Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

Original

Document of

The International Fund for Agricultural Development

For Official Use Only

الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT

Appraisal

VOLUME I: MAIN REPORT

Near East and North Africa Division
Project Management Department

REPORT No.
December 1991

LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT
APPRAISAL REPORT

TABLE OF CONTENTS

LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT
APPRAISAL REPORT

Table of Contents (cont.)

LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT
APPRAISAL REPORT

Table of Contents (cont.)

TABLES

APPENDICES

ANNEXES (VOLUME II)

LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT
APPRAISAL REPORT

CURRENCY EQUIVALENTS

Currency Unit	=	Lebanese Pound (LBP)
LBP 1.00	=	USD 1.136
USD 1.00	=	LBP 880

WEIGHTS AND MEASURES

1 kilogram (kg)	=	2.204 lb.
1 hectare (ha)	=	10 dunums
1 hectare	=	2.47 acres
1 000 kg	=	1 metric ton (mt)
1 dunum (du)	=	0.1 hectares (ha)
1 acre	=	0.405 ha
1 litre	=	1.06 quarts
1 kilometre	=	0.39 square miles

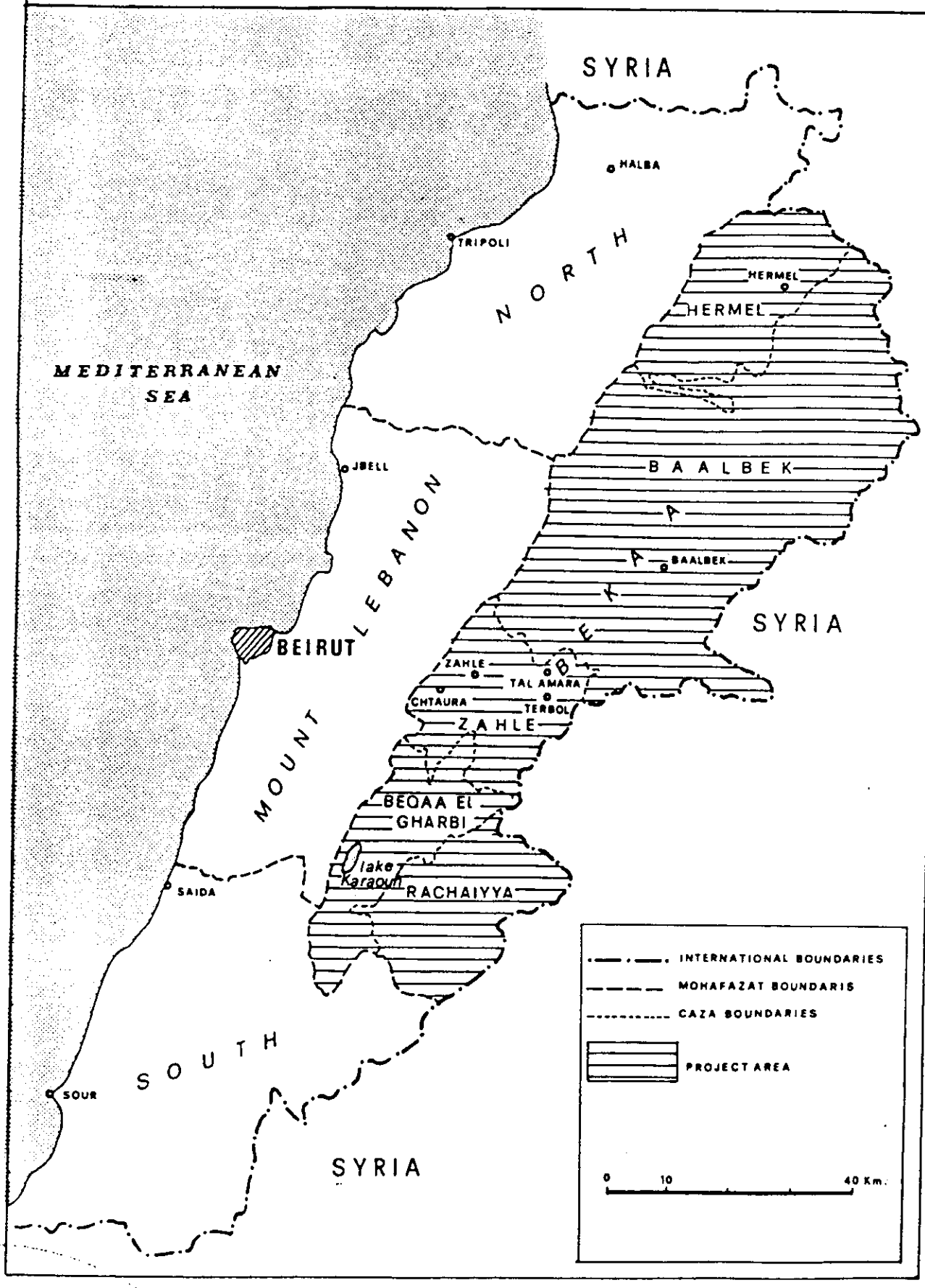
ABBREVIATIONS AND ACRONYMS

AI	Artificial Insemination
AREC	Agriculture Research and Education Center
AUB	American University of Beirut
Caza	Districts
CDR	Council for Development and Reconstruction
CTA	Chief Technical Adviser
EC	European Community
ESDC	Economic and Social Development Council
FAFS	Faculty of Agriculture and Food Science
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GNP	Gross National Product
ICARDA	International Center for Agricultural Research in the Dry Areas
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
LARI	Lebanese Agricultural Research Institute
MOA	Ministry of Agriculture
NADB	National Agricultural Development Bank
NCSR	National Council for Scientific Research
NGO	Non-Government Organization
NUCC	National Union of Cooperatives and Credit
PCB	Planning and Coordination Board
PCC	Project Coordinating Committee
PFLP	Pasture, Forage and Livestock Program
PMU	Project Management Unit
SCF	Save the Children Federation
SOE	Statement of Expenditure
SSE	Small Scale Enterprise
UNDP	United Nations Development Program
USAID	United States Agency for International Development

FISCAL YEAR

July 1 - June 30

REPUBLIC OF LEBANON
Smallholder Animal Production Development Project



LEBANON
SMALLHOLDER LIVESTOCK DEVELOPMENT PROJECT
APPRAISAL REPORT

I. PROJECT AND SECTORAL BACKGROUND

A. Project Background

1.01 The project aims at increasing the income of some 8 500 livestock farm families, including rural women, in the Bekaa valley of Lebanon. The project would provide improved breeds of cattle, sheep and goat, remove major obstacles to increased productivity in the livestock sector - (inadequate veterinarian extension services, and poor nutritional practices, lack of credit as well as inadequate farm management). The project would strengthen the institutional capacity of the Ministry of Agriculture to deliver essential services including extension and research efforts in the areas of genetics and reproduction, and forage production and management of pastures. In addition, the project would specifically address the needs of rural women by offering training as well as credit for off farm income generating activities to about 500 women.

B. Recent Sectoral Performance

Economic Setting

