AGRICULTURAL POLICY ANALYSIS PROJECT, PHASE III

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FOR AGRICULTURAL POLICY
IMPLEMENTATION: PLANNING AND
EVALUATION

SEPTEMBER 1995

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Technical Report
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PRECIS

This report, prepared in cooperation with the Ministry of Agriculture and a team of expatriates and Jordanian specialists, uses Jordan's Agricultural Policy charter (APC) as its point of departure to propose a set of reforms necessary to realize the Charter's implementation, followed by an in-depth analysis of the technical and institutional implementation requirements. The reforms are grouped within four APC-determined categories: increased food self-reliance, stimulating agricultural growth, promoting balanced economic growth and equity, and improved resource management and conservation. The reforms are also examined for their importance to the agricultural sector as a whole as well as at the subsectoral level.

The priority reforms within each category are presented as are the public and/or private sector institutions responsible for their implementation. The capacity of these institutions to implement such reforms is also assessed. Four critical implementation areas are singled out for special attention: the legal and regulatory framework, the statistical base underlying sound development decision making, support from the Kingdom's research and extension institutions, and establishment of an effective monitoring and evaluation system. Strengths and weaknesses are assessed and suggestions made for improving overall performance.

The report concludes with an examination of the role that the Ministry of Agriculture is expected to play in supporting Jordan's agricultural sector's development. Building upon the APC's vision of a reorganized and highly effective ministry spearheading change within the agricultural sector, a three stage reorganization plan is proposed as a means of helping the ministry to realize such a role.

Appended to the report are three companion stdies which focus on the legal and regulatory reform requirements of the APC; environmental impact assessments with the agricultural sector; and a study of the quantitative policy analysis methods required to implement the Charter.

FOREWORD

Designing an activity which seeks to strengthen institutional capacity to analyze, design and implement agricultural policy is always a challenge. The activity team wishes to thank H.E. Mansour Ben Tarif, Minister of Agriculture, and H.E. Ghaleb Abu Orabi for their support in making staff and resources at the Ministry of Agriculture so accessible to the team. Special thanks are due Dr. Walid Abed Rabboh, Mahmoud Nejdawi and Malek Mahadin of the AEPD, whose tireless efforts opened doors in many ministries and other public and private institutions, and whose critiques helped hone the quality of the product. This undertaking would have been impossible without the contributions of USAID and GTZ, which provided both the resources and intellectual leadership in seeing this process through. Particular gratitude is due Drs. Carl Dutto and Peter Müller. Indeed, Dr. Müller provided constant support, friendship and encouragement, facilitating efforts between the donors and between the team components each donor funded. Dr. William T. Oliver, USAID Mission Director, saw to the involvement of the larger donor community, including the World Bank, in this activity. Drs. Ed Loomis and later, Tim Miller also made valuable comments and contributions to the team efforts. Many others contributed to this effort: the team would like to voice special thanks to Ms. Abeer Hweide and Ms. Rania Wazani, whose administrative support efforts kept the effort on an even keel. The team does, of course, assume full responsibility for the contents of the report.

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ACRONYMS

AC	Agricultural Council
ACC	Agricultural Credit Corporation
AEPD	Agricultural Economics and Policy Department
AMO	Agricultural Marketing Organization
AMPCO	Agricultural Marketing and Processing Company
APAP III	Agricultural Policy Analysis Project, Phase III
ASAL	Agricultural Sector Adjustment Loan
ASTAP	Agricultural Sector Technical Assistance Project
ASTSUP	Agricultural Sector Technical Support Project
BPU	Basin Protection Unit
CBJ	Central Bank of Jordan
CIDA	Canadian International Development Agency
DARE	Department of Agricultural Research and Extension
DOE	Department of the Environment
DOEI	Department of Extension and Information
DOS	Department of Statistics
DU/du	Dunum (.1 hectare)
DRMSC	Department of Range Management and Soil Conservation
EC	European Community
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agricultural Organization
FFV	Fresh Fruits and Vegetables
GDP	Gross Domestic Product
GNP	Gross National Product
GOJ	Government of Jordan
GTZ	German Agency for Technical Cooperation
HCST	Higher Council for Science and Technology

IBRD	World Bank
ICARDA	International Center for Agricultural Research in Dry Areas
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
IUCN	International Union for the Conservation of Nature
JCO	Jordan Cooperative Organization
JD	Jordanian Dinar
JES	Jordanian Environmental Society
JICA	Japan International Cooperation Agency
JUST	Jordan University of Science and Technology
JVA	Jordan Valley Authority
JVFA	Jordan Valley Farmers Association
JVFU	Jordan Valley Farmers Union
KfW	Kreditanstalt fur Wiederaufbau(German Credit Agency for Reconstruction
M&E	Monitoring and Evaluation
MM3	Cubic Meter
MMRAE	Ministry of Municipalities, RuralAffairs and the Environment
MIT	Ministry of Industry and Trade
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOH	Ministry of Health
MOP	Ministry of Planning
MOS	Ministry of Supply
MWI	Ministry of Water and Irrigation
NCARTT	National Center for Agricultural Research and Technology Transfer
NEIEP	National Environmental Information and Education Program
NGO	Non-Governmental Organization
O&M	Operation and Maintenance (costs)

PP&MD	Programme, Project and Monitoring Division (proposed)
RASC/RCARTT	Regional Agricultural Service Center/Regional Center for Agricultural Research and Technology Transfer
RSS	Royal Scientific Society
RSCN	Royal Society for the Conservation of Nature
SD	Statistics Division
UOJ	University of Jordan
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
WAJ	Water Authority of Jordan
WB	World Bank
WHO	World Health Organization
WUA	Water Users' Association

CHAPTER I

JORDAN: AGRICULTURAL POLICY CHARTER IMPLEMENTATION ACTION PLAN

EXECUTIVE SUMMARY

1.0 Introduction

This report, prepared in cooperation with the Ministry of Agriculture (MOA) and a team of expatriates and Jordanian specialists, uses Jordan's draft Agricultural Policy Charter (APC) as its point of departure to propose a set of reforms necessary to realize the Charter's implementation. The policy directions expressed in the Charter are examined within the context of four major APC objectives:

- Increased Food Self-Reliance
- Stimulating Agricultural Growth
- Promoting Balanced Economic Growth and Equity, and
- Improved Resource Management and Conservation

Reforms to achieve these objectives are presented and prioritized, along with identification of the public and/or private sector institution(s) responsible for their implementation. The capacity of these institutions to actually implement the necessary reforms is assessed.

Reforms are identified at both the sector-wide and subsectoral levels. Five subsectors are employed: irrigated agriculture; rainfed agriculture; low rainfall agriculture; integrated livestock production; and forestry.

After examining these reforms within the context of the key APC objectives, the report turns to an in-depth analysis of the technical and institutional requirements of implementation. Four key ingredients necessary to implement the Charter are examined:

- Reform of the Legal and Regulatory Framework to Promote Change;
- Strengthening the Statistical Base Underlying Project and Programme Design, and Reform Decision Making;
- Undertaking Research and Extension to Identify the Scientifically Optimal

Economic and Environmentally Sustainable Choices when Modernizing Jordan's Agriculture Sector, and

- Monitoring and Evaluating the Reform Process.

The report concludes with an examination of the institutional implications of the Charter's implementation for the Ministry of Agriculture. Building upon the APC's vision of a reorganized and redirected ministry, a reorganization plan is offered as an alternative to the MOA's present structure and functions.

Appended to the report are three companion studies which focus on: a) the legal and regulatory reform requirements of the APC; b) environmental impact assessments within the agricultural sector; and c) a study of quantitative policy analysis methods for implementation of the Charter.

1.1 Summary of Findings

Reforms focusing upon **increased food self-reliance** seek to reorient the sector away from an outdated and unattainable "self sufficiency" approach toward one that promotes Jordan's capacity to achieve food security through growing, trading for and buying sufficient food stocks. The reforms include laws, regulations, practices and technical requirements necessary to ensure the Kingdom's food security.

Stimulating agricultural growth calls for a series of reforms aimed at liberalizing market mechanisms, eliminating constraints, and promoting participation in Jordan's food system by making its rules and regulations more transparent.

The Agricultural Policy Charter's commitment to **promoting balanced economic growth and equity** recognizes the needs that a rapidly changing economic, environmental and political setting have occasioned. Specifically, it comprehends that its farmers are rapidly being skewed into either large, economically viable units or small unsustainable ones. Accordingly, it seeks to assist those farm families on the cusp through reforms that promote opportunities for access to land, labor and capital markets.

The Kingdom also recognizes that its fragile ecology is clearly at risk. The Charter's commitment to **improved resource management and conservation** seeks to promote reforms capable to ensuring that its agricultural system (including its forests) is genuinely sustainable.

1.1.1 Reform Priorities[1]

Utilizing these four major objectives of the Agricultural Policy Charter (APC), 102 reforms were analyzed[2], 74 of which were ranked as top priority reforms by Government officials and Jordanian experts. However, 21 of these reforms, many of which called for significant changes in land ownership and use, and alteration of the participation process within the agricultural sector, were also perceived as politically sensitive and therefore will be challenging and exceedingly difficult to implement.

Elements within the Ministry of Agriculture (MOA) and the Government at large are aware that implementing reforms in the agricultural sector are necessary[3], whether as the result of internal changes, political and/or economic changes within the region, or stemming from the requirements of external donors. This awareness, however, has but partially resulted in significant action. Fifteen high priority reforms are presently being acted upon by the GOJ.

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[1] The findings described herein are summarized in a matrix which appears in Appendix A.

[2] Several reforms were double counted, insofar as they had differential impacts upon individual sectoral and subsectoral objectives.

[3] Within the MOA, there are a number of staff who continue to believe that Jordan is capable of being self sufficient in food, and that this should be its policy. Still others find the move toward a more fully developed market economy unacceptable because it poses a threat to their interventionist orientation, is too western, or is repugnant to their religious views. Yet others find the changes required within the MOA to implement these proposed reforms a threat to their jobs as they know them.

Another 12 medium and low priority reforms being proposed have been or are also being addressed. Thus, almost 80 percent of the high priority reforms proposed in the APC remain to be acted upon.

Part of the difficulty the MOA faces in enacting the Charter's reforms stems from the organizational complexity occasioned by how government authority is organized within the agricultural sector. Ministries such as Water and Irrigation, Supply, Municipalities, Rural Affairs and the Environment have real authority and responsibility for activities which, in many parts of the world, are more often exclusively centered in the ministry of agriculture. Indeed, authority for 44 of the reforms identified in the APC demand leadership from ministries other than the MOA, and 72 require significant interministerial cooperation (or cooperation with external institutions such as the University of Jordan, the Higher Council for Science and Technology, or NGOs such as the Queen Noor Foundation) for their implementation.

Complicating matters further is the fact that several reforms (29) require revision of two or more existing laws, while another 18 require wholly new legislation. While one-third (32) require no legislation whatsoever, authority for implementing many of them rests outside the MOA.

The political stature of the MOA vis-a-vis other ministries is an additional problem. It represents a small (and shrinking) clientele and has a history of short tenure of its leaders. This has sufficiently diminished its status to call into question its effectiveness in enacting many of the reforms its Charter calls upon it to champion.

1.1.2 Institutional Capacities to Implement the APC

One of the most sobering findings of this exercize was the recognition that for more than two-thirds of the activities (71), the ministries or organizations mandated to implement them hadn't the capacity to do so. Forty-three MOA-led activities reflect such a capacity problem; 17 of the APC reforms which the Ministry of Water and Irrigation (MWI) would have to oversee

also disclosed serious capacity difficulties; and nine reforms to be led by the Ministry of Municipalities, Rural Affairs and the Environment (MMRAE) indicated a similar lack of institutional capacity to implement them. This figure might be higher except for the fact that some of the reforms simply called upon the GOJ to enact new legislation rather than focus on implementation issues.

Capacity problems extended to: acquiring the necessary background to comprehend the full dimensions of proposed policy changes, training of both GOJ professionals and stakeholders in implementing changes, and the need for both Jordanian and expatriate technical assistance to augment the training and implementation process. Eighty-one of the proposed Charter reforms were identified as requiring additional research. Implementing 68 of the activities will require additional training of GOJ personnel and 49 programs to train stakeholders. Seventy-nine of the policy changes also require expertise currently unavailable within the Government. Sixty-six of these changes necessitate identifying and hiring non-Jordanians; 58 call for hiring Jordanian consultants.

1.1.3. Institutional and Implementation-Related Support Systems

The study alters its focus from the reforms called for in the APC (and the capacity of the sector to implement them) to a review of the legal framework within which the reforms will occur, and three support functions essential to realizing the implementation of these reforms. These are: effective statistics; research and extension services; and monitoring and evaluation activities. Issues surrounding the legal framework are alluded to above.

Making informed decisions regarding policy design and implementation in Jordan requires substantial strengthening of the Kingdom's agricultural statistics base. At present, the MOA and the Ministry of Planning (MOP) are the key institutions tasked with statistics collection, aggregation and dissemination. Within these agencies, statistics gathering, processing and publication efforts are handled among too many divisions, few of which have the staff necessary

to maintain an effective system. Consequently, data quality suffers, and delays in data collection, processing and publication occur.

The MOP and MOA need to coordinate their statistical services more rationally, insofar as each has attributes the other lacks and each provides services decision makers need. The Statistics Division of the MOA needs additional staff, equipment and technical training at both headquarters and directorate offices to improve the accuracy of existing data and to expand the types of data required to monitor the newly approved World Bank Agricultural Sector Adjustment Loan provisions as well as the Charter's implementation.

Research and extension services to Jordan's farmers are very varied in quantity and quality. Private sector services have been growing and have gone a long way toward meeting the needs of Jordan's larger and wealthier farmers. The picture changes dramatically for those farmers who rely upon the public sector for such services. Most of these farmers and livestock producers are poor or manage enterprises which are economically marginal. These producers have been specifically targeted by the Charter and the ASAL to be the recipients of research and extension services to be provided by public sector institutions.

Public sector research has not, however, systematically focused upon Jordan's marginal producers as its clientele. The National Center for Agricultural Research and Technology Transfer (NCARTT), Jordan's universities and other smaller units certainly have the physical capacity to meet the kingdom's agricultural research needs, but lack the staff, management and programmatic focus, communication channels with other institutions, and financial resources to effectively implement the ambitious research agenda planned for them in both the APC and proposed Agricultural Research Strategy.

These problems extend equally to the extension service which lacks new information, necessary field staff, adequate training for those in the field, and the status and resources to improve institutional morale. Amelioration efforts include reuniting extension and research within an autonomous NCARTT, improving NCARTT's funding and management procedures,

developing a tightly focused extension strategy, and strengthening the professionalism of Jordan's extension agents.

Implementation of the APC and the ASAL require careful monitoring and evaluation. At present, several monitoring and evaluation units exist within the sector as a whole and the MOA in particular but these narrowly focus on project monitoring. The monitoring and evaluation capabilities essential to meeting ASAL and APC objectives simply don't exist. Expanding the MOA's Monitoring and Evaluation (M&E) Division to meet this challenge will have to include both agricultural sector performance and tracking implementation of policy reforms in participating agencies. It is recommended that M&E be changed and its staff expanded and upgraded to reflect its new mission and be called the Project and Programme Monitoring Division.

The report concludes with a broad review of the institutional implications for the MOA in implementing the Agricultural Policy Charter. Two major types of constraints hinder the Ministry from providing the leadership it needs to exert in overseeing the implementation of the Charter: first there are public sector-wide constraints which revolve around managerial, financial and civil service regulations, low pay scales, and overlapping institutional jurisdictions. Second, specific MOA constraints exist which revolve around the structure of the ministry, distribution of responsibilities, delegation of authority and management practices.

To increase the capacity of the MOA to function effectively in implementing both the APC and execute its ongoing responsibilities requires modifications in the areas of organizational structure, management practices and human resources policies. Among the major changes recommend are:

- the reinvigoration of the Agricultural Council as a policy making body and as a forum for participation in policy issues;

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- reorganization of the MOA to more clearly reflect the relative importance of its functions within its structure;

- clearer definition of the tasks and responsibilities of central departments and field directorates;

- reduction of the number of units reporting to the Secretary General;

- strengthening the organizational relationship between the center and the field directorates; and

- establishing a systematic planning process which ensures the participation of the ministry's units in setting priorities and objectives.

A three stage reorganization plan is proposed to realize these recommendations whose hallmarks include: broadening awareness of the need for and support for changes necessary to implement the APC and fulfill its role for the future; and movement to a new organizational structure infused with new management processes, values, behavior and attitudes; all of which leads to a final stage in which the new system will be institutionalized.

CHAPTER II.
INTRODUCTION

2.0 Background

Several events in the late eighties forced Jordan to take a fresh look at its longstanding economic management practices and policies. Falling worker remittances and reduced generosity of neighboring donors had the expected impact on the kingdom's external current accounts. Declining fiscal resources and the need to reign in increasing fiscal deficits made reducing significant agricultural subsidies an inescapable necessity. It was in this context that talks with the World Bank were initiated.

The need for an Agricultural Sector Adjustment Loan (ASAL) was quickly identified as an effective way to seek market-led modernization of the sector; second to improve the efficiency of resource use; and finally to reduce the level of intervention of the government in commercial activities.

At this same time the Ministry of Agriculture commenced a policy review of the agricultural sector with technical and financial support from FAO, USAID/Jordan and GTZ. The review emphasized identifying the sector's development constraints and proposing policy and institutional measures for ameliorating them. This exercise formed the basis for the Agricultural Policy Charter (APC).

The Agricultural Policy Charter, although prepared under the leadership of the Ministry

of Agriculture, is a sector-wide document. For example, it charts a new course in water management and water use in Jordan, a topic which is under the purview of the Ministry of Water and Irrigation. It also calls for stricter application of the legal provisions governing lands receiving less than 200 mm of rainfall which are the direct reponsibility of the Ministry of Interior. The Agricultural Policy Charter thus cuts across the agricultural sector and its institutions.

2.1 Purpose of this Study

It was soon realized that implementation of the Agricultural Policy Charter would not be a simple exercise. The scope of the actions involved and the large number of agencies associated with its implementation required careful planning. This study is the result of that realization. Its principal objective is to: 1) identify the reforms that are necessary to implement the APC; 2) assess the capacity of both the private and public sectors to implement the new directions advocated by the Agricultural Policy Charter; and 3) where these capacities are lacking or inadequate, to identify measures required to overcome them.

Three additional areas of concentration were included in this study:

- Environmental Impact Assessments
- Quantitative Policy Analysis Methods, and
- Legal and Regulatory Framework.

The aim of the Environmental Impact Assessment was to review the need for conducting environmental impact assessments for programmes, projects and activities to be initiated in the course of implementing the APC. The Quantitative Policy Analysis Methods study focused on Ministry of Agriculture capabilities with respect to utilizing quantitative analysis, and which such tools were best suited to the implementation of the APC. Finally, the Legal and Regulatory Framework study reviewed the legislation pertaining to the agricultural sector, described some of the constraints that existing policies placed in the way of change, and assessed changes required to enable implementation of the new directions advocated by the APC.

Despite the APC being a sector-wide document, special attention was placed on the

organizational requirements of the Ministry of Agriculture to play a leading role in the implementation of the Charter. The prominence given to the MoA flowed also from the role it is expected to play in the implementation of the Agricultural Sector Adjustment Loan (ASAL), particularly in regard to monitoring and evaluating its implementation.

2.2 THE AGRICULTURAL POLICY CHARTER

The conceptual framework of the Agricultural Policy Charter rests on three pillars: efficiency, sustainability and equity. The Agricultural Policy Charter (APC) defines efficiency as "Developing and making optimal use of the available natural and agricultural resources and applying concepts of economic efficiency and competitive advantages in utilizing these resources".

Sustainability is considered in terms of "managing and conserving the natural resources for agricultural production such that these resources (especially soils and water resources) are saved or even enhanced in terms of quantity and quality, where technically and economically feasible". Also included are ideas about promoting agricultural development without putting undue burdens on the national budget; developing a legal and regulatory framework which provides a favourable investment environment in addition to securing stability and continuity; and assuring food supplies to consumers in adequate quantity and quality.

The equity concept is developed in the APC by making reference to "Achieving social and economic equity between agriculture and other economic sectors, but also within the agricultural sector itself". Included in this concept are references to providing equal social and economic opportunities to all participants in the sector especially those engaged in agricultural production and who depend on the land for a significant proportion of their livelihood.

After defining the framework in terms of efficiency, sustainability and equity, the APC goes on to define clear policy objectives. A total of eight objectives are enunciated. Within this report, these eight objectives are arranged within four topical areas:

- **Increased Food Self-reliance**
  - Increase the ratio of Jordan's food self-reliance

- **Stimulating Agricultural Growth**
  - Production of food and other agricultural commodities is oriented towards the demand in domestic, regional and other international markets and is competitive in quality and price.
  - The value added in the gross domestic product of Jordan's agribusiness sector, and particularly of agriculture, and its share in the national GDP is maximized.
  - Export of agricultural and livestock products as a positive contribution to the national trade balance is maximized.
  - Integration of agribusiness, and particularly agricultural production, among the neighbouring countries of the region is achieved.
- **Promoting Balanced Economic Growth and Equity**
  - Profitability and incomes generated by the agricultural sector as well as standards of living for farmers, agribusiness entrepreneurs and the workers employed are improved and/or increased.
  - Social and economic equity between the agricultural and other sectors of the economy, but also within the agricultural sector, is attained.
- **Improving Resource Management and Conservation**
  - Available agricultural production resources, especially water, land and labour, are managed and used with economic efficiency, while preserving the environment and ensuring the sustainability of agricultural production in the long run.

2.3 Guiding Principles

There are different ways to implement a policy. Guiding principles become important in this regard because they mark the boundaries of what is permissible when implementing a policy. The guiding principles enunciated in the Agricultural Policy Charter can be interpreted as follows:

- Government will concentrate on developing the physical infrastructure for growth and development;

- Government will create the conditions for greater people's participation; and
- Government will concentrate on creating a conducive policy environment for growth and development.

2.4 Subsectoral orientations

After laying the overall policy framework, the Agricultural Policy Charter deals with specific actions and reforms to be implemented in the five subsectors which constitute

> Agricultural Policy Charter Wording
>
> - Provide the appropriate environment for the agricultural sector to grow, while encouraging private agribusinesses to play the major role in agricultural development.
> - Provide favourable environment, including the necessary regulatory and monitoring framework to ensure a freely functioning market place.
> - Strengthen the implementation of government policies supporting agricultural production development, through the formulation, monitoring and evaluation of specific new agricultural policies and making the necessary adjustments to existing policies. The key objective will be transparency in Jordan's agricultural policies.
> - Agricultural policy will be integrated and in line with other general and sectoral governmental policies.
> - Agricultural development will constitute the core of integrated development of Jordan's rural areas.

Jordan's agriculture sector. These are:

- Irrigated Agriculture
- Rainfed Agriculture
- Low Rainfall (Badia) Agriculture
- Livestock Production, and
- Forestry

2.4.1 Irrigated Agriculture. The main thrust in irrigated agriculture will be to price the delivery of water at actual costs to convey it to the farmgate (operation and maintenance (O&M) cost). This will entail an increase in the price farmers presently pay for government-supplied water O&M services. Accent is placed on increasing the efficiency of water utilization at the farm level and improving water harvesting methods to increase availability.

2.4.2 Rainfed Agriculture. Main objectives in this sub-sector are to improve resource conservation and management. The APC calls for planting trees in areas of less than 400 mm of rainfall and over 8 percent slope; and to encourage farmers to shift to barley-livestock farming systems in medium rainfall areas (200-350 mm rainfall/year).

2.4.3 Low Rainfall (Badia) Agriculture. In the Badia the main orientation is to improve its management and ensure sustainable exploitation of the rangelands for livestock production.

2.4.4 Livestock Production. The APC advocates increasing production of red meat from goats and sheep, integrating forage in crop rotations in rainfed and irrigated areas and increasing domestic production of sheep and goat milk.

2.4.5 Forestry. In Forestry the main orientations are: improving management of existing forests; acquiring lands capable of supporting forests and developing them; and improving national capability for forestry development.

2.5 Organization of this Report

As mentioned in the introduction, the main purpose of this study is to assess the capabilities of the public and private sectors of Jordan to carry out the new directions enunciated in the Agricultural Policy Charter, and to help plot a course for its implementation.

This report addresses the following issues:

Are the government-based support services for agriculture adequate to sustain a major effort in order to make domestic agriculture competitive in quality and price?

Competitiveness is a prerequisite for the export-led agricultural development advocated by the Agricultural Policy Charter.

If government-based services are not sufficient, is there adequate capacity in the private sector to provide those services?

Implementation of the Agricultural Policy Charter entails a major deviation from traditional approaches. Moreover, the recommendations in APC form an integral part of the Agricultural Sector Adjustment Loan (ASAL). In these circumstances, are existing statistics and monitoring capacities sufficient to track the direction of changes taking place, provide expedient analysis of the situation and provide the basis for mid-course corrections where necessary?

Where statistical and monitoring capacities are deficient, what improvements are necessary and where should this ability be placed within Jordan's public institutional framework?

Since the Ministry of Agriculture provides the bulk of support services for agricultural development in Jordan, what is the most appropriate organizational structure for the Ministry to meet the new and enhanced demands being placed on it?

An additional dimension was also considered. This is the impact that sector-wide policy reorientations and institutional restructuring would have on the individual sub-sectors.

For presentation purposes, the stated Government objectives as enunciated in the Agricultural Policy Charter are taken as the point of departure. The report then examines the various actions and redirections which contribute to those objectives in terms of the current capabilities to carry them out. Required improvements are discussed both at the sector-wide and the subsectoral levels.

A chapter is devoted to the technical requirements of implementing the Agricultural Policy Charter. A comprehensive analysis of these requirements (Monitoring and Evaluation, Statistics, Laws and Regulations, and Research and Extension), is assembled in this chapter but cross referenced frequently in the dicussion of the previous chapters.

The organizational requirements which implementation of the APC places on the Ministry of Agriculture are dicussed in Chapter VIII. A proposal outlining one potential approach to providing the MOA with an efficient and relevant organizational structure is presented.

CHAPTER III

INCREASED FOOD SELF-RELIANCE: IMPLEMENTATION REQUIREMENTS

3.0 Introduction

This chapter examines capacity of the government and the private sector to implement the actions proposed by the Agricultural Policy Charter to achieve the food self-reliance policy objective. These include actions required to implement proposed policy reforms, formulating options, managing the decision making process, and monitoring implementation. Also examined are those actions whose principal aims are either to create the conditions for economic agents (both public and private) to take maximum advantage of the opportunities created by the new policy environment; or ameliorate the adverse effects associated with particular reforms.

Required reforms and the capacity to implement them are discussed under two headings. The sector-wide heading includes actions which have repercussions on the agricultural sector as a whole (e.g., phase out of subsidies). These differ from the subsectoral actions whose impact is limited to a particular subsector (e.g., in rainfed areas, encouraging farmers to shift to barley-livestock systems).

3.1 Sector-wide Actions and Capacity to Achieve Food Self-Reliance

Jordan has always been open to trade of agricultural commodities. Given the kingdom's agricultural resource base and rate of population growth, in modern Jordan,[1] it has always been unrealistic to expect its agricultural sector to produce enough food to make it completely self sufficient, let alone generate exportable surpluses to pay for the country's food import requirements. Nevertheless, advocacy of food self sufficiency has

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[1] Jordan since 1948

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always had strong and vocal adherents. When pushed to recognize Jordan's production limitations, self-sufficiency advocates reinterpreted the objective to mean promoting domestic production of "strategic" commodities such as wheat, barley and red meat.

Even during the heyday of the self-sufficiency objective, complete substitution of "strategic" commodities for domestic production was considered unattainable by most analysts. In essence, Jordan was simply attempting to maximize its self-sufficiency ratio in these commodities. To maximize domestic production of "strategic" commodities, numerous supports were employed, including: price supports, liberal access to fragile and nonrenewable resources, input and output subsidies.

Jordan's present agricultural sector has become more complex, both in terms of what it produces and its role as a player in a much larger regional production system. In this new policy environment, self sufficiency has been replaced by self reliance. Self-reliance has a very different meaning: the removal of all special privileges accorded to the production of hitherto protected commodities and the decision to promote and maximize the production of all agricultural commodities on the basis of market forces, economic efficiency (comparative and competitive advantage) and environmental sustainability. This effort to maximize production and earnings, when tied to comparable efforts in the Kingdom's other productive sectors, should provide Jordan with the financial resources to become and remain food self-reliant.

A number of reforms are required to realize this objective of increased food self reliance. They can be grouped into four categories: legal and regulatory reforms; government services; producer initiatives; and private sector services.

3.1.1. <u>Legal and Regulatory Reforms.</u> Underlying Jordan's agricultural reform process will be the need to revise a number of existing laws and regulations and/or legislate new ones. Increased food self-reliance will require eliminating price controls, licensing and restrictions deterring production and marketing. The fundamental piece of legislation governing the agricultural sector and requiring

REQUIRED REFORMS FOR INCREASED FOOD SELF-RELIANCE

LEGAL AND REGULATORY REFORMS

- Revision of Agricultural Law No. 20 of 1973
- Revision of Agricultural Marketing Organization Law No. 15, of 1987
- Revision of Supply Law No. 17 of 1992
- Adoption of the proposed National Environmental Law of 1994,
- Development of a National Land Use Plan
- Amend the Law of Cities, Villages and Building Planning No. 79, of 1966
- Amend the Land and Water Rights Settlement Law No. 40, of 1952
- Amend the Jordan Valley Development Law No. 19, of 1988
- Amend Council of Ministers Regulation No. 42, of 1993
- Revise the ACC Law No. 12, of 1963
- Revise the Jordan Cooperative Organization Law No. 20, of 1971
- Amend Council of Ministers Regulation No. 24, of 989
- Amend Water Authority Law No. 18, of 1988

reform, is Agriculture Law No. 20 of 1973. Over 20 years old, its focus has been regulatory rather than promotional, with sections on control of crop sequencing, allotments and other production aspects, fixing of prices, control of livestock production (importation of breeding stock), and slaughter, and the like. Moreover, its sections dealing with insecticides, pesticides and other agrochemicals, fertilizers, and animal health measures are outdated and require substantial updating. The law has been amended and augmented several times, but the changes have not been integrated within a single available text.

Two additional laws whose agricultural price controls controls and licensing restrictions need to be lifted to expand production and promote self-reliance are the Agricultural Marketing Organization Law No. 15 of 1987, and the Law of Supply No.

17 of 1992. The Ministry of Agriculture (MOA)[2], particularly its Agricultural Economics and Policy Department (AEPD), Agricultural Council, and Ministry of Supply (MOS) will be mandated with principal responsibility for developing new legislation to enable the sector to grow, unencumbered by eneconomical and outdated restrictions.

Achieving increased food self-reliance also calls for maximizing the sustainable utilization of arable land. This in turn necessitates a comprehensive examination of the legal and regulatory basis of land use in Jordan. Regulating urban expansion to protect agriculturally productive land, avoiding land fragmentation and introducing land consolidation, improving land leasing and tenancy requirements, and ensuring sustainable land use, call for the passage of two new pieces of legislation: the proposed National Environmental Strategy; and development of a national land use plan. Three other relevant pieces of legislation in need of revision include the Law of Cities, Villages and Building Planning, No. 79, of 1966; the Land and Water Rights Settlement Law, No. 40, of 1952; and the Jordan Valley Development Law No. 19, of 1988. Substantial policy and legal coordination between MOA's AEPD, the Ministry of Municipal and Rural Affairs and the Environment (MMRAE), the Ministry of Public Works (MPW), the Ministry of Health (MOH), the Ministry of Water and Irrigation (MWI), and autonomous entities such as the Jordan Building Council, Engineers' Association, Housing Organization, and the Jordan Valley Authority (JVA).

Increasing food self-reliance also calls for an examination and reorientation of government services provided to targeted farmers with this objective in mind.[3] These

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[2] During the spring of 1994, the prime minister announced that, henceforth, every ministry would have a full-time legal council. The MOA has yet to appoint such an individual. Assuming that such a position is filled within each ministry, these individuals would participate in all legal and regulatory development activities alongside those other organizations and departments named herein.

[3] Services provided to farmers by the private sector which promote self-reliance, are growing (see, Chapter VII). By and large, the wealthier producers are receiving the bulk of such services. This implies that services provided by public sector professionals will be targeted to those farmers currently without

include: applied research focusing on improved production of new and existing crops and livestock; delivery of relevant technology packages by a well trained and trusted extension service; and availability of credit and financial services. The legal and regulatory bases of the current system in need of reform include: amending the Council of Ministers Regulation No. 42, of 1993 (regarding NCARTT); adoption of the Proposed NCARTT draft National Agricultural Research Strategy; development of a national extension strategy; and revision of the Agricultural Credit Corporation (ACC) Law No. 12, of 1963. MOA, NCARTT, current extension leadership within the Department of Extension and Information (DOEI), ACC and the AEPD will coordinate this effort.

Producer initiatives will play a critical role in increasing food self-reliance. This will be achieved by: encouraging farmers and livestock producers to develop self-help organizations such as machinery rental units, marketing cooperatives, and unions; encouraging these organizations to play an active role in policy formulation and implementation; and encouraging agribusiness to play an aggressive role in providing inputs and processing services. These actions will require reform of laws such as the Jordan Cooperative Organization Law No. 20, of 1971, the Water Authority Law No. 18, of 1988, amendment of the Council of Ministers Regulation No. 24, of 1989, the Agricultural Marketing Organization Law No. 15, of 1987, and the Jordan Companies Law No. 1, of 1989. The Agricultural Council, supported by MOA's AEPD will lead this regulatory design effort. They will be assisted by representatives of the Jordan Cooperative Organization (whose role and functions will be completely overhauled. See, Chapter V), Jordan Valley Farmers' Union (JVFU), Agricultural Marketing Organization (AMO), and Chambers of Commerce and Industry.

Once these legal reforms are crafted and accepted by the stakeholders affected by them, they can be submitted to the appropriate ministerial channels for discussion and, hopefully, passage by parliament. The capacity to do this, however, to establish the necessary inter-institutional coordination and provide technical and legal expertise, will

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access yet equally in need of such services (see, Chapter V).

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pose a significant challenge. In the MOA, for example, at present, the Agricultural Council meets infrequently; there is no single repository of statutes and regulations; services of a part-time legal council are maintained, but no one within the AEPD is trained in this aspect of policy design and implementation. It is recommended that the initiation of this exercize be overseen by a trained long-term legal consultant who will be housed within the Ministry of Agriculture.

3.1.2 Government Services to Increase Food Self-Reliance. The need for government services to support farmers and livestock producers in achieving increased food self-reliance was addressed above. Along with providing the necessary legal and regulatory support to facilitate providing services to targeted producers, it is essential to develop a comprehensive vision, strategy and implementation plan to guide these efforts. These reform requirements have been recognized and are already underway and/or planned for.

As early as 1992, the Minister of Agriculture recognized the need for and oversaw the development of a team to prepare a national agricultural research strategy. NCARTT was seen to be the chief vehicle for providing such research. The strategy, a draft of which was completed in 1994, seeks both to provide an applied research agenda for each of the Kingdom's agricultural subsectors, and recommendations regarding how NCARTT can most effectively function as an institution to implement such research. The World Bank has agreed, as part of its Agricultural Sector Technical Support (ASTSUP) Project to provide management and training support for NCARTT.

Research without effective extension of its results is of little value. The MOA recognized this as well, and the German Agency for Technical Cooperation (GTZ) has agreed to provide a technical assistance team in the Fall of 1994 to undertake the development of a national extension strategy.

In similar fashion, the World Bank is seeking donor support to provide resources for the necessary groundwork studies to enable the Agricultural Credit Corporation to reemerge as an effective full financial services institution (see, Chapter V, for a discussion of this sub-project).

3.1.3 Strengthening Producer Participation to Increase Food Self-Reliance. The Agricultural Policy Charter recognizes that increased agricultural production depends in large measure upon producers taking control of their economic futures. The chief vehicle for achieving this is through self-help organizations, marketing cooperatives and unions. To date, the chief means of organization has been through the Jordan Cooperative Organization, which, for numerous reasons has been unsuccessful (see, Chapter V, for a discussion of JCO). The government has expressed a strong desire to reorganize JCO and to energize self-help development within the sector. The World Bank has recognized the importance of this need as well, and through its proposed Agricultural Support Technical Assistance Project (ASTAP), is seeking donor support to finance a series of studies aimed at accomplishing this.

3.1.4 Private Sector Services. Increased food self-reliance will require that the private sector continues to assume a significant role in providing an array of services to agricultural producers. Chief among these services are extension; financial services; veterinary and laboratory support services; and agribusiness inputs and processing opportunities.

Private sector extension services are effectively reaching commercially viable farmers in the Jordan Valley and in the highlands. Hybrid seed varieties have been successfully introduced as have new species of fruit trees, the poultry industry serviced, and a broad array of inputs provided. These inputs have been accompanied by applied research results garnered from the region and provided to producers as easily read extension bulletins. Coordination with the public sector extension services is the most important reform required. Lingering suspicion of private sector intentions in offering extension services remains high among the sector's public employees. This revolves around concerns that private sector agents are doing little more than pushing the products they sell, rather than providing disinterested scientifically based support to producers. Jealousy over territorial and financial remuneration undoubtedly play a part in this relationship, or lack of one. For their part, the private sector extension agents have indicated their willingness to share their information with their counterparts, but tend to

view these counterparts as unmotivated bureaucrats rather than partners in a sector-wide effort. To the extent that these tensions can be bridged by a series of interactive workshops to discuss, approve, and seek common cause in implementing the national research and extension priorities, a more productive and hopefully ongoing relationship can be arrived at.

Studies of rural financial services indicate that: over one-third of Jordan's farmers self finance their agricultural operations with earnings from non-farm incomes; in the drylands, only 13 percent of producers were willing to borrow money at commercial rates; rural agribusiness and non-farm enterprise development was inadequately served by available financial services; and that there is strong on-farm demand for credit services.[4]

As of 1992, approximately JD 110 million were provided in formal agricultural credit loans (of a total lending program of some JD2,400 million), or five percent of Jordan's total formal credit loans. Commercial banks provided approximately JD54 million, with two-thirds of that amount being allocated as production loans and one-third for trade and marketing ventures. Informal credit has not been widely studied, but is believed to be in excess of JD80 million per year, widely available, used by some 15 percent of Jordan's producers (triple the percentage of formal lenders such as commercial banks and the ACC), and provided mainly by traders, input suppliers and marketing agents.[5]

The single biggest impediment to expanded private sector provision of financial services to the agriculture sector has been availability of subsidized and thus cheaper (in sometimes free) credit provided through the ACC. Plans to reorganize the ACC along commercial lines and ultimately, to privatize it, should alleviate this constraint. Other constraints include the diminishing size of the sector, and banks' continuing preoccupation with debt security.

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[4] Jordan: Agriculture Sector Technical Project: Preparation Report, FAO, 14 May, 1993, Annex $, pp. 3-4.

[5] Ibid., pp. 4-5.

These constraints will probably still leave the ACC as the major formal lender within the private sector. Other commercial banks will continue to provide loans, but are unlikely to aggressively compete with a major, private, and specialized financial services institution. Informal lenders will probably continue to be the chief source of short-term loans.

It is imperative that a comprehensive study of rural financial markets be undertaken to provide a clearer picture of the needs, and investment costs emerges. The results could paint a picture of a sector with increasing potential for growth, which in turn would encourage more lenders to venture into agricultural loans. Rural credit expertise exists on the agricultural campuses of Jordan's universities. This capability should be merged with expatriate counterparts who possess greater familiarity with the privatization process.

Jordan has witnessed a substantial increase in the number of private sector companies and consultants providing services to (larger and often wealthier) farmers and livestock producers. Companies have established laboratories and research stations where they have developed new, hybrid seed varieties of cucumbers, tomatoes, potatoes and cut flowers (See, Chapter VII). Veterinary services have also been provided, especially in large animal medicine and poultry production.

There is a robust and growing agricultural consultant industry, supported largely by larger farmers, and consisting of faculty members at the UOJ and JUST, along with ex-MOA, regional and international agricultural organizations. The further development of both commercial and consulting operations will be encouraged (see, see, Section 3.1.4, Agribusiness Inputs,below).

The Agricultural Policy Charter calls for exploring the possibilities of privatizing veterinary and plant production laboratories currently within the MOA, or at least having them operate autonomously on the basis of full cost recovery.[6] The privatization of

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[6] Some tension already exists within the MOA regarding pay differentials between veterinarians and agricultural engineers. If veterinary and other laboratory services were to autonomously operate within the ministry, salary differentials might escalate and exacerbate the present problem.

these services would result in the government competitively contracting for its needs in these areas. One critical need will be to ensure that farmers and livestock producers who are deemed most economically vulnerable during Jordan's agricultural transition will receive high quality and relevant services. Professionals providing veterinary and laboratory services have the capacity to extend technical services to their clients. What will be needed is medium-term management assistance to ensure an orderly transition to privatization or autonomy, and financial viability.

Agribusiness in Jordan has been growing. Currently, over 100 companies provide import, manufacturing, input development and distribution, marketing, processing and trade services. To sustain and encourage further growth, it will be necessary to enact those legal reforms which remove production and marketing restrictions, provide means of quality assurance, and financial support. The Chambers of Commerce and Industry have the capacity to provide overall organization and participation for sector-wide agribusiness persons. Producer and marketing organizations remain in an embryonic stage and do require organizational and management assistance. More important, they need access to financial services. To the extent that the ACC becomes a full service financial institution, it will be able to provide agribusiness loans as part of its portfolio.[7]

3.2 Subsectoral Reforms and Implementation Capabilities

3.2.1 Irrigated Agriculture Subsector. Twenty-six reforms were identified in

[7] Another subsector in need of financial assistance is the rural non-farm enterprise area. The FAO study cited above indicates that this important engine of rural growth is being constrained by a virtual absence of financial services.

the irrigated agriculture subsector, eight of which were identified as priority reforms to increase food self-reliance. They are:

PRIORITY REFORMS IN IRRIGATED AGRICULTURE TO INCREASE FOOD SELF-RELIANCE

- Develop and Encact a National Water Policy
- Encourage the Building of Water Storage Structures
- Replace Furrow with Drip Irrigation Systems
- Increase Water for Winter Crops
- Increase Market Information to Producers and Consumers
- Encourage the Development of Self-Help Organizations
- Introduce and Enforce Quality Control/Grading System
- Enhance Post-Harvest Technical Services

One of these reforms--encouraging the development of self-help organizations--applies to all sectors and was treated above and elsewhere (see, Chapter V).

At the core of increasing food self-reliance in the irrigated agriculture sector is the need for the development of a national water policy. Spearheaded by MWI (WAJ and JVA), but with input from MOA and MMRAE, this policy must establish priorities, allocation strategies (including seasonal allocations), means of maintaining quality control, treatment of wastewater, operation and maintenance (O & M) pricing, water management, and monitoring. Irrigated agricultural producers and their representative organizations (JVFU) should have the opportunity to respond and have input to the development of the strategy. When developed, it should give producers a clear picture as to what water resources they can reasonably expect to have, their obligations with regard to maintaining it, and the costs associated with this critical input.

Water storage structures on farms are seen as expanding the acreage which can be brought under production, while promoting aquifer recharge through reduced pumping. Better water management also serves to improve soil leaching practices and

thereby provide more productive soils. Developing water storage structures within the irrigated subsector is technically the responsibility of the Ministry of Water and Irrigation (MWI). Part of NCARTT's proposed national agricultural research strategy, however, includes focusing on water management systems. Numerous farms in the Jordan Valley already have water storage structures. NCARTT should undertake a study of these structures, aimed at identifying the most efficient and cost effective methods of water storage. MWI (JVA) and the DOEI should next develop a program based on the findings, ensure that trained personnel are available to present technology packages to producers at area workshops, and implement the effort over a two year period.

A good deal of attention has been paid to water losses attendant upon using furrow irrigation. The government has called for broader use of drip irrigation. This call has been heeded both in terms of the number of farmers using this technology and the growth of a domestic drip irrigation system industry. While there is little question that drip irrigation can improve water management, this happens where water is priced at actual operation and maintenance costs. If the costs of water remain as low as they currently are in the Jordan Valley, there is little incentive to economize on water use. Determination by the GOJ to price O & M costs realistically, then, must precede achieving expected results from employing drip irrigation. An additional consideration needs to be taken into account regarding drip irrigation use. Soils under intensive irrigation such as those in the valley are threatened by salinization unless effective leaching occurs. Drip irrigation, by cutting the amount of water used, can actually increase the chances of soils becoming too saline. Therefore, the JVA, which is mandated to oversee implementation of irrigation systems, must factor leaching requirements into their water management equations.

NCARTT and the JVA need to undertake research on which irrigated crops provide the highest return per cubic meter of water, and then utilize the DOEI and private extension services to assist producers in replacing low return per cubic meter of water crops with higher yielding varieties.

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Studies by KfW[8] indicated that tomatoes, eggplant, squash, cucumber, potatoes, strawberries, grapes and oranges all could be internationally competitive in the winter. Cereals and bananas provide relatively poor returns vis-a-vis other crops. Within the valley, however, particularly in the South and Ghor Safi zones, lack of water, bad weather, diseases and selection of crop,[9] have historically plagued Jordan at the very time when its valley system should be producing high value crops for domestic and international consumption. This research and extension effort must, then begin with an understanding of the seasonal allocation of water and crop selection, and include identifying a strategic crop mix with the highest production and return potential, a water allocation strategy that maximizes realizing production potential for high value winter crops, and the presence of effective pest management.

Improving market information to producers and consumers is cited as a priority in irrigated agriculture. In fact, this reform is central to producers in all of Jordan's agricultural subsectors, with respect to improving planting and marketing decisions. Willem Zjip[10], in his study of the extension needs in the Kingdom, points to the need to provide marketing, business skills, quality control, IPM, and water efficiency information within the irrigated subsector[11]. A comprehensive extension information system is also cited in the draft National Agricultural Research Strategy as a key task for NCARTT and the DOEI, and will be a central concern of the upcoming national extension strategy.

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[8] Dietz, M., Hannover, W., and Lindauer, G., Assessment of the Potential Impact of Agricultural Adjustment Measures, as Proposed Under ASAL on Farmers" Incomes in Jordan: Main Report, Frankfurt, 1993, pp. 8-9.

[9] South Ghor is the main banana producing zone. Because of the high water consumption required by bananas, South Ghor has the lowest cropping intensity (71 %) of any area in the Valley.

[10] Jordan: Agricultural Extension Working Paper, World Bank, January, 1994, p.3.

[11] Ibid.

At present, extension services are being provided by the private sector (input suppliers, consultants, press), the public sector (DOEI, NCARTT, universities, media), parastatals (ACC, Farmers' Union, JCO, AMO), and NGOs (Queen Noor Foundation, Queen Alia Fund, JES). The quality of this information varies widely: private sector packages include reasonably effective information delivery. University research efforts have been less successful and the public sector and parastatals have been least effective in outreach efforts.

For more than a decade, Jordan has been producing sufficient quantities of fruits, vegetables and livestock to play a regional role as exporter. With a growing Gulf trade during the '80s, post-harvest technologies seemed adequate (as evidenced by the continuing increases in exports). However, the Gulf War and the appearance of regonal competitors from Turkey, Egypt and even Iran affected not only the reliability and availability of Jordan's traditional export markets, it necessitated a top to bottom review of the Kingdom's ability to compete with its neighbors, and the need for development of a strategy to enable the agricultural sector to remain economically viable. The Agricultural Policy Charter was an outgrowth of this need. The Charter's (and Government's) strong advocacy of a sustainable agricultural domestic and export-oriented production system promoting increased food self-reliance, required that public and private sector stakeholders examine the issue of post-harvest technology services as one of the critical inputs ensuring sustainability.

Improved post-harvest services, including information and provision of services for storage, marketing, sales, packaging, processing and export, like information services, call for an effective and coordinated effort between numerous public, parastatal, private and producer organizations. Public sector participants include: NCARTT, AMO and DOEI, the Ministries of Agriculture, Supply, Transportation, and Finance; the Agricultural Marketing Organization, the UOJ and JUST, and, for the present, JCO and AMPCO. Neither the public nor private sectors are providing effective post-harvest services capable of enabling the sector to attain its goal as a significant and reliable

producer of quality agricultural products for the region and beyond.[12] FAO, in a recent project preparation report[13], described these limitations as including "...limited marketing and enterprise management capability, sub-standard post-harvest handling and packing technology, lack of field pre-cooling and packing facilities, and inadequate pesticide residue monitoring capability."[14]

The First steps to be taken in addressing these deficiencies include assembling stakeholders in a workshop to define the nature of the problem, identifying and prioritizing assistance needs, and developing an implementation strategy. A stakeholders' steering committee would be formed consisting of public and private sector players.

AMO would be a logical task leader in this effort. Implementation elements would be apportioned to the institutions responsible for providing services. For example, NCARTT might oversee research on field storage and pre-cooling; DOEI would provide training in pesticide use; AMO would work with the container manufacturing industry to develop materials acceptable by foreign markets, offer enterprise management seminars, and the Ministry of Transportation would offer seminars to producers and exporters demonstrating appropriate handling techniques for refrigerated shipping.

The steering committee would meet on a semi-annual basis to evaluate progress and resolve problems. Regular, annual meetings of stakeholders would occur at which post-harvest technical service issues would be discussed and service offerors given the opportunity to inform producers of innovations. Concomitantly, producers would have the opportunity to acquaint service offerors with new or ongoing post-harvest problems in need of resolution.

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[12] Private sector organizations such as the Agricultural Exporters Association and the Flower Growers Association have described providing post-harvest technical services as part of their raison d'etre, but aside from marketing efforts, few such services have been made available to members.

[13] Jordan: Agriculture Sector Technical Assistance Project, FAO, 1993; p. 10.

[14] Ibid.

