits for all producers and consumers in BiH. The establishment of an inter-entity market information system will do much to enhance this trade, but it must be accompanied by inter-entity cooperation in the monitoring of plant and animal health and the control and eradication of plant and animal diseases. At the institutional level there is also much to be gained from a joint programme to align product standards in both entities with those applied by the European Union. In the future, the two ministries of agriculture may also find it useful to prepare joint positions on state-level issues such as customs procedures and international trade, as a means of strengthening their influence on public policy.

Other issues may be more controversial, including measures to accelerate land transactions, and to establish a more rational approach to the use and development of research and education facilities. Under these circumstances the strategy recognizes that cooperation will require the agreement of both entities and the support of the Office of the High Representative (OHR), and will take time.

Objective

To establish mechanisms to improve inter-entity trade and cooperation in areas which benefit both entities.

Short-Term Strategy Responses

(1) The international community should support the establishment of a system for collecting and disseminating information from the major markets in Bosnia and Herzegovina.

(2) With the support of OHR, the donor community should refurbish the pre-war veterinary institutes in Sarajevo, Banja Luka, Tuzla and Mostar and the diagnostic laboratories in Sarajevo, Zenica and Brcko to identical standards, should retrain staff in order to ensure equivalent levels of analysis and should establish mechanisms which ensure the regular exchange of information on issues of animal health.

(3) With the support of OHR, the donor community should refurbish the public institutions in each entity responsible for seed certification, seed selection and plant protection to identical standards, should retrain staff in order to ensure equivalent levels of analysis and should establish mechanisms which ensure the regular exchange of information on issues of plant protection.

(4) Under the auspices of the OHR, the donor community and the ministries of agriculture in each entity will review the current proliferation of research and education institutions in both entities and develop guidelines as to which institutions should have the highest priority for support.

(5) The international community should support the establishment of a centre for the training of extension agents from both entities.

(6) Ministry of Agriculture representatives from both entities should participate actively in the task forces set up by the Ministry of Foreign Trade and Economic Relations to formulate state level policy, including customs procedures, international trade and membership of WTO and the European Union.

Medium-Term Strategy Responses

- (1) With support from the international community implement a programme to align product standards and trade, health and safety regulations throughout BiH with those applied by the European Union.

