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Appraisal of First Livestock Development Project Syria

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Projects Department
Europe, Middle East and North Africa Regional Office

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CURRENCY EQUIVALENTS (As of March 31, 1976)

Currency Unit	=	Syrian Pound (LS)
LS 1.00	=	US\$0.272
US\$1.00	=	LS 3.675

WEIGHTS AND MEASURES

<u>Metric Unit</u>		<u>British/US Equivalent</u>
1 millimeter (mm)	=	0.039 inches
1 meter (m)	=	3.28 feet
1 kilometer (km)	=	0.62 miles
1 hectare (ha)	=	2.47 acres
1 litre (l)	=	0.264 gallons
1 kilogram (kg)	=	2.26 pounds
1 metric ton (ton)	=	2,205 pounds

GLOSSARY OF ABBREVIATIONS

ACB	=	Agricultural Cooperative Bank
GOF	=	General Organization for Feed
MAAR	=	Ministry of Agriculture and Agrarian Reform
NFPC	=	National Feed Policy Committee
NFRF	=	National Feed Revolving Fund
UNDP	=	United Nations Development Program
USAID	=	United States Agency for International Development
WFP	=	World Food Program

GOVERNMENT OF SYRIA
FISCAL YEAR

January 1 to December 31

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT
SYRIA

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APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT
SYRIA

SUMMARY AND CONCLUSIONS

i. The Government of Syrian Arab Republic has requested Bank assistance in preparing and financing a first livestock development project. This would be the second agricultural project of the Bank Group in Syria, after the Balikh I Irrigation project.

ii. Agriculture is the single most important sector of the national economy accounting for 21% of GDP, about half of the labor force, and 60% of total export earnings. Within the sector, livestock accounts for 35% of output. Most of agricultural production, especially sheep production, is extremely vulnerable to drought conditions. Under these conditions sheep flocks suffer from sharp reductions in range feed and in supplemental farm-produced concentrates. Consequently, meat production and breeding flocks are subject to great variability causing important losses to the national economy and to individual flock owners.

iii. The project aims at increasing and stabilizing sheep production and the incomes of semi-nomadic flock owners and sheep fatteners through stabilization of feed availability and improvement of veterinary services. The project, together with on-going and planned Government actions, particularly the establishment of an emergency feed reserve, would fill the major gaps in meeting the development objectives of the livestock sector.

iv. The project would provide for the establishment of an organizational framework for improved decision making on national feed resource distribution, the financing of annual purchased feed needs of existing and new sheep cooperatives and a study of feed prices; and it would strengthen the national animal health services by the provision of equipment, pharmaceuticals, vehicles, and incremental operating funds, and by a study of the manpower requirements and training needs in the animal health field.

v. The feed development component of the project would be implemented by the National Feed Policy Committee (NFPC), with a permanent secretariat to be established; the General Organization for Feed (GOF); the Animal Production Department of the Ministry of Agriculture and Agrarian Reform (MAAR) administering the National Feed Revolving Fund (NFRF); and the Agricultural Cooperative Bank (ACB). The animal health services component would be implemented by the Animal Health Department of MAAR. Five consultants for a total of six man-years would assist in implementing the project.

vi. The project would be implemented in 5 years at an estimated cost of US\$34.5 million, of which the Bank would finance US\$17.5 million (51% of total project cost including physical and price contingencies), covering

the full foreign exchange cost and 30% of the local cost. Members of sheep cooperatives would contribute US\$5.5 million. The Government would finance the balance. Vehicles would be procured through international competitive bidding in accordance with the Bank's Guidelines for Procurement. Pharmaceuticals would be procured through international shopping with at least three quotes. Equipment for the animal health services would be procured through competitive bidding locally advertised and acceptable to the Bank or, where applicable, through international shopping with at least three quotes. Feed purchased with credit provided by NFRF would be procured by sheep owners through existing public and private trade channels.

vii. At full development, in about 1983, the incremental production in the sheep subsector due to the project and the associated emergency feed reserve would be 59,800 tons of meat (liveweight basis), 49,600 tons of milk and 1,300 tons of wool. The project would have important secondary benefits in the form of stabilizing producer incomes, institution building, and improved veterinary services to other livestock subsectors. The main beneficiaries would be about 27,000 families including 24,000 semi-nomadic families whose average incomes would be raised by an estimated 82%, from about US\$1,330 at present to US\$2,420 at full development, and about 3,000 member families of sheep fattening cooperatives whose average incomes would increase by an estimated 45% from an average US\$1,295 to US\$1,880. The economic rate of return for the project is estimated to be 21% and would not be less than 9% even under the two combined most adverse assumptions about costs and benefits.

viii. Agreement having been reached on the principal issues, subject to the conditions of effectiveness, the project is suitable for a Bank loan of US\$5.0 million equivalent and a Third Window loan of US\$12.5 million equivalent to the Government of the Syrian Arab Republic. The Bank loan would be for 20 years including 5 years of grace, and the Third Window loan would be on standard terms.

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

I. INTRODUCTION

1.01 The Government of the Syrian Arab Republic has requested a Bank loan to help finance a project to stabilize the feed base of the livestock sector and to strengthen the veterinary services to improve livestock production.

1.02 The project was identified by a FAO/World Bank Cooperative Program Mission in February-March 1974 from a range of possibilities proposed by the Government and was prepared by a further Cooperative Program Mission jointly with the Government in September 1974.

1.03 This report is based on the Cooperative Program's Preparation Report, on additional information provided by the Syrian authorities, and on the findings of an appraisal mission consisting of Messrs. J. R. Vaughn, W. A. Hardison, H. van Wersch (Bank) and J. D. McCrary (Consultant) and of a post-appraisal mission consisting of Messrs. M. D. French-Mullen and M. F. Carter (Bank).

1.04 During appraisal one component of the project as originally proposed, namely hay production through intensification of a biennial wheat-fallow rotation, was eliminated. This was done on the grounds that the Government had decided to greatly accelerate fallow elimination. This would jeopardize the success of the proposed hay production component. Moreover, the Government and the United States Agency for International Development (USAID) had concluded a loan agreement which included financing for this project component. Following appraisal, it was decided not to include the emergency feed reserve in the project as the Government undertook to finance entirely such a reserve.

II. THE AGRICULTURAL SECTOR

A. General Description

2.01 Agriculture is the single most important sector of the Syrian economy with about half of the national labor force, a 21% share in GDP, and 60% of total export earnings. Major crops are cereals, pulses, cotton and a variety of fruits and vegetables. Livestock, mainly sheep, accounts for about 35% of agricultural output.

2.02 Agricultural production is closely linked to the amount and distribution of rainfall, both in space and in time. As a result, out of a total land area of 18.5 million ha, 7.9 million ha are cultivable. However, only

3.4 million ha were under crops in 1973, of which only 0.6 million ha irrigated. Much of the uncultivable and most of the uncultivated lands are utilized for grazing. Extensive sheep production is particularly vulnerable to drought conditions as these reduce both the amount of range feed and of supplemental farm-produced feed.

2.03 Crop yields and sheep production vary considerably with rainfall patterns and so do marketings, although to a lesser extent. As in drought years bad crops go with high levels of sheep sales and in high rainfall years good crops go with smaller sheep sales due to the need to rebuild breeding flocks. Over the past decade, agricultural output has shown no discernible growth trend and consequently agricultural output per caput has declined because of increased population.

2.04 While national income per caput remained constant in 1972 and 1973, respectively LS 1,168 and LS 1,172 (US\$320), agricultural income dropped from LS 680 (US\$185) to LS 470 (US\$128), primarily because of drought conditions.

2.05 The Government is making a large effort to both increase and stabilize agricultural production and incomes through a major expansion of the irrigated area and through intensifying cropping patterns in rainfed farming areas. Major investments are also made in dairy and poultry production.

B. The Livestock and Feed Subsectors

2.06 The livestock sector in Syria (Annex 1) is based on cattle, poultry and sheep production. The cattle population is about 500,000, some 40,000 of which are reported to be medium-to-high producing dairy animals of either the local Shami breed, crossbreeds, or purebred foreign dairy breeds. These animals are found in the irrigated areas while the remaining cattle, consisting of small indigenous low-yielding breeds, are mainly located in the higher rainfall areas. Poultry numbers have increased considerably in recent years with the development of large-scale poultry units. Present annual production amounts to 10 million chickens and 350 million eggs, of which 6 million chickens and 100 million eggs are accounted for by the modern sector.

2.07 Sheep husbandry is the most important component of livestock production in Syria, accounting for more than 65% of all meat produced, and about 50% of the total output of milk and milk products. The population of adult sheep is about 6.4 million (1967-73 average). There are three characteristic forms of sheep production: (a) range-based sheep raising, which is the major source of income for some 35,000 transhumant bedouin families, amongst the poorer people in Syria, and which is concentrated in the low rainfall areas of central and eastern Syria, (b) farm-based sheep production, carried out by most of the country's half million farm families, to supplement cash income and for family consumption and (c) intensive lamb fattening and finishing of cull ewes in and near towns.

2.08 Since on average about two-thirds of sheep feed intake comes from natural grazing land, sheep are subject to large interannual nutritional fluctuations due to rainfall variability. This in turn leads to considerable variations in fertility levels, weaning rates, mortality, population and productive output. During drought years, sheep raisers are forced to sell breeding stock while in years of good rainfall offtake rates are reduced in order to rebuild flocks. As a result, rainfall fluctuations impose considerable losses on the Syrian economy, and meat and milk supply and prices fluctuate considerably.

2.09 While most sheep are used for domestic consumption, Syria has benefited from a substantial but fluctuating import and export trade in meat and live animals. Typically, yearling rams are imported from Turkey and Iraq for fattening; and exports, both of meat and live animals are directed towards Jordan and Lebanon. Occasionally imports are interrupted by Turkey and Iraq on animal health grounds, and, more frequently, in years of poor rainfall, exports are restricted or banned by the Government in order to keep down domestic prices. However there is substantial illegal trade. Over 1967-73 recorded imports of sheep and goats averaged 250,000 head, valued at \$3.2 million, and recorded exports averaged 389,000 head, valued at \$11.2 million. However, over the same period the trade surplus in live animals has declined and an average annual trade deficit in fresh and frozen meat of 82,000 tons has been recorded.

2.10 The marketing and prices of sheep and sheep products within Syria are free, except for supplies to Damascus, which are channelled through the General Supply Institution at fixed prices. Bedouin sheep are marketed mainly through merchants or small shopkeepers, while villagers usually sell their animals at regional markets or, on occasion, to merchants. Typically, fattened animals are sold to traders in regional markets, or to the General Supply Institution, or are exported. Sheep milk is marketed in the cities mostly in the form of cheese. Wool is marketed through merchants who use commission agents to determine its availability for sale. The wool is subsequently sold to larger merchants who control both domestic and export trade.

2.11 The main livestock feed resources in Syria are rangeland, crop residue, fallow grazing, straw and concentrates. In general range grazing provides about 50% of the feed consumed by all livestock; crop residue, straw and fallow about 32%, and concentrates (barley, cottonseed cake, wheat bran, sugarbeet pulp, beet molasses) about 16%. Dependence on range grazing is greatest in the case of bedouin sheep and extensively managed goats (approximately 70% of total intake from range) followed by farm sheep and local cattle (48%), draught animals (20%) and high producing dairy cows and milking goats (0%). On average, sheep receive from 25% (in the case of bedouin sheep) to 40% (for farm sheep) of their total feed intake from crop residue, fallow and straw, and from 3% (bedouin sheep) to 13% (farm sheep) from concentrates.

2.12 Concentrate prices are affected by Government intervention. The prices paid by livestock producers for barley, wheat bran, cottonseed and sugarbeet pulp reflect the growers' prices for these commodities fixed by the Government. Barley is purchased from merchants acting as intermediaries with the General Organization for Trade and Processing of Cereals. Other concentrates are obtained directly from processing plants, which are Government-owned.

C. Livestock Services

2.13 Development of the livestock sector is the responsibility of the Ministry of Agriculture and Agrarian Reform (MAAR), through its Departments of Animal Health and Animal Production and through several parastatal organisations which are directly responsible to the Minister. These Departments provide extension services through the provincial offices of MAAR. The Animal Health Department operates the veterinary field clinics, which administer about 6 million vaccinations and treat some 5 million cases of disease a year. However the Department is seriously short of qualified staff and of funds, particularly to purchase pharmaceuticals which at present are provided free to livestock owners.

2.14 In 1965 a National Feed Revolving Fund (NFRF) was established with the proceeds from the sale of feed supplied by the World Food Program (WFP). The fund is administered by the Sheep and Range Section of the Animal Production Department and held in the Agricultural Cooperative Bank (ACB). The fund provides short-term credit to sheep producers who are organized in cooperatives for feed purchases and to sheep cooperatives for the construction of feed stores. With the original WFP feed aid and later with interest-free loans from the revolving fund NFRF has stimulated the creation to date of 14 sheep and range cooperatives and 22 sheep fattening cooperatives. Assistance to farmers in farming and running cooperatives is provided by the general Farmers' Union and by the Animal Production Department.

2.15 The General Organization for Feed (GOF) was established in February 1974. It has broad responsibilities in the feed sector, including the supervision of feed processing and establishment of feed mills, establishment of feed storage warehouses, supervision of the marketing of all feed commodities both inside and outside the country, supervision of domestic feed distribution and the purchase of feed from producers through advance contracts. GOF has also assumed responsibility for planning the feed needs of the livestock sector and the allocation of feed resources. GOF warehouses, both existing and under construction, have a storage capacity of 245,000 tons of grain in sacks. In addition, cooperative warehouses provide space for about 155,000 tons, giving a combined total storage capacity of 400,000 tons of feed (Map 11912).

2.16 The General Organization for Trade and Processing of Cereals purchases wheat and barley, through its collection points, at fixed prices and operates flour mills. It is the public sector source of barley and the sole source of wheat bran used as animal feed.

2.17 The National Feed Policy Committee (NFPC) discusses, approves and submits general feed policy guidelines to the Minister of Agriculture and Agrarian Reform for issue as ministerial decisions. NFPC also discusses and makes recommendations on feed prices to the Council of Ministers for Economic Affairs. The Committee is composed of the heads or their representatives of all Government departments and parastatal organizations concerned with the production, marketing or consumption of feed and is chaired by the Minister of Agriculture or his deputy.

D. Agricultural Credit

2.18 The role of institutional credit in the livestock sector is very limited at present (Annex 2). The main source of lending for agricultural producers, ACB, has in recent years made no loans for feed or feeder stock purchases. Only a few loans were made for acquisition of breeding and dairy stock and for the establishment of irrigated forage crops, totalling about US\$2 million, or 4% of its total lending. ACB lending rates are 4% to cooperatives and 5.5% to private producers on loans for all durations and all purposes. The bank has a good repayment record due to its stringent security requirements.

2.19 The only other source of institutional credit for livestock producers is the NFRF which, since its creation in 1965, has grown to some LS 10.1 million at the end of 1974, with support of both WFP and the Government. NFRF makes available to members of livestock cooperatives short-term loans for feed purchases and to the cooperatives long-term loans for the construction of feed storage facilities. Feed loans are interest free and storage construction loans carry a one-time service charge of 1% to encourage sheep producers to join cooperatives. In 1974, NFRF lent LS 3.1 million for feed loans while another LS 2.4 million was disbursed for storage construction. Demand for feed loans, however, greatly exceeded available lending resources and credit was rationed by decreasing the number of loans made or reducing the financing percentage of individual feed needs.

2.20 Private traders continue to be the major source of credit in the livestock sector, offering deferred payment facilities at annual interest rates of 10 to 25% under normal conditions. The Meat Bureau of the General Supply Institution, a public sector organization supplying the Damascus market, provides credit for fattening animals in the form of advance payments under supply contracts, with delivery prices negotiated in advance.

E. Government Livestock Programs

2.21 The current 5-Year Plan, 1971-1975, has as a general objective the raising of livestock production through, inter alia, expanded veterinary services, increased feed availability, improved extension services and the provision of additional credit for livestock development purposes. Under the plan, meat, milk and egg production is expected to increase 32, 23 and 67%, respectively. It appears unlikely that any of these targets will be reached with the possible exception of the latter. A livestock development plan drafted in 1973, but not officially approved, contains the general lines of development as envisaged by the Government to 1980. The plan calls for a tripling of meat and milk production from cattle while meat and milk output from the sheep sub-sector is expected to increase 2.5 and 4 times respectively. Broiler production would triple and the number of layers increase 7-fold.

2.22 With the help of a loan from the Arab Fund for Economic and Social Development and bilateral assistance the Government is proceeding with the construction of several large state dairy farms together with a number of heifer rearing and bull fattening stations. Each state farm will accommodate 600 imported dairy cows while the total annual throughput of the rearing and fattening stations will be 10,600 head and 5,500 head respectively. Two artificial insemination centers for cattle and a 200-head quarantine station are also being developed. The Government is in the process of organizing some 120 dairy cooperatives. In 1974 about 3,500 dairy animals were imported and distributed to private and state farms. Large scale developments with bilateral assistance are also underway in the poultry field with the aim of increasing broiler and egg production by 40 million and 350 million annually.

2.23 Government efforts to increase production from sheep, and particularly from the nomadic and semi-nomadic flocks, are continuing with assistance from the WFP and UNDP. Special attention has been given to the establishment of sheep fattening cooperatives and sheep and range cooperatives and to increasing the availability of feed through the growing of fodder crops on fallow land (recently with USAID assistance) and the establishment of fodder shrubs in the steppe for emergency feeding. The WFP has provided over US\$2 million worth of food aid for these activities.

F. Previous Bank Project in Agriculture

2.24 In March 1974, the Bank approved a US\$73 million loan and credit for the Balikh Irrigation Project, which consists of development of irrigated agriculture over 45,000 ha in the Balikh River Basin and the resettlement of farmers displaced by the filling of Lake Assad. The project suffers from substantial delays in implementation and cost overruns. The first three civil works contracts have been awarded. In view of the greatly increased cost of the project, the plan for its financing is now being reviewed.

III. THE PROJECT

A. Objectives

3.01 The project aims at increasing and stabilizing the production of and income from the sheep subsector throughout Syria, through the strengthening of national feed policy, the increased use of supplementary feed, and the reinforcement of the animal health services.

3.02 The project would complement the national emergency feed reserve, to be established, operated and wholly financed by the Government. The establishment of the emergency feed reserve would provide subsistence rations, consisting mostly of feed grains to sheep producers in drought years, in order to reduce the losses from the national sheep flock. Details on the emergency feed reserve are in Annex 3.

B. Description

3.03 The project elements, more fully described below and in Annex 3 and 4, are:

- (a) strengthening of the organizational framework including NFPC, GOF, NFRF and ACB, to be responsible for defining and implementing feed policies aiming at optimizing, on a national basis, the use of available feed materials and feed storage facilities;
- (b) provision of financing for the annual purchased feed needs of sheep cooperatives, while permitting the establishment of 12 new sheep and range cooperatives as well as of 12 new sheep fattening cooperatives;
- (c) reinforcement of the animal health services of the Ministry of Agriculture and Agrarian Reform;
- (d) execution of a study of feed prices; and
- (e) execution of a study of manpower requirements and staff training needs in the animal health field.

3.04 The feed resources problem has to be approached on a national basis given the competing demands of different subsectors as well as export demand for available supplies. The Government has recognized the need to think in terms of a national feed development scheme to ensure that through reducing the strong seasonal and inter-annual fluctuations in supplies and prices, all livestock producers (State farms, cooperative and private sector operators) can satisfy their feed requirements at reasonable prices. The organizational framework for feed allocation to be developed under the project would include the NFPC with a secretariat (para 4.02), and the existing GOF, NFRF and ACB. Within this framework, a national plan for the distribution of feed resources would be drawn up annually in line with domestic availabilities, storage capacities, and policy objectives. It would also serve to define and modify national feed policy including decisions on feed prices and imports and exports. Under the project, technical assistance would be provided in three crucial areas through the attachment to the Committee's secretariat of a price policy adviser, a feed distribution adviser, and a cost accounting adviser.

3.05 The financing to be provided for annual purchased feed would provide for the major needs of the existing sheep cooperatives and the new ones to be established through NFRF. The total annual financing needs for feed of the cooperatives would be for the purchase of about 243,000 tons, on credit made available under the project to NFRF.

3.06 Within the NFFC's secretariat's terms of reference a study would be carried out by a task force of Government officials appointed by the committee and chaired by the executive secretary of the committee to review feed prices and the feed/meat price relationships, paying particular attention to present price distortions, and to make recommendations for a more rational feed price policy (para 4.02). During negotiations assurances were obtained from the Government that a study would be carried out to review feed price policy, that the terms of reference of the study would be drawn up in consultation with the Bank, that the results of the study and its recommendations would be submitted to the Bank for review before June 30, 1977, and that the Bank would be informed of the proposed program to implement these recommendations and that the implementation would be initiated before December 31, 1977.

3.07 The Animal Health Department of MAAR would be strengthened under the project to improve disease control for sheep and provide improved health services to cattle and poultry based on private farms. This would entail the provision of equipment and technical assistance (a laboratory equipment adviser) for upgrading the vaccine production capability of the Central Veterinary Laboratory, equipment and vehicles for veterinary field centers and mobile teams, sheep dipping centers, pharmaceuticals, (insecticides and anthelmintics) and incremental operating expenditures for vehicles and laboratory staff.

