

447

(AB)
AEO

SYMPOSIUM
ON
AGRICULTURAL DEVELOPMENT
IN JORDAN

FINAL REPORT

APRIL — MAY, 1974

CONTENTS

PAGE

Introduction

Agricultural Zoning 1

Wheat and Field Crops Development Programme 8

Vegetables Development Programme 18

Fruit Trees Development Programme 23

Animal Wealth Development Programme 33

Management of Agricultural Development 40

General Recommendations 46

INTRODUCTION

Although Jordan is agricultural by nature and resources, the volume of agricultural production is still short of satisfying domestic demand. Agricultural exports are confined to some vegetables and bananas in certain seasons of the year. Given the population explosion and the trend of increased food prices, as much self reliance as possible in agricultural output is one big advantage and the reduction of the equally rising agricultural imports is another.

At present, the agricultural sector suffers from low productivity, smallness of individual enterprises, insufficiency of capital investments, incompatibility of production lack of storage and marketing methods using modern techniques, and the poor utilization of the known natural agricultural resources.

In order to achieve these goals, the major target is the development of the human element represented mainly in the Jordanian farmer-citizen who is the most important element in agricultural development and who is not being afforded.

equitable opportunities comparable to other population sectors. This is in spite of this farmer being one of the most basic elements of economic development.

On this human development rely almost all the hopes of rural community development and the hope of reversing or at least checking the dangerous trend of rural migration to the city.

The main strategy depends on defining, for the first time in Jordan, a sound adaptable long-range agricultural policy. As a result of this exercise, this policy is being based on the best possible land use and on agricultural zoning and suitable cropping patterns; and this policy will certainly lead to the badly needed integrated regional and national development as a package-deal.

In order to implement this policy, management was also studied and general guide-lines are suggested in this report. Defined projects for the various sectors are included in the detailed working papers.

Input costs, expected outputs and increments are estimated and are supported by preliminary technical and economic feasibility studies.

The executive programmes and recommendations were discussed jointly with a number of representatives of international and foreign agencies involved in development in Jordan. This views were taken into account when this Final Report was prepared. The Report which contains summaries of the various working papers with some changes includes recommendation adopted by the Symposium along with some of the views expressed by the joint Jordanian and foreign committee.

Finally, it is to be noted that the recommendations and suggested action programmes constitute an extension of and a booster to the Three Year Plan (1973-1975) and basis for future agricultural development plans.

AGRICULTURAL ZONING

The East Bank of Jordan, because of the considerable similarities in the natural vegetation, soil groups and climatological patterns and changes in these patterns with altitude and the frequency distribution of the minimum average annual rainfall over the past thirty years, may be divided into five agricultural zones:

1. The Arid Zone (BADIA) where the average annual rainfall has been less than 200mm. This zone occupies an area of 8,456,900 hectares or 91% of the total areas of the East Bank and extends from the Syrian borders in the north to the Saudi Arabian borders in the south and from east of the Hijazi railway occupying all the desert east of the railway.

Natural vegetation in this zone is scarce and is limited in nonutilized areas to Shesh, Atl Shinan and Turfa with the exception of stream paths and valleys where there is a good supply of grazing shrubs.

Studies included in the different working papers indicated that the best utilization policy for this zone is the following:

- a) Utilization of the natural vegetation and restricting it to the development of grazing and meat production through the raising of sheep and goats.
- b) Utilization of the areas taht have sufficient groundwater or surface water for agricultural purposes.
- c) Support of egg and meat producing poultry industries.

2. The Marginal Zone where the minimum average annual rainfall has been greater than 200 mm. and the maximum average annual rainfall has been less than 350 mm. This zone occupies about 563,400 hectares or about 6% of the total area of the East Bank and covers three different regions. These regions can be seen in the maps attached to the report on agricultural zoning. The major soil groups of this zone are the yellow mediteranean soils and the natural vegetation is more variable and visible than in the Arid Zone. This zone may be divided into two subregions as follows:
- A) That of annual rainfall between 200-250 mm.
 - B) That of annual rainfall between 250-350 mm.

According to the studies included in the working papers, the following policy is recommended:-

- a) Restricting of the first subregion to barley production together with other suitable fodder crops.
- b) Utilization of the second sub-region mainly for wheat production and other summer rotation crops in areas with gentle slopes of less than 9%.
- c) Restriction of the areas with a slope of 9 to 25 % to the production of suitable fruit trees.
- d) Continuation of the programmes to plant with forest trees areas with slopes greater than 25%.

3. The Semi Arid Zone where the minimum average annual rainfall has been greater than 350 mm. and the maximum average annual rainfall has been less than 500 mm. This zone occupies about 135900 hectares or about 1.5% of the total area of the East Bank and the major area of this zone falls between the Yarmouk river in the north and Madaba in the South and between the northern Ghor in the West and Jarash and Amman in the East. The other area of this zone lies around Karak as can be seen in the maps attached to the report on agricultural zoning.

The major soil groups of this zone are the red Mediterranean soils. According to the studies included in the working papers, the following policy is recommended:-

- a) The planting of wheat and other crops of summer rotation.
- b) The planting of fruit trees in areas of 9 to 25% slopes.
- c) The planting of forest trees in hilly areas with slopes more than 25%.
- d) The development of egg and meat producing poultry industries.

4. The Semi Humid Zone where the minimum average annual rainfall has been greater than 500 mm, and the maximum average annual rainfall has been less than 800 mm. This zone occupies an area of about 98900 hectares or about 1% of the total area of the East Bank.