STRATEGY MATRIX

The preceding strategy outline has also been summarized and presented in matrix form to enhance understanding of its structure and content.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: EFFICIENCY AND PROFITABILITY OF CROP PRODUCTION			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Increase crop yields	<ul style="list-style-type: none"> - Inadequate use of improved varieties. - Improved varieties not always appropriate. - Low fertilizer use and poor weed and pest control. 	<ul style="list-style-type: none"> - Expand the national seed list. - Encourage private sector import, multiplication and distribution of certified, improved seed varieties. - Support the establishment of private sector nurseries for fruit trees, berry fruit and grapes. - Develop recommendations for the profitable use of fertilizers and agricultural chemicals. 	<ul style="list-style-type: none"> - Strengthen the institutional capacity for seed certification and selection.
Reduce production costs	<ul style="list-style-type: none"> - Excessive seeding rates (cereals). - Inefficient and outdated cultivation practices and inappropriate machinery. 	<ul style="list-style-type: none"> - Develop recommendations for cost-effective cereal planting. 	<ul style="list-style-type: none"> - Develop recommendations for modern, cost-effective cultivation practices and the type of machinery required. - Use these recommendations to guide donor and private sector purchase of farm machinery.
Increase the use of improved technology by small-scale farmers	<ul style="list-style-type: none"> - Inadequate extension messages and services, particularly for small-scale commercial farmers. - Diseconomies of small fragmented farms. - Outmoded management systems for fruit production. 	<ul style="list-style-type: none"> - Develop extension recommendations for small-scale commercial farmers on the use of low-cost measures to improve productivity and profitability. - Train private and public extension agents to disseminate these messages. - Promote the widespread establishment of producer associations as a vehicle for disseminating extension messages and reducing diseconomies of scale. 	<ul style="list-style-type: none"> - Support the establishment of private sector extension facilities by producer associations, agro-processors and agri-business enterprises. - With donor and government support establish a moderately scaled canton-level public extension service, which should be self-financing by the year 2005. - Introduce new fruit varieties and modern systems of orchard management.
Diversification into higher returning crops	<ul style="list-style-type: none"> - Farmer focus on food self-sufficiency. - Inadequate information. 	<ul style="list-style-type: none"> - Review the profitability of alternative crops grown under small-scale farm conditions and develop extension programmes that encourage commercial farmers to diversify into new crops. 	<ul style="list-style-type: none"> - Promote the production of organically grown fruit and vegetables.
Increased use of irrigation	<ul style="list-style-type: none"> - Inadequate information on irrigation systems suited to small farms. - Inadequate finance for small-scale commercial farmers. 		<ul style="list-style-type: none"> - Identify low cost irrigation systems suited to small-scale commercial farms and develop management guidelines to promote their use. - Establish credit lines for investment in irrigation.
Improve the efficiency of farm machinery use	<ul style="list-style-type: none"> - Adequate machinery per hectare but inadequate machinery per farm. 		<ul style="list-style-type: none"> - Promote the establishment of farm machinery rings. - Establish credit lines for farm machinery sale outlets and farm machinery contractors.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: EFFICIENCY AND PROFITABILITY OF LIVESTOCK PRODUCTION			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Improve the quality and quantity of pasture, fodder and forage production and its utilization	<ul style="list-style-type: none"> - Low production and inefficient use of pastures and forage crops. - Inadequate use of mountain grazing resources. 	<ul style="list-style-type: none"> Develop extension recommendations for: <ul style="list-style-type: none"> (i) improving the quality of pasture and hay; (ii) the cost-effective use of fertilizer on pastures; (iii) low-cost systems of silage making. - Introduce alternative forage and fodder crops as a means of improving lowland livestock production. 	<ul style="list-style-type: none"> - Increase the use of mountain grazing resources by establishing Land Development Boards to manage them (see Land Use) - Increase the number of livestock water points in mountain pastures.
Increase the profitability and diversity of livestock production	<ul style="list-style-type: none"> - Poor livestock nutrition and low consequent animal productivity. - Inadequate use of improved management systems by small-scale farmers. - Low returns to sheep production and decline of the national flock. - Potential for increased fish and honey production. 	<ul style="list-style-type: none"> - Develop low-cost feeding recommendations suited to small-scale commercial farmers as the basis for improving the growth rates of young stock, reducing the age of first parturition and shortening the breeding interval. - Promote the widespread establishment of producer associations as a vehicle for increasing the adoption of improved management techniques. - Develop recommendations on grazing management and shearing times as the basis for improving wool quality and train farmers to class wool. - Promote fish and honey production. 	<ul style="list-style-type: none"> - Establish a research centre for animal production to conduct research on: animal nutrition, pasture and forage management, animal health and animal breeding and to coordinate the dairy performance recording scheme. This research should cover all livestock and respond to the issues effecting small-scale commercial farmers.
Increase livestock numbers and improve the genetic base for livestock production	<ul style="list-style-type: none"> - War-related losses of livestock in general and improved breeding stock in particular. - Low genetic potential of traditional breeds and low use of AI. - War-related breakdown of dairy performance recording system. 	<ul style="list-style-type: none"> - Continue donor support for the import of young, high quality breeding stock as a means of improving the genetic potential of livestock in FBiH, but: <ul style="list-style-type: none"> - stock to be distributed only to commercial farmers; - farmers to pay a portion of the purchase price and to pay for performance recording of these animals. - Budget restrictions permitting, government to finance a modest subsidy programme to encourage farmers to retain young dairy stock. This programme to be limited to the period 2000-2002 and to cost no more than DM2.5 million per year. - Remove the import tariff on breeding cattle. - Establish private sector stud farms through support for privatization and development of the state-owned animal breeding and reproduction centres. 	<ul style="list-style-type: none"> - Government to facilitate the private sector import of livestock and animal semen by improving the efficiency of administrative procedures. - Train and licence technicians to perform AI and remove the monopoly control of veterinarians over the provision of animal breeding services. - Re-establish the dairy performance recording scheme on a self-financing basis.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: MARKETING AND PROCESSING OF AGRICULTURE PRODUCTS			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Rapid, appropriate privatization of state-owned agro-processors and agri-business enterprises	<ul style="list-style-type: none"> - The increasing weakness of state-owned enterprises due to their limited ability to restructure and poor access to donor funds. - The risk of privatizing unviable business entities. 	<ul style="list-style-type: none"> - Ministry and canton governments to effect rapid privatization. - The international community to assist state enterprises to determine which components are commercially viable and the associated optimal level of staff; government to facilitate this restructuring. 	
Increase the efficiency and competitiveness of private sector agro-processors and agri-business enterprises; and expand their share in domestic and international markets	<ul style="list-style-type: none"> - Limited ability to compete with imports due to excess capacity, outdated plant and equipment and inadequate management. - The need to link production decisions more closely to consumer demand; and adjust to war-related changes in the characteristics and level of consumer demand. - The shortage of credit for working capital and investment. 	<ul style="list-style-type: none"> - The international community to provide training in business management, accounting, marketing and to assist managers to increase production efficiency, assess the level and characteristics of current and future consumer demand and to develop suitable products. - Donors to provide credit lines for investment and working capital for those enterprises able to adapt to current market conditions. - Government to reduce the import tariffs on maize and sugar to zero percent in order to support the development of domestic industries for animal feed and fruit and vegetable processing. - Improve the enforcement of border controls and the collection of import duties. 	<ul style="list-style-type: none"> - Assist the Chamber of Commerce to promote domestically produced agricultural products on international markets.
Increase marketed surplus and farm incomes	<ul style="list-style-type: none"> - Low marketed surplus for most agricultural commodities. - The breakdown of pre-war assembly and marketing mechanisms. 	<ul style="list-style-type: none"> - Promote the establishment of producer associations as a vehicle for linking producers to marketing outlets and increasing marketed surplus. - Re-establish milk assembly systems by providing finance for lacto-freezers, and establishing producer associations to coordinate collection and sales. - Ensure that producers are paid promptly by processors. 	
Strengthen market institutions and infrastructure	<ul style="list-style-type: none"> - The collapse of state and cooperative marketing institutions. - The lack of market information within and between entities. - The alignment of product and health standards with the EU. 	<ul style="list-style-type: none"> - Re-establish and restructure agriculture cooperatives, and where appropriate, support their development into private agri-business enterprises. - Develop systems to collect and disseminate market information in both entities, and to follow trends in agriculture prices in international markets. 	<ul style="list-style-type: none"> - Working with canton governments, construct wholesale markets in the major urban centres and producer areas, and improve the standard of facilities in local green markets. - Align product standards and health and safety regulations in both entities with those in the EU.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: RURAL DEVELOPMENT			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
To improve the welfare of rural households and strengthen rural communities	<ul style="list-style-type: none"> - The need to increase access to opportunities for non-farm employment in rural areas. - The need to improve the quality of rural health and education services. 	<ul style="list-style-type: none"> - Prepare canton and municipality level rural development plans that reflect the needs and aspirations of local people and the nature of the local resource base. - With the support of donors, NGOs, canton and municipality government, establish job and business training programmes and micro-credit lines as the basis for encouraging small enterprise development in rural areas. - With donor support, strengthen the institutional capacity of canton and municipality government to design and implement rural development programmes. 	<ul style="list-style-type: none"> - Together with other relevant ministries, develop programmes to improve the quality of rural education and rural health services.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: LAND USE AND NATURAL RESOURCE MANAGEMENT			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
To accelerate the de-mining of agricultural land	- The low priority given to de-mining agricultural land, lack of an institutional framework and limited consequent progress.	- Establish a unit within the MAWMF to: identify and prioritize agriculture land for de-mining, obtain the requisite donor finance and coordinate and monitor de-mining activities.	- To effect the de-mining of at least 1000 ha of agricultural land per year.
To support the resettlement of displaced persons and refugees according to the guidelines established by the RRTF	The social and economic imperatives to re-establish rural families.	- Ensure that returnees, re-locating families and residents in resettlement areas have full access to credit and extension facilities, and to rural development programmes designed to create opportunities for non-farm rural employment.	
To promote the enlargement and consolidation of small-scale farms	- The constraints to agricultural production caused by the predominance of small fragmented farms in FBiH. - The constraints to land market transactions as a vehicle for addressing this problem. - Inheritance laws and customs. - The high cost of land consolidation programmes.	- Encourage the leasing of rural land by developing legally recognized, standard lease contracts which protect both lessee and lessor. - Promote increased land sales by: (i) Removing the current tax on land transactions; (ii) Establishing information systems which describe the location, characteristics and price of rural property available for sale or exchange; (iii) Establishing registers of lawyers, valuers and property agents who provide the technical and administrative services needed to effect land transactions. - Prepare six monthly property reports that indicate the current level of activity and prices in the main sectors and locations of the land market.	- Provide technical and financial support to strengthen the legal and institutional basis for effecting land transactions within and between entities. - Amend current land laws such that ,in the absence of any formal lease agreement, the conditions of the standard lease agreement will apply. - Improve the efficiency and probity of land transactions by: training valuers and property agents, establishing codes of conduct for their activities, and establishing relevant professional associations. - Government to establish legal recognition of these associations, and procedures for licensing members. - Review and amend inheritance laws to prevent further land fragmentation. - Continue the pre-war system of land consolidation programmes, but land owners and/or donors to fund part of the cost of associated infrastructure.
To privatize state farms and ensure that ex-state farm land is used efficiently	- The need for policies to optimize the current and future use of ex-state farm land.	- Privatize all state farms, with the land to be occupied on the basis of medium-term lease agreements at market rentals. - Where appropriate, small areas of the state farms to be transferred to agriculture research centres.	- Review the policies that determine the ownership of ex-state farm land and the efficiency with which it is used. Consider the need for: privatization of this land; dividing it into smaller, but fully commercial farms; and its use for enlarging small-scale farms.

