

Republic of Yemen
Ministry of Agriculture &
Irrigation
General Directorate of
Planning & Monitoring



الجمهورية اليمنية
وزارة الزراعة والري
الإدارة العامة للتخطيط والمتابعة

Aden Agenda

**Framework of the Structural Adjustments
For Reform of the Agriculture and Irrigation Sector**

Part I

Yemeni Agricultural Policies and Strategies

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التعديلات الهيكلية للقطاع الزراعي (أجندة عدن)

1- يوافق مجلس الوزراء على التعديلات الهيكلية للقطاع الزراعي (أجندة عدن) المقدمة من وزارة الزراعة والري والمتضمنة مايلي:

أولاً : وثيقة سياسات وإستراتيجيات الزراعة اليمنية
ثانياً : آفاق التطوير المؤسسي للقطاع الزراعي كما يلي:

أ- إعادة هيكلة الموارد البشرية في الوزارة
ب- إعادة هيكلة الخدمات الحقلية للقطاع الزراعي

2- ينفذ القرار بالوسائل الإدارية المناسبة .

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Executive Summary

Yemeni Agriculture is classified as being subsistence agriculture– though the agriculture contributes 17% of the Gross Domestic Product, and employs more than half of the available manpower – that relies upon the use of the limited natural resources of water and land as a base for its continuity, which is rapidly depleting. This is due to the bias towards groundwater irrigated agriculture, and a distorted price structure for agricultural inputs and outputs and in view of the existence of small and widely dispersed farm holdings, not to mention the neglect of the traditional farming methods by Research and Extension and the lack of compatibility of the advanced inputted technologies because they do not meet the needs of the farmers and do not correspond to the available resources.

The rainfed and irrigated agricultural systems in their present forms also lead to the poor levels of output, which make agriculture unattractive and unsustainable. Plant and livestock production is in the forefront of the agriculture economic systems, in addition to the diversified forestry and pasturage productive systems. Included in this system is production in fisheries, in view of the linkages and intertwining aspects of the two in the lives of the rural population with their various ecological breakdowns.

The manufacturing systems are still in their primary stages, both in terms of processing and industrial context (cotton, tobacco, vegetables, dairy products, oils fish, leather, etc.)

There is also a reasonably good trading system developed for agricultural produce which contributes a reasonably good proportion of the GDP, where the agricultural exports account for more than 30% of the total non-petroleum exports.

The current bias in favor of one sector against the other has adverse effects, especially for the agriculture sector, in all its activities, and this bias takes its form in the small size and the proportion of the investment budget which is presented for the agriculture sector, despite its importance economically and socially, and the increased deductions thereof by more than half, with a bias towards a pricing policy, customs tariff and protective measures that work against agriculture, as well as the inequitable trade balance.

The natural human and financial resources the basis and center of the agriculture structure, as there are more than 76.5% of the total population that live in the rural areas, and with a 3.5% population growth rate, the population in the Year 2010 will reach 26 million people. This requires that the agriculture sector achieve growth rates that exceed the growth rate of the population in order to meet the increasing needs of the population.

The agricultural land resources used in agricultural investment constitute about 3% of the land area of the Republic of Yemen.

The annual renewable water resources amount to approximately 2.1 billion cubic meters, whereas the estimated water used comes to 2.8 billion cubic meters, and the financial resources (loans and aid) for capital investments in the sector, in the Three Year and Five-Year Plans, from 1972 – 1997, are estimated to amount to US \$

600 million. This does not exceed US \$ 20 per hectare annually. This is considered a very low investment rate, under which agriculture can never be expected to progress by this manner of investment.

The agriculture services in the sector center on providing research and extension services and some of the basic services in plant protection, livestock breeding, quarantine and rural credit.

Agriculture is beset by a number of natural, technical, social economic, institutional and legislative constraints and difficulties.

To remedy the difficulties requires turning towards a new form of remedies that starts with linking the actual present situation with the lessons learned over the different past stages which agriculture has gone through, in particular, and what the development process went through in general, through the comprehension and recognition of the challenges faced by the sector, including the depletion of the natural resources and the poor position of agriculture economically, as well as the issues of poverty and hunger that is sensed by most of those involved with the sector.

Overcoming the difficulties and constraints relied upon the adoption of guiding principles that will lead to determining the objectives, the formulation of policies, and the development of the features of the agricultural strategies in two models, which are first, the farmers and second, the interventions. To meet the base of the second model, the interventions, this requires the determination and the breakdown of the roles between the different parties involved in the development process, at the executive, service and management level, whereby its features are linked by integration and compatibility.

The development objectives of the policies are the achievement of food security, combating poverty and sustainable growth. These policies were formulated in a number of forms and they were framed within the context of the general policy expressions within the appropriate physical, technical, economic social, legislative and institutional setting. In order to realize these policies the strategic choices were adopted for the accomplishment of targeted increases in the output of grain, livestock production, and the increase of incomes generated by rainfed agriculture, and the increase of the output from irrigated agriculture.

The achievement of the strategic targets rested on the magnitudes/devices for making them possible, such as enabled farmers, institutional reinforcement, appropriate settings, and investment guidance through programs that seek to proceed to the target and that aim for the strategic devices in the fields of technology and productive programs, finance, investment and human development programs, management improvement and policy analysis programs, from the standpoint of modernized outlooks, which are based on the expanse of time and space. All these steps would require that change is instilled by combined of proficient efforts and the farmer's convinced of the need for participation and of taking measures that ascend to the prerequisites for change, which are linked with the analysis beyond the outlooks that are associated with analysis of the actual situation and the absorption of the implications of the notion of change itself for what lies beyond the modernization outlooks.

1. Introduction

Strategic planning entails that future outlooks and perceptions are drawn up, with a view towards achievement of the objectives which will lead to meeting the needs, by means of depicting the broad outlines and designing the pathways that will lead to reaching desired aspirations and to the clarification of the agricultural strategies and the method by which to mobilize resources and to organize economic activity for the implementation of agricultural policies.

The preparation of agricultural development policies and strategies come in light of the present challenges that are confronted by the agriculture sector, lead by the deterioration of the natural resources upon which agriculture relies, in addition to the position of agriculture in the economy, and the vulnerability to poverty and hunger of most of those tied to the agriculture sector.

Therefore, the General Directorate for Planning and Monitoring in the Ministry of Agriculture and Irrigation took on the task of preparing this important national document, which was preceded by the preparation of a set of working papers that reviewed the situation of the agriculture sector and the problems and constraints confronting the sector, which work to hinder its progress and prosperity. These papers were as follows:

1. The Basic Facts of the Economics of Crop Production in Yemen
2. Review of the Marketing Policies and Analysis of the Strategies
3. The Prospects for the Application of Agricultural Policy (Sources of Growth)
4. Rural Finance
5. Public Expenditures in the Ministry of Agriculture and Irrigation
6. The Agricultural and Fisheries Production Promotion Fund
7. The Privatization of Government Owned Agricultural Economic Entities and Assets
8. Agriculture Cooperatives in Yemen
9. The Qat Phenomenon

The International Development Association assisted in the preparation of these papers by providing technical assistance in close coordination with the Agriculture Sector Management Support Project. The practical steps were revealed by the review of the working papers in extended workshops that were set up for discussion of each individual paper, involving representatives of all those concerned. They resulted in the preparation of sectoral policies that constituted an important database useful in the preparation and formulation of the implications of this document. In addition to the results of the workshops which preceded them, which were concerned with the preparation of Agriculture Research and Extension Strategy and Water Resources Strategy, as well as the subsequent results of the workshops on Studies on Reform of Agricultural Services and Budgeting and Labor, Gender Strategy, Seeds Strategy, and Livestock Strategy.

2. Yemeni Agriculture

Yemen is considered an agricultural country by virtue of its natural and environmental features, when compared to the surrounding areas in the Arabian

Peninsula and the Gulf. In total, agriculture constitutes a significant element in the Yemeni economic equation. This is reflected by the policies and investments that the Government undertook and directed during the Seventies and Eighties, of the last Century, which played a considerable role in the growth of the agriculture sector. There was a noticeable increase in the output of fruits and vegetables as a result of the protection and support, that were a part of government policy to protect local production, until Yemen became self sufficient in these crops. However, there was no proportional increase in the production of cereals that coincided with this increase, especially that of wheat, as the cultivated area for wheat and its productivity declined accordingly. There was also no coincidental change with respect to the other food crops (maize, corn...etc.). In contrast, there was a relative improvement in the production of animal feed and in livestock production, qualitatively and quantitatively, and of their associated farm systems. Despite this, however, there was only minor change in these systems, which clearly indicates the poor interconnection between the links of agricultural production on the one hand and with the production factors externally on the other, in particular, the social and economic factors.

The water resources are what determine the pursuit of the specific agriculture systems that correspond to such water resource, with the following agriculture systems being prevalent accordingly:

1. Rainfed Systems: This is the leading prevalent agricultural system, which occupies about 53% of the total cultivated areas. In the medium rainfall areas, the cultivation of maize and sorghum prevail, whereas animal feed cultivation prevails in the Coastal Plains. In the mountainous plains, wheat, barely, maize and lentil are grown, However in the high rainfall areas (in the highlands and terraced mountainous areas) maize, corn, wheat and barely, some of the legumes and fruit are cultivated, as well as coffee and qat.
2. Irrigated Systems: This includes groundwater, runoff and spring irrigated systems , which account for 47%, with groundwater irrigation at 30%, spate irrigation at 12% and spring water irrigation at 5% accordingly. The crops that are grown by these systems are lead by farm and garden crops, in accordance with the applicable crop systems and as determined by the features of the various environmental regions, as well as the other feed crops that are related to feeding and raising livestock.

2.1 The Position of Agriculture in the Yemeni Economy

Agriculture occupies a dynamic social position in the Yemeni economy, since 17% of the Gross Domestic Product and 6% of the country's foreign currency income are generated by the sector. Similarly, about 75% of the population, who constitute the rural population of the country, depend on it.

2.1.1 The Agriculture Economic Systems

Yemeni Agriculture is characterized by the diversity of its climatic features, especially the level of rainfall, temperature and humidity and the different topographical conditions. This lead to the diversity of the plant regions and accordingly helped to diversify production. However, the reliance of a number of the regions on rainfed agriculture affects the sustainability of agricultural production, apart from the poor productivity per unit area. There are also other regions that depend on ground water, a set of cisterns and dams or on spate irrigation, water springs or streams.

2.1.1.1 Agriculture Production Systems

Agricultural production is classified as plant production, livestock production and fish production, in additional to pasturage and forestry production.

i. Plant Production

Plant production is first ranking in terms of its share of the agricultural domestic production, although the annually cultivated area constitutes three-quarters of all the area of the farmland holdings. There is a specific group of crops that dominate the cultivated land in the various agricultural regions dominated by the lead farm crops, and they occupy the lion's share of the cultivated land. Cereals take up 60% of the total crop arrangement for 1998, while animal feed, qat, the cash crops, fruit, legumes and vegetables constituted 8.8%, 7.6%, 7.1%, 6.6%, 4.9% and 4.8% respectively. Thin maize takes the lead position in the farm crops, whereby it is grown in the different areas covering about 40% of the annually cultivated area. Plant production is characterized by low yields per unit area cultivated, especially in the mountainous valleys (wadis) and the highlands, where rainfed agriculture prevails, thus subjecting agriculture production to lower yields, compared to that of irrigated yields. Rainfed agriculture also does not help in intensive crop cultivation or sustainable agriculture, in addition to the primitive farming techniques, the poor income generated, and the poor support services provided, such as access to credit, research and extension, etc.

ii. Livestock Production

This comes as second in rank to plant production, in terms of its share of domestic agricultural production and a source of livelihood nutritional sustenance for farmers and their families. Statistical data indicate that there are 9.6 million heads of different livestock, including 4.5 million heads of sheep, 4.1 heads of goat, 1.3 million heads of cattle and 0.2 million heads of camel. The nature of livestock production and its sensitivity to the natural and seasonal climatic conditions are major reasons for the fluctuations of supply of production output of this sector in the markets, that occur from time to time. The annual production is estimated at around 45 thousand tons of red meat and 61 thousand tons of white meat¹, 168 thousand tons of milk and 600 million eggs.

¹ I.e., poultry meat; mainly chicken.