1.02. Lebanon, with an area of 10 452 km^2 and with an estimated population of about 3.2 million (1991), is one of the smallest countries in the Middle East. Prior to the civil war, the rate of natural increase of population was 3.1%. Available estimate for 1982 is 2.2%. Its location at the mid point between Europe and the East has enabled its people to play the role of middlemen in trade. The Lebanese economy has always been service oriented.

1.03 Analysis of economic activities in Lebanon is seriously hampered by lack of reliable data. The last official national accounts statistics was prepared in 1975. In recent years, estimates of the GDP have been prepared based either on surveys of the most important economic activities or on certain indicators such as electricity production, industrial outputs and export and import trends.

1.04 Economic and financial development in Lebanon since 1976 has been dominated by the conflicts. The fragmentation of the country disrupted the movements of goods and factors of production. Nevertheless, the economy has shown considerable resilience and has recovered slightly during periods of relative peace (1987-88, 1990 onwards). The flexible response of the economy to prevailing security conditions reflects in large part the free market pricing of most goods and services and, in recent months, the improved competitiveness of the economy. According to the International Monetary Fund (IMF), the structure of the economy has shifted away from services towards industry and agriculture. At the same time, because of transport difficulties, production has shifted towards easily transported, less bulky and high value goods. Many industrial plants have relocated to parts of the country less affected by the conflict. Some have relocated abroad while retaining a presence in Lebanon, thereby strengthening their earnings at a time of declining economic activity.

1.05 Prior to the civil war, Lebanon enjoyed a period of economic growth and financial stability. Lebanon maintains an exchange and trade systems which is almost entirely free of restrictions on payments and transfers for current and capital transactions. The foreign exchange value of the Lebanese pound (LBP) is determined by supply and demand in the Beirut foreign exchange market, which consists of the major financial institutions, including the Bank of Lebanon, and exchange dealers. The pound was fairly stable until 1975. The exchange rate in relation to the USD varied between LBP 2.38 and 3.25. At the beginning of 1979, the pound began falling reaching LBP 5.29 in November 1983. Since 1984, the slide has been most dramatic because of the propensity of the private sector to hold their reserves in other currencies. In September 1990, the rate of exchange vis-à-vis the USD was LBP 1 200. It has now stabilized at LBP 880 to USD 1. Currently, most prices are quoted in USD. Real GDP growth rate averaged 6% per annum during the period 1965-75 and per capita reached USD 2 250 in 1975. In 1986 the economy recovered slightly due to improved security combined with substantial decline in labour costs in real terms and the sharp depreciation of the Lebanese pound. However, the events of 1989-90, particularly in the Beirut area, resulted in a decrease of output by 15% in 1989, and a further fall in 1990 by 10%. Industry and commerce were particularly affected by the blockade of the Port of Beirut which made foreign trade (including the importation of raw materials) difficult.