It occupies comparatively small areas of land scattered between Irbid and Ajlun in the North around Karak in the middle of the country and around Salt which is in between these two regions. The major soil group of this zone is the brown soil with fine structure and calcareous surface soil.

The best utilization as defined in the working papers would be as follows:

- a) Flat and gently sloping lands should be utilized for the development of summer and winter productions of field crops and for summer vegetable production.
- b) Areas with slopes between 9 to 25% should be used mainly for the development of suitable fruit tree production.
- c) Steep and rocky areas should be planted with forest trees.

5. The Ghor

This zone lies between the Yarmouk river in the north and Wadi Gharandal south with the Dead Sea in the middle. The Jordan Valley occupies the northern sector of this zone while the south Ghors between Hadetha and Khinzera valleys occupy the middle sector of this zone, with Wadi Araba constituting the western part of this zone.

These sectors are considered two of the most fertile agricultural areas in Jordan. This is due to the availability

of water. This zone lies between 200 and 350 meters below sea level and characterised by hot summers and warm winters. It occupies about 100,000 hectares and has high production potentials where cropping density can be doubled and 3 to 4 crops may be produced annually by rotation. Also, horizontal expansion is possible in this zone.

According to the studies included in the working papers, the best agricultural policy to be followed in this zone is :

- a) Development of water resources to their maximum especially the Yarmouk river which is the major source of water in Jordan.
- b) Intensification of the cropping pattern in this zone mainly vegetable production of out of season crops for export and local consumption. This intensification will be reached through an integrated overall regional plan which depends on the development of human resources and capabilities.
- c) Rationalization, extension and increase in the productivity of different citrus fruit trees and supporting banana production.

- d) Production of suitable summer and winter forage crops, particularly the different kinds of corn in the cropping pattern to develop animal production the milk industry.
- e) Introduce and intensify the production of some industrial field crops of high returns mainly sugar beet and oil seed for local consumption.

Finally, to accomplish these objectives, it is necessary to (a) to adopt and finance a general soil survey and classification project for all agricultural zones of Jordan, giving priority to hilly areas with average rainfall greater than 250 mm and (b) to undertake an agricultural census for the whole country.

WHEAT AND FIELD CROPS DEVELOPMENT PROGRAMME

Wheat is considered the most important crop in Jordan because it is the principal food for most of the people. Its production occupies the largest area of agricultural land allocated to field crops. Wheat is suited for areas with rainfall of more than 250 mm. especially on level or only slightly sloping land.

The average area planted with wheat during the period 1967-1973 is estimated at 1.5 million dunums (table 1). The annual average production was around 135,000 metric tone and the consumption for 1974 is estimated at 285,000 metric tons. It is estimated that wheat requirements will increase to about 335,000 metric tons in 1980 on the assumption of an increase in population of about 3.1% annually.

Accordingly, the improvement of wheat production is considered to be a major step in implementing Jordan Agricultural policy. The working paper submitted on the subject included detailed plans for increasing production, through the use of demonstrations and the adoption of modern techniques. Therefore it is recommended that the wheat areas follow a rotation with other crops like legumes, oil seeds, and vegetables.

Further- more wheat farming should be concentrated on level or slightly sloping with an average rainfall of mor than 250 mm as shown in table (1).

Table (1) shows the distribution of wheat area in dunums by districts according to the rainfall in mm. The Jordan valley is excluded from the table.

Districts	250-300	300-400	above 400	Total in (000)dunums
Irbid	240	282	90	612
Amman	191	243	700	504
Balqa	45	40	20	105
Karak	180	50	-	230
Ma'an	45	4	-	49
Total	701	619	180	1.500

On the basis of the above the wheat area is located geographically in a line, which starts from Ramtha in the north and runs south wards passing through Rihab, Sokneh, Amman, Shaab, Zezia, Thiban, Ljjon, Muab, La'aban, Tawafy, Shajarat El Tayar, and Ras Naqab, then to the west towerds the Ghorheights.

Table (2) below shows the suitable districts by dunums for wheat according to the average rainfall.

District	250-300 mm	300-400 mm	Above 400 mm	Total 000/dunums
Irbid	230	280	40	550
Amman	180	230	25	435
Balqa	45	40	6	91
Karak	160	50	-	210
Ma'an	35	4	-	39
Total	650	604	71	1325

Based on these figures, the following is recommended:

1. Wheat should be planted in the above mentioned areas, while barley should be planted in areas having an average rainfall between 150-250 mm.
2. The wheat project should start in the Irbid district as reported in the working paper for the following reasons:-
 - a) The wheat area in Irbid district occupies about 35% of the total wheat area and its production constitutes about 40% of the countrys total wheat production.

- b) Irbid district is considered suitable for wheat farming, because of its level lands, soil, weather, and rainfall. This proposal agrees with the zoning working paper.
- c) The farmers in the area have had some experience, and are willing to adopt modern techniques in wheat farming to increase the productivity of the unit area. There are also some cooperative societies already handling wheat farming.

Increased production of wheat depends on the following :-

1. Improved methods of plowing and suitable agricultural practices.
2. Use of chemical fertilizers and weed control at economical rates.
3. Use of improved seeds and high yielding varieties.
4. Use of combines and modern farming equipment.

The program included two main phases; both for organized grouping of farmers to allow and facilitate the provision of needed inputs and services effectively and efficacitly .