FOCUS: LAND USE AND NATURAL RESOURCE MANAGEMENT (continued)			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
To develop an appropriate legislative and institutional basis for land use management, and to strengthen the institutions responsible for land policy implementation	<ul style="list-style-type: none"> - The appropriateness of current policies and procedures on land tenure, land administration and land management. - The limited capacity of the institutions responsible for implementing these policies. 	<ul style="list-style-type: none"> - Continue the process of updating and reconciling the land book and the land registry, and computerizing land records. 	<ul style="list-style-type: none"> - Promote the establishment of Land Development Boards to initiate and manage land development and maintenance projects that require cooperative action. Activities to be implemented by these Boards include the drainage, irrigation and land consolidation programmes currently directed by local government authorities; and the management of communal grazing areas. - Review the current legislation on natural resource management and the institutional base responsible for implementing this legislation. Where appropriate, modify this legislation to comply with international standards on acceptable levels of pollution and strengthen relevant institutions. - Develop extension programmes that enable farmers to restore the fertility and stability of environmentally damaged land. - Review the current policies and institutions relating to land tenure, land administration and land management. On the basis of this review, develop a comprehensive framework for guiding: the operation of land markets, the management of unused land (abandoned, mined etc.), the use of rural land for non-farm purposes, the use of value-based land taxation instead of cadastral taxes, the roles of the institutions which administer land policy, and measures to increase their capacity.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS - MAWMF and CANTON GOVERNMENT			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Define the roles of the MAWMF and canton governments and strengthen their capacity to fulfil these roles.	<ul style="list-style-type: none"> - The redefinition of MAWMF responsibilities consistent with the operation of a market-oriented economy and the increased role of private sector institutions. - The need to inform and train MAWMF personnel and enhance their capacity to fulfil these new responsibilities. - The future role of canton governments in the areas of agriculture extension and rural development. 	<ul style="list-style-type: none"> - Restructure the MAWMF to strengthen capacity in its main future areas of responsibility: policy analysis, monitoring and enforcement of plant and animal health regulations, market information, and stewardship of natural resources. - Transfer responsibility for veterinary services, and plant and animal breeding to the private sector: - Donor community to organize and finance visits to central European and EU countries to inform FBiH policy makers of current agricultural policies and institutions in these countries. - With donor support, canton governments to establish a modest self-financing extension service. 	<ul style="list-style-type: none"> - With donor support, strengthen the institutional capacity of canton and municipality government to design and implement rural development programmes.
Revise and re-allocate the MAWMF agriculture budget to increase the impact of direct support on agriculture sector development	<ul style="list-style-type: none"> -The limited MAWMF budget allocation for agriculture and the probability that any increase in this allocation will be dependent on economic growth. - The need to use this limited budget for public activities which benefit a broad range of farmers and/or key sub-sectors, in order to maximize its impact. - The current lack of budget support for agriculture research. 	<ul style="list-style-type: none"> - Budget restrictions permitting, MAWMF to begin funding agriculture research. - Budget restrictions permitting, finance a modest subsidy programme to encourage farmers to retain young dairy stock. This programme to be limited to the period 2000-2002, and to cost no more than DM2.5 million per year. - Phase out the current MAWMF tobacco subsidy and replace it with support from those cantons where tobacco is produced. 	
Minimize the level of intervention in agriculture markets, consistent with the operation of a market-oriented economy	<ul style="list-style-type: none"> - The role of trade policy rather than price policy as the basis for influencing agriculture prices. - The need to focus agriculture price policy on a small number of key commodities. 	<ul style="list-style-type: none"> - Phase out the official minimum prices for: rye, barley, maize, beans, tobacco, eggs, beef, veal, lambs, swine and broilers. - Maintain the system of guaranteed prices for wheat, official minimum prices for milk and the subsidy on milk production, at their existing level. - Reduce the current import tariffs on breeding cattle, maize and sugar to zero. 	<ul style="list-style-type: none"> - Once the political and economic situation stabilizes, review the policies and operations of the Strategic Reserves Agency and develop a more cost-effective approach to the management of strategic stocks and protection of the wheat floor price.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS - RURAL FINANCE			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Pending recovery of the financial sector, to assure access to suitable sources of credit to finance agriculture sector recovery and development	<ul style="list-style-type: none"> - The collapse of the pre-war system of rural credit and the commercial banking system, and the consequent shortage of credit. - The need to support reform of the banking sector. 	<ul style="list-style-type: none"> - The international community to finance further credit lines for investment and working capital, to support the establishment and growth of private sector agri-business and marketing agencies, agro-processors and commercial farmers. - Donor credit lines to be administered by commercial banks in conjunction with concurrent programmes of financial sector reform and the improvement of commercial bank management. - The international community to modify the conditions of donor funded loans to agriculture enterprises in order to improve borrower cash flow during the first 12 months of business operation. These modifications should increase the length of the loan term and any grace period. 	
To establish a broad-based system of rural financial institutions, located in the private sector, as the basis for providing financial services to large- and small-scale producers, agro-processors and agri-business enterprises	<ul style="list-style-type: none"> - Measures to encourage the establishment of the main rural financial institutions: the Federation Investment Bank, commercial banks such as the Raiffeisen Bank, and Village Credit Unions. - The need to establish financial institutions with the capacity of delivering reasonably priced financial services to agriculture. 	<ul style="list-style-type: none"> - The international community to encourage the establishment of financial institutions such as the Raiffeisen Bank, which have special expertise in agriculture credit. - Initiate a pilot programme to establish Village Credit Unions as the basis for providing affordable financial services to small-scale farmers. 	<ul style="list-style-type: none"> - The international community to continue technical assistance to the Federation Investment Bank with the aim of establishing it as the principal source of medium and long-term finance for agro-processors, agri-business enterprises and large-scale commercial agriculture. - Particular emphasis should be given to: privatization of the FIB, measures to increase its capital base, the reduction of government involvement in ownership and management, and staff training.

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS - AGRICULTURE EXTENSION, RESEARCH AND EDUCATION			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
To establish a cost-effective extension service able to respond to the interests of small-scale commercial farmers	<ul style="list-style-type: none"> - The focus of pre-war extension on state farms, and the lack of any post-war extension services. - The current lack of extension messages suited to small-scale commercial farmers. - The lack of public resources for extension, and the corresponding emphasis on moderately scaled, cost-effective services. - The limited ability of farmers to pay for extension services. 	<ul style="list-style-type: none"> - Develop gender-sensitive extension packages appropriate for small-scale commercial farmers, to improve farm productivity and profitability through the adoption of simple, cost-effective technologies. - Develop training programmes for all public and private sector extension agents. This training to be conducted in a new centre for training extension agents from both entities. - Establish a moderately scaled, canton extension service. To be funded initially by the donor community, but to be fully funded by canton budgets and user fees by the year 2002, and to be self-financing by 2005. 	<ul style="list-style-type: none"> - Resources permitting, expand the public extension programme to encompass family issues and measures to generate non-farm income.
To establish a research system which responds to the interests of small-scale commercial farmers	<ul style="list-style-type: none"> - The focus of pre-war research on the interests of state farms, plant and animal breeding, and the maximization of production rather than profits. - The post-war collapse and fragmentation of research institutions, and the absence of public funding for research. - The severe shortage of human and material resources for research. 	<ul style="list-style-type: none"> - Establish an Agriculture Research Council to define the agriculture research agenda for FBiH and allocate research funds. The Council and its research fund to be donor-financed for its first three years of operation. Membership to include producers, processors, extension, academia and government. - Direct ARC support to the pre-war research centres working on temperate and Mediterranean crops, and to the new research centre for animal production. - As more funding becomes available, the crop institutes to cease their involvement in commercial activities such as seed multiplication and sales. 	<ul style="list-style-type: none"> - Establish a research centre for animal production to conduct research on animal nutrition, pasture and forage management, animal health, and animal breeding and to coordinate the national performance recording programme. This research should respond primarily to the interests of small-scale commercial farmers. - Increase the agricultural research budget (from all sources) to one percent of agriculture GDP by 2009. (Two percent of agriculture GDP is considered the minimum for successful agriculture sector development).
To establish appropriate, high quality vocational and university education programmes in the agriculture sciences	<ul style="list-style-type: none"> - The focus of pre-war education on the intensive production systems on state farms, and the maximization of production rather than profits. - The need for generalists rather than specialists to work with small-scale commercial farmers. 	<ul style="list-style-type: none"> - Provide support for the reform of curricula, and the replacement of teaching and research materials damaged during the war; to the agriculture faculty in Sarajevo and to pre-war institutions in Mostar. - With international support, improve the curricula and teaching capacity of the institutions responsible for training agricultural and veterinary technicians, and assist them to obtain new teaching materials. 	

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS – AGRICULTURE EXTENSION, RESEARCH AND EDUCATION (cont)			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
To strengthen the institutional capacity of the extension, research and education systems	<ul style="list-style-type: none"> - Limited awareness of comparable systems in western and central Europe and in the USA. - Weak links between education, research and extension to the detriment of producers and agriculture sector development. - The post-war tendency for each entity to duplicate facilities at a time of scarce human and financial resources. 	<ul style="list-style-type: none"> - Donor community to organize and finance visits to central European and EU countries and to the USA to acquaint key personnel involved in agriculture extension, research and education with the policies, and public and private institutional structures used in these countries. - Develop an institutional framework to ensure effective communication between extension, research and education centres. - Under the auspices of the OHR, review the current proliferation of research and education institutions in both entities, and develop guidelines for donors as to which institutions should have the highest priority for support. 	