3.08 Present Government planning for staffing can be expected to lead to an imbalance between graduate veterinarians and other animal health workers. In conjunction with the investment efforts to strengthen the Animal Health Services, a study should be made, if necessary with outside assistance, to find ways to correct this misallocation of resources. During negotiations assurances were obtained from the Government that it would undertake a study of the manpower requirements and training needs for staff in the animal health area, and that this study, of which the terms of reference would be drawn up in consultation with Bank, would be completed and sent to the Bank for review by June 30, 1977, and that the proposed program to implement the recommendations of the study would be communicated to the Bank and that implementation would commence before December 31, 1977.

C. Cost Estimates

3.09 Total project cost is estimated at US\$34.5 million equivalent, including contingencies. The foreign exchange component is US\$10.3 million or 30% of total project cost. The cost of financing the annual feed needs of cooperatives is based on the requirements for each type of sheep production and on the projected number of animals to be included in the project. The costs of the animal health services component are based on projected requirements and on unit rates obtained from current contracts in Syria or from suppliers. The base cost has been adjusted to end-1975 price levels. Physical contingencies included are 10% of the cost of the animal health component and 5% of the cost of technical assistance. Price contingencies, which total 13.5% of base cost plus physical contingencies, were compounded at the following annual rates for equipment and feed, 12% for 1975, 10% for 1976, 8% for 1977-79 and 7% for 1980 onwards, and for civil works and consultants, 16%, 14%, 12% and 10%, respectively.

3.10 The foreign exchange cost of financing the cooperatives' annual feed needs is defined as the indirect foreign exchange element in the production and marketing costs of these feeds, estimated at 17%.

3.11 Detailed cost estimates are in Annex 5, and are summarized below. Discrepancies are due to rounding.

	<u>Project Costs</u>						<u>% Foreign Exchange Component</u>
	<u>LS million</u>			<u>US\$ million</u>			
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	
A. Cooperatives' annual feed needs	75.3	15.4	90.7	20.5	4.2	24.7	17
B. Animal health services	4.0	13.2	17.2	1.1	3.6	4.7	77
C. Technical assistance	<u>0.3</u>	<u>1.5</u>	<u>1.8</u>	<u>0.1</u>	<u>0.4</u>	<u>0.5</u>	80
Subtotal	79.6	30.1	109.7	21.7	8.2	29.9	27
D. Contingency allowances							
1. Physical contingencies (1.7%)	0.4	1.4	1.8	0.1	0.4	0.5	
2. Price increases (13.5%)	<u>8.8</u>	<u>6.2</u>	<u>15.0</u>	<u>2.4</u>	<u>1.7</u>	<u>4.1</u>	
Total Project Cost	<u>88.8</u>	<u>37.7</u>	<u>126.5</u>	<u>24.2</u>	<u>10.3</u>	<u>34.5</u>	30

D. Financing

3.12 The Bank loan of US\$5.0 million together with a Third Window loan of US\$12.5 million would finance 51% of total project cost. Bank financing would cover the total foreign exchange cost plus 30% of local cost of the project. The Bank loan would be made for a 20-year term including 5 years of grace, and the Third Window loan would be on standard terms. The borrower would be the Government of the Syrian Arab Republic.

3.13 Through budgetary allocations, the Government would make the necessary resources available to NFRF to enable it to make loans to members of sheep cooperatives for the purchase of 243,000 tons of feed annually. The cost of this is currently estimated at US\$19.7 million equivalent. These loans would finance 80% of the cost of purchased feed, leaving 20% (US\$5.5 million)

for self financing by the cooperatives' members. NFRF would levy an interest charge of 7.5% and 5.5% per annum on beneficiaries depending on the income levels of the loan applicants and would use the interest payments to expand its feed loan operations. The lower rate would apply to beneficiaries with net annual incomes below LS 3,500, in 1976 prices, which is less than 30% of the average national family income (para 4.10). The proposed interest rates would be a major advance and would be an acceptable first step in a rationalization of agricultural interest rates. Presently loans extended by NFRF are interest free. Furthermore, the national agricultural credit institution (ACB) presently lends to the cooperative sector at an interest rate of 4.5% per annum.

3.14 The animal health services component of the project would be financed through annual budgetary allocations to MAAR's Animal Health Department, totalling an estimated US\$4.9 million equivalent over 5 years.

3.15 The technical assistance component of the project would be financed through (a) budgetary allocations to MAAR totalling US\$0.44 million equivalent, for the consultant to the Animal Health Department (para 3.07) and the three consultants to the executive secretariat of the NFPC (para 3.04), and (b) a Government grant to GOF for financing the cost of the feed stock management consultant.

3.16 During negotiations assurances were obtained from the Government that it (a) would make budgetary allocations available to NFRF covering the total resource requirements for the annual financing to members of sheep cooperatives of purchased feed, totalling about 243,000 tons; (b) would require NFRF to levy an interest charge of 7.5% and 5.5% (the lower rate for farmers with net annual incomes below LS 3,500) on feed loans, the revenue of which would be used to increase NFRF's lending operations; (c) would make available to MAAR's Animal Health Department a total of US\$4.9 million equivalent over 5 years through annual budgetary allocations to meet both the foreign and local currency cost of the project's animal health services component and the laboratory equipment consultant; (d) would make available to MAAR US\$0.32 million equivalent over 3 years through annual budgetary allocations to finance the cost of three consultants to the executive secretariat of NFPC; and (e) would provide a grant to GOF covering the cost of the feed stock management consultant.

3.17 The project's financing plan is as follows:

	Cooperatives' Annual Feed Needs	Animal Health Services/1	Technical Assistance	Contin- gencies	Total
	----- US\$ million equivalent -----				
Members of Cooperatives	5.0	-	-	0.5	5.5
Government	8.4	1.6	0.1	1.4	11.5
IBRD	<u>11.3</u>	<u>3.1</u>	<u>0.4</u>	<u>2.7</u> /2	<u>17.5</u>
Total Project Cost	<u>24.7</u>	<u>4.7</u>	<u>0.5</u>	<u>4.6</u>	<u>34.5</u>

/1 Beneficiaries would in year 4 and 5 contribute US\$1.6 million through recovery of drug expenses.

/2 This would form the unallocated category.

E. Implementation

3.18 The project would be completed in 5 years and its full development would be attained in about 8 years. The project implementation schedule is shown in Chart 15363.

3.19 The cooperatives' annual needs for purchased feed have been based on the 1975 estimated needs and allow for a 10% increase in 1976 and 5% increases for 1977-80, due to enlarged membership as well as a larger number of animals per member.

3.20 During negotiations the Government undertook to establish, as from the date of effectiveness of the loan, over a period of 3 years and to maintain thereafter an emergency feed reserve to provide adequate feed resources to sheep producers during drought years. It was further agreed that GOF would appoint (a) a Director, with qualifications and experience satisfactory to the Bank, to be solely responsible for the establishment and operation of the emergency feed reserve, and (b) a feed stock management adviser whose qualifications, experience and terms and conditions of employment would be satisfactory to the Bank. These appointments would be conditions of effectiveness of the loan. Details on the emergency feed reserve are in Annex 3.

3.21 For the animal health component the investment expenditures are expected to be incurred almost entirely in the first and second years. Expenditures for pharmaceuticals, however, would gradually increase to reach a maximum in the fourth year. Operating expenses are assumed to be constant over the implementation period.

3.22 Technical assistance to be provided to the NFPC secretariat, the Animal Health Department and GOF is scheduled for the first two years of the project.

3.23 Procurement. Vehicles required for the animal health component would be procured under international competitive bidding in accordance with the Bank's "Guidelines for Procurement". Equipment required for the animal health component would be procured on the basis of competitive bidding advertised locally, under procedures acceptable to the Bank, or if international shopping is found more appropriate on the basis of at least three quotations from overseas suppliers. Pharmaceuticals would be procured through international shopping on the basis of at least three quotations from overseas suppliers. The feed purchased with the aid of NFRF financing would be procured by the sheep cooperatives through existing private and public trade channels. Contracts for the construction of sheep dipping centers (total cost US\$0.6 million) would be awarded on the basis of competitive bidding, advertised locally, following a review by the Bank of the bidding documents. The requirements for vehicles, equipment and pharmaceuticals would be grouped as far as practicable in order to ensure effective competition for procurement. The list of goods to be procured is in Annex 6.

3.24 Storage Facilities and Stock Management. A tentative least cost system of total feed movements is given in Chart 15309. Sheep cooperatives have adequate storage capacity to accommodate the needs of their members for seasonal purchased feed. A problem of rodent and insect infestation exists at present in the storage facilities of GOF and of the cooperatives. During negotiations, an assurance was obtained that GOF and MAAR would, by December 31, 1976 at the latest, submit to the Bank for comments plans for rodent and insect control in the warehouses operated by GOF and the sheep cooperatives, respectively, and that these plans would be implemented no later than June 30, 1977.

F. Disbursements

3.25 The proposed loan would reimburse 51% of total project cost over 5-3/4 years as follows:

- (a) 57% of gross disbursements made by NFRF until December 31, 1976, and thereafter of annual incremental gross disbursements of feed loans to members of sheep cooperatives;
- (b) 100% of foreign expenditures or 70% of local expenditures for equipment, pharmaceuticals and vehicles for animal health services; and
- (c) 100% of foreign expenditures for consultants' services.

3.26 The proposed schedule of capital expenditures (Annex 5) is summarized below. An estimated quarterly disbursement schedule is presented in Annex 7.

<u>Syrian Fiscal</u> <u>Year</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Total</u>
	----- US\$ million -----						
Local Expenditures	5.8	9.5	5.5	1.2	1.1	1.1	24.2
Foreign Expenditures	<u>1.4</u>	<u>4.4</u>	<u>2.0</u>	<u>1.2</u>	<u>0.9</u>	<u>0.4</u>	<u>10.3</u>
Total	<u>7.2</u>	<u>13.9</u>	<u>7.5</u>	<u>2.4</u>	<u>2.0</u>	<u>1.5</u>	<u>34.5</u>

IV. PROJECT IMPLEMENTATION

A. Organization and Management

The National Feed Development Scheme

4.01 The organizational components of the feed development part of the project would be:

- the National Feed Policy Committee, with a secretariat to be established;
- the General Organization for Feed;
- the National Feed Revolving Fund;
- The Animal Production Department of MAAR; and
- the Agricultural Cooperative Bank.

4.02 The Secretariat of the National Feed Policy Committee. Under the project, a small permanent secretariat would be created under the executive secretary of the NFPC. The executive secretary would be a full-time staff member of MAAR directly attached to the office of the Minister. The qualifications and experience required and the functions to be performed are outlined in Annex 8. The secretariat would formulate proposals and clear and coordinate proposals from other organizational units in the feed/livestock sector to be placed before the Committee. In particular, the secretariat would concern itself with the establishment and periodic review of general feed policy guidelines, the preparation of annual national estimates of the sources and distribution of feed, export/import decisions, and the size of emergency feed reserve. During the initial years the secretariat would be reinforced by three consultants provided under the project. These consultants would include a price policy adviser, a feed distribution adviser and a cost accounting adviser. The price policy adviser would review feed prices and the feed/meat price relationship, paying particular attention to present price distortions, and would offer general guidance for a more rational price policy; in doing so he would work closely with the Government's task force set up to carry out the study of feed prices to be undertaken as part of the project (para 3.06); the feed distribution adviser would assist in the preparation of at least two annual plans for

feed distribution to the various user categories; the cost accounting adviser would introduce cost accounting and analysis in state enterprises operating in the feed sector such as GOF and the General Organization for Trade and Processing of Cereals. Draft terms of reference for these consultants are given in Annex 8. During negotiations assurances were obtained from the Government that (a) MAAR would establish not later than October 31, 1976 within NFPC an adequately staffed secretariat headed by an executive secretary whose qualifications and experience would be acceptable to the Bank; and (b) MAAR would employ four consultants i.e. a price policy adviser, a feed distribution adviser and a cost accounting adviser for the secretariat of NFPC, and a laboratory equipment adviser for the Animal Health Department (para 3.07). The appointment of the executive secretary of NFPC and that of the price policy adviser, the feed distribution adviser, the cost accounting adviser and the laboratory equipment adviser would be conditions of effectiveness of the loan.

4.03 The National Feed Revolving Fund. Under the project, NFRF would continue to be responsible for financing the annual purchased feed needs of sheep cooperatives. The Sheep and Range Section of MAAR's Animal Production Department, which is responsible for NFRF's day-to-day operations, would need to be reinforced to carry out its expanded technical responsibilities. This refers particularly to the establishment of the 12 new range cooperatives and 12 new sheep fattening cooperatives, the provision of adequate guidance on appropriate stocking rates and range utilization of both the 14 existing range cooperatives and the new cooperatives to be formed under the project, and to the establishment and implementation of 3 monitoring programs (paras 4.18-4.20). There is also a need for strengthening the accounting capability of NFRF commensurate with the major increase in its lending activity going from LS 3.1 million for feed loans in 1974 to an expected LS 91 million in 1980. During loan negotiations, assurances were obtained to this effect.

4.04 The General Organization for Feed. GOF would be responsible for the establishment and operation of the emergency feed reserve, including the procurement of feed grain, through the General Organization for Trade and Processing of Cereals, its storage and distribution and sale to end users. Details on the emergency feed reserve are in Annex 3.

4.05 The Animal Production Department of MAAR. Besides its responsibility for NFRF, the Animal Production Department would be the principal source of technical information for the NFPC. It would also make the technical decision on when and where the conditions are met for distribution of emergency feed. During negotiations, an assurance was obtained that the Animal Production Department, through MAAR's provincial services, would monitor the shortfall of available feed required by sheep producers.

4.06 The Agricultural Cooperative Bank. ACB would continue as banking agent for the NFRF. ACB is well-managed and has an adequate staff to carry out the additional operations generated by the project. It has branch offices within reach of all cooperatives and it has an established procedure for dealing with them on NFRF feed loans.

Animal Health Services

4.07 The Director of the Animal Health Department of MAAR would be responsible for the implementation of the animal health project component. The veterinary field service would be organized in 56 mobile teams each with the necessary staff, vehicles, equipment, and pharmaceuticals. The Central Laboratory would supply adequate quantities of vaccines. During negotiations assurances were obtained from Government that in the event adequate quantities of vaccine should not be produced by the Central Veterinary Laboratory, the Government would provide such quantities of vaccine from external sources.

4.08 During negotiations assurances were obtained that the Government would cause MAAR and the other agencies responsible for carrying out the project to cooperate effectively in implementing the project.

B. Credit and Cost Recovery

NFRF Financing of Cooperatives Annual Feed Needs

4.09 Through NFRF the project would provide short-term credit to members of sheep and range and fattening cooperatives for purchased feed. Total revolving fund requirements are estimated at US\$19.7 million, based on 80% of the full annual needs of farm and range sheep and of two-thirds of the annual needs of fattened sheep, the latter on the premise that repayment of the loan for the first fattening batch would allow financing of the third batch. This leaves 20% of feed costs for self-financing. The procedure for NFRF's dealing with sheep cooperatives and the role of ACB as NFRF's banking agent is well established and would continue to be followed under the project. NFRF would continue to bear the credit risk. During negotiations an assurance was obtained that NFRF would be the exclusive source of institutional financing of feed, except for emergency feed, for the members of sheep cooperatives.

4.10 The existing credit terms need to be hardened to reflect the fact that a sector-wide demand for purchased feed is now well established and no longer needs to be encouraged by highly subsidized credit. Under the project, beneficiaries of NFRF loans would pay an interest charge of 7.5% per annum. Cooperative members with an annual family income of less than LS 3,500 (in 1976 prices), which is below the relative poverty level, would receive loans at 5.5% interest per annum, provided that they can show evidence of such income levels satisfactory to NFRF on the basis of criteria acceptable to the Bank. These criteria are to be established by a study, undertaken by the Government on terms of reference prepared in consultation with the Bank, of the pre-project income and credit situation of members of sheep cooperatives. Until these criteria have been established, members of sheep and range cooperatives will be considered eligible for the 5.5% interest rates if they hold less than 60 ewes, and members of sheep fattening cooperatives if they fatten less than 255 sheep per year. On the basis of the income and credit monitoring studies (para 4.20), the Government and the Bank will review, not later than July 30, 1978, the need for the preferential interest rate (5.5%) and the need for a revision of the LS 3,500 income level criterion. During negotiations assurances were obtained to this effect.

4.11 No administrative costs would be charged by MAAR to borrowers as those of NFRF would be small and consist of part-time use of technical staff of MAAR's Animal Production Department. These costs are similar to those incurred by the crop extension service for the technical assessment of loan applications to ACB and for which no charge is made. The existing arrangement between NFRF and ACB whereby ACB pays 1.5% annual interest on the positive balance in NFRF's account, rather than the usual demand deposit rate of 4% per annum, would continue to meet ACB disbursement and collection costs for NFRF loans. Loan repayments would go back to the revolving fund for the following year's operation and the revenues of the service charge would be used to expand the fund's loan operations.

Animal Health Services

4.12 To ensure continued success of this project component after the implementation period, it would be necessary to ask the beneficiaries to repay the cost of vaccines and pharmaceuticals. Availability of budgetary means would be a serious constraint to continuation of drug treatments on the scale envisaged by the project. Therefore, the veterinary services would, after a 3-year period of gratis treatment for demonstration and incentive reasons, require a 50% repayment of drug costs in the fourth year and full payment from the fifth year onward. The funds thus collected would, at the end of the fifth year, constitute a revolving fund, to be established in MAAR under the control of the Director of the Animal Health Department. This fund would be used exclusively for the purchase of new pharmaceuticals and the production of new vaccines.

4.13 During negotiations, assurances were obtained from the Government that:

- (a) beneficiaries of veterinary services would pay for the full cost of pharmaceuticals and vaccines after a 3-year demonstration period at the rate of 50% of cost during the fourth project year and 100% from the fifth project year onward; and
- (b) the funds thus collected would be placed in a revolving fund administered by MAAR's Director of Animal Health and used exclusively to purchase pharmaceuticals and manufacture vaccines.

C. Accounts and Audit

4.14 NFRF. The accounting capability of NFRF would be strengthened and an assurance to that effect was obtained during negotiations (para 4.03). NFRF would establish a separate project account showing loan disbursements and repayments by type of sheep cooperative as well as expenses incurred in administration of the project funds.

4.15 MAAR. Separate accounts would be established for the animal health services project component and for the Drug Revolving Fund to be established at the beginning of the fourth project year.

4.16 During negotiations the Bank obtained assurances that (a) no later than October 31, 1976 separate project accounts would be established in NFRF, GOF and MAAR, (b) these accounts would be audited by independent auditors acceptable to the Bank, and (c) these accounts together with the audit reports would be submitted to the Bank within 4 months of the end of each fiscal year. A further assurance was obtained that a separate account be kept in MAAR's Animal Health Department for the Drug Revolving Fund to be established at the beginning of the fourth project year which would be audited by independent auditors acceptable to the Bank.

D. Monitoring

4.17 Under the project the number of animals held by members of sheep and range cooperatives is expected to double by about 1980, going from 0.76 million to 1.6 million head. This would bring roughly 40% of the range sheep population and about 20% of the total steppe area under control of the cooperatives.

4.18 By legislative action each cooperative is allocated a specific geographic area over which it has control with respect to sheep numbers carried and grazing systems followed. With the project, the productive potential of these areas would materially improve relative to that of the steppe in general. The extent to which such improvement occurs can only be determined by examining over a period of several years the vegetation trends in representative range areas utilized by the cooperatives. Agreement to carry out such studies has been reached between the Sheep and Range Section of MAAR's Animal Production Department and the Range Section of the University of Aleppo. To date this agreement has not been implemented. This would permit the establishment of baseline data which are essential for evaluating future progress. During loan negotiations, assurances were obtained that by June 30, 1977 MAAR would implement a system, acceptable to the Bank, which would effectively monitor the vegetative changes in the range areas used by the sheep and range cooperatives.

4.19 In the past, range and sheep cooperatives have been provided concentrates through WFP-assisted projects. While it is generally recognized that this increased availability of feed has had a favorable effect on animal productivity, no empirical data are available showing the extent of this effect or how it has been brought about, thereby providing a check on the assumptions underlying the project benefit estimates. Under the project, purchased feed would continue to be provided annually to the same and additional cooperatives. It is recommended that the Sheep and Range Section of MAAR seek the cooperation of the Animal Production Department of the University of Aleppo, or the Arab League Arid Zone Center, in carrying out field studies, utilizing sampling techniques, designed to determine the effect of feeding purchased concentrates on the production of sheep belonging to members of sheep and range cooperatives. The studies would measure, inter alia, changes in breeding performance, mortality

rates and growth rates. Assurances were obtained during negotiations that no later than December 31, 1977, MAAR would in consultation with the Bank, initiate such studies.