Livestock production is characterized by poor productivity levels per productive unit, due to the disparity of the traditional methods found in the sector. Poultry production was the exception, where there was rapid growth in poultry production, as a reflection of the large private sector investments in the sector.

iii. Pasturage

Pastureland covers more than 40% of the total land area of Yemen, or 22.6 million hectares, and represents the major source of feed for livestock. The traditional pasturage methods significantly affected the vitality of this coverage, and helped to erode soil and the deterioration of the land over the past three decades. This was also linked institutional and technical factors that lead to the neglect of this area, and accordingly affected the ecological systems culminating in its deterioration. This is in addition to the factors that arose with the social and economic transformations that occurred over the same span of time.

iv. Forestry

Forests and rangeland occupy 2.7% of the total area of Yemen or 1.5 million hectares. Rare trees are found in this cover, which is a natural wealth by itself. In addition, a number of different kinds and varieties of trees can be found that are of economic significance, which can provide Yemen with economic returns. It also constitute a permanent source of fuel, if they were managed better and their form of development can be enhanced. This cover also suffers from severe damages from cutting trees for firewood and construction material, which would lead to the the elimination of whatever remains of this valuable natural resource and could result in desertification and the loss of the ecological diversity of the land.

v. Fisheries

The data shows that the quantities produced in fisheries is low over the past recent years, when they are compared to earlier years, due to the archaic production methods used, the deficiency of the institutional organs and the lack of the regulations and the laws that regulate the exploitation of the fish resources.

The potential for expansion of the fish production is still huge, whereas the quantity produced is estimated at 90 thousand tons. Initial estimates indicate that the annual production of fish, in all their varieties, may reach 400 thousand tons a year, if there was efficient exploitation of this resource through the use of modern methods that do not harm the fish reserve base.

Approximately 40% of the total production is provided from within the territorial waters in the Red Sea, where there are around 40 farm villages or fishing communities in the Tihama Coast. On the other hand, 60% of the total production comes from the Gulf of Aden and the Arabian Sea. The most important areas of production are: the coast of Hadhramaut and Al-Muhara Governorates, The Island of Socatra and the Bab Al-Mandab Straits.

The average per capita consumption amounts to 6 kg/annum, while estimates indicate that the present per capita consumption could be doubled in the coastal areas, and could reach about 23 kg/annum in the Hadhramaut and Al-Muhara coastal area alone. This sector is still not economically exploited, since the percentage of the present exploitation is only 25% of the potential.

2.1.1.2 The Manufacturing Systems of Agricultural Products

This includes the manufacturing of the primary products like cotton, tobacco, vegetables, wool, dairy products, oils, fish and leather, the latter of which forms the basis of a simple industry for footwear and other traditional crafts.

2.1.1.3 Trading Systems for Agricultural Products

Agriculture production significantly contributes to domestic trade, and to foreign trade by the export of fruits and vegetables (to Saudi Arabia, Jordan, Djibouti, and some of the other Gulf states), various livestock exports, leather skins and fresh fish exports, this is in addition to the entry of honey, cotton and fish as relatively significant products in foreign trade. In 1998, agricultural exports constituted 4.6% of the total exports of Yemen, while food exports comprised 2% of the total exports. Agricultural exports represent 8% of the total Gross Domestic Product for the same period.

Concerning agricultural imports, we find that they are on a continuous increase, where they reached 15.2% of all imports, and which constitutes 42% of the Gross Domestic Agriculture Product. As for food imports, these amount to 13% of the total gross imports, and comprise 35% of the Gross Domestic Agriculture Product (GDAP), i.e., the value of GDAP comes to approximately US \$ 331 Million, at current prices for the Year 1998, while the cost of food imports to Yemen amounted to US \$ 277 Million for the same year.

2.1.2 The Gross Domestic Agricultural Product

The agriculture sector is one of the primary economic sectors, in terms of contributing 17% of GDP, which is considered high when compared to the other sectors, such as the manufacturing, trade, storage, transport, construction and building sectors, all of which contribute 12%, 12%, 9% and 5% respectively. Data on the GDAP for the last ten years show that, the numbers in the GDAP at cost price fluctuated up and down in the Nineties.

2.1.3 Agricultural Development

Data shows that the rate of growth of the GDAP (including fisheries) was lower than the population growth rate, where the growth rate of the former was estimated, at 1998 constant prices, to be 1.4%, which is considered a subsistence growth rate, and needs to be doubled, if it was to keep up with the population growth.

2.1.4 The Bias

Inevitably, the bias towards a sector over another, will lead to adverse effects to all the activities within such neglected sector. The bias towards non-agricultural sectors can be noticed by:

- The bias for the non-agriculture sectors, in terms of the amount and the percentage share of the investment budget and the lack of consideration to the size and importance of the sector economically and socially.
- Actively Progressive increase in the investment budget-cut of the share allocated to the agriculture sector that has reached above half the amounts proposed.
- The bias against agriculture in the policies on pricing, customs tariffs and protection, which adversely affects all the activities in the sector.
- The damage to agriculture because of the inequitable reciprocal trade terms in international trade.

2.2 The Resources of the Sector

The resources of the sector, such as the human, natural and financial resources, are the basis and the pillar on which the agriculture structure rests. Thus through looking at such resources, the place of agriculture in the economy can be determined. By a quick analytical look at the present status of the existing, accessible and exploited of such resources, a full picture can be drawn up on the situation with regards to this sector accordingly.

2.2.1 Human Resources

The population of Yemen was 15,804,654 people according to the 1994 Census. The number of them residing in Yemen was 14,587,807 people, of whom 11,164,289 live in the rural areas (i.e., 76.5% of the total resident population. The urban population is estimated at 3,423,518 people or 23.5% of the total population.

With an annual population growth rate of 3.7% (which is considered one of the highest growth rates in the world), the population figure will reach more than 26 million by the Year 2010, which would require that the growth in the agriculture sector must be at higher rates than the population growth rate, in order to meet the increasing needs of the population.

Over the next twenty years, the rural population will increase by more than 8 Million people, and estimates indicate that 18.8% of the rural population are poor. Therefore, if there are no means found that will absorb the increasing labor supply in the rural economy, then rural poverty will undergo persistently rise.

The Present Situation of the Human Resources of the Government Agriculture Sector: The study of the manpower in the Agriculture Sector (1997) shows that the total manpower numbers approximately 14 thousand, with the specialized qualified staff comprising 15%, those with medium qualifications, 32% and the intermediate

school level and below, coming to 53%. These represent quantitative and qualitative potential that could be S if used effectively, efficiently and fairly.

2.2.2 Land Resources

The land area of the Republic of Yemen is 555,000 square kilometers without the Empty Quarter Desert (55.5 million hectares). The use of land in the country is broken down as follows:

54%, which equals	30 million hectares, which is	rocky, desert or urban.
40%, which equals	22.6 million hectares, which is	ranges or pastureland
3%, which equals	1.5 million hectares, which is	forests or thickets
3%, which equals	1.4 million hectares, which is	under agriculture investment .

However, of the land under agriculture investment, 890,000 – 1,300,000 hectares is cultivated annually, based on the amount of rainfall. From the 1998 data, the agricultural land may be broken down by the type of agricultural use as follows:

- 60.2% for cereals;
- 7.1% for cash crops;
- 6.6% for fruit;
- 4.8% for vegetables;
- 4.9% for legumes;
- 8.8% for livestock feed; and
- 7.6% for qat.

Based on the source of water, under the different productive systems, the agriculture land area can be broken down as follows:

- 53% of the agricultural land depend on rainwater (rainfed systems);
- 30% depends on groundwater extracted from wells (irrigated systems);
- 12% depends on floods (spate irrigated); and
- 5% depends on springs.

Yemen is facing deterioration of its agricultural land in some of the regions. This is exemplified by the increase of soil salinity, which leads to the reduction of its productivity; and desertification, especially in the Tihama Strip, Delta Abyan, Wadi Hadhramaut, Mareb and Shabwa areas. Reports indicate that from 3% to 5% of the agricultural land is subject to sand dune encroachment and eventually to desertification.

2.2.3 Water Resources

Yemen suffers from scarce water resources, where annual rainfall is 50 - 250 mm in the desert plateaus, and rises gradually until it reaches up to 1,200 mm per annum in the south of the Western Highlands. The water extracted from underground basins annually is estimated to be 135% of the annual replenishment of underground reserves, which is leading to the reduction of the water table in the underground basins, to the deterioration of its quality and to an increase to its salinity. Statistics

show that the renewable water amount to 2.1 billion cubic meters and the available per capita quantity of water is no more than 133 cubic meters per annum. This constitutes the biggest constraint to the horizontal and vertical expansion of agriculture, since it depends on rains, which subjects agricultural production to severe fluctuations, apart from the excessive depletion of groundwater, which could climb to 400% of the recoverable amounts, in some of the regions of Yemen. This does not only represent a threat to the agriculture sector, but to the country as a whole. In addition, there is the use of traditional irrigation methods, while at the same time not following any of the modern irrigation systems, which leads to a high water loss rate accordingly. Unless measures are taken that are linked with efficient, effective and equitable exploitation of water, then otherwise, the development and growth of agriculture will be subject to severe limitations.

2.2.4 Physical Resources

In the Seventies, the different institutions of Government, worked to develop the rural areas through the construction of infrastructure, including roads, water supply projects, irrigation structures, utilities. These helped to create job opportunities and raise the standard of living in the rural areas. The loans and assistance for capital investment, from the Three-Year Plan and the subsequent Five-Year Plans from 1972 – 1997, amounted to US \$ 600 Million. These include the programs and plans executed by the regional agricultural development authorities, cooperative development associations and projects. However on a per capita basis this does not exceed US \$ 20 per hectare per annum, which is considered a very low investment rate. Agriculture can never be expected to develop under such a low rate of investment. These various structures were characterized as being unsustainable due to the deficit in the allocated resources for their operations and maintenance. With the completion of the projects, their operations cease. The development of these structures is still important and the Government must continue to follow through on them, with a view towards making them viable. In order to retain them and maintain them, this should be done with the participation of the beneficiaries, based on the priorities and at the appropriate place and time. The issues related to the deficiency and inefficiency of the infrastructure will hinder the progress of projects and could lead to the drop in output.

2.2.5 Financial Resources

The sector especially suffers from the inadequacy and inefficiency of financial resources, whether in foreign currency or local currency, both on a short term or long term basis. The public expenditures of the Ministry of Agriculture and Irrigation accounts for only 3% of the total public expenditures of the Government and agriculture's share of the investment budget is only 7% of the total public investments. The expenditures of MAI are classified as the expenses of the Head Office of MAI, its branches, the regional authorities, rental stations, state farms, and the general corporations that fall under it, in addition to the Agricultural and Fisheries Production Promotion Fund. By looking at the actual expenditures of the budget, it is apparent that the actual expenditures are less than the amounts proposed in the budget. The recent trends in the agriculture sector and performance level of the agriculture services suggest that there is an opportunity for restructuring the current and investment expenditures of MAI, with a view towards achieving better effectiveness

for such expenditures. The investments in agriculture are often unproductive, because the amounts appropriated in the current budget insufficient and not enough to meet the operations and maintenance needs of the existing structures. On the other hand, the existing staff, in terms of numbers, is above the present staffing requirements of the Ministry – apart from the low salaries and wages. Therefore, the farmers are not getting high quality service from research and extension and from the other services that constitute the infrastructure of the rural areas of the country. It is the Government that bears the responsibility for providing access to and providing such services. The annual lending ratio does not exceed US \$ 5 per hectare, which is distressingly low, whereas more agriculturally advanced countries provide over a hundred times this amount.

2.3 Rural Services (Field or Farm Services)

Field services are those services that are provided in the areas of: Research, Extension, Finance, Supply of Agricultural Inputs/Requirements, Veterinary Services, Marketing and Protection and Development of Resources. The services that are provided by the different relevant sectors are as follows:

1. The Government Sector: Provides services in the areas of Research, Extension, Finance, Supply of Agricultural Inputs/Requirements, Veterinary Services, Marketing and Protection and Development of Resources
2. The Cooperative Sector: Provides services in the areas of marketing, inputs, resource protection, development of resources.
3. Private Sector: Participates in providing services in the areas of limited financing, marketing protection, and inputs/requirements.

The following is a simplified brief overview on some of the most significant services, such as:

Agricultural Research

A general service that is presented through eight regional research stations and five specialized researches centers. There are 310 researchers and 179 technicians. Ph.D. holders are 16%, Masters Degree holders are 23% and Bachelors Degree holders are 61% of all the researchers. The researchers comprise 22% of all the staff who are employed with The General Authority for Agricultural Research and Extension, or AREA (i.e., one researcher serves 3,600 agricultural landholder).

Agricultural Extension

This is carried out through the Government extension organs that are under the regional development authorities and some of the Agriculture Offices in the Governorates, and consist of 36 complexes and 258 extension centers. The service is covered by 385 specialist guides and technical guides (at the rate of 3,000 landholdings per extension guide. There are some extension services that are transferred informally from one farmer to the next.

Rural Finance:

Agricultural credit is provided through the Agricultural and Cooperative Credit Bank (ACCB), AFPPF and the Social Fund for Development (SFD). The current credit policies and procedures of the ACCB do not help in allowing farmers to take advantage of its services, in view of the complex bureaucratic routine that the bank works under. The AFPPF and the SFD are still too new in the provision of this service (the services were evaluated in the study on the restructuring of MAI). For this service to be sustainable, the beneficiaries must participate in providing the service.