To achieve the targets for increased wheat production the following recommendations should be adopted:

1. To establish a Wheat Board to develop wheat production and to share in planning guidance.

The board shall buy the local produce from farmers at remunerative prices with world prices of wheat as a maximum indication of price to be paid. The board shall not intend to make any profit as such.

2. Farmers should be grouped by encouraging cooperative societies and by establishing farmers unions for wheat farmers and other field crops to complement the cooperatives.
3. The Ministry of Agriculture should produce the Registered seed in stations under its control by applying adoptive research methods. These strains of registered seed will be propagated and given to the cooperatives or farmers unions through the Wheat Board, either directly or through contracts to produce improved seed on special fields under the continuous control of the Ministry of Agriculture. Also the Ministry will make sure that the seed will meet the specifications for production and after approving it, deliver the seed to the cooperatives and farming unions.
4. The Wheat Board, through farmers association, will provide all production requisites in adequate time, prior to the planting season to encourage farmers to join these associations, At the same time, a policy should be agreed on that no members outside these associations should be given any of these privileges.

5. The cultivation of the total area of 550 thousand dunums should be phased over three years to allow the technical and organizational ways to be gradually strengthened over the same period.
6. One half of the area should be operated by the cooperatives, and the other half by farmers unions. These ratios will be subject to any change according to the avaluation and success of each sector on the understanding that all farmers in to both sectors would be treated equally.
7. The project aims to develop wheat production and other crops, in the rotation completely and thoroughly from the stage of land preparation for planting to the storage and central marketing stage and by agreement with the Ministry of Supply. The Wheat Board will provide all means and inputs needed for establishment of storage facilities at the level of the cooperative societies and of farmers union to the central storage for the total production in the governorate. This is estimated at about 40-50 thousand tons annuslly and will be reached by constructing storage silos.
8. The Ministry of Agriculture will provide, through this executive plan to the Wheat Board the agricultural engineers necessary for agriculture extension and farm management for both the cooperatives or farmers unions.

9. The suggested development programme for wheat should be adopted in regard to timing of execution and to its spreading all over the villages in the Irbid governerate.

In order to achieve this programme, the following should be undertaken:

- A. Implementation of the responsibilities of the Wheat Board as was mentioned in recommendation No. 1.
- B. Establishment of an improved seed station at Irbed governerate under the control of the Ministry of Agriculture within an area of 3000 dunums to produce 200 tons of registered seed annually at a cost of 256 thousand dinars, in addition to 20 thousand dinars to continue the wheat demonstrations in the governaerate as part of the programme of extention methods and applied research.

To render this recommendation feasible, so that this program will start in October 1974, it is necessary to establish the Wheat Board and allocate the funds needed prior to the end of May 1974. Otherwise the program will be delayed for a whole year.

The total cost estimated for the first year of the program is 634 thousand dinars as shown in the table(3) below:

TABLE (3)

	Base 1974	First 1975	Second 1976	Third 1977
Year/Area in 000 Dunum	-	150	200	200
<u>A.O. & M. Costs (000JD)</u>				
Seed/ton	1500	2000	2000	1800
Value/JD	90	120	120	108
N. Fertilizers/ton	1500	2000	2000	5500
Value / JD	75	100	100	275
P. Fertilizers/ton	750	1000	1000	2750
Value/ JD	128	170	170	468
Weed Killars/ton	15	20	20	55
Value/JD	18	24	24	66
chemicals for Dressing	3	4	11	4
Value /JD	105	2	2	5.5
Agri. Engineers/No.	10	20	30	30
Salaries /JD	15	14	21	21
Field assistants/No	10	20	30	30
Wages / JD	5	10	15	15
Total O. & M costs (000JD)	324.5	440	452	958.5

con: Table (3)

B - Capital Investment Costs

Mechanical Units without

Tractors/No	28	50	50	-
Value/JD	175	230	230	-
Combines/No	15	20	20	-
Value/JD	90	120	120	-
Trucks/No	15	20	6	-
Value/ JD	45	60	18	-

Total Capital Investment(000JD.)	310	410	386	-
----------------------------------	-----	-----	-----	---

Total Costs (000 JD.)	634.5	850	820	958.5
Conterngency 20%	120.9	170	164	191.7
Grand Total Costs(000JD.)	761.4	1020	984	1150.2

The costs shown in table 3 could be supplied to the Wheat Board as annual or short term loans at a reasonable interest which will repaid back every season as the crop is sold.

As to the seed production station and demonstrations, these are considered as a main part of the Ministry of Agriculture funds or Budget,

The working paper outlined the economical feasibility of this project and with the development of wheat farming assuring an increase in the total national income and the farmers income with an annual increase in Production estimated for the area covered in this program, at about 36 thousand tons which is equal to 55% increase over percent production.

If it recommended that the Wheat Board will start as soon as it is formed, to prepare similar programmes to cover the rest of the wheat regions in other governates of the kingdom. In addition to its original fund. the Board should be furinshed the gegining with the technical and financial means necessary to develop these programmes. The additional costs for the first year of this programme in other areas than Irbid are estimated at about 30% of the Wheat program costs for Irbid governarate. These additional costs should be added to the Wheat Board funds as soon as its is formed.

VEGETABLES DEVELOPMENT PROGRAMME

Vegetables represent a very important sector of agricultural production and as such is a valuable contributor to the national economy.