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS - ANIMAL HEALTH AND BREEDING			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Define the new roles and responsibilities of the public animal health service and strengthen its capacity to fulfil these responsibilities	<ul style="list-style-type: none"> - The redefinition of MAWMF responsibilities, consistent with the operation of a market-oriented economy, and the increased role of private sector institutions. - The need for key sector personnel to learn more about comparable public and private sector roles in other countries, and how these countries structure relevant public and private sector institutions. 	<ul style="list-style-type: none"> - Limit direct government involvement in the management of animal health to: licensing of veterinarians and veterinary technicians; specification of minimum hygiene standards to be observed in enterprises which process animal products, minimum health and quality standards for domestic and imported animal products and conditions for the import and export of live animals and animal semen; monitoring and enforcement of these regulations in FBiH and on national borders; and management of the veterinary institutes. - Re-establish the national performance recording scheme in the research centre for animal production. - Donor community to organize and finance visits to central European and EU countries and to the USA to acquaint key personnel involved in animal health and breeding with the policies, and public and private institutional structures used in these countries. 	<ul style="list-style-type: none"> - With donor support, complete the refurbishment of the veterinary institutes and diagnostic laboratories responsible for monitoring and advising on animal health.
Broaden and strengthen the private sector capacity to provide cost-effective services for animal health and animal breeding	<ul style="list-style-type: none"> - The need to ensure that private sector agents involved in animal health and animal breeding are adequately trained professionals, and have the resources to provide cost-effective services. - The need to remove any monopoly control associated with the provision of animal breeding services, and to ensure that farmers have complete choice as to the source and type of service obtained. 	<ul style="list-style-type: none"> - Support privatization of the veterinarian system by: ensuring that veterinarians have access to credit to acquire necessary facilities, and establish a professional association to guide the provision of veterinary services. - Train technicians to perform artificial insemination; and license trainees to perform these services on a commercial basis. - Establish administrative procedures to facilitate the commercial import and distribution of animal semen. - Remove the monopoly control which veterinarians have over the acquisition and sale of animal semen and the provision of artificial insemination. - Establish private sector stud farms through support for privatization and development of the state-owned animal breeding and reproduction centres. 	

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS – PLANT BREEDING AND PROTECTION			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Define the new roles and responsibilities of the public institutions involved in plant breeding and plant protection, and strengthen their capacity to fulfil these responsibilities	<ul style="list-style-type: none"> - The need to modernize the public institutional structures responsible for seed certification and selection. - The need for key sector personnel to learn more about comparable public and private sector roles in other countries, and how these countries structure relevant public and private sector institutions. 	<ul style="list-style-type: none"> - Government to be responsible for seed testing, certification and selection; the national seed list; the specification and enforcement of regulations for the export, import and distribution of plant materials and agriculture chemicals. - Continue donor support for the establishment of modern standards for seed certification, and the public institutions responsible for this activity. - Increase donor support for the testing and selection procedures for expansion of the national seed list. Consider allowing the import of seeds approved by EU member countries to advance this process. - Donor community to organize and finance visits to central European and EU countries and to the USA to acquaint key personnel involved in plant breeding and protection with the policies, and public and private institutional structures in these countries. 	
Broaden and strengthen the private sector capacity to provide cost-effective input services	<ul style="list-style-type: none"> - The need to ensure that farmers have complete choice as to which farm inputs they buy and from whom they buy them. 	<ul style="list-style-type: none"> - Promote private sector commercial seed multiplication and sales, and discontinue the involvement of research institutes in these activities. - Support private sector input suppliers through access to credit and more efficient import procedures. 	
FOCUS: AGRICULTURE POLICIES AND INSTITUTIONS – PRODUCER ASSOCIATIONS			
Promote producer associations as a means of reducing diseconomies of small farm size, improve access to markets and the efficiency of machinery use, and facilitate agriculture extension	<ul style="list-style-type: none"> - The numerous potential roles for these institutional structures. - The need to broaden the existing focus on cooperatives and to better inform key personnel of the alternatives. - The need to restructure existing cooperatives according to new legislation. 	<ul style="list-style-type: none"> - Promote all forms of producer associations to allow members to choose according to the preferences and activities of the association. - Support the privatization and restructuring of agric. cooperatives, and their adoption of new legislation on cooperative governance and membership. - Donor community to organize and finance visits to central European and EU countries and to the USA to acquaint people with the structures, activities and legal status of producer associations elsewhere. 	

AGRICULTURE SECTOR STRATEGY MATRIX

FOCUS: INTER-ENTITY TRADE AND COOPERATION			
OBJECTIVE	ISSUES/CONSTRAINTS	STRATEGY RESPONSE	
		SHORT-TERM	MEDIUM-TERM
Increase inter-entity trade	- The benefits to producers and consumers of re-establishing traditional patterns of internal trade.	- Establish a mechanism for collecting and disseminating market information throughout both entities.	
Improve inter-entity cooperation relevant to the monitoring of animal and plant health	- Once inter-entity trade resumes, the risk of serious plant and animal diseases will increase unless there is effective cooperation between the public institutions responsible for plant and animal health.	- With the support of OHR, the donor community to refurbish all pre-war veterinary institutes and diagnostic laboratories in BiH to identical standards; to re-train staff in order to ensure equivalent levels of analysis and to organize the regular exchange of information on issues of animal health. - With the support of OHR, the donor community to refurbish the public institutions in each entity responsible for seed certification, seed selection and plant protection to identical standards, to retrain staff in order to ensure equivalent levels of analysis and to organize the regular exchange of information on relevant issues of plant protection.	
Improve entity level participation in the formation of state level policy relevant to agriculture	- Weak entity level involvement in the activities of task forces established by the state ministries to formulate state-level policy.	- Ministry of Agriculture representatives from both entities to participate actively in the task forces set up by the Ministry of Foreign Trade and Economic Relations to formulate state level policy; including customs procedures, international trade and membership of WTO and the European Union.	- With the support of the international community implement a programme to align product standards and trade, health and safety regulations throughout BiH with those applied by the European Union.
Establish a more rational basis for the use and development of public institutions for agriculture research and education	- The waste of scarce human, institutional and financial resources caused by the unnecessary fragmentation and duplication of the institutions for agriculture research and education.	Under the auspices of the OHR, review the current proliferation of research and education institutions in both entities and develop guidelines for donors as to which institutions should have priority for support. - The international community to support the establishment of a centre for training extension agents from both entities.	

Table 1: Land Resources of Bosnia and Herzegovina

Land Type	Land Area (ha)		Land Area (percent)	
	FBiH	RS	FbiH	RS
Total Area	2607579	2505300	51.0	49.0
Arable Land	508062	671599	43.1	56.9
Field Crops	461360	616548	42.8	57.2
Orchards	41395	54358	43.2	56.8
Vineyards	5307	693	88.5	11.5
Meadows	248291	236922	51.2	48.8
Pastures	502443	358734	58.3	41.7
Other (Ponds etc)	0	31364	na	na
Total Agric Land	1258796	1298619	49.2	50.8
Population ^a	2250000	1450000	61.6	38.4
Pop Density (/km ²)	86.3	57.9	na	na
Agricultural Land/Person	0.56	0.90	na	na
Arable Land/Person	0.23	0.46	na	na

Sources: MAWMF, FBiH; MAFWM, RS.