3.4 Institutional Arrangements

The preparation of the agricultural policies, as well as the coordination of the national services and the general services in this sector and directing the services of MAI as support for the development of agricultural production are the major functions of the ministry. These are run, managed and implemented through hierarchical levels. These hierarchical levels are as follows:

A. General Headquarters

This is the top of the institutional pyramid of the agriculture sector. Its tasks focus on preparing policies, strategies and programs, following up on implementation, coordinating national investments, undertaking studies, drafting laws, decrees regulations, representing the Ministry with third parties, preparing the estimated general budgets for the sector, undertaking overall evaluation and analysis of the activities of the sector, preparing the structures, internal rules and procedures and the setting up and improving services. The General Headquarters also presently provides some of the agricultural services, collects agricultural information data and statistics and protects and develops the natural resources.

B. Agriculture Offices

These are the agriculture offices in the governorates, which are not included with the authorities. They number 16 agriculture offices, while noting that there is no agriculture office in the Capital Secretariat. These offices carry out current activities in the areas of extension, protection and veterinary services. They also execute investment activities through the national projects.

C. Regional Authorities

The authorities undertake development work within a specific geographical area, which focus on the provision of services and the implementation of agricultural and development oriented activities. The existing regional authorities are:

1. Tihama Development Authority

Responsible for the development work and agricultural activities in the Tihama Plains (within the Governorate of Hodeida).

2. Development Authority of Sana'a, Sa'ada and Hajjah Governorates

Responsible for the implementation of agricultural development within the Governorates of Sana'a, Sa'ada and Hajjah, and lately the fourth Governorate was added to it, which is the newly formed Governorate of Amran, which was within Sana'a Governorate before that.

3. Eastern Regional Development Authority

It is responsible for the implementation of agricultural development within the Governorates of Mareb and Al-Jouf only, and does not cover all the Eastern Governorates of the country.

D. Specialized Authorities, Corporations and Companies

These authorities provide support services for agriculture development and production and include the following:

- 1. The General Authority for Agricultural Research and Extension:** Undertakes agriculture research, extension, and the application thereof.
- 2. Delta Abyan Authority and Delta Tiban Authority:** Provides cotton-ginning services in the areas of their operations.
- 3. Agricultural and Cooperative Credit Bank:** Responsible for the provision of credit throughout the Governorates of the Republic.
- 4. General Corporation for Agricultural Services:** Provides inputs and requirements for agricultural production, and covers the most important agricultural regions accordingly
- 5. The General Corporations for Proliferation of Seeds:** Selects high quality seeds, improves and sustains the quality of seeds; increases agricultural output and contributes to food security and to the expansion of the crop areas through the dissemination and distribution of seeds which it proliferates and also provides other related services.
- 6. General Drilling Corporation:** Provides some well drilling services in a lawful manner, despite the poor financial and physical means available to it.
- 7. The General Company for the Proliferation of Potato Seeds:** Carries out a double role of research and production, whereby it integrates with the General Corporation for the Proliferation of Seeds and the General Company for the Proliferation of Vegetable Seeds on the production side, and works to increase

the crop area, while, at the same time, integrating with the Agriculture Research and Extension in the area of research.

8. **General Company for the Proliferation of Vegetable Seeds:** Its services focus on the provision of production inputs of high quality and improved vegetable seeds and to work towards the sustainability of their availability and the coverage of a greater area than covered by the other entities that are charged with the same function.

E. Project Units

These are units, through which some development activities are implemented, such as: Southern Highlands Project Unit, the implementation units of the Water and Soil Conservation Projects in seven Governorates, in addition to the Regional Development Project for the Southern Governorates, the Rural Development Project in Reima, the Rural Development Project in Al-Muhara, the Agriculture Services and Seeds Project, ...etc.

2.5 Difficulties and Constraints

- Natural:

These include (scarcity of land, scarcity of water, drought/floods, soil erosion, and desertification.

- Technical:

These include use of inefficient technology, poor production structures, inadequacy of rainfed agriculture, inefficient livestock production, low productivity, poor management of pastureland, the unsuitable methods of water use.

- Social:

Insecure holdings; high population growth; poor awareness, poor health conditions; malnutrition; poor education, Differences in consumption habits, and the use of qat.

- Economic:

Inadequate credit facilities, shortage of job opportunities; high prices, low incomes, and increasing poverty.

- Institutional:

Poor institutional structuring; failure of the sector strategies, the lack of clear policies; shortage and poor quality of information; poor institutional capacity of the staff; the problem of equity, poor effectiveness and efficiency.

- **Legal:**

Inadequate legal framework, poor law enforcement and application.

3.0 Modernization Prospects

3.1 Introduction

Any outlook towards modernization in the agriculture sector, with a view towards developing and improving the sector, is nothing more than a reflection of the scrutiny of the current situation of Yemeni agriculture. As previously cited in the last Section, agreement could be arrived at that the most significant problems (constraints) faced by the agriculture sector may be summarized within three principal challenges. These challenges are: the deterioration of the natural resources, which agriculture depends upon; the poor economic significance given to agriculture, and the sense of poverty and hunger, which can be sensed by most of those connected with the sector, with open and realistic minds, in a way that is consistent with the changes, aspirations and the available means. This outlook may be formulated so that it becomes tantamount to the answers to three questions:

- What lessons have we learned from our readings on the actual present situation of agriculture? When defining the lessons learned from all the above, we would have arrived to a set of considerations (or guiding concepts), which shall be focused upon when setting the objectives.
- What is it that we wish to achieve, in order to revitalize agriculture? When we realistically put forth the desired objectives, we will then have set forth the development objectives towards the improvement of the agriculture sector.
- What will guide us to achievement of such objectives? The answer to this question will enable us to clarify the features of the general policies before setting out the strategies, which will be discussed later in this section.

This three pronged system (concepts/objectives/strategies) has been called the prospects for modernization, which are now believed to be the sources of enlightenment for the path that will lead to any change culminating from the process to reform the sector.

The outlooks that will follow – based on analytical studies of the sector – in a participatory manner, were formulated after extensive discussions by all those with a stake in the sector, at all levels (implementation/service/management).

3.2 Guiding Concepts

It might be appropriate to mention, inspired by the lessons learned from the situation of Yemeni agriculture, that a set of concepts should be taken into consideration which need to be instilled, not just when determining the objectives and formulating the policies, but also when developing the features of the agriculture strategy, and the associated measures for its implementation. These concepts may be

set forth in two consecutive modules: The Farmers, first, and the Interventions, second.

3.2.1 First, The Farmers

We could not have easily placed the farmers (male and female) in the lead, had we not first turned to three concepts. These concepts are, namely: participation/compatibility/suitability). In order to keep the farmers in the lead, efforts must be taken so that they are rigged up to "participate" knowingly and voluntarily, for the benefit of their own interests. In addition, the setting, in which agriculture will develop, should be "compatible" to them, whereby they accept it, and are ready to bear the costs involved, in accordance with their abilities and the means available to them. In addition, the development of agriculture must be directed so that it is "suitable" to the farmer's needs and aspirations and consistent with the extent of the obstacles they face.

3.3.1.1 Participation

Both rural men and women have the "perception and the awareness" that are essential for them to feel secure to join in the development of agriculture, but at varying levels, based on the information they obtain regarding the level of their participation and to what extent that it shall lead to serving their interests. The poor level of awareness will need to be upgraded in order to ensure that the participation is voluntary and which, in turn, will lead to the maximum benefits.

The participation should not be limited to undertaking development tasks, but should go beyond that to include the involvement in formulating, planning and the managing such tasks and in the decision making involved with respect to such tasks accordingly. In view of the significant role of women in agriculture in Yemen, the involvement of rural women becomes a primary pillar for any strategy and policy system for the agriculture sector. Moreover, the cooperative self-help activities, in all their voluntary manifestations will assure the various roles that must be assumed by both men and women accordingly.

3.3.1.2 Compatibility

The progress in agricultural development requires that there is a compatible setting, institutionally, socially, economically, naturally and technologically.

Institutional Compatibility of the Setting

This requires that policies and laws are established that will meet the requirements for real and compatible institutional structures, which will be able to carry out their social, economic and other similar functions, in the manner that will best serve the interests of the local communities and that will enhance the development role of community groups (women's organizations, farmer's associations, etc.).

Economic and Social Compatibility of the Setting

The compatibility of the setting, economically and socially should, through awareness and responsiveness, be able to arrive to an adequate level for discussing and solving the problem of landholdings, and to a willingness to bear costs, and obtain a proportionate share of the benefits, and to be able to grasp the implications of economic comparative advantage.

The Natural and Technical Compatibility of the Setting

In order for the setting to be compatible with the development side naturally and technically, it must be linked with the compatibility of the target to the scarcity of resources. The same also should be the case for the compatibility of the technical level to the target as well.

3.2.1.3 The Suitability

The approach to be taken should be demand oriented, with an objective, problem-solving and should meet the suitability requirements accordingly.

3.2.2 The Interventions

Updating the prospects cannot be expected to occur without consideration of the interventions that must be undertaken by the parties that have a stake in the development of the agriculture sector at all the different levels; i.e., implementation/service/management levels. This should be based on the role, which will be assumed by such interventions, especially those of the government. The characteristics of such interventions are that they should be "integrated" and "interconnected" actions, in addition to the requirements of sincerity and "accountability" of those who are in charge of such interventions, with respect to their performance. Otherwise, without these traits, there will be more random and ambiguous interventions and the priority needs of farmers will not be fulfilled. Yet, these traits alone might lead to a waste of effort, funds and time, unless the interventions have undergone a process of selectivity based on "equity" and aimed at enabling the farmers to realize their desired goals and towards achieving effectiveness that is based on efficiency and the sustainability of the efforts exerted and the funds and time spent. The Yemenis' perception of time needs to be changed, if we are to overcome the challenges confronting agricultural development. There are different levels of intervention. At the head is the provision of full support and at the tail is support through motivation by incentives.

3.2.2.1 Selectivity

Not all those who have farmed or who have lived in the rural areas (implementation level) deserve intervention by full support. There are those who are self-supporting and only require motivating incentives. Similarly, not all the sector services (service level) should receive full support for providing such services. There

are some services, which could be supported by the Government, such as most of agriculture research services. However, there are other services the Government might as well just drop.

Undoubtedly, the management of the agriculture sector is a burden that is fully borne by the Government, for it is obvious now, that it is not possible that the private sector should be charged with selectivity, that includes all the forms of interventions at the level of the farmers/producers (implementation), at the level of provision of rural/farm services (the service) and at the level of sector management. There are benefits that come with selectivity, of which the most important are: saving and rationing the use of resources (efforts, funds and time), and it also reinforces enabling the farmers and gives them access to such interventions equitably.

However, selectivity without controls and standards will only lead to having the interventions go to those who are not really entitled to them, and loses all the significance intended by such selectivity.

3.2.2.2 Effectiveness

Effective interventions must be efficient and sustainable. Sustainable is not implied here in the comprehensive sense of the word, which would entail efficiency, effectiveness and equity. Rather the implication here is the continuity of the intervention with the same effectiveness – the intervention that meets the requirements at all levels of the sector. This guiding concept arose after the rural/farm service institutions were studied, which lead to the requirement that the roles (interventions) must be divided among all the parties (from the public, cooperative and private sectors) (Refer to Result² 2 of Aden Agenda).

3.3 Development Objectives (Policy Objectives)

What has become almost certain is that over the next twenty years, the rural population of Yemen will rise by 12 million people, and accordingly the demand for food will increase. Actually already more than one-fifth of the rural population is considered poor. Therefore, unless the rural economy is able to absorb the increased labor force, then the number of the poor rural population will rise to uncontrollable levels then. Accordingly, the general policy of agricultural policies then should be to "achieve increasing growth - sustainably and equitably – of the outputs of the agriculture sector and increase the incomes of those who are dependent on agriculture, especially of the rural poor.

Within the context of this general policy objective, the implementation of the "Aden Agenda" has resulted in setting forth the general objectives of the agriculture sector, which are:

1. **Food Security:** The achievement of high levels of food security that depends on the domestic agriculture production of food.

² Could also mean "Conclusion" or "Finding" 2.

2. **Combating Poverty:** Support the anti-poverty efforts exerted in rural communities.
3. **Sustainable Growth:** The realization of sustainable growth at rates that should at least be not less than the population growth rate.

3.4 General Policies

After completing the frameworks for the Guiding Concepts and formulating the development objectives, now it is possible to draft a set of expressions that – in light of which – could provide guidance towards the achievement of the development objectives (Policy Objectives).