1.06 There have been recent attempts to estimate the Gross Domestic Product (GDP). A United Nations Development Programme (UNDP) financed study estimated the GDP in 1988 at about USD 3.3 billion and Gross National Product (GNP) at USD 3.9 billion; thus, per capita GNP in 1988 is estimated at USD 1 270[1/]. A 1991 paper prepared for the World Bank/IMF Bangkok Annual Meeting estimated the GNP per capita to be around USD 980. In terms of sectoral shares of the GDP, the UNDP study found that trade continued to rank first with 28% of the GDP, followed by manufacturing (20.5%) and agriculture (10.5%). The total economically active population was estimated in 1983 at around 815 000 and 855 000 in 1987 as compared to 748 000 (of which 18.4% were women) in 1975. 1985 estimates by the National Employment Office indicated that the labour force was distributed as follows: manufacturing - 10%; agriculture - 23%, trade, restaurants and hotels 17.2%. In 1990, the United Nations Disaster Relief Organisation estimated the unemployment rate to be 35%.

1.07 The Council for Development and Reconstruction (CDR) is preparing plans for rebuilding the infrastructure and establishing sectoral strategies after it was empowered to do so by the Government. A recent position paper prepared by the Government of Lebanon for the Bangkok IMF/ World Bank annual meeting has estimated that it would cost USD 4 billion to reconstruct Lebanon of which USD 136 million would go to the agricultural sector.

Agricultural Sector

Overview

1.08 The agricultural sector has played a relatively minor role in the Lebanese economy since the 1960s. Its share of the GDP has declined from 12% in 1964 to 10.5% in 1988 according to the latest available

---

1/ UNDP: Lebanon - The Gross Domestic Product and Gross National Income 1988, Preliminary Results, (Beirut, 1990).

statistics. This decline, however, does not represent an overall decrease in agricultural production but rather a relative increase in the share of the other sectors, particularly the service sector. Its share of the Government budget (1%) underscores its relative weakness compared to the other sectors. About 7.5% of the labour force are involved in agriculture, compared to 38.3% in the 1960s. This is mainly the result of rapid urbanization, the mechanization of agriculture and the relative attractiveness of the service sector.

1.09 The potential for agriculture in Lebanon is considerable. Of its 1.01 milllion ha, approximately 360 000 ha are arable[1/]. (Although the number under cultivation has been considerably reduced during the last 15 years.) Of the total arable land, 66 000 ha are under permanent irrigation and another 20 000 ha seasonally irrigated. Permanent meadows and pastures are estimated at 10 000 ha, forests and wetlands at 80 000 ha. According to estimates prepared by the Food and Agriculture Organization (FAO), 31% of the arable land can be classified as productive, while 57% is marginally productive. It is estimated that, of the area under commercial cultivation, including forest plantations, fruit trees account for 30%, vegetables 6%, cereals 19%, industrial crops 7%, fodder crops 7% and forest plantings 27%[2/].

1.10 Lebanon has traditionally been the fruit and vegetable exporter to its Middle Eastern neighbours but recent events had disrupted agricultural production generally and had disastrous consequences on the agricultural productivity of South Lebanon and the Bekaa valley, in particular. Vast crop fields were destroyed. There was extensive damage to infrastructure and a disruption of Government extension services and research. The deterioration of the irrigation network led to farmers increasingly resorting to private wells. The underground water supply was affected and this led to a shift to the production of crops such as olives and grapes requiring less water. Cropping patterns have changed during the last few years. With the deterioration of transportation routes and higher demand for fruits and vegetables in the traditional markets for Lebanese exports, agricultural production has shifted to high value crops that are easier to transport and to production of high value illegal crops. Sugar beet production has declined, especially after the only sugar factory was destroyed. Tobacco, which once occupied 7 000 ha now covers only about 740 ha in 1991. It is estimated, by the IMF, that the production of cereals has declined by over one third between 1975 and 1987. The total Gross Output of agriculture for 1988 amounted to USD 598 million[3/]. Of this, the major crops (field crops, industrial and illegal crops and fruits) contributed 72% of the total. Animal production accounted for 21% and other minor crops 7%. (See Appendix 2.)

1.11 With the return to normal conditions, the agricultural sector faces major constraints which must be addressed. These are: (a) absence of zoning laws to regulate land utilization and reduce the transformation of agricultural land into housing and industrial zones; (b) the shortage of irrigation water due to delays in the implementation of major irrigation

---

1/ IMF: Lebanon - Recent Economic Developments, 1991.
2/ Economic Intelligence Unit: Lebanon Country Profile, 1991.
3/ UNDP op.cit.

schemes; (c) the lack of agricultural credit, mainly seasonal, short- and medium-term credit to small farmers; and (d) the disappearance of forested areas due to negligence and violations resulting in soil erosion and severe environmental problems. The Government is aware of these problems and is trying to put a strategy in place to resolve them. The Government is looking to the agricultural sector as a source of growth in the medium term. The overall goal emphasizes the need to achieve food security, ameliorate the balance of trade and improve the standard of living of the rural population as a means of curbing the rural-urban migration.