4.20 Furthermore, studies would be undertaken by the Government, under the project, of the provision of credit to members of both fattening and sheep and range cooperatives. These studies would include:

- (a) a survey of the pre-project income situation and of the availability of credit for the purchase of feed from existing sources, as well as the terms and conditions of such credit. This study, the terms of reference of which would be prepared in consultation with the Bank, would be carried out before December 31, 1976, and the results made available to the Bank. It would include recommendations for criteria to be used by NFRF in determining which members of the cooperatives are eligible for obtaining feed loans at the preferential interest rate of 5.5% per annum;
- (b) a quarterly monitoring of the income levels and of the availability and cost of credit would provide information about the debt service burden and debt service payment capacity of members of the cooperatives. The terms of reference of this monitoring exercise would be prepared in consultation with the Bank and the results would be incorporated in the quarterly progress reports on the project to be submitted to the Bank.

Assurances to this effect were obtained during negotiations.

V. BENEFITS AND JUSTIFICATION

A. Production

5.01 In conjunction with the Government-financed emergency feed reserve, which would prevent the decimation of flocks now occurring in drought years, the project would lead to a major increase in output of the national sheep flock. Through the provision of adequate financing of purchased feed the project would provide incentives for fattening for about twice the number of animals fattened at present, strengthen the recent trend of providing supplementary winter feed to animals on the range, and increase the availability of grazing resources to range sheep. The strengthening of animal health services would consolidate the gains in sheep flock stabilization by sharply reducing the losses in livestock and production resulting from preventable infectious diseases and parasites.

5.02 The overall production effect of the project and the emergency feed reserve in an average rainfall year at full development, about 1983, is derived in Annex 9 and summarized below:

Item	Present	Full Development		Increase With over Without Project (%)
		Without Project	With Project	
		thousand	ton	
Lamb/Mutton (liveweight)	81.2	88.6	148.4	67
Milk	144.1	148.8	198.4	33
Wool (greasy)	12.2	13.5	14.8	10

Over the development period the production increase attributable to the project and the emergency feed reserve represent average annual growth rates of 8% for meat, 4% for milk and 2.5% for wool. Incremental production, valued at economic prices, would amount to US\$75.4 million at full development compared with a total production of US\$139 million without the project and the emergency feed reserve.

B. Markets

5.03 Syrian foreign trade statistics show the country as a net importer of fresh and frozen meat and the State Planning Commission has estimated the import gap for 1974 at 20,000 tons, carcass weight equivalent, out of a total consumption of 107,000 tons. Indications of significant illegal border crossings of animals into Syria from Turkey and Iraq, and out of Syria into Lebanon and Jordan cast doubt on the realism underlying these figures. Nevertheless, these indications confirm that a sizeable export demand exists, particularly for fattened sheep, in Lebanon and Jordan which is far from being satisfied. Occasionally, the Government has imposed volume controls on meat exports and has even banned exports in an effort to relieve pressure on domestic meat prices.

5.04 Domestic demand for meat is determined by the high rate of population growth, rising income levels, and the pronounced consumer preference for lamb and mutton. The recent phenomenon of cheap poultry meat increasing its market share at the expense of mutton is expected to be temporary in view of rising feed prices on the world market on which Syria's poultry industry would largely depend. Under these circumstances, it is likely that the growth rate of the poultry industry would decline. The supply of beef from on-going development efforts in the dairy subsector is not expected to pose a threat to demand for mutton. The existing market for imported frozen beef is limited and could in the future be supplied with the culled animals from the dairy subsector. Moreover, the Beirut market and Syria's expanding hotel and tourist trade offer an assured outlet for baby beef.

5.05 The incremental milk production resulting from the project and the emergency feed reserve would make a welcome contribution to reducing the large import gap for milk and milk products which currently is valued at about US\$17.5 million. The additional wool output would be absorbed by the domestic market, notably in the expanding manufacture of both handknotted and machine-made carpets, and by exports.

5.06 In summary, no marketing difficulties are anticipated for the incremental production generated.

C. Prices

5.07 Prices for livestock and meat are free except for meat supply to the Damascus urban market where administrative prices apply set in agreement with the General Supply Institution. Concentrate feeds handled by the public sector are priced by the Government, often below export market prices. However, barley prices have been set above world market price levels since 1973/74. Price relationships between various types of feed and between feeds and meat are distorted, leading to inefficient utilization of some feed resources because of the coexistence of excess supply and a ban on exports. The price policy adviser, provided under the project would advise the task force, led by NFPC, in reviewing these price relationships and in defining a price policy based on efficiency considerations (para 4.02).

5.08 In this report, prices are based on local prices collected during appraisal. For the economic analysis, these financial prices are adjusted, if applicable, for local subsidy elements, regional export market conditions, and for the long-term price projections provided by the Bank's Economic Analysis and Projections Department. The actual prices used for the major commodities are:

	<u>Financial Price</u>	<u>Economic Price</u>
	-----US\$/ton-----	
Meat (liveweight)	1,360	1,100
Milk	163	163
Wool (greasy)	1,088	1,300
Barley	125	105

D. Producer Income

5.09 Around 1983, when the full effect of the project and the emergency feed reserve on the national sheep flock would be felt, the annual net income of a member family of a range and sheep cooperative, would have increased by 82% over the present level to reach about LS 8,900 (US\$2,420). This would permit these semi-nomadic flock owners to keep pace with the projected growth in average national income, thereby maintaining their 49% gap. ^{1/} These

^{1/} This assumes an average family size of 6. Present average national income (in 1974 prices) is US\$535 per caput. Projected average national income (in 1974 prices) per caput: US\$740 in 1980 and US\$950 in 1983.

income figures refer to an average rainfall year. Details of producer income estimates are given in Annex 10. Of perhaps greater importance than the increase in income expected is the reduced variability in income between years, and in particular the change from a loss to a profit position in a drought year.

5.10 Around 1980, when the full effect of the project and the emergency feed reserve on sheep fattening cooperatives would be felt, the average income of a member family of a sheep fattening cooperative is expected to increase by 45% to LS 6,900 (US\$1,880). This would raise the income of cooperative fatteners from 63% below the present average national income to 58% below the projected average national income for 1980. This increase would derive chiefly from the stabilization of feed prices and from the resultant higher average utilization of feedlot capacity.

E. Benefits and Beneficiaries

Benefits

5.11 Primary benefits, i.e. benefits that have been quantified for the economic analysis of the project and the related emergency feed reserve, would be (a) the overall increase in sheep production during average and good rainfall years through credit availability and stabilized feed prices which would result from the financing of the sheep cooperatives' annual feed needs; (b) the prevention of major losses in productive potential of flocks and the increase in overall production which would result from the availability of feed in drought years through the emergency feed reserve; and (c) the overall rise in flock productivity and reduction in mortality rates which would result from the strengthening of animal health services.

5.12 The secondary benefits of the project, and of the emergency feed reserve, which are not expressed in the economic rate of return, would nevertheless be real and quite substantial. Producer incomes would be stabilized, thus reducing the degree of flock owners' indebtedness to private money lenders. Furthermore, in the economic analysis only benefits derived from the sheep subsector have been taken into account. Nevertheless, it is certain that the feed price stabilization and the improved veterinary services would provide important benefits to other livestock subsectors.

5.13 Another major secondary benefit would be the project's support to the viability of existing and the establishment of new cooperatives in the livestock sector. The success of cooperatives in this sector would boost the Government's effort to effectively extend services to small operators in other sectors of agriculture. The project would contribute to the success of the pioneer effort of organizing semi-nomads in order to open a channel for providing Government services and to make them directly responsible for a more rational management of range resources.

5.14 Finally, the experience gained from this project, but particularly the results obtained from operating the emergency feed reserve, would be of great value to other countries in the Middle East and North Africa.

Beneficiaries

5.15 The principal beneficiaries of the project would be the bedouin and semi-nomadic flock owners, members of the sheep and range cooperatives. Under the project, their number would increase from 11,400 at present to 24,000 by 1980, thus covering two-thirds of the bedouin flock owners. They control 1.6 million sheep or about 40% of the total range sheep population and 25% of the national sheep flock. They would be assured of supplementary feed, which would qualify for short-term institutional financing.

5.16 The number of sheep fatteners benefitting from the project is expected to increase from about 1,600 at present to 2,800 by the end of project implementation. While fatteners generally are not among the poorest of the agricultural population, those who belong to cooperatives are as a rule less well off than others.

5.17 Given the average income of the beneficiaries, around US\$1,300 (Annex 10), and the relative poverty level of about US\$1,070 for a family of 6, a significant proportion of the beneficiaries has an income below the relative poverty level.

5.18 All bedouin flock owners (estimated at 35,000), and to a lesser extent all sheep fatteners, would benefit from the Government's emergency feed reserve. This would protect them from extreme variability in income from year to year and from, an often, perpetual indebtedness to merchants.

F. Economic Evaluation

5.19 At appraisal, the sheep production part of the project was seen as an integral package of three interdependent components, viz., the provision of subsistence feed rations during drought years (the emergency feed reserve), the provision of credit for the annual requirements of purchased feed of members of sheep cooperatives, and the strengthening of the animal health services to reduce the losses in livestock and animal production. The total impact of this package would be greater than the sum of the parts. Consequently, no consideration was given to the effect that the project components, taken separately, might have on sheep production. Therefore, in the economic analysis of the project as appraised no attempt was made to estimate the viability of the separate components.

5.20 The quantifiable economic benefits of the project and the inter-related emergency feed reserve, when compared with total investment and incremental operating costs, give rise to an economic rate of return of 21% (Annex 11). This return is based on economic prices for both output and cost items and on a 20-year project life.

5.21 Sensitivity tests run on the basic assumptions indicate that even if operating cost increased by 10% simultaneously with a 15% decline in incremental output, the rate of return would not fall below 9%.

5.22 An analysis was also undertaken of an alternative for the emergency feed reserve of domestically produced feed grain. This alternative would consist of feed grain exports in surplus years and imports in deficit years. The leadtime required to procure (i.e. locating supplies, placing order, shipping, and clearing through port) and distribute imported feed grain to flock owners in the areas affected by drought was estimated at a minimum of two to three months. To be effective, however, the emergency feed distribution must commence immediately following the identification and declaration of a drought. As the imported feed grain could not be available to end users within two to three months after the onset of a drought, and since by that time the need for such feed grain would have ceased, this alternative was rejected.

VI. AGREEMENT REACHED AND RECOMMENDATIONS

6.01 During negotiations, agreement was reached on the following principal points:

- (a) NFRF would levy an interest charge of 7.5% and 5.5% (the lower rate for farmers with net annual incomes below LS 3,500, in 1976 prices, which is less than 30% of the average national family income) on feed loans, the revenue of which would be used to increase its lending operations (para 3.16);
- (b) the Government would establish, as from the date of effectiveness of the loan, over a period of 3 years and maintain thereafter an emergency feed reserve to provide adequate feed resources to sheep producers during drought years. It was further agreed that GOF would appoint (i) a Director, with qualifications and experience satisfactory to the Bank, to be solely responsible for the establishment and operation of the emergency feed reserve, and (ii) a feed stock management adviser whose qualifications, experience and terms and conditions of employment would be satisfactory to the Bank (para 3.20);
- (c) MAAR would establish not later than October 31, 1976 within NFPC an adequately staffed secretariat headed by an executive secretary whose qualifications and experience would be acceptable to the Bank (para 4.02);

- (d) the Government would assure an effective coordination between MAAR and the other agencies responsible for carrying out the project (para 4.08); and
- (e) a study would be undertaken by the Government, on terms of reference prepared in consultation with the Bank, of the pre-project income and credit situation of members of sheep cooperatives with a view to establishing criteria providing evidence, acceptable to the Bank, of a family income of less than LS 3,500 in order to benefit from the preferential (5.5%) interest rate on NFRF feed loans (para 4.10).

6.02 Conditions of effectiveness of the loan are:

- (a) the appointment of the Director of the emergency feed reserve and of the feed stock management adviser to GOF (para 3.20);
- (b) the appointment of the executive secretary of NFPC (para 4.02);
- (c) the appointment of the price policy adviser, the feed distribution adviser and the cost accounting adviser to NFPC (para 4.02); and
- (d) the appointment of the laboratory equipment adviser to MAAR's Animal Health Department (para 4.02).

6.03 The project is technically feasible, economically sound and financially viable. Having received the necessary assurances and subject to the conditions of effectiveness, the project is suitable for a Bank loan of US\$5.0 million equivalent for 20 years including 5 years of grace, and for a Third Window loan of US\$12.5 million equivalent on standard terms. The borrower would be the Government of the Syrian Arab Republic.

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

The Livestock Sector

Importance of Livestock in the Economy

1. The livestock sector accounts for about 35% of agricultural production and contributes approximately 5% to gross domestic production (1970-73, constant 1963 prices). In 1973 livestock and animal products accounted for about 6% of the total export earnings.

Production and Trade

2. Total annual meat production is estimated at 75,000 tons, of which some 50,000 tons are sheep and goat meat, 15,000 tons beef and 10,000 tons poultry meat. Output of cow's milk is estimated at 140,000 tons annually, while sheep and goats produce on average about 170,000 and 30,000 tons per year respectively.

3. There is a considerable regional trade in live animals. Significant numbers of livestock cross the frontier illegally into Syria from Turkey and Iraq, and out of Syria to Lebanon and Jordan. Over the period 1967-73, the recorded number of sheep and goats imported annually averaged about 250,000 head at a total cost of US\$3.2 million. Comparable figures for sheep and goats exported were 389,000 head valued at US\$11.2 million. However, a declining trend is evident in the value of the trade surplus in live animals with a persistent trade deficit, in physical terms, since 1971. Moreover, the import gap of fresh and frozen meat has been about 33,000 tons per year over the period 1971-73. Over the same period net exports of cattle averaged about 37,000 head per year (US\$5.7 million). Syria is a net importer of milk and milk products. The value of net imports which was estimated at US\$2.7 million in 1968 rose to US\$11.1 million in 1971 and increased to US\$17.5 million in 1973.

Sheep Production

4. Importance. The adult sheep population as recorded at the time of collecting the annual head tax is about 5.5 million (1967-73 average). Assuming that 15% of the animals are not covered by the tax enumeration, total sheep numbers are estimated at approximately 6.4 million head. Sheep husbandry is the most important component of livestock production in Syria, accounting for more than 65% of all meat produced and about 50% of the total output of milk and milk products. Total value of sheep production is estimated at about US\$110 million per year, approximately 68% of which comes from meat while

milk and wool contribute about 25% and 7%, respectively. Some 35,000 bedouin families depend largely or wholly on sheep raising for their livelihood, while most of the country's estimated 500,000 farm families raise sheep to supplement their cash income and family food production. Lamb fattening and the finishing of cull ewes are important enterprises near the towns located on the fringe of the range area (Homs, Hama, Deir-ez-Zor) and close to import routes (Aleppo).

5. Fluctuations in Output. Since, on average, an estimated 60% of their total feed intake comes from natural grazing land (steppe and sub-humid areas), sheep are subject to large inter-annual nutritional fluctuations due to rainfall variability. This in turn leads to considerable variations in fertility levels, weaning rates, mortality and productive output. It is reported that lambing rates vary from about 40% in a drought year to 90% in a good rainfall year, adult mortality rates range from 20% to 5%, and lamb mortalities from 20% to 6%. During drought years sheep raisers are forced to sell breeding stock while in years of good rainfall offtake rates are reduced in order to rebuild the flocks. The net result of these interrelated factors is an irregular supply of meat and milk.

6. Production Systems. Roughly 60% of the sheep population are bedouin sheep, the majority of which are tended by semi-nomadic people who may or may not own the animals. Only a small portion of bedouin sheep are found in truly nomadic flocks. In years of medium to good rainfall bedouin sheep spend about 9 months in the steppe where they obtain about 75% of their total annual intake from range grazing. The other 3 months of the year are spent in the cultivated area grazing cereal stubble and crop residue. During a drought year the sheep may be in the steppe for no more than 4 months and obtain only about 40% of their total intake from the range (Map IBRD 11912).

7. Approximately 2.5 million or about 40% of the estimated 6.4 million sheep are classified as farm sheep. Most of these are owned by farmers in the relatively densely populated rainfed agriculture areas of western Syria. Compared with bedouin sheep the sheep in these areas obtain a larger proportion of their total feed from crop residue, fallow land, straw and concentrates. However, on average, it is estimated that farm sheep spend from 2 months (drought year) to 7 months (good year) per year on the range. During winter the sheep graze near the villages and are usually tended by members of the farmers' families. In the spring when animals are moved to grazing areas some distance from the villages, flocks of 50-100 head are made up from sheep of several different farmers and shepherds are hired to tend the flocks.

8. Government Assistance. Since the prolonged drought of 1958-60 which resulted in severe sheep losses, the Government has undertaken programs aimed at stabilizing sheep production, particularly bedouin sheep, through improved range management and the provision of extra feed during critical periods. Both FAO and the World Food Program (WFP) have provided technical and material assistance to the Government in the execution of its programs. Initially, emergency and supplementary feed were provided as incentives for deferred and controlled grazing of the range, but since 1967 the WFP-assisted project has been

based on the establishment of sheep and range cooperatives which provide members with supplementary feed and make collective arrangements for the controlled grazing of allocated range areas and for flock migrations at determined periods for crop residue grazing. The legislative framework for effective operation of the sheep and range cooperatives was established by Legislative Decree No. 140 in 1970 and Law No. 13 in 1973. On the basis of these acts gradual improvements are to be made in controlling the number of animals grazing within the range area of a cooperative. Limits are also set on the number of animals per family for which feed can be obtained through the cooperative. An important element of this approach to assistance is that responsibility for proper range utilization and increased sheep production rests with the community, i.e., the cooperative, rather than with the Government.

9. Sheep Fattening. Sheep fattening is a long-established practice, particularly in western Syria. The practice was originally based on importation of yearling rams from Turkey and, to a lesser extent, Iraq. However, over the past decade the fattening of local animals has greatly increased, primarily as a result of the formation of fattening cooperatives and the availability to members of credit for the purchase of feed. On average about 1 million animals from the national flock are fattened annually in addition to approximately 500,000 imported sheep. The degree of utilization of available feed yard capacity depends on the supply and demand of animals, prices and availability of feed and expected profit margins. The feeding period is usually about 90 days and normally 2 to 3 batches of sheep are fattened per year. Average liveweight gain per head is estimated to range from about 10 kg for cull ewes to 20-25 kg for yearling rams. Traditionally, sheep fattening rations consisted of cereal and/or legume straw and barley. In recent years cottonseed cake has become an important feed ingredient and at present ration composition may vary considerably depending upon the availability and price of individual feeds.

10. Research. Studies on range carrying capacity, sheep management and sheep selection are carried out at the Wadi El A'azib Range and Sheep Station. Recently 10 Government Range Sheep Centers have been established to demonstrate improved systems of range utilization and sheep husbandry, and for the training of local technicians. In cooperation with the Arab League Arid Zone Research Center a breeding and selection program with Awassi sheep is underway at Hama and the Marj El Kreim Center near Selemye. The program aims first at selecting for meat, milk and wool lines within the Awassi breed. Later, exotic blood is to be introduced in an attempt to raise fertility levels and increase meat production under intensive management conditions. Lamb fattening experiments are carried out at the University of Aleppo. Also, the Range Section of the University and the Sheep and Range Section of MAAR have agreed to collaborate on a study of the vegetation trends in the grazing areas utilized by the sheep and range cooperatives.

Cattle and Poultry Production

11. The total cattle population is estimated at 500,000 head, some 40,000 of which are reported to be medium- to high-producing dairy animals of the local Shami breed, often crossed with imported stock, or purebred

foreign dairy breeds. These animals are found in irrigated areas while the remaining cattle, consisting of small indigenous low-yielding breeds, are located in the higher rainfall areas. The small breeds average about 500 kg milk per cow per year while production of higher yielding cattle ranges from about 2,000 kg to 4,000 kg per lactation.

12. Poultry numbers have increased considerably in recent years with the establishment of commercial type poultry farms. Present annual production is estimated at 10 million chickens and 350 million eggs, of which about 4 million chickens and 250 million eggs are produced by the traditional sector. The output of poultry meat amounts to about 10,000 tons yearly.

Animal Health and Veterinary Services

13. The most important infectious diseases of sheep are sheep pox and anthrax. The incidence of enterotoxemia and pasteurellosis has increased in recent years. Parasitic diseases, both internal (roundworms, lungworms, tapeworms and liverfluke) and external (mange, ticks), have a very high incidence. In cattle both internal and external parasites are very common while foot-and-mouth disease, rinderpest and blackleg are also important problems. Newcastle disease is the most important poultry ailment.

14. The Animal Health Department of MAAR is responsible for providing veterinary services through its central facilities and field offices. There are about 120 graduate veterinarians in the country; however, only 40 (10 in central services and 30 in field services) are actually working in the veterinary service. The remainder are allocated to other duties or under military service. About 200 veterinary assistants work in the field. There is a Faculty of Veterinary Medicine at Hama and a school for training of veterinary assistants in Damascus. Current Government programs call for a very substantial increase in the number of veterinarians through the expansion of training facilities at Hama. At the present rate of admission 330 graduates would be produced annually from 1979 on. Using FAO recommendations for the Middle East region of one veterinarian per 20,000 head of livestock, 400-500 veterinarians would be adequate to serve the country's needs. In contrast, the number of veterinary assistants, the staff that presumably could perform most of the routine veterinary tasks, will increase at a much lower rate, thus creating a ratio between veterinarians and assistants which appears to be a gross misallocation of resources.