Quality control and grading reform extends to all subsectors but is treated herein to demonstrate their importance and impact upon the subsector which exports the greatest quantity of its production. Establishing quality controls and setting standards are the public responsibility of the Ministries of Industry and Trade (MIT), Agriculture, and the Agricultural Marketing Organization, and Health. Grades and standards currently exist for virtually all fruits and vegetables in Jordan. These are set by the Department of Standards and Specifications within the MIT. The "yardstick" by which standards are measured and set is the MIT Law No. 16, of 1989. In actuality, specifications and standards are based upon FAO and WHO recommendations, EU standards, and those set by regional trading partners. Within AMO's enabling legislation, a Quality Control Unit exists with the mandate to ensure compliance with rules, regulations and standards. It calls for agents at the borders (Ramtha, Aqaba and Amman), central markets and at exporters' packing warehouses. Samples are to be randomly graded as well as tested for pesticides at a laboratory in Bakaa.

In reality, exporters operate autonomously. When queried regarding the value and importance of AMO's quality control services, producers and exporters have generally been disparaging. Those who have been successful in accessing foreign markets are generally aware of their clients' quality, and phytosanitary requirements. If they both grow and export, they utilize acceptable varieties; if they purchase from growers, they provide inspection and sort for quality themselves. Little, if any in the way of extension efforts by AMO or DOEI regarding grading and standards has been provided.

Some exporters maintain cleaning and sizing machinery at their packing stations; none have pre-cooling facilities. Losses in the process remain high: 30 percent of shipments being rejected in Europe are not uncommon.[15] Pesticide and heavy metal residue testing is generally unavailable. The government pesticide laboratory works on

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[15] Jordan: Agriculture Sector Technical Assistance Project: Annex 2: Horticulture Markets Development, FAO: 1993, p. 6.

government hours, is understaffed, underbudgeted, and in any case, focuses more upon testing pesticide manufacturers' compliance with established specifications[16].

Implementing reforms which establish and enforce quality control and grading standards, clearly illustrates appropriate roles for both the public and private sectors. The public sector should establish quality control parameters that inform Jordan's producers and reassure its consumers of acceptable nutritional and health standards. The MOA, MIT and MOH are the logical entities to jointly arrive at setting and enforcing these standards. Pending specifications and standards legislation in parliament recognizes this need for coordination. Using WHO and FAO-determined standards as a base, current local adaptations are determined by the MIT's Department of Standards and Specifications (DSS)[17] which prepares and circulates a draft of the proposed standard to stakeholders. Once their comments are incorporated, the standard is approved by the minister and given a regulation number.[18] At present, standards are kept in MIT's library. These should be published and a comprehensive set circulated to all public sector stakeholders. They should be available to interested private sector individuals and organizations at cost.

DSS should be empowered with enforcement authority. If standards are violated, this threat to the well being of Jordan's consumers should be met with penalties that serve as realistic deterrents to scofflaws.

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[16] The FAO report cited above, estimated that an average of two pest residue tests per day were beingundertaken at the Bakaa site, and that even in those cases where testing was done, produce was sold before results were released. On those rare occasions when violators were fined, the fines were too small to have the desired effect.

[17] The new legislation calls for a separate and autonomous DSS.

[18] The pending legislation would give approval authority to a DSS Board of Directors.

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The public sector should maintain laboratories that ensure that agrichemicals imported and sold in Jordan are as advertised and meet international safety standards.[19] Standards for agrichemicals are the responsibility of the MOA, which like the DSS requires authority and penalties with teeth to ensure maintenance of standards.

Improving quality control for export purposes should largely fall within the purview of the private sector. This would include building and servicing pre-cooling units; designing and manufacturing sizing and cleaning machinery; building and maintaining a separate quality control laboratory; and outfitting Jordan's ageing refrigerated ground transportation fleet. Government support should extend to liberalizing legislation to encourage the growth of these services, and inspection to ensure that standards are actually being met.

3.2.2 Reforms Required in the Rainfed Agriculture Subsector. Of the numerous reforms required within this sector, five were seen as having the highest priority. They are:

PRIORITY ACTIVITIES IN RAINFED AGRICULTURE TO INCREASE FOOD SELF-RELIANCE

- Establish a Five Year Freeze on Urban Boundary Expansion
- Levy a Conversion Tax on Farmland
- Support Legislation to Promote Larger Plot Size and Ease of Consolidating Multiple Owner Plots
- Encourage the planting of fruit trees on land with Over 400 mm Rainfall and 8 Percent Slopes

[19] According to B.B. Watts, who surveyed the agrichemical (particularly the pesticide) industry in Jordan in 1992 (as part of the GTZ-financed Jordanian-German Pesticide Quality Control Project), over 300 pesticide products with 189 active ingredients are registered in Jordan. Ingredients are imported by some 30 importers, and sold by 220 licensed dealers. One of Jordan's agrichemical formulators is the largest pesticide manufacturer in the region and exports 97 percent of its products.

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- Promotion of an Integrated Barley/Livestock Production System

Three of these actions focus upon ensuring that Jordan maintains its remaining allotment of arable and productive agricultural lands, recognizing that increasing food self reliance will in large measure depend upon its effective use of these lands. Careful husbanding of land and soil, along with maximizing economic return is behind encouraging producers to reject planting horticultural crops or cereals on steep and fragile hillsides, in favor of more environmentally sound fruit tree production. Finally, recognizing the general hardiness and greater profitability and utility of fodder barley in medium (200-350 mm) rainfall zones, cereal subsidies that promoted wheat production will be eliminated, and farmers, many of whom already possess livestock, will be encouraged to develop mixed barley/livestock farming systems. Mixed production farms have been purchasing feed concentrates and straw, rather than relying exclusively upon grazing for their livestock. These concentrates have been subsidized, but such subsidies will be phased out. To the extent that mixed farming producers can provide their own fodder and adopt effective husbandry practices, productivity and profits and self reliance can increase. Reforms necessary to realize these objectives are treated in detail in Chapter VI, below, and will not be examined here.

3.2.3 Low Rainfall Agriculture Subsector.

The low rainfall zone, or Badia or steppe, has historically been used as a natural forage area by Jordan's livestock producers. This 100-200 mm rainfall zone's utility as a fodder area has depended upon livestock management such that the Badia's ground cover can regenerate. In recent years, government intervention in livestock production through feed subsidies, and subsidized purchasing of barley raised in Jordan, has resulted

in increased livestock numbers[20] and opportunistic farming ventures (barley plantations) for feed and straw, both of which are seriously threatening the zone's sustainability.

Three reform issues in the low rainfall zone are considered high priority and related to increased food self sufficiency. They are:

PRIORITY REFORMS IN LOW RAINFALL AGRICULTURE TO INCREASE FOOD SELF RELIANCE

- Development and Allocation of Adequate Water Supplies for Livestock
- Improved Herd Management through Selection and Breeding
- Improved Forage Conversion Efficiency

Livestock are not water intensive users (as are crops), and thus, most studies treating low rainfall areas, focus upon range deterioration from overgrazing, and erosion due to dryland farming practices and wind, rather than water consumption by livestock. Nevertheless, the fact that most of Jordan's livestock rely on low rainfall range for up to more than one-third of their food needs, means that they will require water during their time there[21]. The Agricultural Policy Charter is cognizant of this requirement in its call for adequate and equitable allocation of water for livestock.

Reforms required to address this need include ensuring that the development of a national water policy, referred to above, is responsive to low rainfall area livestock water requirements. At present, stock water needs are being met principally by deep wells and water transport. In a few areas, catchment basins have been dammed. Jordan's national water policy needs to explicitly address water harvesting initiatives.

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[20] It is estimated that between 1980 and 1990, herd size more than doubled.

[21] The removal of feed and fodder production subsidies may alter this ratio. Schillhorn and others (World Bank: 1993) foresee intense if short-term overuse of the low rainfall areas by livestock producers while herd sizes decline from their current numbers.

NCARTT, in its draft National Agricultural Research Strategy, identifies water harvesting as a research need[22], calling for the development of a hydrological model to predict "harvesting potential and proper utilization of harvested water, distribution techniques, effect on vegetation and carrying capacity..."[23]

The formulation of a national water policy inclusive of low rainfall livestock needs will require the cooperation and coordination of experts representing the MWI's WAJ, MOA's Departments of Animal Production, Forestry and Afforestation, Badia, Extension and Information, JCO's extension services, NCARTT, and AEPD; MMRAE's Department of the Environment; HCST; RCS;, JES; Jordan's universities, and producers. This activity, to be led by MWI and MMRAE, should take one year from its initiation meetings to providing the cabinet with an actionable draft piece of legislation.

At present, MOA capabilities with regard to this area are quite limited. The Department of the Badia is moribund; the Department of Forestry and Afforestation rather than the extension service is currently responsible for range management and replanting[24]; AEPD has one person with range policy expertise; and NCARTT's proposed research, should it be undertaken, will prove to be a first step in this direction. The reorganization of the MOA (see, Chapter VIII) will address the functional limitations the MOA is currently grappling with, but human resource development will remain a critical problem through the medium term.

Improved herd management through selection, feeding and breeding, calls for an innovative research and extension program. NCARTT currently has three full-time staff competent to undertake animal nutrition and production research, but work to date has focused on improving the nutritive value of forage. Envisaged programs include selection/breeding programs for both Awassi sheep and Baladi goats to increase milk production, and improved feeding regimes to increase fertility, increase birth weight and

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[22] loc. cit., p. 71.

[23] Ibid.

[24] JCO and the RCSN also manage and replant range reserves.

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reduce weaning periods. The draft National Agricultural Research Strategy also calls for a program which includes cross breeding of domestic small ruminant and cattle stock with foreign lines.[25] The MOA Veterinary Services Department is participating in adaptive research on an animal health inventory, vaccine production and disease diagnosis, as well as providing artificial insemination services for both poultry and livestock. JCO is undertaking adaptive research on animal feeding and intensive production of small ruminants. The DOEI has very limited extension capacity in the area of breeding. The UOJ and to a lesser degree JUST have engaged in a number of low rainfall related livestock improvement research efforts, mostly in the area of animal health and nutrition. These have not been part of any defined livestock improvement strategy, but rather ad hoc. Few private sector livestock breeding efforts have been reported.

Once the National Agricultural Research Strategy has been approved, NCARTT, the university community, MOA's veterinary services[26], JCO, and NGOs such as the Queen Alia and Queen Noor Foundation, both of which support goat production programs, need to meet, establish breeding research priorities and determine which entity will take responsibility for such research.

Improved forage conversion efficiency is central to improved food self-reliance, and is discussed in detail in Chapter VI.

3.2.4 Improved Food Self-Reliance in the Livestock Production Subsector

Nine initiatives have been identified in the livestock production subsector, four of which are considered priority activities requiring initiation of reforms. They are:

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[25] Loc.cit., pp. 68-69.

[26] Either within MOA or privatized.

PRIORITY INITIATIVES IN LIVESTOCK PRODUCTION TO INCREASE FOOD SELF-RELIANCE

- Establish an Equitable Water Allocation Policy for Livestock
- Support Improved Livestock Selection/Breeding Programs/Feeding Regimes
- Optimize Feed Production
- Improve Animal Health Services in the Public and Private Sectors
- Herd Management

The first two of these priority activities are addressed above in Section 3.2.3.

Jordan's national herd size has grown from an estimated 5-700,000 in the 1950's to between 2.5 and 3.5 million in the '90s. The estimated herd consists of over 2 million sheep, over 1 million goats and over 64,000 dairy cattle[27]. This vast increase in herd size is attributable to opportunistic responses to: government policies supporting subsidized feed; subsidized credit and other inputs (e.g., veterinary services); subsidized feed production; and substantial population increases with concomitant increased demand for red meat and dairy products. Without continued government subsidies, the present livestock system is unsustainable.

Forty years ago, natural forage is said to have provided approximately 90 percent of the subsector's feed requirements. Today, that percentage has shrunk to under 40. As recently as 25 years ago, 75 percent of cereals were consumed by humans; by 1990, over 50 percent of production was used as animal feed. Over 50 percent of Jordan's livestock feed requirements are now provided by imported (and subsidized) feed. Altering this system will require a multi-faceted approach to improved feed production systems. The Agricultural Policy Charter advocates a number of operations including:

- -- Planting and maintaining natural fodder on rangelands
- -- Integrating forage in crop rotations in irrigated and rainfed subsectors
- -- Using horticultural and abbatoir by-products

[27] Deitz, et.al. Loc. cit., p.p. 27-31.

-- Using straw and stubble as roughage

-- Allowing grazing on natural vegetation in uncultivatible places in the rainfed subsector

-- Improving feeding and husbandry management

Recent analyses of Jordan's rangelands uniformly conclude that overgrazing and dryland barley farming are destroying its fragile ecosystem. This process must be reversed by ceasing dryland barley farming, establishing and enforcing public ownership of rangelands[28], ending subsidies, and aggressive range management schemes, including replanting campaigns.

To date, range replanting efforts have been initiated on a series of reserves. Some 40 range reserves, managed by MOA's Department of Forestry, Afforestation and Range, JCO and RSCN, have been developed in Jordan[29]. Varying in size from under 300 hectares to 56,000, these reserves total just over 282,000 ha., approximately 25,000 ha. of which have been replanted with fodder shrubs (mostly *Atriplex halimus* and *Atriplex numularia*) . These reserves are fenced, and nominal fees[30] are charged for their use. While some reserves are undoubtedly impressive, when one considers that Jordan has 8 million ha. of rangelands (one million of which falls within the semi-arid [100-200mm rainfall] zone, of which 50-60 percent has already been lost to barley cultivation), this amounts to 0.003 percent of available range. In fact, the total capacity of existing range reserves can provide 10,000 sheep[31] 10 days' rations, and thus can't begin to meet Jordan's needs[32].

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[28] Public ownership does, however, take into account traditional ownership rights and grazing patterns.

[29] MOA's DFAR has overall responsibility for range reserves. JCO, for example, receives funds for its reserves through the MOA(funds allocated to the MOA through the World Food Program). RSCN's reserves are in fact nature preserves to sustain wild animals and have nothing to do with increasing livestock feed.

[30] MOA charges 2 fils/head/day; JCO charges 30fils/head/day. Permits are generally for 15-30 days, depending on the condition of the particular reserve.

[31] Goats are not permitted to graze on range reserves.

[32] T.W. Schillhorn van Veen, The Hashemite Kingdom of Jordan: Rangelands and Livestock, World Bank: 1993, p.p. 9,29.

The environmental benefits of replanting schemes are clear, but so are the economic costs--the estimated cost per hectare for replanting is JD200-350. With an estimated 400,000 ha. in need of rehabilitation, the minimal amount to realize a reserve program would be JD80 million. To date, two private sector initiatives have been launched to establish the equivalent of tribal reserves, but these have not been successful.[33] A pilot project with JCO was funded by Australia with very modest results, and the Arab Fund's regional El Hammad Project has been underfunded and hasn't focused on reserve creation. In 1993, IFAD proposed funding a national range development project with support for the range reserve concept, but this project has yet to be approved. Thus, in the short- to medium-term, prospects for realizing this option appear dim.

Planting range forage may be beyond the system's means, but range management also includes fencing territory and allowing it to naturally recover. The biodiversity achieved by natural regeneration is striking and fodder potential is clearly increased. What is required in achieving this option is a clear understanding on the part of users that regeneration areas are to be left alone, and for those who disregard fencing and use prohibitions, financial penalties high enough to deter abuse. Rangers and extension agents need to be trained to support range regeneration programs, and then launch aggressive information programs to acquaint users with and support the process.[34]

Integrating forage production in crop rotations in irrigated and rainfed sectors is another proposal with intuitive appeal. The problem is that the value of fodder crops in terms of their net return per 1,000m3 of irrigated water used, are substantially lower than almost any

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[33] Personal Communication with Abdul Muti Tillawi, DFAR.

[34] The success of this program also depends upon significant offtake of sheep and goats. The national herd, comprising between 2.5 and 3.5 million head of sheep and goats, is already swollen on the basis of heavily subsidized feed inputs. When these inputs are phased out, unless stock is slaughtered and sold in Jordan, or exported in large numbers to regional markets, herds may move to the already overgrazed rangelands, making the short-term difficult situation even worse.

alternative crop.[35] Moreover, virtually all horticultural crops grown under irrigation employ drip, basin or furrow systems. Field crops require sprinkler systems, which cost considerably more per unit. Thus, opting for fodder options in crop rotations under irrigated conditions may not make economic sense, even when one of the rotations is a fallow one. In the rainfed areas, crops with fodder potential are already being worked into rotations (e.g., vetches and legumes), although few farmers faced with the reality of one crop per year would opt for forage unless wealthy enough to let fields lie fallow for a season. NCARTT sees rotating fodder crops into rainfed farming systems as an area of significant future potential, and advocates cooperation with regonal research entities such as ICARDA in pursuit of new and economically viable crops.[36]

Horticultural by-product use as animal fodder represents an area where Jordan has yet to reach its fullest potential. Table 3.1 illustrates sample by-product use as of 1990. NCARTT, in its

RESOURCE	PRODUCTION (TONS)
Fruits and Vegetable By-Products	
Tomato Paste/Pulp	35,000
Olive Pulp	35,000
Banana Leaves/Plants	10,000
Other (Citrus, Spoiled Vegetables, etc.)	5,000
Industrial By-Products	
Wheat Bran	10,000
Meat/Bone Meal	2,000

SOURCE: T. Schillhorn, Loc.cit., p. 30.

[35] see, Subhi Qasem, Ayed Wir and Muhammad Shatanawi, Policies and Strategies for the Optimization of Development and Performance of Irrigated Agriculture in Jordan, Amman: April, 1993, p. 35.

[36] Loc.cit., p. 66.

draft, National Agricultural Research Strategy, calls for further research in animal feeds derived from by-products, including other fruits, offal, animal blood and poultry manure.[37] By-products, thus, can promote increased feed options. However, a carefully orchestrated applied animal nutrition program will have to be undertaken by the extension service to help users understand both the limitations regarding intake and potential dangers of by-product feeds. No more than 10 percent of animal bone meal, for example, should find its way into sheep diets; 40 percent of banana leaves; or 10 percent of olive pulp. Bakery waste products often contain mycotoxins in mouldy breads and cakes, and potatoes Solanosis.[38]

Jordanian livestock producers have long recognized the value of using straw and stubble as roughage. A recent study[39] points out that between 1989 and 1991, some 5,200 tons of straw from legumes and 66,000 tons of wheat and barley straw were used as animal feed, and that this represented a value added worth JD4,350,000. There is clearly room for growth here, including corn, alfalfa, chickpeas and sorghum stubble, keeping in mind, however, that overall production in cereals in Jordan is declining. Moreover, as subsidies are phased out, this decline may accelerate, although lands most suitable for wheat and barley production may continue to do so, or be planted with other, more profitable and suitable field crops.

Grazing on natural vegetation in uncultivatable places within the rainfed sector has been going on for some time, both legally and illegally. In forests, for example, producers can obtain licenses for 50 fils/head/season to enable their livestock to browse. "Season" is defined according to an individual forest's management plan. Numerous infractions occur in this practice, mostly in the form of illegal grazing, lighting of fires, and removal of trees and/or firewood. The most sobering result of present grazing practices in uncultivatable places is not that it is not being exploited, but rather that overgrazing has resulted and with it the gradual

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[37] Ibid., pp. 69-70.

[38] H. Strobel, L. Durst and Chr. Schuh, Training Course in Applied animal Nutrition and in the use of the Computerized System for the Optimization of Feeding Rations "TOP FEED;" Amman: January, 1994.

[39] Sami Sunna, Sayed Khalil Khattari, Jihad Abou Mushrif, Jordan's Agricultural Sector Review and Policy Implementation Plan: Rainfed Agriculture; Amman: May, 1993, p. 20.

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disappearance of nutritious shrubs. In their place inedible varieties are appearing, replacing between 50 and 90 percent of their predecessors.

Key causes of overgrazing have been treated above. In the case of uncultivated areas, pressures are exacerbated by lack of clarity in land tenure policies. The government's claim to ownership is not backed up by any significant presence, either developmental or regulatory. Traditional claims to ownership have been weakened by government counterclaims, and vast increases in absentee flock ownership, where those actually herding and grazing flocks are not family members and who have correspondingly little interest in sustaining grazing land quality.

What is required is a clear tenure and enforcement policy. One recommendation for achieving this has been to reestablish a variant of the traditional El-Hema, or tribal cooperative system. The weak link in this system is that the pastoral socio-economic structure which enabled El-Hema to work, no longer exists. The political basis of tribal society continues to exert itself, but no longer relies upon territorial control of wells and grazing rights.

For its part, the DFAR (the Department of the Badia is for all practical purposes a paper department) simply lacks the authority, trained personnel and resources to enforce existing law. Thus, sustainable use of this resource will require its presence as part of the national land use plan, advocated above, followed by the development of an effective range management program within the MOA.

Improving feeding and husbandry management can only have a salutory effect on improving food self-reliance. Present carrying capacities of rangelands (sometimes as low as four feeding units per dunum; i.e., six kg. of forage) are low and decreasing in quality, even as the size of Jordan's sheep and goat herds, supported by price supports, has vastly increased. One aspect of this was mentiond above--the appearance of inedible shrubs replacing previously nutritious forage, as the result of overgrazing. Another is the quality of the herd itself. While much is made of the putative quality of domestic red meat, the fact remains that existing herds are suffering an average mortality rate of 15 percent, some of which is being caused by feed borne illnesses. Very little to date has been done in terms of attempting to improve production through breeding programs. The sheep population is overwhelmingly Awassi, a local (Baladi)

variant, with just a smattering[40] of other breeds; 85 percent of the goat population is Baladi[41]. Dairy cattle are largely imported Friesian and Holstein with a small number of Baladi. Some owners have attempted cross-breeding, but no systematic program to define desired characteristics and scientifically breed for them has been attempted. Artificial insemination efforts in Jordan are little used and presently extend mainly to cattle.[42]

A first order response is launching an effective research program in both animal nutrition and animal husbandry/breeding. The draft National Agricultural Research Strategy cites these areas as essential, indicating that the UOJ may be in the best position to take the lead in these efforts. These research efforts are linked directly to those above, namely preparing results for delivery to producers in effective packages, training animal health and extension personnel to deliver such information, and followup with effective monitoring.

A key priority area affecting Jordan's livestock industry is the timely and effective delivery of animal health services. A significant percentage of the national herd suffers from internal and external parasites as well as lung and intestinal worms. Livestock diseases such as mange, hoof and mouth disease and rickets are also present.

To combat disease and maintain national animal health, the MOA provides a wide range of veterinary support services. These include: preventive (border control, inspection), diagnostic, vaccine production, clinical and food inspection services. These activities tend to be subsidized or provided at cost, and are generally thought to be adequate. Parastatal services are also provided through JCO. Private veterinary services are a recent phenomenon, and are largely provided by ex-MOA employees who have decided to launch private practices as clinicians.

Most animal health services can be privatized and thereby operated at considerably less cost to the government. Veterinarians within the MOA recognize this and their department has

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[40] 17,000+ Najdi, and 54,000+ Kuios and other foreign breeds. The latter are imported for slaughter.

[41] Shami goats make up the bulk of the remainder. Under 20,000 goats are cross breeds.

[42] According to Schillhorn (loc. cit., p. 18), 7,500 inseminations were performed in 1992.

voiced its support for such privatizing efforts. The World Bank has drafted a privatization scheme which bears consideration. Prior to describing its basic elements, however, it will be necessary to draw up and secure ministry and Agricultural Council approval of a privatization plan. Development of the plan would be overseen by the Director of the Department of Animal Health, and include representatives from both the department and the private sector. Donor support in the form of technical assistance would be provided. In anticipation of the privatization process, donor support will also be sought to offer a series of seminars at which financial and managerial training will be given to prospective private sector practitioners.

The chief elements of the divestiture program would include:

- Privatization of clinical, breeding, and artificial insemination activities;
- Privatization of vaccination and other epizootic services;
- Development of a set of guidelines and standards to govern the quality of private practice;
- Alteration of existing MOF-determined guidelines so that relevant government units can collect fees, establish revolving accounts for full cost recovery services, and permit a more businesslike approach to their operations;
- Working with banks to enable them to offer loan packages to veterinarians seeking to purchase or lease government clinics and equipment;
- Development of a continuing education program to strengthen the quality of veterinary services, and clarify the responsibilities between the state and private sector in the provision and oversight of services; and
- Evaluation of further privatization (of units such as the Diagnostic Laboratory, or parastatal services)[43].

The public sector function of the animal health professionals would thus change from implementation to inspection and quality control, monitoring and control of epidemics. Services previously provided by the government would be contracted for. The quality control and

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[43] Schillhorn, Loc.Cit., VETMED: pp. 1-2.

inspection services would move into the Animal Production Department and eventually into an Agricultural Control Department[44].

[44] See, Chapter VIII, for a discussion of a reorganization option for housing these and other regulatory functions within the MOA.

CHAPTER IV.

STIMULATE AGRICULTURAL GROWTH: IMPLEMENTATION REQUIREMENTS

4.0 Sector-wide Actions

Increasing growth in Agricultural GDP in Jordan was interrupted only during the Region's unstable years of 1989 and 1991. The sector's proportional contribution to GDP, nevertheless, has been declining steadily. It has decreased from an average of 20% in the seventies to less than 10 percent in the eighties. Currently, the agricultural production sector's contribution to GDP fluctuates around 6 percent.

Recent analyses carried out in Jordan by Abt Associates[1] estimated the actual contribution of the agricultural sector to the national economy to be close to 30 percent, as opposed to the six percent generally cited. This estimate was calculated by including agribusiness activities, such as food, beverage and tobacco and agriculture-related services, such as trade, transport, financial, business and government services, as part of the agricultural sector's contribution to the national product.

The agricultural sector in Jordan employs about 7% of the economically active population and generates between 10-15 percent of the total merchandise exports. The sector also employs a large number of foreign workers.

Despite the diminishing relative contribution of agricultural production to the national product, the agricultural sector is assigned an important role as propeller of national growth and development in the Agricultural Policy Charter. There is recognition, however, that the limited size of the domestic market places added urgency on competitiveness for exports to regional and international markets. The role of agribusinesses in sectoral performance is another very important dimension in future orientations.

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[1] Ismael Ouedraogo and Rosemary Hyson, The Contribution of Agribusiness to National Income and Employment in Jordan. Abt Associates Inc.: 1993.

The following steps have been advocated by the Agricultural Policy Charter to stimulate agricultural growth:

KEY ISSUES AND PROPOSALS

- Make domestic agriculture competitive in quality and price to meet domestic demand and export markets. Efforts in this direction will include introduction and enforcement of grades and standards and streamlining licenses, controls and regulations required for agricultural exports.

- Seek regional integration with neighbouring countries to avoid sharp fluctuations in export performance.

- Encourage private agribusiness and people's participation to obtain maximum contribution to the national product. Farmers organizations will be promoted to provide a conduit for strong and effective participation.

- Encourage a transparent and freely functioning marketing system to eliminate obstacles to participation and allow competitive forces to foster adoption of efficiency enhancing measures in production and marketing.

- Reorient production by facilitating the introduction of new crop varieties while at the same time developing new product types by promoting processing research.

- Expedite enforcement of quarantine regulations and certifications by enabling private sector involvement and focusing government agencies on supervision and inspection where possible.

- Increase the quality and accessibility of agricultural support services, particularly, Agricultural Research and Extension services by involving users in defining priorities and strategies and opening up avenues to private-sector based provision of these services.

4.1 Actions Required to Approve and Implement the Policy Directons

4.1.1 The Agricultural Sector to be Competitive in Quality and Price.

The main instruments to be applied to attain this objective are the removal of input subsidies and other forms of protection to expose its agricultural sector to international competition. By facing the exacting demands of international competition, producers are expected to streamline their operations to preserve their share of the domestic market and compete aggressively in the international market. Actions required to achieve this objective are:

1. Eliminate domestic retail price controls for fruits and vegetables
2. Simpifly export permit requirements and limit import licensing requirements to a fewer number of commodities
3. Promote quality improvements of local production by disseminating product standards required by major importing countries

4.1.1.1 Eliminate Retail Price Controls. Retail price controls are not very strictly enforced at present.

Eliminating this practice is relatively straightforward from the legal point of view. Price differentials for various quality products are expected to become more pronounced. Lower quality products will command lower prices giving an added benefit to lower income consumers. Present capacity to lift price controls and to manage the transition process is considered adequate.

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4.1.1.2 <u>Simplify Export Permit Requirements.</u> Studies conducted by the Agricultural Marketing Organization (AMO) have documented and identified procedural hindrances to exports. Rationalization of these requirements has legal and administrative implications. Administratively, reduction of these requirements will entail a refocusing of the functions of departments in the Ministry of Agriculture from issuing concurrence letters to development promotion.

The same process which is required to simplify exports applies to reducing import licensing requirements. Liberalization of imports, however, has wide ranging implications to domestic production. Tariff policies are to be used to manage domestic production incentives. Analytical and institutional procedures to determine tariff levels and timing of revision do not exist at the present moment.

In the AEPD a policy analysis unit is proposed to provide the analytical support to calculating tariff levels in collaboration with the Ministry of Finance. The proposal is to be initiated by the Minister of Agriculture, to be approved by the Cabinet. Data and methodologies for tariff setting and reform do not currently exist. This is one of the functions assigned to the policy analysis division in the in the proposed AEPD structure.

4.1.1.3 <u>Promote Quality Improvements.</u> The Agricultural Marketing Organization (AMO) is responsible for marketing extension in the country. It provides growers with information on picking times, and handling and packing methods. It has also published the grades and standards required by the European Union, Arab countries and other fruit and vegetable importing countries. Producers can also receive guidance from the Quality Division of the Post-Harvest Directorate of AMO on methods to improve product quality. It presently employs six agricultural engineers trained in marketing extension.

While more field staff may be required to give added momentum to government-based quality improvement efforts, the private sector (especially buyers and brokers) is in a much better position to deliver these techniques to producers because product quality pricing becomes part of the business transaction. Failure to adopt the specifications

results in product rejection. Government-based advice, although useful, does not carry the same force of adoption.

4.1.2 Seek Regional Integration with Neighbouring Countries to Avoid Sharp Fluctuations in Export Performance. Jordan's neighbouring countries tend to produce the same array of crops because their agro-ecological conditions are very similar. This can (and has) led to serious competition and protection problems. Recently, for example, Syria, in search of hard foreign currency, attempted to dump fruits and cereals in Jordan. In order to protect its domestic producers, Jordan felt compelled to respond with import bans. The prospect of peace with Israel may open Jordan Valley citrus to competition it has been able to avoid in the past, or open new markets in Israel.

There are enormous benefits to be derived from coordinated production programmes. Likewise, coordination among countries in the region could make it easier for countries to specialize in products where they have distinct competence. Competence in services might also be mutually exploited. Israel's well developed access to European and even American markets, for example, could also be tapped by having it act as the marketing agent, freeing Jordan from the expense and competition involved in establishing autonomous marketing channels. The Jordan Valley's productive capacities could be channeled in such a way that Jordan could provide Palestine access to Gulf markets through its channels. This is a long-term process and needs to be driven by the country most likely to benefit from closer integration: Jordan.

Jordan's diplomatic missions in Arab countries may need to be given a stronger commercial focus. This is a resource whose commercial potential is not fully utilized. An effective approach may be to give diplomatic missions specific commercial targets or to station agricultural/agribusiness professionals, instead of career diplomats, in priority countries. The Ministry of Agriculture, because of being the most interested party in this area, may have to appoint a liaison officer whose responsibility is to link with the Ministry of Foreign Affairs to initiate the process and give it the continuity it requires.

4.1.3 **Encourage Private Agribusiness and People's Participation.** The policy charter proposes several related actions which impinge on the ability of the private agribusiness sector to expand. These are:

- Ensure a freely functioning market place by removing price controls and quantitative restrictions.

- Improve transparency in agricultural markets by making rules and ensure that regulations are clear and accessible to all market participants.

- Afford private sector with maximum area of operation by government concentrating on areas where it is the most logical provider. This includes: irrigation facilities, farm roads, electricity, health and education and general infrastructure.

- Government will place greater emphasis on processing and marketing research thus creating business opportunities for private sector initiatives.

- Government will increase support for exploring and opening new markets in order to expand export opportunities.

4.1.3.1 Ensure a Freely Functioning Market Place. Elimination of retail price controls and quantitative restrictions are the principal instruments proposed in the APC. The capacity and approaches for carrying out these actions have been discussed under the heading "Agricultural sector competitive in quality and price " above.

4.1.3.2 Improve Transparency in Agricultural Markets. Analysis of the legal and regulatory framework of agriculture discloses a considerable body of laws and regulations. Major weaknesses center on a lack of clarity regarding rules, regulations and procedures. Within the

MOA, for example, no office has a complete set of rules and regulations regarding Law No. 20, of 1973 and its amendments, Council of Ministers' Regulations, Ministry imposed rules, and the like. Moreover, the ministry to date has only had the services of a part-time attorney. An individual wishing to embark on a business venture, obtain a license, or permit has difficulty knowing who is in charge. As cited above, for example, in the case of enforcement of law regarding rangelands, authority is contested between government and traditional claims of authority. In such circumstances, political expedience often prevails. This is certainly a short-run solution, but does little toward clarifying long-term problems such as water rights and land reclamation, both of which have been identified as key areas of attention. Basin management, monitoring of underground water extraction and property rights governing the use of the rangelands are also cited by the World Bank as areas requiring improvement with support from its Agricultural Sector Technical Assistance Project (ASTAP), but doing so will necessitate clarifying lines of authority and responsibility.

An additional major constraint to transparency is the discretionary latitude normally built into rules and regulations, or assumed by individuals in decision-making roles in the absence of clear guidelines. The opposite effect can also be seen--inactivity and refusal to make decisions rather than making the wrong one. Identification and remission of these discretionary elements is a major undertaking. The Ministry of Agriculture does not have sufficient in-house capacity to carry this process out. With a part-time attorney and only a handful of staff acquainted with what they understand, or have been told is the law or the correct procedures, it is necessary to undertake corrective measures to ameliorate this important constraint.

4.1.3.3 <u>Afford the Private Sector a Maximum Area of Operation</u>. Privatization or withdrawal of direct government involvement does not necessariy imply that the private sector will rush to fill the void. Government-sponsored targeted programmes may be required to facilitate private sector entry, as in the case of privatizing the veterinary services, cited above, or in general extension support services. Thus the responsibility of the government does not end with its retraction. Conversely, it marks the beginning of a different sort of involvement, namely: ensuring provision of support services, providing a conducive policy environment, faciliting and regulating. At present, with few exceptions, the government is not prepared to fill this function

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well. For several decades, the prevailing ethos of government workers has been one of stewardship and control. There has been a general distrust of the private sector and a condescending attitude toward the nation's farmers, who are not seen as clients but rather as wards, incapable of making the right decisions on their own. Thus, affording the private sector wide latitude will also require preparing the staff of the ministry to develop a new mindset to enable them to provide support services with the same energy they presently devote to regulation.

4.1.3.4 Government will Place Greater Emphasis on Processing and Marketing Research. Government has limited capacity to conduct processing research. AMO has been heavily involved in export marketing research and has published market intelligence profiles for a large number of products. NCARTT has also described market research as an area in need of attention in its National Agricultural Research Strategy draft. The government is also involved in processing agricultural produce through its parastatal AMPCO. There seems to be general consensus, however, that the tomato paste operations of AMPCO are neither well run nor profitable, and talks are scheduled to arrive at a process of divestiture.

Research in marketing is an appropriate role for government and within the MOA for AMO and AEPD. At present, however, AMO's efforts have not met with success vis-a-vis outreach with producers. Steps are being taken to try and remedy this situation, but this problem of outreach extends to the entire public extension effort. With respect to AEPD, this department hasn't staff with marketing research expertise. Government does not have the financial nor the manpower capability to develop processing research capacity. This is most readily acquired by technology in joint venture arrangements.

4.1.3.5 Government will Increase Support for Exploring and Opening New Markets. The Agricultural Marketing Organization (AMO) has been helping fresh fruit and vegetable exporters in market penetration. A Fruit and Vegetables Exporters Association has recently been formed and is presently initiating activities.

The government can also increase support for exploring new markets by revising legislation such as the Agricultural Credit Corporation Law No. 12, of 1963, the Law of

Cooperatives No. 20 of 1971, and Supply Law No. 17, of 1992, which places restrictions in the way of opening new markets.

Present capacity of private firms to develop new markets, although limited, is to be expanded with the commencement of a GTZ-financed project aimed at funding private sector efforts to open overseas markets. USAID/Jordan is also providing technical and financial support to the above mentioned exporter's association. In essence, support for market penetration is being channeled both directly and indirectly to the private sector by donor agencies. Expansion of government agencies to provide direct support has not been a very effective approach and is not considered the most appropriate way. On the other hand, establishing a legislative and economic environment which lifts restrictions and is conducive to investments and risk taking is both appropriate and well within the abilities of the government to implement.

4.2 Implications at the Subsectoral Level

4.2.1 Reforms and Actions Required in the Irrigated Agriculture Subsector to Stimulate Agricultural Growth.

Planned actions of the APC in the irrigated subsector which are expected to contribute to stimulating agricultural growth include:

- Increase water for winter crops
- Enforce regulations for monitoring aquifers
- Enforce regulations on well licensing
- Facilitate organization of balanced demand and supply of commodities

Increasing water for winter crops, discussed in Chapter III, depends to a great extent on the effectiveness of water conservation measures during summer months. Physical control and increased operation and maintenance (O&M) water prices are the main intruments to be applied. Capacity for exercising these options will be improved by ASTAP when it funds the installation of water meters, and by USAID and CIDA

initiatives with the Ministry of Water and Irrigation (MWI). Limited direct involvement of the Ministry of Agriculture is expected in this area.

ASTAP includes a component to support the Water Authority of Jordan to establish and improve groundwater basin monitoring through its ten Basin Protection Units. In the same vein, enforcement of regulations on wells is a conditionality of the ASAL currently under discussion.

Organization of a balanced demand and supply of commodities was one of the prime objectives of the abandoned mandatory cropping pattern in the Jordan Valley. It seldom achieved its objectives. It is very unlikely that the Government could develop enough capacity to balance demand and supply of the various commodities involved and should not attempt to do it.

4.2.2 Reforms Required in the Rainfed Agriculture Subsector to Stimulate Agricultural Growth

Seven actions in the Charter were identified as relevant to stimulating agricultural growth, three of which were seen as priorities. They are:

PRORITY REFORMS TO STIMULATE AGRICULTURAL GROWTH IN THE RAINFED AGRICULTURE SUBSECTOR

- Plant fruit trees in areas with >400 mm of rainfall and over 8 percent slopes
- Five-year freeze on urban boundaries and a high conversion tax for agricultural lands
- Enact legislation on minimum plot size and concentrate housing construction on lands with 75 percent bedrock.

Orchestration of the proposed tree planting support programme would essentially be an NCARTT research, DOEI extension support, and MOA Plant Production and Plant Protection monitoring and quality control activity, rather than a government-funded planting campaign. In fact, farmers in the rainfed subsector have, for over a decade, been engaged in planting large numbers of trees on their own account, with little public sector assistance. Between 1981 and 1991, for example, acreage devoted to olives, stone and pome fruits (stone fruits are peaches, plums apricots and almonds; pome fruits include apples and pears) increased from just over a quarter million dunums to almost 600,000 dunums[2] while the total value of fruit production tripled between 1985 and 1990.[3] Supplies of saplings, presently amounting to over one million trees per year, most of which are second grade, are largely supplied by private nurseries. The MOA licenses these nurseries but does not monitor them for quality or providing disease-free planting material, and indications are that several such nurseries are being badly managed.[4]

Tree planting activities have also been carried out by the donor-funded Zarqa River Basin Development Project and the Highland Development Project. However, in both of these cases, tree planting was a sub-component confined to specific areas, rather than being a subsector-wide, departmentally-based and domestically-funded activity.

To implement tree planting support as an MOA departmental programme, it is suggested that such a programme be:

- initiated by NCARTT's (with DOEI reintegrated as part of it) undertaking research to establish the most appropriate varieties of seedlings for Jordan's rainfed subsector's slopes;
- followed by DOEI extending the results of this research to the subsector's farmers (and other potential users) through well organized technical package delivery;
- with the private sector simultaneously providing the chosen planting material through its nurseries at actual cost;

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[2]Sunna, et.al., loc. cit., p. 14.

[3] FAO. loc. cit., p. 9.

[4] FAO: Jordan: Agricultural Sector Technical Report, 1993, Annex 3, p. 10.

- and the Plant Production and Protection Departments exercizing a quality control function as per new functions described in Chapter VIII.

Private sector capacity to provide quality seedlings is considered inadequate at the moment. It would improve, however, if the government exercizes its quality control and monitoring responsibilities to ensure that only first quality, disease-free planting materials are produced in the country or are imported. This will entail expanding the plant protection staff and training it further to enhance its quality control and health capabilities. This will also require increasing its plant propagation facilities and capabilities. Improvement will also attend the government ceasing to price the planting material it distributes below production costs. This, too can be remedied with government divestiture of its nurseries. Public plant production and protection functions with respect to trees would then focus on phytosanitary issues, germplasm, monitoring and support.

Priorities requiring reforms surrounding urbanization, conversion, land use, and plot size, are discussed in Chapters III and VI. It bears emphasizing, however, that the present legislative framework lacks sufficient power to enforce the land use restrictions proposed by the APC. These laws will need to be changed to accommodate the desired reforms, but the time and complexity involved in making the necessary changes renders these unlikely instruments for immediate action.

4.2.3 Reforms Required to Stimulate Agricultural Growth in the Livestock Production and Low Rainfall Subsectors. Two subsectors are combined here, given the fact that stimulating agricultural growth in the low rainfall subsector is inextricably bound to livestock production. Livestock production refers both to integrated livestock production and extensive production. As such, it consists of modern dairy and poultry production and small mixed farms and Badia-based small ruminant production. Livestock production reform also extends to the rainfed and even forestry subsectors, calling as it does for encouraging rainfed subsector farmers to adopt barley-livestock farming systems, as well as dealing with grazing in forested areas and calls for expansion of forests on lands adjacent to grazing areas.

The interrelationship which arises from these various subsectors and livestock makes a strong case for centralizing all livestock-related actions presently scattered among various departments into either a single livestock development department or an inter-departmental program cutting across existing departmental lines. Similar in many respects to the Zarqa River Basin Project, in this case the funding and the management would be internal to the Ministry of Agriculture.

Bringing under one umbrella all livestock-related activities is expected to be an administratively complex exercise. It will have to be carried out with the help of an outside management consulting organization to be at all feasible. The process will take at least two years to implement(see, Chapter VIII, for a presentation of one alternative for accomplishing this).

Virtually all of the priority livestock reforms related to strengthening agricultural growth called for in these subsectors have been discussed in Chapters III, VI, and VIII. Rather than reiterate them, a few have been singled out for additional comment and clarification.

4.2.3.1 **Allocating Water to Meet Livestock Requirements.** Experience with the allocation of Disi acquifer water for wheat and barley production has demonstrated the futility of trying to allocate water to pre-determined uses. No capacity exists to monitor and enforce water use for crops and it is very unlikely that it could be improved to accommodate allocation for livestock.

4.2.3.2 **Improving Herd Management and Genetic Resources Through Breeding.** Livestock breeding programmes have been a normal part of livestock development programmes in the MoA. The purpose here is to give them added momentum. The private sector has shown effectiveness and full capacity to sustain breeding efforts in dairy and poultry.

It is advisable that it remains within the private sector's purview. The public sector's role would be limited to providing highly specialized technical support when needed and to enforcing regulations. Breeding of small ruminants, on the other hand, is in dire need of

renewed momentum. NCARTT's proposed research agenda, for example, points to the need to address animal husbandry, genetic enhancement, and general animal health and hygiene problems in Jordan's sheep and goat populations. It further calls for selective breeding programs to cross domestic breeds with foreign lines, and argues that upwards of 45 percent of its integrated livestock research agenda be devoted to these needs.[5]

It will remain the responsibility of institutions within the public sector, including NCARTT, HCST, the Kingdom's universities and the Ministry of Agriculture to respond to these needs, given their socioeconomic importance in Jordan at least until these types of activities are accepted as necessary and/or financially attractive to the private sector. The process of eliminating subsidies within the ruminant subsector, however, is likely to put a damper on private sector assumption of ruminant health and breeding programs until the parameters of the redefined market are determined.

4.2.3.3 **Improving Public and Private Sector Animal Health Services**. Preventive animal health services in the government have been strengthened with the help of donors especially GTZ. Diagnostic and clinical services in government are also functioning reasonably well. The private sector has taken advantage of recent relaxation regarding private veterinary practice. Several clinics and pharmacies have begun operation. Private veterinary practice, however, requires further development before it can provide most of the services currently being provided by the government.

4.2.3.4 **Expand Applied Research on Animal Health and Production Systems.** A recent World Bank mission found no evidence of applied research on animal health or animal production systems. The recently developed National Agricultural Research Strategy has identified several programmes in this area. It will require some time before applied research on livestock management and animal husbandry gets organized and starts to produce results.

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[5] Loomis, loc. cit. pp. 61, 68.

4.2.3.5 Phase Out Price Regulations. Government is committed to lifting price controls on fresh and frozen poulty meat, fresh and chilled red meat, fresh milk and table eggs. From the legal standpoint removal of these controls is a straightforward exercise. Institutionally, most of the responsibility falls on the Ministry of Supply.

4.2.3.6 Maximize Government Support to Trade. The Ministry of Agriculture already participates in a series of bilateral committees regarding agricultural trade with neighbouring countries. These committees are generally coordinated by the Ministry of Foreign Affairs. The sector-wide recommendation on assigning diplomatic missions with defined commercial goals applies here. Movement of livestock across borders, resuming and increasing livestock trade with previously active partners in the Gulf, and seeking out potential opportunities with other nations in the region, should all be priority concerns for commercial attachés.

4.2.3.7 Promote and Monitor Quality Standards in the Private Sector Feed Industry. Review of the capacity of government laboratories to undertake animal feed analysis and quality control revealed that their capacity was considered adequate. A more systematic programme of analysis should be part of the work programme of the Department of Livestock Development. It should also include sampling of animal feed along the marketing channels to prevent product adulteration.

4.3.2.8 Improve the Feeding Schemes for Livestock According to Known Requirements of Species in Connection with Herd Management. The APC calls for aggressive government promotion of barley production as part of an integrated livestock production program in order to address the mounting expenses attendant upon feeding livestock. The economics of such a program need to be thoroughly researched by AEPD prior to embarking upon such a program, insofar as previous public sector barley production promotion programs resulted in heavy subsidies and public indebtedness.

It is, nevertheless, generally acknowledged that little attention has been paid to feedstocks in terms of their quality. NCARTT has identified this issue of type, quality, and appropriateness

of feeds as one of its priorities[6] and it is important that such research be undertaken as soon as possible. Given NCARTT's limited capacity in this area, The MOA's Departments of Animal Production and Animal Health, along with Jordan's universities as well as international resources such as ICARDA, FAO and the International Livestock Center for Africa should be engaged in an effort coordinated by the Department of Animal Production to address feed requirement needs as well as developing a plan to meet such needs.

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[6] Loomis, loc. cit. p. 68.

CHAPTER V.

PROMOTING BALANCED ECONOMIC GROWTH AND EQUITY:

IMPLEMENTATION REQUIREMENTS

5.0 INTRODUCTION

One of the key objectives of the Agricultural Policy Charter is its commitment to both increasing sectoral incomes and to increasing and improving social equity between sectors and within the agricultural sector itself. This commitment recognizes the extant disparity in incomes and services between Jordan's urban and rural populations--the rate of those living in absolute poverty in the rural areas is twice as high as in the urban areas--along with significant income differentials within the Kingdom's farming community--the average net income of farmers on irrigated land in the Jordan Valley is over JD9,000; that of those farmers on rainfed lands with even reasonable (>350mm) rainfall is JD1,147.

Chapter V. seeks first to elaborate those directions within the Agricultural Policy Charter aimed at promoting balanced economic growth and equity, and how their implementation will help realize these twin objectives. Next it will identify the reforms necessary to implement the directions, followed by a discussion of the capacity of both the private and public sectors to implement the sought after reforms. Chapter V concludes with a discussion of the impacts of the reforms upon the subsectors which will be affected by them.

5.1 Policy Directions Proposed by the APC to Achieve these Objectives

Eight major policy directions are proposed by the APC to help accelerate the promotion of balanced economic growth and equity. They are:

- **Adjust Land Leasing and Tenancy Systems to Reflect Technological Changes**
- **Promote Liberal Price Policies**
- **Focus Extension Programs on Groups Presently Not Being Reached**
- **Develop Agricultural Credit and Other Financial Services and Target Individuals not Eligible for Private Bank Loans**
- **Design Enabling Legislation which Promotes Self-Help, Cooperatives, Professional and Other Farmer Organizations**
- **Encourage Participation of Individuals and Target Groups in Policy Formulation and Decision Making**
- **Establish Training Institutions for Agriculture and Rural Development at Suitable Locations Throughout the Country**
- **Mandate NCARTT to Support Extension Institutions and be Included in Organizing the Feedback Between Research, Extension and Producers**

5.2 How Implementation of Charter Objectives will Promote Balanced Economic Growth and Equity

5.2.1 <u>Land Leasing and Tenancy System Adjustment.</u> By all accounts, the current practices of farmland fragmentation, short-term leasing and unabated urbanization are undermining the ability and resolve of farmers to invest in and apply technological changes such as drip irrigation and mechanization, changes which would vastly increase productivity. Adjusting leasing and tenancy systems to promote longer leases, inhibiting the fragmentation process brought on by inheritance practices, and zoning prime agricultural lands lying within the jurisdiction of urban

municipalities for agricultural use, will simultaneously encourage farmers to risk investing in technological changes which will increase their incomes and enhance the overall wellbeing of the sector.

5.2.2 Liberal Price Policy Promotion. Price controls presently include output and input subsidies, retail margins and prices of fresh agricultural produce and processed commodities. By establishing a liberal price policy, the Kingdom will foster economic growth by alleviating the fiscal burden which subsidies place upon the government, and promote transparency by ending the distortion of market price signals. Economic growth will also be fostered by encouraging private investors who will assume functions presently done by the MOS and directly import, purchase, store, process and provide produce and commodities to consumers and merchants.