Although vegetables are considered high income crops and in spite of the fact that Jordan has accomplished a recognizable progress in vegetable growing, there is still a big gap between what is being produced and what could be produced. Vegetable yields at present, are comparatively low and could be doubled for some vegetables and more than doubled for other vegetables. Likewise improvement in quality could be introduced. Production often does not meet market demands, for both local consumption and exports, in terms of timing and quality. As a result, it is clear that there is a need to develop and organize vegetable production. The working paper includes periodical projections of yield per dunum for different vegetables in both the irrigated and dry farming lands.

Acreage available for vegetable production in East Jordan is as follows:

- 1 - Irrigated lands used for vegetables and field crops in both the Ghor and in the eastern hill areas are estimated at 197000 and 67000 dunums respectively, with a total of 264000 dunums.
- 2 - Dry farming lands used for growing vegetables and field crops under rainfall (average exceeding 350 mm) are estimated at 321000 dunums.

According to detailed estimations in the working paper, expected increases in yield per dunum due to the proposed development program, would make lands available for vegetable production to meet increased local consumption and exports in the future as shown below.

Acreage in 000 dunums

Irrigated:-

<u>1972</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
192	248	207	153	195	232	290

Dry-Farming:-

<u>1972</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
214	200	187	149	171	215	269

Raising vegetable yields would economize land use and release adequate lands for the production of sugar beets and forage crops. Two cropping patterns were suggested in the working paper: one for irrigated lands and the other for the dry-farming areas. Both included growing of sugar beets.

The working paper covered in detail the prevailing problems and the various interrelated factors which affect vegetable production in Jordan.

Implementation

- 1 - Vegetable production should follow an oriented policy, based on the philosophy of the group activities of farmers so as to apply the most proper rotation taking into consideration the information obtained from the linear programming study to plan organized production.

- 2 - Development of vegetable production should be undertaken through agricultural development centers, which would cover all agricultural areas. These centers would provide the agricultural inputs to farmers and spread information on improved agricultural practices through farmers organizations. It is proposed that these agricultural development centers will carry out the following responsibilities:

- a) Distribution of production requisites as seeds, pesticides, etc. at the proper time , in quality fit for the production location and at reasonable prices.
- b) Production of seedlings of improved varieties and the provision of them to farmers at reasonable prices.
- c) Facilitation of the economic application of mechanised farming .
- d) The spreading of information on modern agricultural technology and the application of the results of agriculture research in practical extension programmes.

Recommendations to Implement the Programme

- 1- To work through farmers organizations such as the cooperatives and the farmers unions in order to provide the financial and moral motives for workers in the vegetable sector.
- 2- To strengthen agricultural research through the provision of the various means of success and to adopt such results to improve yields continuously.
- 3- To undertake extension activities through agricultural development centers so as to increase the efficiency of extension programmes by closer contact between farmers and extension agents.
Agricultural training centers would also help to strengthen the activities of these agricultural development centers in training extension agents by the use of modern techniques including audio-visual aids.
- 4- To develop and extend agricultural marketing services through farmers organisations so as to improve prevailing marketing channels; and to organise the flow of the produce from the field to collection centers which will sort, grade, pack, and sell all produce for the benefit of farmers.

- 5- To provide necessary finance and credit to farmers' organisations and funds for agricultural research, extension and other complementary services rendered by the Ministry of Agriculture.

FRUIT TREES DEVELOPMENT PROGRAMME

Fruit trees cultivation is considered one of the main crops in Jordan. Existence of variable environmental conditions permits the production of almost all kinds of fruits. Fruit trees cultivation is feasible in rough or sloping terrain unsuitable for other cropping patterns. Fruit tree cultivation could be considered among the traditional types of agriculture in the country.

In spite of the continuous expansion of areas presently covered by fruit trees (approximately 369000 dunums) there is not a uniform distribution over the various governorates. Fruit trees cultivation is mainly concentrated in Irbid and Balka governorates. It is also undertaken in 2nd around Amman and Karak, in addition to a moderate area in the Ghors. Olive trees occupy the majority of these areas followed by grapes, citrus, stone-fruits, pomes and bananas.

Most of the cultivated varieties are of local origin, with proved success and adaptability to a large degree. The Ministry of Agriculture has introduced for fruit cultivation many improved and world-known varieties of stone fruits and pomes, in addition to recommended root-stocks for grapes which have a high degree of resistance to soil conditions and important root pests and diseases.

Total annual production according to 1972 statistics are approximately 24000 tons of grapes, 8000 tons of stone-fruits, 4000 tons of pomes, 40000 tons of citrus, 8000 tons of bananas and 10000 tons of other types of fruits. Present production does not satisfy local consumption in all kinds of fruits except for bananas where there is a surplus of about 2500 tons which is now exported now to various countries. The total annual deficit of all kinds of fruits is estimated at about 62000 tons annually which is expected to increase gradually through the years in proportion to the increase in population and the improvement of the standard of living.

I. Vertical Expansion Programme

It is possible to overcome the present low productivity by a comprehensive programme adapted to face the numerous production problems. There are pest control, fertilizer application, pruning and weed-control. This will require the provision of all needed agricultural equipment and other necessary inputs which are stated in detail in the working paper.

The following are the major requirements:

1. Responsible authorities should be authorised to secure all necessary inputs and provide them directly to the farmers co-operatives or other organizations assigned to play an active role in agricultural development.

Strengthening the present technical, executive and extension agencies in the Ministry of Agriculture and other involved organizations to enable them to handle the added loads of supervision to be undertaken. Present available personnel are only 14 agricultural engineers, 120 trained labourers and 30 mechanical operators.