15. The veterinary field clinics administer about 6 million vaccinations (covering only 25 to 30% of the sheep population) and treat some 5 million individual cases (mainly for parasitic diseases) per year. All pharmaceuticals and vaccines are provided free of charge to livestock owners. Lack of transport facilities and staff prevent the undertaking of systematic disease surveys and adequate disease control programs. Another constraint is the shortage of vaccines and drugs due to insufficient budgetary funds and scarcity of foreign exchange for imports. The Central Veterinary Laboratory produces all the vaccines presently used with the exception of those against rinderpest and foot-and-mouth disease, which are imported. Production techniques of the laboratory need improving and production capacity is limited by obsolete equipment. Practically all the anthelmintics and insecticides used for the control of parasites are imported.

Feed Resources and Consumption

16. The main feed resources are range land, crop residue, fallow grazing, straw and concentrates. In general range grazing provides about 50% of the feed consumed by all livestock: crop residue, straw and fallow about 32%; and concentrates about 16%. Most of the remainder comes from green forage. Dependence on range grazing is greatest in the case of bedouin sheep and extensively managed goats (approximately 70% of total intake from range) followed by farm sheep and local cattle (about 48% from range). High producing dairy animals and milking goats receive none of their feed requirements from the range, while draught animals get only about 20% of their needs from this source. On average, sheep receive from 25% (in the case of bedouin sheep) to 40% (for farm sheep) of their total feed intake from crop residue, fallow and straw, and from 3% (bedouin sheep) to 13% (farm sheep) from concentrates.

Institutions Concerned with Livestock Production

17. MAAR. The sections of the Ministry that have direct responsibility for the livestock subsector are the Animal Health and Animal Production Departments. Animal health services have been discussed above (paras 13-15). The Animal Production Department includes a Sheep and Range Section as well as a Cattle and Poultry Section. Public sector institutions concerned with livestock production, e.g., the Dairy Institution and the Poultry Institution, report directly to the Minister through a special office for public sector enterprises.

18. National Feed Revolving Fund (NFRF). The NFRF, which was established from the proceeds of feed supplied by the WFP, is held at the Agricultural Co-operative Bank (ACB) and is under the day-to-day management of the Sheep and Range Section of the Animal Production Department. The operations of NFRF are described in Annex 2.

19. The General Organization for Trade and Processing of Cereals is the public sector agency in charge of wheat flour mills and the procurement and marketing of wheat, barley and lentils. Its relevance to the livestock sector rests in the fact that through its buying points it purchases a portion of the barley output and is the main source of wheat bran and wheat screenings.

20. The General Farmers' Union is responsible for the supervision of agricultural cooperatives, including the sheep fattening and sheep and range cooperatives, and is the spokesman for all farm organizations. The Union receives half of the LS 10 per ton tax on all feed sold by the public sector (para 23). This income is used for promoting cooperative work.

21. The General Supply Institution, through its Meat Bureau, supplies meat to the Damascus market in order to reduce fluctuations in supply. The Institution makes advance contracts with fattening cooperatives for delivery at specified periods and at specified prices. It gives advances of LS 100 per head to sheep fatteners to help finance the purchase of feeder animals. Some 100,000 head were contracted in 1973. The Institution itself also fattens animals.

22. General Organization for Feed (GOF). The GOF was established by Presidential Decree in February 1974 and became operational in August of the same year. It has broad responsibilities in the feed sector, including the supervision of feed processing and establishment of feed mills, establishment of feed storage warehouses, supervision of the marketing of all feed commodities both inside and outside the country, supervision of domestic feed distribution and the purchase of feed from producers through advance contracts. Although not specifically stated in the decree establishing it, the GOF has assumed responsibility for planning the feed needs of the livestock sector and the allocation of feed resources. GOF warehouses, both existing and under construction, have a storage capacity of about 245,000 tons of grain in sacks. In addition, cooperative warehouses provide space for about 155,000 tons, giving a combined total storage capacity of 400,000 tons of feed.

Marketing and Price Policy

23. Producer prices, for major agricultural commodities, are controlled by the Government, and in general they have been rather stable and quite low over the last decade. Prices of concentrate feeds handled by the public sector are set by government policy, often at levels below foreign market prices. This led in the past to rather large quantities of feed being exported and to shortages on the local market. At present, the export of feed concentrates is banned, except under special circumstances, and this has resulted in some price distortions between feeds and the misallocation of some feed resources. Livestock producers pay a tax of LS 10 per ton on all feed sold by the public sector. One half of this tax goes to the General Farmers' Union and the other half to the NFRF. Recently, GOF was to take over the distribution of all feed controlled by the public sector on which it would levy a standard charge of LS 50 per ton (LS 40 per ton for cooperatives and state enterprises) to cover transportation, overhead and related costs incurred between the feed production point and the Organization's warehouses. This levy would replace the LS 10 per ton feed tax.

24. Prices of livestock are free with the exception of that for meat supplied to Damascus by the General Supply Institution which is set by the Institution with the approval of the Governor of Damascus Province. Bedouin sheep are marketed mainly through merchants or small shopkeepers while villagers usually sell their animals at regional markets or, on occasion, to merchants. Sheep milk is marketed in the cities mostly in the form of cheese. In certain areas cheesemakers enter into contracts with groups of bedouins for the supply of fresh milk. Wool is marketed through merchants who use commission agents to determine its availability for sale. The wool is subsequently sold to larger merchants who control both the domestic and export trade.

25. Fattened sheep are sold either to the General Supply Institution under contract, on a carcass weight basis, or to traders in regional markets on a per head basis. Slaughterhouse records show that about 50% of all lambs are slaughtered in the April-June period while about 25% of the slaughterings occur during the July-September period. The slaughtering of adult sheep is

lowest between April and June, with the other quarters each accounting for about 30% of the total. About one third of the sheep fattened annually are imported animals. Except in years of meat scarcity, when exports may be completely banned, fattened lambs and yearlings are exported live to Lebanon and Jordan.

Government Livestock Programs

26. With regard to livestock development the current Five-Year Plan (1971-1975) has the general objective, "to raise and diversify livestock and crop production by achieving integration between them ...". Specific objectives include:

- (a) strengthening and expansion of the veterinary services to cover prevention and treatment of epizootic diseases;
- (b) increased construction of wells and small dams in the steppe;
- (c) establishing a feed reserve;
- (d) expansion of the extension services for animal production;
- (e) support of projects for the improvement of local cattle and their crossbreeding with exotic animals;
- (f) ensuring self-sufficiency in eggs and broiler production; and
- (g) participation of the Agricultural Cooperative Bank (ACB) in financing livestock projects with medium- and long-term loans, particularly for cooperatives.

27. A draft livestock development plan to 1980 was prepared in 1973, the targets of which are quite ambitious. The national sheep flock would be stabilized at around 6 million breeding animals and production would increase 2.5 (milk) and 4 (meat) times present levels. The plan aims at raising cattle numbers 150% and milk and meat production more than threefold. Broiler production would increase from 10 million to 32 million and layers from 0.5 million to 3.5 million. In the field of feed production and processing, the plan recommends the establishment of 5 new feed mills with a capacity of 100,000 tons each (in 3 shifts). Fodder crops are to be introduced into the rotation on irrigated land; fallow land in areas receiving over 350 mm rainfall annually would be seeded to fodder crops; and perennial fodder shrubs would be established on marginal land. The number of sheep and range cooperatives would be increased to cover half the area of the steppe.

28. Some progress has been made in implementing the plan objectives. The construction of 26 government dairy stations with a total of 15,600 head of imported cattle is underway. Thirteen of the stations are being financed by a loan from the Arab Fund for Economic and Social Development and 13 by the

Romanian Government. Included in the loans is the establishment of 4 heifer rearing stations (10,600 total head per year) and 2 bull fattening stations (5,500 head total per year). Also included are 2 artificial insemination centers and a quarantine station. Large scale developments with outside assistance are also underway in the poultry field. If all these projects are successfully implemented, it is estimated that annual broiler and egg production would increase by 40 million and 350 million respectively. A new WFP project is assisting in the formation of additional sheep and range cooperatives, the establishment of fodder shrubs on marginal land and the introduction of fodder crops into the rotation.

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SYRIA

Sheep Cooperatives and Credit

Present Situation

Sheep Cooperatives

1. Syria has been the site of an interesting pioneer experience in the Middle East in the development of the sheep subsector, both in sheep breeding and range management under marginal and steppe conditions and in organization of sheep breeders and fatteners in cooperatives. These cooperatives have been established with feed aid and later with credit from the National Feed Revolving Fund (NFRF) financed from the proceeds of feed supplied by the World Food Program (WFP). There are at present 14 sheep breeding cooperatives and 37 sheep fattening cooperatives. Additional sheep cooperatives will be established under a new WFP project and under the proposed Bank-assisted project. Moreover, about 12 dairy cooperatives have been established and other cooperatives such as for beef fattening are being considered.
2. The legislative framework for an effective operation of the range cooperatives was established by Legislative Decree No. 140 of 1970 and Law No. 13 of 1973. These provide for gradual improvements in control of animal numbers and in grazing systems within the range area of each cooperative. Limits are set on the number of animals per family for which feed rations can be obtained through the cooperative. The underlying principle of this approach is that responsibility for proper range management lies with the social group rather than with Government.
3. Membership in a fattening cooperative entitles the fattener to a maximum of 14 shares in the cooperative. Each share gives right to feed loans for 15 sheep per fattening cycle, or 45 sheep per year for the normally practised 3 fattening cycles.
4. Each cooperative has an elected board of directors. The Government assists the cooperatives through the assignment of a technical supervisor and a clerk. Members who are found to act contrary to cooperative rules, e.g., through resale of feed to outsiders or by not respecting loan repayment schedules, are disqualified from receiving loans in the next season.

Credit

5. The National Feed Revolving Fund (NFRF). The incentive for organizing sheep producers into cooperatives was originally feed aid and later credit for construction of warehouses and for feed purchases using the proceeds of WFP assistance. With NFRF loans 47 cooperative warehouses have been constructed or are under construction. These loans are interest-free, but carry a one-time service charge of 1% and are repayable over a 10-year period. Farm and range sheep cooperatives obtain short-term credit for the purchase of supplementary feed requirements and cooperatives of feed-lot fatteners are given loans for the purchase of their feed needs.

6. According to present procedures NFRF provides interest-free loans for two thirds of a cooperative member's annual feed requirements. For sheep and range cooperatives, repayment of credit for supplementary feeding is due by the end of June. For fattening cooperatives, 50% repayment is due after 4 months and 50% after 8 months. If these due dates are not met, prevailing ACB interest rates as well as fines for late payment are assessed. The Minister of Agriculture is empowered at any time to impose interest charges on NFRF loans.

7. The NFRF is held at the ACB which acts as NFRF's disbursing and collecting agent. ACB disburses against the NFRF to cooperative borrowers on instructions from MAAR's Animal Production Department which on a day-to-day basis acts for NFRF's Executive Board. Currently, ACB performs this function free of charge but pays NFRF interest of 1.5% p.a. on its positive balance as compared with 4% paid to private depositors. The loan risk is carried entirely by NFRF. Repayment rates for both short- and long-term credit have been excellent, nearly 100%.

8. As of December 31, 1974, NFRF's assets amounted to LS 10.1 million and although a cash availability is shown of LS 2.5 million, this was already committed for the ongoing warehouse construction program. Feed loans made in 1974 amounted to LS 3.1 million, while another LS 2.4 million was disbursed in the same period for warehouse construction (Table 1). Over the same period cooperatives repaid LS 3.2 million, mostly for feed loans. Other sources of NFRF income have been its share of LS 5/ton in the LS 10/ton tax levied on feed sales by the public sector. ^{1/} In view of its existing commitments, especially for warehouse construction, NFRF falls considerably short of financing the feed requirements of sheep cooperatives. Full feed requirements of already existing cooperatives, calculated according to NFRF standards, would amount to 180,000 tons or about LS 40-45 million of which producers would provide one third under present conditions.

9. Other activities of NFRF have been the provision of material, equipment and breeding stock for government range and sheep stations (LS 1.0 million) in exchange for which NFRF received the net income from these stations

1/ The remaining LS 5/ton goes to the General Farmers' Union.

(LS 0.7 million). NFRF has also made short-term loans to livestock cooperatives in farming areas to help finance production costs of the establishment of annual and perennial forage crops, mostly for demonstration purposes (LS 0.4 million).

The Agricultural Cooperative Bank (ACB)

10. ACB is the sole institution for lending to agricultural producers. Its total lending in 1974 amounted to LS 173 million of which LS 87 million in kind and LS 86 million in cash. About 80% of total lending was in short-term loans, mainly for cotton production. The provision of credit in kind--fertilizers, pesticides and seeds--involves the bank in transportation, storage and distribution of these inputs. ACB's policy and operations are overseen by MAAR and by the Ministry of Economy and Foreign Trade. Through its virtual monopoly of input distribution and the need for producers to obtain licenses from MAAR as a condition for credit, ACB is the principal instrument of agricultural production policy.

11. The bank finances about 65% of its operations from its own capital and the balance, in about equal proportions, from resources obtained through its rediscount facilities with the Central Bank and through deposits for which it pays 4% on demand and 6% on time deposits. These deposits belong mainly to cooperatives and public sector organizations. ACB lending rates are 4% to cooperatives and public sector organizations and 5.5% to the private sector, for both short- and longer-term credit. The bank has a good repayment record (around 95%), maintained by requiring for short-term loans two cosignatories known to the bank or, for members of cooperatives, the cosignature of the cooperative. For medium- and long-term loans title to the land must be presented or the loan risk must be assumed by a farmers' organization.

12. ACB has not been a source of financing for livestock feed since 1972 when it lent LS 1.5 million for this purpose to the entire livestock subsector. Existing lending norms do not seem attractive as the maximum loan amount of LS 3,000 would permit fattening of only about 65 head, i.e., one third of the size of the typical fattening batch. Yet, NFRF credit is only available to members of cooperatives and, moreover, has been rationed by a sharp reduction in the percentage of individual feed needs financed and an embargo on admission of new members to participating cooperatives. On the other hand, private feed suppliers and livestock traders are an important source of credit particularly to sheep fatteners. This type of credit is customarily provided in the form of deferred payments with the finance charge concealed in the purchase price. For suppliers' credit over a 2-4 month period, feed prices are typically raised between 10 and 25% on an annual basis.

13. NFRF does not provide credit for the purchase of livestock. ACB data show only small amounts for this purpose, most of which would be for dairy cattle. The main source of credit here is again the private sector. Also the Meat Bureau of the General Supply Institution, a public sector organization supplying the Damascus meat market, provides short-term credit for the purchase of lambs or yearling rams by members of fattening cooperatives. In this

case, a marketing contract is required. This form of credit is not very reliable as its supply fluctuates strongly with the meat demand faced by the Meat Bureau. It is also expected to remain rather limited as the Meat Bureau is building up its own fattening capacity.

Proposed Situation Under the Project

Sheep Cooperatives

14. The existing sheep and range cooperatives are expected to increase from 14 to 26 by 1980, and the sheep fattening cooperatives would increase from the present 37 to 49. Total membership is estimated to double to about 24,000 bedouin or semi-nomadic families for the sheep and range cooperatives with an expected total sheep population of some 1.6 million and membership in fattening cooperatives is expected to go up by 70%, thereby increasing the number of animals to be fattened by 84% to 1.4 million.

Credit

15. Cooperatives Annual Feed Needs. A basic feature of the project would be the expansion of NFRF's capacity for financing the annual requirements for purchased feed of members of sheep and range cooperatives as well as of sheep fattening cooperatives. These requirements are estimated at 243,000 tons, requiring a revolving fund of US\$19.7 million based on the full annual needs of farm and range sheep and on two thirds of the annual needs of fattened sheep, the latter on the premise that repayment of the loan for the first batch would permit financing of the third batch. Credit would be provided for 80% of needs only, leaving 20% for self financing. NFRF would be the sole source of financing the annual feed requirements of members of sheep cooperatives.

16. The demand for supplemental feed is now well established, particularly due to the very favorable terms on which it is being made available to members of cooperatives. The incentive of interest-free feed loans has played a useful role during the introductory period and this period should now be ended. Under the project, beneficiaries of NFRF loans would therefore pay interest at the rate of 7.5% per annum, the maximum legal interest rate for institutional credit to the agricultural sector. However, for beneficiaries below the relative poverty level, defined as those with annual incomes of LS 3,500 or less, a rebate of 2% would be applied to the regular interest rate, provided that they show evidence, satisfactory to NFRF, of such income levels. The criteria used by NFRF to determine income levels of cooperative members would be developed through a baseline study of the pre-project income situation to be carried out under arrangements satisfactory to the Bank, before December 31, 1976. Until the conclusion of this baseline study, NFRF would consider eligible for the preferential interest rate those members of sheep and range cooperatives holding less than 60 ewes and those members of sheep fattening cooperatives fattening less than 255 sheep per year. The income and credit situation would be monitored quarterly to provide information about

the cooperative members' debt service burden and debt service payment capacity. On the basis of the income and credit studies a joint review would be carried out by the Government and the Bank before July 30, 1978 to determine the need for maintaining the preferential interest rate of 5.5% and for revising the LS 3,500 income criterion.

17. The interest payments would accrue to NFRF's revenues for the purpose of making additional feed loans. A tentative cash flow projection for NFRF's feed loan operations is shown in Table 2. No administrative costs would be charged by MAAR to borrowers as those of NFRF would be small and consist of part-time use of MAAR's Animal Production Department staff. These costs would be similar to those borne by the crop extension service for the technical appraisal of agricultural loan applications. The existing arrangement between NFRF and ACB, whereby ACB pays 1.5% annual interest on the positive balance in NFRF's account instead of the regular deposit rate of 4%, would continue to meet ACB's disbursement and collection costs for NFRF loans.

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NFRF Cash Flow Statement

<u>Inflow</u>	<u>LS thousand</u>
Cash balance on January 1, 1974	4,752
Transfer of end-of-period balance of cattle and poultry feed fund	639
Interest on cash balances in ACB during 1973 and until June 30, 1974	19
Loan repayments over 1974	3,168
Income from sheep centers	723
WFP contributions (in kind)	334
Feed tax revenue share	393
Down payments for 1974/75 feed orders	40
	<hr/>
Subtotal	10,069
 <u>Outflow</u>	
Feed loans to cooperatives	3,139
Disbursements on cooperative warehouse construction loans	2,446
Short-term loans for fodder production	377
Transfers to sheep centers	1,025
Other	582
	<hr/>
Subtotal	7,569
 Cash balance on December 31, 1974	 <u>2,500</u>

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NFRF - Sheep Cooperatives Feed Loan Operations

Cash Flow Projection

<u>Item</u>	<u>Year</u>					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
	----- US\$ million -----					
Cash at beginning of year	0.8	12.1	12.9	13.5	14.1	15.6
<u>Inflow</u>						
Government contribution /1	15.6	0.9	0.8	1.0	1.4	-
Principal repayment /2						
Sheep and range cooperatives	6.3	6.6	6.9	7.4	7.9	7.9
Sheep fattening cooperatives	8.6	13.4	13.9	14.7	15.6	15.6
Interest /3						
Sheep and range cooperatives	0.4	0.5	0.5	0.5	0.6	0.6
Sheep fattening cooperatives	<u>0.9</u>	<u>1.0</u>	<u>1.0</u>	<u>1.1</u>	<u>1.1</u>	<u>1.1</u>
Total	<u>31.8</u>	<u>22.4</u>	<u>23.1</u>	<u>24.7</u>	<u>26.6</u>	<u>25.2</u>
<u>Outflow</u>						
Feed loans						
Sheep and range cooperatives	6.6	7.0	7.3	7.8	8.3	8.3
Sheep fattening cooperatives	13.6	14.3	14.9	16.0	16.5	16.5
Administrative expenses /4	0.1	0.1	0.1	0.1	0.1	0.1
Increase in reserves /5	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>
Total	<u>20.5</u>	<u>21.6</u>	<u>22.5</u>	<u>24.1</u>	<u>25.1</u>	<u>25.1</u>
Cash at end of year	<u>12.1</u>	<u>12.9</u>	<u>13.5</u>	<u>14.1</u>	<u>15.6</u>	<u>15.7</u>

/1 First year: total estimated amount of gross disbursements for feed loans to sheep and range cooperatives, and two-third of gross disbursements for fattening cooperatives; years 2-5: estimated incremental gross disbursements for sheep and range cooperatives, and two-third of incremental gross disbursements for fattening cooperatives.

/2 95% average repayment rate assumed.

/3 7.5% of five-sixth of loans repaid and 5.5% of one-sixth of loans repaid, assuming that borrowers eligible for the reduced interest rate constitute one-third of total borrowers and that the size of their loans is one-half that of the wealthier borrowers.

/4 0.5% of loans made.

/5 1% of loans repaid.