Livestock sub-Sector

1.12 Animal production, including poultry, is estimated to contribute about 21% of agricultural GDP and about 2.3% of total GDP. Livestock losses were substantial during the war. Apart from losses directly attributable to the war, the number of cattle and sheep declined due to inability of herders to graze the stock on secure pastures. Prices of imported feed rose dramatically with the decline of the pound and market circuits both internal and external were broken. Lebanon's livestock is kept for milk and meat production and present estimates are 450 000 goats, 184 000 sheep and 42 000 cattle. These numbers include stock of all ages. It is estimated that lactating cows do not exceed 40% and adult sheep and goats 60-65% of the total number of these respective animals. The sheep are of the Awassi breed and are highly valued for their milk and meat. The goat is a local breed characterized by low productivity and very harmful to the environment. Unfortunately, as a result of the recent activities, the number of sheep and cattle have fallen to 74% and 42% respectively over their 1974/75 levels, while the goat stock has increased by 50%. The present cattle stock are mostly crossbred animals obtained by grading-up local (Baladi) cattle to Friesian/Holstein. There are conflicting estimates of the number of purebred Friesian/Holstein cattle because externally they are not different from crossbred animals. It is estimated that the Bekaa contains about 20%, 56% and 34% respectively of the cattle, sheep and goat populations of Lebanon.

C. Main Constraints to Growth

Animal Health

1.13 The animal health situation in Lebanon deteriorated since 1975, primarily due to the collapse of the Government veterinary services, and the absence of organized disease control and eradication programmes. Despite this, however, some veterinary services were maintained in the project area but their services were not free. It is estimated that there are about 110-120 veterinarians in the country of whom about 15-20 are in the Bekaa. Major animal diseases - Foot-and-mouth, Rinderpest, Anthrax, Sheep and Goat Pox, Brucella melitensis and others are present in Lebanon. Rinderpest was first diagnosed in South Lebanon in 1977 but since then, it has not been diagnosed in the laboratory again. Foot-and-mouth occurs periodically during the winter mainly in cows. About 100-150 cases were recorded last year. Veterinarians and farmers are well aware of the presence of the disease and animals are vaccinated around infected flocks. For several years, there was no vaccine production in Lebanon.

1.14 A major concern is the prevalence of Brucella melitensis which is harmful to both animals and humans. A recent study completed under a UNDP supported project found that 56.6% of the farms and 22% of the ruminant stock are infected. The study indicated that the actual occurence may be less because the samples tested were from suspected or infected farms and animals. The factors constraining adequate disease control include weak policy formulation, lack of personnel, equipment and transport, inadequate training of professional staff, absence of disease monitoring, recurring shortages, lack of staff management and supervision.

1.15 The lack of vaccines for many of the diseases is being met by bilateral and multilateral agencies. Vaccines have been made available within the FAO's Middle and Near East Animal Production and Health Project, and bilateral agreements with neighbouring countries. Recently (October 1991), a refresher course on Rinderpest was organized by a consultant, as part of FAO's West Asia Rinderpest Control Programme. Lebanon has also received from Egypt and Iran 25 000 doses of rinderpest vaccine and 75 000 doses of Foot-and-mouth vaccine all of which have been utilized.

1.16 Prior to 1975 the Lebanese Agricultural Research Institute's (LARI) laboratory at Fannar was operating as a regional vaccine production centre specializing in poultry disease vaccines, especially Newcastle disease. Between 1987 and 1990 it received financial assistance from UNDP and was once more offering diagnostic, post mortem, bacteriological, serological and parasitological services. In addition, it has produced a total of 33.1 million doses of Newcastle disease vaccine, 120 000 doses of anthrax vaccine and 200 000 doses of Sheep and Goat Pox vaccine. Further assistance has been promised to the laboratory by UNDP for this work.

Animal Feeding

1.17 Inadequate quantities of locally produced feeding stuffs reduce the profitability of livestock production, forcing the farmers to rely partly on expensive imported grains and other concentrates to feed their stock. Natural pastures have deteriorated, both in quality and output, and their legume content is low. Other sources of feed, such as straw, agricultural residues and agro-industrial by-products - although readily available in sufficient quantities - are still of low nutritional quality to support high yields, especially from dairy cows. On the other hand, a high adoption rate for improved forage production practices has been constrained so far by the low productivity of the stock available to small farmers. Lebanon imports, at world market prices, adequate quantities of concentrates; milling and mixing capacity is sufficient and there is no immediate danger of shortage in compound feeds. Feed included in compound rations for dairy animals are wheat, barley, corn, cotton and linseed cake, soya bean meal and typically over 20% of low priced and readily available local bran. Prices are on the order of USD 170 per ton. This is rather high considering that bran, a major ingredient costs about USD 60 per ton.

Government Services

1.18 Traditionally Lebanon had relied on veterinarians rather than animal production specialists to deliver such advisory services as farm

management, feeding, housing and stock breeding. Between 1975-1990, Government extension and veterinary services broke down. Despite the availability of qualified researchers and professionals, a major weakness of the system at present is the overwhelming lack of field extension services. The small Livestock producers have been left on their own initiatives and have had to pay for advice which would normally be free if such services exist. Farmer training facilities, like the Terbol Station, broke down and small farmers were virtually left to deal with complex technical problems relating to livestock. Artificial insemination services also ceased to exist and the use of natural breeding of the dairy stock increased the cost of production and contributed to the spread of disease and inbreeding. These constraints will be addressed through this project.