Total annual expenditures of all requirements for improving the present productivity including equipment (depreciation at the rate of 10% interest on capital investment at 6% annually) is estimated at 1,693,540 JDs.

Most of this investment should be collected from the farmers by the Ministry (or cooperatives and other supporting organizations) either through direct sale or as feese, estimated at cost value, in payment for its services.

4. The programme requires total supervision and control by the Ministry of Agriculture, especially regarding pest control operations to secure a badly needed and effective control of insects and diseases.

The estimates of costs and values of the expected increase in production, provided in detail in the working paper, prove the technical and economic feasibility of the programme. The percentage of total annual expenditure (1695500 JDs) to the expected annual increase revenue (2907000 JDs) is about 1.7 which is a very acceptable or ~~wvn~~ high rate of return for agricultural projects.

11. Horizontal Expansion Programme

In view of the absence of information on soil structure and types of rocks prevailing in the areas classified now as uncultivable lands. It is difficult to include any part of these areas in a programme for new fruit cultivation. This is due to the difficulty or even the impossibility of estimating rough costs of orchard establishment per unit area in relation to type of rock, degree of hardness and land slope.

Due to the previously mentioned difficulties, only lands classified in accordance with the Department of Statistics Bulletin (1972), as neglected cultivable lands, subject to an average rainfall of not less than 300 mm, have been included in the present programme as a first phase.

Some lands which will be put under irrigation at Ma'an Governorate (Shobak area, estimated at about 20000 dunums) have been added to the present programme of fruit tree cultivation in unsuitable rainfed areas.

According to the detailed studies in the working paper, on a district and governorate level, a total of 231600 dunums is available at present for expansion in fruit tree production. These districts have also been evaluated in respect to climatic conditions; details of which are given in the various tables in the working paper. Local consumption and export potentials, the proven success of traditionally native kinds such as olives, grapes and almonds in addition to the introduction of newly adapted fruits such as peaches, plums and prunes, cherries, pistachio nuts, walnuts, pomes, figs and others were taken into consideration when different species and varieties were selected and assigned to suitable areas in various districts.

The programme is based on the application of modern methods of fruit-tree-cultivation and orchard management along the following lines:

1. The suggested programme is spread over five years for almost all kinds of fruits. The exception is olives which could be covered in a period of two years due to the availability of most of its material requirements being available through the present Three Year Plan.

2. The annual programme of fruit tree expansion is distributed generally as follows:

Ist year	6432 dunums
2nd year	92640 "
3rd year	138960 "
4th year	185280 "
5th Year	231600 "

3. Total estimated costs of the programme up to the full production age of trees (15 years from planting) is estimated as 28027351 JDs as shown in details in the working paper.
4. Total revenues for the same period is estimated at 103667835 JDs or a net revenue of 75,640,484 JDs over the same period. This is equivalent to an average annual net revenue of 5042699 JDs with a high rate of return of 2.68. Expenditures are estimated at 1868490 dinars.

III. Implementation

It is recommended that the following measures of implementation should be adopted :

1. As a first step, stress should be given to support the required expanded programme of fruit-seedling production in accordance with the following dimensions and requirements:

<u>Year</u>	<u>No. of Seedlings</u>	<u>Cost in JDs</u> *
1st year	946000	94600
2nd year	2413300	241330
3rd year	2553015	255301
4th year	<u>2472465</u>	<u>247246</u>
Total	9842453	984147

* Based on the estimated cost of 100 fils per seedling.

2. Application of an intergrated plan of implementation of all required tree cultural practices and orchard establishment. Such a programme should mainly depend on the community development approach of mass farming, group organizations such as co-operatives, farmers; unions etc which exist or will be developed to cover other sectors of agricultural development in various districts.
3. The orientation of aid funds already available for fruit cultivation development should be directed toward supporting the ne enlarged programme, taking into consideration the necessity for just and equitable distribution to cover ail areas after actual confirmations of land & site suitabilities.

4. The provision of necessary measures to assure long term soft loans to fruit farmers organisations for securing all material requirements of the programme.
5. Postponment of the annual down payments for loans given to cover costs of orchard establishment until the trees reach the fruiting stage (7 years for olives & 5 years for all others).
6. Supporting the establishment of required industrial activities to cover the basic technical needs of fruit marketing, with a stress on the olive press to meet the expected increased production. Such development depends mainly on various farmers' organizations which must be afforded the necessary financing facilities at soft terms.

IV. Development of Banana and Citrus Production

Almost all banana and citrus areas are concentrated in the Jordan Valley under permanent irrigation.

Banana

At present, banana cultivation is restricted to an area of about 4643 dunums, although approved permits for its cultivation is estimated at 6500 dunums. The reason for this lower level of production is mainly due to the high risks involved in its culture, especially the dangers of frost. It is estimated that irrigation waters will be available to cover a total

banana area of approximately 10,000 dunums as indicated in detail in the working paper. It is recommended that all necessary incentives and assurances to cover the cover the frost risk should be developed through the collective support of banana cultivation marketing and other activities (to be undertaken by a specialised branch of the Farmer's Union of the Jordan Valley).

Citrus

The present situation of citrus cultivation is more promising. The present area is estimated at 16500 dunums. The country now faces a shortage of approximately 25,000 tons due to the increase of population and improved standard of living. A possibility of increased export also exists to new markets of the Far East, and the Arab world.

The detailed justifications for an expansion programme is given in the working paper. There are irrigation possibilities to cover between 60,000 and 80,000 dunums of citrus and banana expansion in the Valley. The plan will concentrate on suitable species and varieties, virus-free seedlings and other technical requirements.