There are a number of modules for the formulation of policies. However, the policy statements shall be classified here under a number of elements, to facilitate easier reference to them. Among such policy elements are the natural (linked to the resources), technical (linked to methodology), social (linked to relationships), economic (linked to feasibility), institutional (linked to approach), spatial and legal (linked with controls). According to the interconnection between these elements, in adherence to the guiding concepts and within the context of aiming for the achievement of the policy objectives, the sector's general policy statements shall be framed as follows:

- **The Natural Framework**

The optimal use of the natural resources for agriculture; the increase of productivity per unit; support to community participation of in the management of resources; protection of the traditional assets; protection of natural resources and the promotion of setting up natural protected zones.

- **The Technical Framework**

The use of production inputs prudently; participation of the private sector in research and applied research work; to work towards updating technology in a manner that will conform to the local capacities, improve the effectiveness of research and extension work; direct attention to agricultural training programs; and upgrading the performance of the agriculture staff.

- **The Economic/Social Framework**

To lean towards an open market orientation for trade in agricultural products; finding sources of financing for small farmer enterprises; exploitation of climatic comparative advantage; expansion of agricultural self-help or cooperative associations; direct agricultural credit towards actual output; and support to rural women.

- **Legal/Institutional Framework**

Follow the principal of empowerment and delegation of authorities, integration of the various institutional roles, in a manner that does not conflict with the centralization of policies and the decentralization of management and implementation; support to the creation of marketing companies, regulation of agricultural quarantine; finding the accounting system that will motivate the local staff, completion of the regulating legislation in the area of agricultural inputs and output; control the use of production inputs and requirements; open up competition in the provision of inputs and requirements for production; and the provision of information on agricultural markets and data on output.

4.0 Strategic Options

4.1 Strategic Targets

1. Increase production of cereals, especially wheat, and the production of livestock (Food Security)

- Support to the efforts towards enhancing the effectiveness of farm services towards meeting the objectives of the producers and upgrading their capacities;
- Support to the establishment and improvement of the quality of information systems;
- Find food alternatives that compete with qat;
- Secure land property holdings;
- Improve the capacities to confront and reduce the occurrence of natural catastrophes (droughts/floods);
- Remove policies that work against motivating cereals production; and
- Support to finding acceptable alternatives for food consumption habits.

2. Increasing incomes generated by rainfed agriculture (Anti-poverty)

- Support to research and extension in the rainfed agricultural areas;
- Reduction of desertification and the erosion of mountain terraces;
- Give rainfed systems farmers access to financial facilities;
- Vitalize participation in the management of natural resources; and
- Creation of opportunities for diversification of income sources and for the creation of added value in agricultural production.

3. Increase productivity of irrigated agriculture systems (Sustainable Sector Growth)

- Improve groundwater use;
- Activate the participation of farmers in irrigation management from both surface and groundwater;
- Create an integrated incentives system for the sustainable methods of land and water use;
- Reinforce the institutional structuring of farmers' associations and the expansion of their memberships.
- Support the institutional structuring of Sectoral Management (in MAI);
- Support to the potential opportunities for the expansion, improvement and compatibility of agricultural markets.
- Intensify and promote private sector investments in market oriented agriculture; and
- Disseminate awareness among producers on the possibilities for the diversification of the agriculture products that are exportable.

4.2 Strategic Dimensions/Tools

The tools that the strategy depends on are:

- **Enabled Farmers**

To work towards finding enabled farmers, through human development by training and rehabilitation.

- **Reinforced Institutions**

Set up strong institutions, and the laws, policies, strategies, plans, regulations that will support this effort and which will provide information, data and the qualified staff; preparing and stimulating farmers to be involved in voluntary work.

- **Compatibility of the Setting**

This can be realized through the existence of tax and pricing incentives with legal backing; provision of export opportunities and areas for exports in agriculture; solving the problems of land holdings, whereby they are compatible with the requirements of the targeted setting; similarly, the introduction of

compatible techniques that meet the requirements of cost reduction and increased productivity.

- **Investment Guidance**

To direct investment towards small enterprises that generate income and that are consistent with the requirements for the creation of job opportunities and increasing the efficient use of resources, in order to back the sector with quantitative and qualitative output; and to direct government investment towards the essential infrastructure needed for the sector.

4.3 The Trends/Program Areas

4.3.1 Trends

The trends that the programs will take are:

- **To turn towards the targets**

Alleviation of poverty; food provision, rationing of water, reduction of soil erosion; and increase in the rate of agriculture growth;

- **To turn towards the strategic tools**

Enabled farmers; strong institutions, compatible setting; and guided investments.

4.3.2 The Program Areas

The Program Areas within the tasks of the Ministry of Agriculture and Irrigation

- Technology and Production Programs;
- Financial, Investment and Human Development programs;
- Management of Natural Resources and Irrigation programs; and
- Management Improvement and Policy Analysis programs.

4.3.3 Priorities

The priorities are set within the implications of the prospects for modernization, which are based on the time for the fulfillment of a priority need, whereby the time period required for completing an ongoing development activity shall be the criteria that determines the extent of its priority. Its implementation before or after this period takes it out of the sphere of priority. Similarly, it is based on the spatial range, which implies that the site should be the place in which can be found the requirements

for the exploitation of the resources that are directed towards targeted development activity, in a way that such resources will not be wastefully lost.

5.0 The Step after the Outlooks

Change requires that it be instilled in a way so that the concept of change reaches the people, and there is reception and responsiveness to the ideas of change. Change can never be undertaken by just one entity alone, but requires that the efforts of all are combined, knowingly and persuasively. In addition, all share in the responsibility of enduring the tasks and requirements of change itself. Alongside the implanting change comes taking steps and measures that are consistent with the levels that are reached by the different stages of such change.

5.1 Implanting the Idea of Change

Instilling change requires components that first enable it to permeate and the use of the most appropriate method that will be effective in carrying out such a role. Based on the envisioned prospects for modernization, this requires understanding the nature of the agriculture sector, the analysis of its present components for greater insight into the present situation of the sector and drawing out the lessons learned, and accordingly, to grasp the change that is required for the stage that comes in after having set the modernization outlooks, exemplified by the importance of structural adjustments, keeping in mind the effects that are associated with such changes on the Economic, Financial and Administrative Reforms that primarily have a medium and long term effect on the rural poor. This requires clarification of what the farmers and the staff of the sector can expect to gain from these reforms, since it is possible to use the method of promotion, in its various forms, that will lead to the gradual interaction with the idea of change and to having it implanted and instilled by those having a stake in the sector, in order to rejuvenate the sector accordingly.

5.3 The Sequential Measures

Sequencing measures is intended to mean, according to the concept derived from the prospects for modernization of the sector, that priorities follow through sequentially, whereby they achieve compatibility, suitability and equity. In other words, the sequencing of the measures takes on a needed dimension, because some of the measures cannot be implemented except after the implementation of specific prerequisite measures. For example, reduction of groundwater depletion cannot be pursued without the issuance of the Water Law, the availability of the appropriate equipment for the efficient use of water, dealing with the prices for the power that is the essential energy source for pumping the water, etc. In addition, the same thing applies to the remaining measures, which come under each program and which target for the achievement of specific targets.

Annex I

Sectoral Policies

Annex I: Sectoral Policies

1.0 Agriculture Research Policies

Agricultural research is important for the achievement of the objectives of agricultural and sustainable development and for directly contributing to increasing agricultural production, and, accordingly, to the alleviation of poverty. Research shall remain a general service of public benefit that the public sector will continue to provide. Accordingly, research programs will be associated with and linked to whatever will serve the implementation of agricultural development and whatever will lead to increasing the efficiency of production, the determination of the priorities of research and concentration on the activities of direct and immediate impact on increasing and improving production through research plans and programs. Agricultural research shall seek to improve production and productivity on sustainable grounds, to develop different varieties of crops, improve livestock production, improve the uses of land and water resources as well as forests and prairies, whereby agricultural research shall work towards:

1. Increasing the productivity of crops by the development of improved varieties of farm and garden crops, that would have been adapted to different production systems, as they have been applied, scientifically and practically, to different agricultural environments; in addition special emphasis would be placed on overburdening bio-stress (diseases and aphids), physical stress (drought burden), good storage, varieties that are marketable and competitive in export markets.
2. The development of production techniques that are applicable and economically sustainable, and which will lead to reducing the reliance on scarce groundwater and which will help to enhance the efficient use of rainwater.
3. Exploring alternative production methods with emphasis on the conservation and efficient use of water, the development of watersheds and the improvement of water harvesting techniques.
4. Ensure food security at the level of the rural family, especially for cereals and legumes for the small farmers who are dependent on agriculture, and who work in rainfed system settings and eroded settings; improve the efficiency of farmers and rural women through the development of production systems and techniques that help to provide for stable yields and to process the necessary goods that are required for the rural families.
5. Develop efficient sustainable systems, and an integrated pest control system that is environmentally safe and reduces the reliance on chemical pesticides.
6. Development of improved systems for sustainable and high yielding agriculture, including integrating crop production systems with environmental livestock production systems; and integrating fruit production systems with forestry, and integrating feed production systems with farm systems; with a

view towards working towards halting environmental deterioration through the participation of farmers and beneficiary customers.

7. The development of an integrated soil fertilization management process, through the use of a number of options that lead to the increase of production in a sustainable manner and to increase the optimal benefit of the farm resources and agricultural inputs purchased.
8. To improve the free access of small holding families with limited resources to fulfill nutritional requirements, through the development of appropriate techniques that work to improve their purchasing power³ and the production of the appropriate foods in the farm, as well as support the activities of rural women through training.
9. Explore the possibilities of increasing the use of the appropriate drawing animals, manual implements and the effective cost mechanisms that will enhance the efficient use of labor and reduce arduous labor.
10. Increase the abundance and production of natural rangeland pasturage and the vegetative cover, through the participation and rehabilitation of beneficiary users.
11. Improve the productivity of livestock with emphasis on selectivity and proper health care and the improvement of feed resources.
12. Reinforce the dissemination of research efforts without any sexual discrimination, through the development of techniques that are helpful to rural women in improving their incomes and reducing arduous labor.
13. The development and improvement of natural resources for the purpose of achieving better and more efficient use of such resources.
14. The development of techniques for qat and farming that depends on qat , which will help to reduce the use of pesticides and increase the efficient use of water and achieve the optimal productivity per unit of cultivated area used.
15. Reduction of post-harvest losses of farm products through improving the handling and storage techniques, and adding value to such products, as well as the secondary products through the development of storage and processing techniques therefor.
16. Development of the techniques for the rapid proliferation of seeds and the vegetative accretion materials, provided that the contribution of The General Authority for Agricultural Research and Extension is output for the relevant institutes, the priority refined seed breeds of farm and garden crops, for the follow-up proliferation of the original seed breeds and the approved seeds of the National Center for Seed Accretion at the farmer's fields; AREA will also participate in inspections of farms during the agricultural season.

³ I.e., increasing incomes.

17. Improvement of the relationships with the private sector in the areas of reciprocal benefit, such as in training, post harvest techniques, marketing and processing, provision of consultancy that help to solve the problems faced by the private sector.
18. Start on the preparation of a policy on Research in the agriculture sector that will provide guiding signs for the continuing the design of policies for comprehensive economies of production.
19. Reusing⁴ the deteriorated land or soil resources and combating desertification for agricultural purposes, with a view towards developing appropriate agricultural systems for the reclaimed land after its use.

2. Agriculture Extension Policies

- Improve the institutional structure of agriculture extension through the restructuring of the staff, and the provision of the required means that will enable extension to upgrade the farmers to the advanced techniques of agricultural production in terms of organizing production and the optimal use of agricultural resources to reach the desired level of efficiency.
- Strengthen the ties between agricultural extension and research to help in transferring and disseminating modern and improved technologies, as well as communicating to the farmers; the technical recommendations issued by agricultural research; and communicate the problems to agricultural research to come up with the solutions to them accordingly.
- To activate joint planning for extension programs, which allow the participation of farmers in the identification of their problems and the appropriate solutions for them and the adoption of the recommended modern techniques.
- The development of the monitoring and evaluation system, which will help lead to the development of extension programs that will meet the urgent needs of the farmers.
- Involvement of the private and cooperative sector to work in the different agricultural fields.
- Strengthen the ties between agricultural extension and the other institutions, in order to coordinate activities and to make use of the available resources with these entities in backing the extension mission.

⁴ I.e., reclamation of used up land or soil.

3.0 Plant Production Policies

- Raise the levels of production through achievement of higher yields per unit area.
- Find the compatible environment that will help in the improvement of the conditions and efficiency of rainfed crop production as well as increasing its returns.
- Promote the cultivation of market oriented cash crops, in terms of enhancing the efficiency of production techniques used and to market those products that have a comparative advantage.
- The Introduction of modern techniques in rainfed agriculture that are compatible with the traditional practices.