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National Feed Development Scheme

General

1. The Syrian Government has recently embarked on several large-scale intensive dairy and poultry development projects with external financial and technical assistance. While some effort has been made at intensification of sheep production, most sheep are maintained under extensive conditions (with more than 60% of their total feed requirements coming from range land grazing) and their productive output is greatly influenced by fluctuations in feed availability brought about by variability of rainfall and the occurrence of drought. The main feeds used for supplemental feeding of sheep, as well as cattle, are straw and barley. Since much of the barley is grown in areas that are marginal for crop production, the output of this grain is also subject to extreme inter-annual fluctuations. These factors cumulate to create crises during low rainfall years. The typical cycle of events leads to a reduction in sheep numbers during drought years due to deaths and forced slaughtering, with consequent low meat prices, followed by periods of meat shortage and high prices in good years when flocks are being rebuilt. Ensuring the feed needs during normal years and a minimum feed base during drought years would stabilize sheep numbers, increase production and provide for a more balanced development of the whole livestock sector.

Present Feed Situation

2. Feed availability and consumption vary from year to year as a result of variations in inter-annual and intra-annual rainfall. The supply and intake of feed for all livestock have been estimated based on a model providing for the occurrence, in an average 5-year period, of a good, poor, medium, good and medium rainfall year, in that order. These estimates are presented in Table 1. As indicated, some 190 million feed units in the form of straw and cottonseed hulls are available for feeding in a drought year as carry-over from the 4 preceding medium to good rainfall years. Most of this feed is stored on farms or held by private traders. In addition, about 268,000 tons of concentrates (barley equivalent) are carried over to a drought year, of which approximately 200,000 tons are held by the private sector, and 70,000 tons are supplied by the public sector either through imports or from reserve stocks. However, despite the carry-over of an estimated 458 million feed units, in a drought year, sheep receive only about 75% of the feed consumed in a normal year. This reduction in feed availability results in important production losses and a decrease in size of the breeding flock.

3. The average production and availability of feed concentrates are shown in Table 2. Barley is the single most important feed, accounting for 55% of total concentrate production. However, since it is largely grown under marginal climatic conditions on the fringe between the higher rainfall areas and the steppe, barley production shows great year-to-year fluctuations. Over the last 10 years the area sown to barley varied from 300,000 ha to slightly over 1 million ha, and per ha yield ranged from about 100 kg to 1,200 kg. Average total production amounted to about 420,000 tons per year with a range from 100,000 to 700,000 tons. Exports of barley occurred following bumper crop years while barley was imported in drought years. Net annual exports over the last 10 years amounted to 70,000 tons. Seed requirements accounted for another 70,000 tons annually and 280,000 tons were used as animal feed. On average, over 75% of the barley produced is retained on individual farms or held by private traders, and only about 24% is purchased by the public sector.

4. The year-to-year production of other feed grains (grain legumes, maize, sorghum) and agricultural by-products (cottonseed cake, wheat bran, sugarbeet pulp, beet molasses) is more uniform than that of barley since most of these feeds originate from irrigated or high rainfall areas. Regular annual exports of cottonseed cake occurred through 1972 while the exportation of wheat bran has been prohibited since 1970. Roughly 65% of the total available concentrate feed is consumed by sheep and goats and the remainder is divided about equally among cattle, poultry and draught animals.

Expected Future Production of Feed

5. Total feed consumption is expected to increase on average by about 25%, from an estimated 3,200 million feed units at present to just under 4,000 million feed units by 1980, due to expanded poultry production, an expansion of intensive dairy farming, increased cattle and sheep fattening, and improved feeding of sheep breeding flocks. Most of the additional feed requirements would be met through the increased availability of concentrates which would rise from some 500,000 tons at present to about 990,000 tons by 1980, including the net importation of 130,000 tons of poultry feed (Table 3). The national production of concentrates would increase mainly as a result of an expansion of maize, wheat bran and cottonseed cake production. Approximately 20% of the concentrate feeds would be held on-farm and 80% would be provided from commercial sources (public and private). If the poultry industry develops as planned, less than half of the commercial feed would be available for sheep. It is expected that part of the additional feed required would come from the increased availability of irrigated crop residue and green forage and the production of a limited amount of hay.

A National Feed Development Scheme

6. The distribution of feed resources has to be organized on a national basis given the competing demands of different livestock subsectors as well as export demand and the different sectoral origins of feed supplies. The Government has recognized the need for a national feed development scheme that through

reducing the strong seasonal and inter-annual fluctuations in feed supplies and prices would satisfy the feed requirements of all livestock producers at reasonable prices. The National Feed Development Scheme would consist of three components, of which two would be included in the project. The project would provide for development of an organizational framework for defining and implementing national feed policies which would optimize the use of available feed stuffs and feed storage facilities. In conjunction with this, technical assistance would be provided in the form of consultants and a study of feed pricing would be carried out. The project would further provide financing for the annual purchased feed needs of the sheep cooperatives (Annex 2). The Government would undertake to establish and operate an emergency feed reserve to provide feed to sheep producers in drought years. Because it is intimately related to the project and because the project justification assumes the establishment and operation of the emergency feed reserve, agreement was reached with the Government on its major features.

7. The Organizational Framework. The organizational framework for feed distribution decision making to be developed under the project would include the National Feed Policy Committee (NFPC) with a secretariat, MAAR's Animal Production Department, the General Organization for Feed (GOF) and the Agricultural Cooperative Bank (ACB). Based on the information provided by the various department and agencies involved in the feed-livestock sector, all of which are represented in NFPC, the Committee would discuss, approve and submit to the Minister of Agriculture and Agrarian Reform, or the council of Ministers for Economic Affairs as the case may be, for issuance as ministerial decision: (a) general feed policy guidelines, (b) annual feed distribution plans, and (c) recommendations for feed prices and feed/meat price relationships. NFPC would also monitor feed utilization and issue periodic reports on this subject.

8. NFPC's secretariat would be headed by an executive secretary whose qualifications and experience would be acceptable to the Bank. Initially, the secretariat would be reinforced by three consultants, a price policy adviser, a feed distribution adviser and a cost accounting adviser. The functions and qualifications of the executive secretary as well as draft terms of reference for the consultants are in Annex 8. NFPC would sponsor a study to review feed prices and the feed/meat price relationship and to make recommendations for a more rational policy in this area. The study would be carried out by a task force of Government officials assisted by the price policy adviser provided under the project and under the chairmanship of NFPC's executive secretary. The terms of reference of this study would be prepared in consultation with the Bank, its conclusions and recommendations would be submitted to the Bank for review by June 30, 1977, and the Government's plan for implementation would be communicated to the Bank before December 31, 1977 at which time implementation would be initiated.

9. Financing the Cooperatives' Annual Purchased Feed Needs. The total annual financing needs for purchased feed of the projected membership of sheep cooperatives have been estimated at 243,000 tons (Table 4), requiring an initial

revolving loan fund currently valued at US\$19.7 million equivalent, which would be made available under the project (Table 5). This is based on the total feed needs of the sheep and range cooperatives (81,000 tons) and two thirds of the total feed needs of the sheep fattening cooperatives (108,000 tons). In the case of the latter this assumes that 3 batches of animals are fattened each year, with repayment of the credit for fattening the first batch allowing financing of the third batch. Credit would be provided for only 80% of total feed needs; the remaining 20% would be self-financed by the cooperative members.

10. The Emergency Feed Reserve. In conjunction with the project, but wholly financed by the Government, an emergency feed reserve with a target level of 280,000 tons would be established, consisting of 215,000 tons of feed grains, mostly barley, and 65,000 tons of cottonseed cake. Over the previous decade barley production has averaged 420,000 tons annually and it is expected that this level of production would be maintained in the future (Table 3). The emergency reserve of feed grain would be built up over a 3-year period in 3 approximately equal additions. Save for exceptional circumstances, the feed grain component would be built up and replenished from surpluses in domestic production which otherwise would have been exported. If serious droughts occur early in the life of the reserve, a part of the feed grain requirement would be procured abroad. In any case, no exports of feed grain would be permitted whenever the emergency feed reserve is below its target level. The availability of cottonseed cake is rather stable, even in drought years, and normally the surplus over domestic consumption is exported. In a drought year, 65,000 tons of cottonseed cake would be withheld from export to be directed for use as part of the emergency feed reserve.

11. The 280,000 tons are considered to constitute a sufficient reserve level given current information about supply and demand for feed in future emergency situations. When experience has been gained from operation of the emergency reserve scheme and when more reliable production data become available, a more elaborate approach may be adopted, leading possibly to a different optimal stocking level. The reserve would provide feed during drought years for both range and farm breeding flocks. In addition, a small amount would be allocated to fattening cooperatives. The emergency needs were estimated as follows:

(a) Range sheep:	3.85 million x 50 kg	=	192,500 tons
(b) Farm sheep:	2.57 million x 15 kg	=	38,500 tons
(c) Sheep fattening cooperatives		=	<u>49,000 tons</u>
Total		=	280,000 tons

Range sheep would receive the largest share of the feed since they would suffer most from the effects of a drought. Considerably less feed would go to farm

sheep on the assumption that farmers in the higher rainfall areas would normally have available some feed from their own stores. Emergency feed would be distributed for a period of about 60 to 90 days in those years when the amount of rain received by the middle of February is less than two third of the normal rainfall. The decision to set the emergency allocation system in motion would be taken by the Minister of Agriculture and Agrarian Reform upon recommendations of the Director of the Animal Production Department. In order to improve the basis for decision making, the Animal Production Department would develop a procedure through MAAR's provincial extension services to monitor continuously the shortfall of available feed required by sheep producers.

12. The establishment and operation of the emergency feed reserve would be the responsibility of GOF. The funds to establish the reserve would be provided by the Government. Feed grains would be purchased by the General Organization for Trade and Processing of Cereals (GOTPC) through its established buying points. The Government would make available to GOF the funds required to purchase the quantities of feed provided by GOTPC. GOF would charge beneficiaries of emergency feed allocations the actual cost of this feed, including procurement, storage, and distribution charges, determined on the basis of norms to be reviewed by the Bank, as well as any interest payment obligations on loans obtained from the Government to purchase emergency feed. Under exceptional circumstances, defined as two consecutive severe drought years declared by the Government, GOF would be allowed to charge beneficiaries less than the actual cost of emergency feed (as defined above). In this case, the Government will compensate GOF for the shortfall in revenues from the sale of this feed. In the event that emergency feed will be made available on credit, the Government would make available to ACB, when necessary, the funds required to provide adequate credit for this purpose. GOF and ACB would establish not later than December 31, 1976 and thereafter apply, coordinated procedures, to be reviewed by the Bank, for providing emergency feed on credit.

13. Procurement, Storage and Distribution of Feed. Barley and other feed grains would be procured by GOTPC acting on behalf of GOF. GOF would resell these feeds to cooperatives who would store them in their warehouses. Most of the other feed ingredients would be obtained by users direct from the flour and oil mills and sugar factories, on a regular basis. The distribution of animal feed by the cooperative from their warehouses to individual members is already well established. A suggested scheme for the efficient handling of feed materials is presented in Chart 15309. A problem of rodent and insect infestation exists at present in the storage facilities of GOF and of the cooperatives. The Government has agreed that GOF and MAAR would prepare plans for rodent and insect control which would be submitted to the Bank for comments by December 31, 1976 and then implemented before June 30, 1977.

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Estimated Quantities of Feed Available and Consumed in Good, Medium and Poor Rainfall Year

	Range Grazing	Crop Residue			Straw		Cottonseed hulls	Concentrates	Green Forage
		Rainfed	Irrigated	Fallow	Cereal	Legume			
----- million feed unit -----									
<u>Good Year</u>									
Bedouin sheep	886	200	39	--	30	--	1	20	--
Farm sheep	431	74	40	42	90	--	--	79	--
Sheep fattening	--	--	--	--	3	7	1	165	--
Total	1,307	274	79	42	123	7	2	264	--
Goats	125	30	14	10	3	3	--	11	4
Cattle	154	40	46	25	50	21	1	67	80
Poultry	--	--	--	--	--	--	--	66	--
Drought animals	38	100	27	23	94	12	--	52	4
Camels	7	--	--	--	--	--	--	--	--
Total available	1,641	575	200	100	300	53	23	580	88
Total consumed	1,641	444	166	100	270	43	3	460	88
Carryover	--	--	/1	/1	30	10	20	120	--
<u>Medium Year</u>									
Bedouin sheep	971	159	60	--	20	--	5	25	--
Farm sheep	355	142	80	60	60	4	--	99	--
Sheep fattening	--	--	--	--	5	5	5	170	--
Total	1,326	301	140	60	85	9	10	294	--
Goats	157	28	6	10	9	3	--	11	4
Cattle	175	48	42	15	46	12	4	62	80
Poultry	--	--	--	--	--	--	--	66	--
Drought animals	94	48	12	15	90	--	--	53	4
Camels	6	--	--	--	--	--	--	--	--
Total available	1,758	425	200	100	250	30	23	500	88
Total consumed	1,758	425	200	100	230	24	14	486	88
Carryover	--	--	--	--	20	6	9	14	--
<u>Drought Year</u>									
Bedouin sheep	422	254	100	10	54	--	40	110	--
Farm sheep	190	167	35	20	100	6	15	139	--
Sheep fattening	--	--	--	--	8	18	8	180	--
Total	612	421	135	30	162	24	63	429	--
Goats	125	25	18	10	15	5	--	11	4
Cattle	167	25	22	20	24	27	18	47	81
Poultry	--	--	--	--	--	--	--	--	66
Drought animals	58	79	25	15	49	--	--	55	3
Camels	5	--	--	--	--	--	--	--	--
Total available	967	550	200	75	150	24	23	340	88
Carryover from previous years	--	--	--	--	100	32	58	268	--
Total consumed	967	550	200	75	250	56	81	608	88

/1 Unutilized aftermath ploughed under.

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

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Production and Availability of Feed Concentrates, 10-yr. Average, 1965-74

	Total Production	Retained on farm	Commercial		Private	
			Total	Public Domestic Exports		
----- thousand tons -----						
Barley	420	170	250	30	70	150
Cottonseed cake	110	--	110	30	80	--
Grain legumes	50	30	20	--	10	10
Maize	8	3	5	--	--	5
Sorghum	35	20	15	--	--	15
Screenings	5	--	5	5	--	--
Wheat bran	65	--	65	50	15	--
Beet pulp	8	--	8	8	--	--
Beet molasses	9	--	9	--	9	--
Others	<u>50</u>	<u>17</u>	<u>33</u>	<u>12</u>	<u>1</u>	<u>20</u>
Total production	760	240	520	135	-185	200
Used for seed /1	-80	-50	-30	-20	--	-10
Imports /2	40	--	¹ 40	--	--	40
Exports /3	-185	--	-185	--	185	--
Losses	-35	-10	-25	-15	--	-10
Total availability	500	180	320	100	--	220

/1 70,000 tons of total was barley seed.

/2 Mostly poultry feed.

/3 Net exports.

Source: FAU/World Bank Cooperative Program Preparation Report and mission estimates.

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Estimated Annual Production and Availability of Feed Concentrates by 1980

	Total	Retained on farm	Commercial		
			Total	Public	Private
----- thousand tons -----					
Barley	420	140	280	203	77
Cottonseed cake	140	-	140	140	-
Grain legumes	55	45	10	-	10
Maize	80	10	70	65	5
Sorghum	45	30	15	-	15
Wheat screenings	10	-	10	10	-
Wheat bran	120	-	120	120	-
Beet pulp	20	-	20	20	-
Beet molasses	20	-	20	20	-
Soybean meal	10	-	10	10	-
Other	60	45	15	5	10
Hay (barley equivalent)	50	-	50	50	-
Total	1,030	270	760	643	117
Used for seed	- 85	- 55	- 30	- 20	- 10
Imports (poultry feed)	195	-	195	195	-
Exports (cottonseed cake)	- 65	-	- 65	- 65	-
Losses	- 35	- 10	- 25	- 20	- 5
Total availability	1,040 ^{/1}	205	835	733	102

^{/1} 1,040,000 - 50,000 (barley, equivalent as hay) = 990,000 tons concentrates.

Source: FAO/WB Cooperative Program and mission estimate.

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Estimated Annual Feed (Concentrate) Need of Cooperatives
by 1980 (Average Year)

A. Sheep Fattening Cooperatives

Number expected to be fattened in 1975	- 1,060,000 head
Number expected to be fattened in 1980 (10% increase for 1976; 5% annually thereafter)	- 1,400,000 head
Feed needed: 114 kg x 1.4 million head	- 160,000 tons

B. Sheep and Range Cooperatives

Number sheep expected in 1975	- 1,040,000 head
Number sheep expected in 1980 (25% increase for 1976; 5 % annually thereafter)	- 1,600,000 head
Feed needed: 50 kg x 1.6 million head	- 80,000 tons

Total	- 240,000 tons
Including losses at cooperative warehouses	- 243,000 tons

Source: FAO/WB Cooperative Program and mission estimate.

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Basis for Credit Requirements for Annual Purchased Feed Needs of Sheep Cooperatives /1

Feed	Sheep and Range Cooperatives	Sheep Fattening Cooperatives		Total Basis for Revolving Credit Fund
		Total Feed Financed	Basis for Revolving Credit Needs /2	
----- thousand tons -----				
Barley	25	78	52	77
Cottonseed cake	-	17	11	11
Wheat screenings	-	10	7	7
Wheat bran	36	33	22	58
Low quality wheat	-	3	2	2
Beet pulp/molasses	-	6	4	4
Hay (barley equivalent)	<u>20</u>	<u>15</u>	<u>10</u>	<u>30</u>
Total	<u>81</u>	<u>162</u>	<u>108</u>	<u>189</u>

/1 NFRF would provide credit for only 80% of feed needs; the remaining 20% would be supplied by the beneficiaries.

/2 Assuming that three batches are fattened annually. The credit funds needed are only for two-thirds of total annual feed needs of the sheep fattening cooperatives because of the possibility of revolving the repayments from the first batch to finance the third batch.

Source: FAO/WB Cooperative Program and mission estimate.

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Animal Health Development

Introduction

1. As indicated elsewhere (Annex 1, para 15), only a small portion of the sheep population is presently provided with adequate health services, and although the economic importance of this inadequate coverage is not known in precise terms, it seems safe to assume that productive output is materially reduced as a consequence. The project would seek to increase production by providing the Animal Health Department of MAAR with the means to ensure optimum disease control in the sheep population, as well as improved health services to cattle and poultry at the village level.

Project Activities

2. Vaccine production by the Central Veterinary Laboratory would be improved and expanded through the provision of equipment and technical assistance. A laboratory equipment adviser would be provided for a period of 2 years to assist in the selection and installation of new equipment and the maintenance of existing and new equipment. He would also train local personnel. Equipment would be provided for the following functional units of the laboratory: virology; bacteriology; cleaning and sterilization; freeze-drying, bottling and storage. In addition, equipment for air filtering and air conditioning, power supply and a workshop would also be provided, along with 2 vehicles for field use by the staff of the laboratory. The new equipment would allow local vaccine production to increase from the present level of about 6 million doses per year to about 20-25 million doses annually. Most of this production would be accounted for by vaccines for sheep pox, anthrax and Newcastle disease in poultry. If the quantities produced of these vaccines would fall short of requirements, the Government would assure that the shortfall be imported. Vaccines against foot-and-mouth disease and rinderpest would continue to be imported.

3. Implementation of the animal health program would be the responsibility of MAAR's Animal Health Department. The veterinary field services would be organized into 56 mobile teams, i.e. an average of 4 teams per province, and each team would include 4 veterinary assistants, one worker and a driver. Every 2 teams would be supervised by a graduate veterinarian. The project would provide each team with a vehicle as well as the necessary equipment, vaccines and pharmaceuticals. Vaccines used by the mobile teams would be stored at the provincial veterinary centers and sub-centers and these centers would be provided with refrigerators for this purpose.

4. Seven sheep dipping centers would be constructed on the main migratory routes of the bedouin sheep flocks. The provinces of Aleppo, Damascus, Deir-ez-Zor, Homs and Raqqa would have one center each, while 2 centers would be built in Hama province. Each of the first 5 centers would have 2 baths while the centers in Hama would have 3 each. Each center would be located where a known water source already exists, and in addition to the baths (with roof and drains), each would consist of a holding yard, a dripping area, in and out corridors and watering troughs. The total capacity of the centers would be about 3 million animals twice a year during the 2 migratory periods of about 30 days each, i.e. 6,000 sheep per bath per day.

5. In order to continue the veterinary services on the scale envisaged under the project, the Animal Health Department would, after a 3-year period of free treatment for demonstration and incentive purposes, require beneficiaries to repay 50% of the costs of vaccines and pharmaceuticals provided in the 4th year and 100% of costs from the 5th year onward. The funds thus collected would constitute a revolving fund to be established in MAAR under the control of the Director of the Animal Health Department. This fund would be used exclusively for the purchase of pharmaceuticals and production of new vaccines.