5.2.3 Targeting Extension Programs to Presently Unserved Groups. The intent of the APC here, is to reach beyond the irrigated sector to small farmers and livestock producers in the rainfed and Badia subsectors, and to provide them with trustworthy advisory services regarding issues such as integrated pest management, sustainable production, tree cropping, minimum tillage, fodder cropping, environmental protection, non-farm and off farm income generation. The aim is to cushion to the extent possible, the impact of a modern, market driven agricultural system in general and the effects of the ASAL in particular.

5.2.4 Developing Credit and Financial Services for Targeted Individuals. Credit and other financial services have been largely available through the Agricultural Credit Corporation (ACC) in the form of loans. While basically sound as a lender, government involvement in its operations and externalities such as the Gulf War and drought have resulted in unsustainable losses. By privatizing the ACC and expanding its mandate such that it is capable of functioning as a bank, it is expected that it can offer a full array of financial services to the sector as a whole. Moreover, it is hoped that its portfolio, which in the past extended mainly to larger farmers, can be expanded through creative programs to include smaller farmers and livestock producers, thereby directly addressing the equity issue.

5.2.5 Developing Enabling Legislation which Promotes Farmer Organizations. Ultimately, the success of a free market agricultural sector will rely on the active participation of farmers, livestock producers and agribusinessmen and women in shaping and driving its development. By recognizing this through enabling legislation which provides the legal basis for this process, the sector's participants should be free to engage in self-help programs, reinvigorate existing and create new cooperatives, and develop other farmer, livestock, and agribusiness organizations. In this way, this objective directly addresses the need both for economic growth and equity between and within sectors.

5.2.6 Involving Farmers in the Policy Formation Process. The farmer organizations referred to above, will, in addition to energizing the sector socially and economically, serve as channels of communication between the sector's actors and legislators, providing the latter with insights and input regarding policy formulation and decision making. In addition, these organizations will provide the necessary representation called for in the National Agricultural Research Strategy to ensure responsiveness by the agricultural research and technology transfer specialists to their clients needs. The political influence of a few powerful sectoral representatives will thus be replaced by a number of organizations representing the needs and points of view of a broader, more representative and equitable cross section of the agricultural sector.

5.2.7 Establishing Agricultural and Rural Development Training Institutions. The National Center for Agricultural Research and Technology Transfer (NCARTT), will serve as the major vehicle to provide applied research results through agricultural and rural development training institutions at suitable locations throughout the country. The six Regional Agriculture Service Centers (RASCs)[recently renamed Regional Centers for Agriculture Research and Technology Transfer, or RCARTTs], and their 12 research stations under NCARTT's administration, in addition to the Jordan Badia Research and Development Programme at Safawi (Badia), will provide appropriate agro-ecological locations throughout Jordan's agriculturally productive areas for the dissemination of accurate information and training of farmers and livestock producers. Targeted groups will include producers and farm families not presently being reached by private

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sector extension services, thereby responding to the issue of greater equity within the agricultural sector.

5.2.8 Mandating NCARTT to Support a Fully Functioning Extension System. This objective is a logical outgrowth of the recently prepared draft National Agricultural Research Strategy and medium term plan for NCARTT. It responds to the realization that
the government extension services are presently very weak, don't reach poor farmers, and don't provide effective training and demonstration programs on topics of importance to the sector as a whole. While recognizing and encouraging the need for and development of private sector extension services, the government wishes to maximize sector equity by ensuring that producers not adequately reached by these services at present, be provided the information for "managing their farms, especially for achieving efficient, sustainable and ecologically sound production and post harvest handling..."[1]

5.3 Implementation Requirements/Implementation Capabilities

Realizing the objectives aimed at promoting balanced economic growth and equity within Jordan's agricultural sector requires the design and implementation of a number of new and modification of existing policies. Tangible moves have already been initiated by the Government in the case of promoting liberal price policies, and important groundwork has been done in the areas of agricultural research and technology transfer. Much, however, remains to be done. In this section, the major requirements needed to address the objectives are elucidated, after which the institutions which will be engaged in implementing such changes will be identified, along with an assessment of their capacities to carry out such efforts.

5.3.1 Land leasing and Tenancy Systems Adjustment. Development and adoption of a Land Use Plan is the first requirement the Government must tackle. This two year effort will include an in-depth examination of Agricultural Law 20/1973; Preservation of State Lands Law/1961; the Settlement Law of 1930; the Land Registration Law of 1952; and the State

[1] Agricultural Policy Charter Draft, p. 23.

Property Administration Law. Adjustment of tenancy and land leasing will also consider the following options for adoption;

- Liberalize land sales restrictions and extend tenancy leases to 30 years in the Jordan Valley;
- Consideration of a five year moratorium on land conversion in urban and peri-urban areas until existing vacant areas are built out;
- Taxing future conversions;
- Development of a Land Bank to purchase available land for resale to bona fide producers; and
- Incentives to consolidate inheritances to promote production.

The options identified above focus primarily upon farm lands. There is an equally important need to address land use and tenure regulations in the Badia. This area is experiencing dangerous levels of deterioration. Overgrazing by livestock, and soil and natural cover depletion from unsustainable marginal barley cultivation are endangering this critical resource. The Land Use Plan referred to above must include disposition of the rangelands. Issues to be considered should include:

- Creation of an entity within the MOA with both responsibility and authority to administer policy within the Badia;
- Long-term leases with rental fees contingent upon participation of users in sustainable forage production schemes;
- Clear cut and unambiguous determination of user rights;
- Abolition of rainfed farming in areas with <200 mm rainfall;
- Termination of barley forage production subsidies in the badia; and,
- Reinvigoration of the El-Hammad Project to enhance regional cooperation with respect to grazing practices.

Development and implementation of these regulations will be the responsibility of representatives from the MOA, MMRAE, Land Registry Department, and National Municipal Planning Council. Significant input will be required from stakeholders representing the farmer and livestock producer communities. Ideally, the Agricultural Council should oversee and direct

this process. Currently, little coordination exists between these agencies, and the Agricultural Council has neither permanent management capacity nor financial resources to bring to bear on implementing it. Moreover, there are few, if any, professionally trained staff with land use/land tenure policy expertise in any of the institutions mandated to implement such an objective. The implementation of this objective will therefore require considerable external technical assistance and internal political cooperation.

5.3.2 **Liberal Price Policy Promotion.** The specifics of price policy liberalization implementation requirements (i.e., liberalization of subsidies, elimination of price controls, quantity restrictions and related import controls, divestiture of AMPCO, and elimination of import/export monopolies and concomitant establishment of a rational tariff policy) are treated in Chapter III. While the impact of these policies upon Jordan's fiscal deficit will be positive (the World Bank estimates a savings of around JD17 million), and their impact on consumers will also be positive (through expected lower food prices), the farming population in general might be negatively affected in the short to medium term, the rainfed sub-sector will face real risks, and the overall impact upon livestock producers will be negative to marginally positive. Only those farmers in the Jordan Valley and their counterparts in the Highlands using irrigated agriculture are believed to have the potential to be significant "winners"[2].

This reality lies behind the APC's call for phased liberalization along with the aggressive pursuit of a research and extension system capable of assisting targeted farmers and livestock producers deemed most at risk. (see, sections 5.3.3, 5.3.4, 5.3.7 and 5.3.8, below).

In order to ameliorate the adverse impacts of implementing price liberalization policies, two additional activities require implementation:

* the development of an effective monitoring and evaluation system which can accurately gauge the impacts of the liberalization process upon farm and livestock producer families; and

[2]"Assessment of the Potential Impact of ASAL in Farmers' Incomes", KfW, October, 1993.

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* development of the National Assistance Fund into an organization capable of providing safety net services to those truly in need.

The appropriate "home" for such a monitoring and evaluation effort will be the Ministry of Finance, administrator of the National Assistance Fund. It will be essential, however, for the MOA to provide the MOF with the necessary data to determine where assistance needs exist. The present monitoring and evaluation capabilities within the MOA are unequal to the task of providing the data needed by the MOF. However, upgrading MOA's monitoring and evaluation capacity is a planned for donor activity. GTZ's proposed plan to assist the MOA in its monitoring and evaluation efforts (see, Chapter VII) is geared to the evaluation of economic and social impacts of the ASAL upon the most vulnerable groups in the agricultural sector. Economic and social impact data will be collected and evaluated for:

* Farm household socioeconomic characteristics;
* Farm assets and debts;
* Farm Production and inputs;
* Input and output prices (both financial and economic); and
* Farm enterprise data and budgets for 19 different crop, tree crop and livestock enterprises.

The GTZ technical assistance team and MOA Monitoring and Evaluation Unit staff will meet with MOF counterparts to determine if any additional data is required to both undergird the development of an assistance program and enable National Assistance Fund personnel to effectively carry out assistance as needed once the strategy is in place.

This MOA/MOF interaction should precede the development of a comprehensive assistance strategy. Others participating in the design of an assistance strategy should include: civil service and elected officials representing Directorates of potential involvement; representatives of any farmer organizations, tribal leaders, and faculty from UOJ and JUST.

5.3.3 <u>Focusing Extension Programs on Groups Presently Not Being Reached.</u> The largest and wealthiest farmers have taken advantage of extension services provided by the private sector (see, Chapter VII for a description of these organizations). In the public sector, however, a

different picture emerges. With fewer than 100 field agents in the public extension system (resulting in an agent to farmer ratio of approximately 1:1150), it is not surprising that significant numbers of farmers and livestock producers are not being helped. Those groups presently not being reached by services include:

LOCALE	POOREST GROUPS
JORDAN VALLEY	Small Farmers; Renters & Sharecroppers
IRRIGATED HIGHLANDS	Sharecroppers
LOW RAINFALL ZONES	Sheep & Goat Producers & Cereals Producers
RAINFED AREAS	Cereals Producers & Sheep and Goat Predominant Producers

The decision to focus public extension services upon those groups not being served by private services grew out of recommendations by the team which drafted the National Agricultural Research Strategy, as well as various donor studies keying on the state of extension services in Jordan. Building on these findings, the World Bank has designed an Agricultural Sector Technical Support Project (ASTSUP), one of whose components will be the development of a formal extension policy and strategy that will define the specific implementation needs of these farmers and livestock producers, and how to meet them.

GTZ will provide financial and technical assistance resources to implement and field test this undertaking. The strategy will include service elements regarding:

Soil fertility, anti-erosion measures and water retention;

Water quality, crop and animal requirements, retention;

Range management, stock control, grazing schemes, culling;

Livestock feeding, breeding, health, herd management;

Marketing, quality control, storage, processing, farm organizations, farm management; and

Off farm and non-farm income generation.

At present, the public extension service is understaffed, undertrained in terms of understanding and delivery of technology packages, unreasonably deskbound by administrative requirements placed upon them, resource poor, and generally demoralized (see, Chapter VII, section B, below for a more complete description of the capabilities and constraints faced by the public extension system).

5.3.4 <u>Develop Agricultural Credit and Other Financial Services and Target Individuals not Eligible for Private Bank Loans.</u> The Government has embarked on a number of interventions which, it is hoped, will strengthen growth with equity in terms of assisting individuals who are currently ineligible for bank loans. At the macro-economic level, for example, the GOJ has decided to adopt indirect money control instruments that should raise the ceiling on credit expansion. Banking regulations will be modified to make long-term financing instruments available, improve preferential credit management, and make these banking transactions more transparent.

Within the agricultural sector, this will lay the groundwork for a key implementation requirement: restructuring the Agricultural Credit Corporation (ACC). Studies by the World Bank have concluded that the ACC has the potential to become an effective institution. What will be called for is reorganizing it such that it operates more like a full fledged banking entity. This, in turn, will call for:

* Policy revision of Law No. 12 of 1963 (which established the ACC) to enable ACC to function as a deposit taking institution;
* Placing the ACC under Central Bank Supervision;
* Ensuring ACC's autonomy; and
* Developing a loan recovery strategy that will secure ACC's solvency, even as it enables farmers and livestock producers at the productive margin of the sector who prove to be creditworthy risks but who were formerly unable to secure loans, to get them.

This process will also call for the strengthening of the ACC Studies Department such that it can provide effective and reliable data to lending officers. It will also need to be able to monitor and evaluate ACC's ongoing operations. To the extent that ACC's ultimate status is

to be comparable to that of a full service banking institution, it will be essential to strengthen and broaden the functional capabilities of ACC personnel such that they can effectively offer such services.

The World Bank's proposed Agricultural Sector Technical Assistance Program (ASTAP) has proposed to support five diagnostic studies to launch the ACC toward viability. These will address:

* A diagnostic audit of the ACC's portfolio (using generally accepted standards for banks);
* A management and organization assessment and proposal for changes as needed;
* Development of a 5-year business plan (including funding sources, funding uses, and deposit mobilization);
* A rural financial market study to expand the data base; and
* A technical study of agricultural insurance, detailing risk factors.

The results of these studies will form the basis of the ultimate implementation strategy for the ACC.

5.3.5 **Design Enabling Legislation which Promotes Self-Help, Cooperatives, Professional and Other Farm Organizations.** The APC's commitment to economic growth with equity calls for sectoral participants to avail themselves of existing and create new organizations. The key objective here is to enable "Jordanian farmers and producers (to) solve their economic and social problems by marshalling their own strengths.[3]

The present organizational structure within the agricultural sector discloses that a small but significant number of successful farmers are able to purchase necessary services and have personal access to policy makers. The majority of farmers have little experience with or access to organizations capable of enabling them to strengthen their economic and social positions. Indeed organizations such as the Jordan Cooperative Organization or the Jordan Valley Farmers' Association, as Government organizations operate from the top down, supervising the 236 primary cooperatives rather than representing them. Laudible efforts have been made by

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[3]Agricultural Policy Charter, October, 1993 Draft, p. 13.

NGOs such as the Queen Alia Fund and the Queen Noor Foundation in providing training, advice and marketing development services, but these organizations are constrained by resources, and operate basically from the top down as well.

What is called for is an overhaul of existing legislation to enable cooperatives and other private organizations to operate from the bottom up, helping farmers and producers to receive the marketing and input supply services they will need to successfully compete in the changed circumstances they find themselves in today. Inauguration of this process will proceed through World Bank efforts. ASTAP will develop the information necessary for revision and/or development of enabling legislation through three studies which will:

* Develop new cooperative legislation, replacing JCO with a small Jordan Cooperative Authority attached to the Minister of Agriculture's office;
* Develop a Cooperative Code which clarifies the legal, financial, and management roles of cooperatives vis-a-vis their members, management and the Government;
* A termination study and financial audit to bring JCO operations to a timely and effective end; and
* A study to develop strategies to enable primary cooperatives and other self help organizations to develop federated structural capacity.

While the implementation of this objective will entail in depth interviews with staff members and studies of JCO, its present capacity to play an integral role in this process is undermined by the fact that its management and financial practices are responsible for the virtual bankruptcy and ineffectiveness of the agency. The objective of providing decision making authority and overall management responsibilities to cooperative members is tantamount to standing the current JCO on its head. That is, current management views the farmers as clients, not as its bosses. Most staff will hardly be sympathetic to and supportive of a process whose goal includes JCO's demise.

Carrying out these studies will, therefore, require substantial expatriate technical assistance. The Jordan Valley Farmers' Association and Natonal Farmers' Union might be able to provide some assistance. Cooperatives management expertise is unavailable from MOA staff. A few UOJ and JUST faculty have experience in the area of cooperatives, but this extends to

marketing rather than cooperative organization and management. Jordanian legal services, both public and private, with agricultural legislative experience are virtually absent.

5.3.6 Encourage Participation of Individuals and Target Groups in Policy Formation and Decision Making. The success of the enabling legislation referred to above will play a significant role with respect to strengthening the participation of individuals and target groups in policy formation and decision making. To date, the formation of the APC and its proposed implementation elements have been widely discussed in numerous workshops and meetings to ensure that those public and private organizations that will be affected by its proposed changes have a chance to actively participate in the policy formation and implementation process. Farmer and producer cooperatives, unions and rural development associations can and should serve as important means by which members can articulate and aggregate their opinions with respect to policy change and implementation.

Policy formation and decision making also require public channels for input by those farmers and producers who stand to gain or lose most by the APC's adoption. One of the key functions of the newly energized extension system (see, 5.3.3, above and 5.3.7 and 5.3.8 below) will be to provide such channels to expand awareness of proposed policy changes, articulate in a clear and unbiased manner the implications of such changes, and create fora for client responses. These responses must, in turn, be articulated to policy makers who integrate these views within their policies and implementation strategies.

The current extension services do not have the capacity to address these objectives. Grass roots organization development is a specialization that requires substantial training in and an understanding of organization theory, rural sociology, political science and management practices, along with a realistic time commitment and sense of dedication. These skills and the resources to utilize them are in short supply in Jordan at present.

5.3.7 Establish Training Institutions for Agricultural and Rural Development at Suitable Locations Throughout the Country. This targeted objective is perceived as one of the important means by which those participating in farmer and producer organizations can acquire the leadership and management skills to ensure their effectiveness. Section 5.3.3, above,

describes some of the additional elements that will be part of a national extension policy and delivery strategy. The APC articulates the need to develop a flexible and relevant training capability tailored to local conditions.

The "what" of what needs to be provided through training, then, is fairly clear. So too, is the "whence;" research results from NCARTT, Jordan's universities, and other regional and international centers. The "where," at least in the short-term, will logically be at the 6 RCARTTs as well as on the Center research fields. The implication here is that the GTZ-sponsored extension policy and strategy include a very strong focus on "who" will provide the training, (e.g., NCARTT, DOEI, JCO agents posted to new assignments, private sector agents?), and "how" they will do so. This will require development of clear guidelines regarding the relationship between NCARTT and DOEI, as well as other public and private sector technology transfer agents.

In terms of skills, studies have shown that training capacity is one of the areas most in need of addressing among current extension staff. It may be possible to second some university staff to provide such training, but the likelihood of this succeeding is modest. In effect, the extension strategy will have to propose a training plan that addresses this problem head on.

5.3.8 <u>Mandate NCARTT to Support Extension Institutions and Be Included in Organizing the Feedback Between Resarch, Extension and Producers.</u> This objective grows directly from the previous ones as well as Section 5.3.3, above. Here, emphasis is upon ensuring that the technology packages and management training efforts delivered are well received and used by producers; that whenever modifications in extension packages are called for, NCARTT and the extension services are aware of this need and take appropriate steps to respond to it.

NCARTT and the extension services do not possess the orientation or capacity to function in this manner at present. There is little if any interaction between research and extension efforts. Information packages on NCARTT research efforts are slow to develop and extension agents are not trained with respect to their content or application. University researchers often focus on studies which are of little relevance to Jordan's small farmers and livestock producers, but have proved responsive to requests from farm organizations and large private farmers.

Initial steps to revitalize the relationship between NCARTT and the public extension services are currently under way. A first draft of a proposed national agricultural research and technology transfer strategy has been completed and is under discussion. The follow-on national extension policy and strategy study will be undertaken in the Autumn of 1994. By mid-1995, the conceptual framework undergirding this new relationship should be in place.

5.4 Reform Implications by Sub-sectors

5.4.1 Adjusting Land Leasing and Tenancy Systems to Reflect Technological Changes. Addressing the issues of land tenure, leasing and tenancy will have an important impact on all of the sub-sectors covered by the APC. Within the **irrigated agriculture sub-sector**, for example, freeing up sales practices and extending leases to 30 years will create the incentives to make the investments in technological innovations that will lead to improved productivity.

The **rainfed agriculture sub-sector** will benefit in many ways from land policy adjustments. By establishing land use policies such as zoning, building moratoria, and conversion taxes that address urban sprawl upon Jordan's most fertile rainfed lands, the kingdom's modest arable land patrimony will be preserved for agricultural production. Adjustment and enforcement of anti-fragmentation policies will help keep farm sizes economically viable and suitable for technologically supportive inputs.

The **integrated livestock production sub-sector** will be marginally affected by changes in land tenancy and leasing, unless operations are carried out in the **low rainfall livestock production sub-sector.** Legislation clarifying user rights in the Badia, particularly the termination of forage barley production subsidies and abolition of rainfed arable farming in areas with <200 mm rainfall may actually drive some producers out of business. On the other hand, policies which establish long-term leases with fees governed by the preparedness of the lessee to engage in sustainable forage production schemes will serve to maintain the ecology of the Badia while encouraging livestock producers to utilize environmentally sound technologies.

5.4.2 Promoting Liberal Price Policies will have a negative impact on most poor and marginal farmers and livestock producers. This will include sharecroppers and renters in the Jordan Valley, rainfed agriculturalists in the highlands, and livestock producers (particularly those producing primarily goats and/or sheep) and arid zone farmers dependent upon subsidies for

forage and forage production. Estimates[4] are that in the worst case, between 25 and 30% of (some 20,000) farmers in the Jordan Valley and Highlands employing irrigation could face serious declines in their incomes; between 10 and 15 percent of the 80,000 farmers and livestock producers in rainfed, mixed farming and livestock producing zones would face declining earnings as a result of price policy liberalization. However, in the best case scenario, the same study estimates that valley farmers might actually more than double their incomes. In all other cases, there is little if any potential for increasing incomes significantly as the result of price liberalization. The lesson in these cases seems to be that regional competition, high resource costs and concomitant marginal production inputs within these sectors is undermining agriculture, regardless of price liberalization policies. This does not, however, imply that the Government simply throw up its hands and do nothing. Agriculture is, after the service sector, the most important productive sector, contributing between 7 and 27 percent of GDP (depending upon the inclusion of agribusinesses in the equation). The potential for continuing to make a substantial contribution to Jordan's economy dictates that the Government make its best effort to help the agricultural sector realize its potential.

In keeping with the Government's expressed desire to make the transition from an inward facing economy characterized by substantial intervention, subsidies, and controls, to a competitive market economy as easy as possible for its marginal producers, it has committed resources both to alleviate genuine hardship occasioned by this transition and research and extension services to help targeted producers to succeed within the new economy. While these services will help sharecroppers and renters in the irrigated agriculture sector through safety net payments, improved water distribution and use, and extension assistance, the bulk of this assistance will be geared to rainfed farming and livestock producing areas, where the bulk of Jordan's marginal farmers live and work. This will include:

* Refocusing NCARTT's research efforts to improving the cultural and husbandry practices of these targeted groups, assisting farmers now dependent upon subsidies and cereals production to change over to more remunerative crops (see,

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[4] Assessment of the PotentialImpact of Agricultural Adjustment Measures, as Proposed Under ASAL (Draft), on Farmers' Incomes in Jordan. KfW, Frankfurt, October, 1993.

Chapter VII, Section B) and livestock producers to more sustainable integrated livestock production;

* Orienting extension services to provide these targeted groups with technology packages and programs devised by NCARTT, university and private sector researchers. This will entail an extensive overhaul of the extension services, and a vastly improved training and communications capability between NCARTT, extension agents and their clients;
* Financial assistance to those truly in need through outreach services provided by the National Assistance Fund; and
* Direct income transfers linked with suitable production systems.

5.4.3 **Focus Extension Programs on Groups Presently Not Being Reached.** Those groups referred to in section 5.4.2, above, will be the main recipients of extension programs. Insofar as most of these groups are in the rainfed agriculture and low rainfall agriculture and livestock production sub-sectors, these areas will receive the bulk of extension assistance. However, small farmers in the irrigated agriculture sub-sector will also require such assistance. This objective has been articulated in the APC as well as serving as the focus of World Bank and GTZ development assistance efforts. GTZ, in cooperation with the World Bank, will develop an extension strategy whose objective is to realize the APC's expressed intent. A draft companion study focused on development of a National Agricultural Research Strategy, has been completed and is under review. This study calls for development of a research system whose focus is applied research. This research addresses those targeted groups who are deemed most vulnerable as Jordan's agricultural sector changes its focus. It also calls for communicating its research findings to Jordan's extension services such that these extension services are able to provide relevant, state of the art and productive packages to the targeted groups.

5.4.4 **Develop Agricultural Credit and Other Financial Services and Target Individuals not Eligible for Private Bank Loans.** As stated above, the cornerstone of this objective is to transform the Agricultural Credit Corporation into an organizationally autonomous full service banking institution. Part of its mandate will be providing financial support services to those farmers and livestock producers in the rainfed and low rainfall sub-sectors, although in principle,

it will serve all sub-sectors. It will take at least one to two years before the ACC is prepared to grant loans. The terms of these loans, and creditworthiness of borrowers who would not otherwise be eligible for loans from established private banks has yet to be worked out. It may be possible to encourage banks already functioning in the private sector to take on farm loan portfolios as part of their operations.

The likelihood is that a maximum of 60 percent of targeted farmers and livestock producers will be eligible for loans under the to-be-established borrowing criteria. Even under the most concessional of terms, the viability of lending institutions depends upon judicious policies. Thus, some 40 to 50 percent of Jordan's transitional farmers and livestock producers will probably be unable to secure loans from either the revitalized ACC or other banking institutions.

It may still be possible for members from these vulnerable groups to avail themselves of financial services if the ACC and/or other banking institutions are willing to consider group loans. In such cases, a village, or extended family or clan group would take joint responsibility for repayment. This method of borrowing has achieved considerable success in other parts of the world (e.g., Bangladesh. Ghana, Guatemala).

5.4.5 Design Enabling Legislation which Promotes Self-Help, Cooperatives, Professional and other Farmer Organizations. This macro-objective, while targeting the JCO for special consideration, will affect all sub-sectors. As described below (see, Chapter VII, section D), JCO's enabling legislation (No. 20 of 1971) is the only extant vehicle for organizing farm groups. It will have to be dramatically revised to return the management and functions of cooperatives to their members. Other farmer/producer organizations will require new legislation. It should be possible to draft and enact such legislation within a year's time, and will enable groups in all sub-sectors to begin participating more effectively in shaping their futures.

5.4.6 Encourage Participation of Individuals and Target Groups in Policy Formulation and Decision Making. This objective is also multi-sub-sectoral in scope. Should it be successful, small farmers and livestock producers representing virtually every sector, through organizations

or individually, will be able to make their views known and accounted for within the political milieu.

5.4.7 **Establish Training Institutions for Agricultural and Rural Development at Suitable Locations Throughout the Country.** By definition, this objective will affect all sub-sectors. The current RCARTTs, field research stations, and entities such as the Badia research and development programme at Safawi, which can be used as venues for such training, are already in place throughout the Kingdom. The challenge in meeting this objective will be staffing these institutions with effective, highly motivated instructors.

5.4.8 **Mandate NCARTT to Support Extension Institutions and be Included in Organizing the Feedback between Research, Extension and Producers.** As stated above, NCARTT's future has been the objective of a National Agricultural Research Strategy study. The completed draft, now under review, calls for just such a mandate, with a multi-sectoral focus.

CHAPTER VI

IMPROVE RESOURCE MANAGEMENT AND CONSERVATION

6.1 INTRODUCTION

The Agricultural Policy Charter is fully conscious of the need of the need for Jordan's farmers and livestock producers to focus upon "managing and conserving the natural resources for agricultural production such that these resources (especially soils and water resources) are saved or even enhanced in terms of quantity and quality, where technically and economically feasible."[1] The key resource management and conservation issues being confronted by Jordan's agriculture sector include:

Impacts on Soil:

* Salinization
* Erosion
* Degradation

Impacts on Water:

* Surface and Groundwater Depletion
* Degradation
* Salinization
* Wetland Destruction, and

Impacts on the Ecosystem

* Deforestation
* Loss/Degradation of Flora and Fauna

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[1] Agricultural Policy Charter Draft; Amman: 1993, p. 6.

* Quality of Agricultural Products
* Desertification
* Loss of Agricultural Land

In order to address these issues in an actionable manner, it is necessary to classify actions according to: a) those affecting the entire sector; and b) those of importance to the five subsectors addressed by the APC (A review of the 38 actions called for within the five subsectors addressed in the APC discloses that collectively, these directions have some 106 impacts on resource conservation and management, whether positive or negative, 59 of which are seen as high priorities in terms of their amelioration). At the sectoral level, five policy actions emerged (see, box below).

At the subsectoral level, a multi-objective analysis was undertaken. Four criteria were selected which were deemed important to the overall agricultural and environmental well-being of Jordan: health effects; rate of degradation; irreversibility; and, geographic extent of the problem. Each issue was scored for each criterion within each of the subsectors. A composite score for each issue (the weighted average of the four individual scores) was arrived at, resulting in high, medium and low priority environmental issues for each subsector. Taking the Agricultural sector as a whole, the following environmental priorities emerged:

TABLE 6.1

ENVIRONMENTAL PRIORITIES TO BE ADDRESSED BY JORDAN'S AGRICULTURAL SECTOR[2]

	PRIORITY	
HIGH	**MEDIUM**	**LOW**
Soil Salinity Soil Degradation, Groundwater Degradation, Desertification, Soil Erosion	Groundwater Salinity, Groundwater Depletion, Plant Cover Destruction, Surface Water Degradation, Habitat Destruction	Surface Water Salinity, Loss of Agricultural Land, Quality of Products, Deforestation, Wetland Destruction, Cultural Degradation

6.2 How these Policy Directions Contribute to Improving Resource Management and Conservation.

In Chapter VI, those sectoral and subsectoral policy directions rated as the highest priority will be addressed.[3] In this section, we begin with a review of those directions which contribute to meeting the sectoral objectives of the APC.

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[2] Environmental Resources Management Consultants & Abt Associates Inc., "Companion Study on Environmental Impact Assessment," June, 1994, p.29.

[3] All subsectoral actions having an impact on improved resource management and conservation are examined and ranked in the "Companion Study on Environmental Impact Assessment", attached in the appendices. Tables 5 through 9 of the study, provide a comprehensive synopsis. Appendix C provides a thorough description of the multi-objective analysis methodology used to arrive at the study's conclusions.

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- Pass the 1994 MMRAE draft National Environmental Law, enabling the Ministry to establish national policies for environmental protection.
- Draft and implement a National Land Use Plan which lays out rational urban expansion policies, protects valuable arable land, the Badia and Jordan's forests.
- Design and implement a national environmental education plan which both raises awareness of environmental issues and involves the citizenry in active natural resource management and conservation programs.
- Within the MOA, all projects will undergo EIAs during the design stage. Individual units will carry these out. Efforts will be overseen by an EIA Officer. This individual will be housed in the Monitoring and Evaluation Unit, and will report to the Secretary General and the Agricultural Council, and will also coordinate efforts with other ministries.
- An inter-ministerial cooperation and coordination unit will be established to be overseen by MMRAE. EIA officers from MOA, MOWI and MOP will also participate. Chief among its functions will be to establish a set of uniform procedures and guidelines, along with a system of communications.

6.2.1 <u>**Sectoral Directions.**</u> The MMRAE draft National Environmental Law establishes numerous national policies to ensure that national development is consistent with Jordan's preservation of its natural environment. Its provisions include protection of soils, water, forests, and wildlife, in addition to anti-desertification, and unrestricted urbanization. [4] These provisions are perfectly consistent with the APC's call for "an agriculture, animal husbandry and forestry

[4] Draft Law for the Protection of the Environment of 1994, Arts. 2-9.

sector, which is contributing to the protection of the natural environment and to the preservation of natural resources..."[5] The APC envisions the MOA's mission "to manage and use agricultural production resources with economic efficiency, while preserving the environment and ensuring the sustainability of agricultural production in the long-term."[6]

In similar fashion, the APC notes the relationship between and the need for protecting the environment, preservation of natural resources and "..adopting land use patterns and technologies which are sustainable and in harmony with the principles and requirements of the preservation of soils, water, flora and fauna."[7] These issues are at the very core of a national land use plan. In recognition of this, the Charter identifies the need to develop a concerted Government effort to respond to land tenure, land fragmentation, urban encroachment, overgrazing, and accelerated desertification.[8] A national Land Use Plan does exactly that.

The Agricultural Policy Charter strongly endorses human resources development for agriculture and rural development from the primary level through adult education efforts. Calling for an education for agricultural development program which includes the formal education sector as well as adult education, the Charter stresses the need for such programs to be "adapted to local conditions and continuously adjusted to reflect actual developments based on research results and geared to meet future needs.[9]" Environmental awareness and a commitment to resource management and conservation, the cornerstones of the proposed national environmental education plan, are at the very heart of what the Charter is advocating in its human resources development efforts. Each strengthens the other. Sensitivity to the environment undergirds acceptance of sustainable agricultural practices, even as understanding

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[5] APC Final Draft, p. 8.

[6] Ibid., p. 9.

[7] Ibid., p.8

[8] Ibid., pp. 16-17.

[9] APC, Draft, 1993, p. 15.

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of effective agricultural technologies and rural development strategies heightens awareness of the importance of resource conservation and management.

At present, virtually all of the MOA's donor funded programs and projects are subjected to Environmental Impact Assessments (EIAs). Expanding this process to include all the Ministry's proposed programs and projects by establishing both a permanent process within the MOA and the capacity of government officials within the Ministry to effectively carry out EIAs, mirrors the APC's intent to ensure that "available agricultural production resources, especially water, land and labour, are managed and used with economic efficiency, while preserving the environment and ensuring the sustainability of agricultural production in the long-term."[10] Further, it supports the Charter's intent to:

> "Strengthen the implementation of government policies supporting agricultural production and development, through the formulation, monitoring and evaluation of specific new agricultural policies and making the necessary adjustments to existing policies..."[11]

The APC fully endorses the need for interministerial cooperation and coordination in order to realize the sector's fullest potential. It states:

> "The roles, responsibilities, mandates and authorities of all ministries and institutions involved in agricultural sector development must be reviewed and clarified to improve overall public sector performance and effectiveness, and to reduce duplication, institutional frictions and conflicts. Ministerial and institutional coordination and cooperation is critical and will be strengthened, especially when their spheres of influence and responsibility cut across ministerial, institutional and departmental boundaries in areas such as water policy and management, watershed management, preservation of the environment, desertification control, agricultural regulations, plant and animal quarantine, monitoring of imports and export marketing promotion." [12]

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[10] Ibid., p. 9.

[11] Ibid., p. 11.

[12] Ibid., p. 15.

The foundations for such coordination and communication already exist within the Agricultural Council, one of whose members is the Minister of Municipal and Rural Affairs and the Environment. The proposed Law for the Protection of the Environment of 1994 also calls for creation of a Higher Council for Environmental Protection as a policy making body, one of whose members would be the Minister of Agriculture. Establishing uniform procedures and guidelines will strengthen the effectiveness of EIAs, facilitate sharing of information, and make it possible to share staff when necessary.

6.2.2 Subsectoral Directions. As stated above, 38 directions are identified as having a direct impact upon improving resource management and conservation. One hundred and six separate impacts are identified as adversely affecting soils surface and groundwater, forests, drylands, flora and fauna, agricultural product quality and Jordan's cultural heritage. Implementation of these directions is seen as having a high priority with respect to ameliorating 59 of these 106 adverse impacts; 30 were deemed medium priority, and 16 having low priority. The attached Companion Study on Environmental Impact Assessment provides a complete list of these directions as well as which issues they address, how they improve resource management and conservation and what priority they are assigned.

6.3 Reforms Required to Implement the Directions and the Capacity of the Public and Private Sectors to Implement these Reforms.

6.3.1 Sector-Wide reforms Five major initiatives are identified as necessary reforms to achieve the objective of improved resource conservation and management. These are:

- Passage of the National Environmental Law of 1994
- Development and Implementation of a National Land Use Plan
- Design and Adoption of a National Environmental Education Plan
- Adopt Mandatory Environmental Impact Assessment Procedures for all Agricultural Projects and Programs
- Create a Formal Structure for Inter-Ministerial Coordination, Cooperation and Communication on Resource Conservation and Management.

Each of these reforms was briefly described at the outset of Chapter VI. Here, the implementation requirements, along with the capacity of those entities essential to their success to implement such reforms, are examined.

6.3.1.1 Implementation of a National Environmental Law. The current draft National Environmental Law builds on antecedants introduced in 1981, 1987 and 1989. It also grows out of a 1991 National Environmental Strategy for Jordan drafted by MMRAE, the author of the present draft legislation. The draft law seeks to consolidate existing legislation and covers such agriculturally relevant issues as soil and water pollution, forestry, land use planning, environmental education, desertification, urban expansion, and monitoring and inspection. Policies and national strategies within the draft law are devised by a Public Establishment for the Protection of the Environment[13], and approved by a Higher Council for Environmental Protection[14]. One apparent shortcoming in the draft law is that the proposed membership of the Higher Council for the Protection of the Environment does not include the MOA[15]. A first critical step, then, is addressing this oversight in the draft prior to its release to the Lower House of Parliament for debate. This will require negotiation between the MOA, MMRAE and subsequent support in the Lower House. Given MMRAE's membership on the Agricultural Council, and the significant role agriculture plays both in creating and resolving the Kingdom's environmental issues, MOA membership on MMRAE's Higher Council is essential and should not be controversial.

Implementation of the National Environmental Law will involve expertise from the following public and private organizations:

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[13] Proposed Law for the Protection of the Environment of 1994, Art. 3.

[14] Ibid., Art. 6.

[15] Ibid.

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JORDANIAN INSTITUTIONS INVOLVED

IN ENVIRONMENTAL IMPLEMENTATION

MMRAE: Department of Environment
- Land Section
- Water Protection Section
- Nature Protection
- Air Section
- Environmental Education

MOA:
- Forests and Aforestation Department
- Plant Protection Department
- Pesticide Residue Laboratories

MOH: Environmental Health Section
- Environmental Health Laboratory
- Central MOH Laboratory

MOWI:
- Water Authority of Jordan
- Jordan Valley Authority

HCST: Environmental Sector

MOP/MOS:

Royal Scientific Society:

Department of Environment

Jordan Environment Society:
- National Environmental Information and Education Program
- Water Issues Program

RSCN: Research and Survey Section
- Wildlife Reserves

University of Jordan, Yarmouk University, Jordan University of Science and Technology:

Private Sector Consulting Firms

All but two (MOP and MOS) have demonstrated some capabilities regarding environmental management and/or monitoring and analysis.[16] While general oversight and primary implementation of the new National Environmental Law will be the responsibility of MMRAE, effective implementation will require strengthening of capabilities within virtually all of these institutions along with heightened coordination (see, section 6.3.1.5, below).

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[16] See, Companion Study on Environmental Impact Assessment, loc. cit., pp. 52-57, for a description of these capabilities.

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From the MOA perspective, capabilities will have to be strengthened in soils, rangelands, livestock and monitoring and evaluation units in the central office, and throughout NCARRT, the extension services and field offices. Intensive training through short courses will be necessary for existing staff; revising entry qualifications to include formal environmental and natural resources training for new staff persons in these areas, will also have to be done.

6.3.1.2. Development of a National Land Use Plan. At present, a number of disparate laws govern land use in Jordan. These include: Article 11 of the Constitution; the Law of Cities, Villages and Building Planning No. 79 of 1966; Land and Water Rights Settlement Law No. 40 of 1952; the Administration of Government Property Law No. 17 of 1974; and Agricultural Law No. 20 of 1973. If passed, the proposed National Environmental Law of 1994 should subsume and preempt several of these extant pieces of legislation, making it possible to develop a national land use plan to be overseen by MMRAE. Should the new law differ significantly from the present draft, it may become necessary to propose new legislation to develop a national land use plan. As with the case of implementation of a national environmental law, the role of the MOA as an active participant in the process of land use planning needs to be understood and the ministry included in any land use planning efforts. Coordinating development of a national land use plan will require the participation of several institutions, Including: MMRAE; MPW; MOH; the Jordan Building Council; the Housing Organization; Engineer's Association; MOA; MOWI, HCAST, RSS, private sector environmental institutions and Jordan's universities.

The capacity to undertake a national cadastre currently exists in Jordan. The MOA's Forestry Department, for example, recently completed a comprehensive national soils study which can provide valuable baseline data for the design of a national land use plan. The scientific expertise is available. Anticipated difficulties may arise around the political aspects of land use planning, which could take considerable time to resolve.

As a stopgap measure, meeting the APC's objective of regulating urban expansion to protect agriculturally productive land will require representation by the MOA on the National Municipal Planning Committee, which in turn requires modification of the Law of Cities, Villages and Building Planning.

6.3.1.3. Development of a National Environmental Education Plan. The implementation of this objective is already under way. MMRAE's Department of Environment has an Environmental Education unit whose mandate is to increase overall awareness from primary through adult education levels. More directly, an NGO, the Jordan Environment Society (formerly the Jordan Society for the Control of Environmental Pollution), with support from the Friedrich Naumann Foundation and USAID, has embarked on implementing a National Environmental Information and Education Program. A broad array of materials have been developed and distributed to both teachers and government agencies. Representatives of this program will readily meet with MOA (and extension personnel in particular) to discuss how to integrate environmental and agricultural education training efforts.

6.3.1.4 Environmental Impact Assessments Will Become an Integral Part of all MOA Programs and Projects. MMRAE, in developing its National Environmental Strategy for Jordan, argued for adoption of a national EIA process, a position echoed by HCST which described adoption of a national environmental impact assessment program as a priority. Passage of the National Environmental Law will provide the legal basis (Article 5) for implementing such a process.

Programs and Projects being undertaken by the MOA that are donor funded have utilized EIAs in their design phases. These assessments have generally been carried out by expatriates. The development of a national EIA program will necessitate all MOA programs and projects undertaking assessments. Implementing this will call for the identification and appointment of an Environmental Officer within the ministry. Attached to the Monitoring and Evaluation Unit, (s)he will oversee the implementing of EIAs by those departments embarking on relevant programs and projects, train and work with department EIA officers, ensure compliance with EIA guidelines, and report findings to the Secretary General, and Agriculture Council through the Minister. These responsibilities will, in turn, call upon individual MOA departments to identify EIA officers, who will work with and be trained by the Environmental Officer.[17]

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[17] Before embarking on this effort, a benefits/costs analysis should be undertaken to determine if hiring consultants to perform EIAs will be more cost effective than training and maintaining

At present, monitoring and management capabilities exist in the Forests and Aforestation Department. The Plant Protection Department sets regulations for pesticides registration and labelling, and the Pesticide Residue Laboratory tests for residues in food. The laboratory also has the capacity to test soil and water for pesticide residues. None of these units, however, has undertaken an EIA. Soils, Rangelands, livestock and the monitoring and evaluation units, will have to start from scratch. Within the private sector, at least three environmental consulting firms have begun providing services to the public and private sector. With trained environmental scientists on their staffs and/or access to Jordanian consultants from universities, these firms could be contracted to provide EIA services to the government.

6.3.1.5 Establishing an Inter-Ministerial Environmental Coordination Unit. The need for coordination and cooperation as well as improved communications between ministries in improving environmental resource conservation and management is patent. The Agriculture Council (AC) exists in part for this purpose. The proposed National Environmental Law in like fashion calls for the creation of a Higher Council for Environmental Protection (HCEP) as an environmental policy making body. As stated above, one of the first issues to be resolved is to ensure that the MOA is represented on this body in the same manner MMRAE is on the AC.

Establishing a standardized set of EIA guidelines and procedures will be the responsibility of MMRAE's DOE. Participation by the MOA should include having its newly appointed Environmental Officer as a party to the process (along with counterparts from MOWI, MOP, MOS, MPW, NGOs, environmental consultants and universities). Once guidelines are established, those institutions mandated to implement EIAs will host workshops to introduce those within ministries to the principles of EIAs and their application within the agricultural sector and subsectors. These workshops will be led by the DOE and (in the case of agriculture) MOA Environmental Officers.

A regular process of communications between Environmental Officers in participating ministries will be established. Meeting quarterly, these officials will share results of EIAs,

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ministry staff. At present, Jordan has at least three consulting firms which could provide environmental experts, who, with modest additional training could perform EIAs.

review guidelines and procedures to maximize effectiveness and avoid duplication of efforts, and facilitate linkages between the public and private sectors regarding environmental matters. These latter services might include outreach services with media and extension services, support for environmental and agricultural education, and evaluation and selection of private consultant contractors proposing to do environmental work for the government.

6.3.2. Subsectoral Reform Implementation Requirements and Capabilities. The sectoral reforms called for above are designed for and focus directly on improving environmental resource management and conservation. The primary intent of many of the reforms called for in the APC, on the other hand, has been for other purposes, such as improved food self reliance, economic efficiency, equity, maximizing value added contribution, and improved quality and competitiveness.[18] Nonetheless, these reforms also have a direct and often critical impact upon the kingdom's environment. Several such reforms will need to be implemented by institutions other than the MOA. While these will be identified below, the chief focus in this section will be upon those reforms identified as high priority reforms[19] whose implementation requires direct action by the MOA.

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[18] The APAP III team and its UOJ colleagues devised a matrix which attempts to illustrate the multi-objective nature of many of the reforms called for in the APC. Individual reforms are scored according to their importance within each of the four policy objective areas in the APC (i.e., Increased Food Self Reliance, Resource Management and Conservation, Stimulating Agricultural Growth, and Equity and Balanced Economic Growth). These scores are then tallied enabling the user to determine which reform is highest in priority in terms of its multi-objective importance. At the same time, the matrix identifies the importance of any reform to a specific APC policy objective.

The scores are subjective, but enable stakeholders, and knowledgable experts to provide MOA (and other ministry) reform implementers with guidelines in setting priorities. The matrix was sample tested. See, Appendix___ for a presentation of the matrix's scoring methodology and sample results.

[19] see, Companion Study on Environmental Impact Assessment, Appendix C, pp. 80-85, for a description of how multi-objective analysis was used to arrive at establishing priorities for each of these reforms.

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6.3.2.1 Reforms to be implemented in the Irrigated Agriculture Subsector. Fifteen reforms were identified as germane to improving resource conservation and management practices within the irrigated agricultural sector. Five of the reforms focus on water applied to irrigated agriculture in the Jordan Valley and in the highlands. Ten others apply to improved agricultural development in general, and their perceived impact on the Jordan Valley's resource environment in particular.[20] Of the 15 reforms identified for implementation in this subsector, eight were seen as having high priority. They are:

HIGH PRIORITY REFORMS FOR THE IRRIGATED AGRICULTURE SUBSECTOR

- Adjusting the Price of Water to Cover O&M Costs
- Converting to Closed Pipe Conveyance Systems
- Tax Relief for Manufacturers of Water Saving Technologies
- Generate and Distribute Information on Crop Water Requirements
- Generate and Disseminate Water Saving Technologies
- Develop Water Storage Structures
- Enact Wastewater Policies to Protect Groundwater Quality
- Strengthen Generation and Dissemination of Technical Information of Pests and Pest Risks and Pesticides

Implementing these reforms will be the responsibility of a number of institutions. O&M cost adjustments, for example, will be determined by MOWI and JVA if the government agrees to permit the ministry to amend existing regulations. Otherwise, new legislation will be

[20] Several of these reforms will appear in more than one subsector. To the extent that they do appear accross subsectors and are accorded high priority status in more than one, their perceived importance is enhanced.

necessary. MOWI will also play the premier role in converting existing water conveyances from open to closed pipe systems, developing water storage systems in the valley and enacting wastewater policies to protect groundwater quality (the

last in cooperation with MMRAE). Tax relief efforts for those manufacturing water saving technologies will be the responsibilities of the MOF and JVA, and could also include the ACC.[21]

Generation and distribution of information on crop/water requirements, and generation and dissemination of water saving technologies will be the responsibilities of the MOA in league with the JVA, NCARTT, and the university community. These areas are recognized in the draft National Agricultural Research Strategy as needing attention. Dissemination strategies will be developed through the upcoming national extension strategy paper being supported by GTZ. This also applies to the remaining reform; i.e., the need to strengthen the generation and dissemination of technical information regarding pests, pest risks and pesticides. This latter reform will also be the responsibility of the MOA, NCARTT, and the universities.

6.3.2.2 <u>Reforms required in the Rainfed Agricultural Subsector</u>. Twelve reforms in the rainfed agricultural subsector are identified which, if implemented, will improve resource conservation and management in Jordan. All of these reforms are seen as high priority. They are:

[21] As currently configured, one area which the ACC can grant loans for is improved water savings technologies (Art. 5).

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HIGH PRIORITY REFORMS FOR THE RAINFED AGRICULTURE SUBSECTOR

- Encourage Planting Fruit Trees on Slopes Greater than Eight percent in Areas with > 400mm/yr. Rainfall
- Encourage Shift from Wheat to Barley/Livestock Farming System in Medium (200-350mm/yr) Rainfall Locations
- Five Year Freeze on Expansion of Urban Boundaries
- Levy a High Land Use Conversion Tax on Agricultural Land
- Enact Land Subdivision Regulations which Arrest Fragmentation of Agricultural Lands
- Introduce Land Consolidation Measures
- Allocate Adequately Treated Urban Wastewater for Irrigation; especially for Rainfed Agriculture/Supplemental Irrigation
- Enact Wastewater Treatment Policies to Protect Groundwater Quality
- Encourage Private Sector Participation in Soil Conservation
- Develop New Products and Explore Innovative Processing Methods
- Establish and Empower Entities to Enforce Policies which Maximize Quality and Quantity Objectives (including Quality Control of Agrichemicals and Pesticide Residue Testing)
- Help Farmers Increase Production Efficiency

The responsibility for implementing three of the above reforms which focus upon land use (i.e., Five year freeze on urban expansion, land fragmentation prevention, and land consolidation measures) will fall mainly upon the shoulders of MMRAE. To the extent that MOA becomes a member of the proposed Higher Council for Environmental Protection, it will

(and should) provide input which results in legislation that maintains agriculturally productive lands. The MOF will take the lead in developing legislation for taxing land use conversion to further maintain agricultural land in production.

MWI will need to oversee to achieving allocation of adequately treated urban wastewater for irrigation, and will be assisted by MMRAE in developing new legislation for wastewater treatment policies to protect groundwater quality. The remaining six initiatives will be the responsibility of the MOA.