Land Utilization

1.19 There has been a tendency towards concentration of land ownership in recent years as land was acquired for speculative purposes and to provide a source of income less sensitive to the prevailing situation. The land utilization pattern has changed (para 1.10). The cost of renting irrigated land increased and small livestock farmers were forced to rely more on expensive imported concentrates. Crop sharing in the form of renting crop and vegetable residues increased and was taken advantage of mainly by semi-sedentary sheep herders keeping stock of low productivity. In the coming years, a reversal of these phenomena is expected to take place and improved stock, properly managed, would offer farm families attractive opportunities to increase their income and to practice integrated farming systems for which the Bekaa is suitable.

Market Prices

1.20 The market for livestock products, especially milk, did not function properly during the period of emergency. The breakdown of infrastructure and communications had an adverse effect on the small livestock producers who have fallen prey to intermediaries nurtured during the long absence of any government control. Most inputs - seeds, fertilizers, concentrates, vaccines and drugs were available but their prices were high. The situation with milk is more complicated. Lebanon produces 88 000 tons of fresh milk and consumes 384 000 tons of milk and milk products. The difference is met by reconstituted imported powdered milk, as well as imported cheap white cheese. The cost of imported reconstituted milk is half the price of fresh milk because of heavy subsidies in the countries of origin. The low price of fresh milk constitutes a major constraint to increasing production. While some producer cooperatives have recently been formed as a means of influencing the price, their impact has been negligible. Recently (May 1991), the Government in an effort to stabilize the price of domestically produced fresh milk, passed a law requiring processing plants to use equal amounts of fresh and reconstituted powdered milk. This law has yet to be enforced.

D. Sectoral Strategies

Agricultural Sector Strategy

1.21 As stated in para 1.11, the agricultural sector is now expected to play an important role in the reconstruction and the economic development

of the country. The following general objectives were adopted during the Round Table on Reconstruction and Development of the agricultural sector in Lebanon held in Beirut during January of 1982 and still apply

(a) ensuring food security in the country through the rational exploitation of the national productive potential;

(b) ensuring the supply of agricultural products at competitive prices;

(c) promotion of agricultural exports which would contribute to the equilibrium in the trade balance;

(d) providing an equitable income to the farmers which would be in line with other sectors;

(e) optimizing the use of natural resources and ensuring their protection; and

(f) contributing to a more balanced development in the different regions and in the standard of living between the urban and rural zones of the country.

1.22 The Government has begun a review of the function of the Ministry of Agriculture as part of a comprehensive program to reorganize and streamline the civil service. Major emphasis would be placed on reviving the strong Government extension, animal health, and research services which had broken down during the long period of hostilities and on training and/or recruiting new officers to replace those officers who have retired.

Livestock sub-Sector

1.23 The Government's objectives in the livestock subsector are: (a) to increase the volume of production by replenishing part of the livestock (especially dairy cattle) lost during the civil unrest; (b) to improve livestock productivity by encouraging farm families to replace gradually their existing stock with improved breeds and to integrate crop and livestock production; (c) to increase the income of rural families in general and livestock owners, in particular; and (d) to reduce the level of dependency on imported dry milk and dairy products. To achieve these objectives, the government places emphasis on the following areas: (i) re-establishing, strengthening and improving rural animal production; (ii) improving the level and quality of veterinary and extension services available to smallholder farmers; (iii) strengthening research, breeding and disease control services as well as related programs aimed at improving forage production from available resources; (iv) increasing the availability of improved stock in closer fit with integrated crop-livestock farming systems; and (v) promoting milk marketing and processing activities so as to stabilize prices at a level that would permit a reasonable standard of living for the farm family.

E. IFAD's Operation and Experience in Lebanon

1.24 To date, IFAD has not financed any projects in Lebanon. In 1983, IFAD fielded a mission to formulate an Agricultural Development and Rural Rehabilitation Project. The prevailing security situation at that time prevented any follow up on this project. On 23 November 1990, a Government delegation visited IFAD, met with the President, and held discussions with the Near East and North Africa Division regarding future IFAD assistance. Following the discussions between the Government of Lebanon and IFAD, the Lebanese Government submitted two projects for IFAD financing. They are a Rural Development project and a Livestock Development Project. The Livestock Development Project was selected for immediate processing. A Socio-economic Study was funded by IFAD in October as part of the preparation for this project (see Annex II). The project was appraised in the field from 23 October to 10 November 1991.

F. Institutions Related to Agriculture

1.25 The Lebanese agricultural and rural development institutions cover several ministries, autonomous boards and other agriculture related institutions evolving within a legal structure based on free market system. However, their activities have been limited and their roles are not always clear. Activities of most of the Ministries, including the Ministry of Agriculture (MOA), the autonomous boards and the other authorities concerned have been limited. Even when the structures are in place, there are no personnel to carry out the functions either because of absence of key personnel or because many officers have aged and the new recruits lack experience. Since 1978, very few technical officers have been recruited. An inter-Ministerial committee has been in session since July 1991 to decide on the new administrative framework and appoint new officers. The following institutions deal with agriculture:

(a) The Economic and Social Development Council (ESDC). This agency was established in 1990. It aims to ensure, through a system of consultation and proposals, that representatives of all the various sectors in the economy participate in the planning for economic and social policy. The ESDC is not yet operational.