^a Resident population for 1998

Table 2: Macroeconomic Indicators

	1990	1991	1995	1996	1997	1998	1999
State of Bosnia and Herzegovina						estimate	estimate
<i>GDP (US\$ million)</i>	10633	8670	1867	2741	3423	4082	4533
<i>GDP (million DM)</i>	17225	14392	2873	4189	5803	6900	7935
<i>GDP Growth \$ US (percent)</i>	na	-19	na	47	25	19	11
<i>GDP Growth DM (percent)</i>	na	-16	na	46	39	19	15
<i>Per Capita GDP US\$</i>	2444	1979	445	653	815	972	1054
<i>External Current Account (US\$ m)</i>							
Exports	1990	2120	152	336	575	817	1043
Imports	1700	1673	1082	1882	2333	2573	2625
Trade Surplus/Deficit	290	447	-930	-1546	-1758	-1756	-1582
Current Account Balance	na	na	-193	-748	-1060	-1127	-944
<i>External Debt</i>							
External Debt (\$US million)	na	na	3361	3620	4076	2879	3055
External Debt (percent of GDP)	na	na	180	132	119	71	67
Debt Service Ratio (% of exports)	na	na	118	53	16	17	8
Federation of Bosnia and Herzegovina							
<i>GDP (million DM)</i>	11138	na	1962	3049	4189	5348	na
<i>GDP Growth DM (percent)</i>	na	na	na	55	37	27	11
<i>Per Capita GDP DM</i>	2292	na	892	1386	1904	2431	na
<i>Budget Surplus/Deficit^c (DM million)</i>	na	na	0	-90	4	24	na
Revenues and Grants	na	na	855	1661	2100	2052	na
Expenditures	na	na	854	1751	2096	2028	2439
Budget Deficit as percent GDP	na	na	0.00	-2.95	0.10	0.3	na
<i>External Trade (US\$ m)</i>							
Exports	na	na	23.7	57.9	192.6	351.8	na
Imports	na	na	523.6	1203.9	1554.9	2120.3	na
Trade Balance	na	na	-499.9	-1145.9	-1362.4	-1768.5	na
<i>All Industrial Production (1991=100)</i>	132	100	11	16	23	28	31 ^b
Food and Beverage Production	118	100	17	28	36	41	44 ^b
<i>Employment and Wages (December)</i>							
Employment	na	631020	220396	338656	347161	407047 ^d	407194 ^b
Registered Unemployment	na	na	na	176918	222332	256487	262228 ^b
Official Unemployment Rate (percent)	na	na	na	34	39	39	39 ^b
Average Monthly Net Wage DM	na	666 ^a	59.5	236.1	308	357	372 ^b
<i>Prices</i>							
% Change in COL Index (Ann Average)	575 ^a	116 ^a	-14.5	-20.3	8.6	6.8	0.1 ^b
% Change in Retail Prices (Ann Average)	594 ^a	114 ^a	-16.5	-20.1	10.8	5.1	0.3 ^b

Sources: IMF and Donor Conference Reports; USAID Reports; Central Statistical Office, Sarajevo.

^a State of Bosnia and Herzegovina^b Mid-Year data^c Consolidated (Federation government, cantons and municipalities)^d Military included in employment figures beginning in 1998

Table 3: Pre-War Structure of Agricultural Production and Resource Use in BiH

	Private Farms	Ex-Social Sector Farms	Private Farms as percent of Total
Number of Farms	571,207 ¹	300	99.9 percent
Total Area Farmed ('000 ha)	2376 ²	155	6.1 percent
Average Farm Size	2.9	517	na
Land Use² ('000 ha)			
Cereal Crops	426	30	93.4 percent
Industrial Crops	11	7	61.1 percent
Vegetables	115	1	99.1 percent
Fodder Crops	193	9	95.5 percent
Orchards	89	3	96.7 percent
Vineyards	2	3	40.0 percent
Meadows	448	23	95.1 percent
Pastures	870	62	93.5 percent
Livestock³ ('000 head)			
Cattle	923.9	29.8	96.9 percent
Pigs	465.3	110.2	80.9 percent
Poultry	4211.0	2499.0	62.7 percent
Sheep	1304.0	13.0	99.0 percent
Tractors	41400	18600	69.0 percent

Source: World Bank, (Harrison), 1995; Chamber of Commerce, Sarajevo

¹Census of Agricultural Holdings, 1991.

²For the 1991 crop year; ³As at January 1992.

Table 4: Distribution of Rural Households and Land Ownership in BiH, 1981

	Number of Farms	Percent of Farms	Estimated Area (ha)	Percent of Area
Less than 1 ha	186445	34.5 percent	81709	5.3%
1.01 ha - 2.00 ha	105146	19.5%	152462	9.8%
2.01 ha - 5.00 ha	159260	29.5%	521878	33.6%
5.01 ha - 10.00 ha	73774	13.7%	511055	32.9%
10.01 ha - 15.00 ha	9499	1.8%	118738	7.6%
15.01 ha - 20.00 ha	2664	0.5%	46620	3.0%
Over 20 ha	3506	0.6%	122710	7.9%
Total	540294	100%	1555172	100%

Source: World Bank, (Harrison), 1995

Table 5: Pre and Post-war Agriculture Production in FbiH

Crops^a (ha)	1990-91	1995/96	1996/97	1997/98	1998/99^c	Change	
						99/91 %	Δ Ha
Cereal crops	193157	106424	115482	111059	102344	53.0%	-90813
Vegetables	65741	49254	48513	50210	50834	77.3%	-14907
Industrial Crops	7987	737	857	1305	1362	17.1%	-6625
Fodder Crops	117811	52398	56074	64851	62898	53.4%	-54913
Total	384696	208813	220926	227425	217438	56.5%	-167258
Livestock^c	1990	1996	1997	1998	1999	98/90 %	Δ No.
Total Cattle	447371	205390	216731	222895	na	49.8%	-224476
Cows & In-Calf Hfrs	na	152180	158801	172973	na	na	na
Other	na	53210	57930	49922	na	na	na
Total Sheep	651819	236663	263781	290189	na	44.5%	-361630
Breeding ewes	na	170497	189246	209577	na	na	na
Others	na	66166	74535	80612	na	na	na
Pigs	179288	90765	80865	76853	na	42.9%	-102435
Sows & 1 st farrow	na	10797	12928	15272	na	na	na
Other	na	79968	67937	61581	na	na	na
Poultry	2782950	1480656	1877488	2848322	na	102.3%	65372
Horses	46628	17964	18979	19226	na	41.2%	-27402
Goats	na	31672	30313	35621	na	na	na

Source: CSO, Sarajevo.

^a Area harvested; ^b Area planted; ^c As of December 31st

Table 6: Crop and Livestock Performance Indicators

Item	Unit	Western Europe	State Farms (BiH)	Small Farms (BiH)
Cereals^{ab}				
Wheat	mt/ha	7.5	4.4	2.9
Maize	mt/ha	8.4	4.6	2.9
Barley	mt/ha	5.8	3.7	2.2
Oats	mt/ha	5.0	2.4	1.7
Industrial Crops^{bc}				
Sugarbeet	mt/ha	54.9	43.1	38.2
Soybean	mt/ha	2.7	2.2	1.6
Sunflower	mt/ha	2.2	1.0	na
Oilseed Rape	mt/ha	2.95	2.0	0.9
Tobacco	mt/ha	2.7	2.1	1.15
Vegetables^{bc}				
Potatoes	mt/ha	36.8	11.7	5.8
Cabbage	mt/ha	28.9	3.9	7.9
Onions	mt/ha	36.1	5.6	3.6
Tomatoes	mt/ha	320.1	na	6.8
Fruit^{bc}				
Plums	mt/ha	10.8	na	na
Apples	mt/ha	29.7	na	na
Pears	mt/ha	21.7	na	na
Cherries	mt/ha	5.4	na	na
Dairy Production^{ad}				
Milk	lt/cow	5500-8500	4700	1440
Calving Interval	months	13	14	18-24
Calf-Weaning age	days	7-10	7-10	40-60
Sheep Production^{ad}				
Milk	lt/sheep	150-300	na	30
Lambing	%	145	130	90
Wool	kg/sheep	3.0-4.0	na	1.3
Poultry Production^{ad}				
Eggs	#/hen/year	273-292	140	55
Pig Production^{ad}				
Weaners/sow/year	#	21	19	8-10
Goats^{ad}				
Milk	lt/head	500-900	na	100
Prolificacy	%	140-180	na	na

Sources: BiH: CSO, Sarajevo; Crops: FAOSTAT; Livestock: International Farm Comparison Network, Federal Agricultural Research Centre, Germany.