The planting of fruit trees in the rainfed agriculture subsector is already proceeding apace as demonstrated by the significant increases in the number of olive and fruit trees. Public sector (i.e., NCARTT and UOJ) research over the last decade involving fruit production accounts for approximately 18.5 percent of the total research effort. Most of these activities have focused on fertilizer applications and, to a lesser degree, rootstock variety testing.[22] Citrus and banana related research constitutes a significant percentage of what has been done, indicating that greater attention has been paid to fruit production in the Jordan Valley. At Present, only three NCARTT research stations are being used for fruit research, and they are all in irrigated areas (El-Yabis, El-Safi and Shoubak).

Supporting tree planting initiatives on Jordan's rainfed slopes will require: research for genetic enhancement of the Kingdom's present six major fruit crops (olives, grapes, peaches, apples, apricots and almonds); germplasm conservation; soil adaptability and rainfall research; tolerance studies for existing and new rootstock varieties to specific agroclimatic zones; pest management; orchard management; and environmental impact assessments to assist farmers in developing optimal and sustainable planting strategies..[23] At present, NCARTT does not have the human or financial resources to meet this priority (estimated to be the most important subsector priority, which <u>should</u> account for approximately 25% of NCARTT's total rainfed

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[22] Draft <u>National Agricultural Research Strategy</u>, May, 1994, pp. 25-26.

[23] <u>Ibid.,</u> pp.64-65.

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agriculture research effort[24]). The capacity to adapt and extend the research findings essential to this tree planting initiative is also constrained by the present abilities of the extension service.

Market forces unhindered by subsidies should be sufficient to redirect wheat growers into other, more productive cereals and legumes, including barley. While the APC focuses upon encouraging barley/livestock production systems in medium rainfall areas as part of the subsector's integrated livestock production strategy, this is not mirrored within the draft National Agricultural Research Strategy for the rainfed agriculture subsector. Significant research has been done on barley production, although results have been slow in reaching farmers, given the limitations in technology package development by NCARTT and its transfer and delivery by the extension services. Virtually no research, however has been done on integrated livestock production. Achieving this objective, then, will require MOA leadership in crafting a strategy for its realization. Elements will include: redrafting of the research strategy, inclusion as an important element in the extension strategy, identification and/or training of human resources for both research and extension, encouraging private sector services to focus on this production system, and the inclusion of envronmental impact assessments to assist producers in developing sustainable barley/livestock systems.

The inclusion of objectives such as: encouraging new product development and innovative processing methods; helping farmers increase production efficiency; and establishing and empowering regulatory entities to enforce quality and quantity objectives, in addressing improved resource conservation and management, is to stress the need for environmental specialists in their realization. Decreasing the use of agrichemicals, increasing biological controls, lessening agrichemical runoff into soils, surface and groundwater supplies, improvement of wildlife habitats, residue testing, the introduction of extension packages which focus on efficient use of inputs, and appropriate variety to water availability adaptations are central to improved quantity and quality <u>and</u> resource sustainability.

Encouraging the private sector to participate in soil conservation practices will be achieved in two ways. First, the MOA Environmental Officer and/or his/her deputed representative, will meet with private sector vendors to ensure that their extension packages

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[24] <u>Ibid.</u>, p. 59.

include due regard for soil and water conservation practices. Second, public extension services to the private sector will include monitoring to ensure that sustainable soil use practices are being employed, even as agricultural education programs and extension packages seek to impress upon producers the advantages of effective conservation practices.

6.3.2.3 Reforms Required in the Low Rainfall Subsector. Four reforms, all of which are considered high priority, are identified as necessary to improving resource conservation and management in Jordan's low rainfall subsector. They are:

HIGH PRIORITY REFORMS FOR THE LOW RAINFALL AGRICULTURE SUBSECTOR

- Revising Agricultural Law No. 20 of 1973 as it Applies to Uprooting of Shrubs and Trees, Plowing and Overgrazing
- Integrating Forage Production from Range and Croplands to Promote Livestock Production
- Implement a Program to Halt Desertification
- Provide more Human and Financial Resources for Rangeland Development and Management Programs

The APC is very specific in its aim to protect existing vegetative cover as well as improve areas in danger of being overgrazed in the Badia. The Language of Law No. 20 of 1973 needs to be revised to clarify the concepts of controlled grazing, preventing cultivation of cereals, and prohibiting shrub cutting. Equally important, the government has to improve enforcement of these and other provisions seeking to conserve and maintain this fragile subsector. This will entail the MOA working closely with elected and traditional officials to arrive at a mutual understanding regarding the revised legislation, why the provisions have been included, and the intent of the government to enforce them. Regarding the latter, enforcement may require expanding the authority of ministry rangelands staff, the local constabulary, or both, as well as people's participation.

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Removal of fodder subsidies will place substantial short-term pressure upon the low rainfall subsector in terms of possible overgrazing. The government has already done replanting of natural forage in several areas. This will have to be dramatically expanded. In Chapter V, above, one strategy for achieving this was suggested; namely, providing livestock producers with rental incentives if they agree to plant and maintain forage production. In addition, it will be necessary to develop and enforce land use rules such that grazing management is kept in line with the carrying capacity of the land in question. Achieving any of these reforms will necessitate extensive investment in research. NCARTT has undertaken virtually no efforts in this area, and little has been done at the universities. Results from research at the relatively new center at Safawi remain modest. The National Agriculture Research Strategy recognizes these shortcomings and identifies a wide array of research needs.[25] Delivery of extension services in support of rangeland forage production will also require extensive staffing, training and upgrading of existing programs, all issues which the forthcoming extension strategy study will address.

Halting desertification is a key aim of the APC. Deterioration of the Badia has already reached the stage where immediate intervention will be necessary to stave off desertification of large parts of this subsector. A three stage program is proposed, elements of which have been treated above:

- Through land use studies and planning, establish an appropriate land use strategy, followed by a public awareness program;
- Adjust the stocking rates to the carrying capacity of the Badia; and
- Mount an aggressive forage development and range management program.

These elements are consistent with both the APC's objectives and the draft National Agricultural Research Strategy. With authority granted under the revised agricultural law and new national environmental law, NCARTT, the DOE, HCST/RSS, the University of Jordan and the Badia Centre at Safawi will undertake the lead in this effort, providing the research necessary to establish sustainable range management and animal husbandry programs. This will be followed by implementation of the national information campaign and forage development and range

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[25] Ibid., pp. 71-72.

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management program coordinated by the strengthened MOA Livestock and Rangeland Development Department and the Extension Services of NCARTT, in tandem with the Jordan Environment Society's National Environmental Information and Education Program.

Improving resource conservation and management of the low rainfall subsector will require considerable human and financial resources[26]. Little research has been done in this area in Jordan; HCST's efforts in the Badia have been almost exclusively financed by donors and international NGOs. Expanding and sustaining efforts such as that at Safawi will require a greater GOJ financial contribution. NCARTT will have to acquire staff and access to ministry or acquisition of its own field stations for applied research, field testing and technology package development. Extension and information services will have to be increased; training programs for existing and new extension personnel will be essential. The Departments of Badia and Livestock Production will have to be reconfigured, staff added, and budgets enhanced to coordinate the development and implementation of anti-desertification efforts. From a socio-economic and legal point of view, land tenancy and land tenure issues in the low rainfall subsector need to be clarified, codified and enforced. Acquiring and managing these resources will be one of the government's greatest challenges.

6.3.2.4 <u>Reforms Required in the Livestock Subsector.</u> The Agricultural Policy Charter identifies a number of objectives to strengthen the performance of the livestock sector, three of which have a direct and high priority impact upon the environment. They are:

HIGH PRIORITY REFORMS FOR THE LIVESTOCK SUBSECTOR

- Maximize Feed Production
- Increase Small Ruminant Milk Production
- Improve the Efficiency of Processing Livestock and Poultry Products

[26] In 1993, IFAD proposed funding a program to assist Jordan in implementing a National Program for Rangeland Rehabilitation and Development. This program should be reexamined in terms of its "match" with APC objectives.

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Maximizing feed production affects the environment positively to the extent that soil degradation is reduced through controlled grazing. Realizing this objective will require:

- Implementing an effective land use policy which establishes which lands are optimally suited to livestock production;
- Encouraging the adoption of barley/livestock production systems;
- Replenishing natural fodder on publicly held lands and controlling grazing thereon by establishing and enforcing carrying capacity limits and through grazing fees that reflect true cost recovery; and
- Establishing incentives to encourage producers to control their stocking rates to reflect the carrying capacity of the land and to engage in private natural forage planting schemes.

Increasing small ruminant milk production is intuitively attractive, given the adaptability and general health of sheep and goats in contrast to the health problems faced by imported dairy cows. Further, at least 40 percent of milk equivalent products are imported each year. Before pursuing such an objective, however, the actual size of a market for sheep and goat milk and milk products needs to be determined by a thorough study.[27] If a market exists, a land use study and environmental impact assessment will have to be undertaken to determine the optimal location of each production unit. Commercial dairying requires considerable capital investments for animal housing, use of feed concentrates, roughage, potable water availability, electricity, cold storage, strict hygienic standards and quality controls (all of which affect both human and animal health). The price of domestically produced milk has been controlled, and has been selling for approximately 10 to 25 percent more than milk which could be processed from imported milk powder, if the import tax duty on powder was lifted. Caution is recommended in moving precipitously into this area.

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[27] In 1988, it was estimated that dairy sheep and goats produced approximately one-third of the kingdom's dairy output, chiefly in the form of cheese, ghee, and dried laban. These processing industries are the least controlled.

Improving the efficiency of processing livestock and poultry products should serve both to strengthen the economic position of the subsector and mitigate environmental and health hazards associated with improper and unhygienic processing. Four processing areas are in need of strengthening: dairy ,red meat, livestock and ruminant by-products, and poultry processing.

Dairy processing, whether cattle exclusively, or including sheep and goat milk, needs to focus on improved milk collection, and establishing and maintaining hygienic standards throughout subsequent processing and storage stages. Dairy cow milk and its by-products (whose production increased from 33,000 tons in 1988 to 100,000 tons in 1993), appear to be better handled than cheese, ghee, and laban efforts produced by sheep and goat milk. Existing health and agricultural regulations can be strengthened and enforcement practices for all dairy operations can be stiffened. The MOA, MOH, MOS, MMRAE, MIT, NCARTT, AMO and governate officials will have to coordinate such an effort, beginning with an NCARTT in-depth study of the dairy processing industry. Ultimately, however, dairy producers and processers themselves need to organize and meet with the government to arrive at and implement effective processing standards and practices.

Improved red meat production and processing should begin with a series of studies undertaken by NCARTT in order to establish the dimensions of this industry.[28] Establishing standards for abbatoirs, cuts and grades of meat, storage facilities, waste disposal and overall health and safety standards will principally be the responsibility of the MOA, MOH, MMRAE and MIT. As in the case of the dairy industry, the chief environmental considerations in red meats are health and sanitation concerns. Here too, the formation of a private sector association of producers and butchers will go a long way toward establishing quality and health standards as well as anchoring responsibility for processing practices within the private sector.

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[28] Estimates are that between 25 and 50 percent of lambs and kids slaughtered are controlled; i.e., slaughtered in abbatoirs. There are no hard numbers regarding carcass weights, age and breed of animal, or the quality of the carcass. The dimensions of the processing industry are also unknown. Commercial processing (packaged or frozen meat products) is in its infancy in Jordan, but many butchers do make sausages and ground meat.

Processing also extends to by-products such as edible offals, hides and skins, plant and animal food (blood and bone meal), manure and wool. The environmental concern here focuses upon chemicals used in processing, pathogens and waste disposal in general. Once again, NCARTT will need to undertake a study that discloses the magnitude of these industries, means of improving their economic contribution in a sustainable manner, and mitigation considerations with respect to environmental and human and animal health hazards. Public sector oversight will be the responsibility of MMRAE's DOE, the MOH, MIT, and local government officials.

The poultry industry has been one of the successes within the agriculture sector, insofar as it has within a thirty year span achieved virtual self sufficiency. From an environmental perspective, health considerations are paramount. Working closely with private sector entities such as the Jordan Veterinary Association and Jordan Center for Veterinary Vaccines, NCARTT should undertake research on contageous diseases such as salmonella. Similar collaboration with producers should result in establishing quality standards, and determining ecologically appropriate stocking intensities.[29] Within the processing arena, studies on slaughtering, storage and shipment are needed to ensure maintenance of safety standards.

6.3.2.5 Reforms Required in the Forestry Subsector. Three key priority areas call for reform in the forestry subsector. They are:

HIGH PRIORITY REFORMS FOR THE FORESTRY SUBSECTOR
• Expand Jordan's Forested Areas
• Improve the Management of Existing Forests
• Improve the National Capacity for Forestry Development

All three priorities directly and positively affect Jordan's environmental conservation and management efforts insofar as they reduce the hazards of soil erosion, increase forest size and sustain biodiversity, aid in arresting groundwater depletion through increased water infiltration and groundwater recharging, and serve as a break to desertification.

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[29] see, Draft National Agricultural Research Strategy, pp. 69-70.

The expansion of Jordan's forested areas will be augmented by a series of policy interventions, key among which will be:

- Articulation of a National Forestry Plan, with clearly stated and attainable goals;
- Revision/Updating of the Administration of Government Property Law No. 17 of 1974, and the Agricultural Law No. 20 of 1973, Arts. 89-116 in Particular;
- Government Acquistion and Development of Potential Forest Land through Exchanges of Land with Agricultural Potential or Privately Owned Land with High Forest Potential; and
- Expansion of Forest Areas in Zones which are Adjacent to Grazing Grounds.

His Majesty, King Hussein has voiced his energetic support for a national initiative to "Make Jordan Green." Building upon this goal, MOA and MMRAE, along with HCST, RSCN and JES, should establish a coordinating committee with the mandate to establish a national afforestation program. This activity should be begun and completed by Arbor Day (January 15), 1995; announced and inaugurated on that date. It should contain a realistic expansion goal (e.g., increasing Jordan's forest cover from its current one percent to ten percent[30] by 2010); define research and implementation priorities; encompass natural and manmade forests as well as urban and community afforestation; be consistent in its objectives with Jordan's national land use policy (see, above); and articulate the need for and means of achieving public and private sector cooperation and coordination in realizing its objectives.

Development of the national plan and subsequent revision of existing policies will be followed by an in-depth review of existing forests and potential expansion/acquisition sites by the DAF and DOE. NCARTT will engage in species research to ensure appropriate ecological adaptability of species to specific sites and encourage effective biodiversity through multi-species planting.

Actual afforestation activities will be implemented by joint public and private sector efforts led by the MOA's Department of Afforestation and Forestry in cooperation with MMRAE's Department of the Environment, HCST,and NGOs such as the JES and RSCN. Such

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[30] Ten percent is estimated to be the minimal prerequisite for sustaining water and soil resources.

efforts, in addition to ongoing DAF and national Arbor Day planting efforts, could include programs whereby nearby schools and villages are given responsibility for planting and protection of saplings, or employment of military units which could undertake planting campaigns as civil development exercizes.

Improving forest management of existing forests will be achieved by:

- Revising and Updating Forest Protection Legislation (within Agriculture Law No. 20, of 1973);
- Improving Forestry Management Research;
- Expanding the DAF's Field Network; and
- Vesting Forest Officers with Law Enforcement Authority.

The law regarding management of private forests (Articles 89-116) remains ambiguous on two important points. First, technically, afforested areas (i.e., manmade forests) are exempt from the restrictions applying to natural forests. Second, If forests exist on private land and the government wishes to provide management services, it must first obtain the consent of the owner. Regardless of the importance of the proposed conservation and management practices, or the consequences of not employing sound management practces, if the owner disapproves, the government is powerless. Such ambiguities and technicalities must be addressed through legislative modification.

A clear case for updating can be made with respect to controlled grazing. Government fees, collected by forestry officers, are set at .002JD/head/day. This price was set (in Agricultural Law No. 20) in 1973. The comparable current cost of stall feeding stock straw and feed is .130JD/head/day. O&M costs for controlled grazing in forests are likely to be considerably lower (although actual costs remain to be empirically determined)than stall feeding, but are certain to be more than those established over 20 years ago.

The draft National Agricultural Research Strategy proposes using 10 percent of its resources to concentrate on forestry research. Its forest management research agenda will focus on forest utilization and resource management, wood production, agroforestry development and controlled grazing.[31] In each case, research will include an economic analysis of actual

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[31] Draft National Agricultural Research Strategy, p. 67.

operations and management costs, and strategies will be based upon an assumption that publicly provided services will be fully reimbursed by users.

The present DAF field network is unequal to effective management tasks. The department remains understaffed professionally at its core. University-level professional training is unavailable in Jordan, and access to training abroad is complicated by lack of preparation. Directorate Field Officers are only beginning to be exposed to management planning and concepts such as community forestry. Indeed, the press of administrative responsibilities often overwhelms forestry management requirements.

The national forestry strategy must include an in-depth personnel requirements study, articulating both what field objectives will be and what skills are needed to achieve them. Present needs include trained professionals in areas as diverse as: GIS studies and interpretation, nursery management, university level professional training, monitoring and evaluation specialists, silviculture, watershed management, fire control and forest rangering.

Agricultural Law No. 20 of 1973 (Part X), presents a number of restrictions and penalties for cutting trees without a license, erecting buildings, setting fires, and grazing without a permit. Despite the existence of these regulations, intrusions and the destruction of forested areas through grazing, firewood collection, and farming. Much of the difficulty stems from the absence of forest rangers. However, even when they are available, they lack the authority to enforce the law. Under Article 196 of the law, they must turn over suspected violators to the courts for adjudication. Court decisions are often long in coming and when violators are found guilty, fines and punishment are too small to deter such behavior. In order to strengthen overall forest management, the law will be amended to provide forest officers with tangible law enforcement authority. In similar fashion, fines and penalties will be increased so that their imposition will serve as a real deterrent. Forest officers will receive training courses that define the law and its enforcement procedures along with enforcement training short courses offered by the police academy.

Improving the national capacity for forestry development involves a number of issues, some of which have been covered above. They include:

- Introducing an adequate legislative framework, competent staff and a regular budget;
- Developing cooperative agreements among agencies on environmental issues; and
- Involving NGOs and modifying legislation to enable them to raise funds and to participate in forestry action programs.

The capacity of public and private sector institutions to join forces in pursuit of a national forestry program under the aegis of the MOA's DAF and DOE should be fairly straightforward. The same could be said regarding the drafting of cooperative agreements among public and private agencies on environmental issues. In Jordan as elsewhere, supporters of environmental management and conservation have generally had little difficulty in finding common cause.

The drafting of legislation to permit NGOs to raise funds to help realize some environmental management and conservation objectives should not be problematic. It is clear that the magnitude of the task within the area of forestry, and other areas of environmental concern, is significant enough to expect that the government will be unable to fund all of its aspects. In order to respond to these needs, private sector contributions will be essential. These contributions will come both from domestic and international sources. It is the latter that may cause difficulties, given the current international assistance procedures in Jordan.[32] NGOs such as JES are already receiving assistance from the Friedrich Naumann Foundation for environmental education programs. HCST has sought and received support from the Royal Geographic Society (U.K.) and Durham University's Center for Overseas Research and Development. Thus, precedent exists for receiving overseas funding. The issue will be the willingness of the government to countenance foreign governments and multilateral donors to provide resources directly to indigenous Jordanian NGOs. The linkages between public and private organizations anticipated through bodies such as the Agricultural Council or the proposed MMRAE Higher Council for Environmental Protection, should ease procedural difficulties and make it possible for private institutions to raise and expend resources on behalf of environmental

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[32] The Ministry of Planning serves as the vehicle for donor assistance oversight. To date, financial assistance has been a government to government, or foundation to foundation operation. Increasingly, however, government assistance agencies have been moving toward providing direct assistance to NGOs as recipients.

management and conservation projects and programs.

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CHAPTER VII

TECHNICAL AND INSTITUTIONAL IMPLEMENTATION REQUIREMENTS

7.0 INTRODUCTION

Chapter VII seeks to provide an in-depth examination of the technical and institutional requirements undergirding the objectives of the Agricultural Policy Charter. Four key ingredients necessary to implement the APC are examined. They are:

- Reform of the Legal and Regulatory Framework to Promote Change
- Strengthening the Statistical Base underlying Project and Programme Design and Reform Decision-Making
- Undertaking Research and Extension to Identify the Scientifically Optimal Economic and Environmentally Sustainable Choices When Modernizing Jordan's Agriculture Sector, and
- Monitoring and Evaluating the Reform Process

Each will be examined in turn.

7.1 Reform of the Legal and Regulatory Framework

This section reviews the current legislation pertaining to agriculture and identifies the necessary pieces of legislation which need to be amended in order to implement the new policy directions contained in the Agricultural Policy Charter. The proposals and recommendations are based on an examination of the relevant legal and regulatory statutes governing agriculture, and the results of a pilot testing of a multi-objective evaluation instrument designed to help prioritize selection of legislative reforms, as well as on interviews and discussions with personnel of various institutions involved in the agricultural sector. This includes concerned departments of the Ministry of Agriculture and other government institutions. A list of the legislation reviewed appended at the conclusion of this section.

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Key Issues and Proposals

- **Updating the current Agriculture Law, putting emphasis on development, research, technology transfer, training, management of resources and conservation of the environment rather than putting emphasis on traditional legal principles such as requirements for receiving approvals, permits, licenses, violations, penalties and sanctions.**
- **Reexamination of all legislations relative to agriculture for defining and clarifying the jurisdictions and authorities of the different organizations serving the agriculture sector and amending such laws to establish and institutionalize coordination mechanism among such organizations.**
- **Activation of the role of the Agriculture Council to perform a more effective function in formulating the Agriculture Policy and coordinating its implementation among the different organizations involved in the agriculture sector. In this respect it is recommended that certain Articles of the Regulation which established this Council be examined for reassigning clear functions to the Council (Article 2 and 3 of Regulation No. 254 of 1989). In particular the Council should be assigned the function of putting forth a national comprehensive agricultural policy for the country which would include elements of the water policy and preservation of agricultural land within a unified plan for the agricultural sector as a whole.**

- **Establishing a Legal Department for the Ministry of Agriculture in addition to services currently provided by the present outside counsel. Such a department is needed to develop and pursue legislations relative to the Policy Charter and to update the current Agriculture Law as well as serving the legal interests of the Ministry. The Director of the Legal Department should report to the Secretary General of the Ministry. This recommendation is consistent with the recent Prime Minister's circular about establishing legal departments within government organizations.**

7.2 The Legal Framework Governing Agriculture

7.2.1 The Agriculture Sector in General. The general framework under which the agricultural sector and its organizations operate in Jordan is made up of a number of basic enactments which regulate the different aspects of agriculture in Jordan. These basic enactments are supplemented by subordinate regulations represented in Ministerial Orders and Directives issued by the concerned authorities through power delegated to them. In addition to the above, there are the Council of Ministers' Regulations which have established the

administrative organizations of the ministries and other institutions involved in this sector, and have laid down their functions and responsibilities. The basic laws of the agricultural sector are:

- the Agriculture Law of 1973,
- the Jordan Valley Development Law of 1988,
- the Water Authority Law of 1988,
- Agriculture Marketing Organization Law of1987
- Agriculture Credit Corporation Law of 1963, and
- the Jordan Cooperative Organization Law of 1971.

In addition to the above enactments there are several other laws which have an important impact on agriculture, and any reform-related decisions. These include:

- the Law of Supply of 1992;
- Cities, Villages and Building Planning Law of 1966;
- the Administration of Government Property Law of 1974; and
- the Foreign Investment Law of 1987.

The overall legal instrument which regulates agriculture and its administration is the Agriculture Law No. 20 of 1973. This law contains comprehensive provisions controlling the two main areas of agriculture: both plant and livestock resources. The approach adopted by this law is to lay the general rules and principles and to let details be issued by the Minister in the form of Ministerial Orders and Directives.

A large number of Ministerial Orders and Directives regulating the different aspects of agriculture have been issued since the enactment of this law in 1973. These include areas such as plant production, plant protection, forestry and livestock. For example, seven Ministerial Orders were issued in 1973 in the area of forestry dealing mainly with licensing requirements and prescribing procedures for exploitation, while six Ministerial Orders were issued in 1990 in the areas of livestock production to regulate establishment of cattle farms and the manufacturing of animal feed. Other Ministerial Orders were also issued to regulate seeds, nurseries, fertilizers, and pesticides.

On the other hand, the basic enactments which control water and water organizations in the kingdom are: the Jordan Valley Development Law of 1988; the Water Authority Law

of 1988; and the Natural Resources Law of 1986, in particular, Regulation No. 26 of 1977, relevant to the control of underground water. The first law deals mainly with agricultural development of the Jordan Valley. It regulates the Jordan Valley Authority (JVA) and prescribes its roles and functions in the development of this region. Its basic mission is to develop the water resources of the valley, and the utilization of such resources for irrigated farming.

In the meantime, the Water Authority Law of 1988 established the Water Authority of Jordan (WAJ), and gave it responsibilities to manage and develop the water resources in the kingdom. Water in this respect means surface and ground water. The relevance of this law to this study involves the use of underground water for irrigation purposes. Underground water is under the jurisdiction of the WAJ and is currently regulated under the Water Authority Law and certain provisions of the Natural Resources Law of 1968, specifically Regulation No. 26 of 1977. Under these laws, underground water is extracted through a process of licensing including the permits for initiation of work, digging wells and extraction of water.

7.2.2 <u>Irrigated farming.</u> The main area of irrigated farming in the Kingdom is the Jordan Valley and the Southern Ghor. The Jordan Valley Authority (JVA) and its predecessors have developed the area by providing the irrigation infrastructure. In addition, the JVA has been responsible for the operation and maintenance of all irrigation system components.

According to the JVA Law, the irrigated lands expropriated earlier for purposes of reclamation and development are divided into farm units with minimum sizes. Under no circumstances are farm units to be divided or parceled into smaller units. The JVA, through a committee, selects holders of such units in accordance with certain priorities. Preference is given to farmers residing in the area at the time of expropriation. The holder does not have the right at any time to sell his farm to anyone except to the JVA. However, with the approval of the JVA, the holder is allowed to transfer his holding rights of the farm to his wife and sons. In the meantime, holders may lease to the JVA, if so desired, units which they do not wish to utilize, for a period of not more than 33 years. In the case of death of the holder, his rights in the farm are reverted to his heirs, provided that the area of any unit when parceled shall not

thereby be reduced to less than the minimum limit. As to the limit of authority in regard to management of water control in the valley, the JVA maintains the right to fix the upper limit of the amount of water it supplies to the holders in accordance with water availability and the crop plants in the farm units. It also has the authority to supervise the water, its supply and distribution, and to fix its price (Article 24 j).

7.2.3 Rainfed Farming. Given its modest endowment in rainfed arable lands, it is all the more remarkable that it is in the rainfed agricultural subsector where Jordan's cities are burgeoning. Urban growth is advancing at the expense of arable lands, insofar as farmers find offers by builders and developers for their lands difficult to refuse. Little in existing legislation serves to abate such urban spread or even ensure rational urban growth. No legislation currently exists that seeks to control urban spread through high land use conversion taxes that apply to those seeking to convert agricultural land. The current Law of Cities, Villages and Building, No. 79 of 1966, for example, provides no support to determining urban boundaries, or enacting legislation on what kinds of housing can be built on arable land. For those who continue to farm, inheritance customs are diminishing plot sizes to the point where many holdings are simply too small to farm commercially. Article 11 of the Constitution will have to be amended, along with the Land and Water Rights Settlement Law No. 40 of 1952, in order to begin to address the subsector-wide problem of shrinking plot sizes. The legal restrictions that are necessary to curtail the disappearance of Jordan's threatened rainfed agricultural subsector will prove challenging and difficult to enact.

7.2.4 Range and the Badia. The range and the Badia constitute the major portion of the land of Jordan. According to Article 118 of the Agricultural Law, all government lands which receive less than 200 mm of rainfall are considered range. Given the rainfall averages in this country, the range technically includes most of the area to the east of the main highway between Aqaba and Amman and Damascus. The Minister of Agriculture has been granted authority to regulate the use of this area including leasing and allocation for exploitation, provided that such lease or allocation does not involve an area exceeding five-hundred dunums for each family. Also, the Minister is given authority to designate areas allowed for grazing

and those closed for such use. The law sets forth certain penalties for violations of such land use. In fpoint of fact, Jordan lacks the financial and human resources to curtail the spread of dryland farming ventures in this subsector. It is often in the low rainfall areas where traditional claims and practices regarding who owns and can use lands that both the state and individuals and families claim, are tested. In most cases, traditional claims win out over government counterclaims.

7.2.5 Forestry. There are no separate laws which govern Jordan's forests. Rather, they are managed under certain provisions contained in the Agriculture Law (Articles 89-116). These provisions are supplemented by several Ministerial Orders specifying mainly requirements for licensing, exploitation, transport, processing and sale of forests materials. The authority for granting licenses and permits is vested in the Director of Forestry who may delegate his licensing authority. Licenses given are valid for certain periods and holders must observe strict norms and conditions.

According to the law, forests are meant to include trees and shrubs of forest species which may or may not be grafted. Forest material is defined to be any material found on forest land. Forests are divided into either state owned or private forests. State forests consist of lands belonging to the State which are registered as forests in the name of the Public Treasury and the portions of the roads and streets which are partly or wholly covered by forest trees. The private forests are, however, forest plantations naturally grown on lands owned by individuals or corporate bodies. Accordingly, man made forests on private lands do not technically fall within the private forests definition, and therefore may not be subject to the provisions of the Law. This is a deficiency in the forestry law as will be pointed out later, since such forestry plantation may be in jeopardy in terms of its protection.

Conservation and protection of forests, both state and private, are safeguarded by several measures. These include: prohibition of residence in state forests; prohibition of setting fires in state forests within a radius of five hundred meters outside their limits; prohibition of farming in state forests, unless exceptionally authorized; prohibition of cutting down certain types of trees; and prohibition of grazing, except in accordance with certain authorization.

These protective measures and others are supported by a scheme of penalties against offenders. Cutting a tree or a shrub without a license, for example, is penalized with up to one month imprisonment. Besides ordinary penalties of fines and imprisonment against offenders, the law has a provision for imposition of collective sanctions to neighboring inhabitants where actual offenders are unknown (Article 107).

7.2.6 Livestock. The legal system under which this subsector is governed relies mainly on the provisions of Agriculture Law No. 20 dealing with livestock resources, development and protection (Articles 133-86). Provisions contained in the portion of the code involving livestock are supplemented by a number of Ministerial Orders which were issued pursuant to certain provisions in the code. These Orders have laid down procedures, requirements and conditions which regulate the different areas of this sub-sector. Under the law the Minister of Agriculture has broad authority to limit export and import of live animals, if the development of livestock in the country requires such measures. Therefore, the Minister controls the process of establishing and running animal farms through issuance of permits and licensing (Article 133). The Ministry also has authority over production, registration, inspection and trading in animal feed (Articles 136-143). Finally, the Law prescribes measures for fighting animal diseases including identification, tests, quarantine, procedures of control and penalties for violating such rules.

As mentioned earlier, there are many supplementary rules issued in Ministerial Orders regulating the different aspects of the livestock sub-sector. Examples are those relating to establishing chicken farms and incubators, cattle, sheep, rabbit and fish farms. Establishment of any of these farms requires a license upon meeting certain standards. Farms are limited to certain lot sizes, locations away from the city, town and village limits, certain validity dates, availability of certain sanitary facilities, and the maintaining of records for the Ministry's inspection. Violators are subject to certain penalties including closing down such farms pending restoration of conditions required by law.

7.3 Deficiencies in the Current Legal Framework

7.3.1 Absence of an Overall Land-use Plan Enforced by Law. Over the last thirty years, Jordan witnessed substantial expansion in building and construction to meet the needs of the significant increase in population and the growth of urban centers. This expansion has mainly been made on cultivable land which is too small a portion of the total land area of this country and may literally vanish if this trend continues. The problem is caused by a deficiency in the legal system under which city planning is currently pursued. Although the law requires a topographical study of the area involved prior to initiation of city planning including land use for residential, commercial, industrial and agricultural purposes, there is no provision in the law specifically forbidding or barring authorities from including land in city planning for agricultural preservation. In the absence of such a provision, which might have prohibited cities' and towns' expansion at the expense of agricultural land during the mentioned period, a good portion of Jordan's prime arable land has been lost. This loss would not have occurred had there been an overall land-use plan, safeguarded by certain provisions in the law, requiring adherence thereto and making it illegal to utilize the land except for designated purposes. A land use plan would assign agricultural, residential and industrial land, whereby cities and towns may expand only in areas assigned thereunder. The cities and towns could simply have directed their expansion towards areas which are not arable.

7.3.2 Separation of Water Policy Legislation and Organizations from Agriculture Policy Legislation and Organizations. The Ministry of Agriculture, which is the main organization responsible for planning, developing, and maintaining agriculture in the Kingdom, does not have jurisdiction over one of the important elements in agriculture--the water resource. Authority over this essential input is allocated to another organization. Successful agricultural planning for the country should include water policy within agricultural policy. Currently, the legal system provides for two authorities. One is commissioned with overall agricultural development and maintenance; the other manages and controls the water resources and formulates its policies.

7.3.3 Absence of the Ministry of Agriculture Representation in the National Municipal Planning Council. Under Article 5 (1) of the Cities, Villages and Building Planning Law of

1966 regarding the composition of the National Municipal Planning Council, the law does not provide for the representation of the Ministry of Agriculture in the said Council. The absence of the Ministry has left agricultural concerns almost without consideration in the process of planning and expansion of cities and villages on the nearby agricultural lands.

7.3.4 The Current Agriculture Law of 1973. The current Agriculture Law is traditional, restrictive and repressive. It focuses on prohibitions, violations, sanctions, approvals, permits and licenses. It ignores planning, management, development, community participation and involvement as well as training, and preservation of the environment.

7.3.5 Land Fragmentation. Due to inheritance laws, agricultural land has been fragmented into small lots. This hinders investment in agricultural projects involving large land plots. The current legal restraint on land fragmentation is contained in the above mentioned Municipal Planning Law Article No. 28 which requires a minimum size for a parcel of farm land to be ten dunums (one hectare). This is too small to be economically exploitable for most crops.

7.3.6 Absence of an Environmental Protection Framework. Many provisions in the Agriculture Law involve environmental implications. Yet, there are no national standards or specifications for environmental impact assessments.

7.3.7 Lack of Quick Enforcement Procedures. The Ministry of Agriculture is not equipped under the law to deal with situations that sometimes require quick and preemptive enforcement actions. At present, current procedures call for those charged with violations to have their cases turned over to the courts for trial, in accordance with Article 196 of the Agriculture Law. By the time the court issues a decision on the matter, the impact of the violation is sometimes irreversible. Even when such a court decision imposes a fine, it is usually of too little value to deter violators.

7.3.8 Recycled Water from Water Treatment Plants. Currently, effluents are discharged in nearby water courses, causing pollution to these areas. There are micro-biological standards for the plantation of certain types of crops. For example, plantation in polluted areas should involve only vegetables that are to be cooked, not eaten raw. These standards, however, are rarely enforced. Where there are violations in growing such types of plants, the current law doesn't provide for destroying the polluted vegetables. In most cases, these vegetables find their way to markets and eventual human consumption.

7.3.9 Underground Water. With regard to the extraction of underground water and the practice granting permission thereof, the emphasis should consider agricultural needs for such water extraction. The authority for making such a determination is currently not with the Ministry of Agriculture, but with MWI.

7.3.10 Forestry. As far as forest and soil conservation are concerned, the Agriculture Law has erroneously defined private forests as those which are made up of naturally grown forest occurring on private land. Man made forests are therefore not included in the definition of private forests. Technically therefore, planted trees may be dealt with freely without need of licensing as opposed to those naturally grown. On the other hand, the present legal restraints placed on the use and exploitation of private forests deter people from becoming involved in the development of these lands.

The Law requires the consent of certain private forest landowners to permit the government to undertake certain measures aiming at soil conservation and plantation of forests. This refers to privately owned land which has substantial slopes, and land with slopes affecting water resources and tourist land sites where forest plantation is to be undertaken to enhance the beauty of the area (Article 103 of the Agriculture Law). The requirement for the consent of the owner in the situations mentioned above hinders the government from undertaking development programs and ensuring preservation of forestry.

7.4 Legal Requirements for Implementing the Agricultural Policy Charter.

The proposed Agricultural Policy Charter represents the most recent comprehensive reform program for the agriculture sector in Jordan. It contains major proposals for major policy changes in and adjustments to the present legal system of agriculture. This section deals with both the legal constraints to such proposals, and implementation procedures for changing them. Following are some of these constraints that may hinder the process of implementation of certain policies in the Charter.

7.4.1 Consolidating Land and Avoiding Fragmentation. Implementation of the above policies will face problems due to the continuous process of fragmentation resulting from the

obligatory application of the inheritance laws of Jordan, and ongoing politically based transactions which permit building on agricultural lands without careful attention to even the existing laws. Were the government to intervene to prevent land fragmentation, its legal and financial resources would be very limited. First, the law does not permit expropriation of such land except for purposes of public utility, and second, any such expropriation would have to include consideration of a fair compensation (Article No.11 of the Constitution).

7.4.2 **Protecting Agricultural Land from Urban Expansion.** The capacity to check this almost constant process of urban expansion onto prime agricultural lands is made more difficult by:

- Determining the criteria for the which land is suitable for city planning and which is not.
- A large portion of agricultural land is already included within city planning jurisdictions, and this will be difficult to reverse.
- Many cities, towns and villages in Jordan happen to be located on arable land.
- Difficulty exists with regard to stopping building on arable lands outside of city planning limits where people often simply build without obtaining building permits.

7.4.3 **Utilization of Water for Irrigation Due to Having Separate Jurisdictions.** The Policy Charter advocates certain policies regarding efficient utilization of water for irrigation. Implementation of such policies are made considerably more difficult by the existence of separate organizations, laws, jurisdictions, multiple authorities with responsibilities for managing the water resources, and the absence of effective means of coordinating such implementation efforts.

7.4.4 **Regulating the Range Land and Setting Ownership Claims.** Difficulties may arise regarding the implementation of certain legal doctrines where prior ownership of land may be recognized where squatters have utilized such land for a certain period of time. This doctrine is incorporated in Article 1181 and 1182 of the Civil Code of this country. The Civil Code is the main law which will be used to decide these claims. Settlement of these matters which involve private rights and the settlement of these claims on such lands will take a long time

since each individual case will have to be reviewed and decided upon separately on its own merits.

7.5. Required Legal and Regulatory Actions for Implementation of the Proposed Agricultural Policy Charter

7.5.1 **Elimination of Price Controls on Agricultural Products.** Action required for implementation: If this new policy is to be implemented it will require issuance of a resolution by the Council of Ministers taking the agricultural products off the "Basic Food Materials List" as well as the "Supplies Materials List." The Council of Ministers was given authority to identify the materials to be listed. Prices are fixed for all materials contained in both lists. The relevant provisions of the law are Article No. 2 and No. 7 of the Law of Supply No. 17 of 1992. The effective date for such an action will be contained in the Council of Ministers' Resolution issued on this item and communicated to the Minister of Supplies.

7.5.2 **Removing Export/Import and Trade Restrictions on Agricultural Products.** Action required for Implementation: The relevant provisions of the law controlling the above issues are mainly contained in the Agriculture Law No. 20 of 1973, the Supply Law No. 17 of 1992 and the Agricultural Marketing Organization Law No. 15 of 1987. Under Articles 188-189, Article No. 4 and Article No. 6 of the above laws, respectively certain controls are placed on exports, imports and trade of agricultural products. These constraints are expressed in terms of subjecting exports and imports to government monopoly and the necessity of receiving permits from certain authorities. Under the Agriculture Charter, the policy is directed toward reducing or eliminating such constraints and freeing trade. The legal mechanism for achieving this change, if this policy is to be implemented, lies in modifying certain portions of the above laws by removing the restrictions or amending them to the extent necessary. The procedures for undertaking this change involve introduction of specific legislation to this effect, to be reviewed and approved by both Houses of Parliament and then issued in the Official Gazette after receiving the endorsement of His Majesty the King. The new legislation will come into force after thirty days of the date of its publication unless indicated otherwise (Article 93 [2]

of the Constitution). Further, a Resolution of the Council of Ministers will be necessary to remove agricultural products from the two lists mentioned above in Section 7.5.1.

7.5.3 <u>Encouraging Private Agricultural Business by Eliminating Subsidies and Trade Monopolies.</u> Action required for Implementation: The relevant provisions of the law controlling the above issues are mainly contained in the Supply Law No. 17 of 1992. Under Articles No. ((a) and (b) of the Supply Law the Ministry of Supply has been given a monopoly over importing certain Basic Food Materials. In addition, the importation of certain 'Supply Materials' require approval by the same ministry. Under the Agriculture Charter the policy is directed toward encouraging business by eliminating monopolies and subsidies to make such activities accessible and profitable for the private sector. The legal mechanism for achieving this objective, if this policy is to be implemented, lies in issuance of a Resolution by the Council of Ministers removing agricultural products from the list of the "Basic Food Materials" and the "List of Supply Materials" of which the Ministry has been granted monopoly and approval authority of exporting and/or importing. The same requirement will be necessary for removing subsidies on such products. The Resolution will contain the effective date for such removal.

7.5.4 <u>Encouraging Private Sector's Participation in Policy Formulating and Decision Making.</u> Action required for Implementation: At present representatives from the private sectors in the composition of the Boards of Directors of several organizations involved in Agriculture are outnumbered by those from the public sector. The policy is directed under the Charter toward balancing or increasing the influence of the private sector in decisions affecting their economic activities. The private sector should have a stronger voice and involvement. Examples of organizations involved in agriculture where representatives of the private sector on the Board of Directors should be increased are the Agriculture Council, the Water Authority, the Jordan Valley Authority, and the Agricultural Marketing Organization. The legal mechanism for achieving this change, if this policy is to be implemented, lies in modifying certain provisions of the laws of these organizations, in particular those relative to the composition of these organizations. Modifications should be made to the Council of Ministers Regulation No. 24 of 1989, relative to the Agriculture Council, to the Jordan Valley Development Law No. 19

of 1988 Article 8 (6), the Water Authority Law No. 18 of 1988 Article (8), and the Agricultural Marketing Organization Law No. 15 of 1987 Article (5). The procedures for undertaking this change in regard to the above mentioned laws involve the introduction of specific legislation to this effect, review and approval of such legislation by both Houses of Parliament and the issuance of such legislation in the Official Gazette after receiving endorsement of His Majesty the King. The new legislation will become effective after one month unless another date is specified otherwise. As to the first Regulation relative to the Agriculture Council, a new Regulation amending it will be needed from the Council of Ministers and should be published in the Official Gazette.

7.5.5 <u>Improving Agricultural Products in Quality and Price to Internationally Competitive Levels.</u> Action required for Implementation: Raising the quality and quantity of Jordan's agricultural products to internationally competitive levels will require revision of a wide array of policies and practices. These include issues as diverse as: ending wholesale unit pricing in favor of paying higher prices for quality merchandise; ending Royal Jordanian's virtual air freight monopoly; freeing up ground transportation regulations; bringing Jordan's packaging standards up to EU levels; enforcing quality control and phytosanitary regulations; improving marketing communications with producers thereby makeing them more aware of sales and marketing opportunities; and encouraging private foreign investment in agriculture to bring technology as well as know-how and provide means for penetrating foreign markets. Accomplishing these reforms will entail revisions of: the Royal Jordanian Airlines Law No. 10, of 1969 as amended; the Civil Aviation Law No. 50, of 1985; Law of Transport on Roads No. 49, of 1958; AMO's Law No. 15, of 1987, and Ministerial Order No. 1, of 1988 (packing Restrictions); Ministry of Industry and Trade Law No. 16, of 1989 for quality control, health standards and specifications; and the Encouragement of Investment Law No. 11 of 1987. The legal procedures for achieving these reforms involve the introduction of special legislation to this effect, to be reviewed and approved by both Houses of Parliament and then issued in the Official Gazette after receiving the signature of His Majesty the King. The new legislation will be effective after one month of its publication unless another date is specified.

7.5.6 **Effective Application of the Regulatory Framework by Eliminating Controls and Restrictions.** Action required for Implementation: Currently, there are many provisions in the Agriculture Law No. 20, and in the Ministerial Orders which were issued pursuant to it, that require approvals, permits and licenses. Other ministries sch as MIT, and MOS, and organizations such as AMO also require approvals, issue permits and licenses. Examples of such provisions include: importing and exporting licenses for agrichemicals, feed, seeds, plants, fertilizer, livestock, capital equipment; inspection and quarantine; quality control of chemicals; testing for pesticide residues; and standards for grading. The new policy calls for a shift away from such requirements. To implement this policy, these provisions of the laws and the Ministerial Orders should be examined to identify the areas in need of adjustment. The legal mechanism for implementing this adjustment policy in regard to the Agriculture Law itself will require introduction of legislation to this effect. Such legislation should be processed through the stages mentioned earlier, while amending Ministerial Orders will require the issuance of new orders. Such new orders will become effective upon their publication in the Official Gazette.

7.5.7 **Encouraging Formation of Various Types of Farmers' Organizations.** Action required for Implementation: Establishing farmers' organizations is currently possible only under the legal framework of the provisions of the Jordan Cooperative Organization Law No. 20, of 1971. The establishment and the operations of such organizations will be governed by the provisions of the existing law. However, if such farmers' organizations are to be established under the umbrella of the Ministry of Agriculture, new legislation will be necessary. Such new legislation could be in the form of an amendment to the current Agriculture Law, or a separate law specifically for such farmers' organizations. In both situations, the new legislation will have to go through the legislative process of the two Houses of Parliament, endorsed by His Majesty the King and published in the official gazette.

7.5.8 **Promulgation of New Regulations and Repealing Outdated Regulations.** Action required for implementation: A substantial number of Ministerial Orders and Directives have been issued by the Minister to regulate the different aspects of the agriculture sector. These regulations and directives have been issued pursuant to authority vested in the Minister by the

Agriculture Law No. 20 of 1973. The Policy Charter requires re-examination of these existing regulations with a view to eliminating outdated ones and improving the effectiveness of remaining ones. The legal mechanism which the Minister uses to implement this change is for the Minister to rescind outdated regulations by issuing new Ministerial Orders to this effect. The Minister also has authority to amend and update the remaining ones. The new Ministerial Orders introducing such change will become effective upon publication in the Official Gazette.

7.5.9 Exploring and Opening New Markets. Action required for Implementation: AMO has been engaged in efforts to undertake exploratory trips to Eastern Europe and provide producers with marketing information support. One agricultural export marketing group has recently formed, as have cut flower growers to explore export opportunities. Jordan has some large agricultural producers such as Abu Ghazali, and Shukry, valley grape growers who already have international ties and access to markets in western Europe, South America and even the U.S.

Several reforms related to opening new markets by lifting restrictions and encouraging the development of quality produce, were treated in Section 7.5.5, above. These reforms, if enacted, will establish a foundation upon which aggressive and successful exports to existing and new markets can build. An additional approach suggested to implement the above policy is to encourage international trading Houses to open offices in Jordan. Establishing a presence for a foreign company in the kingdom can take many forms. The simplest is establishing and registering a regional office, which it may do by establishing a regional office in Jordan under Articles 280-286 of Jordan Companies Law No. 1 of 1989. This law permits foreign companies to register regional offices with the Ministry of Industry and Trade. Such registration will entitle a regional office to obtain several advantages, including exemption from registration and licensing fees, exemption from custom duties on furniture and equipment for offices, exemption of non-Jordanian staff from Income Tax on their remuneration and the option of bringing a car into the country for each non-Jordanian employee without having to pay custom duties.

7.5.10 NCARTT to Play a Major Coordinating Role for the National Agriculture Research Efforts. Action required for Implementation: Under the Policy Charter NCARTT is to play a major role in coordinating national agriculture research efforts. Institutional reform will be required for NCARTT to perform this leading role in the national agriculture research strategy.

The legal mechanism for this institutional reform of NCARTT, if it is to remain part of the Ministry of Agriculture, requires issuance of a new regulation by the Council of Ministers (based on Article 120 of the Constitution) amending Regulations No. 19 of 1990 as amended by Regulation No. 43 of 1993, and Regulation No. 42 of 1993 to accommodate required institutional reforms on NCARTT. The new regulations have to be approved by His Majesty the King and published in the official Gazette. The new law usually comes into force from the date it is published in the Official Gazette. If however, NCARTT is to become a separate entity, a new law will be required.

7.5.11 **ACC to Function as a Rural Bank.** Action required for Implementation: The Agriculture Credit Corporation Law No. 12 of 1963 under which the ACC currently operates, does not allow this organization to function as Rural Savings and Credit Bank. The Policy Charter proposes that this organization be reformed to function as a rural bank accepting deposits and charge higher rates of interest on its loans. The legal mechanism for undertaking the above change in the ACC function lies in amending its current laws, specifically the ACC law No. 12 of 1963, the ACC Regulation No. 1 of 1963 and the financial regulation of the ACC No. 5 of 1963 to the extent necessary to accommodate the new required functions. This may be achieved through enactment of new legislation to this effect and having it processed through the legislative process mentioned earlier.

7.5.12 **Pricing Water to Cover Operation and Maintenance Costs.** Action required for implementation: The current price of water[1] is too low compared to expenses involved in maintenance operations. The Policy Charter advocates O&M prices to approximate their economic value. Several options have been developed to reflect the value of O&M. The legal mechanism for adopting any new procedures for determining the price of water lies in amending the Jordan Valley Development Law No. 19 of 1988 Article 24 (J) and the Water Authority Law No. 18 of 1988 Article 10 (F) to incorporate the basis on which O&M prices will be established. Also, Article No. 28 of the JVA Law of 1988 should be studied for finding out if this Article may provide the legal mechanism for implementing this policy. The procedures for

[1] Water, according to religious precedent, cannot be priced. Instead, Jordan opts to charge users of public water for operation and maintenance (O&M) costs.

undertaking this effort involve introduction of legislation through the Parliament and processing it through the steps mentioned earlier. These procedures will be different if implementation in regard to the JVA is pursued under Article 28 of the JVA Law of 1988.