6. Present Government programs for training of staff in the animal health area will lead to an imbalance between graduate veterinarians and veterinary assistants. The resulting ratio of veterinarians to the national livestock population would exceed by far the FAO recommendations for the region. It is therefore proposed that under the project the Government, if necessary with outside technical assistance, would carry out a study to determine the country's optimal requirements for animal health staff and their training needs. The results of this study, for which the terms of reference would be drawn up in consultation with the Bank, would be sent to the Bank for review before July 1, 1977, and the Government would inform the Bank of the proposed program for implementing the study's recommendations and begin implementation not later than December 31, 1977.

Estimated Cost

7. The cost of the animal health services component of the project, including technical assistance but excluding contingencies, is estimated at US\$4.9 million with a foreign exchange component of US\$3.8 million.

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Cost Estimates

Project Element	Project Cost			Expenditures																	
	Local	Foreign	Total	1976			1977			1978			1979			1980			1981		
				Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
	US\$ million																				
A. Cooperatives Annual Feed Needs	20.48	4.19	24.67	5.12	1.05	6.17	8.19	1.68	9.87	4.71	0.96	5.67	0.82	0.17	0.99	0.82	0.17	0.99	0.81	0.17	0.98
B. <u>Animal Health Services</u>																					
1. Vaccine production equipment	0.04	0.37	0.41	-	-	-	0.04	0.37	0.41	-	-	-	-	-	-	-	-	-	-	-	-
2. Refrigerators	0.01	0.02	0.03	-	-	-	0.01	0.02	0.03	-	-	-	-	-	-	-	-	-	-	-	-
3. Equipment for mobile teams	0.01	0.11	0.12	-	-	-	0.01	0.11	0.12	-	-	-	-	-	-	-	-	-	-	-	-
4. Vehicles	0.04	0.39	0.43	-	-	-	0.04	0.39	0.43	-	-	-	-	-	-	-	-	-	-	-	-
5. Sheep dipping centers	0.03	0.03	0.06	-	-	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	-	-	-	-	-	-
6. Incremental operating expenses																					
a. Pharmaceuticals	0.22	2.20	2.42	-	-	-	0.05	0.50	0.55	0.05	0.50	0.55	0.06	0.63	0.69	0.04	0.45	0.49	0.02	0.12	0.14
b. Vehicles	0.13	0.29	0.42	0.01	0.02	0.03	0.02	0.09	0.11	0.03	0.05	0.08	0.03	0.05	0.08	0.03	0.05	0.08	0.01	0.03	0.04
c. Central veterinary laboratory	0.03	0.23	0.26	-	-	-	0.01	0.07	0.08	0.01	0.04	0.05	0.01	0.04	0.05	0.01	0.04	0.05	0.01	0.02	0.03
d. Salaries	0.60	-	0.60	0.03	-	0.03	0.12	-	0.12	0.12	-	0.12	0.12	-	0.12	0.12	-	0.12	0.09	-	0.09
Subtotal	1.11	3.64	4.75	0.04	0.02	0.07	0.31	1.56	1.87	0.22	0.60	0.82	0.23	0.73	0.95	0.20	0.54	0.74	0.13	0.17	0.30
C. <u>Technical Assistance</u>																					
1. National Feed Development Scheme	0.06	0.26	0.32	0.02	0.06	0.08	0.04	0.18	0.22	-	0.02	0.02	-	-	-	-	-	-	-	-	-
2. Animal health services	0.03	0.13	0.16	-	0.02	0.02	0.02	0.06	0.08	0.01	0.05	0.06	-	-	-	-	-	-	-	-	-
Subtotal	0.09	0.39	0.48	0.02	0.08	0.10	0.06	0.24	0.30	0.01	0.07	0.08	-	-	-	-	-	-	-	-	-
D. <u>Contingencies</u>																					
1. Physical	0.10	0.39	0.49	-	0.01	0.01	0.03	0.17	0.20	0.02	0.06	0.08	0.02	0.07	0.09	0.02	0.05	0.07	0.01	0.02	0.03
2. Price	2.37	1.74	4.11	0.57	0.22	0.79	0.93	0.74	1.67	0.53	0.35	0.88	0.12	0.20	0.32	0.11	0.15	0.27	0.10	0.07	0.18
Subtotal	2.47	2.13	4.60	0.57	0.23	0.80	0.96	0.91	1.87	0.55	0.41	0.96	0.14	0.27	0.41	0.13	0.20	0.34	0.11	0.09	0.21
Total Project Cost ^{/1}	<u>24.15</u>	<u>10.35</u>	<u>34.50</u>	<u>5.75</u>	<u>1.38</u>	<u>7.14</u>	<u>9.52</u>	<u>4.39</u>	<u>13.91</u>	<u>5.49</u>	<u>2.04</u>	<u>7.53</u>	<u>1.19</u>	<u>1.17</u>	<u>2.36</u>	<u>1.15</u>	<u>0.92</u>	<u>2.07</u>	<u>1.05</u>	<u>0.44</u>	<u>1.49</u>

^{/1} Excluding local taxes and duties.

Note: Discrepancies are due to rounding.

Source: Mission estimate.

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List of Goods to be Procured

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total Cost</u>
		-----	-----
		US\$	-----
Equipment for Central Veterinary Laboratory	1 set	410,000	410,000
Cleaning and sterilization unit			
Cleaning and autoclaving equipment			38,500
Production of distilled water			2,100
Miscellaneous			2,600
Freeze-drying, bottling and storage unit			
Lyophilizator (industrial type, with fittings)			77,200
Walk-in deep freezers			18,000
Bottling equipment			5,100
Refrigeration room			10,300
Virology unit			
Large equipment			51,400
Small equipment			12,800
Fixed installations			38,500
Bacteriology unit			
Large equipment			38,500
Small equipment			12,800
Fixed installations			38,500
General equipment (power supply, air filtering and air conditioning equipment)			37,000
Workshop equipment			12,300
Vehicles			14,400
Refrigerators	74	425	31,450
Equipment for mobile veterinary teams	56 sets	2,100	117,600
Syringes (normal and automatic)			
Hypodermic needles			
Drenching guns			
Spraying pumps			
Thermo-containers			
Post-mortem equipment			
Specimen jars			
Instrument sterilizers			
Vehicles			
Four-wheel drive stationwagons	58	7,400	429,200
Pharmaceuticals			
Anthelmintics	17.5 million doses	0.13 ^{/1}	2,245,000
Insecticides	"	0.01 ^{/1}	175,000
Subtotal			2,420,000
Total			<u>3,408,250</u>

/1 US¢ per dose

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimate.

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Estimated Schedule of Disbursements

<u>IBRD Fiscal Year and Quarter</u>	<u>Cumulative Disbursements at End of Quarter (US\$ million)</u>
1976/77:	
September 30, 1976	-
December 31, 1976	-
March 31, 1977	-
June 30, 1977	0.8
1977/78:	
September 30, 1977	1.2
December 31, 1977	1.7
March 31, 1978	2.4
June 30, 1978	3.2
1978/79:	
September 30, 1978	4.0
December 31, 1978	6.1
March 31, 1979	7.0
June 30, 1979	8.5
1979/80:	
September 30, 1979	10.0
December 31, 1979	11.5
March 31, 1980	12.5
June 30, 1980	13.1
1980/81:	
September 30, 1980	13.6
December 31, 1980	14.1
March 31, 1981	14.5
June 30, 1981	14.9
1981/82:	
September 30, 1981	15.3
December 31, 1981	15.7
March 31, 1982	16.1
June 30, 1982	16.6
1982/83:	
September 30, 1982	17.0
December 31, 1982	17.5

Source: Mission estimate.

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Draft Terms of Reference

Executive Secretary, National Feed Policy Committee

1. Duties. The Executive Secretary would be a full-time staff member of the Ministry of Agriculture and Agrarian Reform, directly attached to the office of the Minister, having the rank of Director. Under him would be a small permanent secretariat which would formulate proposals, and approve and coordinate proposals presented to the Committee by other organizational units within the feed/livestock sector. The secretariat would in particular concern itself with the establishment and periodic review of general feed policy guidelines, preparation of annual estimates of the sources and distribution of feed, feed export/import decisions and the size of emergency feed stocks. The Executive Secretary would coordinate the work of the price policy, feed distribution and cost accounting advisers, who would be attached to the secretariat during the initial years of the project.

2. Qualifications. The Executive Secretary would be a qualified and experienced administrator, with at least five years' experience in an administrative position, preferably in government service. He should have at least a university degree, and preferably post-graduate study, in economics, public administration, or in the area of livestock production, with practical experience in these or closely related fields. A background in research or extension work would be desirable.

Price Policy Adviser

3. Duties. Under the authority of the Executive Secretary of the National Feed Policy Committee, and in collaboration with the staff of the GOF and the Meat Bureau of the General Supply Institution, the Price Policy Adviser would be responsible for:

- (a) Advising on price levels of feed and meat and price relationships between various feeds and between feed and meat;
- (b) Drawing up general guidelines for establishing price levels for feed and meat; and
- (c) Training of local staff.

In the discharge of his duties, the Adviser would take into account:

- (a) The overall low price level in Syria, state intervention and control of prices and their effects:
- (b) Costs of production of various feed commodities and meat:
- (c) Present conversion ratios of feed to meat and possible improvements in the ratios; and
- (d) Price levels of feed, livestock and meat in neighboring countries and legal and illegal export/import possibilities.

4. Qualifications. A university degree in agricultural economics and preferably post-graduate work in price policy. Candidates must have at least 7 years experience in a government department or marketing board concerned with establishing pricing policy and commodity price levels.

Feed Distribution Adviser

5. Duties. Under the authority of the Executive Secretary of the National Feed Policy Committee, and in collaboration with the staff of GOF, the Feed Distribution Adviser would be responsible for:

- (a) Advising on the distribution of available feed resources in order to satisfy the nutritional requirement of livestock to a given standard of performance at least cost, with due consideration of the needs of the various livestock sub-sectors and their comparative advantage of production; and
- (b) Training of local staff.

In the discharge of his duties the Adviser would:

- (a) Assist in establishing standards of performance of all categories of livestock, taking into consideration present levels of performance and those which might be obtained in the foreseeable future;
- (b) Assist in establishing the nutrient specifications of all available feedstuffs;
- (c) Recommend ration formulations and feeding rates for each class of livestock.
- (d) Assist in determining the need for importing feed as well as export possibilities and making recommendations accordingly.

6. Qualifications. A university degree in agricultural science, preferably with an animal husbandry and/or agricultural economics bias, or the equivalent. Candidates must have broad professional experience of at least 7 years in livestock production and nutrition and first-hand knowledge of feed commodity values on the world market. Candidates should also have experience in least-cost ration formulation.

Cost Accounting Adviser

7. Duties. Under the authority of the Executive Secretary of the National Feed Policy Committee, and in collaboration with the staff of GOF and the Cereals Organization, the Cost Accounting Adviser would be responsible for:

- (a) Reviewing present systems of cost accounting, taking account of government regulations concerning general accounting procedures in public sector institutions;
- (b) Assessing the suitability of present systems in allowing identification of cost elements and in allowing close watch over current operating cost and administrative overhead;
- (c) Recommending guidelines for cost accounting and for cost monitoring which would be compatible with Government accounting regulations; and
- (d) Training of local staff.

8. Qualifications. A university degree in cost accounting or business finance, or the equivalent. Candidates should have at least 7 years experience in cost accounting in a public sector commodity marketing organization or in a large commodity trading firm.

Feed Stock Management Adviser

9. Duties. Under the authority of the Director-General of GOF and in collaboration with local staff (and particularly the management of cooperatives), the Stock Management Adviser would be responsible for:

- (a) Ensuring that feed materials which are required to be stored suffer minimum loss and damage;
- (b) Ensuring that costs of movement in and out of store as well as during storage are at a minimum;

- (c) Initiating and ensuring the execution of a system of stock inventory and management;
- (d) Keeping under review all methods of feed handling and storage and making recommendations for improvements in efficiency; and
- (e) Training of local staff.

10. Qualifications. Candidates must have broad experience in warehousing techniques and systems, with particular reference to feed materials, including methods of control of rodents and insects which attack feedingstuffs.

Laboratory Equipment Adviser

11. Duties. Under the authority of the Director of the Central Veterinary Laboratory and in collaboration with the laboratory staff, the Equipment Adviser would be responsible for:

- (a) Assisting in the selection of new laboratory equipment, arranging for its procurement and supervising its installation;
- (b) Supervising the operation and maintenance of both existing and new equipment;
- (c) Assisting in the installation of basic services such as electrical systems, air conditioning systems, gas and water; and
- (d) Training of local staff.

12. Qualifications. A university degree in engineering, preferably with an electrical or mechanical engineering bias. Candidates must have at least 7 years experience in procuring, installing, operating and maintenance of biological laboratory equipment.

13. The total provision for consultants under the project would be:

	<u>Months</u>
Price policy adviser	12
Feed distribution adviser	18
Cost accounting adviser	6
Feed stock management adviser	12
Laboratory equipment adviser	<u>24</u>
Total	<u>72</u>

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APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

National Breeding Flock Growth Projections - Without Project

Item	Present Situation	Year																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
thousand head																					
Breeding ewes																					
Total mated	5,140	4,678	4,896	4,935	5,022	5,097	5,176	5,202	5,228	5,254	5,280	5,306	5,332	5,359	5,386	5,413	5,440	5,467	5,494	5,521	5,549
Less deaths	514	468	490	493	502	510	518	520	523	525	528	531	533	536	539	541	544	547	549	552	555
Less offtake																					
for slaughter	411	374	391	395	402	408	414	416	418	420	422	424	426	429	431	433	435	437	439	442	444
for fattening	360	327	342	345	352	357	362	364	366	368	370	371	373	375	377	379	381	383	384	386	388
On hand end of year	3,855	3,509	3,673	3,702	3,766	3,822	3,882	3,902	3,921	3,941	3,960	3,980	4,000	4,019	4,039	4,060	4,080	4,100	4,122	4,141	4,162
Breeding rams																					
On hand beginning of yr.	243	223	232	235	239	234	246	248	249	250	251	253	254	255	256	258	259	260	262	263	264
Less deaths	24	22	23	23	24	24	25	25	25	25	25	25	25	25	25	26	26	26	26	26	26
Less offtake for slaughter	48	45	46	47	48	49	49	50	50	50	50	50	50	50	51	52	52	52	52	52	52
On hand end of year	171	156	163	165	167	170	172	173	174	175	176	178	179	180	180	181	182	182	184	185	186
Ewe replacements																					
On hand beginning of yr.	945	1,594	1,450	1,517	1,530	1,557	1,517	1,524	1,532	1,539	1,547	1,553	1,562	1,571	1,579	1,586	1,594	1,602	1,608	1,618	1,627
Less deaths	94	159	145	152	153	156	152	152	153	154	155	155	156	157	158	159	159	160	161	162	163
Less offtake for slaughter	28	48	43	45	46	47	45	46	46	46	46	46	47	47	47	48	48	48	48	48	49
On hand end of year	823	1,387	1,262	1,320	1,331	1,354	1,320	1,326	1,333	1,339	1,346	1,352	1,354	1,367	1,374	1,380	1,387	1,394	1,399	1,408	1,415
Ram replacements																					
On hand beginning of yr.	60	88	83	85	88	88	88	88	88	88	89	88	88	88	90	92	92	93	92	92	92
Less deaths	6	9	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Less offtake	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4
On hand end of year	52	76	72	74	76	76	76	76	76	76	77	76	76	76	78	79	79	80	79	79	79
Yearling male lambs																					
On hand beginning of yr.	257	334	309	325	326	332	344	353	355	357	359	375	377	380	382	383	383	385	386	390	393
Less offtake																					
for slaughtering	180	234	216	227	228	232	241	247	248	250	251	262	264	266	267	268	268	269	270	273	275
for fattening	77	102	93	98	98	100	103	106	107	107	108	113	113	114	115	115	115	116	116	117	118
On hand end of year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lambs																					
Males weaned	1,593	1,450	1,518	1,530	1,557	1,605	1,630	1,639	1,647	1,655	1,716	1,724	1,733	1,742	1,750	1,759	1,768	1,777	1,785	1,794	1,804
Less offtake																					
for slaughter	450	406	425	428	436	450	456	459	461	463	480	483	485	488	490	492	495	498	500	502	505
for fattening	721	652	683	688	701	723	733	737	741	745	772	776	780	784	787	792	796	800	803	807	812
On hand end of year	88	83	85	88	88	88	88	88	88	88	89	88	88	88	90	92	92	93	92	92	92
for replacements	314	309	325	326	332	344	353	355	357	359	375	377	380	382	383	383	385	386	390	393	395
Females weaned	1,594	1,450	1,517	1,530	1,557	1,606	1,630	1,647	1,655	1,716	1,725	1,733	1,741	1,751	1,759	1,768	1,776	1,786	1,794	1,803	1,813
Less offtake	-	-	-	-	-	89	103	106	108	108	163	163	162	162	165	166	166	166	167	168	169
for replacements	1,594	1,450	1,517	1,530	1,557	1,517	1,527	1,532	1,539	1,547	1,553	1,562	1,571	1,579	1,586	1,594	1,602	1,608	1,618	1,627	1,634
percentage																					
Production Coefficients																					
Weaning rate	62	62	62	62	62	63	63	63	63	63	63	65	65	65	65	65	65	65	65	65	65
Adult mortality	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Offtake, slaughter																					
Ewes	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Rams	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Replacement ewes	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Replacement rams	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Yearlings	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Lambs (males)	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Lambs (females)	-	-	-	-	-	5	6	6	6	6	9	9	9	9	9	9	9	9	9	9	9
Fattening																					
Ewes	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Yearlings	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Lambs (males)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

APPRAISAL OF

FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

National Breeding Flock Growth Projections - With Project

Item	Present Situation	Year										
		1	2	3	4	5	6	7	8	9	10-19	20
----- thousand head -----												
Breeding ewes												
Total mated	5,140	4,678	4,896	4,723	4,875	5,013	5,246	5,461	5,654	5,654	5,654	5,654
Less deaths	514	468	441	301	341	351	367	382	396	396	396	396
Less offtake												
for slaughter	411	374	392	378	390	401	420	437	452	452	452	452
for fattening	360	327	588	567	585	602	630	655	678	678	678	678
On hand end of year	3,855	3,509	3,475	3,477	3,559	3,659	3,829	3,987	4,128	4,128	4,128	4,128
Breeding rams												
On hand beginning of year	243	223	233	225	232	239	250	260	269	269	269	269
Less deaths	24	22	21	16	16	17	17	18	19	19	19	19
Less offtake for slaughter	48	44	58	56	58	59	62	65	67	67	67	67
On hand end of year	171	157	154	153	158	163	171	177	183	183	183	183
Ewe replacements												
On hand beginning of year	945	1,594	1,450	1,591	1,653	1,803	1,855	1,895	1,734	1,734	1,734	1,734
Less deaths	94	159	130	113	116	126	130	133	121	121	121	121
Less offtake for slaughter	28	48	72	80	83	90	93	95	87	87	87	87
On hand end of year	823	1,387	1,248	1,398	1,454	1,587	1,632	1,667	1,526	1,526	1,526	1,526
Ram replacements												
On hand beginning of year	60	88	84	90	92	100	102	105	99	99	99	99
Less deaths	6	9	8	6	6	7	7	7	7	7	7	7
Less offtake	2	3	5	5	5	6	6	6	6	6	6	6
On hand end of year	52	76	71	79	81	87	89	92	86	86	86	86
Yearling male lambs												
On hand beginning of year	257	334	305	302	248	198	204	214	222	230	230	230
Less offtake												
for slaughter	180	234	153	151	124	99	102	107	111	115	115	115
for fattening	77	102	152	151	124	99	102	107	111	115	115	115
On hand end of year	-	-	-	-	-	-	-	-	-	-	-	-
Lambs												
Males weaned	1,593	1,450	1,591	1,653	1,804	1,855	1,941	2,020	2,092	2,092	2,092	2,092
Less offtake												
for slaughter	450	414	464	482	528	542	568	597	620	620	620	620
for fattening	721	647	735	831	978	1,007	1,054	1,102	1,143	1,143	1,143	1,143
On hand end of year												
for replacements	88	84	90	92	100	102	105	99	99	99	99	99
for sale as yearlings	334	305	302	248	198	204	214	222	230	230	230	230
Females weaned	1,594	1,450	1,591	1,653	1,803	1,855	1,941	2,021	2,092	2,092	2,092	2,092
Less offtake	-	-	-	-	-	-	46	287	358	358	358	358
for replacements	1,594	1,450	1,591	1,653	1,803	1,855	1,895	1,734	1,734	1,734	1,734	1,734
----- percent -----												
Production coefficients												
Weaning rate	62	62	65	70	74	74	74	74	74	74	74	74
Adult mortality	10	10	9	7	7	7	7	7	7	7	7	7
Offtake												
For slaughter												
Ewes	8	8	8	8	8	8	8	8	8	8	8	8
Rams	20	20	25	25	25	25	25	25	25	25	25	25
Replacement ewes	3	3	5	5	5	5	5	5	5	5	5	5
Replacement rams	4	4	6	6	6	6	6	6	6	6	6	6
Yearlings	70	70	50	50	50	50	50	50	50	50	50	50
Lambs (males)	28	28	29	29	29	29	29	29	29	29	29	29
For fattening												
Ewes	7	7	12	12	12	12	12	12	12	12	12	12
Yearlings	30	30	50	50	50	50	50	50	50	50	50	50
Lambs (males)	45	45	46	50	54	54	54	54	54	54	54	54
Lambs (females)	-	-	-	-	-	-	-	14	17	17	17	17