The financing and detailed planning could be spread over ten years and integrated through a specialized committee, or branch of the suggested Farmer's Association of the valley which will secure easy-term loans, marketing, technical and economic facilities and other needed inputs.

Under the present production conditions, livestock contribution to the national gross product (NGP) is around 7% and equals about 34% of local agricultural income. However, the value of imported livestock and livestock products is around 4 to 6 million dinars per year (1972 census).

This total sum is broken down into the following values, by commodity:

<u>Commodity</u>	<u>Value/million JDs</u>
Red meat	1.7
Fish	0.95
Broiler	0.178
Eggs	1.30
Milk & milk products	1.90
Skin & hides	0.23

The working paper has shown in detail the amounts of imported produce and the deficit, which will increase due to the increase in population and in the income of the individual. Table (2) shows the estimated consumption, local production, deficit, percentage of local production relative to consumption as well as per capita consumption

Table 2

Commodity	Consumption Ton/No.	Production Ton/No	Deficit Ton/No	Ration of local Pro- duction to consumption	Per Capita Consumption
Poultry meat	13842	13050	792	94.2	8.2
Milk & milk equi- valents	62190	32143	30047	51.7	40
Red meat	15780	5938	9724	37.5	9.2
Eggs	142,944,570	46,000,000	96944570	32.2	84
Fish	1880	141	1739	7.5	1.1

1. GENERAL POLICY FOR DEVELOPMENT OF LIVESTOCK PRODUCTION

The proposed policy in its initial stages depends on the following requirements:

- 1.1 Increasing local production to meet the local demand in the coming 3 years in the fields of eggs, broiler and fish production.
- 1.2 Increasing local milk production to the highest possible level using the available resources to minimize the volume of imported milk and milk products.

- 1.3 Increasing the production of red meat with the scope of available resources as determined by the overall agricultural zoning plan.
- 1.4 Rationalizing range land utilization and improving its productivity within the geographic zoning of the agricultural master plan using constitutional and physical means as detailed in the working paper.
- 1.5 Undertaking all necessary measures which enhance and encourage the establishment of animal production farms in suitable zones such as the Jordan Valley and in the irrigated area of the uplands.
- 1.6 Establishing a specialized body to promote animal production (Animal Production Board), within the global plan of agricultural development.

2. PROPOSED PROGRAMMES FOR INCREASED PRODUCTION

A. Egg Production:

The programme aims at increasing egg production by 100 million eggs per year. This objective is attainable through the establishment of four layer farms with a total capacity of 400,000 layers. The programme will be carried out by the private sector and with effective government support. Those farms have to be located in accordance with the principles of zoning adopted in the working paper and along the following lines:

1. The construction of those 4 farms with 100,000 layers-capacity each could be completed during out the period 1975 and 1976.
2. The cost of construction of each farm of that size is estimated at JD.350,000, of which 20% represents the cost of imported equipment.
3. Annual estimated operation costs for each farm is 400,000 dinars with an initial 30% of this sum to be provided at the outset. The rest is met from t the sale of eggs after 6 months from the beginning of operation.
4. It is recommended that financing of these projects should be secured at low interest from local and/or foreign sources. It finance cannot be secured during the assigned period, then the programme could be staggered.
5. It is suggested also that the Animal Production Board work together with other agricultural boards for se- curing the required quantities of grains such as maize, barley and wheat bran from local sources.
6. It is envisaged that the increase in egg production will be gradual and will increase at the rate of market demand. Thus the production programme neces- sitates government protection of local producers from from foreign dumping competition.

B. Broiler Production

The present local broiler production is around 13,000 tons annually and the consumption is around 14,000 tons. As a result of the great rise in red meat prices, the programmes' objective is to increase the production of this commodity at the expense of red meat production. The total increase should be equal to 25% of the present volume of production. The target of increased production can be achieved by making loans available at easy terms and by reducing feed prices.

C. Fish Production:

The programme aims at :

1. The production of 2000 tons of fish per year. This target can be achieved during 1975-1976 according to the following plan of work:
 - i. It is envisaged that 30% of the present total demand will be produced by the UNDP/FAO - Ministry of Agriculture Project.
 - ii. The rest will be produced by the Jordan Fisheries Company and the Animal Production Board as per its coordinated plan. The company will employ about JD 400,000 in this venture. It is recommended that this money be secured as a loan with easy terms.
2. It is recommended that fish production from inland fisheries should be enhanced along the UNDP/FAO - Ministry of Agriculture Project philosophy and plan of work. The private sector should also be encouraged to exploit water resources in fish production.

D. Milk Production

The programme aims at increasing milk production by keeping and breeding high yielding dairy cattle mainly for milk production. The zoning programme has earmarked certain areas of the country to be utilized in projects for milk production. Under intensive management systems specially in irrigated areas forage can be produced for those animals, as outlined in the working paper. The area that can be set aside for forage production is about 70,000 dunums in both the Jordan Valley and the eastern uplands. This area is sufficient to keep 20,000 dairy cattle.

The meat produced from 20,000 dairy cows per year amount to 1200 tons of real .

E. RED MEAT PRODUCTION FROM SHEEP AND GOATS

The programme comprised the development of sheep and goat production which depends basically on the utilization of range areas as receiving less than 200 millimeters of rain per year, as designated by the zoning paper.

The productivity of these classes of animals can be improved by supplementary feeding from available sources in the country such as crop residues, straw and barley which can be produced successfully in marginal areas.