7.5.13 <u>Encourage Manufacturing of Water Saving Technology.</u> Actions required for Implementation: The Policy Charter calls for irrigation techniques and technologies for water saving. Several options for implementation are suggested, including a rebate program based on sales of irrigation equipment and reducing taxes on imports for manufacturing technologies and exemption of such industries from income tax. The legal mechanism for introducing tax incentives to companies manufacturing such equipment involves amending the Income Tax Law No. 57 of 1985 Article 7 if such incentives would involve total exemption. Reduction in tax rates would involve amending Article 17 of the Tax Law. This would be done through a special legislation enacted by the legislative process and published in the Official Gazette.

7.5.14 <u>Take into Account Agriculture Concerns When Deciding Urban Expansion.</u> Action required for Implementation: Developing a rational and economic strategy for urban expansion that does not consume even more agricultural land will call for a mix of policies that includes both new and modification of existing legislation. New legislation would include development and adoption of a national land use plan. Conceivably, this could be done as part of the pending National Environmental Law now before parliament, but more likely will have to be developed by a joint ministerial committee led by MMRAR, and with MOA, MIT, JVA, MPW (Public Works), MOH, MOF, Land and Survey Department and private sector representation. Other potential legislation could include introduction of a five year moratorium on expansion of urban areas whilst existing undeveloped land already included within urban boundaries is used.

With respect to existing legislation, the Policy Charter urges that agricultural concerns be taken into account by the National Municipal Planning Council prior to its deciding upon the future expansion of urban limits. Currently, expansion is usually readily approved by this body. To implement this change, the legal framework of the National Municipal Planning Council should be amended to include a representative from the Ministry of Agriculture in order to voice such concerns. The legal mechanism to bring about this change lies in amending the law governing the composition of the said Council. Under Article 5 (1), the Council is composed of the Minister of Municipal and Rural Affairs as chairman, the Mayor of Amman, the Secretary

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General of the Ministry of Public Works, Secretary General of the Jordan Building Council, the Director General of the Housing Organization, Manager of the Department of City and Village Planing, the Prosecutor General, the President of the Engineers Association and the Secretary General of the Ministry of Health. Specifically, implementation requires introduction of a special law to this effect, which implies completing the lengthy process of being reviewed and approved by the two Houses of Parliament and then published in the Official Gazette after receiving endorsement by His Majesty the King. The new legislation would come into effect after one month of its publication unless another date was indicated.

7.5.15 **Avoid Land Fragmentation and Introducing Land Consolidation.** Action required for Implementation: Present laws do not allow compulsory consolidation. According to Article 11 of the Constitution, no property of any person may be expropriated except for purposes of public interest and in consideration of a just compensation. The only means for implementing this policy is therefore through indirect measures, such as increasing the minimum allowable lot size that existing farms can be subdivided into. Currently, this minimum is ten dunums (Article 28 (1) of the Cities, Villages and Building Planning Law 79 of 1966). Also, an incentive program to encourage the transfer of ownership of land fragments within a family could be created in the form of eliminating taxes upon transferal and consolidation of such property.

7.5.16 **Land Leasing in Irrigated Zones will be Adjusted to Respond to Actual Social, Economical and Technical Requirements.** Action required for Implementation: The relevant provisions of land leasing in irrigated zones are contained in Article 22 (H-K) of the Jordan Valley Development Law No. 19 of 1988. What is in need of adjustment is the length of leases, such that lessees have the incentive to invest in lands because they have sufficiently long leases to make such investments worthwhile. As a condition of securing the Agricultural Sector Adjustment Loan, the government has agreed to propose legislation which legalizes private, freely transferrable long-term leases up to 30 years.[2] Adjustment should be made to existing

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[2] World Bank: Proposed Agricultural Sector Adjustment Loan. 1994: p. 17.

legislation to the extent necessary to accommodate this new policy. This will require new legislation and publication to go through the legislative process and publication in the Official Gazette.

7.15.17 **Government Acquiring Forest Land and/or Developing It.** Action required for Implementation: a) Private Forest Land: Implementation of this policy may be pursued within the current legal framework of trading government land for private forest land. This legal mechanism is available under provisions of the Administration of Government Property Law No. 17 of 1974. According to Article 10 of this law, private forest land may be traded for government land located in the same area for purposes of consolidating forest land provided, however, that approval is granted by the Minister of Agriculture, and the Supreme Committee and the Council of Ministers. The Supreme Committee referred to consists of the Minister of Finance as Chairman, the Director General of the Land and Survey Department, the Director General of the Agriculture Credit Corporation, Secretary General of Ministry of Interior, Secretary General of the Ministry of Municipal and Rural Affairs and the Environment, along with the Director of the Forestry Department.

In order for the trading of government land for private forest land to be more effective, an amendment to this law is necessary. This amendment involves removing the condition which requires that the two lots of land to be traded be in the same location. The amendment should accommodate trading government land for private forest land, even though the two lots are in different locations. The legal mechanism to achieve this change requires a special law to be enacted by the legislative process, endorsed by His Majesty the King and published in the Official Gazette. b. Development and Reclamation of Private Forest Land: The Agriculture Law contains a mechanism for achieving this objective. Article 103 enables the government to develop certain forest land (such development being paid for by the government) provided, however, that the owner of such land agrees to such measures. This hinders implementation of such land development. To implement this policy, amendment of the law will be necessary to remove the approval of the owner for such measures.

7.5.18 **Improve Management of Existing Forestry Resources.** Action required for Implementation: Several measures are suggested including revising legislation to provide forest officers with enforcement authority. The legal mechanism for achieving the above lies in

amending the Agriculture Law No. 20 of 1973, Articles 97, 98 and 99. The amendment would be in the form of new legislation to be enacted through the legislative process of the two Houses of Parliament and endorsed by His Majesty the King. Such new amendments would come into force after thirty days of the date of its publication in the Official Gazette unless another effective date is indicated.

7.5.19 Establishing Principles Restricting Conversion of Forest Lands. Action Required for Implementation: The relevant provisions for conversion of private owned forests are contained in Articles 100 and 101 of the Agriculture Law No. 20 of 1973. The new policy principles are to be included in an amendment to the said Articles. Such an amendment will be in the form of a legislation to be processed through the legislative process through stages mentioned earlier.

7.5.20 Establishing of Special Training Centers. Action required for Implementation: It is presently proposed that such centers be developed within existing RASC (now RCARTTs) structures as part of the proposed NCARTT/Extension reorganization. If these centers are to remain part of the administrative organization of the Ministry of Agriculture, the legal mechanism is to issue a regulation from the Council of Ministers pursuant to Article 120 of the Constitution amending Regulation No. 19 of 1990 as amended by Regulation No. 43 of 1993 relative to the organization and administration of the Ministry of Agriculture. If, however, such centers are ultimately designed as stand alone institutions with the legal status of a fully autonomous body, such as the Agriculture Marketing Organization or the Agricultural Credit Corporation, then the legal mechanism for implementation will require issuing a special law creating a separate and independent entity, and involve the participation of the Ministry of Higher Education.

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7.6. AGRICULTURAL STATISTICS

The Department of Statistics of the Ministry of Planning and the Statistics Division of the Ministry of Agriculture are the main sources of agricultural statistics in Jordan. The figures published by these agencies on similar topics, however, tend to diverge. The impending implementation of the Agricultural Policy Charter focused attention on statistical data required for tracking performance of the sector and for measuring the impact of reforms on variables of interest.

This section examines the country's data collection system in order to define the role and scope of the Statistical Division of the Ministry of Agriculture. It also proposes changes and improvements in this Division so that it can increase the quantity of agricultural statistics with minimal deterioration in quality and in reliability. Three sub-sections examine the current agricultural statistics system of Jordan and the types of information being collected, the structure and functions of statistical divisions within the MOA, and the statistical needs for monitoring the Agricultural Policy Charter. For monitoring, data-provision responsibilities among the various organizations are identified.

7.6.1 <u>The Current Status of the Agricultural Statistics System In Jordan</u>. This section describes the current sources of agricultural statistics and assesses the capabilities and deficiencies of each. In Table 1, the names and functions of principal organizations that collect agricultural data in Jordan are identified. These institutions use different data collection methods and store information on computerized databases.

Organizations such as the Agricultural Marketing Organization (AMO) and the Ministry of Supply (MOS) collect domestic and regional marketing information. The Jordan Valley Authority (JVA), Water Authority of Jordan (WAJ) and Ministry of Water and Irrigation (MWI) all gather production figures on irrigated agriculture and water use data in targeted areas. The ACC maintains lists of farmers with outstanding loans and their financial situations. The two main institutions responsible for gathering information on agricultural production in the country are the Ministry of Agriculture's Statistics Division (SD) and the

Key Issues and Proposals

- **The DOS and MOA do not have overlapping statistical functions if one considers coverage, level of disaggregation and reporting requirements.**

- **DOS data collection methods are more scientific and more rigorous than MOA statistics. MOA, on the other hand, have permanent staff in directorate offices who have a better understanding of local agricultural situations.**

- **Statistics gathering, processing and publication efforts in the MOA are scattered among too many divisions. These divisions have small staffs and lack the critical mass needed to maintain an effective statistical system. Consequently, the quality of data suffers and there are delays in the data collection, processing and publishing process.**

- **The Statistics Division of the MOA needs additional staff, equipment and technical training at both headquarters and directorate offices to improve the accuracy of existing data and to expand the types of data required to monitor agricultural policy implementation.**

Ministry of Planning's Department of Statistics (DOS). Information sharing between these organizations occurs, but usually only at an aggregate (governorate) level.

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TABLE 1: CURRENT SOURCES AND USERS OF AGRICULTURAL STATISTICS IN JORDAN

INST.	DIVSION	TASKS AND DATA COLLECTED	METHODS & SOURCES	REPORTING FREQUENCY	DATA LIMITATIONS
1. MOA-AEPD	Stats	-Collect data on area and production of crops at the village level	census MOA-SD	annual	-Quality of data is sometimes suspect. Under-staffed field offices must conduct censuses of all crops.
		-Number of livestock and livestock products at district levels	census DOS	annual	-Primary data from MOA only covers area and production of crops, fruits and vegetables.
		-Forestry and rangeland statistics	census	annual	
		-movement of agri products in the wholesale markets (price & quantity)	AMO	daily	-MOA has no mandate to publish agricultural statistics
		-follow-up on quantity of exports of fruits and vegetables (including West Bank and Gaza)	census	annual	
	Policy Anal.	Conduct policy analysis	MOA-SD	annual reports	-Same as above
	Data bank	Analysis of crops, fruit, vegs and livestock	MOA-SD	annual reports	-Same as above
2. MOP-DOS	Agri-Stats	-Collect data on area and production of crops.	census 20% of villages	annual reports	-DOS only has estimates ready at the end of each year. There is no quick response capability.
		-Export and imports of agricultural commodities	census	report	-Data accuracy could be improved if enumerators had more practical and agricultural experience.
		-Agri prices, costs and farm management	sample	report	
		-Inputs (values and quantities)	sample	report	-Data is not available at the village level.
		-Agri. census			
		-Captial and capital formation	census sample	report	
		-livestock estimates			
		-economic indicators	census	annual report	
			sample	annual report	

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INST.	DIVSION	TASKS AND DATA COLLECTED	METHODS & SOURCES	REPORTING FREQUEN-CY	DATA LIMITATIONS
3. JVA	Studies	-Collect area of crops in Jordan Valley -Data on water uses -Samples for testing water quality -returns of agricultural production in the Jordan Valley -water requirements for crops and fruit trees	estimates from field " " " " estimates from central office estimates from field	not published " " " " " " " "	Data only covers the Jordan Valley
4. AMO	Studies	-Data on exports and imports of fruits and vegetables -Prices and quantity of fruits and vegetables in wholesale markets -Issues import and export licenses of agri. products.	census census census	published daily published daily N.A.	Data is published at the Kingdom level (lower levels of aggregation are not available)
5. ACC	Studies	-Data on farmers who have loans -Data on cost of production	their own records MOA	annual reports annual reports	Agricultural loans data only
6. MOWI	Studies	-Data on water sources, dams, artesian wells	their own records	not published	Data published only at the Kingdom level
7. MOS	Studies	-Data on agricultural production estimates -Issue licenses for import and exports of food commodities -Retail prices -Reserves of strategic commodities -Data on subsidized feed distributed to livestock owners	from MOA their own records MOS reps collect their own records their own records	not published published daily not published not published	Data published only at the Kingdom level
8. JCO	Studies	-Data on agricultural cooperatives	their own records	annual report	Data published only at the Kingdom level
9. JVFA	Studies	-Data on activities and services provided to its members	their own records	annual reports	Data published for the Jordan Valley only

INST.	DIVSION	TASKS AND DATA COLLECTED	METHODS & SOURCES	REPORTING FREQUEN-CY	DATA LIMITATIONS
10.CBJ	Studies	-Data on the volume of production for the estimation of income and national product	from MOP-DOS	published annually	Data published at the Kingdom level only
11.Royal Geograph. Center	Studies	-Data on area and production, services and distribution according to management units	from MOA	explained in form of maps	Data is recorded only at the Kingdom level
12.MOP	Studies	-Data for preparing plans and programs of agric. development	from MOA	published in develop. plans	Data is published only at the Kingdom level
13.RSS	Studies	-Different data for the purpose of studies	from MOA	not published	Data is published only at the Kingdom level
14.Faculties of Agri.		-Different agricultural data for conducting studies and research	from MOA	not published	Data is published only at the Kingdom level
15.priv. sector, Arab and Inter. Organ.		-Data on various agricultural statistics	from MOA	published	Data is published only at the Kingdom level
16.WAJ	Studies	-Data on water use (uplands, industry, agriculture) -Data on ground water (Jordan Valley only) -Licenses for drilling wells with supervision (water quality, deepness, and capacity (private and govt), experimental wells)	from its own records	annual report	Data is published only at the Kingdom level
17.NCARTT		-Data collection and documentation through the data bank and NCARR	field data and other sources	annual report	Data is published only at the Kingdom level
18.NIC		-Its role is to coordinate among different data collection agencies. They do not collect data.			Does not collect, store or publish statistics
19.Dept of Licenses		-Data on licenses given to operators of farm machinery	their owmn records	not published	Would also include farm machines not used for ag. purposes
20.Gover-norate Offices	Stats	-Various types of data from secondary sources(ag, population)	various sources	not published	May be difficult to get consistent type of data among all governorates
21.Dept of Land and Surveying		-Total areas (cultivated, forested.etc) at the village level	their own records	published	

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Although the SD and DOS collect similar types of statistics, their methods of collections and reporting requirements are very different. The DOS, for example, uses sampling procedures to measure crop area and production in targeted regions. They employ a large number of enumerators who move from region to region throughout the year to accomplish this task. Aggregated data on crops and livestock production is processed at the headquarter's office in Amman where it will be published at the end of each year.

The SD relies on extension agents and statisticians in directorate offices to collect agricultural statistics. They do not collect livestock estimates and rely on ancillary data for marketing, socio-economic and water use data. Unlike the DOS, the SD does not use sampling procedures, preferring to record the production and area of all crops in every major agricultural village. Data is collected monthly on different crops and is sent immediately back to Amman for processing. SD headquarters is therefore kept abreast of trends in agricultural production even before harvest. The precision of these figures, however, is sometimes suspect. SD field offices are under-staffed and lack the financial and logistical means to complete their jobs effectively.

Given the differences in collection methods and discrepancies in production figures, improvements must be made in coordination and communication among the statistical organizations. The result of such actions will lead to the improved quality of agricultural statistics, and to a consistent set of published data.

7.7 Structure and Functions of Statistical Divisions within the MOA

There are three divisions within the AEPD that deal with agricultural statistics. A lack of communication and coordination among these divisions has hindered their effectiveness and efficiency. For example, each division has its own data coding systems for governorate and villages; they each have their own databases with some of the same data included. A brief description of each follows:

7.7.1 <u>Statistics Division (SD):</u> The SD collects, aggregates and publishes area and production estimates. Their publication also includes ancillary data from other organizations such as input

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costs, prices and livestock. The SD headquarters office has four staff, two with bachelors degrees in agriculture and two with specialized post-highschool training. There are 33 field staff statistical specialists located in 24 Directorate offices. An unknown number of extension specialists gather the data from farmers, approximately two per directorate.

Data forms are sent to the district offices at the beginning of each year and are completed and returned to headquarters on a monthly schedule. Area for each crop is collected and reported at planting and harvest. The accuracy and reliability of the data is suspect. Data collection approaches suffer from too much subjectivity and too little sound statistical procedures.

At headquarters, village level data is aggregated to a directorate level and entered into the computers. Their publication also contains import and export, price and other data from secondary data sources.

7.7.2 <u>Databank Division:</u> The Databank Division is responsible for providing data to the AEPD, verifying data and credibility, establishing and managing the databank, preparing time series, statistical analysis of data and preparing reports. There are two staff members, with MA and BA degrees in agriculture.
The Databank does not collect data, but take data from all available sources, assess their relative value, correct where possible, do the required analysis and publish reports on their findings.

The computer capacity is sufficient for their current needs and the computer training is good. They would like more training in optimization techniques, GIS and computer packages.

7.7.3 <u>Policy Analysis Division:</u> This division is responsible for policy analysis, acting as a liaison with the Ministry of Planning, analyzing emergency problems and making recommendations and coordinating with international institutions working in the agricultural sector. There is presently only one staff member in this division. There is no data collected

in this division. Data from other sources are used to do budget analysis, policy analysis, econometric estimation and optimization models.

7.8 Statistical Needs for Implementing the Agricultural Policy Charter

Implementing the Agricultural Policy Charter will require detailed information on the agricultural sector at both the macro and micro levels. Much of the data needed in the charter for quantitative, policy analysis and monitoring and evaluation is currently unavailable, especially at the micro level. Therefore, the GOJ must strengthen its statistical capabilities in order to provide such information.

A "quick response" capability is also needed to reply promptly and intelligently to ministry officials' questions concerning the effects of policy decisions. These requests often arise without notice and require immediate answers. Therefore, it is necessary to collect and process reliable data on a broad spectrum of topics at all levels of aggregation in anticipation of such requests. Below is a list of data categories that should be maintained for such purposes:

Sector Level:

1. Water usage and distributions
2. Natural Resources and the environment
3. Import and export - quantities, prices and subsidies

SubSector Level (for all 5 sub-sectors):

1. Area, yield and production for all crops and vegetables
2. Area, yield and production of fruit trees(bearing and non)
3. Input and output farm costs and volumes used
4. Water usage - volume used, costs, type irrigation
5. Socio-Economic data - for farmers and livestock producers
6. Rainfall and other climatic data
7. Tenure data - Land owned, rented from and to others

8. Land use - total land, arable, irrigated, canals, buildings, forest, etc.
9. Crop Sales Costs of sales - Boxes or bags, transportation, commissions paid to agents or markets.
10. Prices received for crops - farmgate, wholesale, retail.
11. Livestock numbers - by type, sex, age categories.
12. Livestock input costs - Feed by kind, concentrates and minerals, water, veterinary, Labor (shepherd, shearer, by sex and full- or part-time, etc.), cost of replacement stock, lost or dead animals.
13. Livestock Costs of sales - Veterinary costs, transport, commissions paid to agents or markets.
14. Prices received for livestock - Farmgate, wholesale, retail, by type, age and weight categories.
15. Machinery - Type and size, value and debt,use on farm and off-farm (custom work), rental fees.
16. Demographics - People living on farm, family members on farm, laborers hired or family, non-farm work done on farm, off-farm work, debt.

In addition to these data on farming operations, there is also data needed on the subsidies provided farmers, import and export volumes and prices, retail and wholesale prices at markets in the country and regional markets. These are primarily needed in analyses to determine the farmers well being and the effects of policy changes.

Some of this data is already being collected by agencies in the GOJ but is rarely available at the village or household level. Another problem is that there are discrepancies among figures from different data sources. Given these obstacles, the future emphasis in statistical organizations should be to provide better quality and precise data that can be disseminated quickly to policy makers. Statistical organizations will also need to coordinate their efforts in order to eliminate duplication of efforts.

7.9 Data Collection Techniques: Census versus Sampling Approach

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There are two generally accepted approaches to data collection; census and sampling. A census or complete enumeration of the population, provides the most complete and detailed data but requires extensive financial and human resources to administer. Since large quantities of data are collected in a census, there is also a substantial time lag before the data can be processed and published.

The second approach is to sample a segment of the population which can provide representative information on the population as a whole. This approach requires less personnel, finances and logistical support than a census. It is also easier to control external errors and takes a shorter period of time to process and publish findings.

Given the limited resources and future demands for timely and specific data, sampling can best service the future needs of the Ministry. Moving from a census to sampling approach will require carefully designed sampling procedures and training of headquarter and field staff.

7.10 Directives for Sources of Data Under the Charter

As stated earlier, implementing the agricultural policy charter will require the unification of functions and the elimination of redundancies among institutions. Given the limited resources in Jordan, duplication within organizations must be minimized. While combining or restructuring organizations often results in real savings, it also causes conflicts and sometimes political repercussions. All of these need to be considered by the GOJ. Below are some considerations to take into account when restructuring.

7.10.1 <u>Avoid Relying on Regulatory Agencies as Major Data Sources.</u> Experience has proven that organizations such as the MWI, JVA, MOS, ACC can provide valuable data but should not be primary statistical gathering organization since their major function is regulatory. Farmers, or individuals being regulated, are inclined to give such agencies misleading information in order to appear as if they are complying with the regulations being enforced. Non-regulatory agencies, on the other hand, have less difficulty acquiring more accurate

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information since the farmer does not feel threatened by repercussions and is assured of confidentiality.

Non-regulatory agencies, such as the MOP-DOS and MOA-SD, aggregate farm level data thus assuring individual farmers who may be violating certain regulations that they will not be identified. One example of this is a study showing that 30 percent of farmers in the Jordan Valley bypass irrigation meters and modify water usage. Since the data is aggregated, the true information is recovered, but the violators are assured anonymity. The regulatory agency benefits by knowing the extent of regulation violations and can institute corrective measures targeted at all violators. Therefore, the main data gathering agencies should be the MOP-DOS and the MOA-SD.

7.10.2 Do Not Rely on Another Agency to Solve Duplication Problems. Overlap in functions and mistrust among statistical agencies reduces their effectiveness. The National Information Center (NIC) is a newly created agency whose purpose is to coordinate and facilitate exchange of data among all organizations. The reason for creating the NIC may have initially been to provide a central depository for all data. The main objective now concentrates on overcoming the lack of communication and cooperation between statistical organizations. The problem with this plan is that another layer of government becomes involved in already fractured statistical collection and reporting system. There are also no guarantees that such a move will improve the quality or access to data.

7.10.3 Foster Improved Communication and Strengthen Expertise of SD. It is imperative that the MOA develop the capability to gather and process data at all levels, from the farmer up to the Kingdom. This capability is needed to carry out the mandate for policy analysis, monitoring and evaluation, quantitative analysis and quick response analysis. Considerable resources, training, personnel and supervision will be required to develop a good statistical division. Some of these skills can be improved through interaction with other statistical agencies such as the DOS.

The MOP-DOS is technically stronger in sampling procedures and collects a greater variety of data than the MOA-SD. On the other hand, the SD's major advantage is that they have permanent field staff in the districts who deal on a daily basis with farmers and who understand the local agricultural situation. Comparing work programs and procedures would strengthen both organizations. Eventually, computer linkages between the organizations' databases could be established to facilitate comparisons and eliminate discrepancies among statistics.

One problem is that socio-economic data collected, processed and published by the DOS do not conform with standard agro-economic definitions and criteria (e.g., the data are not immediately suitable for gross margin calculations). Thus, there must be coordination of information and communication between the DOS and SD to overcome this kind of problem.

Formal recognition and authorization is required in order to permit the exchange of information. One avenue would be through law or decree. Perhaps the easiest way would be through a Memorandum of Understanding (MOU) between the MOP and the MOA. This MOU would authorize and direct free exchange of data sets at all levels of data collections.

The exchange of data sets should be in compatible machine media along with documentation. Much of the everyday communication and linkages could be through electronic means. Facsimile and electronic mail could be used for communication and computer modem linkages can be used for data exchanges. Of course, some regular meetings would be advantageous to keep the process moving smoothly.

7.11 Institutional Structure for the MOA-Statistics Division

This section describes proposed structural changes and functions for statistical divisions in the AEPD.

7.11.1 <u>Statistics Division.</u> In order to increase the types and quality of statistics in the SD, significant changes are needed. First of all, the four person staff is not large enough to collect and process village level data. This, in addition to coordinating surveys will require additional staff. In the interim, there should be one person assigned as a Survey Manager. S/he would assure that data is collected in a timely and efficient manner from the field and would compile questionnaires at headquarters and oversee the data processing. The remaining three people would assist in processing data. Each of these positions would require computer training. In Year 02, these jobs may become more clearly defined and a Data Processing Manager may be added to the staff.

Over the next year, temporary data entry people will need to be hired to help enter the backlog of data stored in this division. Three additional computers have been acquired to handle the data entry requirements. A technical assistant is also needed to assure that the three separate divisions receive all the necessary information among each other.

7.11.2 <u>Field Offices.</u> The Directorate Field Office survey personnel will require extensive training in statistical procedures in order to improve the accuracy and reliability of data. Nearly all of the agricultural data is currently being collected by extension agents, most of who have no formal training in statistical procedures or computers. The MOA Planning Committee has recently decided that extension personnel will no longer provide this data service and thus, the need for additional statistical enumerators at the directorate level is even more imperative. There is usually one Statistical Specialist in each Directorate Office who tabulates data, but rarely collects production data or conducts surveys. Field offices do not have computers.

The work plan proposes that a part-time person should be added to each Directorate office whose sole task is to collect accurate reliable statistics during the planting and harvesting seasons. This person would report directly to the Statistical Specialist and would work with extension agents when data is collected. This enumerator would be responsible for taking forms out into the fields and would use measurement techniques to record areas and production of field and horticultural crops. An additional person for each field office would raise the statistics staff personnel in the field from 24 to 48 over the next two years.

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Since there are no computers in the field offices, the priority over the next few years is to concentrate on data collection techniques rather than computer literacy. Through workshops and survey training, the competency of field staff will improve resulting in more accurate statistics. Computer installation and training would best be targeted for headquarters staff instead of field offices, although the issue of computerization of all government offices will be taken up as part of a master plan for computerizing government agencies in the near future.

7.12 RESEARCH AND EXTENSION

A major orientation of the Agricultural Policy Charter is to encourage the private sector to provide support services to agriculture in areas which have hitherto been provided almost exclusively by the Government. This section examines the existing capacity of the research and extension system to provide agricultural support services to farmers. It also looks into the capacity of the private sector to provide services to the agricultural community in areas advocated by the Agricultural Policy Charter.

Key Issues and Proposals

- **NCARTT must be allowed by law to set its own personnel policies and salary levels. This is essential for NCARTT to attract and retain high quality researchers.**

- **Research and Extension need to be reunited at NCARTT. The Extension Department at the Ministry of Agriculture needs a continuous flow of technology to disseminate.**

- **The private sector in Jordan has a proven capacity in Research and Extension. It has introduced several innovations in agricultural production. Private sector companies own and operate research stations and laboratories.**

- **The private sector research and development capacity includes: micropropagation techniques, embryo transplantation, seed production and multiplication, soil, plant and fertilizer analysis services.**

- **Below-cost pricing by Government departments hinders private sector involvement in many areas. The following government departments need to move to full-cost pricing to foster private sector participation: Forestry Department-seedlings; Plant Production Department-seeds and seedlings; Department of Animal Health and veterinary health services-vaccines; Department of Plant Protection-formulation and residue control analyses-soil analyses.**

7.13 CAPABILITIES OF AGRICULTURAL INSTITUTIONS IN JORDAN TO CONDUCT RESEARCH AND EXTENSION

A major constraint to agricultural research in Jordan has been the absence of a well defined and comprehensive agricultural development strategy. The Agricultural Policy Charter and the National Agricultural Research Strategy, both presently under consideration by the GOJ, should do much to alleviate this problem.

There is ample research capacity in Jordan with a range of disciplines represented at the universities, the National Center for Agricultural Research and Technology Transfer (NCARTT), other scientific institutions, and the private sector.

7.13.1 Agricultural Research. Research activities under the MOA are conducted mainly at NCARTT, but research in plant protection and tissue culture is conducted in two separate laboratories. NCARTT research has received considerable assistance from international donors. The infrastructure and research facilities developed at NCARTT will meet the country's research needs for the forseeable future. However, key positions in the scientific staff need to be filled and the general quality of staff must be upgraded for NCARTT to fulfill its mandate as coordinator of all agricultural research in the country.

Research at the universities and other scientific institutions is less problem driven than at NCARTT, concentrating more on the development of processes which could be applied to various sectors of the agricultural industry. However, universities have provided backup research to NCARTT and to organizations such as the Jordan Cooperative Organization (JCO), the Jordan Valley Farmers' Union (JVFU), and private companies whose research activities are oriented toward on-farm problems.

The private sector, which is comprised of more than 100 companies, has been aggressive in its activities to identify and introduce new technologies which have been successful in other countries. Notable contributions are the development of the poultry industry, which meets local

demand and exports to countries in the region; the introduction of hybrid seeds, and new species and cultivars of fruit trees; and the introduction of a range of modern inputs to support agricultural production.

7.13.2 Research and Extension Linkages. Communication and coordination is weak between research institutions, between research and extension in the MOA, and is practically non-existent between various organizations with extension activities. NCARTT research results often fail to find their way to becoming useful extension packages, even as extension bulletins generated by various institutions are rarely passed on to NCARTT. Communication between participants in various research activities has been on a voluntary basis, rather than through a formal process. A concerted effort to share research information between institutions is not evident.

The private sector is generally willing to share research results unless they involve new technology which might be patented, or would significantly benefit a competitor. Staff of the Faculty of Agriculture (FOA) at the Unversity of Jordan (UOJ) have stated that of those research results which have potential value to producers, only about 15 percent has been written up in agricultural bulletins.

Farmers' inputs into research planning and execution are minimal, except for research conducted by the JCO and the JVFU, whose research is geared specifically to farmers' needs. A great deal of technological information has reached farmers through the extension activities of several organizations operating in Jordan. However, the results are much below the potential of existing services. For example, bulletins are rarely done which fully describe the recommended cultural practices for crops commonly grown in Jordan. Most of these are for growing specific crop hybrids and are distributed by the private companies which developed them.

Contact between NCARTT and the Department of Extension and Information (DOEI) is limited because of the complex procedures required to arrange official cooperation. Contacts

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which take place are dependent on personal relationships between research and extension personnel.

The private sector is effective in reporting its research by means of bulletins, which are distributed to MOA extension and to farmers. The same may be said for farmers' cooperatives, but distribution of bulletins is generally limited to their members. Extension bulletins based on research at the UOJ are also limited to farmers in the Jordan Valley where most of the research is conducted. Hence, the majority of available bulletins are not funneled to MOA extension.

MOA extension is beset by a number of problems which result in inefficiencies. A basic deficiency is a clear statement from the MOA which describes roles and linkages of extension. Other constraints are a low level of staff training, numerous unfilled staff vacancies, deficiencies in equipment and means of transportation, management, motivation and career potential.

7.14 Agricultural Research in the Ministry of Agriculture

Agricultural research in Jordan began in 1952 with the establishment of the Deir Alla Agricultural Research Station in the Jordan Valley. Following the establishment of two stations at Al-Fariah in the West Bank, a Department of Agricultural Research was established in 1958 with assistance from the United States Agency for International Development (USAID). Agricultural research and extension has been reorganized several times in the past 20 years. In 1970, they were joined to form the Department of Agricultural Research and Extension (DARE). The department was renamed the National Center for Agricultural Research and Technology Transfer (NCARTT) in 1986, when Regional Agricultural Support Centers (RASCs) were planned to be added to serve the country's irrigated, humid, semi-arid, arid, and semi-desert areas. The RASCS were completed in 1991-92.

NCARTT was mandated, by means of By-law number 42 of 1993, to serve as the lead center to coordinate research and technology transfer programs with the various institutions in

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Jordan and to disseminate information to extension for diffusion to producers. This has not happened to date.

Other responsibilities were to conduct studies to determine the technical, economic and social needs of the agricultural community and to arrange for training of farmer and agricultural personnel, based on needs. An impressive body of information has been generated by research conducted on the production of various crops in irrigated and rainfed agriculture. At least 200 bulletins have been produced and NCARTT has generated an estimated 40 percent of the technical information available to the agricultural sector.

NCARTT is, nevertheless, operating under several major constraints:

7.14.1 **Lack of a national agricultural research policy.** At this writing, such a policy has not been approved. However, at the instigation of the MOA, an agricultural research strategy has been developed based on: i) national goals, ii) water availability, iii) production costs, iv) advantages in international markets, and v) demands of domestic, regional, and international markets.

7.14.2 **Lack of managerial autonomy.** The salary scale for civil servants is about half of that received by counterparts with equivalent qualifications at the universities, the JCO or in the private sector. Such salary disparities make it difficult for NCARTT to attract and retain qualified staff, a situation that compromises its ability to take a leading role in research planning and coordination for the country. Low salaries erode staff morale and research projects are interrupted because of staff turnover. High staff turnover, with tenure reported to be an average of 18 months, is a persistent problem at NCARTT. The semi-autonomy granted to NCARTT in 1993 did not permit it to set its own salary and incentive levels. Until its salaries and personnel benefits are equivalent to those of other scientific institutions in the country, the institution will be seriously handicapped in accomplishing its goals.

7.14.3 **Inadequate funding for areas of research that are mandated.** USAID has provided excellent research facilities, many of which are not yet fully equipped or staffed. A shortage of vehicles for researchers adversely affects field efficiency. There are several staff vacancies in research areas of high priority. NCARTT has a total of 132 scientists, of whom only 13 have PhDs and 47 have MScs. Of these, 27 are located at headquarters, the largest group researching issues in soils and irrigation.

7.14.4 **An ineffective system for information exchange between NCARTT and other research institutions.** Information generated by research at the universities and other institutions is shared with NCARTT only if studies are funded by NCARTT. This problem prevails in spite of the fact that NCARTT's research and steering committees include representatives from national scientific organizations.

7.14.5 **Lack of a decentralized management system.** Decision making is concentrated at the top instead of delegating it to appropriate managers. NCARTT has a core of competent and dedicated leaders, to whom introduction of process management would result in significant benefits to the institution.Few NCARTT staff have job descriptions and the development of goals and objectives (with timetables) for each staff member is just beginning in some sections. The Director of NCARTT cannot dismiss personnel for inadequate performance and promotion is based less on employee performance than on length of service.

7.14.6 **System of appointment of NCARTT directors.** The present system under which NCARTT's directors are appointed does not ensure the selection of those who are most qualified in terms of the particular skills needed for the leadership and management of the institution.

7.14.7 **Frequent changes of the Minister of Agriculture.** There have been about 10 during the last 8 years. The Minister is also Chairman of NCARTT's Steering Committee and has the authority to make policy changes. Frequent changes in this position can lead to instability in

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research and extension programs. Development and approval of a formal agricultural policy and strategy should assure the continuity of programs.

7.15 Agricultural Extension in the Ministry of Agriculture

The Agricultural Extension Division was established in the MOA in 1954, nearly 15 years after creation of the MOA. Its responsibility was to transfer research results to producers and to disseminate practical knowledge that would meet technical, environmental and economic standards.

The basic education level of extension staff appears to be satisfactory, with more than 90 percent of the staff having a university degree. However, training is inadequate in extension techniques and technical expertise needed to serve a specific area of assignment is insufficient. A recent survey showed that the majority of staff spend less than half of their time on extension in favor of statistics gathering, administration and input supply. When polled, farmers reported that about half of their information is obtained from other farmers, 25 percent from public extension and 13 percent from private extension services.

Efficient and effective operation of extension is handicapped by the following constraints:

- **New information is not forthcoming from NCARTT.** According to extension staff at DOEI headquarters, no new technology has been received from NCARTT since the separation occurred.

- **Shortage of extension field staff based on planned requirements and a high level of turnover.** There are 63 reported vacancies in the DOEI which are not likely to be filled in the near future.

- **Extensionists are inadequately trained for field assignments.** New staff are assigned to field locations without training in either extension techniques or

applicable technology. As a result, farmer's knowledge is often superior to that of extensionists.

- **Funding for extension is inadequate.** Funding for extension represents 2.9 percent of the MOA budget and 1.2 percent of the 1992 agricultural gross domestic product. Salaries account for 80 percent of the extension budget and only 15 percent is alloted for programs, operation and maintenance. One extension field unit interviewed had one operating vehicle for five field staff.

- **Extensionists are poorly paid; there is little opportunity for career advancement; and extension has a low status.** As a result, the extension service finds it difficult to attract top notch personnel, and staff morale is low.

7.16 The Research and Extension Issue

The public extension service in Jordan is at a crossroads. It must evolve to meet the needs of an agricultural sector that is becoming increasingly divergent, from subsistence farming to sophisticated horticultural production. However, the primary goal remains the same, to provide information appropriate to the needs of farmers in each agro-ecological zone.

Extension and research have been married, divorced and remarried several times, the most recent divorce occurring in 1992, when extension was removed from NCARTT to become the DOEI in the MOA. While these shifts reflect a concern about the effectiveness of extension, they have skirted the basic problems confronting the department. These include: a) a lack of policies and planning to provide focus and long-term direction, b) a clear definition of the role of extension vis-a-vis research, c) a low budget, d) apportionment of the budget, and e) management that is handicapped by government regulations which adversely affect salaries, and staff motivation and morale. Extension persons are more productive in the JCO and much more productive in the private sector, both of which base their management on staff incentives. To

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raise government-based extension to the level of efficiency comparable to services provided in the private sector and semi-autonomous institutions, the following is recommended:

7.16.1 **Reunite extension and research in NCARTT.** This relationship should be maintained regardless of where NCARTT is assigned. The Head of Extension should report to the Director of NCARTT. Assuming that NCARTT will have a continuous flow of technology to introduce, and if NCARTT adopts a system of management by objectives, the advantages of this affiliation would be:

- Facilitation of cooperation between extension and research, hence ensuring the transfer of technology.

- Opportunities for extensionists to participate in the last year of research trials before release of a technology. Extensionists are then trained in a technology as soon as it is ready for diffusion, thus saving a year in getting information to farmers.

- Unused facilities at NCARTT could be used by extension staff.

- A close relationship between research and extension permits formal and on the job training of extensionists on a daily basis.

7.16.2 **Establish a pilot program to measure and determine the effectiveness and performance of DOEI extensionists** when incentives are instituted similar to those adopted by the JCO and the private sector. This pilot program should be undertaken in a well-equipped MOA directorate which has strong NCARTT support.

7.16.3 **Extension activities should be prioritized** and, within the budget, the most important ones implemented. At least 30 percent of the budget should be allocated to projects, instead of the current 15 percent.

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7.17 CAPABILITIES OF THE PRIVATE SECTOR TO CONDUCT RESEARCH AND EXTENSION

It is well established that several innovations in agricultural production in Jordan, as in many other countries, are the result of private sector willingness to pioneer new technologies. For example, rice production in the Zarka River basin between 1952-1956 was a result of technology and know-how brought in from Syria. Other innovations were the introduction and development of commercial poultry production, the use of a fine netting to control insects and virus in vegetables, the introduction of various inputs in crop and animal production, and the introduction and development of high yielding vegetable varieties.

There are more than 100 companies which deal with imports, manufacturing development, production, wholesale, retail and/or distribution of inputs. Activities include trade in pesticides, vegetable seeds, fertilizers, tools, implements and equipment, drip irrigation systems, plastic houses, vegetable and fruit tree seedlings, packing materials, poultry feed, day old chicks, and veterinary products. In 1985, private sector companies employed a total of 116 agricultural engineers who are qualified at the BSc, MSc or PhD levels. At present, it is estimated that the number has more than doubled. Many of these engineers are former public sector employees with research and extension experience. Employees of these companies are more motivated than their colleagues in the public sector because they are better paid and enjoy greater incentives. They are also more mobile since most of them drive company vehicles which enable them to be in daily contact with farmers.

7.17.1 <u>Extension Services.</u> The main goals of these companies is to trade in agricultural production inputs at a profit. Through this activity they offer farmers a wide range of technical services, including the following:

- Advice on how to combat pests and diseases by extensive use of chemical agents;

- Distribution of seed samples of new cultivars and pesticides samples for evaluation;

- Soil sampling and testing to help solve nutritional problems or to economize on fertilizer use;

- Providing farmers with extension leaflets related to production;

- Conducting field days;

- Advice on irrigation system design, installation and maintenance;

- Plastic house erection; and

- Fertilizer and pesticide application.

The links between farmers and private sector extension agents are stronger than those with public sector extension agents because private sector agents:

- Provide inputs to farmers on credit;

- Provide the latest inputs and technologies, e.g. new varieties, pesticides, fertilizers;

- Respond quickly to farmers inquiries, problems and needs;

- Establish a relationship with farmers due to frequent visits;

- Provide manpower to install irrigation systems, erect plastic houses, maintain machinery and sprayers; and

- Deliver inputs where and when farmers need them.

It is evident that the services provided by private sector extension agents, along with the competent dissemination of technology related to material inputs is effective in increasing agricultural production and maximizing farmers' profits. The only reservation involved in this situation concerns the possibility of a vested interest, since these extension agents are essentially sales representatives whose incentives are usually based on sales volume, and therefore commits them to targeting only farmers whose production systems are large enough to warrant investments in time and inputs.

Some large-scale farming operations and investors in agricultural production, especially in the fields of animal production, and irrigated and plastic agriculture, utilize extension services from private consultants. These consultants are usually faculty members from universities or individuals with MOA experience. In a few cases, such as the Abu-Ghazali operations in the Jordan Valley, experts have been brought from Chile to assist the owners in selecting and cultivating new varieties of grapes. Fees for their services are generally too high for small-scale farmers. Consultation and extension services provided by these consultants are highly respected by farmers since their services are not related to sale of inputs. Some consultants serve on agricultural and technical committees, and conduct seminars and workshops for the public sector. They also help in writing and producing extension materials.

It should be noted that the increasing number of private sector consultants reflect the need for extension and technology transfer services not presently provided by the public sector. It also indicates a need for information and training on the establishment and management of agricultural projects.

7.17.2 <u>Research Capacity.</u> Some private sector companies own and operate research stations where new varieties are evaluated before being approved for release to farmers. Their efforts have succeeded in producing hybrid seed of both cucumbers and tomatoes. A few companies focus on the production of virus-free seed potatoes and cut flowers.

As a result of the MOA's permittng private nursery fruit tree production, the private sector began new nursery operations. Several firms have developed mother tree orchards and two companies have established micro-propagation laboratories for the production of fruit tree root stocks, potato tubers and flowers.

The private sector could make additional effective contributions and eventually assume complete responsibility for research and development in the following areas:

- Micro-propagation technologies whereby the private sector could produce in quantity at lower cost, thus opening new markets in the region and possibly beyond;

- Embryo transplantation in the field of animal husbandry;

- Water saving technologies such as drip systems and accessories, as well as soil conditioners;

- Agricultural tools and implements;

- Marketing of agricultural produce utilizing the comparative advantage of agro-climatic zones;

- Packing materials utilizing existing industries;

- Processing of plant, animal and dairy products;

- Seed production and multiplication from the development of hybrids;

- Soil, plant and fertilizer analysis services could be provided by the private sector on a fee basis at cost;

- Veterinary services not offered by the private sector as a sales tool could be provided on a fee basis;

- A seed and plant testing and certification service could be operated on a fee basis, provided additional equipment is acquired. However, the MOA should continue to be responsible for regulatory supervision;

- Rental of modern machinery to farmers.
  Research shows that the moldboard plow should be retired from rainfed areas in favor of machinery that leaves crop residue on the soil surface, thus reducing soil erosion; and

- Virus indexing and analysis for pesticides in food and the environment. The private sector is not equipped at present to do this, and in the short term the MOA should continue to provide these services. When the private sector becomes involved in these activities, they should be regulated by the MOA.

Participation by the private sector in the above-noted areas could be encouraged in several ways:

- Tax breaks on expenditures allocated to research and extension;

- Establishment of patent rights for new technologies and/or new products such as vegetable and fruit tree cultivars;

- Availability of soft long-term loans to support research and development of new technologies;

- Involvement of representatives of the private sector in planning and prioritizing research programs; and

- Establishment of a system of national reward(s) and or recognition for noted achievement or excellence in research and development in various fields of agriculture.

The private sector is capable of tissue culture research, but results are often kept confidential to maintain a superior position in the market place. For this reason, tissue culture services should be maintained in the public sector, as a service to the private sector in teaching and research on additional crops in which basic techniques need to be adapted to suit each new crop. Mature technology could be sold to the private sector, or the private sector can rely on the laboratory to develop practical techniques for a specific crop. Consideration should be given to assigning responsibility for basic research studies in tissue culture to JUST and conducting support studies at the MOA laboratory as a backup for the tissue culture industry.

7.18 Research and Extension Programmes required to Implement Agricultural Policy

Many of the new directions contained in the Agricultural Policy Charter require specific research and extension programmes to translate them into actual implementation. This section lists the various programmes and projects which may be required to implement these new policy directions. The exact components of theses programmes and their implementation requirements will have to be developed in detail as part of the five-year implementation plan.

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TABLE 2.
RESEARCH & EXTENSION PROGRAMMES REQUIRED TO IMPLEMENT AGRICULTURAL POLICY

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Increased food self-reliance	•Improve flexibility of the agricultural sector to enable it to respond to market forces through the removal of subsidies provided to the production of wheat, barley, lentil and chickpeas.	•Research and extension about means to improve land productivity through the use of improved technological practices. •Research on means to develop mechanical harvesting suitable to the land topographhy in order to encourage production of such crops like chickpeas, lentils, sesame and fodder and to reduce costs of production.
Domestic agricultural production competitive in quality and price	•Increase the percent of grade I exportable production. •Increase knowledge of post-harvest, handling and packaging techniques.	•Extension programe aimed at improving cultural practices and help produce high quality produce. •Extension programme to rationalize the use of pesticides to produce crops with acceptable residue levels required by export markets. •Extension programme to improve harvesting, handling, packing and transportation.

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Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Encourage people's participation in developing research and extension objectives, priorities and strategies	Increase farmers participation in decision making and other production and marketing policies.	•National extension programme to promote formation of farmer organizations to improve their participation in economic, social and political activites.
Establish training institutions for agriculture and rural development	Continuous education and training of coherent groups of farmers and extension agents	•Regular training programmes and specially designed courses utilizing facilities of RASCS or NCARTT to strengthen relevant agricultural practices and introduce new technologies.
		•Research contracted by the private sector companies that aim at introducing new technologies like seeds of new varieties and new seedlings of fruit trees.
Conduct processing and marketing research	Promote the advancement of food processing technology through the Universities and private sector industries.	•Research funded by NCARTT in cooperation with the Universities and the private sector to aim at improving agro-industries to render its products competitive in export markets.
Introduce and maintain product standards and grades	Develop clear and well designed specifications and standards for agricultural produce that meet the standards of export markets.	•Extension programme aimed at informing farmers about the standards of wholesale markets both locally and abroad.

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Help in exploring and opening up new markets	Increase exports through the development of existing markets and opening up ones.	•Marketing research through AEPD and AMO in collaboration with private sector export companies.
Develop water storage structures both on-farm and off-farm	Encourage farmers to use improved water storage and conveyance systems to reduce water losses.	•Extension and technology transfer about efficient methods for water storage and conveyance systems.
Design low-cost water harvesting methods in the highlands and the eastern plains	Identify low-cost water harvesting and distribution methods	•Research on most efficient and cost effective mehods in collaboration with UOJ and HCST. •Technology transfer of proven most efficient and economical methods.
Generate and disseminate water saving technologies. Develop crop regimes which maximize returns per cubic meter of water	Economize in using water for irrigation and development of production systems that maximize returns per cubic meter of water.	•Research to develop appropriate technologies that help in economizing in water use. •Extension programme to disseminate these technologies to farmers. •Extension programme to disseminate crop regimes which maximize returns per cubic meter of water used.

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Proper treatment of recycled water	Increase the benefit of using recycled water in irrigation crops and improve use of resources to help protect the environment and public health.	•Research to study the suitability of recycled water to produce various crops and study the effect of the use of crop residues on animal production. •Research programme on the influence of recylced water on soil fertility and productivity. •Research programme on the effects of recycled water on underground aquifers in the regions where recycled water is used for irrigation. •Research programme on the suitability of produce cultivated with treated water for human consumption. •Extension to disseminate information to ensure proper use of resources, protect the environment and public health.
Increase competitiveness by increasing production efficiency	Reduce cost of production and increase productivity.	•Research programme on ways to economize on pesticides, fertilizer, labour. •Extension programme to disseminate research results.

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Encourage fruit tree planting in areas of over 400 mm of rainfall and over 8% slope		•Research programme to identify rootstocks and cultivars suitable for different soils and climatic conditions. •Research programme to improve moisture conservation. •Extension programme on pruning methods, pest- and disease control and harvesting and handling.
In medium rainfall areas encourage farmers to shift to barley-livestock farming system	Improve utilization of resources and increase animal production.	•Extension programmes on the most appropriate method to produce barley and fodder crops and soil tillage using implements that help preserve the soil's organic matter. Extension programme on problems related to animal production.
Improve management and ensure orderly exploitation of the rangelands for livestock production	Ensure sustainability of grazing areas	•Extension on animal husbandry in areas such as selection, nutrition, herd management, diseases, parasites, wool and milk processing. •Research to identify suitable fodder plants. •Extension demonstration programmes on appropriate flock size in light of range capabilities of various areas.