^a BiH: Average for 1987-1991;

^b W Europe (France, Germany, Bel-Lux, Italy, Netherlands, UK; Average for 1993-1997)

^c BiH: 1990/91 Crop Year

^d Livestock Data: International Farm Comparison Network, Germany.

Table 7: Characteristics of Cereal Crop Production in FbiH

Crop	1990/91	1995/96	1996/97	1997/98	1998/99
	Area Harvested^a (ha)				
Maize	98192	55694	61453	58525	55092
Wheat	63809	33625	36254	35039	29102
Rye	2156	1021	1258	1585	1505
Barley	17954	11158	11810	12178	11116
Oats	11046	4926	4707	3732	5529
All Cereal	193157	106424	115482	111059	102344
	Production (mt)				
Maize	na	165285	213456	204322	na
Wheat	na	80711	89628	95673	na
Rye	na	2348	3101	3777	na
Barley	na	22939	30118	28689	na
Oats	na	9642	1320	8374	na
All Cereal	na	280925	346623	340835	na
	Yield (mt/ha)				
Maize	na	3.0	3.5	3.5	na
Wheat	na	2.4	2.5	2.7	na
Rye	na	2.3	2.5	2.4	na
Barley	na	2.1	2.6	2.4	na
Oats	na	2.0	2.2	2.2	na

Source: CSO, Sarajevo.

^a Area planted for 1998/99**Table 8: Characteristics of Industrial Crop Production in FbiH**

Crop	1990/91	1995/96	1996/97	1997/98	1998/99
	Area Harvested^a (ha)				
Tobacco	4481	737	857	1305	1362
Soybean	2700	0	0	0	0
Oilseed Rape	0	0	0	0	0
Sunflower	6	0	0	0	0
Sugarbeet	800	0	0	0	0
Total	7987	737	857	1305	1362
	Production (mt)				
Tobacco	na	816	1026	1827	na
Soybean	na	0	0	0	na
Oilseed Rape	na	0	0	0	na
Sunflower	na	0	0	0	na
Sugarbeet	na	0	0	0	na
Total	na	816	1026	1827	na
	Yield (mt/ha)				
Tobacco	na	1.1	1.2	1.4	na
Soybean	na	0	0	0	na
Oilseed Rape	na	0	0	0	na
Sunflower	na	0	0	0	na
Sugarbeet	na	0	0	0	na

Source: CSO, Sarajevo.

^a Area planted for 1998/99

Table 9: Characteristics of Vegetable Crop Production^b in FbiH

Crop	1990/91	1995/96	1996/97	1997/98	1998/99^a
	Area Harvested^a (ha)				
Potatoes	34195	29040	26485	28876	29329
Beans	7176	4456	5350	4781	5231
Cabbage/Kale	na	5198	6153	4659	4382
Onions	na	3688	3623	3697	3557
Green Pepper	na	1982	1855	2057	1691
Tomatoes	na	2409	2229	2836	2332
	Production (mt)				
Potatoes	na	245926	239741	231552	na
Beans	na	5088	6572	5564	na
Cabbage/Kale	na	42624	61232	63100	na
Onions	na	23685	25933	31388	na
Green Pepper	na	9490	12412	14198	na
Tomatoes	na	17537	15604	24654	na
	Yield (mt/ha)				
Potatoes	na	8.5	9.1	8.0	na
Beans	na	1.1	1.2	1.2	na
Cabbage/Kale	na	8.2	9.9	13.5	na
Onions	na	6.4	7.1	8.5	na
Green Pepper	na	4.8	6.7	6.9	na
Tomatoes	na	7.3	7.0	8.7	na

Source: CSO, Sarajevo.

^a Area planted for 1998/99

^b These six crops account for approximately 85 percent of all vegetable production

Table 10: Pre-war Production and Exports of Berry Fruit in BiH

Fruit	Average Production 1988-91 (mt)	Average Exports 1988-91 (mt)
Strawberry	6930	1305
Raspberry	2322	495
Blackberry	1071	225
Total	10323	2025

Source: Agriculture Institute, University of Sarajevo

Table 11: Pre and Post-war Fruit Production^a

Crop	1990-1991 All BiH	1990-1991 % Composition	1995-1996	1996-1997 FBiH only	1997/98
Number of Trees					
Plum	12785073	66.7%	5277170	4901651	4786540
Apple	2666493	13.9%	1463524	1128278	1170950
Pears	1736328	9.1%	910566	733415	728660
Cherry	934187	4.9%	272971	428788	398378
Sour Cherry	500241	2.6%	127659	179295	171196
Peach	359001	1.9%	na	205077	178200
Quince	103487	0.5%	77390	na	46965
Apricot	69464	0.4%	16187	31278	32256
Walnut	539577	na	218947	301781	321623
Almond	na	na	na	16986	16938
Grapes	21929394	na	na	7066580	6402300
Production (mt)					
Plum	72928	51.2%	55938	62767	58639
Apple	32479	22.8%	17855	25373	24959
Pears	14921	10.5%	9652	12304	12398
Cherry	11338	8.0%	5005	6655	7370
Sour Cherry	4060	2.9%	1596	2467	2431
Peach	5961	4.2%	na	1164	2031
Quince	741	0.5%	680	na	669
Apricot	916	0.6%	280	394	487
Walnut	3754	na	2080	3352	3263
Almond	na	na	na	50	90
Grapes	29595	na	na	12497	12804
Yield (kg/tree)					
Plum	5.7	na	10.6	12.8	12.2
Apple	12.2	na	12.2	22.5	21.3
Pears	8.6	na	10.6	16.8	17.0
Cherry	12.1	na	18.3	15.5	18.5
Sour Cherry	8.1	na	12.5	13.8	14.2
Peach	16.6	na	na	5.7	11.4
Quince	7.2	na	8.8	na	14.2
Apricot	13.2	na	17.3	12.6	15.1
Walnut	7.0	na	9.5	11.1	10.1
Almond	na	na	na	2.9	5.3
Grapes	1.3	na	na	1.8	2.0

Source: CSO, Sarajevo

^a Post-war statistics should be treated with caution.

Table 12: Characteristics of Fodder Crop Production in FbiH

Crop	1990/91	1995/96	1996/97	1997/98	1998/99^a	
		Area Harvested^a (ha)				
Clover	na	16874	18623	20417	19123	
Lucerne	na	14542	13165	16465	16427	
Grass/Legume	na	2632	2081	2940	1866	
Cereal/Legume	na	2501	573	628	586	
Grass/Clover	na	10416	17359	17981	18622	
Maize for Fodder	na	3280	1943	3751	3836	
Beet for Fodder	na	1691	2112	2404	2112	
Vetch	na	462	218	265	326	
Total	na	52398	56074	64851	62898	
		Production (mt)				
Clover	na	67496	102073	85036	na	
Lucerne	na	55260	75769	74185	na	
Grass/Legume	na	6909	10225	10981	na	
Cereal/Legume	na	13433	2945	2686	na	
Grass/Clover	na	na	72557	59104	na	
Maize for Fodder	na	29520	30685	72543	na	
Beet for Fodder	na	15366	23415	43563	na	
Vetch	na	1032	661	1002	na	
Total	na	na	245112	288994	na	
		Yield (mt/ha)				
Clover	na	4.0	5.5	4.2	na	
Lucerne	na	3.8	5.8	4.5	na	
Grass/Legume	na	2.6	4.9	3.7	na	
Cereal/Legume	na	5.4	5.1	4.3	na	
Grass/Clover	na	na	4.2	3.3	na	
Maize for Fodder	na	9.0	15.8	19.3	na	
Beet for Fodder	na	9.1	11.1	18.1	na	
Vetch	na	2.2	3.0	3.8	na	
Total	na	na	na	na	na	

Source: CSO, Sarajevo.