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

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APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

National Sheep Flock Production Projections - Without Project

Item	Unit	Present Situation	Year																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
			<u>Meat Production</u>																			
<u>Animals Sold</u>																						
Lambs from pasture	'000 head	450	406	425	428	436	539	559	565	569	571	643	646	647	650	655	657	661	664	668	669	674
Lambs for fattening	"	721	652	683	688	701	723	733	737	741	745	772	776	780	784	787	792	796	800	803	807	812
Cull ewes from pasture	"	411	374	391	395	402	408	414	416	418	420	422	424	426	429	431	433	435	437	439	442	444
Cull ewes fattened	"	360	327	342	345	352	357	362	364	366	368	370	371	373	375	377	379	381	383	384	386	388
Cull rams from pasture	"	48	45	46	47	48	49	49	50	50	50	50	50	50	50	51	52	52	52	52	52	52
Yearlings from pasture	"	180	234	216	227	228	232	241	247	248	250	251	262	264	266	267	268	268	269	270	273	275
Yearlings fattened	"	77	102	93	98	98	100	103	106	107	107	108	113	113	114	115	115	115	116	116	117	118
<u>Average Liveweight</u>																						
Lambs from pasture	kg	25	25	25	25	25	25	25	25	25	25	26	26	26	26	26	26	26	26	26	26	26
Lambs for fattening	"	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Cull ewes from pasture	"	31	31	31	31	31	31	31	31	31	31	32	32	32	32	32	32	32	32	32	32	32
Cull ewes fattened	"	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
Cull rams from pasture	"	45	45	45	45	45	45	45	45	45	45	47	47	47	47	47	47	47	47	47	47	47
Yearlings from pasture	"	35	35	35	35	35	35	35	35	35	35	36	36	36	36	36	36	36	36	36	36	36
Yearlings fattened	"	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
<u>Total Liveweight</u>																						
Lambs from pasture	'000 ton	11.25	10.15	10.62	10.70	10.90	13.47	13.97	14.12	14.22	14.27	16.72	16.80	16.82	16.90	17.03	17.08	17.19	17.26	17.37	17.39	17.52
Lambs for fattening	"	28.84	26.08	27.32	27.52	28.04	28.92	29.32	29.48	29.64	29.80	30.88	31.04	31.20	31.36	31.48	31.68	31.84	32.00	32.12	32.28	32.48
Cull ewes from pasture	"	13.61	11.59	12.12	12.24	12.46	12.65	12.83	12.90	12.96	13.02	13.50	13.57	13.63	13.73	13.79	13.86	13.92	13.98	14.05	14.14	14.21
Cull ewes fattened	"	14.76	13.41	14.02	14.14	14.43	14.64	14.84	14.92	15.01	15.09	15.17	15.21	15.29	15.37	15.46	15.54	15.62	15.70	15.74	15.83	15.91
Cull rams from pasture	"	2.25	2.02	2.07	2.11	2.16	2.20	2.20	2.25	2.25	2.25	2.35	2.35	2.35	2.35	2.40	2.44	2.44	2.44	2.44	2.44	2.44
Yearlings from pasture	"	6.30	8.19	7.56	7.94	7.98	8.12	8.43	8.64	8.68	8.75	9.04	9.17	9.50	9.58	9.61	9.65	9.65	9.68	9.72	9.83	9.90
Yearlings fattened	"	4.23	5.61	5.11	5.39	5.39	5.50	5.66	5.83	5.88	5.88	5.94	6.21	6.21	6.27	6.32	6.32	6.32	6.38	6.38	6.43	6.49
Total		81.24	77.06	78.83	80.04	81.36	85.50	87.28	88.15	88.64	89.07	93.60	94.35	95.02	95.56	96.09	96.57	96.98	97.46	97.82	98.35	98.95
			<u>Milk Production</u>																			
Ewes lambing	'000 head	3,495	3,181	3,329	3,356	3,415	3,517	3,571	3,589	3,607	3,625	3,749	3,767	3,786	3,805	3,824	3,843	3,862	3,882	3,901	3,920	3,940
Ewes milking	"	2,621	2,386	2,497	2,517	2,561	2,638	2,678	2,692	2,705	2,719	2,812	2,825	2,839	2,854	2,868	2,882	2,896	2,911	2,926	2,940	2,955
Yield per ewe	kg	55	55	55	55	55	55	55	55	55	55	56	56	56	56	56	56	56	56	56	56	56
Production	'000 ton	144.1	131.2	137.3	138.4	140.8	145.1	147.3	148.1	148.8	149.5	157.5	158.2	159.0	159.8	16.01	161.4	162.2	163.0	163.9	164.6	165.5
			<u>Wool Production</u>																			
Animals shorn	'000 head	6,085	6,272	6,346	6,452	6,552	6,654	6,693	6,726	6,760	6,793	6,827	6,859	6,894	6,930	6,965	6,999	7,034	7,069	7,102	7,139	7,176
Yield per head	kg	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Production	'000 ton	12.2	12.5	12.7	12.9	13.1	13.3	13.4	13.4	13.5	13.6	13.7	13.7	13.8	13.9	13.9	14.0	14.1	14.1	14.2	14.3	14.3

Source: FAO/World Bank Cooperative Program Preparation Paper and mission estimate.

June 1976

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT
SYRIA

National Sheep Flock Production Projections--With Project

Item	Unit	Present Situation	Years											
			1	2	3	4	5	6	7	8	9-19	20		
			<u>Meat Production</u>											
<u>Animals Sold</u>														
Lambs from pasture	'000 head	450	414	464	482	528	542	568	597	620	620	620	620	620
Lambs fattened	"	721	647	735	831	978	1,007	1,100	1,389	1,501	1,501	1,501	1,501	1,501
Cull ewes from pasture	"	439	422	464	458	473	491	513	532	539	539	539	539	539
Cull ewes fattened	"	360	327	588	567	585	602	630	655	678	678	678	678	678
Cull rams from pasture	"	50	47	63	61	63	65	68	71	73	73	73	73	73
Yearlings from pasture	"	180	234	153	151	124	99	102	107	111	115	115	115	115
Yearlings fattened	"	77	102	152	151	124	99	102	107	111	115	115	115	115
<u>Average Liveweight</u>														
Lambs from pasture	kg	25	26	27	28	28	28	28	28	28	28	28	28	28
Lambs fattened	"	40	42	43	44	44	44	44	44	44	44	44	44	44
Cull ewes from pasture	"	31	33	35	36	36	36	36	36	36	36	36	36	36
Cull ewes fattened	"	41	43	45	46	46	46	46	46	46	46	46	46	46
Cull rams from pasture	"	45	48	50	52	52	52	52	52	52	52	52	52	52
Yearlings from pasture	"	35	37	38	39	39	39	39	39	39	39	39	39	39
Yearlings fattened	"	55	56	56	57	57	57	57	57	57	57	57	57	57
<u>Total Liveweight</u>														
Lambs from pasture	'000 ton	11.25	10.76	12.53	13.50	14.78	15.18	15.90	16.72	17.36	17.36	17.36	17.36	17.36
Lambs fattened	"	28.84	21.17	31.60	36.56	43.03	44.31	48.40	61.12	66.04	66.04	66.04	66.04	66.04
Cull ewes from pasture	"	13.61	13.93	16.24	16.49	17.03	17.68	18.47	19.15	19.40	19.40	19.40	19.40	19.40
Cull ewes fattened	"	14.76	14.06	26.46	26.08	26.91	27.69	28.98	30.13	31.19	31.19	31.19	31.19	31.19
Cull rams from pasture	"	2.25	2.26	3.15	3.17	3.28	3.38	3.54	3.69	3.80	3.80	3.80	3.80	3.80
Yearlings from pasture	"	6.30	8.66	5.81	5.89	4.84	3.86	3.98	4.17	4.33	4.48	4.48	4.48	4.48
Yearlings fattened	"	4.23	5.71	8.51	8.61	7.07	5.64	5.81	6.10	6.33	6.55	6.55	6.55	6.55
Total	"	81.24	82.55	104.31	110.30	116.93	117.74	125.08	141.08	148.45	148.83	148.83	148.83	148.83
			<u>Milk Production</u>											
Ewes lambing	'000 head	3,495	3,181	3,525	3,542	3,802	3,910	4,092	4,260	4,410	4,410	4,410	4,410	4,410
Ewes milking (75% of ewes lambed)	"	2,621	2,386	2,644	2,656	2,851	2,932	3,069	3,195	3,307	3,307	3,307	3,307	3,307
Yield per ewe	kg	55	55	58	60	60	60	60	60	60	60	60	60	60
Production	'000 ton	144.15	131.23	153.35	159.36	171.06	175.92	184.14	191.70	198.42	198.42	198.42	198.42	198.42
			<u>Wool Production</u>											
Animals shorn	'000 head	6,085	6,272	6,346	6,314	6,528	6,816	7,101	7,356	7,388	7,388	7,388	7,388	7,388
Yield per head	kg	2	2	2	2	2	2	2	2	2	2	2	2	2
Production	'000 ton	12.2	12.5	12.7	12.6	13.1	13.6	14.2	14.7	14.8	14.8	14.8	14.8	14.8

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

June 1976

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

Incremental Production of National Sheep Flock

Item	Before Development	Year																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		----- thousand ton -----																			
<u>Without Project</u>																					
Meat (liveweight)	81.2	77.1	78.8	80.0	81.4	85.5	87.3	88.1	88.6	89.1	93.6	94.3	95.0	95.6	96.1	96.6	97.0	97.5	97.8	98.3	98.9
Milk	144.1	131.2	137.3	138.4	140.8	145.1	147.3	148.1	148.8	149.5	157.5	158.2	159.0	159.8	160.1	161.4	162.2	163.0	163.9	164.6	165.5
Wool (greasy)	12.2	12.5	12.7	12.9	13.1	13.3	13.4	13.4	13.5	13.6	13.7	13.7	13.8	13.9	13.9	14.0	14.1	14.1	14.2	14.3	14.3
<u>With Project</u>																					
Meat (liveweight)	81.2	82.5	104.3	110.3	116.9	117.7	125.1	141.1	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4
Milk	144.1	131.2	153.3	159.3	171.1	175.9	184.1	191.7	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4	198.4
Wool (greasy)	12.2	12.5	12.7	12.6	13.1	13.6	14.2	14.7	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8
<u>Incremental Production</u>																					
Meat (liveweight)	-	5.4	25.5	30.0	35.5	32.2	37.8	53.0	60.0	59.3	54.8	54.1	53.4	52.8	52.3	51.8	51.4	50.9	50.6	50.1	49.5
Milk	-	-	16.0	20.9	30.3	30.8	36.8	43.6	49.6	48.9	40.9	40.2	39.4	38.6	38.3	37.0	36.2	35.4	34.5	33.8	32.9
Wool (greasy)	-	-	-	(0.3)	-	0.3	0.8	1.3	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5
<u>Value of Incremental Production</u>																					
<u>at financial farmgate prices</u> ^{/1}																					
		----- US\$ million -----																			
Meat (liveweight)	-	7.3	34.7	40.8	48.3	43.7	51.4	72.0	81.6	80.6	74.5	73.6	72.6	71.8	71.1	70.4	69.9	69.2	68.8	68.1	67.3
Milk	-	-	2.6	3.4	4.9	5.0	5.9	7.1	8.0	7.9	6.6	6.5	6.4	6.3	6.2	6.0	5.9	5.7	5.6	5.5	5.3
Wool (greasy)	-	-	-	(0.3)	-	0.3	0.9	1.4	1.4	1.3	1.2	1.2	1.1	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5
Total	-	7.3	37.3	43.9	53.2	49.0	58.2	80.5	91.0	89.8	82.3	81.3	80.1	79.0	78.2	77.2	76.5	75.6	75.0	74.1	73.1
<u>at economic farmgate prices</u> ^{/2}																					
Meat (liveweight)	-	5.9	28.0	33.0	39.0	35.4	41.6	58.3	66.0	65.2	60.3	59.5	58.7	58.1	57.5	56.9	56.5	56.0	55.7	55.1	54.4
Milk	-	-	2.6	3.4	4.9	5.0	5.9	7.1	8.0	7.9	6.6	6.5	6.4	6.3	6.2	6.0	5.9	5.7	5.6	5.5	5.3
Wool (greasy)	-	-	-	(0.4)	-	0.4	1.0	1.7	1.7	1.6	1.4	1.4	1.3	1.2	1.2	1.0	0.9	0.9	0.8	0.6	0.6
Total	-	5.9	30.6	36.0	43.9	40.8	48.5	67.1	75.7	74.7	68.3	67.4	66.4	65.6	64.9	63.9	63.3	62.6	62.1	61.2	60.3
Incremental Flock Value ^{/3}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.6

^{/1} Meat (liveweight) US\$1,360/ton; milk US\$163/ton; wool US\$1,088/ton.

^{/2} Meat (liveweight) US\$1,100/ton; milk US\$163/ton; wool US\$1,300/ton.

^{/3} Valued at liveweight meat prices.

Source: FAO/World Bank Cooperative Program
Preparation Report and mission estimate.

June 1976

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

Bedouin Sheep Flock - Member of Range and Sheep Cooperative

Flock Projection

Item	Present Situation	Year										
		1	2	3	4	5	6	7	8	9	10	11-20
----- head -----												
<u>Breeding ewes</u>												
Total mated	80	75	80	80	86	88	88	88	88	88	88	88
Less deaths	8	7	6	4	4	4	4	4	4	4	4	4
Less offtake	11	11	15	15	17	18	18	18	18	18	18	18
On hand end of year	61	57	59	61	65	66	66	66	66	66	66	66
<u>Breeding rams</u>												
On hand beginning of year	4	5	4	3	4	4	4	4	4	4	4	4
Less deaths	-	1	-	-	-	1	-	-	-	1	-	-
Less offtake	1	1	1	1	1	1	1	1	1	1	1	1
On hand end of year	3	3	3	2	3	2	3	3	3	2	3	3
<u>Ewe replacements</u>												
On hand beginning of year	15	26	24	27	25	24	24	24	24	24	24	24
Less deaths	1	2	2	1	1	1	1	1	1	1	1	1
Less offtake	-	1	1	1	1	1	1	1	1	1	1	1
On hand end of year	14	23	21	25	23	22	22	22	22	22	22	22
<u>Ram replacements</u>												
On hand beginning of year	2	1	-	2	1	3	1	1	2	2	1	1
Less deaths	-	-	-	-	-	-	-	-	1	-	-	-
Less offtake	-	-	-	-	-	1	-	-	-	-	-	-
On hand end of year	2	1	-	2	1	2	1	1	1	2	1	1
<u>Yearling male lambs</u>												
On hand beginning of year	4	5	5	5	4	4	4	4	4	4	4	4
Less offtake	4	5	5	5	4	4	4	4	4	4	4	4
On hand end of year	-	-	-	-	-	-	-	-	-	-	-	-
<u>Lambs</u>												
Males weaned	26	24	27	29	33	34	34	34	34	34	34	34
Less offtake	20	19	20	24	26	29	29	28	28	29	29	29
For replacements	1	-	2	1	3	1	1	2	2	1	1	1
For sale as yearlings	5	5	5	4	4	4	4	4	4	4	4	4
Females weaned	26	24	27	29	33	34	34	34	34	34	34	34
Less offtake	-	-	-	4	9	10	10	10	10	10	10	10
For replacements	26	24	27	25	24	24	24	24	24	24	24	24
----- percent -----												
<u>Production coefficients</u>												
Weaning rate	65	65	68	73	77	77	77	77	77	77	77	77
Adult mortality	10	10	8	5	5	5	5	5	5	5	5	5
Offtake												
Ewes	13	14	19	19	20	20	20	20	20	20	20	20
Rams	20	20	25	25	25	25	25	25	25	25	25	25
Replacement ewes	3	3	5	5	5	5	5	5	5	5	5	5
Replacement rams	4	4	6	6	6	6	6	6	6	6	6	6
Yearlings	100	100	100	100	100	100	100	100	100	100	100	100
Lambs	38	39	37	49	54	59	59	57	57	59	59	59

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

Bedouin Sheep Flock - Member of Range and Sheep Cooperative

Sales Projections

Item	Unit	Present Situation	Year										
			1	2	3	4	5	6	7	8	9	10	11-20
Animals Sold													
Lambs	head	20	19	20	28	35	39	39	38	38	39	39	39
Cull ewes	"	11	12	16	16	18	19	19	19	19	19	19	19
Cull rams	"	1	1	1	1	1	2	1	1	1	1	1	1
Yearlings	"	4	5	5	5	4	4	4	4	4	4	4	4
Average Liveweight													
Lambs	kg	27	27	29	31	31	31	31	31	31	31	31	31
Cull ewes	kg	35	35	38	40	40	40	40	40	40	40	40	40
Cull rams	kg	50	50	54	57	57	57	57	57	57	57	57	57
Yearlings	kg	38	38	41	43	43	43	43	43	43	43	43	43
Total Liveweight													
Lambs	kg	540	513	580	868	1,085	1,209	1,209	1,178	1,178	1,209	1,209	1,209
Cull ewes	kg	385	420	608	640	720	760	760	760	760	760	760	760
Cull rams	kg	50	50	54	57	57	114	57	57	57	57	57	57
Yearlings	kg	152	190	205	215	172	172	172	172	172	172	172	172
Sub-total	kg	1,127	1,173	1,447	1,780	2,034	2,255	2,198	2,167	2,167	2,198	2,198	2,198
Income from Sale of Animals													
Lambs	LS	2,484	2,360	2,668	3,993	4,991	5,561	5,561	5,419	5,419	5,561	5,561	5,561
Cull ewes	LS	1,771	1,932	2,797	2,944	3,312	3,496	3,496	3,496	3,496	3,496	3,496	3,496
Cull rams	LS	230	230	248	262	262	524	262	262	262	262	262	262
Yearlings	LS	760	950	1,025	1,075	860	860	860	860	860	860	860	860
Sub-total	LS	5,245	5,472	6,738	8,274	9,425	10,441	10,179	10,037	10,037	10,179	10,179	10,179
Income from Milk													
Ewes milking	head	43	40	44	47	52	53	53	53	53	53	53	53
Yield	kg/ewe	60	60	63	65	65	65	65	65	65	65	65	65
Production	kg	2,580	2,400	2,772	3,055	3,380	3,445	3,445	3,445	3,445	3,445	3,445	3,445
Value	LS	1,548	1,440	1,663	1,833	2,028	2,067	2,067	2,067	2,067	2,067	2,067	2,067
Income from Wool													
Animals shorn	head	95	101	104	107	111	112	112	112	112	112	112	112
Yield	kg/head	2	2	2	2	2	2	2	2	2	2	2	2
Production	kg	190	202	208	214	222	224	224	224	224	224	224	224
Value	LS	760	808	832	856	888	896	896	896	896	896	896	896
Total Income	LS	7,553	7,720	9,233	10,963	12,341	13,404	13,142	13,000	13,000	13,142	13,142	13,142

/1 Sold for LS 4.60 per kg liveweight.

/2 Sold for LS 5.00 per kg liveweight.

/3 75% of ewes lambing

/4 Sold for LS 0.60 per kg.

/5 Sold for LS 4.00 per kg.

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

June 1976

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

5-year Average Annual Producer Income
Member of Sheep and Range Cooperative
(80 ewe semi-nomadic sheep flock)

Item	Present Situation	Full development With project ^{/1}	Increase
	----- LS -----		%
<u>Sales</u> ^{/2}			
Meat	5,245	10,179	94
Milk	1,548	2,067	33
Wool	760	896	18
Total sales	7,553	13,142	74
<u>Operating Costs</u>			
Feed ^{/3}	1,828	3,238	77
Watering ^{/4}	480	528	10
Veterinary expenses ^{/5}	48	106	121
Head tax ^{/6}	278	321	15
Short-term credit ^{/7}	40	66	65
Total cost	2,674	4,259	59
<u>Net Returns</u>	4,879	8,883	82
	----- US\$ -----		
	1,328	2,417	

^{/1} About year 6 of project.

^{/2} From Annex 10, Table 2.

^{/3} Estimated at LS 22.85 and LS 36.80 per breeding unit, respectively; all concentrates for supplemental feeding.

^{/4} Assuming LS 6 per breeding unit.

^{/5} LS 0.60 without and LS 1.20 with the project.

^{/6} LS 2.65 for each animal over 1 year of age.

^{/7} Without project: two thirds of feed requirements financed interest-free through NFRF, the remainder through private dealer at 20% interest p.a.; with project: 80% financed at 8.5% p.a. interest through NFRF, and remainder paid cash.

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimate.