(b) Ministry of Agriculture (MOA). By decree of law N.97, dated 16 September 1983, the Ministry of Agriculture (MOA) was completely reorganized and granted full responsibility for agricultural and rural development. This decree was followed by an order outlining practical measures for its implementation. The order which has not yet been implemented:

- incorporates three autonomous boards (the Fruit, the Silk, and the Livestock Boards) within the framework of MOA. These became departments of the Ministry, which inherited their prerogatives, assets and liabilities;

- establishes the Rural Development and Natural Resources Department to which the Office of the Green Plan is attached (see para 1.27);

- the Planning and Coordination Board (PCB), headed by the Minister of Agriculture, and with the Directors of the different departments of the Ministry as members. The Board's role is to set medium and long term programs, to evaluate the annual goals of the Ministry's various boards, coordinate their work and assess the productivity of the various divisions;

- the Prime Agricultural Board, a consultative body to assess the development programs of the Ministry, also has the Minister of Agriculture as its President. The other members are: the Dean of Agriculture of the Lebanese University, the Director General of the National Union of Cooperatives Credit (NUCC), the General Director of the National Agricultural Development Bank (NADB), representatives from the National Board of Foreign and Economic Affairs, the Chamber of Commerce and Industry and three representatives of the farmers.

1.26 Figure 1, in Appendix 1, shows the current situation and the Attachment explains the responsibilities of the various agricultural Boards. MOA is in the process of being rehabilitated and reorganized under a special two year UNDP funded project. There will be five different technical departments (see Appendix 1).

(a) the Agricultural Resources Department, incorporating the fruit and silk boards (this department is also responsible for import and export licences as well as for all activities relating to plant agriculture);

(b) the Animal Production Resources Department, incorporating the former Animal Protection Office and the Department of Animal Production which used to be in charge of the veterinary services implementing Government plans for disease control and eradication, operating a quarantine station and controlling imports and exports of all products of animal origin. It was further responsible for operating artificial insemination (AI) for cattle and for general animal production services with sections for ruminants, horses, reproduction and AI and for poultry. All these services broke down. However, most of the personnel have remained on the payroll and have been offering services, sometimes for a fee, to the public in the areas where they lived;

(c) the Rural Development and Natural Resources Department is responsible for forestry, natural resources, rural development and agro industry;

(d) the Department of Studies and Coordination is responsible for planning, agricultural economics, statistics and extension;

(e) the Administration Department.

1.27 The Green Plan was created in 1963 as an autonomous office under the Minister of Agriculture. It is headed by an Executive Committee of three. Its main objective is to extend the arable area of the country.

This objective is achieved through loans for construction of large terraces, building of feeder roads and earthen water reservoirs for irrigation, producing and distributing seedlings. Since the start of the operation, the Green Plan has reclaimed 22 500 ha of land belonging to 45 000 farmers in nearly 1 500 villages throughout Lebanon at an average cost of USD 2 000 per ha of land reclaimed. It has also constructed 900 km of feeder roads (6 m wide) at a cost of USD 5 000 to USD 15 000 per km depending on the topography and geology of the soil. It has been responsible for planting about 2.5 million fruit trees and 0.8 million forest trees. It has also been supported by a grant of about USD 10.0 million equivalent of food aid from the World Food Program (WFP) for the funding of some of its activities. For more on the Green Plan's activities see Appendix 5.

Agricultural Research

1.28 Lebanese agricultural research bodies, which date back to the early fifties, had attained a high level of technical expertise. The Lebanese Agricultural Research Institute (LARI) handled crop production research, while the Livestock Board dealt with livestock production research. Agricultural research suffered enormously during the last sixteen years.

1.29 The Lebanese Agricultural Research Institute (LARI). The LARI is the premier agriculture research institution in Lebanon. It operates eight regional stations:

(a) Tel Amara in the Bekaa valley is responsible for research on soil, water and crops. This station is being rehabilitated through a joint effort by the International Centre for Agricultural Research in Dry Areas (ICARDA) and UNDP financing and has since July 1991 resumed its activities specifically in soil analysis, pathology, and veterinary laboratory services and programmes for the development of wheat and sorghum hybrid seeds;

(b) the Terbol Station, also in the Bekaa, is an animal research and training centre. It is at present not functioning since it suffered heavy damage. Some of its buildings are occupied by military forces and 50 ha of the land have been leased to ICARDA. The Government hopes to restore it to its past function through this project;

(c) the Fanar station near Beirut operates as a vaccine production and veterinary laboratory and also conducts research on crop pests and diseases. It also operates a secondary agricultural school;

(d) Abdeh coastal station conducting research on citrus and citrus related diseases;

(e) Libaa in the Zahrani region responsible for agricultural research in South Lebanon;

(f) Kfardan in the Bekaa responsible for research on semi-arid agriculture;

(g) Kfar-Khashna in Zghorta responsible for research on olives;

(h) the Tyre Station conducting research on citrus production.