^a Area planted for 1998/99

Table 13: Import Tariffs for Agricultural Products: BiH March 1998

Wheat and Rye	5%
Maize Grain	10%
Maize Seed	5%
Wheat Flour	10%
Soybeans	0%
Oilseed Rape	5%
Sunflower	5%
Soybean Oil	5%
Rape Oil	5%
Sunflower Oil	5%
Raw Sugar	10%
Processed Sugar	10%
Tomatoes	10%
Onions	5-10%
All other vegetables	5%
Apples and Pears	10%
Apricots, cherries, peaches, plums	10%
Berries	5%
Processed and semi-processed fruits and berries	10%
Milk and Milk Products	10%
Eggs for consumption	0%
Live Animals	
All Horses	0%
Breeding heifers	5%
Other cattle	10%
Live cattle for slaughter (< 300 kg)	5%
All other cattle for slaughter	10%
Maiden Breeding Sows	0%
All other live pigs	10%
Breeding stock for sheep and goats	0%
All other live sheep and goats	10%
Breeding poultry	0%
All other live poultry	10%
Meat and Meat Products	
Fresh and chilled meat	10%
Except fresh and chilled meat for horses and mules	5%
Meat by-products	5%
Except meat by-products for poultry	10%
Animal Feed	
Oil cakes and by-products of cereals and sugar	5%
Concentrates, pre-mixes, vitamins & minerals	0%
Fertilizers	
Organic	0%
Urea and ammonium-nitrate	0%
Superphosphate, DAP, MAP	5%
Complex and mixed fertilizers	5%
All Agricultural Chemicals	0%

Table 14: Imports and Exports of Agricultural Products for FBiH, 1997 and 1998

Commodity	Imports		Exports	
	1997	1998	1997	1998
SPECIFIC AGRICULTURAL PRODUCTS^a by VOLUME (mt)				
Wheat	134265	131689	0	786
Flour	44061	22767	152	23
Maize	8905	14609	3	1
Pig Meat	2566	4611	0	477
Poultry Meat	30885	11478	143	85
Veal	226	107	0	383
Beef	8562	3693	0	1751
Sheep Meat	338	53	0	1
Lamb	224	23	0	290
Wool	1	20	11	25
Liquid Cows Milk	25629	34460	20	5201
Processed	20544	31429	20	5121
Raw Milk	5085	3031	0	80
Eggs	2959	3059	0	24
Fresh Vegetables	39342	17798	236	3402
Processed Vegetables	3095	6826	158	932
Fresh Fruit	140750	60256	1158	1887
Processed Fruit	12480	1314	910	1206
Fresh Berries	59	167	703	28
Processed Berries	381	14	36	0
Vegetable Oil	36188	11794	0	282
Refined	36060	11792	0	282
Unrefined	128	2	0	0
Sugar	44561	99726	0	65
Refined	40351	84588	0	65
Unrefined	4210	15138	0	0
Livestock Feed	2763	19285	6	621
Mineral Fertilizer	9750	74851	0	0

AGRICULTURAL PRODUCTS by VALUE (\$US '000) SITC DEFINITION

Total Trade	1554970	2120298	192571	351816
Food & Live Animals	301560	407387	3006	34410
As % of Total Trade	19.4%	19.2%	1.6%	9.8%

Source: Central Statistical Office, Sarajevo

^a Includes products outside SITC definition of "food and live animals"

Table 15: FBiH: Floor and Minimum Prices, 1999

Commodity	Floor/Minimum Price	Nominal Protection Coefficient
Floor Price		
Wheat	300 DM/mt	1.15
Minimum Prices		
Rye	300 DM/mt	na
Barley	250 DM/mt	na
Maize	290 DM/mt	1.10
Beans	750 DM/mt	na
Tobacco	3000 DM/mt ^a	na
Milk (3.6% fat)	0.45 DM/litre ^b	1.35
Eggs	0.12 DM/egg	na
Beef	3100 DM/mt	0.82
Veal	3200 DM/mt	na
Lamb	3100 DM/mt	0.65
Swine	3460 DM/mt	0.83
Broilers	2200 DM/mt	0.78

Sources: MAWMF, Minimum Prices; World Bank Commodity Reports, world prices

^a Plus subsidy of 0.90 DM/kg

^b Plus subsidy of 0.13 DM/litre

Table 16: Average Consumer Prices^a for Agricultural Products (DM)

	Unit	1990	1991	1996	1997	1998	1999 (Q1&2)	% Change 1990-1999
Cows Milk	litre	0.99	1.44	1.03	1.09	1.08	1.00	1.0
Chicken Meat	kg	4.52	7.07	4.79	5.34	6.16	5.42	19.9
Beef with Bone	kg	6.77	8.83	7.18	7.46	7.50	7.50	10.8
Veal with Bone	kg	9.97	11.08	10.50	9.46	10.00	10.00	0.3
Pork	kg	8.91	10.45	9.33	9.96	10.00	9.33	4.7
Lamb	kg	12.56	12.48	9.78	9.25	10.25	10.36	-17.5
Eggs	unit	0.24	0.34	0.22	0.23	0.20	0.20	-16.7
Potatoes	kg	1.05	0.98	0.62	0.65	0.51	0.63	-40.0
Onions	kg	1.71	1.76	0.98	1.35	1.48	1.24	-27.5
Cabbage	kg	1.46	1.15	0.92	0.86	0.76	0.91	-37.7
Apples	kg	2.11	2.26	1.68	1.51	1.42	1.44	-31.8
Sugar	kg	1.81	1.72	1.26	1.17	1.11	0.94	-48.1
Edible Oil	kg	2.59	3.98	2.06	2.14	2.37	2.13	-17.8
Bread	kg	1.21	1.71	1.04	1.00	1.00	1.00	-17.4

Source: Central Statistical Office, Sarajevo.

^a Most common shop prices in Sarajevo, average of monthly prices.

Table 17: Inventory of Pre-War Institutions in BiH Involved in Agriculture and Veterinary Research, Extension and University Education

Agriculture Faculties

Agriculture Faculty, University of Mostar
Agriculture Faculty, University of Sarajevo

Veterinary Faculties

Veterinary Faculty, University of Sarajevo

Agriculture Institutes

AIPK Agriculture Institute, Banja Luka
APRO Research and Development Institute, Mostar
UPI Research and Development Institute, Sarajevo

Veterinary Institutes

Banja Luka
Mostar
Sarajevo
Tuzla

Veterinary Laboratories

Brcko
Sarajevo
Zenica

Agriculture Research Centres

Agro-Pedological Institute, Sarajevo
Banja Luka Research Centre
Bijeljina Research Centre
Doboj Research Centre
Sokolac Research and Development Centre for Mountain Agriculture
Tuzla Research Centre