4.0 Seeds and Fertilizer Production Policies

Increase agriculture output through the exploitation of the natural resources by the methods that will lead to conservation of natural resources, and that will ensure their continuity, by means of upgrading the productive capacity of one unit area, quantitatively and qualitatively, with the participation of the beneficiaries to ensure the efficient use of the natural resources available.

- Meet local requirements of improved seeds and appropriate fertilizers.
- Preparation of the regulations for handling agricultural seeds and fertilizers.
- Set up an effective mechanism for coordination among the relevant entities in the production of seeds and fertilizers.
- Vitalize the role of the quality control unit and coordination of its activities in accordance with international and domestic standards in effect.
- Continuation of the research in the production of original breed seeds and drought resistant seeds.
- Provision of technical research information for the beneficiaries.
- Improve technical awareness and training of human resources of the beneficiaries in producing and handling seeds and agricultural fertilizers.
- Support the establishment of specialized associations for the producing and supplying seeds and agricultural fertilizers in the different agricultural regions.

- Upgrade the efficiency of control of fertilizers and seeds at the entry points.

5. Protection Policies

- Support to the research on protection from agricultural diseases and aphids.
- Activate the agriculture quarantine measures.

6.0 Forestry and Anti-Desertification Policies

- Provision of forestry and pasturage seeds and the expansion of rangeland areas and provision of incentives for this.
- Promotion of recreational parks, based on the concept of available social efficiency.
- Expand the establishment and dissemination of natural protected zones and, with a view towards conserving inherited plant assets and protecting the ecological bio-sphere.
- Provision of investment conditions for the private sector that encourage the establishment of health resorts in the range land areas and as a first pilot project to include the planting of mixed forestry trees.
- Development of the legal frameworks by taking advantage of traditional social practices in forestry and range land management.
- Improvement of the management, conservation and development of the existing forests and natural vegetative pasturage areas, and to involve local communities in this respect.
- Support farmers and social institutions to set up windbreaker tree belts and the construction of terraces and water barriers.
- Coordination with non-governmental organizations and the relevant environmental protection agencies through having them support the government efforts to combat desertification of the hinterland, which is threatened by encroaching sands.
- Support activities, at the school, university and social levels for the establishment of vegetative grounds and recreational parks.
- Expansion of community participation in the expansion of tree planted areas on the Day of the Tree.

- Promote the use of terraces to protect soil from erosion and provide economic benefits, using efficient techniques, in which the government and the communities participate jointly.

7.0 Livestock Policies

- Motivation of small farmers to create small enterprises for producing dairy products, and to form associations for assembling milk; and encouragement of the manufacture of dairy products.
- Issue the required legislation for the preservation of animals and livestock by banning the sale of young female livestock, and to set the bottom age limit for slaughtering livestock.
- Activate the animal quarantine in all the entry points to prevent the entry of animal diseases and aphids from these entry points.
- Increase veterinarian services and encourage the private sector to enter this field.
- Increase the production of poultry products through adoption of the essential measures to improve the quality of production, reduce costs, especially feed costs. This could be done by supporting the establishment of companies that produce poultry feed, by the use of the maximum amount of local raw materials available.
- Increase the production of red meat by disseminating and spreading the cultivation of high nutrition feed crops that animals require; and expand on the use of concentrated nutritional supplements.
- Improve livestock extension directed towards rural women, concerning the feeding and care methods in the barns and stables; and spread awareness on the importance of minimum weight requirements before slaughtering, in view of the fact that most animal husbandry is undertaken by rural women and small farmers.
- Direct attention to the Domestic Livestock Breed Improvement Centers by taking advantage of imported breeds to arrive to highly productive breeds.
- Motivation of the private sector to adopt and provide veterinary health services.
- Expand in the dissemination of national campaigns against livestock diseases and aphids.
- Enhance the performance level of and activate internal and external veterinary quarantine.

- Improve the quality of veterinarian technical training and enhance veterinary awareness among breeders and producers.
- Direct attention to grazing areas and to shepherds; and to commence using the concepts of feed units and the spread of such concepts using the public media channels.
- Motivate the cooperative sector in spreading and expanding agriculture and livestock integration and the expansion of livestock producing farms.

8.0 Marketing Policies

- Follow marketing policies that correspond to the government orientation towards liberalizing trade, which are in keeping with international economic changes, and which work based on a market economy.
- Undertake marketing studies and research and improve the efficiency of marketing extension that is directed to reduce post harvest losses and to introduce modern marketing techniques.
- Improve and upgrade the efficiency of the marketing information system to contribute to making it accessible to the beneficiaries, and to assist decision-makers in drawing up policies and in making the appropriate marketing decisions.
- Development of agricultural exports, making them more competitive in world markets.
- Reinforce quality control, specifications and standards and to enforce them with respect to agricultural products.
- Improve and prepare the legislation and laws related to the regulation of marketing activities.
- Motivate and direct investments by agricultural cooperative in the areas of marketing and preparing exports and food manufacturing as much as possible.

9.0 Irrigation Policies

- Improve efficiency in the use of water in irrigation, and obtain the maximum benefit from one unit of water used to arrive to the best unit product, and to adopt the principles of comparative advantage and economic feasibility in the production of irrigated crops; reduce the excessive waste of water used through the introduction of efficient and suitable irrigation techniques and systems, with a view towards

achievement of an equilibrium between the available water supply and increasing water needs.

- Continue the development of wadis and the construction of water barriers and dikes; construction of small dams and to support the use of rainwater harvesting techniques, with the aim of increasing the development of surface water resources, and the replenishment of groundwater basins, in order to reduce excessive extraction of groundwater; work towards averting flooding and rushing runoff and to alleviate the damages they cause; and reduce the amount of water that is lost to the sea as much as possible.
- Prepare and update the legal and institutional frameworks and take the required measures that will ensure community participation of the beneficiaries in bearing the responsibility for operations and maintenance of irrigation structures, in order to reduce the burden on the Government in having to bear such responsibility.
- Take advantage of treated waste water, considering that it is a continuing resource, in order to protect the environment and to use such water for unrestricted agricultural plants, and in economic and environmental activities whenever possible, and in such a manner that will protect the environment from pollution and that will contribute to increasing vegetative superficies, forests etc.

10.0 Policies on Rural Women

- Vitalize the role of women in contributing to the formulation of rural development policies and strategy.
- Involve rural women in planning and implementation of agriculture projects and programs.
- Encouragement of rural women to increase agricultural production and to provide them with support, and credit and marketing facilities.
- Give rural women a larger role in contributing to securing a part of the nutritional needs and the elimination of poverty in the rural area.
- Create the appropriate environment for women's extension in rural areas with emphasis on income generating activities such as home economics.
- Encouragement of rural women to rejuvenate the traditional and cooperative practices of keeping and breeding livestock and directing attention to and improvement of rainfed agriculture.

11. Community Participation (Farmers' Organizations)

- Continue the government policy of supporting and enhancing the cooperative movement and increasing community participation, private, individual and group initiative, as well as open up competition both in production and in marketing, in order to revitalize the agriculture sector.
- Improve the performance level of cooperative work through the introduction of the concepts and fundamentals of cooperative work in the primary and higher educational level syllabi, as well as in specialized training and research and extension work.
- Implant and instill the legislative and legal aspects of cooperative activities through the completion of the legislative measures by the issuance of the Cooperatives Law and its Explanatory By-Laws⁵
- Adopt and create credit policies that will ensure the development of agricultural and cooperative projects, and to activate the integration of efforts between them.
- Development of the infrastructure required for cooperative activities, and their institutions, as well as introduce the structural improvements and capacity build-up and involve the different elements of cooperative work in the fields of relevant institutions, with a view toward improvement of the state policy in this area and the expansion of cooperative activities in general.

12. The Privatization of the Agriculture Sector

- Follow the structural and legal plan for privatization of parastatals, and determine the methods of privatization based on a step by step approach, or as the case may dictate.
- The priority of settling the land ownership issues in advance and the management of the social issues related to the user's rights equitably.
- Give priority to the users for the ownership of these parastatals, but this should not be at the expense of the public interest.

13. The Agriculture and Cooperative Credit Bank

- The internal management improvements thereof should include greater delegations of authority, improvement of the internal controls and procedures followed by the staff
- To consider and to make sure that the interest rates should be focused on protecting its clients within the framework of the external operations and the updating of perspectives on cooperative work.

⁵ I.e., Interpreting By-Laws or Regulations.

- Coordination of reform efforts among the concerned entities and foreign financiers or donors.
- Expand the scope of activities to cover rural development.
- The earnest review of the possible alternative models for reforming the ACCB, including privatization or the conversion of the bank into a specialized cooperative bank of rural development.

14. Agricultural and Fisheries Production Promotion Fund

- Vitalize and harmonize the operations of AFPPF, and to prepare an appropriate fixed financing plan, taking into consideration its future as an instrument for the promotion of production.
- The mobilization of communities is the basis of the work of the AFPPF.
- The expansion of its work to cover water and productive structures, but also rural development, the management of natural resources, the rehabilitation of water structures through construction of water harvesters and modernization of agricultural and irrigation techniques.
- Periodic evaluation is essential for the AFPPF, which should involve the Representatives, beneficiaries and the Board of Management.
- To work with all the relevant financial institutions, and not just with only the ACCB.

15. Qat

- To find the social active and appropriate alternatives that will replace the role of qat as a stimulating social factor.
- To encourage farmers to switch to the cultivation of basic and cash crops that provide a compensatory return.
- The adoption and reinforcement of The Qat Research Unit and gathering the different information on qat from the inside and the outside the country.
- Encouragement of scientific researches on the qat phenomenon and its effects, economically, socially and healthwise, as well as the impact of using chemical pesticides on qat and dealing with qat as a crop that is worthy of being included in agricultural extension.

Appendix 2: The Primary Team for the Implementation Aden Agenda

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Part II

The Vistas for the Institutional Development of the Agriculture Sector

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Preface

- i. The most recent data on agriculture indicates that the rural area of the country still represents the domicile of over 75% of the total population of

Yemen totaling 17.5 million, based on the a population growth rate of 3.7%. Most of the rural population generally lives under low standards of living, due to the poor rainfall and the deterioration of the natural resources. Recent statistics confirm that the rural areas of the country are congested with four million poor people.

- ii. In order to combat poverty in the rural countryside, an agricultural strategy must be adopted, which will ensure the sustainability of the development of the agricultural sector. This will only come through the optimal utilization of the natural resources, the participation of the targeted beneficiaries in decision making at all levels and the motivation of the private sector to take part in the provision of various agriculture services, while the public sector should focus on providing essential required services that the other sectors do not provide.
- iii. Accordingly, based on the foregoing, it was essential that the previous policies on the development of agriculture be reviewed and that the lessons learned thereof should be benefited from, with a view towards revising the general objectives of Ministry of Agriculture and Irrigation, in a manner that will lead to the reinforcement of its role of raising the standard of living in the rural areas, confronting poverty, improving food security and vitalize the contribution of women to the development of agriculture.
- iv. Consistent with the orientation of the Government's Economic, Financial and Administrative Reform Program, MAI started of by holding the Workshop on The Future of Agricultural Development in Yemen, in March 1997, at the University of Aden for the purpose of reviewing the roles and objectives of the agriculture sector and to prepare a future prospectus of the vistas of for the institutional modernization, which will be consistent with the new roles and objectives envisioned, and accordingly arriving to the development of the national agriculture sector strategy for the country.
- v. The determination of the sectoral outlooks and the preparation of the strategy for agriculture, besides the institutional and administrative restructuring is nothing more than the real interpretation of the Government policies of the Economic, Financial and Administrative Reform Program for the modernization of the Agriculture Sector.

1. Introduction

In the Workshop on the Future of Agriculture Development in Yemen, the following main issues were agreed on:

- The need for reviewing the objectives and for determining the roles to be played by the public and other sectors in providing agricultural and rural services.
- The need for adapting to the available financial and human resources and their use optimally.
- The need for the restructuring of MAI in a manner that will be in line with the objectives and roles set forth, with a view towards upgrading performance.
- The provision of agricultural and rural services should be on an economic basis, and based on the demand of the targeted beneficiaries and on broadening their participation.
- The need for the preparation of an implementation program and for working towards its completion.

These issues were consistent with, and based on the orientation of the Government in the Economic, Financial and Administrative Reform Program with the following objectives:

1. Adoption of a market economy.
2. Freeing prices from any administrative or other controls.
3. Reinforcement of the role of the private sector in the various areas of investment.
4. Freeing the capabilities of the society towards participation in and contributing to agricultural development.

Hence, the Workshop was able to set out the roles of the private sector and of the other sectors with respect to the provision of agricultural and rural services based on the orientation of the Government cited above (Refer to Annex 1).