1.30 Research activities of the LARI were diminished with the exception of the Fanar Laboratory which continues to function on a limited basis. There was a severe reduction in personnel at all levels. Buildings, including equipment and infrastructure, were destroyed and in need of replacement and rehabilitation.

1.31 The National Council for Scientific Research (NCSR). This Council is responsible for planning and coordinating scientific activities in Lebanon. Its budget is in principle financed through a 1% allocation from the national budget, but it has never really received that much. It used to allocate 15% of its budget to agricultural research, funding the Green Plan and other economic and technical studies.

1.32 The only private agricultural research organization in Lebanon is the Faculty of Agricultural and Food Sciences of the American University of Beirut and its Agricultural Research and Education Centre (AREC), which operates on a surface area of about 1 000 du in the Bekaa, conducting basic and applied research in the field of crop production and protection, animal production, soil, irrigation and mechanization.

Other Ministries involved in Agriculture and Rural Development

(a) The Ministry of Water and Electrical Resources, particularly the Irrigation Services and the Litani National Board, which operates under the Ministry's supervision, and is responsible for irrigation.

(b) The Ministry of Finance, together with the Land Registry and Topography services and the National Tobacco Company, which has the monopoly for tobacco: planting, purchasing, storing, and processing the harvest.

(c) The Ministry of the Economy and Trade. The Cereal and Sugar Beet Board, under the Ministry's supervision, used to be responsible for supplying the country with wheat and sugar, but sugar production ceased in 1975 and wheat import subsidy was abolished in 1991.

(c) The Ministry of Housing and Cooperatives, together with the Cooperatives Department, which is responsible for the National Union of Cooperatives and Credit (NUCC) and is currently responsible for Agriculture Cooperatives.

(d) The Ministry of Labour and Social Matters, together with the Social Development Board and its Rural Development Services, is expected to promote and fund small rural development projects.

(e) The Ministry of Education, together with the Technical Training Department and the Lebanese University where a Faculty of Agriculture and Veterinary Medicine is being set up.

1.33 The Council for Reconstruction and Development (CDR). The task of the CDR (established in 1977) was to prepare a general development and reconstruction plan. The CDR replaced the Ministry of Planning, which was abolished by the decree establishing CDR. The CDR was also assigned the unprecedented authority to borrow money from both in and outside the country in order to finance any project or program it was assigned. A ten year plan was drawn up in 1978, but its implementation was hampered, inter alia, by the war. The existing organization chart is shown in Figure 3 of Appendix 1. This chart is under modification.

1.34 Agricultural Education. The institutions providing agricultural education are: the National Training School at Fanar for secondary education; the Lebanese University's Faculty of Agriculture and the Faculty of Agricultural and Food Sciences (FAFS) of the American University of Beirut, founded in 1952, which provides both undergraduate and postgraduate degrees in crop production and protection, agricultural economics and development, animal production, soil, irrigation and mechanization, as well as food technology.

1.35 Cooperative Movement. The word cooperative is used loosely in Lebanon and most cooperatives are consumer cooperatives. Those cooperatives operating under the heading of Agricultural cooperatives are really commercial/consumer institutions. Where service cooperatives exist, their services are limited to making machinery and other inputs available at cost to members. Extension, veterinary and operating services are seldom offered. Problems typically associated with cooperatives in rural settings of Lebanon are individualism, mismanagement and suspicion. Successful cooperatives are mostly associations of large farmers who, because of their size, are able to benefit from economies of scale. Smallholder groups exist and in some cases function well but are competitively at a disadvantage.

1.36 In the whole of Lebanon, there are about 500 cooperatives of which 73 are operational. In the Bekaa, there are 59 cooperatives (28 of which are non-functional, 23 barely exist, and eight can be classified as functional). Of the eight in existence, three are animal producers' cooperatives. (The list of Agricultural Cooperatives is provided in Appendix 5).

1.37 Cooperatives are administratively under the Ministry of Housing and Cooperatives. However, a recent edict of the Government has removed all agriculture cooperatives from this Ministry and placed them under the Ministry of Agriculture. The strengthening of the agriculture cooperatives is one of the activities to be undertaken in the course of the UNDP project implementation period (para 1.26).

1.38 There are two other institutions dealing with cooperatives in Lebanon:

(a) The National Union of Cooperative Credit (NUCC). The NUCC was founded in 1968 to support small scale farmers with technical and financial resources. It is administered by a seven member Board of Directors - five of whom are appointed by the General Assembly of Cooperatives and two by the Government. Its funds are either from the Government budget or through financial

assistance from multilateral and bilateral agencies. It has received support from USAID (USD 2.0 million) and European Community (EC) (DM 2.0 million). NUCC gives loans only to cooperatives to purchase farm equipment and to establish processing plants. Recently it approved a loan of about DM 300 000 for development of dairy processing plant. The loan was mainly for the purchase of cars for milk collection in the Bekaa. Repayment periods are seven years for tractors and 13 years for olive oil processing and dairy milk processing. The interest rate charged depends on the cost of the funds and the currency in which the loan is issued. Currently, the interest rate is between 5% and 6% if the loan is disbursed in foreign currency and around 13% if the loan is issued in local currency. The recovery rate of the NUCC is poor. On the USAID loan, there was no account of the use made of the funds and it was not possible to determine its recovery rate;

(b) The National Federation of Lebanese Cooperatives, founded in 1968, for promotion, organization and coordination of cooperative activities, conducting of studies and research on methods of group formation and for dissemination of information to members.