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Reverse desertification	Arrest desertification by reducing soil erosion and increasing plant cover	•Research programme on water harvesting methods and water re-distribution methods to increase plant cover. •Research programme to determine indigenous species and the possibility of introducing new ones. •Extension programme on methods and approaches for range mangement (managed grazing).
Plant fodder shrubs on rangelands	Increase animal production.	•Research on most suitable fodder plants in various soil conditions, rainfall levels and agroclimatic zones. •Research programme on the feed value of various range plants. •Extension programme on most appropriate methods of using range areas. •Extension and supply farmers with fodder plants and demonstrate how to grow and cultivate them.
Integrate forage in crop rotations in rainfed and irrigated areas	Increase and encourage fodder planting to meet the local needs of animal production.	•Extension programme on crop rotation techniques to preserve soil fertility and limit the incidence of pest and diseases. •Research programme on most suitable crop rotation system taking into consideration major crops grown.

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Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Plant natural vegetation in uncultivable places in rainfed areas.	Improve plant cover on non-cultivable lands in rainfed areas.	•Extension on most appropriate method to encourage plant growth and grazing management.
Improve preventive and curative veterinary services	Increase profitability of animal production.	•Training programmes for technicians and veterinarians. •Extension campaigns and educaction programmes for farmers. •Continuous monitoring of animal health situation and effective quarantine at borders.
Improve feeding and husbandy practices	Increase profitability of animal production	•Research on locally available sources of feed from agro-processing plants such as tomato peels and seeds and olive mills and the evaluation of their nutritive values. •Extension programme on animal husbandry..
Increase milk production from goats, sheep and dairy cows for the domestic market	Increase export of livestock products	•Research to develop dairy products (skim milk, yogurt, etc). •Research programme on animal nutrition and local sources of feed and their nutritive value. •Extension programme on animal husbandry and demonstrating the financial benefits of not slaughtering goats and sheeps of less than 35 kgs in weight.

Policy direction advocated by the Policy Charter	Implications of the policy direction	Research and Extension programmes required to implement the new direction
Poultry meat: concentrate on processing, storing and marketing	Balance supply and demand and reduce price fluctuations.	•Extension programme on using slaughter house by-products in animal feed manufacturing. •Extension programme on the importance of cold storage as a mean of assuring even supplies year round.
Government to acquire forest land and develop it accordingly	Increase reliance on afforested lands for grazing.	•Research programme on best method to develop forest lands as grazing areas. •Extension programme about importance of forests to help modify the climate and rainfall patterns.
Improve management of existing forests	Make forests attractive centers for local tourism and educational areas for students.	Extension programme on the importance and feasibility of investment in touristic projects in forest areas.

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7.19 MONITORING AND EVALUATION

This section evaluates the capacity of the government of Jordan and particularly the Ministry of Agriculture to monitor and evaluate the implementation of the Agricultural Sector Adjustment Loan and of the Agricultural Policy Charter. Where necessary it recommends the institutional reforms required to bring such capacity to higher levels of effectiveness. The particular Agricultural Policy Charter

Key Issues and Proposals

- There are several monitoring units currently functioning in the Ministry of Agriculture. All of them are narrowly focused on project monitoring.

- The capacity to monitor the implementation of the Agricultural Policy Charter does not currently exist and needs to be developed.

- The Monitoring and Evaluation Unit of the Agricultural Economics and Policy Department (AEPD) is the most logical seat for monitoring implementation of the APC because the AEPD is the Secretariat to the Agricultural Council.

- The Ministry of Agriculture requires an internal management system to direct its human and financial resources to the achievement of the sectoral objectives spelled out in the APC. Monitoring of these programmes and projects should also be done by the Monitoring and Evaluation Unit.

- To assume the expanded scope of activities just described the Monitoring and Evaluation Unit needs to be raised to a division level and be called the Programme and Project Monitoring Division. Personnel presently located in other AEPD units performing related functions will need to be moved into this divions.

reforms and policy directions which require monitoring and evaluation are identified and a programme for developing the required capacity is suggested.

7.20 Background

The issue of monitoring and evaluation was first introduced in connection with monitoring the impact of the Agricultural Sector Adjustment Loan. The basic idea was to track the progress in implementing the ASAL and to evaluate the impact of the policy changes emanating from the ASAL implementation. Although monitoring and evalution are closely interrelated, they entail completely different approaches and institutional requirements. These are discussed separately below.

7.20.1 On Monitoring. The monitoring requirements of the ASAL have been identified by the World Bank Mission. They include monitoring at four levels: implementation of the legal covenants and enactment of policy changes; movement of macro-economic and sectoral indicators; effect and impact on agricultural production and income; and finally impact on household income of the agricultural population. When discussing monitoring requirements, the World Bank mission raised the issue of locating monitoring in the Ministry of Planning or Ministry of Agriculture.

The Ministry of Agriculture at the same time finalized the preparation of its Agricultural Policy Charter and decided that its implementation also required an effective monitoring system. Since the APC is much more comprehensive than the ASAL in terms of reforms and sub-sectors, it requires a much more sophisticated monitoring system. To provide adequate responses to both monitoring requirements analysis focused first on evaluating institutional capacity within the Government of Jordan to monitor the ASAL. Second, it addressed the monitoring capability within the Ministry of Agriculture to do its share within the ASAL and to monitor implementation of the much broader Agricultural Policy Charter.

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Additionally, the organizational review of the Ministry of Agriculture conducted by MMIS under the Institutional Support Project uncovered the need of a management information systems to steer such a complex institution towards the achievement of sectoral development objectives. Monitoring of programmes and projects within the Ministry was identified as a monitoring need in addition to the ASAL and APC monitoring.

7.20.2 <u>On Evaluation.</u> Evaluation of the ASAL also presents its own particular requirements. The principal objective is to ascertain the extent to which the reforms are reaching intended objectives. Impact evaluation can be done in many different ways but in almost all cases it requires high caliber analysis and applied experience. It is understood that GTZ is funding a German University to conduct all the aspects of the ASAL impact evaluation.

Then there is the impact evaluation of the Agricultural Policy Charter. Periodic surveys are equally required but for the sake of sustainability greater reliance will have to be put on local talent and institutions. Local capacity is essential because the time horizon for implementation of the APC is longer than that of the ASAL.

One final aspect of evaluation must be emphasized. It has to do with evaluating the impact and effectiveness of the development programmes implemented by the technical departments in the MInistry. Examples of these are the afforestation programme of the Department of Forestry, the vaccination programme of the Department of Veterinary Services or the breeding programme of the Department of Animal Production. The accent of these evaluations will be to ascertain the extent to which these programmes have achieved the physical and implementation targets described in annual reports and to provide the basis for programme redesign.

7.21 Evaluation of Monitoring Capacity

The review of the monitoring and evaluation capabilities conducted by the Institutional Support Project in the Ministry of Agriculture found them to be weak. The Monitoring and

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Evaluation Division of the Agricutlural Economics and Planning Department (AEPD) is the main monitoring entity in the MoA, although there are project-specific monitoring units in the Department of Forestry, in the Department of Animal Production and in the Department of Projects. The Monitoring and Evaluation Unit of the Ministry has three professionals mainly concerned with financial monitoring of local- and foreign-funded projects. Data on project expenditures and physical progress are sent from this unit to the Ministry of Planning as it is mandatory in the present reporting system.

The technical capacity of the Department of Animal Production to conduct monitoring and evaluation is lacking. The Department of Animal Production is also not able to do economic analysis of important issues facing the livestock sub-sector or to forecast domestic supplies and prices. At least one analyst should be trained in economic analysis of production and marketing costs and in basic forecasting of domestic and regional supply and demand conditions.

In the Forestry Department the Planning and Studies Division is working principally on the EC-funded Soil Survey and Mapping Project, which is being followed up with land use planning and legislation. The Monitoring and Evaluation Unit, strengthened with funding and technical assistance by GTZ over two years, is largely focused on monitoring of field activities and expenditures, and not on assessing the economic impact of forest preservation and afforestaticn.

Under the APC, the monitoring capacity of the Forestry Department will continue to be strengthened by the GTZ project. Monitoring efforts will be focused on gauging whether sustainable resource management is being practiced in forested areas. Tracking the number of dunums planted to trees and shrubs is considered useful for monitoring afforestation efforts.

Monitoring of the ASAL and the APC requires a monitoring system and a flow of information which exceeds the current objectives and mission of the MoA's Monitoring and Evaluation Division (M&E). In the first place, the M&E Division will have to expand its purview beyond project monitoring and reporting to include agricultural sector performance and

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tracking implementation of policy reforms in the participating agencies. To reflect its new mission and mandate this division is to be called the Project and Programme Monitoring (P&PM) Division.

Necessary data on the performance of the sector is to be collected by a strengthened Statistics Division in the MoA. The principal role of the P&PM division will be to process this into the analytical reports on progress and achievements. The Statistics Division of the MoA will provide data on all agriculture-related topic including changes in crops budgets, cropping patterns, farm and household budgets.

The Ministry of Water and Irrigation (MWI) through the Jordan Valley Authority (JVA) and the Water Authority of Jordan (WAJ) will provide the P&PM Division of the MoA with all water-related data (Details on data requirements are discussed in Sections 7.6-7.11). The Agricultural Credit Corporation (ACC) is to provide information on loans and performance on ASAL-based credit reforms.

The institutional capacity to monitor land and water use and management is limited in the Ministry of Municipalities, Rural Areas and Environment (MMRAE) and MWI. Short-term training courses in monitoring methods could be used to strengthen these ministries' capabilities. It is in the best interest of MOA to support much of this training in order to reduce the scope of policy measures to be monitored by MOA. A short course in monitoring could be offered to two groups: one in the MOA,MOS, and AMO (concerned with changes in price,subsidy, marketing and trade policies) , and another in agencies charged with monitoring changes in resource use or pricing policy (MWI, including JVA).

The Ministry of Agriculture will have to move to a budgeting system based on programmes and projects in order to increase effective use of its current human and physical resources. In addition to developing a new programme-based budgeting system, the MoA will need an effective monitoring and evaluation system to track performance. It is recommended that this capacity be based in the PP&M Division.

To summarize, the Monitoring and Evaluation Unit of the Ministry of Agriculture will play a pivotal role in monitoring implementation of ASAL, in tracking implementation of the APC and in providing the MoA with feedback on programme and project implementation. To accomplish this new mandate the M&E unit will have to be strengthened with more personnel and computing equipment as follows:

- 1 senior staff with 2 junior assistants to continue ongoing project monitoring activities
- 1 senior staff with 2 junior assistants to assemble data from the participating agencies on ASAL performance. This working group will be responsible for writing the progress reports on ASAL and for monitoring performace of the Agricultural Policy Charter.
- 1 senior staff and 4 junior assistants to maintain unpdated information on project and programme implementation.

This section is divided into two parts: monitoring of APC implementation and monitoring of the ASAL.

7.22.1 MONITORING REQUIREMENTS OF THE AGRICULTURAL POLICY CHARTER

7.22.1.1 Sector-wide. The MoA will monitor trends in production costs and access to inputs, price supports and their budgetary impact, effect of price supports on small farmers, avilability and accessibility to essential services and the capacity of the private sector to provide them, adoption of water saving technologies and changes in crop mix. Efforts and programs to target small farmers and create or strengthen self-help groups will be tracked by the MoA. Furterhmore, the MoA will responsible for evaluating the effectiveness and impact of these programs.

7.22.1.2 Irrigated Agriculture. Since different institutions are involved in irrigation agricultural subsector, there is a need to monitor roles of involved institutions and evaluate coordination effectiveness. MOA and MWI will be expected to co-lead coordination efforts.

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Progressive block water pricing policy necessitates monitoring of prices paid for water by Jordan Valley farmers and highland irrigated farms. Sources of required information will be the JVA/WAJ for water pricing data, and the DOS for crop mix data.

Promoting crops which maximize net return to water coupled with promoting export oriented trade policies will encourage cropping shifts and will reduce irrigation water requirements. The MOA will be expected to analyze returns to water use of cropping patterns. Using Customs Service data the MoA is expected to study changes in export composition, volume and values.

MOA/NCARTT will provide basic data on research outlays by sub-sector and be responsible for periodically testing waste-water quality in several sites. UOJ and RSS labs have adequate facilities and know-how to test water quality.

MWI will provide information on water supply levels and monitor the quality of treated waste-water and its allocation to competing uses.

7.22.1.3 **Rainfed Agriculture.** The first two policies in rainfed agriculture are to encourage fruit tree planting in areas with more than 400mm rain and over 8 degree slope, and encourage a shift to barley-livestock production in medium rainfall areas. Monitoring the implementation of these policies needs inspection visits to sloped rainfed areas and to collect statistics on the agricultural land use. The Department of Information and Extension of the Ministry of Agriculture will do inspection visits, while crop area and production shifts will be captured by MOA, DOS, GTZ/ASTAP surveys. NCARTT will assess the impact of fruit tree planting on soil conservation, while crop area and production shifts will be analyzed by the MOA.

The second group of policies are related to land use in rainfed regions. There is need to monitor urban and semi-urban land use and conversion, farm size, subdivisions and land consolidation programs. The monitoring agency for this group of policies is expected to be the Ministry of Municipalities, Rural areas and Environment (MMRAE).

7.22.1.4 Low Rainfall Areas. Monitoring requirements for Low Rainfall (Badia) Agriculture are mainly related to monitoring enforcement of Agriculture Law # 20. The following are the main topics to be monitored: expansion of cooperative rangeland management; forage production; herd and water supply management and grazing control programs; progress in implementing a three-phase program to reverse desertification; roles and activities of range management graduates once they are placed; spending levels and how funds are allocated; and of cross-border movements of livestock at key crossings. Regional cooperation with neighboring countries is absolutely critical, given frequent livestock border crossings for herding or trade purposes.

7.22.1.5 Livestock. In the livestock production subsector, monitoring will cover shrub planting, crop rotation, by-product use, vegetation management, animal husbandry, small ruminant numbers, live-weights, carcass weights and offtake. Also, it will cover milk production of small ruminants and special MOA programs to promote expanded production, private sector investment and processed throughput and trends in processing livestock products, and programs designed to improve preventive services. In addition, monitoring will cover investment of cold storage and marketing facilities, their efficiencies of operation and quality of broiler meat, egg prices marketing volumes, and domestic dairy production and imports(by product type).

7.22.2 MONITORING REQUIREMENTS OF THE AGRICULTURAL ADJUSTMENT SECTOR LOAN (ASAL)

Several studies are to be conducted to prepare baseline information for subsequent comparison with achievements. These include a special socio-economic study of land tenure and user rights, studies of rural finance, and cooperative legislation and cooperative development strategy under ASTSUP (the World Bank). These studies are expected to be externally funded.

7.22.2.1 Impact Evaluation. As indicated before, impact evaluation of ASAL is expected to be supportedt by a GTZ-funded team. They will be supported by the strengthened Statistics

Division of the MoA. The scope of activities and the analytical approach to be used will be developed by the German team under GTZ assistance.

Impact evaluation of the MoA programmes and projects is expected to be a recurrent activity. It is considered essential to improve the internal performance of the MoA as well as its capacity to direct internal resources to the achievement of clearly identified sectoral development objectives. At the outset, programme evaluation is expected to be carried out with the assistance of private consulting firms. This approach will enhance objectivity and provide the opportunity for the on-job-training. At a later stage, evaluation programmes and their implementation are expected to reside entirely within the P&PM division.

The M&E unit will focus on issues concerning dissemination and enforcement of regulations, and appropriate public and private sector roles in research, agricultural sector support services, and post-harvest and marketing functions. Periodic back-stopping from a consultant with similar experience in developing countries will be required. This consultant could participate in the design, execution and write-up of impact assessments.

Evaluation of research and extension policies and programs is also required. Support will be required from a Jordanian research and extension consultant to carry out periodic assessments of institutional effectiveness and research and extension's impact on small farmers..

The MOA will be responsible for evaluating the impact of policy implementation in the Badia subsector. It will assess the extent to which degradation is reversed and the degree of adoption of improved practices by herders in pilot areas. An outside consultant should evaluate how effectively the three-phase program to reverse desertification is conceived, managed and implemented. Also an outside consultant should evaluate the effectiveness of range development projects in promoting changed practices and livestock production systems,and evaluate the effectiveness of monitoring crossing-border movements efforts. MOA senior management and an outside consultant should evaluate the effectiveness of range managers in MOA.

Using sythetic budgets constructed from detailed case studies, the MoA will be expected to evaluate the effects of production and offtake on producer net incomes, and the effect of increased milk production on net incomes. It will assess resulting employment and efficiency gains from private sector investment, cost-effectiveness of preventive measures and impact of improved services on herd size and herder income, analyze net returns to processing and marketing enterprises and producer and consumer prices. MOA/Dept. of Livestock production will assess the impact of the policies which maximize feed production on animal production (growth, live-weights, carcass weights).

The tables below provide schematics for the key monitoring and evaluation tasks. Beginning with selected policy reforms, the tables also present needed measures which provide monitoring data for evaluation regarding farm- level economic impacts, market-level economic impacts and resource use and management.

Table 7.1

Selected Policy Reforms to Monitor

Policy Objective	Implementation Measures	Implementation Timetable	Implementing Agency (provides information)
Reduce area planted to wheat	Reduce wheat support price when it is > import parity price	Agree acceptable method for cal-culating import parity price by 8/94 and apply.	MOS implem.; MOA & DOS data.
Reduce area planted to tomatoes	Eliminate tomato support price	Precondition of ASAL presentation to Board.	AMPCO implem.; JVA, MOA, DOS data.
Increase competition in tomato processing	Eliminate AMPCO tomato procurement monopsony	Done prior to ASAL appraisal. Privat-ization timetable to be agreed upon.	AMPCO, MOIT implem.; AMO data.

Policy Objective	Implementation Measures	Implementation Timetable	Implementing Agency (provides information)
Eliminate import & export controls on key agric. products, packaging & planting materials	Eliminate import restrictions on onions, potatoes, apples, garlic	Precondition of ASAL presentation to Board.	AMPCO, MOIT implem.; Customs data via DOS, AMO, MOA.
Simplify agric. product import & export procedures	Eliminate export licenses	Some X/M licenses removed. Others need to be elim.	MOS, MOIT, MOA, AMO
↓ overstocking & use of artificial cheap imported feed	Eliminate subsidies on barley & wheat bran.	Timetable to be determined.	MOS. MOA & DOS data
Increase invest-ment & competition in agricultural marketing	Eliminate fixed marketing margins & retail prices	Precondition of ASAL Board presentation	MOS implem.; MOA & DOS data
ACC becomes more commercially oriented agricultural bank	ACC to charge higher interest rates & accept savings deposits	Adopt policy statemt., charter & loan recovery plan by 8/94. Implement program by 8/95.	ACC. Studies Dept. to monitor
Raise cost of irrigation water in Jordan Valley	Increase O&M water charge to Jordan Valley farmers	O&M charge from 6 fils/m3 to 15 fils/m3 by 8/94; 25 fils/m3, 8/95	Jordan Valley Authority, MWI. DOS cross-check.
Charge well water users higher fees for drawing water	Do volumetric metering on all public & private wells in Jordan.	Agree policy to enforce metering by 8/94. Implement policy by 8/95.	Water Authority of Jordan, MWI. DOS cross-check.
Stop irrigating in low-potential zones with non-renewable water	Enforce Agricultural Law # 20 which prohibits irrigation on land w/< 200 mm. rainfall	Agree program for renegotiating re-maining Disi contracts prior to ASAL Board presentation. Complete renegotiation or termination of Disi contracts by 8/95	MOA, Dept. of Badia. Special rangeland (Badia) development projects.
Reduce conversion of prime highland land to urban uses	Establish a five-year moratorium on land convers-ion. Tax future conversion.	As soon as Charter is approved	MMRAE (Min. of Municipalities, Rural Areas and Environment), Land Dept, MOA
Avoid land fragmentation	Enforce current regulations that prohibit land units < 10 dunums		MMRAE, MOA & Land Dept.

Policy Objective	Implementation Measures	Implementation Timetable	Implementing Agency (provides information)
Maximize forest cover in Jordan	Prohibit tree cutting	Ongoing; stren-gthen capacity to enforce law	MOA, Dept. of Forestry & Afforestation
Provide incentive for private sector investment in livestock production	Eliminate public sector monopoly on livestock slaughter		MOA, Dept. of Animal Health; MMRAE

TABLE 7.2

Farm-Level Economic Impacts

Subcomponent to Evaluate	Data Source	Timing of Collection	Evaluatn Agency	Timing of Evaluation
Shifts in cropping patterns	MOA, DOS, GTZ/ASTAP	Annual surveys	GTZ/ASTAP M&E Unit	Annual after survey.
Shifts in water use and prices	MOA, DOS, GTZ/ASTAP, JVA, WAJ	Annual surveys; Ongoing	M&E Unit, GTZ/ASTAP; JVA, WAJ	**Annual after survey. Establ. by JVA, WAJ**
Changes in levels & costs of other input use	DOS, GTZ/ASTAP	Annual surveys	GTZ/ASTAP M&E Unit	Annual after survey.
Changes in output prices received	GTZ/ASTAP DOS	Annual surveys	GTZ/ASTAP M&E Unit	Annual after survey.
Changes in enterprise-level profitability	GTZ/ASTAP DOS	Annual surveys	GTZ/ASTAP M&E Unit	Annual after survey.
Changes in farm income	GTZ/ASTAP DOS	Annual surveys	GTZ/ASTAP M&E Unit	Annual after survey.
Changes in enter-prise mix (within farm; farm vs. non-farm)	GTZ/ASTAP DOS M&E Unit	Annual surveys; Case studies		Annual after survey; periodic case studies.
Changes in employment in farm households	GTZ/ASTAP M&E Unit	Annual surveys; Case studies	GTZ/ASTAP M&E Unit	Annual after survey; periodic case studies.
Changes in land ownership, tenure, and area cultivated & planted to trees	GTZ/ASTAP M&E Unit	Annual surveys; Case studies	GTZ/ASTAP M&E Unit	Annual after survey; periodic case studies.
Changes in levels of farm indebtedness	GTZ/ASTAP M&E Unit	Annual surveys; Case studies	GTZ/ASTAP M&E Unit	Annual after survey; periodic case studies.
Changes in farm and hired labor use & costs	GTZ/ASTAP M&E Unit	Annual surveys; Case studies	GTZ/ASTAP M&E Unit	Annual after survey; periodic case studies.

TABLE 7.3
Market-Level Economic Impacts

Subcomponent to Evaluate	Data Source	Timing of Collection	Evaluation Agency	Timing of Evaluation
Import/export price trends	Customs Service	Continuous	MOA/M&E Div AMO	Semi-annual
Import/export volume, composition trends	Customs Service	Continuous	MOA/M&E Div AMO	Semi-annual
Competition in key export markets (price, quantity, quality)	Intl. studies (WB, ITC, COLEACP); AMO	Continuous	MOA/M&E Div AMO	Semi-annual; special con-sultancies
Wholesale price trends	AMO, MOS	Continuous	MOA/M&E Div AMO	Semi-annual
Wholesale market volumes	AMO, MOS	Continuous	MOA/M&E Div AMO	Semi-annual
Wholesale market transparency & performance	AMO, MOS; municipal market author-ities; special studies	Ongoing observation; periodic studies and assessment	M&E Div with consultant (and support from AMO?)	Periodic; yrs. 2 & 4
Private sector response to improved grades, standards, regulations	Special studies; AMO, MOS; municipal authorities	Periodic studies & ongoing observation	M&E Div with consultant (and AMO & Livestock Prod. Dept.?)	Periodic; yrs. 2 & 4
Improved crop handling, processing & mkt.	Special studies, NCARTT	Periodic studies	M&E Div with outside consultant	Periodic; yrs. 3 & 5
Improved live-stock slaughter, processing & marketing	Special studies; Livestock Production Department	Periodic studies	Livestock Production Department (with outside consultant)?	Periodic; yrs. 3 & 5
Provision of private sector support services	Special studies	Periodic studies	M&E Unit with outside consultant	Periodic; yrs. 3 & 5
Broad price policy, incl. support prices & subsidies	Special studies	Periodic studies	M&E Unit; MOA/Policy Analysis Div.	As needed, when problems arise.

TABLE 7.4
Resource Use and ManagementImpacts

Subcomponent to Evaluate	Data Source	Timing of Collection	Evaluation Agency	Timing of Evaluation
Crop choice maximing returns to water	GTZ/ASTAP DOS; JVA & WAJ	Annual surveys	GTZ/ASTAP; M&E Div, MWI	Annual after survey.
Effectiveness of coordination in using water	JVA, WAJ MWI, MOA	Continuous	M&E Unit; consultant	Ongoing; consultant in yrs. 2 & 4
Farmer adoption of water-conserving technologies	MOA extension service; NCARTT	Continuous observations	M&E Unit; consultant	Ongoing; consultant in yrs. 2 & 4
Effectiveness of regional water management	MWI	Continuous	MWI	Periodic written assessments to be determined
Wastewater use on rainfed farms	MWI, MOA extension service	Continuous	MWI, MOA extension service, UOJ, RSS	Periodic written assessments to be determined
Effectiveness of programs to promote tree planting & soil conservation	MOA extension service; NCARTT	Continuous	MOA extension service; NCARTT, MWI	Periodic written assessments to be determined
Effectiveness of programs to promote forage production on farms & rangelands	MOA extension service; Dept. of Badia*	Continuous	MOA extension service; Dept. of Badia	Periodic written assessments to be determined
Effectiveness of enforcing Agricultural Law #20; program to reverse desertification	MOA/Dept. of Badia & Animal Production; rangeland management projects	Continuous	MOA/Dept. of Badia & Animal Production; rangeland management projects	Periodic written assessments to be determined
Effectiveness of forestry protection & management programs	MOA/Forestry Department	Continuous	MOA/Forestry Department	Periodic written assessments to be determined

* At present, the Department of Badia is moribund. Chapter VIII recommends consolidation of range programs within a strengthened range department. This could conceivably be the Badia Department of the future.

Chapter VIII

INSTITUTIONAL IMPLICATIONS FOR THE MOA OF IMPLEMENTING THE APC

8.0 Introduction

This chapter aims to identify and examine key issues related to the institutional capacity of the Ministry of Agriculture (MoA) to implement proposed measures of the Agricultural Policy Charter (APC) and develop recommendations to improve effectiveness of the MoA. The chapter is divided into five sections.

The first section of the study presents the MoA from a management perspective. It identifies a variety of management criteria by which the current structure of MoA has been organized. The current functions of both the central and field departments are detailed. The second section distinguishes two major types of constraints, public sector and internal, hindering the organizational efficiency of the MoA. Recommendations to improve the organizational performance of the Ministry are identified in the following section. The fourth section introduces organizational requirements for implementation of APC new organizational structure, associated with the directives of the APC. This section illustrates the proposed alternative organizational changes for the MoA. A multi-stage process presenting organizational options is also discussed. This section also identifies improved outcome resulting from adoption of either option. The final section maps the organization development plan to support the AP implementation process in the MoA.

8.1 Methodology

The methodology employed herein is principally participatory involving personnel at the MoA, field directorates and related institutions involved in policy implementation. Close

cooperation has been maintained throughout with other group members and experts. Information for this study was gathered by attending an inception workshop, interviewing key personnel, organizing focus group sessions, questionnaires, and reviewing literature regarding the agriculture sector. This approach was applied in order to ensure effective and proper participation by key personnel and concerned parties and to support organizational development to ensure long-term commitment to proposed APC changes.

The management team assessed the organizational structure and specific areas were evaluated with regard to functions, activities, systems, utilization of human and physical resources, and assessment of training and staff development programs. MMIS reviewed coordination practices and linkages between MoA headquarters, field directorates and other institutions involved in the agriculture sector.

MOA - Key Organization and Management Issues

Major functions of the ministry are distributed among numerous departments. The ministry needs to group its tasks and responsibilities into four major areas: Agricultural Development, Policy Analysis, Agricultural Control and Administrative Affairs and Services.

The present span of control is wide thus hindering the process of efficient supervision, performance appraisal and evaluation.

The planning process in the ministry is not used as a management tool. The ministry needs to establish a planning process to ensure participation and institutionalize accountability measures.

The present organizational structure of the MoA does not foster coordination. Thus creating the need for various formal (committees) and informal (interpersonal contacts) channels. Systems and procedures need to be clearly defined to enhance interdepartmental coordination.

The MoA should develop an organizational strategy to determine central departments' authorities and to decentralize tasks and responsibilities in the field directorates.

Organizational development efforts at the MoA are progressing in a non-systematic manner. The MoA needs to strengthen its administrative functions to establish systematic approach that ensures continuity of organizational development programs

The reorganization of the MoA to respond to APC proposed changes requires a multi-stage approach to ensure the acceptance, involvement and commitment of ministry personnel.

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8.2 The Ministry of Agriculture from a Management Perspective.

Organizations can be viewed as a series of subsystems that are interrelated and interdependent. Therefore, an organization exists not only as a system in its own right, but also as a subsystem of a larger system. Thus, organizations can be examined and described from at least three highly interrelated perspectives:

Structural-design perspective: The way the organizational design is determined, which includes the formal subsystems of the organization and the way in which these subsystems are linked together.

Work Flow Perspective (Procedures): The way functions are assigned and grouped among different departments (planning, objectives, personnel policies, teamwork, centralization or decentralization of functions and management development).

The human perspective: This deals with individual behaviour traits, including desires, needs and beliefs, the interaction of individuals with the group, including inter-group relationship and the development or change of group norms and standards, and the interaction of individuals with the organization as a whole.

The system approach used in studying MoA organizational effectiveness and efficiency includes examining the organizational design that constitutes the base for any future development, the information flow required to enhance planning and monitoring activity, and finally assessing human resources aspects of the MoA. The optional organization effectiveness can be attained only if all the three perspectives are considered concurrently.

* **Current Organizational Structure of the Ministry of Agriculture (MoA) - (see Table-1)**

This section will examine the **Agricultural Council (AC)** which is the main conduit through which the Ministry of Agriculture coordinates with those government agencies which affect the performance of the agricultural sector. The current structure of the **MoA** will be examined in terms of central departments, functions and staff. A description of the **Field Directorates** follows. Field directorates are the main link of the MoA with rural areas.

Table - 1

Current Organizational Chart of the Ministry of Agriculture

8.2.1 Agricultural Council (AC). The mission of AC is to formulate Jordan's agricultural strategies, and define policies related to production, extension, research, finance, and marketing of agricultural products including livestock and plant production. Its duties include developing plans and programs for agricultural development and evaluating laws and regulations impacting on agricultural sector.

The Agricultural Council is chaired by the Minister of Agriculture. Members of the council are:

- Minister of Water and Irrigation
- Minister of Municipalities, Rural Affairs and Environment
- Minister of Higher Education
- Minister of Planning
- Minister of Industry and Trade
- Minister of Supply
- Secretary General - Ministry of Agriculture
- Director General - Agricultural Credit Corporation
- Chairperson - Jordan Valley Farmer Union
- Chairperson - Professional Association of Veterinarians
- Chairperson - Professional Association of Agricultural Engineers
- Four representatives from the regions in Jordan appointed by the Minister of Agriculture

The Agricultural Council has witnessed frequent changes in membership due to position-based representation. It is perceived as an advisory body which meets irregularly and whose actual functions are not in total harmony with those stated in its bylaws. Recently, the policy analysis department in MoA was assigned to work as Secretariat to the Agricultural Council.

8.2.2 The Ministry of Agriculture (MoA). The MoA has been organized using a variety of management criteria:

Functional (extension and information, agricultural economics and policy , administrative affairs, finance, administrative development, projects);
Sub-sectoral (forestry, badia, rangeland);
Services (plant production, plant protection, livestock production, veterinary, machinery and construction);
Geographical (all directorates);
Expertise (advisors, Assistants to the Secretary General, committees).

The total personnel of the MoA number 6,128 (data collected Dec. 1993), 2,300 of which are daily labourers. Of the 2,828 permanent staff members, 38% are at MoA headquarters and 62% in the field. 20% of the permanent staff are agricultural engineers, 17% are high school graduates, 9% have less than high school education, 9% have diploma degree, 3% are veterinarians, 2% have other university degrees. Only 30% of the staff members fall in the category of "classified" according to civil service regulations. The rest are hired under lump-sum, contractual or as daily labourers.

The Minister of Agriculture and the Secretary General are assisted by three assistants in the fields of: Livestock Production and Health, Plant Production, and Administrative and Financial Affairs. Moreover, the Secretary General has three advisors in the areas of farmer services, legal and technical issues.

At the executive level, three committees operate: Planning, Reorganization and Steering. The Planning Committee's responsibilities include recommending policy direction, developing the ministry's work plans, follow-up on implementation and preparing the annual budget. The Reorganization Committee was formed in light of the MoA's pressing concerns and needs to reorganize and manage its major activities. The Steering Committee is responsible for the

planning and implementation of MoA projects. Its membership is shared by the Minister of Agriculture, Secretary General, Secretary General of the Ministry of Planning, Director-ACC, Director-JCO, Dean of Faculty of Agriculture (University of Jordan), and two representatives of the private sector.

The MoA operates through 14 central departments (whose functions are listed in Annex 1):

- Plant Production
- Plant Protection
- Animal Production
- Animal Health
- Forestry and Afforestation
- Information and Extension
- Projects
- Agricultural Construction and Machinery
- Economics and Agricultural Policy
- Personnel
- Administrative Development
- Finance
- Public Relations and Training
- Badia

Field activities are overseen through nineteen district directorates distributed over eight governorates (four new districts have been upgraded recently to governorates). All of these management units report **directly** to the Secretary General. In addition there are numerous ongoing projects which refer issues to the Secretary General.

MoA coordination with other institutions in the agricultural sector is achieved at many levels. At the highest, the Minister of Agriculture chairs the boards of NCARTT, ACC, AMO

and the Agricultural Council. The Secretary General of the MoA is a member in the boards of AMO, JVA, WAJ, Higher Council of Supply, Royal Geographic Center. Heads of Departments of the MoA participate in a variety of inter-institutional committees such as the Purchasing Committee in the Ministry of Supply and Project Selection Committee in the Ministry of Planning.

8.2.3 Field Directorates. According to the bylaws which created field directorates, each field directorate is expected to consist of five divisions: Extension, Technical Services, Rangeland, Veterinary, Administrative and Financial Affairs. Directorates interact with the ministry on the following issues which include: Administrative matters, Supplies (inputs, machinery), Training needs, Forestry programs, Extension, Licensing and Registration.

According to the MoA regulations, tasks and duties of field directorates are as follows:

- Define agricultural activities in the area , provide all information and statistics, disseminate relevant information through available media-channels.

- Identify development opportunities and suggest ways of developing these opportunities.

- Identify technical and organizational obstacles which hinder the agricultural sector in the area and suggest solutions.

- Participate in the implementation of plans targeted at developing the agricultural sector in the region.

- Develop work plans which adhere to the overall plans of the ministry and implement them.

- Provide numerous types of extension services for all agricultural activities.

- Exchange information with NCARTT, transfer technical information, identify problems which affect the agricultural sector and help find proper solutions for such problems.

- Implement programs to combat pests and epidemics of livestock and plants.

- Organize and participate in activities and functions related to agriculture in the area.

- Enforce rules and regulations in the agricultural sector.

8.3 Organizational and Managerial Constraints of the Ministry of Agriculture

Analyzing the current organization of MoA identifies two types of constraints, public sector wide constraints and MoA specific constraints. Such constraints hinder the effective utilization of both human and physical resources. The public sector wide constraints revolve around financial and civil service regulations, whereas the specific MoA constraints revolve around the structure of the ministry, distribution of responsibilities, delegation of authority and management practices.

8.3.1 Public Sector - Wide Constraints:

- The establishment of new units in ministries is at times an ad-hoc initiative stemming from the central government, as was the case in creating the Administrative Development Departments and the decision to establish the Legal Advisory Units.

- In the public sector approval and final decision-making for budget allocation and procurement (exceeding ceiling price) falls under the responsibility of the Budget Department at the MoF. The MoA as other ministries, is confined to preparing budgetary requirements. It is the norm for MoA to receive 60-70% of requested funds. Government regulations do not allow revenue transfers within units as revenues are directly paid to the GOJ General Budget and not to the unit rendering the services.

- Pay scales in the government are lower than in the private sector resulting in demoralization, absenteeism, low performance standards and expectations

- Overlapping in government institutional jurisdictions results in higher utilization of resources and negatively affects overall sector performance

- Management is still an underdeveloped discipline. Management style is non-participate and rigid.

8.3.2 MoA Specific management constraints:

- The existing MoA structure is flat with fourteen central departments and nineteen field directorates reporting directly to the Secretary General. Such an organizational setup puts considerable pressure on the Secretary General's position. The Secretary General is also a member of the Planning, Reorganization and Steering Committees, and a board member of NCARTT and AMPCO, in addition to representing MoA in various institutions including the MoS, JVA, ACC, and JCO. This results in management overload insofar that no single person can be expected to manage and oversee so many functions effectively.

- Field directorates must refer any requests to the MoA for decision-making regarding material procurement, human resources, machinery, etc. The functions of field directorates are primarily management supervision of their staff and field activities.

- Responsibilities and authority which are decentralized to the field directorates are not clearly defined, creating overlapping responsibilities between the field and the central offices.

- Delegation of authority is minimal resulting in lower performance. Lines of authority indicate that decision making is centralized at the top level of the MoA organizational hierarchy.

- Development activities at the executive levels are not given due priority owing to managerial involvement and preoccupation with day-to-day procedural tasks.

- The planning function at the MoA is not well developed or utilized as a management tool for measuring and evaluating performance.

- No established mechanism for information flow exists among the personnel at MoA. As a result, internal communication channels are weak and staff are often unaware of what is occurring within the ministry.

- Periodical reports produced by departments are not designed to serve management functions (planning, control and follow-up).

- Human resources development plans are weak as there is no allotted budget for training at the MoA. Training is provided primarily through donor funded projects.

- Differential payment scales applied to civil servants at large are partially related to degrees of specialization. Such pay standards create internal conflicts (e.g. veterinarians are paid higher than agricultural engineers who assume similar responsibilities).

8.4 Recommendations to Improve Organizational Performance of the Ministry of Agriculture and the Agriculture Council

Increasing the capacity of the MoA to function in an improved manner, requires modifications in the areas of organizational structure, management practices and human resources policies. The following are major recommendations for the key issues:

8.4.1 *The Agricultural Council (AC)* Activate the Agricultural Council (AC) as a policy making body and as a forum for participation in policy issues. The council should extend its membership to include representatives from the private sector, namely Chamber of Commerce; Chamber of Industry, Export Associations, and more farmers' representatives.

8.4.2. *The Ministry of Agriculture (MoA).* Reorganize the Ministry of Agriculture taking into account the need to:

- Reflect the relative importance of the MoA functions in the organization structure.
- Clearly define tasks and responsibilities of central departments and field directorates.
- Reduce number of units reporting to the Secretary General
- Strengthen the organizational relationship between the MoA central office and the field directorates.

Establish a systematic planning process which ensures the participation of the ministry's units in setting priorities and objectives. Planning can also serve as a tool to establish

annual accountability tables for key positions in order to provide them with periodical targets related to tasks, budget and time-frame.

Design a reporting system that will serve the management functions and ensure timely delivery of needed information.

Assess the need for office automation and establish a computerized network to link MoA's central offices with the field directorates.

Intensify efforts to develop human resources in the MoA. These efforts will include:

- Detailed analyses of personnel qualifications and skills
- Identification of work standards and requirements in each department and unit.
- Personnel development plans to include training, career planning and other appropriate measures.

8.5 Organizational Requirements and Proposed Organizational Changes for Implementing Agricultural Policy Charter

8.4.1 Organizational Requirements. To implement the Agricultural Policy Charter, the MoA organization should be adjusted to meet the following requirements:

The Policy Charter requires that MoA places more emphasis on development promotion functions. This requires the redefining of functional areas and improved management planning and control mechanisms to help translate policy objectives into effective action plans.

The Policy Charter emphasizes the need for greater people's participation in policy formulation, decision making and ensuring their involvement in the implementation

activities. This requires the setting of organizational mechanism to improve the quality and degree of participation of the different actors in the agricultural sector.

Human resources and facilities in the MoA are not being effectively utilized. The reforms advocated by the APC require an MoA which can deliver improved support services and technology to the agriculture sector. This necessitates setting up systems to track performance and monitor the use of material resources.

The private sector and the cooperatives are expected to play an increasingly important role. The MoA needs to redefine its major areas of concern and activities to stimulate the private sector and the cooperatives to participate in the agricultural sector.

The APC points out the need to clearly define the roles and responsibilities of the various agriculture-related institutions in order to ensure accountability, transparency, improve coordination and eliminate duplication.
The Policy Charter recognized the need to upgrade the quality of local agricultural products and to meet regional and international export markets requirements. MoA should provide a mechanism to enforce regulations that ensure the quality of agricultural inputs and activities in order to maintain a competitive quality of agricultural production.

The formulation and implementation of the Agricultural Policy will be the responsibility of the MoA according to the APC. The structural design will consider APC goals and requirements.

8.4.2 **Proposed Organizational Changes for the MoA.** Meeting the APC organizational requirements will entail introducing major changes to MoA functions, structure, human capabilities and management practices. The changes will include:

- Redefining the major functional areas of MoA to include strengthening development, planning and monitoring functions; redefining the regulatory

functions and gradually phasing out revenue generating services to be ultimately transferred to the private sector and/or other institutions.

- Greater involvement of the field directorates in decision-making process at the MoA requires strengthening the linkages with the central departments and simultaneously securing greater flexibility for field directorates to better serve their communities.

- Change in authority lines and reporting relationships which will take different patterns.

- Change in top management activities: The structural changes will require substantial delegation of authority in operating matters; the administrative assignments of top management are supposed to become increasingly concerned with matters of broad policy and less with details, as the latter will be delegated to lower echelons.

- Development of new communication structure in the MoA: This implies that information flow within the ministry's departments should be closely related to the organization structure. Decision centers to be located in light of communication considerations.

- Communications will be organized so that decision makers receive the information which have significance for the effectiveness of their decision. Direct lateral communications among middle and lower echelon decision units to be strengthened in order to achieve effective coordination.

- Improvement of the capabilities and the values of MoA staff at all organizational levels will include management, interpersonal and technical

capabilities. Improvement plans to be designed in light of the functional and structural changes.

The major challenge which will face the MoA management in introducing this comprehensive change is to mange the change process, taking into consideration two main issues, first, the changes will be implemented with the current human, financial and management resources; second, the MoA must ensure the stability of the Ministry's operations during the change process. Therefore, it is of utmost importance to the MoA to adapt an approach to introduce change that meets the above mentioned requirements.

8.4.3 Proposed Organizational Changes Approach for the MoA. This section presents an organizational development option for the MoA using a multi-stage process to gradually introduce change over time, in line with the APC reform program and time-frame to enhance participation and commitment by the Ministry's staff members. In this context, organizational change is introduced in three stages: transitional, intermediate, and final.

The aim of the transitional stage is to develop the need for change, to change the forces keeping the Ministry at its current situation, and to establish a change relationship. At this stage, information about current discrepancies will be introduced, planned efforts will be invested to decrease the strength of current negative values, attitudes and behaviors resulting from misinformation about the change. Involvement of staff member in preparation to introduce change will be developed.

The aim of the intermediate stage is to work toward change. At this stage major changes will be implemented: The organizational structure will be developed, new procedures and flow of information will be installed. In addition, new values, behaviour and attitudes will be developed through obtaining new management skills and using other supporting mechanisms to introduce change in organizational culture and group-norms.

The aim of the final stage is to stabilize the change. At this stage planned efforts will be used to reinforce the positive attributes of the new system; retraining will be conducted along with performance evaluation that will include productivity, absenteeism rate and staff turnover. Results of evaluation to be made available to all staff members.

The following sections describe the major functional changes that will be implemented at each stage and the major structural issues that should be considered accordingly. The final section presents an action plan to introduce other organizational, managerial and behavioral changes to the MoA.

8.6 The Transitional Stage. The proposed organizational changes in the transitional stage should be comprehended by key decision-makers and implementors as a preparatory step to introduce changes proposed by the APC.

This stage is an important step in changing the organizational structure and culture of MoA. This stage will enable the MoA management and staff to enhance the Ministry's capacity to meet the expected role of the Ministry and ensure the commitment and awareness to the change process.

During this stage, policy actions that are recommended by the Policy Charter will be put into effect such as reviewing the legal framework, removing price controls and establishing various forms of farmers organizations. This will give the MoA the time to build systems and capacity to implement the agricultural policy such as monitoring, statistics and planning.

During this stage, the Ministry will identify the potential services and areas that can operate on commercial basis and/or in which the private sector participation is desired.

Therefore, At the transitional stage (Table-2), the current activities in the MoA are grouped within six functional areas: Livestock Development; Plant Development; Forestry and Rangeland; Agricultural Economics and Policy; Coordination with Field Directorates; Administrative Affairs and Services.

This grouping of functions is based on the currently set objectives of the Ministry. The objective of agricultural development will be realized by the activities of plant and livestock production; plant protection and animal health services; and extension. The achievement of the Ministry's role in the conservation of natural resources will be realized through the activities of forestry management, afforstation and range land management. The objective of policy formulation, agricultural development planning will be achieved by the support of the activities of the agricultural economics and policy function. Insuring proper communications with field directorates and greater input will be achieved by the proposed function of field directorates coordination. The function of administrative affairs and services would include all inter-ministry services.

This functional restructuring will require considering devolving authority over each area to a senior official, thereby providing the Secretary General with a management and decision making support cadre. This functional reorganization also promotes more effective use and coordination of the Ministry's human resources.

Changes at this stage include two newly established functions; one to coordinate field directorates activities, and another to provide legal services to top management. It is recommended that a public relations function be attached to the Secretary General's office. Both machinery and construction and projects activities are considered as part of the Administrative Affairs and Services functions due to the administrative nature of tasks both departments are rendering to the Ministry.

It is recommended to consider the proposed functional grouping as a basis to reorganize the Ministry at this stage.

As a result of changes introduced at this stage, the Planning Committee, consisting of the Secretary General, the heads of the six functional areas, and the legal council, is anticipated to play a more effective and comprehensive role in developing MoA future strategies.

Table 2 illustrates two groups of functions in the MoA in the transitional stage: first, the top management support function; second, the proposed executive functions and their related activities.

Table - 2

Ministry of Agriculture

"Transitional Stage"

8.7 The Intermediate Stage. The intermediate stage should be perceived as the stage of introducing and implementing fundamental changes in the ministry's organization to meet the APC requirements to take place upon revision and finalization of laws and regulations related to the APC implementation, and after effecting other policy actions recommended by the agriculture policy.

At this stage, two groups of functions in the MoA have been identified: Developmental and Administrative (Table-3).

Development functions will provide methods and means to:

- Integrate and coordinate efforts and resources available to the different MoA agricultural sub-sectors and other involved actors and institutions in order to achieve the policy objectives.

- Optimize the efficiency of the agricultural services and ensure their effective delivery to farmers and other intended target groups.

- Define areas of involvement for the MoA; provide conductive policy environment and track and monitor the impact of change on the agricultural sector.

The development functions will include: Development Programs, Agricultural Economics and Policy, and Laboratory Management.

Administrative functions will contribute to:

- Ensuring the quality of agricultural inputs and activities in Jordan which will result in upgrading the standards of local agricultural products to meet export markets requirements.

- Ascertaining the active involvement of field directorates in carrying out their major role as a link with farmers and the public in different areas.

- The efficient utilization of human, financial and material resources required to carry out the Ministry's functions.

The administrative functions are to be achieved through: agricultural control, coordination of field directorates and administrative affairs and services.

The Ministry would be organized taking into consideration the following organizational aspects:

- Clear distinction between the central department and field directorates' responsibilities;

- Central Departments are expected to plan, monitor and design development programs and projects, set standards, control agricultural activities, input and output, ensure coordination among the ministry departments and with other institutions.

- Field Directorates will implement the MoA programs, projects, and provide services, including issuing licenses, to farmers and the public at large (Table-4).

- Field directorates will be grouped into five regional offices in accordance with government regional development distribution.

This distribution will ensure the proper organizational links between the Ministry and the field directorates. These links will be maintained in the case of applying the government decentralization policy, which requires Directors of field directorates (for all ministries) to report to the governors in their respective governorates. On the other hand, the regional offices will

have more power to implement the Ministry's programs by utilizing greater resources in the region.

- All laboratory services will be supervised by a laboratory management unit to ensure their effective operation and rendering of quality services.

- Agricultural development programs will be responsible for the design of short and long-term nation-wide agricultural programs in cooperation with the different actors involved in the agricultural sector.

- Agricultural control functions will ensure compliance with the set standards for the quality of the agricultural products .

- Machinery and construction functions to be transferred to the Administrative Affairs and Services function.

- The planning function within the AEPD will identify priorities and develop medium and long-range plans, monitor their implementation and assess progress.

- Extension will be integrated as a core component in Agriculture Development Programs in coordination with NCARTT.

Table - 3

Ministry of Agriculture

" Intermediate Stage "

* *The MoA may consider the six operational functions as executive functions in reorganizing the Ministry; an alternative organizational structure may be designed by grouping the proposed functions under two main areas: Development and Administration. Development would include the agricultural development program, laboratory management, and the agricultural economics and policy analysis, while the Administration would include the field directorates coordination, agricultural control, and the administrative affairs and services.*

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Table - 4

Field Directorates

" Intermediate Stage "

8.7.1 Intermediate Stage: Proposed Functions

This section presents the functions of the Agricultural Council, MoA Central Departments and Field Directorates under proposed organizational changes for the intermediate stage.

8.7.1.1 The Agricultural Council. The agricultural policy emphasized the active participation of the different actors in the agricultural sector in decision making and policy formulation. Those actors to include government institutions, private sector and cooperatives.

To provide a mechanism for the required participation, it is recommended to activate and strengthen the Agricultural Council to function as a policy making body and as a forum for various actors participation in policy formulation.

The Agricultural Council will be strengthened. The expected role of the AC will be activated through institutionalizing a permanent Secretariat to include the following units:

- Policy analysis.
- Budgetary planning
- Monitoring and Information
- Legal services

The Agricultural Council members will include Chamber of Industry, Chamber of Commerce, Cooperative Union, farmer unions, Export Associations, JEDCO, AMPCO, along with MoA, MWI, MMR&E, MoF, MoP, MI&T, MoI, NCARTT, and ACC.