The outcome of the Workshop was a specific program called the "Aden Agenda", the components of which comprised a number of measures and activities, which included certain fundamental studies that will help MAI towards the institutional restructuring of the sector. For this purpose, there were three field studies, which were undertaken through local consultancy firms, which addressed the following topics:

- Review of Agricultural Services
- Review of the Human Resources of MAI and its branch offices and affiliated authorities.

Accordingly, this paper was prepared through referring to the most important results of the studies cited above, as well as by alluding to the valuable views and ideas that arose in the several consultative meetings held among the senior staff in the Ministry, MAI service organs, international consultants and the relevant and informed local staff on the subject.

2. Field Services

2.1 Assessment of the Current Situation

Government Service Areas

Currently, the Ministry of Agriculture and Irrigation provides a profusion of services through its existing institutional frameworks, which are the regional authorities, investment projects and the branch offices in the Governorates. Table 1 shows a selected sample of the major services and facilities provided by MAI in the regions, as well as the future policies with respect to each of these services:

Table I:
The Services and Activities and Facilities of
The Ministry of Agriculture and Irrigation

Activity	Future Policies	Mountain Highlands			Coastal Plains			Eastern Plateaus		
		NRA	SHP	Mah. Off	TRA	Lahj Off.	Abyan Off.	ERA	WHP	Shabwa Off
Service Provision										
Monitoring Water	Transfer				XX				XX	
O&M Water Structures	Partners				XX	XX	XX	XX		
Dev. Rural Women	Merger	x	Xx	XX	XX	XX	XX			x
Agr. Road Maint.	Partners			XX	XX					
Plant Protection	Split	x		XX	XX	XX	XX	X		
Veterinary Services	Split	x		x	XX	XX				
Organizing Communities	Support									
Working Networks: With AFPPF										
With Com. Dev. Fund	Support	x	X	x		x	x			
Creation and Transfer of Technology										
Research	Restructure									
Groundwater Mgmt.	Support									
Watershed Mgmt.	Support									
Livestock Research	Support									
Rainfed Agriculture. Res. Extension	Support Restructure	xx		xx	xx	xx	xx	xx		xx
Agriculture Education	Restructure									
Agriculture Training	Restructure		X				X			
Disseminating Info.	Restructure		X		x					
Investments										
Flood Protection	Support		X	X						
Spate Structures	Restructure				xx					
Water Supply	Transfer		Xx					xx		
Groundwater Irrigation	Transfer	xx			x					
Cons. Rural Roads	Transfer		Xx	xx	xx				x	

X – Some activity; xx – The main activity

Transfer – Other Governments provide the service.

Division – The work divided between Government frameworks and other frameworks (I.e. "The Government should not undertake what other are doing successfully").

Future Policies Reflects some of the ideas that are being formulated presently in MAI with respect to agricultural services.

Merger or amalgamation: The integration of some of the activities, in the Development of Rural Women with

Partnership – The Government Frameworks working in partnership with the Other Framework.

Support – Government frameworks providing support for this type of service.

Restructure – means that the service needs restructuring.

Current Performance

- The activities of the service organs in the Mountain Highlands is focused on infrastructure, such as laying and maintaining roads, water supply projects, extension and the development of women. In the Coastal Plains, most of the services are directed towards operations and maintenance of spate irrigation structures, extension, the development of rural women, beside plant protection and veterinary services. In the Eastern Plateaus region, the services cover extension, operations and maintenance of spate irrigation structures and groundwater irrigation.
- There are no fundamental differences in the type of services provided by the various institutional frameworks (authorities, projects, and branch offices); each institutional framework is able to provide the same set of services as the other frameworks and there is no clear delineation of activities among the different frameworks.
- The approval of the investment projects and provision of agriculture services normally is based on the supply of the side rather than relying on the response to the needs of the community.
- There are some services that are still provided by the organs of MAI, such as road construction, monitoring groundwater and water projects. These services would normally be under the responsibilities of other entities; there are also other services that are deemed to be among the core responsibilities of MAI, yet they are not accorded the attention they require, such as organization of rural communities, agriculture training, management of watersheds and natural resources, etc.
- The current services currently provided by MAI are very limited, in contrast to the needs of the communities. This is partly due to the scanty resources available that are appropriated for operations. The limited resources that are provided need to have clear perceptions and the objectives and priorities need to be clearly set forth.
- Most of the organs are overstaffed, and are faced with low wages and incentives and the lack of any human resource development.
- The existing investment projects or those that fall under the development authorities are in better conditions for providing their services since they are provided with adequate appropriations and have clear and specific objectives set out for them.

Cost Effectiveness

- Budgets are not linked to programs with clearly defined objectives and expenditures are not weighted to performance.
- Monitoring and evaluation are obviously weak and is confined to the identification of activities or constraints, without any measurement of effects or the assessment of their effectiveness or their monetary value⁶.
- The actual specialized manpower cost is low and averages between US \$ 1,000 and 2,000 per annum/per man. However, the cost to benefit ratio is not used now, because the significant benefits are low at present.
- There are indicators that the agriculture function can be revitalized significantly and therefore lead to the improvement of the resulting benefits by simply increasing the appropriations for the operations budget.

Management

- Management is one of the major weak areas generally confronting the organs of MAI, especially in the area of service provision. The central supervisory organs, in turn, do not undertake the appropriate guidance and oversight required. On the contrary, they complicate matters by their interference. Generally, management capabilities and qualifications are rare, and senior leadership lacks any strategic outlook. There is also an obvious shortage of knowledge related to Management Information Systems and Management of Human Resources and there is no systematic staff rehabilitation/training program in these areas.
- Coordination is poor between all the different units, although there is talk of some coordination between the organs, on the whole, however, they are governed by interpersonal relationships rather than regulations or procedural systems in place, and is usually not routed through official settings.
- The Government financial and administrative procedural systems are a hindrance to efforts towards vitalizing the agricultural services.

⁶ Probably the intended words here are the value of the efforts, in keeping with the context of the clause.

Farmers Organizations and Local Accountability

- Farmers have set some Farmers' Associations for the provision of fee-based services. However, the response of Government institutions remains substandard.
- Normally, services are not coordinated with organizations representing local interests, whether they are government or community organizations. The exceptions in this area are rare and are confined to the small projects financed by the Agricultural and Fisheries Production Promotion Fund, with the participation of the local communities. The Self-Help or Self-Initiative Pilot Project, financed by the German Government is an example of support to the participation of the beneficiaries in solving their own problems that is worthy of attention.

Cost Recovery

- Revenues are obtained through the following sources of revenue:

Provision of veterinary services;

Plant protection;

Sale of nursery seedlings/plants; and

Irrigation services.

Yet, such revenues, by law, cannot be used for the branch offices and the investment projects and the proceeds must be deposited with the Ministry of Finance. However, the development authorities may use their revenues, but, during the discussion of the annual budgets, the Ministry of Finance deducts an estimated amount from their budgets, in lieu of the estimated forecasted revenues for the year.

- There are no allocations approved in the budgets for incentives for good performance of the staff in the agriculture projects and offices. However, the authorities do have their share of motivating incentives. It is inevitable that cost recovery in the authorities is better compared to the other agriculture organs, in view of the ability of the authorities to use recovered cost proceeds.
- Farmers accept the idea of paying for good services, and they are willing to contribute to the costs of projects they need. The best example of this are the projects financed by the AFPPF, which are lower in costs and more sustainable, when compared to the projects in which the beneficiaries do not participate in their planning and implementation.

The Nature of the Tasks

- The development authorities are considered as investment and service organs simultaneously.
- The projects are considered investment organs, but they also provide some services as well.
- The agriculture offices are service organs, but they may carry out some investment activities as well.

The concurrent existence of three models of service organs has given rise to some difficulties, among which are:

- The duplicity of tasks between the Agriculture Office in Ta'ez and the Southern Highlands Project, where we find the Agriculture Office is responsible for extension, in general, whereas the Project maintains responsibility over the Development of Rural Women.
- There is also duplicity in the functions between the MAI and other Government organs, for example between the Southern Highlands Project and the General Authority for Rural Electrification and Water Supply Projects, in the provision of potable water in the Governorate of Ta'ez.
- Most current agriculture services focus on irrigated agriculture systems, whereas rainfed systems, rural women, and small farmers are not accorded the support needed in these areas.
- Services that are directed towards women remain supply oriented and they do not touch upon the actual needs of rural women in production activities, especially in livestock husbandry.
- In most of the agricultural areas, the scarcity of natural resources, especially water for irrigation, is becoming worse, there is a vital need for management of watersheds and for the conservation of soil and the preservation of the mountain terraces. Services in these areas are still limited.

Comparison of Resources in the Different Agriculture Regions

- Most of the agricultural area in Yemen is concentrated in the Mountain Highland Region. The cultivated land area in 1997 amounted to 1,034,686 hectares, spread out over 801,342 land

holdings. The agriculture in this area essentially relies on rain. This region is followed by the Coastal Plains Region, which is ranked second, in terms of cultivated area that amounts to 411,039 hectares distributed between 212,173 holdings. Spate systems prevail in this region. The Eastern Plateaus has a cultivated area of 218,233 hectares spread out between 101,999 holdings. The agriculture in this area depends on spate and groundwater irrigation systems.

- The agriculture employees in the mountainous regions number 2,388 employees, which means a proportion of one employee for each 327 holdings. This proportion is at its maximum in the Governorate of Ibb, where there is one employee for each 598 holdings. This indicator demonstrates the shortage of qualified staff required for provision of services in the region.
- In the Coastal Plains, the number of agriculture employees is 6,981 employees, which means a proportion of 53 holdings for each employee. This indicator needs to be corrected. The reason goes back essentially to the Governorates of Lahj and Abyan, where the agriculture offices in these areas include a large number of the employees of the Government Agricultural Corporations who have stopped working a long time ago, such as the Digging Corporation, the Fruits and Vegetables Corp., the State Farms and some of the completed projects. However the Aden Office is a special case, since it includes, in addition to the staff of the non-operating organs, a large number of the staff of the other agriculture organs that operate beyond the Aden Governorate, such as the General Directorate for Irrigation and Land Reclamation, the Cooperative Institute, the Irrigation Institute and the General Authority for Water Resources, etc.
- The number of employees in the Eastern Plateaus Region is 2,552 employees, which is a proportion of 49 holdings per employee. One can notice the increase in the number of employees to the number of holdings⁷ in all the governorates of the region, which could be attributed to the large geographical area of the region wide dispersion of the land holdings. (See Tables 2 and 3).
- There is qualified and specialized manpower in the various fields of irrigation, engineering and mechanics. Most of them endure stagnancy within the framework of stagnant organs in the Governorates of Aden, Lahj, Abyan and Hadhramaut. The experiences of these people could be useful if they were reorganized within the framework of a development authority, in the Governorates of Aden, Lahj and Abyan and another one in the Governorates of Hadhramaut, Shabwa and Al-Muhara on the

⁷ Actually a decrease in the number of holdings per employee.

same basis as the financial and human resources that are available to the General Directorate for Irrigation and Land Reclamation Project, the separate Irrigation Projects, Wadi Hadhramaut Agriculture Development Project. These organizations could later be converted into irrigation institutions/corporations in preparation for their divestiture in later future.

Comparison of the Different Organizational Structures (Authorities, Projects and Branch Offices)

- In general, the regional authorities, the development projects that fall under them and the investment projects (such as the Wadi Hadhramaut Project, the Southern Highlands Projects in Ta'ez, the Medium Highlands Project in Abyan Governorate) were more fortunate in terms of having higher appropriations for operations and capital expenditures.
- As for the agriculture offices, they are appropriated lesser amounts of such funds, and investment projects are rarely found, such as the case of the Rural Electrification Project and the Maintenance of Al-Mahweet Governorate Branch Roads. Both of these projects represent rare example, and their activities were integrated within and supplemented the activities of the Al-Mahweet Agriculture Office.
- The performance of the some of the development authorities is better than the Agriculture Offices because they are appropriated more funds to meet their expenditures for operations. For example, in the case of the Tihama Development Authority, the amount allocated for operations amounted to YR 334 per each land holding within the area under their responsibility. This is equivalent to twice the general average on a nationwide basis, which was YR 149 per single land holding. The Eastern Regional Development Authority obtained YR 518 for each land holding in the area under its responsibilities to cover cost of operation. This increase in the appropriations may be justified by the fact that both authorities are responsible for the operations and maintenance of irrigation facilities in Tihama and Mareb, nevertheless, it is worth mentioning that most of the other activities in both authorities have come to a stop, as is the case in most of the agriculture offices.
- The development authorities are also given more capital appropriations when compared to the agriculture offices, which is why they are in a better position, with respect to the rate of capital expenditures per single land holding, in the areas of their operations. The capital expenditures for the Eastern Regional Development Authority amounts to YR 7,141 per single

landholding, while the general average nationally amounts to YR 5,042 per single land holding (See Table 3).