The range areas cover 85 million dunums of land and the carrying capacity is estimated at half a million breeding sheep and goats. This number of animals would produce about 2000 tons of red meat per year and 7500 tons of milk. The programme encourages the establishment of tethered goat farming in irrigated areas and aims at improving the production characteristics of sheep and milking goats as detailed in the working paper.

MANAGEMENT

OF AGRICULTURAL DEVELOPMENT

The Symposium Committee, is formulating its final recommendations, based its findings on the objectives and aims included in the 1973 Agricultural Law, the existing organization of the Ministry of Agriculture and its specialized agencies and on the qualifications of the respective staff. It arrived at the following recommendations in light of the needs of the adopted development plan and in accordance with the recommendation included in the previous chapters.

In the light of the above priority must be given to the reconsideration of the responsibilities of the Ministry of Agriculture, with a stress on strengthening of adoptive research and extension work

In the management of agricultural development as pertaining to Jordan, the following principles should be adopted:

1. A High Council for Agricultural Production shall be formed to establish and certify the production plan for the agricultural sector and to continuously develop such a plan and to supervise the specialised agencies in its different sectors. The Ministry of Agriculture shall be the secretarial of the Council and the responsible body to follow-up its decisions. The Ministry shall report to the Council on the implementation and results achieved. The Council shall be attached to the Higher Committee of the Three Year Plan. Its membership shall include: the Ministers of Agriculture supply Finance, president of the National Planning council President of the Jordan Valley Commission, and chiefs of Natural Resources Authority, the Jordan Cooperative Organization, the Agricultural Credit Corporation and chiefs of the agricultural boards plus three representatives of the private sector with experience in agriculture appointed by the Cabinet on the recommendation of the Ministry of Agriculture. This Council shall also seek the advise of anyone it sees fit to ask.

2. The Ministry of Agriculture shall act directly under the supervision of the Council to implement the Agricultural law of 1973(No. 20) and those responsibilities outlined in its regnitations

(No. 18 of 1971) .The Ministry shall also supervise the plans that organise production together with the development of such policies and plans as per the decisions of the High Agricultural Planning Council including the supervision of implementation plans of all specialised Boards and the reconciliation of such plans with the adopted agricultural plan.

3. A part from the Jordan Valley Commission, set up by a special law, the following specialised boards shall be established for the purpose of implementing the new agricultural plan:

3.1 The Wheat Production Board: A semi- autonomous body which includes the Ministers of Agricultural supply Finance, the Director of land Registration and a permanent member of the specialised wheat agency in the Ministry, a permanent member representing the co-operative societies, one member from the ACC , one member from the Farmers Union and three members from the private sector with experience in wheat productions.

- a. This Board shall enjoy an independent
embity with complete prerogative for action
in the development of wheat production in

- b. This Board shall be responsible in terms of supervision and policy to the Minister of Agriculture.
- c. The responsibilities, powers, entity and finance of the above Board are similar to those mentioned in 3.1 above.

3.3 The Agricultural Marketing and Export Board:

Its duty shall be: detailed studies on outside markets for commodities assigned for export and the preparation and supervision and execution of export specifications to meet the market demands. It shall also negotiate and contract for such exports in the light of the available excess of commodities in accordance with time programmes and with procedures covering relations between producers, markets and the Board

- a. The permanent membership of this Board includes the Ministers of Agriculture Economy supply, Finance/Customs, directors of the agriculture economics department, the AMO, ACC and President of the Jordan Valley Farmers Association, a representatives of the Wheat Board, The Animal Wealth Board and three full-time members from the private sector with experience in marketing.

accordance with the adopted plan. It shall be both self financing and supported by the Budget. It shall also be given the right to plan, execute, negotiate and obtain credit and accept assistance.

- b. The Ministry of Agriculture shall put at the disposal of this Board all personnel specialised in wheat production and they shall be an integral part of its staff.

3.2 Animal Wealth Development Board

This is a semi-autonomous body similar to that of 3.1 specialised in the development of animal production and specifically broilers, eggs, fish, milk and meat, together with the development of range resources in dry areas lying outside the wheat and barley production areas.

- a. The permanent membership of the Animal Wealth Development Board shall include: the Ministers of Agriculture supply, Economy director of the animal wealth department, director of the veterinary department, the director of ACE(ACC) a representative of the Agricultural Marketing Department and three full-time members representing the private sector with experience in livestock production

- b. The Agricultural Marketing Organization shall put at the disposal of this Board all staff members of AMO specialised in export marketing. These shall become members of the Board's staff.
- c. The Board shall be given enough legislative and furnished support by the Government of its outset to enable the Board to provide centers for produce collection, handing grading and padding and to enable also to finance means of transport and shipping, being the sole authorized body for export of agricultural products.

General Recommendations

In addition to the specific recommendations arrived at for each sector, the following general recommendations should be adopted:

1. The highest priority should be given to the execution of the suggested agricultural development programmes. Newly suggested management organizations should be promptly established in addition to providing the needed support to those already existing. This will assure the execution of the proposed plan of action by the 1975 agricultural season.
2. A decision, at the highest government level, should be formulated to define priorities to direct central and private financing to the new integrated agricultural development plans, both on the national and regional levels. Loans and national capital investment policies should be based upon such priorities.
3. All supporting sectors bearing on developmental activities should participate according to specified roles within the suggested plan. This should cover the various governmental and semi governmental agricultural produce consuming sectors.