Introducing change to the Agricultural Council will need amendment to the AC regulation that organize the AC and define its duties and units. It also requires assigning staff from the MoA and/or other institutions to work as permanent staff at the AC.

Introducing the above changes falls within the authority of the Minister of Agriculture supported by an approval from the Cabinet of Ministers.

The permanent secretariat will constantly provide the AC with sectorial information and analysis required for planning, decision making, monitoring and evaluation.

8.7.1.2 *MoA Functions.* The functions of the MoA are classified in two types: first, the support functions for top management to include public relations and legal services; second, operational functions to include agriculture development programs, laboratory management, agricultural economics and policy, agricultural control, administrative affairs and services.

8.7.1.3 Support Functions for Top Management:

- **Public Relations.** The mission of this department is to project MoA's objectives and achievements through disseminating updated MoA and agricultural sector news, information and events to special interest media groups and concerned parties. Moreover, the department is expected to follow-up on parliamentary discussions regarding agricultural matters and keep their records; and work as a liaison officer, with concerned institutions, for regional and international agricultural agreements. The supportive nature of this function requires its direct affiliation with top management, this will enable the unit to render its services to all functions and levels in the MoA.

- Legal Services. A full time legal counselor will be appointed to the Ministry whose duties will include:

    - Rendering opinions on legal questions arising in the ministry's departments
    - Preparing and interpreting contracts and other documents.

- Ensuring the legitimacy of decisions to be made by the ministry's officials.

This function must report to the top management of the ministry as stipulated by the central government instructions.

Table 3 shows the proposed organizational relationship of support services with top management.

8.7.1.4 ***Operational Functions:*** Operational functions represent the major areas of operation that contribute to achieve the MoA objectives. Following is a description of these functional areas and the activities which are affiliated to them:

- **Agricultural Development Programs.** The function will conceptualize, implement and promote development programs/projects. The chief mission of this function is to adopt and replicate development experiences and spread them to cover areas not reached by other institutions. Implementing capital projects in the MoA will be integrated into this functions.

  The department will consist of the following activities:

- Livestock Resources, Rangeland and Veterinary Preventive Services
- Crop production and Plant Protection
- Forestry
- Extension

- **Laboratory Management.** The mission of this function is to ensure the effective and efficient operation of the ministry's laboratories; to establish an effective system to strengthen the capabilities of the staff and upgrade the laboratories' performance and credibility.

The function will consist of the following activities:

- Veterinary Laboratories
- Plant Laboratories
- Pesticides Laboratory
- Animal Feed Laboratory

- **Agricultural Economics and Policy.** The function is being reorganized to meet the future needs under the Agriculture Policy Charter. The function mission is to help the MoA to conceptualize the agricultural sector's development strategy, contribute to the analysis, formulation and development of programs, projects and policy interventions, which will effectively implement the chosen strategy and set up monitoring and evaluation systems to improve implementation management.

The function will consist of three activities:

- Program and Project Monitoring and Evaluation
- Policy Analysis and Development Planning
- Agricultural Statistics and Information

- **Agricultural Control.** The mission of this function is to ensure animal and plant health protection for the benefit of people and the environment. The function is constituted by grouping the current regulatory tasks of MoA in one function.

The expected role of this function is:

- Gathering, clarifying and revising the agricultural regulations and specifications
- Setting regulations and specifications for agricultural products and activities according to the ministry's directives

- Enforcing regulations and ensuring their proper compliance

The function will consist of three activities:

- Regulation
- Inspection
- Registration information and records

- **Administrative Affairs and Services.** The function will be responsible for managing and maintaining the efficient utilization of the ministry's human and material resources. The major activities of this function are:

- Personnel and financial administration
- Supplies and inventories
- Maintenance of the ministry's equipment and construction
- Preparation and review of rules and regulations, work procedures manuals and proposed changes
- Planning and management of organizational development programs
- Managing human and material resources for the donor funded projects

- **Field Directorates Coordination.** The mission of this function is to create a link between the ministry's central department and field offices. Proper supervision will entail establishing five regional offices to maintain an effective span of control, utilization of resources and geographic proximity. The region will be grouped in accordance to the government development regional distribution.

The purpose of this function will be to strengthen the organizational relationships through ensuring and maintaining timely flow of information and responding to technical queries from field offices.

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Table 4 presents the major operational functions and the activities which constitute them.

- **Field Directorates**

  - **Functions and organizational changes.** As the MoA is undergoing organizational restructuring, the structure of the field directorates will need to be modified. This will necessitate that field directorates assume increased responsibilities and enhanced decision-making power in regulatory and administrative matters.

At the intermediate stage of reorganization, the role of field directorates is expected to be as follows:

- Implementing assigned components of the agricultural development programs prepared by the Ministry

- Providing the field coordination department with timely and duly prepared reports, data and information

- Issuing licenses for export and import and registration of agricultural products an activities in accordance with regulations

- Extending support services to farmers in the area

- Closely cooperate with other governmental institutions

8.7.2 ***Organizational Changes:*** In accordance with the Government's decentralization policy, it is inevitable to establish twelve agricultural directorates to correspond to the number of

governorates currently in Jordan. The remaining directorates will serve as field service offices, and operate according to their respective area's needs. This requires a thorough needs related analysis for respective areas. Field service offices will be organized in light of study findings.

The field directorates will be grouped in five regional offices. The regional offices will be represented in the MoA by the Directorate coordination function. Communication between headquarters and MoA directorates will be effectuated through the regional offices . The latter will report to the field coordination unit at MoA headquarters. Field service offices will report directly to field directorates.

8.7.3 Field Office Functions

According to the expected role of the field directorates, each directorate will perform the following four functions:

8.7.3.1 Program Implementation. The mission of this function is to promote agricultural development through programs and projects in the area it serves, identify priorities of the region and relay feedback to the planning department at the ministry. The expected role will include:

- Implementing the component of the development programs designated to the area by Agricultural Development Department, and report the progress of program/project implementation.

- The function will consist of the following activities:

- Livestock Resources and Rangeland
- Crop Production
- Forestry

8.7.3.2 Agricultural Control. The mission of this function is to ensure animal and plant health protection for the benefit of people and the environment. The anticipated role is to enforce regulations regarding plant and animal health and ensure their proper compliance.

The function will be composed of the following activities:

- Quarantine and animal health
- Quarantine and plant protection
- Licensing
- Registration

8.7.3.3 Farmer Services. The mission of this function is largely to add value to farmers' work through identifying farmers needs and providing support services in coordination with other institutions (e.g. NCARTT), and to:

- Provide services to farmers to help them improve their farm management and outputs
- Train farmers to use new agricultural technologies to increase the effectiveness of their operations
- Provide preventative veterinary services through the ministry's clinics
- Organize pest surveys and eradication campaigns

8.7.3.4 Administrative Services. The mission of this function is to ensuring proper operation through efficient utilization of human and physical resources of the field directorates as a whole, maintain personnel records and identify staffing requirements, handle all administrative and management matters related to MoA. This function will include the following activities:

- Manage personnel and financial matters for the field office and keep records in accordance with the ministry's regulations
- Collect and tabulate data and report them in the required time and form

- Receive community inquiries and information concerning agricultural matters and report them to the director for appropriate action.

8.8 The Final Stage

At the final stage, it is expected that the proposed organizational changes which would be introduced in the intermediate stage will be stabilized and fully functional.
The major changes of the final stage will include the implementation of the decisions that would be made in the intermediate stage regarding both the phasing out of the MoA services that will involve the private sector, and the inclusion within MoA or transfer of certain activities to other related institutions.

In the course of this study, a number of MoA services were identified as possible for private sector participation. These activities include Laboratory Services, Machinery and Construction Services, and MoA Stations.

The MoA activities that were considered for either inclusion within MoA or within other institutions are: Extension Services and Irrigation. Extension Services is proposed to be either incorporated with NCARTT or remain with the MoA. Irrigation is proposed to be either incorporated within the MoA or remain within the MWI.

Table 5 presents the expected major functions of the MoA in the final stage, highlighting the areas that could be phased out or transferred as proposed.

Table 6 presents the proposed functions of the field directorates in the final stage.

Table - 5

Ministry of Agriculture

" Final Stage "

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Table - 6

Field Directorates

" Final Stage "

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* *Extension services to be rendered in close coordination with NCARTT and provide services to areas not reached by R&E institutions.*

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8.9 Organizational Development Plan

Organizational development is a process which creates an organizational culture that supports the institutionalization of functions with active cooperation and input from MoA personnel to develop problem solving approaches that will introduce change and increase efficiency.

The reorganization process of the ministry will entail a multi-stage process: pre-transitional, transitional, intermediate, and final. The organizational development plan for agricultural policy implementation will be undertaken by a team of professionals which includes:

- Professionals from the MoA identified to oversee and coordinate Organizational Development (OD) plans
- Jordanian consultants from the private and public sectors
- International consultants

The organizational development plan has identified five major areas over the various stages as follows:

8.9.1 *Organization structural and functional changes:*

Stage I : Transitional and Pre-transitional

This stage will serve to build awareness and consensus among MoA top management and key personnel of the need for reorganization, as well as the introduction of effective performance measures. This will be achieved as follows:

- Organize four to six seminars (3 days each) between management consultants and top MoA officials.

- Identify internal "change agents" to contribute to the process of change
- Determine functions, responsibilities and authorities
- Identify potential candidates for executive positions
- Develop accountability tasks for key positions.

- **Stages II and III : Intermediate and Final**

- Redefine functions, responsibilities, authorities and accountability tables
- Prepare job descriptions and job requirements

8.9.2 Systems and procedures

- **Stage I - Transitional**

  - Develop systems and procedures for evolving key functions in the areas of statistics, monitoring and evaluation, and extension. These will be defined in coordination with consultant(s), MoA officials and change agents.

- **Stage II - Intermediate**

  - Develop systems designed to include management information systems, personnel policies, inventory and purchasing systems. Assess MoA computer automation requirements.

8.9.3 Assess manpower requirements

- Examine qualifications and skills of MoA staff.

8.9.4 Conduct training needs assessments

- Assessments of overall training needs
- Management training

8.9.5 Privatization options

- **Stage I : Transitional and Pre-transitional**

  - Develop privatization plan
  - Study plans to privatize activities taking into account:
    - Cost benefit analysis
    - MoA strategic focus

- **Stage II : Intermediate**

  - Examine privatization plan, strategy, assessment of worth for activities undertaken, preparation of phase-out process and the monitoring of phase-out procedures.

8.9.6 Organization development/monitoring and evaluation

- This activity will ensure continuous monitoring, evaluation and update of the organizational development process progress.

Annex 1

Current Functions Of MOA Central Department

A. Department of Animal Production

1. Proposal of suitable measures to implement agricultural policy in the field of animal production.

2. Setting the technical requirements for animal production farms and the supervision of their implementation.

3. Organizing of animal production activities and the enforcement of pertinent directives and the issuing of needed licensing.

4. Supervision and control of import and export of live animals, poultry and feed in collaboration of concerned agencies.

5. Multiplication of improved breeds of sheep, goat and cows in the ministry stations

B. Department of Animal Health

1. Providing private sector animal production operations through veterinary clinics and centers BY providing them with needed veterinary supplies.

2. Put plans and programs for vaccination against epidemics and the control of external and internal veterinary parasites and rabies.

3. The enforcement of quarantine regulations.

4. Production of veterinary vaccines.

5. Registration of veterinary medicines and the organization of their handling and distribution (and the recommendation of their import and export).

6. Development and promotion of bee keeping, rabbit farms and fisheries projects including technical supervision if needed.

7. Executing studies and technical reports related to the development of animal production.

Annex 1 (Cont'd)

C. Department of Plant Production

1. Monitoring and supervision of the imports and exports and the production of seeds, and planting needs/necessities, and issue licenses for such activities.

2. Monitor the local production of planting and inputs issuance of licenses in cooperation with MOA area directorates.

3. Production of improved seeds and other plant production requirements in cooperation with MOA station.

4. Cooperation with departments and implementation of the Ministry's Agricultural policy.

5. Formulate regulation and decisions regarding various plant production policies through specialized committees.

6. Response to complaints and needs from the private sector, and help to solve their problems.

7. Assist in agricultural research/extension through the department of research and information and through various media channels.

Annex 1 (Cont'd)

D. Department of Plant Protection

1. Enforcement of regulations related to plant protection.

2. Execution of surveys for agricultural pests.

3. Outlining methods and means to combat agricultural pests and stressing the integrated approach and executing the needed applied research.

4. Organization of national activity to combat epidemics if needed.

5. Collaboration with other government agencies and other international agencies to combat Locusts.

6. Organizing the registration and sale of agricultural chemicals as well as monitoring their use and their residues on agricultural commodities in collaboration with other government agencies.

7. Organization of agricultural quarantine.

8. Establish plans for crop protection and following their execution with other government agencies.

9. Keeping records related to crop pests in the country including monthly reports.

10. Supplying needed equipment and means to combat pest.

11. Preparation of studies and technical reports needed for crop protection in collaboration with other government agencies.

Annex 1 (Cont'd)

E. Department of Information and Extension

1. Suggest extension policies in light of national and agricultural development objective and policies.

2. Transfer technical agricultural and economical information to farms through extension programs and special campaigns.

3. Cooperation and coordination with NCARTT and technology transfer with the objective of resolving technical problems and transferring new technology.

4. Study agricultural and social economical situation of farmers with objectives to identify similar groups to enable directorates to provide better extension services for each group.

5. Provide training and information services for all targeted groups to upgrade abilities/skills and improve productivity.

6. Build awareness to farmers on technical services offered by MOA regional directorates and centers.

7. Identify training needs for those working in field of agricultural extension and preparation of training programs to develop these human resources.

8. Coordination with various agencies involved in R&E.

9. Monitor and evaluate farmer experiences and development in cooperation with agriculture research centers.

10. Encourage exchange of information and experiences among farmers.

11. Cooperate with the concerned parties to provide agricultural information at proper time.

12. Evaluate currently applied extension means and programs to determine effectiveness in achieving objectives.

13. Create public awareness to promote national agriculture development policies.

14. Prepare periodical reports on activities and achievements of the department, including obstacles and recommendations for increasing effectiveness.

Annex 1 (Cont'd)

F. * Department of Forests and Afforestation and Range Land

1. Executing needed studies to develop the national forests and range land outside the badia region.

2. Forest, range land and wild life protection.

3. Organization and exploitation of forests and range land resources as well as wild animals and birds.

4. Putting and executing afforestation plans for government lands

5. Production of forest tree seedlings.

6. Production of extension materials for the population about forests, range land and wild life and the importance of their preservation.

7. Collaboration with other government agencies for government land management.

G. Department of Public Relations and International Cooperation

1. Coordination of cooperation activities between the ministry and other local, regional and international agencies including foreign parrots.

2. Publicising the ministry activities.

3. Filing of agreements signed between the ministry and other local and international agencies and the follow up of their implementation.

4. Organization and development of work relations (including press reports) between the ministry and other mass media channels inside the country and abroad.

5. Preparation of all related activities needed for ministries workshops, official meetings with local and international agencies.

* *The department of forestry and rangeland is in charge of carrying out the Badia department functions.*

Annex 1 (Cont'd)

H. Department of Agricultural Economics and Policy Analysis

1. Suggestion of plans and programs related to agricultural development and the needed procedures for their execution.

2. Executing technical and feasibility studies for agricultural projects.

3. Follow-up and evaluation of the ministry's annual programs and putting the needed recommendations.

4. Preparation of studies and plans related to agricultural production and the follow up of their implementation.

5. Suggesting policies related to import and export of agricultural commodities the setting regulation to follow their execution in collaboration with other government agencies.

6. Collection of relevant agricultural data needed by the ministry.

7. Follow-up of bilateral agreements with other countries in the field of agricultural products.

8. Follow-up of new agricultural projects in other countries and assessment of their impact on the national agricultural economy.

9. Analysis and evaluation of Agricultural Policies and their impact on the Agricultural Sector.

10. Studying and evaluating agriculture development plans under execution and proposing needed adjustments.

11. Studying problems in the agricultural sector and proposing needed solutions.

12. Collection and documenting information related to Agricultural Policies.

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Annex 1 (Cont'd)

I. Department of Projects

1. Preparation of execution plans for projects and actual execution in collaboration with other departments in the ministry, other government agencies and funding agencies.

2. Preparation of studies needed for multi purpose projects in collaboration with other government agencies.

3. Preparation of annual budget of the department and its projects.

4. Preparation of tender documents for various supplies and works of its projects.

5. Book-keeping and records or ongoing projects.

6. Preparation of quarterly reports for projects under execution including the collaboration of data and other information needed to follow up the execution and evaluation of projects.

7. Identifying development projects.

J. Department of Personnel

1. Organizing the affairs of the ministry employees and labour according to the laws and regulation and the follow up of their execution.

2. Keeping personnel files for all ministry employees and labour.

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3. Preparation of salaries and wages of all employees and labour.

4. Organizing incoming and out going mail, it registration and follow up of all measures related.

5. Typing, photocopying, communications, services in the ministry.

6. Securing and organizing transportation in the ministry.

7. Follow up and supervision of all administrative affairs in the ministry department.

Annex 1 (Cont'd)

K. Department of Administrative Development and Training

1. Preparation of the annual organizational charts of the ministry.

2. Follow-up of needed actions related to the ministry trainees and employees sent either to local universities or abroad for higher degrees.

3. Information and data collection regarding the Ministry duties, its organization and updating.

4. Continuous evaluation of the ministry's administrative charts, proposing means for it development.

5. Conducting studies related to outline the ministry's personnel needs for training locally and abroad.

6. Participation in the preparation of the needed training programs, and the follow up of their execution and evaluation in cooperation with the concerned departments.

L. Department of Financial Affairs

1. Preparation of the Annual Budget in collaboration with the other departments and directorates.

2. Follow-up of the expenditures and keep recorded of the ministry's financial status.

3. Book-keeping of the ministry's records and its projects according to the financial by laws of the government.

4. Supervision of all financial affairs, stores, supplies, revenues.

5. Securing of all of the ministry's procurements and coordination with the general supplies department in tendering the ministry's needed supplies.

Annex 1 (Cont'd)

M. Department of Construction and Machinery

1. Executing Specialized studies related to agricultural machinery and implements and their modification to suit Jordanian Agricultural conditions.

2. Producing prototypes of these machinery and implements and making them available to Jordanian companies.

3. Developing engineering designs for buildings not exceeding 150m, and supervision of their construction.

4. Putting engineering designs for animal farm buildings.

5. Performing general maintenance works in the ministry building.

6. Follow-up of procedures related for the ministry construction needs with other government agencies.

7. Performing maintenance works for all ministries vehicles, agricultural machinery and implements.

8. Putting technical specifications for agricultural implements produced locally and follow-up of their enforcement.

9. Suggesting recommendations related for the import and export of agricultural machinery and implements.

10. Training farmers and Ministry employees to the use of Agricultural Machinery.

11. Providing the Ministry with needed vehicles and the follow up of their annual insurance.

12. Control of use of ministry car pool and Agricultural Machinery.

Annex II

Institutions In The Agricultural Sector

AC

The Agricultural Council is chaired by the Minister of Agriculture. Members of the council are:

- Minister of Water and Irrigation
- Minister of Municipalities, Rural Affairs and Environment
- Minster of Higher Education
- Minister of Planning
- Minster of Industry and Trade
- Minster of Supply
- Secretary General - Ministry of Agricultural
- Director General - Agricultural Credit Corporation
- Chairperson - Jordan Valley Farmer Union
- Chairperson - Professional Association of Veterinarians
- Chairperson - Professional Association of Agricultural Engineers
- 4 representatives from the regions in Jordan - to be assigned by the Minister of Agriculture

Responsible for policy formulation, planning in the agricultural sector, coordinating among institutions involved in agricultural. Recently the policy analysis department in MoA has been assigned to work as secretariat to the Agricultural Council.

ACC

An independent institution engaged exclusively in lending medium to long-term loans to agriculture projects. ACC assists farmers in investing in new technology (drip irrigation and plastic houses) in the Jordan Valley. ACC is managed by a board of directors chaired by the Minister of Agriculture. Members are ACC director, representatives of MoP, MoF and five financial and agricultural experts assigned by the cabinet. Directors of MoA district offices are members of lending committees in their respective districts.

Annex II (Cont'd)

AMO

Has the responsibility for formulating the marketing policies pertaining to agricultural products within and outside the Kingdom, following up their implementation and organization, and developing marketing through market research and implementation of trade policies and market regulations. It sets up quality and grading standards, oversees domestic horticultural supplies and issues import/export licenses. AMO is managed by a board chaired by the Minister of Agriculture and the membership of AMO director, representatives of MoA, MI&T, MoS, Custom Department, JCO director and three experts in agriculture and marketing assigned by the cabinet.

NCARTT

Mandated to operate as the prime center to coordinate agricultural research and technology transfer programs with the various institutions in Jordan and to disseminate information through extension to farmers. NCARTT conducts studies and determines training needs of farmers and personnel.

AMPCO

AMPCO was established with the objective of providing support and services to Jordanian farmers in marketing and processing their agricultural products. AMPCO is primarily owned by the Jordan Investment Corporation which is the investment arm of the government. Its activities include marketing and processing of fruits and vegetables. Currently the government is studying options to privatize AMPCO

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Annex II (Cont'd)

MoS

The Ministry of Supply has the responsibility for securing food commodities in the country through formulating general supply policies and setting pricing for various commodities. The Ministry currently imposes restrictions on exports and imports of selected food products. In addition, the Ministry is the sole importer for basic food items (i.e. rice, sugar, wheat, etc.).

MoP

Has the responsibility for examining and approving projects and ensuring that they fit within the overall development strategy of the Government. It undertakes initiatives for foreign assistance for projects and negotiates with donors. Capital projects of the MoA are handled and disbursed through the MoP, upon request of the MoA.

MWI

The Ministry of Water and Irrigation has the responsibility for water planning and management in Jordan. The ministry's main functions were allocated to (JVA) and (WAJ). The MOWI established a new unit under a secretary general at a level equal to that of JVA and WAJ. The new facility will be responsible for all water resource planning, policy and strategy formulation, human resource development, and data collection and analysis.

WAJ

Its mandate includes the monitoring of ground water quality, and the licensing of all extraction of water. Responsible for national municipalities' water supplies.

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Annex II (Cont'd)

JVA

Major activities are development of water resources in the Jordan Valley and its economic and social development. This includes the promotion of developing irrigation water (dams, canals, drainage), the construction and maintenance of agricultural roads, the monitoring and management of water quality and environmental issues in the Jordan valley. The JVA laboratory has the task of periodically monitoring the biological and chemical composition of the Jordan valley irrigation water

JVFU

Provides a channel to farmers in the Jordan Valley to participate in planned program identification and implementation. It provides extension, loan and agricultural input services. Out of fifteen board members, five are government representatives (MoA, JVA, AMO, ACC, JCO); the other ten are elected.

JCO

JCO is responsible for Cooperative development in all sectors including agriculture, and provides loans and services to farmers through agricultural cooperatives. JCO undertakes regulatory , developmental, financial and commercial roles.

Educational Institutions

Two high schools are available for agriculture in South Jordan. Jordan University and JUST Agriculture faculties are available. Universities' agricultural faculties contribute to research in the agricultural field.

Annex II (Cont'd)

HCST

An independent institution mandated to formulate policies and plans in science and technology and to support research and development projects. It is chaired by representatives of the Ministries of Planning, Industry and Trade, Finance, Higher Education and Agriculture.

Annex III

List of Interviews

Annex IV

ABBREVIATIONS

ACC	Agricultural Credit Corporation
AMO	Agricultural Marketing Organization
AMPCO	Agricultural Marketing and Processing Company
APC	Agricultural Policy Charter
JCO	Jordan Cooperative Organization
JEDCO	Jordan Export Development Corporation
JIPA	Jordan Institute of Public Administration
JVA	Jordan Valley Authority
JVFU	Jordan Valley Farmers Union
MI&T	Ministry of Industry and Trade
MMRA&E	Ministry of Municipalities, Rural Affairs and Environment
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoI	Ministry of Interior
MoP	Ministry of Planning
MoS	Ministry of Supply
MWI	Ministry of Water and Irrigation
NCARTT	National Center for Agricultural Research and Technology Transfer
R&E	Research and Extension
WAJ	Water Authority of Jordan

APPENDIX A

AGRICULTURAL POLICY CHARTER

REFORM IMPLEMENTATION PRIORITIES

POLICY IMPLEMENTATION SYNOPSIS

The followng pages synopsize the Planning Frame contents. The synopsis proceeds by chapter, first examining sector-wide changes called for by Agricultural Policy Charter objective. It then turns to subsectoral policies and regulatory changes. Specifically, it treats the objectives of: increased food self-reliance; stimulating agricultural growth, achieving balanced economic growth with equity; and promoting resource conservation and management.

In order to encapsulate a vast amount of information within a manageable space, a number of codes are employed in filling out the tables. Here, they are described as follows:

1. Priority: Priority implies the importance of the particular change, according to evaluations using the ranking instruments found in the appendices. they are ranked 1 through 3, with 1 implying highest priority, 2, second priority, and 3, low priority.

2. Stage(s) of Change: The Planning Frame sees the policy planning process occurring in five stages. The first stage (1), revolves around achieving political consensus regarding the need for a change in the first place; the second stage (2), calls upon its champions to develop a design. The third stage (3), refers to actually passing a law or regulation supporting the policy change (if this is necessary). The fourth stage (4), is the implementation stage, which may include training as well as executing the policy itself. The fifth stage (5), refers to monitoring and evaluating the progress of the policy. These stages may occur concomitantly. Sometimes, policy change efforts back slide; at other times, the reform process itself demands modification, so that an individual policy may be experiencing more than one stage simultaneously. The numbers one to five, then, correspond to their respective stages.

3. Organizations Involved: merely refers to the one or more organizations that are the most relevant in undertaking a particular change. Standardized acronyms are used. That acronym highlighted and underlined is the institution that would take the lead in implementing that particular policy.

4. Implementation Capacity?: answers the question as to whether the organization(s) involved in implementing a particular proposed policy have the human, financial, or technical resources to carry the change off.

5. Legislative Changes Required: cites the law(s) and regulation(s) that may need to be changed in order to implement a particular policy.

6. Research Needed?: responds to the question as to whether enough information presently exists to enact a particular policy. The acronyms following a "Y," or yes, are:

NC = NCARTT
U = Universities
AEPD = the Agricultural Economics and Policy Department, MOA
P = Private Sector
R = DFAR MOA
O = Other (regional, international, etc.) Research entities
or, the standardized acronyms

7. Training Needed?": answers the question as to whether the policy change can be implemented by the organization empowered to do so, without having its staff undergo additional training. It also indicates if part of the change process itself calls for training producers in a certain skill. Therefore,

Y/G = Government personnel require advance training to implement their tasks; and
Y/P = Producers will receive training as part of the reform process.

8. Technical Assistance Needed?: responds as to whether the change can be realized without support from the private sector or the donor community.

Y/J = Support is required to be provided by a Jordanian national;
Y/X = Support will be required by an expatriate, usually representing a donor agency as a direct hire or consultant.

9. An asterisk (*) placed next to the policy objective in question, indicates that the Planning Frame team believes that such proposed changes will, given their complexities, prove very challenging to implement.

10. Footnotes are treated at the end of each section.

REFORMS REQUIRED TO INCREASE FOOD SELF-RELIANCE

SECTOR-WIDE REFORMS

SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATION(S) INVOLVED	IMPLEMENTATION CAPACITY ?	LEGISLATIVE CHANGES REQUIRED	RESEARCH NEEDED ?	TRAINING NEEDED ?	TECHNICAL ASSISTANCE NEEDED?
Revision of Agricultural Law No. 20 of 1973[1]	1	1,2	MOA, AC	Y	New Law	Y/AEFD	N	Y/Legal
Elimination of Price Controls on Agricultural Products	1	1,2,3	MOS, Council of Ministers	Y	Council of Ministers Resolution re: Law of Supply No. 17 of 1992	N	N	N
Encouraging the Private Sector's Participation in Policy Formulation and Decision Making[2]	1	1,2	MOA/DOEI, MWI, JVA, AMO, MOS, COUNCIL OF MINISTERS	N	New Legislation re: Council of Ministers Reg. No. 24, of 1989; Jordan Valley Development Law No. 19, of 1988; Water Authority Law No. 18, of 1988; Agricultural Marketing Organization Law No. 15 of 1987	Y/NC,U	Y/G Y/P	Y/J Y/X
Removing Import/Export & Trade Restrictions on Agricultural Products	1	1,2,3	MOA, AMO, MOS	Y	Agriculture Law No. 20 of 1973; Supply Law No. 17 of 1992; Agricultural Marketing Organization Law No. 15 of 1987	N	N	N
Eliminating Price Controls and Licensing Restrictions[3]	1	1,2,3	MOA, MOS, MOT, MOF, AMO, AMPCO	Y	Long-run revision of Agricultural Law No. 20 of 1973; Agricultural Marketing Organization Law No. 15 of 1987, Supply Law No. 17 of 1992, & Various Ministerial Orders to be rescinded	N	N	N
ACC To Function as a Rural Bank	1	1,2	MOA, ACC, MOF, Central Bank	N	ACC Law No. 12 of 1963; Regulations No. 1 & No. 5 of 1963	Y/O	Y/G	Y/X
Encouraging the Formation of Self-Help Groups, Cooperatives and Farmers' Organizations[4]	1	1	MOA/DOEI, JCO, JVFA, JVFU	N	JCO Law No. 20 of 1971	Y/U Y/O	Y/G Y/P	Y/J Y/X
Adoption of the Proposed National Environmental Law of 1994	1	1,2,3	MMRAE/DOE, MOA, MWI/WAJ, JVA, MOH, HCST, MOP, MOS, RSS, JES, RSCN, UOJ, JUST	Yes, to Pass Law; No, to Implement it	Revised National Environmental Law of 1994	Y/NC,U,P, O	N	N

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SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATION(S) INVOLVED	IMPLEMENTATION CAPACITY ?	LEGISLATIVE CHANGES REQUIRED	RESEARCH NEEDED ?	TRAINING NEEDED ?	TECHNICAL ASSISTANCE NEEDED?
Development of a National Land Use Plan[65]	1	1,2	MMRAE/DOE, MOA,MWI,HCST, RSS, JES, RSCN, UOJ, JUST, NGC, MOP	N	A Legislated National Land Use Plan	Y/U,P,O,R	Y/G	Y/J Y/X
Five Year Freeze on Urban Expansion to Protect Agriculturally Productive Land[66]	1	1	MMRAE, MPW,MOH,JBC, MOA, Housing Org., Engineer's Org.	Y	Law of Cities, Villages and Building Planning No. 79 of 1966	Y/U,NC,P, O	Y/G	Y/J Y/X
Avoid Land Fragmentation and Introduce Land Consolidation Measures[67]	1	1,2	MMRAE, MOA, JVA, MOF	Y	Article 11 of the Constitution; Law of Cities, Villages and Building Planning No. 79 of 1966; Land and Water Rights Settlement Law No. 40 of 1952; Jordan Valley Development Law No. 18 of 1988	N	N	Y/J
Support Applied Research Focusing on Improved Production of New and Existing Crops and Livestock	1	2	MOA/NCARTT, UOJ, JUST, HCST, COM	N	Council of Ministers Regulation No. 19 of 1990, as Amended by No. 42 of 1993	Y/NC,U,O	Y/G	Y/J Y/X
Deliver relevant Technology Packages by a Well Trained and Trusted Extension Service*	1	1,2	MOA/NCARTT, DOEI, AC, JCO	N	New Legislation redefining DOEI's mandate	Y/O	Y/G Y/P	Y/J Y/X

1. There is a tendency in Jordan to pass omnibus laws, such as the Agricultural Law No. 20, or the proposed National Environmental Law. Because of their scope, they have proved difficult to pass (e.g., variants of the present environmental law have been debated by the national assembly for the past six years without being adopted. There is some question as to the fate of the present legislation), and equally difficult to amend. Their virtue is reputed to be that they focus lawmakers' attention on one item at a time, and provide a very limited number of statutes which those involved in the system need to refer to. What they don't disclose, however, are the numerous ministerial regulations and decrees that are necessitated by significant gaps in the law. These have not been effectively codified over time. Hence, instances have arisen when ministry officials have declared behavior such as requests for licenses illegal, only to be presented with a ragged copy of a decree stating them wrong. In the future, lawmakers may want to consider dividing legislation into more discrete and manageable units. In addition, a unified computerized codification system should be installed, so that the legislative and regulatory underpinnings of the agriculture sector are more transparent.

262 2. To the extent that DOEI lacks the implementation capacity to achieve this objective, i.e., lacks the personnel with professional organizational and management development skills necessary to provide guidance to nascent groups in the private sector, it will be difficult

undertaken some of these activities but also is constrained by its lack of trained personnel.

3. The issue here is that while price controls and licensing restrictions have been eliminated by the government in keeping with conditions precedent governing the recently negotiated World Bank Agricultural Sector Adjustment Loan, the legal basis for reimposing such restrictions continues to exist in extant legislation. In the long run, to promote transparency and eliminate a return to these forms of restriction, it will be necessary to amend these laws and regulations.

4. The MOA in general, and DOEI in particular, lack the management development skills to effectively implement this objective without substantial technical assistance support.

5. The traditional political culture will make passage of such a plan insurmountable.

6. See, above

7. See, above.

SUBSECTORAL REFORMS REQUIRED TO INCREASE FOOD SELF-RELIANCE
IRRIGATED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Develop & Enact a National Water Policy	1	1,2	MWI, MOA, MMRAE, NRA, HCAST, UOJ	Current design underway by CIDA & JICA	Draft of a new National Water Law	Y/G	N	Y
Encourage the building of Water Storage Structures	1	1,2,4	JVA,JCO,DOEI, DFAR	N	N	Y/NC	Y/G Y/P	Y/X
Replace Furrow with Drip Irrigation Systems	2	1,2,4	JVA, JVFA	Y	N	N	N	N
Increase Market Information to Producers & Consumers	1	2,4	AMO,AEPD, DOEI	N	N	Y/NC U, AEPD	Y/G	Y/X
Encourage the Development of Self-Help Organizations*	1	1	MOA/DOEI, JCO,JVFA,JVFU	N	Jordan Cooperative Organization Law No. 20 of 1971	Y/O	Y/G Y/P	Y/X
Introduce & Enforce Quality Control/Grading System	1	1,2	MOA,MOS,AMO, MOT,MIT,DSS	N	AMO Law No. 15 of 1987; Supply Law No. 17 of 1992	Y/NC U,P,O	Y/G Y/P	Y/X
Enhance Post-Harvest Technical Services*	1	1,2,4	MOA/DOEI,JCO, JVFA,NCARTT, UOJ,JUST	N	N	Y/NC, U,P,O	Y/G Y/P	Y/J Y/X
Promote Crops that Provide the Highest Economic Return per Cubic Meter of Water	2	2,4	NCARTT, JVA,DOEI	N	N	Y/NC	Y/G Y/P	N

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SUBSECTORAL REFORMS REQUIRED TO INCREASE FOOD SELF-RELIANCE

RAINFED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY	LEGISLATIVE CHANGE REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Establish a Five Year Freeze on Urban Boundary Expansion*	1	1	MMRAE, MPW, MOH, MOA, Jordan Bldg. Council, Housing Org., Engineers Assn.	Y	Legislation to replace the Law of Cities, Villages & Bldg. Planning of 1966	Y/AEPD, O	N	N
Levy a Conversion Tax on Farmland*	1	1	MMRAE, MOA, MOF	Y	New Legislation	Y/MMRAE, AEPD	N	N
Support Legislation to Promote Larger Plot Size and Ease of Consolidating Multiple Owner Plots*	1	1	MOA, MWI, MMRAE	Y	New Legislation	Y/AEPD, MMRAE	N	N
Encourage the Planting of Fruit Trees on Land with Over 400 MM Rainfall & 8% Slopes	3	1,4	MOA, NCARTT, DOEI, PP&PP, PRIVATE SECTOR COs.	N	N	Y/NC	Y/G Y/P	N
Promotion of an Integrated Barley Livestock Production System	3	1	MOA, NCARTT, DOEI	N	N	Y/NC	Y/G Y/P	Y

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SUBSECTORAL REFORMS REQUIRED TO INCREASE FOOD SELF-RELIANCE
LOW RAINFALL AND LIVESTOCK PRODUCTION SUBSECTORS

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Development and Allocation of Adequate Water Supplies for Livestock	2	1,2	MWI,MOP,CIDA,JICA, NCARTT, MOA-DFAR,AP,AEPD,HCST, RCS,JES,MMRAE,NRA, UNIVERSITIES	N	New National Water Law	Underway	N	Y/X
Improved Herd Management through Selection & Breeding	3	0	NCARTT, MOA-VETERINARY SERVICES, JCO,UOJ,QAF, QNF	N	N	Y/NC,U	Y/G Y/P	Y/J Y/X
Improved Forage Conversion Efficiency	2	0	NCARTT, UOJ	N	N	Y/NC,P,U	Y/G	Y/X
Optimize Feed Production	1	2	DFAR,JCO,DOEI, NCARTT	N	N	Y/NC,U,O	Y/G Y/P	Y/X
Improved Animal health Services in the Public and Private Sectors	2	1,2,3	MOA-Veterinary Services, Private PractitionersUOJ	Y	Agricultural Council Approval of Privatization Plan; MOF approval of use of revolving funds	Y/NC,U	Y/G Y/P	Y/J

REFORMS REQUIRED TO STIMULATE AGRICULTURAL GROWTH

SECTOR-WIDE REFORMS

SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGE REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Eliminate Domestic Retail Price Controls for Fruits & Vegetables	1	1,2,3,4	MOA, AMO, MOS, Council of Ministers	Y	Council of Ministers' Resolution to Amend Supply Law No. 17 of 1992	N	N	Y/J
Simplify Export Permit Requirements & Limit Import Licensing Requirements to Fewer Commodities	1	1,2,3,4	MOA/AEPD, AMO,MOS,MOF	Y	Amendment of Agricultural Law No. 20 of 1973 and Supply Law No. 17 of 1992	Y/AEPD	N	N
Promote Quality Improvements of Local Production by Disseminating Standards Required by Major Importing Countries	2	1,2,4	MOA, AMO, MOS Private Sector,MIT, DSS	N	AMO Law No. 15 of 1987, Supply Law No. 17 of 1992	Y/NC,P,OU	Y/G Y/P	Y/X
Improve Transparancy in Agricultural Markets	1	1,2,3,4	MOA, MWI, MOS, MIT,MOF,MOT, AC,Council of Ministers	N	Review, Revision and Dissemination of all Sectoral Legislation	Y/AEPD,UO	Y/G	Y/J Y/X
Afford the Private Sector Maximum Operational Latitude	3	1,2,3,4	MOA, MWI, MOS, MIT,MOF,MOT, AC,Council of Ministers	N	Enactment of all legislative initiatives cited in Charter	Y/AEPD,UO	Y/G Y/P	Y/J Y/X
Government to Place Greater Emphasis on Processing & Marketing Research	3	1,2,3,4	MOA/AEPD, AMO AMPCO,NCARTT	N	N	Y/NC, AEPD,U,O	Y/G	Y/J Y/X
Government Will Increase Support for Exploring & Opening New Markets	3	2,3,4	AMO, ACC, MOS, MOA-AEPD	N	Revision of ACC Law No. 12 of 1963, JCO Law No. 20 of 1971, Supply Law No.17 of 1992	Y/AEPD,U O	Y/G Y/P	Y/J Y/X
Seek Regional Integration with Neighboring Countries re: Production & Marketing	2	1,2,3	MOP, MOA, MFA, Council of Ministers	Y	Negotiation of Treaties Establish-ing Economic Relations	Y/AEPD,U O	N	Y/J Y/X

SUBSECTORAL REFORMS REQUIRED TO STIMULATE AGRICULTURAL GROWTH
IRRIGATED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Increase Water for Winter Crops	1	1,2,3	MWI/JVA/WAJ MOA/DOEI JCO	N	N	Y/NC,U O	Y/G Y/P	Y/X
Enforce Regulations for Monitoring Aquifers	1	1,2,3	MWI/JVA/WAJ/BPU	N	New Enforcement regulations	N	Y/G Y/P	Y/J Y/X
Enforce Regulations on Well Licensing	1	1,2,3	MWI/JVA/WAJ/BPU	N	New Enforcement regulations	N	Y/G Y/P	Y/J Y/X
Facilitate Organization of Balanced Demand and supply of Commodities[1]	3	1,2,3,4	MWI/JVA, MOA, JCO	N	N	N	N	N

1. To the extent possible, the government should refrain from this activity, leaving the market to determine supply and demand contingencies.

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SUBSECTORAL REFORMS REQUIRED TO STIMULATE AGRICULTURAL GROWTH
RAINFED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Plant Fruit Trees in Areas With >400 mm of Rainfall & >8% Slopes	3	1,4	MOA/NCARTT/ DOEI/PP&PP, PRIVATE SECTOR COs.	N	N	Y/NC,U,P	Y/G Y/P	N
Five Year Freeze on Urban Boundaries*	1	1	MMRAE,MPW,MOH, JBC,MOA, HOUSING ORG., ENGINEERS' ORG.	Y	Amend Law of Cities, Villages and Building No. 79 of 1966	Y/MMRAE, U,P O	Y/G	Y/J Y/X
High Conversion Tax on Agricultural Lands*	1	1	MMRAE, MOA, MOF	Y	New Legislation	Y/MMRAE, MOA-AEPD	N	N
Enact Legislation on Minimum Plot Size*	1	1.2	MMRAE, MOA, MOF	Y	Amend: Article 11 of the Constitution; Law of Cities, Villages and Building No. 79 of 1966; Land & Water Rights Settlement Law No. 40 of 1952	Y/MMRAE, AEPD	N	Y/J
Housing to be Constructed on Lands with 75% Bedrock*	3	1	MMRAE, JBC, MPW MOH,HOUSING ORG., ENGINEERS' ORG.	N	Amend Law of Cities, Villages and Building No. 79 of 1966	Y/MMRAE,J BC,U	Y/G Y/P	Y/J Y/X

SUBSECTORAL REFORMS REQUIRED TO STIMULATE AGRICULTURAL GROWTH
LIVESTOCK PRODUCTION AND LOW RAINFALL AGRICULTURE SUBSECTORS

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Allocate Water to Meet Livestock Requirements	2	1,2	MOP-CIDA/JICA MWI,NCARTT, MOA-DFAR,AP,AEPD HCST,RCS,JES MMRAE,NRA, UNIVERSITIES	N	New National Water Law	Under way	N	Y/X
Improve Herd Management and Genetic Resources through Breeding	3	2	NCARTT,MOA-VETERINARY SERVICES, JCO UOJ, QAF, QNF	N	N	Y/NC,U	Y/G Y/P	Y/J Y/X
Improve Public and Private Sector Animal Health	2	1,2,3	MOA-VETERINARY SERVICES, PRIVATE PRACTITIONERS UOJ	Y	N	Y/NC/U, Private Sector	Y/G Y/P	Y/X
Expand Applied Research on Animal Health and Production Systems	2	2	NCARTT, MOA-VETERINARY SERVICES, UOJ, PRIVATE PRACTITIONERS	N	N	Y/NC,U, Private Sector	Y/G Y/P	Y/X
Phase Out Price Regulations	1	1,2,3,4	MOS, Council of Ministers, MOA-AEPD	Y	Under Way	N	N	N
Maximize Government Support to Trade	1	1,2,3,4	MIT, MFA, MOA/AEPD	Y	N	Y/AEPD	Y/G	Y/X
Promote and Monitor Quality Standards in the Private Sector Feed Industry	3	4	MOA/LDD, AMO	Y	Improved Enforcement Capacity	Y/LDD	Y/G	Y/X

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REFORMS REQUIRED TO PROMOTE BALANCED ECONOMIC GROWTH AND EQUITY
SECTOR-WIDE REFORMS

SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Adjust Land Leasing and Tenancy Systems to Reflect Technological Changes	1	1,2,3	MMRAE,MOA, MPW,JBC, Land Registry Department, Natonal Municipal Planning Council	N	Revise Law of cities, Villages and Planning No. 79 of 1966; Land & Water Rights Settlement Law No. 40 of 1952; Amend Article 11 of the Constitution	Y/AEPD,UO	Y/G	Y/X
Promote Liberal Price Policies	1	1,2,3,4	MOA/AEPD, MOS,MOT MOF,AMO,AMPCO	Y	Revise Agricultural Law No. 20 of 1973; AMO Law No. 15 of 1987, Supply Law No. 17 of 1992; and Various Ministerial Orders	N	N	N
Focus Extension Programs on Groups Presently Not Being Reached*[1]	1	1,2	MOA/DOEI, GTZ NCARTT,WB	N	Reconfiguration of DEOI	Under way	Y/G Y/P	Y/J Y/X
Develop Agricultural Credit and Other Financial Services, and Target Individuals Ineligible for Bank Loans	1	1,2	ACC, JCO, MOA CBJ, MOF	N	Revision of ACC Law No. 12 of 1963	Y/O	Y/G Y/P	Y/X
Design Enabling Legislation to Promote Sectoral Self-Help Organizations*	1	1,2	JCO, NCARTT, MOA/DOEI, AEPD UOJ,QAF,QNF JVFA,JUST, NFU	N	Revision of JCO Law No. 12 of 1963, as Amended	Y/U,O	Y/G Y/P	Y/X
Encourage Producer Participation in Policy Formulation and Decision Making*	1	1,2	MOA/DOEI, MWI, JVA,AMO, MOS, Council of Ministers	N	Amend COM Reg. No. 24 of 1929; Jordan Valley Development Law No. 19 of 1988; Water Authority Law No. 18 of 1988; AMO Law No. 15 of 1987	Y/NC,U,O	Y/G Y/P	Y/J Y/X
Establish Training Institutions for Agriculture & Rural Development throughout the Country*	1	1,2	MOA/DOEI, NCARTT JCO,UOJ,JUST	N	Agricultural Law No. 20 of 1973;COM Reg. No. 19 of 1990; Reg. No. 43 of 1993	Y/U,O	Y/G Y/P	Y/J Y/X
Mandate NCARTT to Support Extension Institutions & be Included in Organizing the Feedback Between Research, Extension and Producers	1	1,2	MOA/NCARTT, DOEI, JCO, UNIVERSITIES, Private Sector Deliverers, COM	N	COM Reg. No. 19 of 1990, as Amended by Reg. No. 42 of 1993	Y/NC,U, O	Y/G Y/P	Y/J Y/X
Liberalize Land Sales Restrictions & Extend Leases to 30 Years	1	1,2	MWI/JVA	N	Revise Jordan Valley Development Law No. 19 of 1988	Y/MWI,U,O	N	Y/J Y/X

SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF RE[illegible]	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Development of a National Land Use Plan*	1	1,2	MMRAE/DOE, MOA, HCST, RSS,JES RSCN,JUST,UOJ NGC,MOP	N	A Legislated National Land Use Plan	Y/U,P,O	N	Y/J Y/X
Development of a Land Bank to Purchase Available Land for Resale to Bona Fide Producers*	3	1	MOA/AEPD, ACC CBJ,MOF,MMRAEMWI-JVA	N	New Legislation	Y/U,AEPDO	Y/G	Y/J Y/X
Tax Incentives to Promote Consolidating Inheritances	1	1,2	MMRAE, MOA, JVA MOF	Y	Amend Law of Cities, Villages and Building Planning No. 79 of 1966; Land & Water Rights Settlement Law No. 40 of 1952; Jordan Valley Development Law No. 18 of 1988; Art. 11 of the Constitution	N	N	Y/J

1. The delivery of extension services will be difficult in the short- to medium term, given the efficacy of the extension service at present.