- The large development authorities and the Projects, when compared to the agriculture offices are faced with extreme centralization, with most of the qualified and specialized employees concentrated in the Headquarters and in the main offices in the cities, accordingly making them isolated from the rural population and the level of their response to the needs of the farmers is very low.

- The Al-Mahweet Office is an exceptional case, in terms of the allocations for capital expenditures it is provided with, because of the continuation of the Government allocations for the Rural Development Project and the Branch Road Maintenance Project. These allocations help the office improve the quality of its services, yet, on the other hand, this is offset by the fact that there are no current expenditures allocated for this office.

Table 2:
Cultivated Land Area, Land Holdings Number of Employees
And the Appropriations of MAI Budget by Region

Region	Land Area (Hectares)	No. of Holdings	No. of Employees*	1997 (Y R Billions)		
Mountain Highlands			846	82.3	8.5	541.7
North. Dev. Auth.						
Sana'a	380,726	168,707				
Sa'ada	61,030	41,276				
Hajjah	124,594	86,918				
Al-Mahweet	29,168	38,227	253	13.9	-----	26.5
Dhamar	138,220	111,540	299	31.6	3.3	----
Al-Beidha and Rada'a Project	75,895	37,462	188	18.0	1.4	9.3
Ta'ez and So. High. Project	123,432	157,556	535	52.6	3.2	267.3
Ibb	101,621	159,656	267	28.5	2.8	----
Sub-total	1,034,686	801,342	2,388	226.9	19.2	577.5
Coastal Plains:						
Tihama Dev Auth. (Hodeida)	336,613	113,050	1032	147.2	37.8	184.1
Lahj (Ag. Office and All Other Organs)	32,017	54,392	1793	187.9	4.2	27.2
Abyan (Middle Elevation Areas)	38,474	40,304	2106	245.6	9.1	17.0
Aden	3,935	4,427	2050	182.6	10.1	----
Sub-total	411,039	212,173	6,981	763.3	61.2	228.3
Eastern Plateaus						
East Regional Dev. Authority			429	34.7	7.5	480.4
Mareb	86,190	14,488				
Al-Jouf	69,594	10,564				
Hadhramaut and Wadi Hadhramaut Project	39,785	45,638	1287	135.4	2.9	325.9
Shabwa	21,215	25,843	757	84.7	1.5	----
Al-Muhara	1,449	5,466	79	10.6	101	----
Sub-total	218,233	101,999	2,552	265.4	13.0	805.3
Grand Total	1,663,958	1,115,496	11,921	2,255.6	93.4	1,611.1

(*) Source: The Statistical Book 1998.

* Source 1998: Book of Statistics

Table 3:
Manpower Cost and Capital Expenditures
with Respect to Land Holdings

Region	Holdings/ Per Employee	Salaries and Wages		Current Expenditures		Capital Expenditures Per Holding
		Per holding	Per employee			
Mountain Highlands						
North. Dev. Auth. (Sana'a, Sa'ada, Hajjah)	350	361	97,281	29	10,047	1825
Al-Mahweet	151	364	54,941	-	-	693
Dhamar	373	283	105,686	30	11,190	-
Al-Beidha and Rada'a Project	199	480	95,745	37	7,447	248
Ta'ez and So. High. Project	294	334	98,318	20	5,981	1,697
Ibb	598	179	10,742	17	10,487	-
Median	327	334	93,119	26	9,030	1,116
Coastal Plains:						
Tihama Dev Auth. (Hodeida)	109	1,302	142,636	334	36,406	1,628
Lahj	30	3,455	104,796	77	2,310	500
Abyan	19	6,094	116,619	226	4,294	422
Aden	(2)	(41,247)	89,073	(2281)	4,927	-
Median (Without Aden)	53	3,617	121,350	212	14,337	850
Eastern Plateaus						
East Regional Dev. Authority (Mareb and Al-Jouf)	58	2,395	80,886	518	17,483	19,176
Hadhramaut and Wadi Hadhramaut Project	35	2,966	105,947	63	2,2531,98 1	7,141
Shabwa	34	3,366	111,889	58	13,924	-
Al-Muhara	69	1,939	134,177	201	8910	-
Median	49	2,667	108,225	210	10,759	13,159
General Median (Without Aden)	143	2,206	107,231	149	10,759	5,0425,042

The above indicators could not be taken for Aden Office, because the appropriations for that office include all agriculture-related entities, with many of them operating beyond the borders of Aden Governorate.

- Land Areas: 1997 Statistics
- Expenditures: 1997 Budget
- Does not include AREA, Agriculture and Cooperative Credit Bank and the Agriculture Corporations.

2.2 Recommendations

Current Services and Investment Projects

Investment institutions must be isolated and distinguished for the entities that provide current services. The problems faced by each may be spelled out as follows:

- It is well known that investment tasks should be on a short-term basis. However, in reality, they are not as such. The investment project units continue to exist for considerable periods. The problem becomes more exacerbated lately, because of the scarcity of financial allocations available for setting up new investment activities within the existing project units. Therefore, we believe that most of these units, although they are still considered government organs, they are faced with a halt in activities or a considerable reduction of investment activities.
- The service organs are beset by inflation, whether in terms of human resources or financial means, as well as having to face severe shortage of funds and poor management.
- Some of the funds allocated for investment activities are used to cover some of the current expenditures, such as electricity and other current costs. These are not associated with the activities within the services that are required.

Accordingly, the following may be proposed

- I. That investment tasks should be separated from the provision of services, whereby the services provided should be consistent with the general policy and be supported to make them more efficient and effective.**

This would call for turning towards a new form of rural service institutions that should enjoy the following features:

- Maintain only those services that are consistent with the policies and objectives for the agriculture sector, which concentrate on the poorest areas and agriculture systems, as well as on the role of women in production.
- Services should be provided based on the demand of the organized farmer groups, and with a view towards building up the capacities of these groups, which should be deemed the most important aims of these groups.
- To work at the Governorate and District level , side by side with the representatives of the farmers and the local authorities.
- Restructure some specific services, consistent with the general policy of the sector, such as the extension services and operations and maintenance of spate irrigation facilities.

- Introduce certain elements of cost recovery or community contributions to costs, which will confirm that the services is indeed required, and whereby the recovered costs should remain in with the relevant service and be used for the purpose of providing incentives to staff, as well as increase available financial resources.
- Use the effective techniques and approaches, such as the numerous public media channels and farmer groups, with a view towards reducing costs and improve management and broadening the areas and the fields covered by the service functions.
- Improve management through employment by means of competitive contracts.
- Testing of staff, as required, and as appropriate to the functional area and ensuring that appropriate and regular training is provided for staff. Provide the required facilities and equipment, as well as providing incentives for good performance.
- Transfer and redistribution of surplus staff.
- Transparency in accounting with to the financial resources and the other material requirements including motor vehicles.
- Use of the Management Information System and program budgets to link inputs with outputs and costs with derived benefits.
- Ensure proper supervision.
- Integrating the service function with that of others, such as the Agricultural and Fisheries Production Promotion Fund, the Social Fund for Development, the national agriculture projects and the provision of fee – based services and the use of the proceeds within the organ.

II. Deal with investment projects as limited term activities and form temporary teams for their implementation. For this the following would be required:

- Setting up a team for each project for a limited period, which would end with the end of the project.
- Optimal use of the contract employees and consultancy work.
- The project team should not be assigned responsibility over provision of current service provision.
- Institutional and administrative restructuring of the existing projects and rearrangement of the staff within the framework of limited term project

structures and transfer current service provision to permanent institutional frameworks and relocation of surplus staff.

Institutional Structuring

Based on the accomplishments, it is not clear which is the better, the development authorities or the agriculture offices, in terms of carrying out tasks and responsibilities. Both of them are confronted with the problem of poor service provision, and, for both of them, this is attributed to financial difficulties and problems. Moreover, many of the agriculture offices face the problem of overstaffing and the availability of scanty financing.

Some of the bright aspects of the institutional structures do not necessarily mean that this organ is distinctive from the other. For example, we find that the Tihama Development Authority did some good things, and Al-Mahweet Agriculture Office achieved some good things. Observations demonstrate that competent management and suitable funding, sense of responsibility, clear objectives, in addition to having well-trained staff and adequate incentives are bound to lead to exceptional work, whether in the agriculture offices or the development authorities.

The relative independent character enjoyed by the authorities, is not useful due to their extreme internal centralization.

III. Gradual change to new institutional structures, whereby the authorities and agriculture offices will have equal responsibilities for providing services and equal access to resources and whereby the temporary projects will be attached to either of them. This would require the following:

- Selection of pilot organs (from among the authorities and agriculture offices) where the reforms mentioned in Items I and II may be initiated.
- To work towards reorganizing presently existing projects in keeping with the proposed reforms and work with the representatives of the authority and the farmers at the Governorate level and maybe at the District level.

2. Human Resources

3.1 Analysis of the Present Situation

The Size and Distribution of the Manpower

- At present, the number of employees in MAI comes to 154,456 employees as compared to 1,115,496 land holdings throughout the country. This means that there is one employee for each 72 land holdings. This is a high ratio, which increases Government labor costs for the sector. The wages and salaries bill amounted to YR 1.73 billion for 1997.

- The staff with university qualifications and with specialized professional training constitute only 20% of the total MAI staff, whereas non-agricultural university degree holders and Secondary School certificate holders comprise 14%, and the staff who are holding intermediate school certificates and below constitute 66% of the total manpower.
- There is an obvious surplus of intermediate school level certificate holders and below comprise 14% and an obvious shortage of some of the specialized staff such as economists, sociologists, livestock zoologists, irrigation and engineering, information technology (data processing), monitoring and evaluation, etc. The percentage of female employees constitutes 10% of the total MAI manpower.
- Most of the MAI employees are concentrated in the following organs: The General Head Office, Abyan Agriculture Office, Lahj Agriculture Office, AREA, and the Tihama Development Authority (See Table 4).

The Reasons for the Problem

1. Change of the economic regime in the Southern Governorates, which lead to the cancellation of many previous government jobs without the necessary arrangements to release the staff.
2. Shutdown of the former Ministry of Agriculture, without setting up solutions for its staff.
3. Rapid employment since 1990 (23% of the present manpower were recruited after 1990, and about two-thirds of these are holders of qualification levels below secondary school, most of whom were working with non-governmental organizations ("organizations of the masses").
4. Lack of application of the optimal use of staff and of the retirement regulations and referral to pensions.

3.2 Recommendations

- The human resources problem is closely linked with the financial problems and they should be both dealt with concurrently.
- When restructuring the human resources, the priority should be given to the organs with large numbers of employees that are confronted with the problem more than the others are. Examples are the Irrigation and Land Reclamation Projects in Aden, Lahj, Abyan and Hadhramaut. Other areas worthy of attention in the restructuring process, by virtue of the size of their manpower are the following organs: The General Headquarters of MAI, Aden Agriculture Office, Lahj Agriculture Office, Hadhramaut Agriculture Office, AREA and the Tihama Development Authority.

- Within the context of restructuring of human resources, **some of the standards that link the size of the manpower and the available agriculture resources and means in the relevant area that is covered should be used.** Generally, to strive towards achieving a proportion of 100 landholdings for each employee would be a logical target to pursue after over the next five years, rather than keeping the present ration of 72 holdings per employee.
- The **frontline employees**, who administer the direct services to the farmer, must also be distinguished from the supporting staff that support the "frontline" staff. For the frontline staff, a ration of 200 holdings per employee should be reached by the Year 2004. The achievement of these ratios would mean that by the Year 2004 the total manpower of MAI would be 11,154 employees with the frontline staff numbering 5,577 employees accordingly.
- **The restructuring of the human resources should proceed as much as possible** by the retirement of staff and to direct attention towards recruitment of staff for the scarcely available qualifications that are needed by the units that are undergoing such restructuring. Consideration should also be given, when recruiting employees to the imbalance between male and female staff, and to giving opportunities to highly qualified women to be employed in the units that directly provide services to the farmers.
- Attention should also be directed to training and rehabilitation, to meet the requirements of the new tasks of the units that will be subject to restructuring. Whenever possible, staff should be relocated or redistributed, besides the provision of incentives for improving performance.
- The suggested schedule for the retirement of staff during the period from 1999 to 2000 should be as follows:

	Immediate Retirement	Retirement during 99 - 2005	Total
Employees who reached Age 60	778	1,339	2,117
Employees who have completed 35 years of service	260	501	761
Total	<u>1,038</u>	<u>1,840</u>	<u>2,878</u>

- Besides this, a number of Government institutions shall be included in the privatization program. The needed arrangements for repositioning the staff in these corporations should be within the framework of restructuring of human resources. The number of these staff is 1,735 employees, with the following breakdown:

General Poultry Corporation	248
State Farms	861
Agriculture Equipment Leasing Corporation	539
General Drilling Corporation	87
	<u>1,735</u>

- Encouragement of the early retirement, especially among the staff of lower qualifications, who constitute the surplus manpower. This choice will be able to those who have surpassed the age of 60 years or those who have over 25 years of service. Such staff number 581 employees.
- All the options cited above will contribute to reducing the total researched workforce in MAI by 37%.