Agriculture Extension Stations

Banja Luka
Bihac
Brcko
Glamoc
Prijedor
Srebrenik

Animal Reproduction

Animal Reproduction Centre, Banja Luka

Table 18: Food Consumption Levels (kg/capita): Selected Middle Income Countries

Country Year	BiH 1990	FBiH 1997	RS 1997	Jordan 1996	Morocco 1996	Yugoslavia 1996	Romania 1996	Tunisia 1996	Turkey 1996	Poland 1996	Croatia 1996
GDP/capita (US\$)	2445	1390	885	1270	1290	1520	1600	1910	2870	3230	4200
Commodity											
Wheat	189.1	125	150	145.7	198.3	107.2	142.9	210.9	194.4	111.0	93.4
Potatoes	45.8	80	na	29.6	35.5	28.5	79.5	26.9	61.6	136.1	118.1
Other Vegetables	75.5	80	120	180.1	80.0	93.7	112.5	143.9	183.3	122.1	85.5
Fruit	71.2	70	70	97.7	84.7	138.9	64.4	103.6	151.9	48.1	105.5
Sugar (Raw equiv.)	42.2	25	15	35.7	34.9	21.5	24.0	30.3	29.5	42.3	27.2
Vegetable Oils	12.8	15	10	16.5	12.7	10.8	7.2	19.5	19.0	12.0	9.8
All Meat	71.6	30.0	35	30.2	16.2	101.7	51.0	19.7	19.5	70.5	28.4
Beef and Veal	17.8	10.0	15	2.3	4.1	24.1	7.4	5.2	5.2	10.0	5.4
Mutton and Goat	2.8	1.5	2	5.3	3.7	3.0	2.6	5.8	5.2	0.1	0.7
Pig Meat	38.2	3.0	10	0.0	0.0	63.2	27.4	0.0	0.0	49.9	15.5
Poultry	12.5	15.5	8	22.4	6.9	11.3	12.9	7.8	9.1	10.2	6.9
Eggs (kg/capita)	9.9	11.1	na	9.2	6.2	7.7	9.9	5.8	8.5	9.8	8.5
Milk and Butter	179.4	132	132	39.7	30.9	178.5	193.5	74.0	145.6	194.9	161.9

Sources: GDP Data: World Bank Development Indicators

Consumption Data: Ministries of Agriculture for FBiH, RS; FAOSTAT Food Balance Sheets for other data.

Table 19: Cereal Production, Sales and Processing

	BiH			FBiH	
	1990	1991	1996	1997	1998
Wheat and Flour					
Wheat Production (mt)	456691	413448	80711	89628	95673
Marketed Surplus (mt)	134194	63807	na	5000	na
MS as % of production	29.4%	15.4%	na	5.6%	na
Consumption (kg/capita)	189	na	na	125	125
Number Processors					
Private	0	0	na	2	2
State	19	19	na	5	5
Processing Capacity (mt/year)					
Private	0	0	na	16500	16500
State	455400	455400	na	250800	250800
Wheat Milled (mt/year)	352661	361855	na	na	na
% Capacity Utilization	77.4%	79.5%	na	na	na
Flour Production (mt)	255219	262788	68956	78041	82558
Bread and Bakery Product (mt)	123724	98674	na	42157	42368
Animal Feed					
Maize Production (mt)	734049	746820	165285	213456	204322
Marketed Surplus (mt)	na	22776	174	1200	na
MS as % of production	na	3.0%	0.1%	0.6%	na
Number Feed Processors					
Private	0	0	2	2(+4)	6
State	12	12	4	4	4
Processing Capacity (mt/year)					
Private	0	0	49000	49000	na
State	479000	479000	39000	162600	na
Animal Feed Production (mt)	297056	261766	4677	22503	na
% Capacity Utilization	62.0%	74.6%	5.3%	10.6%	na

Sources: CSO, Sarajevo; Working Group Report, 1998.

Table 20: Milk Production, Sales and Processing

	BiH			FBiH	
	1990	1991	1996	1997	1998
Cattle Numbers	873605	852990	205390	216731	222895
Cow numbers	632371	622919	152180	158801	172973
% Private	99%	99%	99%	99%	99%
% State	1%	1%	1%	1%	1%
Milk Production (m lt)	880118	874324	207589	230249	276971
% Private	3.9%	3.4%	na	na	na
% State	96.1%	96.6%	na	na	na
Marketed Surplus (m lt)	92933	82028	9620	17852	
Private	58413	52114	5858	12831	na
State	34520	29914	3762	5020	na
As % of Total Production	10.6%	9.4%	4.6%	7.8%	
Consumption (kg/capita)	190	190	na	118	118
Number Processors	<i>FBiH</i>	<i>RS</i>	<i>All BiH</i>		
Private	1	na	na	11	13
State	7	na	na	4	6
				7	7
Processing Capacity lt/day)	356000	158000	514000	na	283000
Private	12000	24000	36000	na	34000
State	344000	134000	478000	na	249000
Annual Processing Output	na	na	na	13.691	na
Pasteurised Milk (m lt)	na	101.029	8.115	11.912	15.060
Sterilised (UHT) Milk (m lt)	na	5.377	0.082	0.722	2.128
Other Milk Products (m lt)	na	na	na	1.057	na
% Capacity Utilization	na	80%	na	27%	na

Sources: CSO, Sarajevo; Working Group Report, 1998.

Table 21: Meat Production and Processing

	Beef	Pork	Poultry	Sheep	Total
BiH (1991)					
Livestock Numbers	852990	616700	10607000	1317000	na
% Private	96.4	80.0	55.8	99.5	na
% State	3.6	20.0	44.2	0.5	na
Meat Consumption (kg/capita)	14.5	32.0	10.0	2.5	59.0
Meat Production (kg/capita)	11.3	10.8	5.5	2.0	29.6
Animals Slaughtered (hd)	171000	269000	na	128000	568000
Meat Processed (mt)	44500	47500	25500	13500	131000
Small-Scale Slaughter Houses (30 head/day: beef, pigs, sheep)					211
# Private					123
# State					88
Total Capacity (hd/year)					1582500
Meat Processing Capacity					
FBiH (hd/year)	137500	165000	19750000	297500	na
RS (mt/year)	na	na	na	na	206000
FBiH (1997)					
Livestock Numbers	216371	80865	1877488	263781	na
% Private	98.6	100.0	26.2	99.9	na
% State	1.4	0.0	73.8	0.1	na
Meat Consumption (kg/capita)	9.8	3.0	15.7	1.3	29.8
Meat Production (kg/capita)	5.9	1.9	2.0	1.0	10.8
Animals Slaughtered (hd)	59000	22000	na	42000	123000
Meat Processed (mt)	13400	4200	4500	2400	24500
Small-Scale Slaughter Houses (30 head/day: beef, pigs, sheep)					125
# Private					85
# State					40
Total Capacity (hd/year)					937500
Meat Processing Capacity					
Head/Year	75000	106250	500000	91250	na
% Private	16.7	15.3	34.2	100.0	na

Sources: CSO, Sarajevo. Working Group Report, 1998.

Table 22: Fruit and Vegetable Production, Sales and Processing

	Potatoes	Vegetables	Fruit	Total
BiH (1991)				
Production (mt)	331422	145000	148100	624522
Marketed Surplus (mt)	18000	34400	18100	70500
MS as % Production	5.4%	23.7%	12.2%	11.3%
MS sold on Green Markets	na	na	na	62%
MS sold to Agric Coops	na	na	na	38%
Consumption (kg/capita)	60	86	65	na
Number Processors	1	17		18
Private	0	0		0
State	1	17		18
Processing Capacity (mt/yr)	14700	216700		231400
Private	0	0		0
State	14700	216700		231400
Processed Output (mt/yr)	1400	17100	144000	162500
Capacity Utilization	9.5%	74%		70.25
FBiH (1997 and 1998)				
Production (mt)				
1997	239741	98424	114526	452691
1998	231552	121753	138904	492209
Marketed Surplus 1997 (mt)	4400	5500	4530	14430
MS as % Production	1.8%	4.5%	4.0%	3.0%
Consumption (kg/capita)	80	80	65	na
Number Processors		11		11
Private		4		4
State		7		7
Processing Capacity (mt/yr)	12000	68100		80100
Private	0	16400		16400
State	12000	51700		63700
Processed Output (mt/yr)	0	4200	7800	12000
Capacity Utilization	0%	23.2%		15.0%
Imports (mt)				
Fresh				
1997	na	39342	140750	180092
1998	na	17798	60256	78054
Processed				
1997	na	3095	12480	15575
1998	na	6826	1314	8140

Sources: CSO, Sarajevo. Working Group Report, 1998.