4. A special committee shall be established to coordinate the various specialised commissions and boards. This committee will be offshoot of the High Council for Agriculture Production. Its permanent membership shall include representatives of Production Board the JVC and the specialised agencies in addition to representatives of the co-operative societies, the Agriculture Credit Association the Natural Resources Authority and representatives of the Jordan Valley Farmers Association and the Association of Wheat Production Farmers.
5. Adopting of an organizational and management approach conforming with the reports recommendations aiming at introducing higher efficiency and effectiveness in the implementation of productive agricultural projects.
6. A paramount importance should be given to evaluating the economic aspects of the programme and in particular, the principle of introducing incentives at the inputs level, with the aim of improving production quantitatively and qualitatively to meet local demand and exports at remunerative prices and returns to the farmers.

7. A stronger stress on the introduction of improved technological methods and support of adaptive research in the implementation of the new agricultural development programmes.
8. Each of the suggested boards shall be organized through a detailed ordinance whereby responsibilities, duties and relations shall be carried out jointly by the Ministry of Agriculture, the National Planning Council and the Ministry of Justice.
9. An association for wheat production farmers shall be established in accordance with a special law.
10. The ownership, administration and operation of the underground-water irrigation facilities in the eastern highlands shall be transferred to the beneficiaries in each district through the organization of agriculture co-operative societies for the purpose of running these works.
11. The cooperative Societies shall be assigned a definite part of the wheat production programme.
12. In view of the provision of agricultural hand-labour to the agricultural agencies who need hand-labour the following is recommended:

Employment of adult students and soldiers in agricultural production activities against wages during specified seasons during which a large labour force is needed. Such seasons for example are:

- a. May and June: being the harvest seasons for wheat and grains.
- b. Mid-October for olive picking
- c. The beginning of December for ploughing

13. All necessary steps should be taken to speedily enforce the agricultural law No. 20 of 1973.

14. It is necessary to establish a flexible price-policy which will ensure the product remunerative prices to enable him to use modern production techniques to increase the quantity and quality of his produce.

15. Cooperation with the Ministry of Education in order to reconsider curricula of education in rural and agricultural development areas in order to complement and meet the needs of the new agricultural plan and to produce trained people able to work on and contribute to development project.

16. To undertake as soon as possible a general agricultural census for the country to provide accurate & up dated information.

15th May 1974

At the suggestion of His Royal Highness Crown Prince Hasan a joint committee comprised of representatives of donor countries and international institutions concerned with agricultural development in Jordan and responsible Jordanians representing both public and private sectors, has been formed to study and discuss the Agricultural Symposium Draft Report and detailed Working Papers.

The joint committee was presided over by His Excellency Mr. Marwan Humud Minister of Agriculture and consisted of the attending following members.

Mr. H. Farihan	From the private sector
Dr. K. Lubani	Undersecretary of Agriculture
Mr. M.R. Melhwish	Counsellor the British Embassy
Mr. C.E. Johnson	British Embassy-Beirut
Mr. P. Willis	British Embassy- Amman
Dr. F. Dassel	Change d'Affairs German Embassy.
Mr. B. Hafenberg	German Embassy
Mr. E.P. Schulz	Agri, Advisor/Min. of Agric.
Mr. G.K. pierson	Programme officer/U.S. Embas
Mr. J. Moa'la	F.A.O Amman
Mr. C.J. Martin	UNDP/IBRD
Mr. Q.L. Brough	Ford Foundation
Mr. A.L. Mackintosh	JCO Advisor

Dr. M. Elazzouni	F.A.O advisor/Min of Agri.
Mr. M. Termazi	JVC
Mr. M. Huneidi	JVC
Mr. A. Awad	JCO Acting Director
Mr. W. Kanan	NPC
Dr. R. Moasher	RSS
DR. O. Modallal	NRA
Mr. N. Duliel	NRA
Mr. T. Hazou	JVC

Also taking part were the following reporters and experts who participated in the various working papers:

Mr. A. Zubi , Mr. J. Dajani, Mr.S. Ghazawi, Dr. H. Gharaybeh, Mr. Y. Attieh, Mr. S. Banna, Dr. N. Sha'aha'a Dr. M. Lubani, Mr. A. Nabulsi, Mr. B. Abu- Howayj.

The committee held several meetings between 13th-15th of May 1974 during which the detailed working papers and the Symposium Draft Report were reviewed and discussed. The outcome of these deliberations resulted in recommendations and ammendments which will be incorporated in the final report. These recommendations reflected in general, high lights along the following lines:

1. The participants unanimously recognized the documents submitted to represent a constructive contribution to the agricultural development planning in Jordan.

11. The participants expressed their appreciation for the importance of the documents as being a national basis for a new agricultural policy, a real improvement toward project formulation , and a method of implementing improved agricultural practices.

111. In particular, the participants stressed recommendations along the following major lines:
 1. The necessity of adopting an organizational and management approach conforming with the draft report recommendations aiming at introducing higher efficiency and effectiveness in the implementation of productive agricultural projects.

 2. The paramount importance of evaluating the economic aspects of the programme, and in particular, the principle of introducing incentives at the inputs level with the aim of improving

production quantitatively and qualitatively to meet local demand and exports at remunerative prices and returns to the farmers.

3. A stronger stress on the introduction of improved technological methods and support of adaptive research in the implementation of the new agricultural development programme.

iv. It was also recognized that the new plan will complement the present 3 Year Development Plan and any future extension of it. Jordan Government intends to base its approach regarding the financing of the programme through bilateral and international financing arrangements.