Table 4
The Manpower of the MAI Organs (1999)

Organ	No. of Emp.	Units included
1. General Headquarters	1,952	General Directorates; Productive Farms: Surdoud, Risabah and Mareb; Projects: Soil Conservation, Flood Damages; AFPPF, GAWR.
2. Aden Agriculture Office	2,050	The Departments of the Office; The General Directorate for Irrigation and Land Reclamation; the Agriculture Institutes: Irrigation Inst. and the Cooperative Inst.; Seed Procreation; suspended corporations: Drilling, Fruits and Vegetables, Poultry; Suspended Farms: People's, Sixth Conference; Suspended Projects: Secondary Irrigation, GAWR Branch
3. Abyan Agriculture Office	2,106	The Departments of the Office, the suspended farms and equipment leasing stations; Traditional Irrigation Project (suspended); Seed Procreation
4. Aden Agriculture Office	1,793	Agriculture Office Departments; Seeds Procreation; Suspended State Farms and Eqpt. Leasing Stations
5. Hadhramaut Agriculture Office	1,287	Agriculture Office Departments; Wadi Hadhramaut Project; Seeds Procreation; Suspended State Farms and Eqpt. Leasing Stations; Suspended General Poultry Corporation.
6. Shabwa Agriculture Office	757	Agriculture Office Departments; Agriculture Associations and Cooperatives; and Eqpt. Leasing Stations
7. Ta'ez Agriculture Office	535	Agriculture Office Departments; Southern Highlands Development Project
8. Dhamar Agriculture Office	299	Agriculture Office Departments
9. Ibb Agriculture Office	267	Agriculture Office Departments
10. Al-Mahweet Agriculture Office	253	Agriculture Office Departments; Branch Road Maintenance Project.
11. Al-Beidha Agriculture Office	188	Agriculture Office Departments; Rural Development Project (Rada'a)
12. Al-Muhara Agriculture Office	79	Agriculture Office Departments
13. Tihama Development Authority	1,032	Headquarters and Branches of the Authority
14. Northern Regional Development Authority	846	Headquarters and Branches of the Authority
15. Eastern Regional Development Authority	429	Headquarters and Branches of the Authority
16. Delta Abyan Regional Development Authority	48	Headquarters and Cotton Gin
17. Delta Tiban Development	46	Headquarters and Cotton Gin

Authority		
18 The General Authority for Agricultural Research and Extension	1,390	Headquarters and Branches of the Authority
19. The General Corporation for Agricultural Services	99	Headquarters and Branches of the Corporation

5. Financial Resources

4.1 Analysis of the Present Situation

- In view of the low current expenditures under Chapter II, the performance of the most of the MAI organs becomes distorted, although the expenditures for operations and maintenance of the machinery, equipment, motor vehicles and trucks and for the maintenance of the buildings, structures and public utilities are deemed important. These expenditures also include the costs of the various inputs of the activities of MAI and the services it provides. Therefore, increases in the appropriations under this Chapter will inevitably lead to revitalizing and improving the standards of operations of MAI.
- The present method of approving the budget is ineffective and fails to link the budget to specific programs and targets, except whatever is approved as the minimum obligation of the Government's contribution against the foreign contributions. It is also worth mentioning that expenditures are not tied to the work need to be implemented.
- The amount allocated for operations is low, amounting to only YR 11,300 = US \$ 75 per employee per annum, which, for all practical purposes, render MAI Headquarters and MAI Agriculture Offices incapable of providing their services. This also makes the payment of YR 1.3 Billion for salaries and wages feasibly unproductive, and makes reforms a necessity (See Table 5).
- There is an imbalance between the salaries (Chapter I) and Current Expenditures (Chapter II), whereby the amounts under Chapter II amount to 7.5% = YR 174,896, while Chapter I amounts to YR 1,729 million = 92.5%.
- The assistance provided to cover the deficit in Chapter III, Item 6 Class 4 is not considered an optimal method. MAI has worked towards reducing this amount especially in Agriculture Equipment Leasing Stations, whereby no amounts will be appropriated for 1999.

4.2 Recommendations

- The budget for expenditures must be adequate: in 1997, the actual expenditures for salaries amounted to YR 1,729 millions; for Chapter II the amount was YR 190.6 million. By adding the salaries of Chapter V (YR87.175 millions and expenses under Chapter V (YR 806.710 Millions, the total comes to YR 2,813.485 millions = approximately US \$ 18 million. In this respect, the recommendation is that we suggest that the total current

expenditures should not be less than US \$ 18 million, **but with the restructuring of the allocations to correct the low expenditures for operations and increasing the incentives in salaries and wagers, in order to improve effectiveness and increase revenues.**

- **Reduce wage costs and increase expenditures for operations**, until they reach YR 75 thousand/employee/annum (the equivalent of US \$ 500), with the targeted number of employees about 10,000 = YR 1.5 billion; i.e., the equivalent of US \$ 10 million.
- Increase the average salaries above the present average (YR 99,000 per annum, or the equivalent of US \$ 660 to a targeted average of YR 150,000, the equivalent of US \$ 1,000 per annum x the number of employees (about 10,000 employees) = YR 1.5 billion or the equivalent of US \$ 10 Million.
- **Improve the effectiveness by restructuring field services and the General Headquarters and the preparation of a program budget.** Consideration should be given to the priority of tasks requiring that the implementation and the output should be tied to the approved budget, the increase of the contribution of the beneficiaries to the costs and to obtaining authorization for use of the revenues.

Table 5
Actual MAI Expenditures for 1997
(YR MM)

The Entity	TOTAL	Chapter I	Chapter II	Chapter III	Chapter IV	Chapter V
General Headquarters	1,271.9	200.1	43.2		318.3	719.3
Aden Agriculture Office	192.6	182.6	10.1			
Ta'ez Agriculture Office	55.8	52.6	3.2			
Hadhramaut Agriculture Office	138.3	135.4	2.9			
Al-Hodeida Agriculture Office	-	-	-			
Lahj Agriculture Office	219.3	187.9	4.2	16.9	-	10.3
Ibb Agriculture Office	31.3	28.5	2.8			
Abyan Agriculture Office	271.7	245.6	9.1	-	-	17.0
Dhamar Agriculture Office	35.0	31.6	3.3			
Shabwa Agriculture Office	86.2	84.7	1.5			
Al-Muhara Agriculture Office	11.7	10.6	1.1			
Al-Beidha Agriculture Office	28.7	18.0	1.4	-	-	9.3
Al-Mahweet	40.4	13.9	-	-	-	26.5
Total Agriculture Offices	1,111.0	991.3	39.6	16.9	-	63.2
Tihama Development Authority	369.1	142.2	37.8	1.6	111.4	71.1
Eastern Regional Development Authority	522.5	34.7	7.5	0.9	453.1	26.4
Northern Regional Development Authority	632.5	82.3	8.5	21.9	507.8	12.0
The General Authority for Agricultural Research and Extension	279.5	229.8	33.1	7.8	8.7	-
Delta Abyan Regional Development Authority	39.2	24.5	9.7	1.3	-	3.6
Delta Tiban Development Authority	28.2	13.2	5.3	5.2	4.3	0.2
Total Agriculture Authorities	1,871.0	531.7	101.8	38.8	1,085.4	113.3
Total Equipment Rental Stations	12.5	6.4	6.0	0.1	-	-
Southern Highlands Project	267.3					267.3
Wadi Hadhramaut Project	325.9					325.9
Other Projects	2,432.8					2,432.8
Total Projects	3,026.0	-	-	-	-	3,026.0
Grand Total	7,292.4	1,729.5	190.6	766.1	1,403.7	3,202.5

5. Summary/Conclusion

The institutional restructuring of agriculture sector, in light of the recommendations of this paper could start in the Year 2000, whereby the agriculture services should be carried out in parallel with the decrees related to the issuance of the decrees on the Agriculture Sector Policies and concurrently with the restructuring of the human resources and the financial resources. These four elements should proceed together and all the measures taken at the national and local levels should be congruous.

The vital component from the restructuring process of the highest significance is to be found in the savings derived from the reduction of the number of employees and potentially using such savings to increase the expenditures for operations in the agriculture services sector, the improvement of staff performance quality through rehabilitation and training and the payment of remuneration that is linked to good staff performance.

After having taken the appropriate decisions, with respect to the recommendations, the implementation of the measures taken accordingly would require coordinated well organized efforts by The Agriculture 21 Agenda Team, which would require the support in the form of technical assistance. It is possible to start with four selected units, commencing in the Second Half of the Year 2000

Annex 1
Aden Agenda The Role of the Public Sector and the Other Sectors for the
Provision of Agricultural and Rural Services

Service	Public Sector Role	Role of Other Sectors (Cooperative/Private)
<u>1. Agricultural Research</u>		
Policies and Strategies	XXX	X
Research Based on Farmer Demand	XX	XX
Resource Management Research	XXX	XX
Rainfed Agriculture Research	XXX	XX
Livestock Research	XX	XX XX
Refined Bred Seed Production	XXX	XX
<u>2. Agriculture Extension and Training</u>		
Policies and Strategies	XXX	X
Optimal Use of Resources	XX	XXX
Focus on Rainfed Areas	XXX	XX
Publication/Circulation of Information and Making Technology Generic	XX	XX
Focus on Small Producers and Women	XX	XX
Training of Extension Staff and Farmers	XX	XX
Meeting the Needs of Large Investments	X	XXX
<u>3. Agriculture Education</u>		
Policies and Strategies	XXX	XXX
<u>4. Lending and Rural Financial Services</u>		
Conservation of Resources	XX	XX
Traditional Agriculture and Production of Strategic Crops	XX	XXX
Focus on Small Farmers	XXX	XX
Large Investments in Agriculture	XX	XXX
<u>5. Plant and Livestock Agriculture Quarantine Services</u>		
Laws, Regulations and Legislation	XXX	X
National Immunization Campaigns against Livestock Diseases	XXX	X
Control of Main Entry Points to the Country	XXX	X
Domestic Quarantine	XXX	X
<u>6. Plant Protection and Livestock Health Services</u>		
National Anti-Agriculture Disease Campaigns	XXX	X
National Anti-Livestock Disease Campaigns	XXX	X
Combating Locusts	XXX	X
Crop Protection Services for Farmers	X	XXX
Veterinary Services for Farmers' Livestock	X	XXX
XXX Major role	XX Participatory role	X Assisting/Responding role

Annex 1 (Con'd.)
Aden Agenda The Role of the Public Sector and the Other Sectors for the
Provision of Agricultural and Rural Services

Service	Public Sector Role	Role of Other Sectors (Cooperative/Private)
<u>7. Agricultural Marketing Services</u>		
Standards and Measures	XXX	X
Data and Information	XX	XX
Markets	X	XXX
<u>8. Rural Infrastructure Services</u>		
Rural Road Construction	XX	X
Spate Irrigation Schemes	XX	X
Wadi Bank Protection	XX	XX
Water Supply Projects	XX	XX
Maintenance of Spate Irrigation Schemes	XX	XX
Construction of Water Dams and Dikes	X	XX
Maintenance of Rural Agricultural Roads	X	XX
Maintenance of Water Dams and Dikes	X	XX
<u>9. Management of Natural Resources</u>		
Policies, Strategies Regulations and Legislation	XX	X
Watershed Management	XX	X
Forest and Rangeland Management	XX	X
Anti-desertification	XX	X
Rangeland Work	XX	X
Soil Protection	XX	X
Water Harvesting	X	XX
Groundwater Irrigation	X	XX
Protection of Terraces	X	XX
<u>10. Agriculture Inputs Services</u>		
Laws, Regulations and Legislation	XX	X
Quality Control	XX	X
Procreation of Major Grain Seeds	XX	X
Production of Forest Trees Nurseries	XX	X
Exports and Distribution	X	XX
Procreation of Vegetable Seeds	X	XX
Fruits and Vegetables Nursery Production	X	XX
<u>11. Agricultural Mechanization Services</u>		
Specifications and Measures	XX	X
Exports and Distribution	X	XX
Leasing	X	XX
<u>12. Support to Farmers' Organizations</u>		
Policies, Strategies Regulations and Legislation	XX	X
Support to the establishment of Farmers' Organizations	XX	XX
Support to Participation of Women in Development	XX	XX
XXX Major role	XX Participatory role	X Assisting/Responding role