June 1976

APPRAISAL OF
FIRST LIVESTOCK DEVELOPMENT PROJECT

SYRIA

Average Producer Income in Drought Year
Member of Sheep and Range Cooperative
(80 ewe semi-nomadic sheep flock)

Item	Present Situation	Full development with project ^{/1}	Increase
----- LS -----			
<u>Sales</u> ^{/2}			
Meat	3,446	10,434	
Milk	183	301	
Wool	912	948	
Total sales	<u>4,541</u>	<u>11,683</u>	<u>7,142</u>
<u>Operating Costs</u>			
Feed ^{/3}	5,150	9,960	
Watering ^{/4}	492	507	
Veterinary expenses ^{/5}	49	101	
Head tax ^{/6}	299	308	
Short-term credit ^{/7}	255	219	
Total cost	<u>6,245</u>	<u>11,095</u>	<u>4,850</u>
<u>Net Returns</u>	<u>-1,704</u>	<u>588</u>	<u>2,292</u>
----- US\$ -----			
	<u>-464</u>	<u>160</u>	<u>624</u>

^{/1} About year 6 of project.

^{/2} Present drought year sales: ewes 568 kg (liveweight) at LS 3.70, lambs, yearlings and rams 320 kg at LS 4.20, milk 305 kg at LS 0.60, and wool 228 kg at LS 4. Future, with project, drought year sales: ewes 737 kg at LS 3.70, lambs, yearlings and rams 1,835 kg at LS 4.20, milk 502 kg at LS 0.60, and wool 237 kg at LS 4.

^{/3} Present drought year feed costs based on current prices, except for a 75% increase in average year barley price. Future, with project, drought year: annual feed price based on current prices, except for a 20% increase in average year barley price; emergency feed price of LS 0.67/kg for a 50 kg feed allocation per breeding unit.

^{/4} Assuming LS 6 per breeding unit.

^{/5} LS 0.60 without and LS 1.20 with the project

^{/6} LS 2.65 for each animal over 1 year of age.

^{/7} Present drought year: two thirds of feed requirements financed interest-free through NFRF, the remainder financed through private dealer at 20% interest p.a. with loan outstanding over 9 months. Future, with project, drought year: 80% of annual feed financed by NFRF with 8.5% interest p.a. over 4 months and balance of feed self-financed; emergency feed half self-financed and half with ACB loan at 4% interest p.a. for 1 year.

Source: FAO/WB Cooperative Program Preparation Report and mission estimates.

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Producer Income - Member of Sheep Fattening Cooperative

Item	Full Development	
	Without Project	With Project
<u>Assumptions</u>		
Number of batches fattened per year	3	3
Average number of sheep fattened per year	345	460
Number of sheep by type		
lambs	114	207
yearlings	159	124
ewes	72	129
Average liveweight at purchase/sale (kg/head)		
lambs	20/35	23/39
yearlings	32/54	32/54
ewes	29/40	33/44
Average purchase/sale price (LS/kg liveweight)		
lambs	4.60/4.60	4.60/4.60
yearlings	5.00/5.00	5.00/5.00
ewes	4.60/4.60	4.60/4.60
Value of wool and manure (LS/head)	5.00	5.00
Feed price (LS/1,000 F.U.)	449	428
Feed consumed		
lambs & ewes 100 F.U.		
yearlings 130 F.U.		
Investment in feedlot (160 head capacity)	2,300	2,300
320 m ² @ LS 100 = LS 32,000		
20% self-financing and 80% loan from ACB at 4% repaid over 15 years		
<u>Sales</u>		
	-----LS-----	
Meat	74,532	96,725
Other: manure and wool	1,725	2,300
Less: 2% for mortalities		
Total sales	<u>74,732</u>	<u>97,044</u>
<u>Costs</u>		
Feeder animals	45,533	61,323
Feed	17,632	21,280
Water, electricity (LS 1.00/head)	345	400
Veterinary expenses (LS 0.60/1.20/head)	207	552
Labor (½ man @ LS 3,000/yr)	1,500	1,500
Debt service		
repayment principal and interest	2,300	2,300
construction loan		
interest on feed loans ^{/1}	1,175	1,447
Maintenance of feed yard ^{/2}	<u>1,280</u>	<u>1,280</u>
Total cost	<u>69,972</u>	<u>90,142</u>
Net Return	<u>4,760</u>	<u>6,902</u>
Net Return (US\$)	1,295	1,878
Increase:		45%

^{/1} Without project: 20% p.a. over 1/3 of feed needs (private credit); other 2/3 of feed financed interest free by NFRF. With project: 8.5% over 4 months, for each batch, over 80% of feed needs; remainder self-financed.

^{/2} 4% on investment.

Source: FAO/World Bank Cooperative Program Preparation Report and mission estimates.

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Economic Analysis

Rate of Return

1. The quantifiable economic benefits of the project together with the emergency feed reserve would be the incremental production of meat, milk and wool obtained through stabilizing and increasing the feed availability to flock owners and sheep fatteners, and through the strengthening of veterinary services. These benefits have been valued over the 20-year life of the project at economic prices reflecting export parity prices in regional markets and the long-term price projections provided by the Bank's Economic Analysis and Projections Department.

2. The economic costs were obtained by deducting from financial costs price contingencies, and making adjustments for taxes and subsidies. The incremental value of the breeding flock, the cost of establishing the NFRF cooperative feed fund and the emergency feed reserve as well as the assets of the drug revolving fund, after a 15% adjustment for possible defaults, have been added to the benefits in the last project year to reflect their residual value.

3. Based on the economic benefits and costs, as defined above, a 21% economic rate of return was estimated for the project (Table 1). A number of sensitivity tests were made on the rate of return (Table 2). These tests showed that, if the two most adverse hypothesized conditions would occur together, the rate of return would not fall below 9%.

Benefits not Included in Rate of Return Calculation

4. The non-quantified economic benefits of the project and the emergency feed reserve, while not reflected in the rate of return, greatly support its justification. They would include:

- (a) higher income stability for flock owners and consequent reduction in their degree of financial dependence on private merchants and money lenders;
- (b) increased productivity in other livestock subsectors due to the general effect of feed price stabilization and improved veterinary services;

- (c) the demonstration effect of the success of sheep cooperatives on small farmers' interest in joining cooperatives in general;
- (d) the support for the experiment to design an organization form which facilitates the provision of Government services to previously hard-to-reach Bedouins and which provides incentives for more rational range management.

Emergency Reserve of Domestic Feed Grain vs. Export/Import

5. The basic justification for an emergency reserve of concentrate feed is the insurance of having a guaranteed stock under public sector control which can be allocated rapidly in cases of drought emergency to avoid disastrous reduction of the breeding flock. The emergency reserve would also exercise a moderating influence over otherwise speculative trade by the private sector in whatever small quantities of feed are available in drought years.

6. Two main considerations enter into the choice between such an emergency reserve and the alternative of permitting barley to be exported during surplus years and, importation of barley in drought years: first, the timely delivery of minimum emergency requirements must be assured, and second, the cost of the export/import solution should not be significantly higher than the real cost of creating and holding the domestic reserve.

7. The leadtime required for procurement, i.e. locating supplies, placing order, shipping, and clearing through port of entry, and for distribution of adequate quantities of imported feed grain to flock owners in the areas affected by drought was estimated at a minimum of 2 to 3 months. To be effective, however, the distribution of emergency feed must begin immediately after the identification and declaration of a drought. After 2 to 3 months the need for emergency feed would have ceased since by that time flocks would have access to crop residue in the rainfed and irrigated farming areas. During the 1972/73 drought, orders for barley were placed abroad but they arrived after considerable slaughtering of both production and breeding stock had already taken place. In addition, speculative buying of barley in 1972/73 drove local prices up 40% over the official Government-set price for that year and more than 75% over the official price in normal years. As the imported feed grain could not be made available to end users within the required time, the export/import alternative was rejected. Moreover, a comparative cost analysis of the two alternatives shows the emergency feed reserve only at a slight disadvantage (Table 3).

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Economic Rate of Return

Item	Project Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	US\$ million																			
Costs																				
1. Project investments ^{/1}	23.8	10.3	8.8	8.9	8.7	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Replacement cost ^{/2}	-	-	-	-	-	-	0.6	-	-	-	-	1.1	-	-	-	-	0.5	-	-	-
3. Incremental investments - feed lots ^{/3}	5.5	5.5	3.6	3.6	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Incremental operating cost - sheep flock	25.7	26.1	23.9	26.1	29.6	33.5	36.5	37.8	37.8	36.9	36.9	36.9	36.1	36.1	36.1	35.2	35.2	34.3	34.3	34.3
5. Incremental operating cost - fattening	1.2	1.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
6. Incremental operating cost - animal health services ^{/4}	-	-	-	-	-	0.5	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8
Total incremental cost	56.2	43.1	37.1	39.4	42.7	35.1	38.6	39.4	39.3	38.5	38.4	39.6	37.6	37.7	37.6	36.8	37.2	35.8	35.8	35.9
Benefits																				
1. Incremental value of production ^{/5}	5.9	30.6	36.0	43.9	40.8	48.5	67.1	75.7	74.7	68.3	67.4	66.4	65.6	64.9	63.9	63.3	62.6	62.1	61.2	60.3
2. Incremental value of breeding flock ^{/5}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.6
3. Residual value of project investments ^{/6}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89.5
Total incremental benefits	5.9	30.6	36.0	43.9	40.8	48.5	67.1	75.7	74.7	68.3	67.4	66.4	65.6	64.9	63.9	63.3	62.6	62.1	61.2	195.4
Net Incremental Benefits	(50.3)	(12.5)	(1.1)	4.5	(1.9)	13.4	28.5	36.3	35.4	29.8	29.0	26.8	28.0	27.2	26.3	26.5	25.4	26.3	25.4	159.5

Economic Rate of Return: 21%

/1 From Annex 5, including physical contingencies.

/2 Veterinary laboratory equipment replaced after 10 years; veterinary field equipment and vehicles replaced every 5 years.

/3 Construction by sheep fatteners of feed lots, assuming an average 160-head capacity and a unit cost of LS 32,000 for the incremental number of sheep to be fattened (400,000 head).

/4 Included in project cost during implementation period.

/5 Valued at economic prices.

/6 Includes NPRF and GOP administered project funds and drug revolving fund, assuming a 15% loss due to defaults.

Source: Mission estimates.

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Sensitivity Analysis - Economic Rate of Return

<u>Assumptions</u>	<u>Rate of Return</u>
1. Basic run ^{/1}	21
2. Project investment costs increased by 25%	18
3. Operating costs increased by 10%	17
4. Incremental value of production decreased by 10%	15
5. Incremental value of production decreased by 15%	13
6. A 10% increase in operating costs combined with a 15% decrease in the incremental value of production	9

/1 See Table 1.

Source: Mission estimates.

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Comparative Cost Analysis of Stocking
of Domestic Barley vs. Export/Import

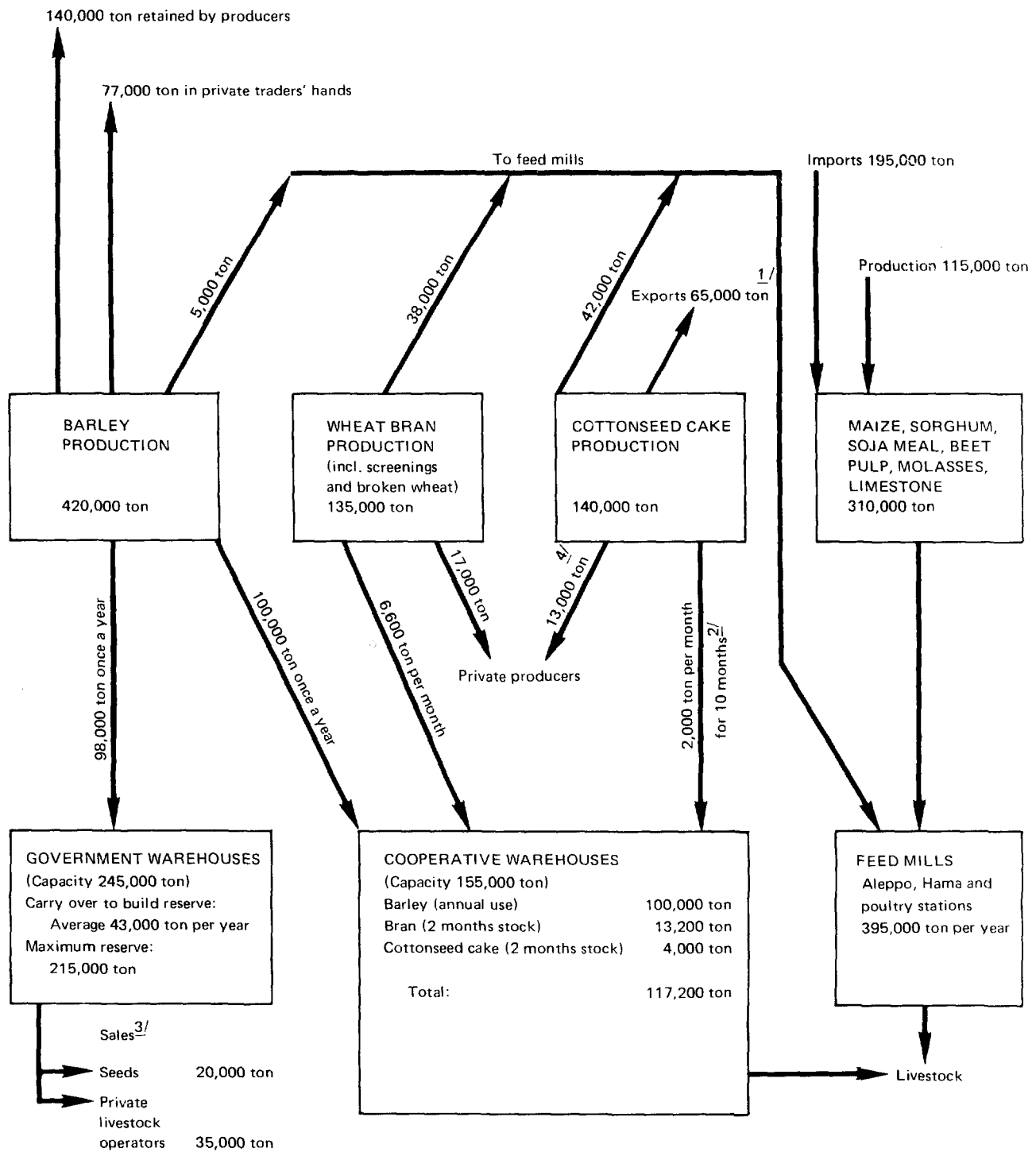
	<u>LS/ton</u>
<hr/>	
<u>Cost of Emergency Reserve Feed Ex-Warehouse</u>	
Producer price (1974/75)	460
Plus: loading and unloading at buying point	10
administrative overheads	
at buying point	25
at warehouse	18
transport to warehouse	18
loading to and unloading at warehouse	8
losses (3% p.a. over 2 years)	28
Subtotal	<u>567</u>
financial cost of holding reserve	
(8.5% over an average of 2 years)	<u>100</u>
Total	<u>667</u>
Less: Producer price	
= Cost of establishing and holding reserve	<u>207</u>
<hr/>	
<u>Cost of Export/Import Alternative</u>	
<u>Export Returns</u>	
FOB price (1975)	386
Less: loading and unloading at buying point	10
administrative overheads at buying point	25
losses (3%)	10
transport to port (600 km at LS 4.4/100 km)	26
port handling, loading, etc.	10
administrative overheads for exporting (3%)	12
Total	<u>293</u>
<hr/>	
<u>Cost of Imported Barley (rendered warehouse)</u>	
CIF price (1975)	424
Plus: loading and handling at port	10
losses to warehouse (2%)	8
transport port to warehouse (500 km at LS 4.4/100 km)	22
administrative overheads for import procurement	12
administrative overheads for warehousing	10
Total	<u>486</u>
<hr/>	
<u>Differential between net export return and net import cost</u>	<u>193</u>

Source: FAO/World Bank Cooperative Program Preparation Report
and Cereals Organization.

**APPRAISAL OF
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IMPLEMENTATION SCHEDULE**

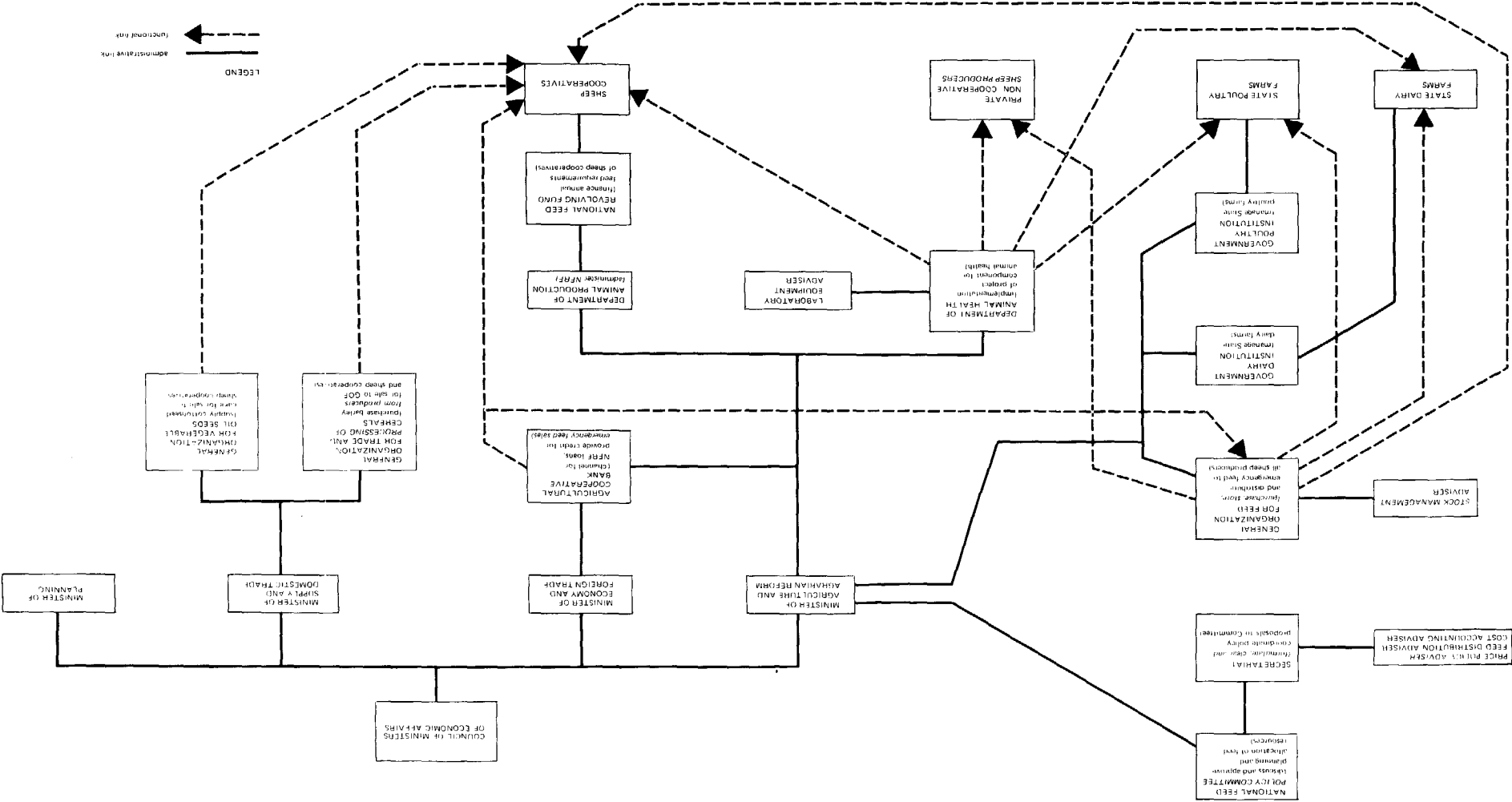
PROJECT ELEMENT	CALENDAR YEAR					
	1976	1977	1978	1979	1980	1981
Financing Annual Purchased Feed Needs of Cooperatives	—————					
Reinforcement of Animal Health Services	—————					
Procurement of Equipment and Vehicles	—————					
Construction of Sheep Dipping Centers	—————					
Financing Operational Expenses	—————					
Technical Assistance						
National Feed Development Scheme						
- Price Policy Adviser	—————					
- Feed Allocation Adviser	—————					
- Cost Accounting Adviser	—————					
- Stock Management Adviser	—————					
Animal Health Services						
- Laboratory Equipment Adviser	—————					
Studies						
- Manpower and Training Needs for Animal Health Services	—————					
- Review of Feed Pricing Policies	—————					
- Feed Financing for Members of Sheep Cooperatives (Baseline Study and Subsequent Quarterly Monitoring)	- - - - -					

**APPRAISAL OF
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LEAST COST SYSTEM OF MOVING FEED MATERIALS BY 1980**



1/ Exports are 78,000 ton during 4 years and nil 1 year out of 5 (drought).
 2/ 1,500 ton per month for 10 months during 4 years; 4,000 ton per month for 10 months during 1 year out of 5 (drought).
 3/ Volume of sales would allow rotation of emergency stocks in most years.
 4/ 5,000 ton per year during 4 years; 45,000 ton during the drought year (of which 40,000 ton for emergency use).

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Organization Chart



LEGEND
 ← administrative link
 ← functional link