REFORMS REQUIRED TO IMPROVE RESOURCE MANAGEMENT AND CONSERVATION
SECTOR-WIDE REFORMS

SECTOR-WIDE OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Pass the 1994 draft National Environmental Law	1	1,2,3	MMRAE/DOE, MOA, MWI/WAJ, JVA, MOH, HCST, MOP, MOS, RSS, JES, RSCN, UOJ, JUST	Yes to pass law, no to implement it	Revise Draft National Environmental Law of 1994	Y/NC, U,P,O	N	N
Draft and Implement a National Land Use Plan*	1	1,2,3	MMRAE/DOE, MOA,MWI, HCST, RSS, JES, RSCN, UOJ, JUST, NGC, MOP	N	A formally legislated national land use plan	Y/U,P,OR	Y/G	Y/J Y/X
Design and Implement a national Environmental Education Plan	3	1,2,3,4	MMRAE/DOE, JES, MOA, MOE, UOJ, JUST	Y	N	N	Y/P	N
Design and implement an Environmental Impact Assessment process for all MOA projects	1	1,2,3 4	MMRAE/DOE, MOA, MWI, HCST, UOJ, JUST	N	Can be incorporated within the National Environmental Law	Y/DOE, G, U, O	Y/G	Y/J Y/O
Create and maintain an inter-ministerial coordination unit to address environmental issues	1	1	MMRAE/DOE, MOA, MWI, MOH, HCST	Y	N	N	N	N

SUBSECTORAL REFORMS REQUIRED TO IMPROVE RESOURCE MANAGEMENT AND CONSERVATION IRRIGATED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Adjust the price of water to cover O&M costs	1	1,2,3,4	MWI/JVA/WAJ, MOP,COM,MOA	N	Amend elements of JVA Development Law of 1988; Water Authority Law of 1986	N	Y/G Y/P	Y/X
Promote conversion to closed pipe conveyance systems	1	1,2	MWI/JVA, JCO, MOA, MOP	N	Amend elements of JVA Development Law of 1988	N	N	N
Provide tax relief for manufacturers of water saving technologies	2	1,2	MOF, MOS,MWI/JVA, ACC	Y	Revise Income Tax law No. 57 of 1985; ACC Law no. 1[illegible] of 1963; JVA Development Law No. 18 of 1988	N	N	N
Generate and distribute information of crop/water requirements	1	2,4	MOA/DOEI, NCARTT, JVA	N	N	Y/NC, U, O	Y/G Y/P	Y/I Y/X
Generate and disseminate water saving technologies	1	1,2	JVA, NCARTT, DOEI, PRIVATE SECTOR	N	N	Y/JVA, NC, DOEI	Y/G Y/P	Y/I Y/X
Develop water storage structures	1	1,2,4	JVA,JCO,DOEI DFAR	N	N	Y/NC	Y/G Y/P	Y/X
Enact wastewater policies to protect groundwater quality	1	1,2,3,4	WAJ, JVA, MOA, MMRAE	N	Amend the Water Authority Law of 1988; Include water provisions in National Environmental Law of 1994	Y/WAJ, DOE, NC	Y/G	Y/I Y/X
Strengthen generation and dissemination of technical information regarding pests, pest risks and pesticides[1]	1	1,2	JVA, JCO, NCARTT, MOA/PP, DOEI	N	N	Y/NC, U, O	Y/G Y/P	Y/I Y/X

1. Dissemination, if overseen by DOEI will prove problematic in the short- and medium-term.

SUBSECTORAL REFORMS REQUIRED TO IMPROVE RESOURCE MANAGEMENT AND CONSERVATION
RAINFED AGRICULTURE SUBSECTOR

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Encourage planting fruit trees on slopes >8% in areas with >400 mm/yr. rainfall	3	1,4	MOA, NCARTT, DOEI, PP &PP, PRIVATE SECTOR COS.	N	N	Y/NC	Y/G Y/P	N
Encourage shift from wheat to barley/livestock farming systems in medium (200-350mm/yr) rainfall areas	3	1	MOA, NCARTT, DOEI, PP, PP	N	N	Y/NC,U	Y/G Y/P	Y/J Y/X
Five year freeze on expansion of urban boundaries*	1	1	MMRAE, MPW, MOH, MOA, JORDAN BLDG. COUNCIL, HOUSING ORGZN., ENGINEERS ASSN.	Y	Legislation to replace the Law of cities, Villages & Bldg Planning of 1966	Y/AEPD,O	N	N
Levy a high land use conversion tax on agricultural land	1	1	MMRAE, MOA, MOF	Y	New fiscal legislation	Y/MMRAE, AEPD,U,O	N	N
Enact land subdivision regulations which arrest fragmentation of agricultural lands*	1	1,2	MMRAE, MOA, MOF	Y	Article 11 of the Constitution; Law of Cities, Villages and Bldg. Planning No. 79 of 1966; Land and Water Rights Settlement Law No. 40 of 1952	N	N	Y/J
Introduce land consolidation measures	1	1,2	MMRAE, MOA, MOF	Y	Article 11 of the Constitution; Law of Cities, Villages & Bldg Planning No. 79 of 1966; Land and Water Rights Settlement Law No. 40 of 1952	N	N	Y/J
Allocate adequately treated urban wastewater for irrigation, especially for rainfed agriculture/supplemental irrigation	1	1,2	MWI/WAJ, MMRAE, MOA	Y	Draft of a new national Water Law; Amend Water Authority Law of 1988	Y/MWI,NC, U,O	Y/G Y/P	Y/J Y/X
Enact Wastewater treatment policies to protecty groundwater quality	1	1,2,3,4	MWI/WAJ, MMRAE, MOA	N	Amend Water Authority Law of 1988; Include water provisions in proposed National Environmental Law of 1994	Y/WAJ, DOE, NC, U, O	Y/G	Y/J Y/X
Encourage private sector participation in soil conservation*[1]	1	1,2	MOA/DOEI MMRAE/DOE, NCARTT,	N	N	N	Y/G Y/P	Y/J

Develop new products and explore innovative processing methods	1	1,2	MMRAE/DOE, NCARTT, AMO, AMPCO,ACC, PRIVATE SECTOR COS.	N	N	Y/U,NC,O	Y/G Y/P	Y/J Y/X
Establish and empower entities to enforce policies which maximize quality and quantity objectives (including quality control of agrichemicals and pesticide residue testing)	1	1,2,3	MOA/PP&PP, MGP, MMRAE, MOS, MOT, MIT DSS AMO	N	Amend AMO Law No. 15 of 1987; Supply Law No. 17 of 1992; Strengthen enforcement provisions of new Agricultural Law and draft National Environmental Law of 1994	Y/NC, U,O	Y/G	Y/J Y/X
Help farmers increase production efficiency*	1	1,2	MOA/DOEI, NCARTT, AEPD, MMRAE/DOE	N	N	Y/NC, U,O	Y/G Y/P	Y/J Y/X

1. DOEI's capacity to engage in such activities is at present constrained by its own staffing and substantive limitations. This unit lacks the capacity to provide such services, without substantial use of externally provided technical assistance.

SUBSECTORAL REFORMS REQUIRED TO IMPROVE RESOURCE MANAGEMENT AND CONSERVATION
LOW RAINFALL AGRICULTURE, LIVESTOCK, & FORESTRY SUBSECTORS

SUBSECTOR OBJECTIVES	PRIORITY	STAGE(S) OF REFORM	ORGANIZATIONS INVOLVED	IMPLEMENTATION CAPACITY?	LEGISLATIVE CHANGES REQUIRED?	RESEARCH NEEDED?	TRAINING NEEDED?	TECHNICAL ASSISTANCE NEEDED?
Revision of Law No. 20 of 1973 as it applies to uprooting of shrubs & trees and overgrazing	1	1,2	MOA/DFAR/AEPD, AC, HCST, RSS, JES, RSCN, UOJ, JUST,	N	Revision of Law No. 20 of 1973	Y/NC, UOJ, JUST, O	Y/G Y/P	Y/J Y/X
Integrating forage production from range and croplands to promote livestock production*	3	1	MOA/DFAR/ NCARTT/DOEI/ PPROD, JES, RSCN, UOJ, JUST, HCST	N	N	Y/NC,U,O	Y/G Y/P	Y/J Y/X
Implementation of a program to halt desertification	1	1,2,3,4,5	MOA/DFAR/ NCARTT/AEPD, MMRAE/DOE, HCST, RSCN, JES, UOJ, JUST, MOP	N	Aspects to be covered in revised Agriculture Law No. 20 of 1973, National environmental Law of 1994, & National land use plan	Y/U,NC,OF	Y/G Y/P	Y/J Y/X
Provide more human and financial resources for rangeland development and management programs	1	1,2	MOA/DFAR/PP MMRAE/DOE, HCST, RSCN, JES, UOJ, JUST	N	N	N	Y/G	Y/J Y/X
Maximize feed production	1	2	MOA/DFAR/ NCARTT/DOEI, JCO, UOJ, JUST	N	N	Y/NC,U,O	Y/G Y/P	Y/J Y/X
Increase small ruminant milk production	2	1,2	MOA/DAP/DAH AEPD/NCARTT/ DFAR/DOEI	N	N	Y/NC, AEPD,U,O	Y/G Y/P	Y/J Y/X
Improve efficiency of processing livestock & Poultry products	1	1,2,3	MOA/DAP/DAH/ NCARTT, MOH, MOS,MMRAE/DOEMIT, AMO	N	Strengthen existing health and agricultural regulations, standards for abbatoirs, cuts & grades of meat, storage facilities, waste disposal	Y/NC,U, JCVV,O	Y/G Y/P	Y/J Y/X
Expand Jordan's forested areas	1	1,2,3	MOA/DFAR/ NCARTT, MMRAE/DOE, HCST, RSS, JES, RSCN	Yes, but lack resources	Revision of Administration of Government Property Law No. 17 of 1974, Agricultural Law No. 20, of 1973, articulation of a National Forestry Plan	Y/NC,U,O	Y/G Y/P	Y/J Y/X
Improve management of existing forests	1	1,2	MOA/DFAR/ NCARTT, JES, RSCN	N	Revision of Agricultural Law No. 20 of 1973	Y/NC,U,O	Y/G	Y/J Y/X
Improve the National capacity for forest development	1	1,2	MOA/DFAR, MMRAE/DOE, HCST, JES, RSCN	N	Ensuring the ability of NGOs to interact with and receive funding from international donors	N	N	Y/J

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APPENDIX B

A PROPOSED PLAN FOR THE

REORGANIZATION OF AEPD

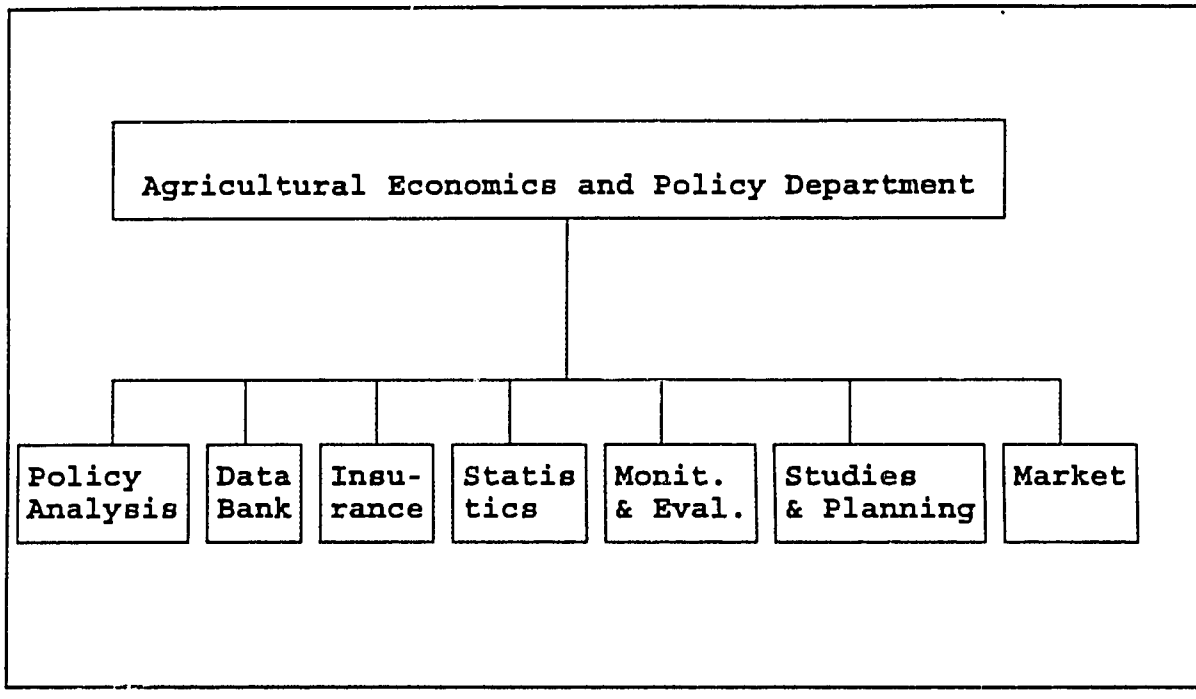
A New Organizational Structure for the MOA/AEPD

n September 1993, the Agricultural Economic Department and the Agricultural Policy Department in the Ministry of Agriculture were merged to form the Agricultural Economic and Policy Department (AEPD). Although a new director and assistant director were appointed to manage the AEPD, all of the divisions from the two former departments remained unchanged. This section describes the current organizational structure and functions of the AEPD and proposes a structure which can help the AEPD to fulfill its mandate and mission more effectively.

A. Current Structure and Functions

There are currently seven divisions within the AEPD and 23 staff members (excluding the Director, Assistant Director and Administrative Assistant). Below in Figure 1, is an organizational chart illustrating each of these divisions.

Figure 1. Current Organizational Structure of the AEPD



These different divisions have various functions that provide the director with information on the agricultural sector and with evaluations on different programs. What follows is brief description of the size and functions of each of these divisions.

1.Statistics Division: There are currently four staff in this division who are responsible for collecting and processing data on crop area and production nationwide. They maintain a database system that is used by other divisions within the AEPD such as the Databank and Policy Analysis. Statistics Division has a direct working relationship with all 24 directorate offices who send data on a monthly basis to the division.

2.Data Bank Division: This division has two personnel and is responsible for establishing, maintaining and updating a data bank for policy analysis. It is also expected to analyze statistical data as required by the Department and identify data needs according to the analytical criteria provided by the Department. The division houses data bases from USDA, FAO and Arab Countries on international trade on agricultural commodities and other related international data. Personnel in the division have experience in animal feed optimization calculations and crop optimization models.

3.Policy Analysis Division: has one person and is responsible for preparing draft policy recommendations using established scientific criteria and methods. The division is expected to use information from the data bank and statistics units and collect data only for the requirements of specialized studies. Cooperation with other government agencies, parastatals and private organizations, national and international institutions in matters related to planning and policy analysis is centered in this division.

4.Insurance Division: This division is expected to study the feasibility of establishing an agricultural insurance system in Jordan. This involves deciding on the crops to insure and the actuarial and financial requirements for a sustainable and self-financing agricultural insurance scheme. Staff strength: 3.

5.Markets Division: With five personnel this division develops monthly import and export plan for processed (canned) fruits and vegetable and provide concurrence on the import licenses issued by the Ministry of Trade. It monitors and issue licenses for

trade between Jordan and the West Bank.

6.Studies and Planning: The division conducts feasibility studies for projects and carries out general social and development studies. It analyzes the mechanics of the wholesale market and assesses the supply situation of important agricultural commodities. The division is expected to conduct studies on the human resources within the Ministry and is involved in inter-ministerial committees developing agricultural-product specifications. Staff strength: 5.

7.Monitoring and Evaluation: This division is in charge of developing plans for monitoring and evaluating MoA projects, programmes and activities. It reports periodically on the MoA's achievements. Develops in cooperation with concerned parties, project and programme indicators which are later used to monitor progress. Provides the Ministry of Planning for with implementation data on the donor-funded projects implemented by the Ministry of Agriculture and on achievements by the MoA on the implementation of the five-year development plan. It monitors implementation of the working plans of the divisions within the AEPD. A staff of 5 is located here.

B. Proposed Structural Changes and Functions

One of the major weaknesses of the AEPD's current organizational structure is that the department is fragmented into too many different divisions. Some of these divisions only have one or two employees and lack the manpower to accomplish different tasks. As a result, productivity falls below its potential.

Implementation of the Policy Charter will place increased demand on AEPD staff for timely and reliable statistics and for rapid analysis of policy options. For improved policy analysis there needs to be closer integration between those involved in producing data and those analyzing it. Improved monitoring of the Agricultural Policy Charter, in addition to requiring closer integration among data suppliers both within and without the MoA, it requires more people exclusively devoted to this task. In both cases, the current dispersion of personnel is major constraint that needs to be overcome.

In order to meet the future needs under the APC, an alternative organizational structure for

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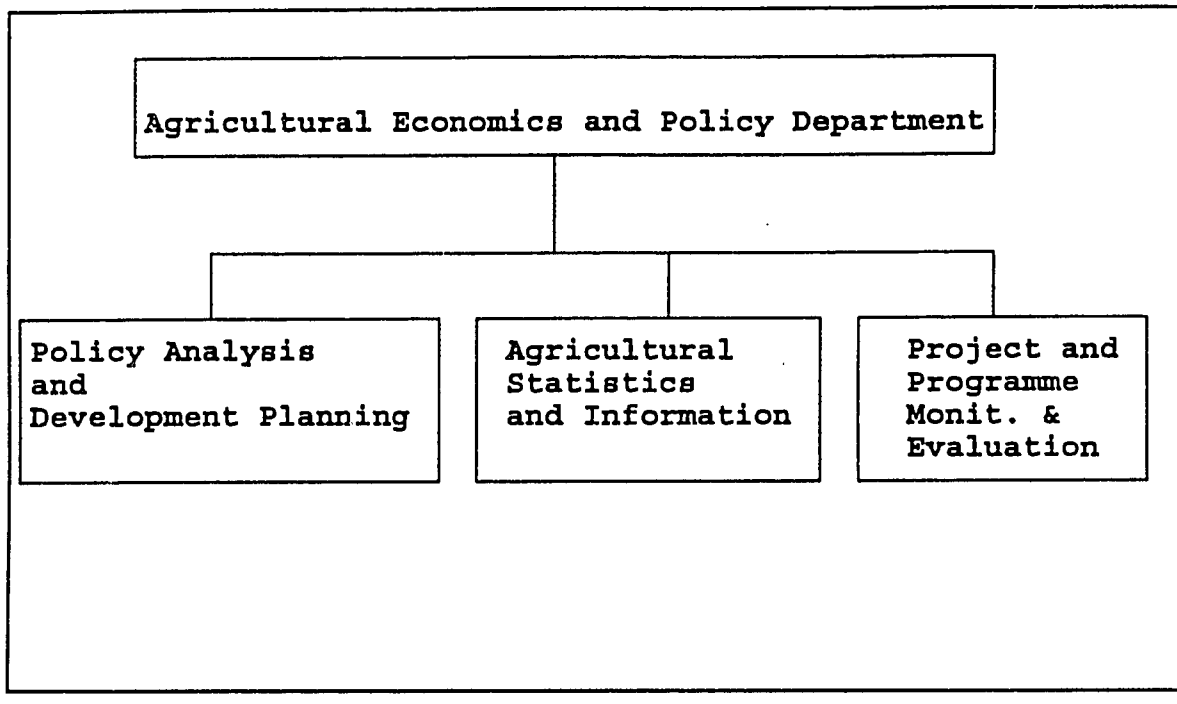
AEPD is presented in Figure 2. This new structure creates within each division the critical mass needed to generate the required data and analytical output. It also enables the utilization of all resources (human and physical) for the achievement of the Department's mission which is "to help the MoA conceptualize the agricultural sector's development strategy, contribute to the analysis, formulation and development of programme, project and policy interventions which will best implement the chosen strategy and set up information and monitoring systems which will improve implementation management".

The AEPD can fulfill its mission by an organizational structure consisting of three divisions which will: 1) analyze policies and develop programmes and projects; 2) collect, process and disseminate statistical information which will feed into the planning, policy analysis and monitoring efforts; and finally 3) a programme and project monitoring unit to feed information back into the system regarding performance. The description of the scope of activities and units within the three proposed divisions follows.

Figure 2. PROPOSED ORGANIZATIONAL STRUCTURE OF AEPD



The Project and Program Monitoring and Implementation. This division will:

1. Monitor the performance of the programme-based budgeting to the instituted in the Ministry of Agriculture (proposed in this study).
2. Continue monitoring of the donor-funded projects as required by the Ministry of Planning.
3. Monitor implementation of the Agricultural Policy Charter using internally generated data and by arranging for participating agencies to provide data required for reporting on APC implementation progress.
4. Monitor trade with the West Bank and issue concurrence on import licenses.

The Agricultural Statistics and Information. This division will:

1. Collect, process, maintain and update data from directorates.
2. Collect information from other agencies to meet the data needs of the AEPD.
3. Conduct surveys and case studies as required for monitoring the implementation of the APC.
4. Coordinate with the Department of Statistics and other data gathering agencies to ensure consistency of data across agencies.

It is suggested that this division be organized into two separate units:

i. Data Collection Unit:

- conduct surveys
- manage data collection from directorate offices
- gather ancillary data (DOS, AMO..)for other divisions
- organize data for easy entry into computers
- store hard copies of all data.
- write monthly reports on data acquired and data needs of the AEPD. Also should mention any problems encountered with acquiring data from other

ministries or from directorate offices.

- provide suggestions on how to improve data collection in the future.

ii. Data Processing Unit:

- enter all data from the data collection unit into the computers (MOA data and ancillary data).
- maintain a system to check all data before and after computer entry to detect any unreasonable figures.
- provide the data collection unit and division head with processed data.
- write monthly reports on any difficulties encountered with processing data in the unit.

The Policy Analysis and Development Planning Division. The main functions of this division are expected to be:

1. Quantitative and qualitative analysis of the policy issues being considered by the Ministry of Agriculture.
2. Development of agricultural development strategies; development of project profiles for donor agencies; development of locally-funded programmes and projects to be implemented by the departments of the Ministry of Agriculture.
3. Collect and process quick response data as required by decision makers in the MoA.
4. Conduct social and economic studies. Produce reports and documents required by bilateral and multilateral agencies.

Three units may be required to carry out the functions of this division:

i. Policy Analysis Unit

- Write policy analysis papers
- Formulate position papers

ii. Development planning and Studies Unit

- Conceptualize project ideas
- Develop programmes and projects for programme-based budgeting

iii. Quick Response/Data Bank Unit

- Develop linkages with data sources which can provide information on short notice, over the phone or by facsimile.
- respond to requests from decision makers on data for decision making

APPENDIX C

RESEARCH AND EXTENSION CAPABILITIES, CONSTRAINTS

AND

RECOMMENDATIONS

DETAILED DESCRIPTION OF RESEARCH AND EXTENSION CAPACITIES

A. The Faculty of Agriculture, University of Jordan/Amman

The Faculty of Agriculture (FOA) was established in 1972 to: a) train students, b) conduct agricultural research, c) publish research results, and d) disseminate research results through appropriate media. Although teaching is the major responsibility of the faculty (65 percent) (37), research has been conducted in plant and animal production, soil and irrigation, economics, nutrition, food processing, extension, plant protection, and farm machinery. These research activities represent 64 staff members, as indicated in Table 1. Completed studies are published in international and/or national journals.

Some of the information generated, e.g. in economics, soils, and pathology, has been utilized in extension bulletins for the benefit of agricultural producers. This has been associated with extension activities such as seminars to farmers, field demonstrations at the university research station, and presentations to the media. Advanced farmers in the Jordan Valley have also requested studies by the FOA to solve specific problems.

In addition to agricultural training leading to advanced degrees, the faculty provides training in several disciplines upon request, for farmers, extension staff and employees of the private sector.

B. Jordan University of Science and Technology (JUST)/Irbid

A Faculty of Agriculture and Veterinary Medicine, established at JUST in 1985, was divided into separate faculties in 1990. Its mandate includes teaching, research, and providing the media with results which are useful to producers. The institution is also a resource for short-term training in several disciplines. The Faculty of Agriculture consists of plant production, nutrition, and animal production; the Faculty of Veterinary Medicine is divided into medical science and clinical sciences (33). The two faculties, which have a total

of 18 members representing 9 disciplines (Table 2), produced their first BSc graduates in 1989.

Voluntary cooperation is notable between staff of the Veterinary Department and the MOA's Regional Agricultural Service Center (RASC) at Ramtha in solving problems of local animal husbandry producers. The tissue culture section has produced virus-free minitubers in sufficient numbers for seed production in the field. Cooperation with the private sector in this activity is under negotiation.

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Table 1. Specializations of FOA Staff at the UOJ

Department/Disciplines	Number of Staff
Plant Production	
Vegetables	4
Field crops	3
Fruit trees	4
Sub-total	**11**
Animal Production	
Sheep and goats	1
Cattle	1
Poultry	2
Veterinary medicine	1
Range management	1
Sub-total	**4**
Soil and Irrigation	
Soil	9
Irrigation	3
Sub-total	**12**
Nutrition and Food Processing	
Nutrition	8
Microbiology	1
Processing	2
Sub-total	**11**

Agricultural Economics and Extension	
Economics	5
Marketing	1
Extension	1
Sub-total	**7**
Mechanization	
Machinery	2
Plant Protection	
Plant Pathology	3
Entomology	5
Virology	2
Nematology	1
Weed science	2
Pesticides	2
Sub-total	**15**
TOTAL	**64**

Source: UOJ/FAO

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Table 2. Specializations of JUST Staff.

Department/discipline	Number of staff
Plant production	
Soils	2
Agricultural extension	1
Plant physiology	1
Landscaping	1
Forage production	1
Plant breeding	1
Entomology	2
Tissue culture	1
Sub-total	**10**
Animal production	
Nutrition	6
Animal breeding	1
Animal physiology	1
Sub-total	**8**
TOTAL	**18**

Source: JUST

NCARTT Seed Laboratory

NCARTT's Seed Laboratory, located at headquarters, is responsible for ensuring the quality of plant seed imported into the country. All incoming seed samples are funneled to the laboratory, which tests them for germination levels and genetic and physical purity. Chemical analysis is planned for the future. A seed multiplication service provides commercial quantities of seed on demand, particularly of wheat and barley. Seed is multiplied through farm contracts, usually arranged through the JCO.

The private sector is capable of running a seed laboratory and conducting the necessary tests, upon purchase of additional equipment and training of staff. Such a service would have to charge a fee for each sample tested. If this were encouraged by the MOA, the NCARTT laboratory should retain its regulatory responsibilities and monitor performance of the private seed laboratory. Hence the responsibility for seed testing should remain in the MOA.

4. Tissue Culture Laboratory

The Tissue Culture Laboratory was established in the MOA in 1990-1991 with assistance from the French government. The laboratory has imported rootstocks of apples and other fruits, from which virus-free rootstocks are mass produced in nurseries and distributed to growers. Ten thousand virus-free rootstocks of three lines of Golden Delicious apples are now ready for multiplication in MOA nurseries. However, this activity is presently suspended, due to a lack of nursery facilities.

Experiments are underway on olives, tomatoes and cucumbers. The latter two crops are also researched at the Tissue Culture Laboratory at the JUST, with which cooperative activities have been established. Progress in tissue culture with olives has been hampered by inappropriate conditions in a nursery controlled by another organization.

Laboratory staff also train two students per month in tissue culture technology, for a period of one month each. Graduates are usually employed by the private sector. Tissue culture staff would benefit from closer contact with other scientists, which could easily be formalized by attaching the laboratory to NCARTT. This may also alleviate problems presently encountered with timely availability and appropriate management of rootstock nurseries.

The capability of the staff is adequate in teaching and research; physical constraints to research can be solved with better management. The laboratory contributes expertise to staff of those private sector agri-businesses presently involved in tissue culture of cut flowers and potatoes.

5. Plant Protection Department

The Plant Protection Department, located at NCARTT, reports directly to the MOA. Responsibilities include monitoring of pesticide imports for conformity to label specifications relative to content, purity, efficacy , etc. However, physical limitations prevent testing for efficacy of all products submitted.

Some plant protection regulations promote contravention, e.g. one regulation stipulates that application of a pesticide in Jordan is limited to label instructions for its use in the country of origin. As a result, product labels cannot be modified even though an importer conducts field tests and generates data which show that under Jordanian conditions, its product is effective against an insect and/or on a crop not on the original label. This situation can jeopardize successful commercial production of a crop.

D. The Jordan Cooperative Organization (JCO)

The JCO is a farm service organization that supplies production inputs, tools, and equipment at a discount to member farmers through savings realized by bulk purchases for its 109 cooperative stores. It is also involved in research and extension to solve practical farm

problems. The JCO has 83 agricultural engineers in the field to serve farmers in 248 agricultural cooperatives. The organization has conducted more than 37 research studies during the past 3 years, in cooperation with research institutions. Programs include field crops, red meat production, sheep breeding and fattening, machinery development, seed multiplication and rangeland management, all of which are priority programs listed in the MOA charter and approved by the HCST. Research programs are approved and funded by the HCST after careful internal planning in the JCO.

Extension and training are important activities; 17 roving extension personnel show instructional video tapes, and arrange training courses for member farmers and JCO staff. More than 60 video tapes are used on a routine basis and some of them are shown on national television.

The JCO's Department of Rural Development also assists in the establishment of facilities needed by group organizations, cooperatives, and training centers, and supports research and extension demonstrations in agriculture. The rural population is thus assisted by the creation of new job opportunities in food processing and preservation, and the introduction of new technologies needed for food production in home gardens. It also encourages rural families in animal production.

Vehicles available at the field centers permit extensionists to drive themselves and set their own schedules. Working hours depend on the season and the intensity of farmer operations. Extensionists are compensated for overtime and receive bonuses at the end of the year, based on their level of output. The JCO appears to be making worthwhile contributions to research and training needs of its member farmers.

E. Higher Council for Science and Technology (HCST)

The HCST, financially and administratively independent, has the mandate to formulate policies and plans in science and technology (S&T), to ensure financial support for S&T

activities, and to support research and development projects. Chaired by HRH, the Crown Prince, HCST board members are the Ministers of Planning and Trade, Industry, Finance, Higher Education, Energy, and Mineral Resources and Agriculture.

The agricultural sector is under the HCST secretariat, headed by a Secretary General. Each sector has a national committee which includes representatives from relevant government organizations, universities, research and development centers, and the private sector. All research proposals from NCARTT and certain other institutions involved in agricultural research are approved by this committee.

F. Agricultural Marketing Organization (AMO)

AMO was established in 1987 for the purpose of formulating and implementing marketing policies for agricultural produce. It is also responsible for developing markets and organizing marketing activites. AMO cooperates with several organizations in the following activities:

a) Execution of research related to domestic and export marketing, as well as the collection of market information which is disseminated to both the public and private sectors.

b) The development of import and export plans and enforcement of their implementation.

c) Determination of the kinds, quantities and timing of agricultural produce to be imported or exported.

d) Enforcement of produce specifications for both domestic and export markets.

e) Development of specifications for packing crates.

f) Participation on the committee responsible for controlling consumer prices of agricultural produce.

g) Cooperation with other organizations in conducting economic and technical studies concerned with agricultural production and food processing.

h) Issuing recommendations to exporters for obtaining export and import licenses and export certificates from other government agencies.

i) Establishment of marketing boards and assistance in the promotion abroad of local produce.

j) Supervision of marketing activities related to storage and wholesale markets.

AMO is responsible for marketing extension in the country. It provides growers with information on picking times, and handling and packing methods for various kinds of produce. AMO also collects information on both local and foreign markets. The organization employs six agricultural engineers who are trained in marketing extension. They make field visits to growers and exporters; hold seminars; help produce extension leaflets, and radio and TV programs; and organize agricultural exhibitions. However, there is no coordination between this department and the DOEI in the MOA.

In 1988, USAID funded the development of Jordan's agricultural marketing capabilities in the region and internationally. This project was extended for 2 additional years to compensate for setbacks encountered during its launching and the Gulf War.

G. Parastatal Organizations

1. Queen Alia Fund for Jordanian Voluntary Social Work

Established in 1985, this fund organizes and steers voluntary participation in the social and economic development of local communities. The fund's efforts are focused on rural areas where it promotes the establishment of small agricultural projects to provide families with supplementary income from such activities as the production of vegetable and medicinal plants in home gardens. The fund also encourages the planting of fruit trees, plastic culture, and sheep and goat production.

The fund supports 40 centers for social services, which are located throughout the country. It provides agricultural production inputs to qualified families, as well as extension and training in cooperation with MOA extension agents and the JCO through its Department of Rural Development.

2. Queen Noor Foundation

This foundation targets low income families in villages identified by economic and social studies. Village development boards are chosen, which are supported by technical committees appointed by the foundation. Members of these committees represent the MOA and the JCO.

The foundation has activities in eight villages, where it executes the program " Women and Development". The objective of this program is to increase the participation of women in social and economic development through training in small-scale agricultural projects to supplement family incomes. Such programs include rabbit farming, production of medicinal plants, goat production, and poultry farms for egg production. The foundation has introduced new programs in dairy cattle, bee keeping, and plastic culture for vegetable production. The foundation employs six agricultural engineers in various specialties.

IV. INCREASED FOOD SELF RELIANCE

Research provides the blueprint for progress in increased self reliance in food production. Research activities should be viewed in terms of: i) potential markets for high value crops; ii) availability of resources, especially water; iii) sustainability of introduced technology; and iv) cost of production. In each agro-ecological zone, research should target those crops and technologies which have potential competitive advantages. The MOA's goal to improve the competitive capacity of agricultural products and decrease production costs must be based on improved technologies and cultural practices generated by all organizations serving agriculture. The reasons for low rate adoption of certain packages should be identified and new technologies developed which are technically sound and economically feasible (39).

A. Research Priorities in Agriculture

Four production thrusts were identified in the National Agricultural Research Strategy using the "Weighted Criteria' model to set research priorities. Based on 100 percent of research resources in terms of staff salaries and projects, research opportunities were identified as follows: i) irrigated agriculture (35%); ii) rainfed agriculture (24%); iii) low rainfall areas (19%); and iv) integrated livestock (22%) (33).

The strategy properly assigns high priority to research which will optimize the use of water and land resources by:

a) Improving water use efficiency,
b) Utilizing non-traditional water resources,
c) Minimizing environmental degradation and pollution, and
d) Intensifying cropping systems.

Additional objectives which should be considered (4) are:

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e) Maximizing efficiency of water storage, conveyance, distribution and on-farm application, and

f) Maximizing economic net returns from the use of irrigation water.

A long-term research priority that applies to all agricultural sub-sectors is the development of techniques in integrated pest management (IPM). Such techniques can be developed only by studies of the life history of a pest and its relationship with other organisims in its environment. This information can identify a pest's weaknesses and lead to effective control through cultural practices, management of predators, and/or the use of chemicals. In the meantime, in the interests of food and water purity, chemical methods to control pests should be used conservatively and only as a last resort.

The recommendation in the strategy (2) regarding IPM should be followed, that is, appoint an IPM specialist to focus on research of priority problems and to train research staff in IPM methodologies.

1. Irrigated Subsector Strategy Recommendations

Recommended research strategies on crop production under irrigation deal with optimum utilization of production inputs; improvement of crop yields, harvesting, handling and quality; evaluation of new crops with domestic and export potential; and reduction of post-harvest losses. Research efforts are to be apportioned as follows: vegetable crops - 30 percent, water resources - 20 percent, fruit crops - 15 percent, soil and land resources - 15 percent, and field and 'other crops' - 10 percent each (33). Wheat and barley are designated crops for plant breeding research. Recognizing water constraints, research under irrigated conditions should be limited to high value crops and breeding research on wheat and barley should be confined to rainfed conditions. Research on bananas should be dropped; in fact bananas should not be grown commercially because of their high water requirement.

Long-term research plans in irrigated agriculture should take two factors into consideration: i) water supplies in Jordan are already critical and ii) the population is increasing at an annual rate of 3.3 percent. As water decreases in supply, delivery costs will escalate, crop production costs will increase and economic production will be confined to crops of highest value. In an extreme case scenario, irrigated crop production could be banned, with all water resources channelled to domestic use. In the long term, there will be increased reliance on agricultural production from rainfed areas. It may be prudent, therefore to limit research on irrigated crops to short-term goals, eliminating grain crops and bananas from irrigated research projects, and assigning a higher share of the total research budget to rainfed agriculture, rangelands, and animal production.

2. Rainfed, Low-Rainfall and Livestock Subsector Recommendations

Research strategies for rainfed agriculture, low-rainfall areas, and integrated livestock production are well thought out and the research generated should improve production levels and reverse environmental deterioration. However, careful consideration should be given to the selection of priority research projects from those listed in draft strategies from agricultural sub-sectors, particularly in the draft of Research Strategy for Rainfed Agriculture (1). In rainfed agriculture and grazing lands, programs which emphasize soil conservation, soil erosion control, grazing management and the stabilization and reversal of desertification should be given highest priority. Results of these practices will stabilize and protect the environment while improving production capacity and decreasing production costs.

Breeding and genetics should play an important role, particularly to develop improved varieties of fruits and improved breeds of animals. There is a need for increased research in post-harvest technology and for food processing. In these latter activities, the UOJ should take a leading role, in cooperation with the private sector.

Increased agricultural production appears to be highly dependent upon inputs. Table 3 shows that as the total value of inputs to animal and plant production increased from JD 83 million

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in 1986 to JD 145 million in 1990, the value of agricultural output rose from JD 181 million to JD 325 million. During the same period, the value added for plant products increased sharply from JD 63 million to JD 141 million, while the value added for animal production increased only slightly from JD 35 million to JD 39 million. The figures also show that while the contribution of plant production to total value added increased from 64 percent in 1986 to 78 percent in 1990, that of animal production decreased from 36 percent to 22 percent during the same period. It is evident from these data that private sector investment is geared toward plant production, and that more research is needed in animal production to reverse the trend of decreasing value added to animal products (Table 3).

III. RECOMMENDATIONS

The following constraints to agricultural research and extension in Jordan, which were identified by an analysis conducted in 1985 (7), are still applicable:

a) An absence of fixed policies from the MOA,

b) Inadequate capacity of existing public institutions to provide systematic, regular, and effective technical services for farmers.

c) A low level of farmer participation in the decision making process for agricultural research,

d) Weakness of research and extension and lack of training for farmers (38),

The development of the MOA policy charter and the agricultural strategy soon to be issued will serve to focus energies and activities on priorities in agricultural research and development. Delineation of these priorities will help to target international donors on the needs of Jordan's agricultural sector, while it will also justify insistence by the MOA that donor projects be in the interests of Jordanian agriculture.

Basic criteria for all field agricultural research should include resource conservation, particularly water; sustainability; market potential; cost of production; and introduction and development of high value crops which would give Jordan a superior competitive advantage over other international suppliers.

Research in the Ministry of Agriculture (NCARTT)

NCARTT is poised to fulfill its designated role as the lead institution in agricultural research and technology transfer in Jordan. It has a core of well trained and capable scientists and excellent facilities at headquarters and in the field. NCARTT should now be accorded complete autonomy and authority in staff management to meet its obligations to the agricultural sector. The following alternatives are suggested to attain autonomy for NCARTT:

a) Introduce a law to allow NCARTT to develop its own personnel policies and salary levels which would attract quality staff and ensure their motivation. Continued location of NCARTT within the MOA should simplify relationships with their partners in the MOA, particularly the DOEI.

b) Introduce a bylaw to enable NCARRT to sub-contract research with Universities. Universities would be allowed to run and manage particular research stations for a fixed period of time based on a muttually agreed research and extension plan.

The UOJ would be the university of choice because of its experienced and mature faculty and the opportunity such an affiliation would provide for association with a large number of scientists. Joint NCARTT/UOJ research effort would: i) result in closer working relationships with the majority of scientists in the country, ii) facilitate follow up on the collection of research

data, iii) facilitate cooperation with UOJ staff on joint research projects, iv) more fully utilize NCARTT facilities and equipment, and v) provide the opportunity for research by graduate students and by faculty on sabbatical leave. UOJ staff would react positively to the opportunity of conducting research in the excellent NCARTT laboratories. The Faculty of Agriculture at JUST or faculties of other universities would have the same privileges at NCARTT as that of the UOJ and relationships between NCARTT and JUST should not be affected by NCARTT's association with the UOJ.

Recommendations on Staffing and Management

The following recommendations concern the general functioning of NCARTT, regardless of its institutional location:

a) Advertise nationally and internationally for the position of Director and all other scientific staff at the PhD level. Selections should be based on qualifications as judged by a committee of experts from NCARTT, the UOJ, JUST, and the HCST. Salaries and perquisites should be competitive with other Jordanian scientific institutions. Positions should be for a period of 5 years with the first year designated as a trial period.

b) Undertake a thorough evaluation of NCARTT staff. Upgrade staff when merited and relocate others when justified. It is likely that some staff will serve more effectively in other positions in the MOA, such as Subject Matter Specialists (SMS) or in the DOEI to upgrade its staff.

c) NCARTT should initiate a system of process management by objectives. This system encourages staff responsibility, removes daily decision making from top management, monitors progress on agreed-upon goals and objectives, and assesses staff based on the level of accomplishment of these objectives.

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Rewards and promotions are based on measured performance and assistance is given to under-achievers where practical. Consistent under-achievers are dismissed. The system should be initiated by a local expert or an expatriate who would train top management and assist them in introducing procedures to their immediate staff. The same procedure is passed on to each level of staff. In the meantime, the local personnel manager should be sent for training to prepare for administering a permanent program based on incentives. This system of management should be introduced throughout the MOA.

d) Coordination and information exchange of extension activities need to be formalized to permit free exchange in all areas. Procedures for information transfer from NCARTT to the DOEI should be simplified.

Budgeting and Funding

The goal of research and extension should be to develop excellent staff and programs in the high priority areas. Setting of desired budget levels for NCARTT for the next 5 years and decisions on priority research will determine the disciplines needed to meet research goals. The NCARTT Steering Committee should develop budgets for both research and extension activities of high priority. These budgets should be extrapolated to anticipate the priority needs of research and extension each year for the next five years.

The level of research activity should be guided by the anticipated availability of funds and should be sustainable in terms of staff and projects at NCARTT. Projects should be terminated rather than expend resources on a low level of output and efficiency. If funds are deficient from regular sources, the following actions should be considered:

a) Approach international donors to support specific priority areas. To do this efficiently, a person who is knowledgeable about programs, policies and

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specialties of donors and international centers should be assigned to write and submit proposals to appropriate organizations.

b) Establish a levy of between 0.5 and 2.0 percent on sales of agricultural produce in wholesale markets, or distribute an existing levy to allocate a certain percentage for research and extension.

c) Establish a levy on carcasses in slaughter houses or redistribute the existing levy.

d) Establish a levy of 1 fils/kw of electric power used and/or a levy on telephone bills.

e) Make donations for agricultural research and extension to NCARTT a deductible item for income tax.

f) Place a levy on imported produce and luxury food commodities.

Procedures to coordinate research planning, execution and reporting

a) Minor modifications in the present system would improve efficiency. The research planning committee should be composed of scientists representing cooperating agencies, including the JCO and a qualified representative of the private sector.

b) Members of the research planning committee would hold farmer meetings organized by local extensionists for each of the agro-ecological regions. The group would present their concept of farmers' needs and the research planned to meet those needs. This will prompt farmers to volunteer their opinions. Two or three such meetings in each region should be sufficient. This system

is more economical of both time and money, as well as being more reliable, than a farm-to-farm survey conducted by an extensionist. The JCO and private sector representatives would contribute their annual analysis of farmers' needs upon request. The entire list would then be prioritized for short-term and long-term projects and the plan submitted to the HCST for its assessment. Upon approval, the projects should be grouped into related types and research teams of appropriate disciplines should be selected from NCARTT and the universities.

c) A senior person from NCARTT should chair each research team, whose members (or an appropriate representative of their institution) would be invited to participate in some aspect of the research. In this way, interdisciplinary researchers from NCARTT, JUST, HCST, UOJ, JOC, and the private sector would participate in some phase of the same project. Projects may complement UOJ research which would benefit from an interdisciplinary approach. Committee members would be responsible for ensuring that NCARTT receives progress reports at the end of each season.

d) Based on NCARTT's mandate, the heads of all scientific institututions in the country should be notified of their responsibility to supply NCARTT with progess reports on all agricultural research. Researchers of each institution must be advised of this requirement and, if necessary, it should be included in their job descriptions. Also, designated staff members of NCARTT should be responsible for collection of results of research conducted. Reports of mature technology would be modified for technical bulletins either by institutional researchers themselves (for a modest honorarium) or by NCARTT technology transfer staff. Translation, editing staff, and printing facilities are available at the UOJ.

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e) NCARTT coordinators should be appointed to liase with other research institutions to ensure collection of research reports at the end of each season.

f) The agricultural strategy, once approved, should be distributed to the heads of agricultural faculties at the universities, with the requirement that all faculty and graduate student research should contribute to priority needs as identified in the national agricultural strategy.

g) As part of the coordination program, NCARTT research facilties could be used by gradute students while working on their research, as well as by university faculty on sabbatical leave. In this way, university faculty could be used to research special projects at NCARTT.

h) Information exchange within NCARTT could be facilitated by substituting the title of Section Director with Team Leader. The title of director implies an exclusivity that discourages communication.

Table 3: Gross Value and Value Added of Plant and Animal Output, 1986-1990.

Item/Value	1986	1987	1988	1989	1990
Plant Value					
A. Gross output (I)	95.6	117.6	106.5	121.8	172.0
Prod'n input (ii)	32.9	33.5	27.1	24.2	31.0
B. Value added (i-ii)	62.7	84.1	79.4	97.6	141.0
% value added (B/F)	66.0	72.0	75.0	80.0	82.0

Animal Value

C. Gross output (III)	85.0	90.2	98.7	106.4	153.0
Prod'n output (IV)	50.4	52.4	57.8	60.6	114.0
D. Value added (III-IV)	34.6	37.8	40.9	45.8	39.0
% value added (D/F)	41.0	42.0	41.0	43.0	25.0
E. Total gross value of outputs (I+III)	180.6	207.7	205.1	228.2	325.0
Total value of prod'n outputs (II+IV)	83.3	85.9	85.0	84.7	145.0
F. Total value added (B+D)	97.3	121.8	120.1	143.5	180.0
Contribution of plant output to total value added (A/F)	64.0	69.0	66.0	68.0	78.0
Contribution of animal output to total value added (C/F)	36.0	31.0	34.0	32.0	22.0
Total value added (F/E)	54.0	59.0	59.0	63.0	55.0

Total value of domestic production in million J.D. and contribution in %.

Source: Department of Statistics, Jordanian Statistical Year Book of 1990 (adapted from reference 41).

2. Operation

a) The MOA should issue a statement on the role of extension and its linkages with clients and peers (47).

b) The MOA and the Director of DOEI should issue a statement encouraging communication and cooperation with extensionists from other organizations, including the private sector. This would include visits to field research and demonstration trials, and joint participation in farmer meetings. In general, MOA extensionists should regard all extensionists as partners rather than competitors and become familiar with all extension recommendations available.

c) A representative of the information section of the DOEI should be responsible for obtaining copies of pamphlets and bulletins from all sources, e.g. the UOJ, JCO, AMO, and private companies and ensure that they are available to all extensionists.

d) Qualified representatives of the private sector should be included as members of the Extension Steering and Research Committees.

e) Field extensionists should submit plans for the next season to the Extension Steering Committee for approval. These plans should be based on farmers' priority needs and mature technologies introduced by NCARTT. After further prioritization by the Director of Extension and his staff, these plans should be incorporated into a national plan for the season. Specific programs should then be developed for each field extensionist.

f) With a personnel policy in place, it is assumed that the turnover of extension staff will be decreased or halted. This will permit training programs to have

continued impact. Training should be a continuous process for extensionists, starting with preparation for the area of assignment and continuing with the development of each new technology. Arrangement of training courses are the responsibility of the training section of NCARTT.

- Each new employee should receive a short course on extension techniques and technologies appropriate to the area of assignment. Various courses are available at the UOJ or JUST, who recruit resource persons from JCO and the private sector.

- The UOJ Agricultural Economics and Extension Department should consider strengthening their extension arm to provide a MSc in extension.

- NCARTT researchers should be responsible for maintaining the level of expertise of extensionists through periodic short courses and seminars. This should include plot techniques for farm demonstrations and field tours to demonstrate current promising research. To accomplish this, it may be necessary to allocate up to 20 percent of a researcher's time to training.

- Training priorities should emphasize farm management and business skills relative to farming.

- Give priority to training growers in: i) water requirements of crops at various stages of growth in relation to the operation of drip irrigation systems, and ii) technology related to tree fruit production.

g) Field extensionists should be given housing assistance in the area where they are assigned. This would encourage extensionists to reside and become part of

the community for which they are responsible. This will improve the level of field extension activities.

h) Field extensionists should be actively involved with NCARTT researchers' on-farm trials to ensure that they are capable of carrying out farm demonstration programs when the technology is released.

i) Field extension staff should communicate with extensionists of other organizations in their areas to find out their perception of farmers' priority needs. This information should be relayed to extension headquarters.

j) Organize semi-annual seminars for technical representatives of all organizations involved in extension, at which programs planned for the following season would be reported. This should lead to cooperative activities in areas of mutual interest and avoid duplication of effort.

k) Meetings should be held prior to every season to obtain farmers' inputs to research needs. Extension staff from other organizations should be invited and their inputs solicited.

l) Field staff in each RASC should be assessed in terms of extension objectives accomplished. Cooperation between extensionists from different organizations should be encouraged.

m) Extension districts should be analyzed to determine the level of extension expertise required and extension staff assigned to meet the needs. For example, there are areas in the Jordan Valley where farmer expertise surpasses that of extension personnel, thus eroding farmer confidence in MOA extensionists. These should be identified and either researchers or SMS assigned part time to administer to special needs.

n) Appropriate researchers from universities or NCARTT should be invited occassionally to speak at farmer meetings, along with the extensionist in charge.

o) Qualified members of farmers' organizations and the private sector should be represented on the Extension Steering Committee.

p) The MOA should encourage the establishment of consulting firms to service the technical needs of large-scale farmers. This can be done by recommending tax breaks on income generated from consultation services. As time goes on, these farmers will not use the extension service because they will obtain the information they need either from scientific organizations, consulting firms, or from technology available abroad.

In 1970, research and extension were merged, which was renamed NCARTT in 1985. At the time of publication of By-law 42 in 1993, extension responsibilities were removed from the purview of NCARTT and assigned to a newly created Department of Extension and Information (DOEI) in the MoA with 96 extensionists, including 9 females.

The recent decision to seperate extension from NCARTT was justified on the basis of allocating more priority to extension activities. However, it has resulted in a decline in regular contacts between research and extension staff and seldom do research and extension and farmers meet together. Official contact between NCARTT and DOEI staff requires time consuming formalities which discourage coordination and cooperation. Hence, most research extension contacts are made on the initiative of RASC and extension staff at the field level for the purpose of meeting farmers' needs. However, extension staff often cooperate in arranging farmer contacts when research is involved with farm trials for new technology.

To overcome this lack of contact, NCARTT is in the process of developing a Department of Technology Transfer to do some of the tasks previously done by extension staff when they were part of NCARTT.

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ANNEXURE I. Scope-of-work for the Agricultural Policy Research/Extension Specialist

This senior specialist will work closely with Jordanian counterparts in incorporating the results of the national Agricultural Research Strategy into the overall report and in completing the following tasks:

- Identify the issues which will need to be addressed when implementing the agricultural policy charter in the agricultural sector with respect to agricultural research, technology transfer and extension;

- Review and assess the capabilities of the ministries, existing agricultural sector institutions, organizations and/or groups, which would have the responsibility for addressing the issues and/or implementing research, technology transfer and extension activities. Identify the needed organizational adjustments, for those institutions to play significant roles in the future;

- Assess the capabilities within the MOA of the various departments at MOA headquarters and in the field directorates and/or concerned entities for dealing with the issues and implementing and/or supportng research, technology transfer and extension activities; and

- Draw up a plan for implementing the recommendations.

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Dr. B. Hattar	Professor, Soils Dept.
Dr. Sadgi Khadar	Chairman, Sols Dept.
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