G. Agricultural Credit

1.39 Banks. Lebanon has a thriving banking sector and branches of all the major Banks operate in the Bekaa (for details see Appendix 5). Although most major landowners are customers of the commercial banks, only about 2% of the total credit granted by commercial banks is for agricultural purposes. In recognition of this situation, the Government decided to establish a National Agricultural Development Bank (NADB). This Bank is only on paper. The decree establishing it stipulates that the Government would have a 50% share and that its objective would be to fund agricultural projects, including animal production as well as agro-industrial activities.

1.40 In spite of its importance in the Lebanese economy, the agricultural sector has received only a minimal share of total banking credit. The total amount of capital lent out by commercial banks for agricultural activities (exclusively to large farmers) was never above 2.6%. The main sector benefitting from commercial bank credit is the commercial sector (around 50%). Loans issued by commercial banks to agriculture are based exclusively on commercial criteria and the current (1991) interest rate is 27% p.a.

1.41 Other sources of agricultural credit, which do exist in Lebanon, are the following:

(a) Loans by the National Union of Cooperative Credit (NUCC), (para 1.38) with funds obtained from the Government, and other foreign donors. With funds obtained from the EC, NUCC has extended medium term credit to some agricultural cooperatives for certain investments such as: tractors, establishment of olive oil processing units or other agro-processing industries.

(b) Loans issued by merchants who supply inputs or purchase agricultural products. Interest rate payable by the farmers from this source is much higher than the rate charged by commercial banks, and varies between 4% to 8% per month[1/] corresponding to 72% p.a. The selling price of agricultural machinery is sometimes inflated by as much as 40% if the repayment period is between 24 to 30 months. Small farmers usually pay cash for inputs but at an inflated price of 20% to 40% more than the large farmers when the repayment period is after the harvest. In addition, they are obliged to buy certain inputs, like seeds even when they are unsuitable for local conditions.

(c) One non-Government Organization (NGO) involved in credit to small farmers is the Save the Children Federation (SCF). This NGO started its programme in Lebanon in 1953. It has five distinct programmes of which one - the small scale enterprise/credit programme is of immediate interest to this project.

1.42 The objectives of the Small Scale Enterprise (SSE) programme, which started operation in 1977, are:

(a) to provide loan capital for rehabilitating and restoring the productive capacity of war-affected farmers and small scale entrepreneurs;

(b) to stimulate commercial lending for small scale enterprises through the provision of guarantees and other incentives and by enabling small scale borrowers to build up a credit history;

(c) to establish a credit institution for small scale farmers and entrepreneurs.

1.43 The primary thrust of the SSE programme is to extend loans for the purpose of economic recovery. This has evolved into development of a credit institution for small and medium scale borrowers with the following characteristics:

- a demonstrated concern for and proficiency with SSE;
- managerial and administrative capability and integrity;
- a financial and legal structure that permits receiving grants, borrowing funds, owing physical assets, receiving or making investments, and operating in accordance with commercial principles.

1.44 The credit programme has 5 785 creditors consisting mainly of small scale farmers and entrepreneurs. It operates in 274 villages all over Lebanon. Ten percent of its borrowers are rural women and the average loan is USD 1 000. The SCF only funds between 60% - 70% of the financial requirement of the potential creditor. The current interest rates charged are between 14-18% and is reviewed annually depending on the economic situation. The repayment period varies between one to three years.

1/ Socio Economic Spot Survey: A. Baalbaki and K. Hamden. October 23-November 17, 1991. Prepared for IFAD (see Annex II).

1.45 The SCF portfolio consists mainly of small farm families and small scale entrepreneurs. The demand for agricultural projects is mainly in the Bekaa, south Lebanon and parts of Beirut. Among the various agricultural projects for which loans have been granted are: greenhouses, livestock, apiary, vine trellises, poultry, land reclamation, etc.

1.46 To improve the overall efficiency and the recovery rate, the SCF undertakes constant management reviews including workshops and evaluation of its operations. It has computerized all its SSE operations. Its field coordinators are agronomists and trained loan officers who are able to provide its borrowers with on-site technical assistance and advice. Its recovery rate is around 80%.

II. THE PROJECT AREA

A. Physical Features

2.01 The Bekaa mohafazat is one of the five mohafazats of Lebanon. The Bekaa mohafazat not only covers the Bekaa plain, but also the eastern side of the Lebanon mountains, and the western side of the Anti-Lebanon mountains. The project area covers the Bekaa mohafazat. The project area is sandwiched between the Lebanon and the Anti-Lebanon mountains. The Bekaa Valley is a narrow plain (10-15 km^2 wide) lying at a high altitude of about 900 m. The flat, slightly southerly sloping Bekaa valley in the central part between Baalbeck and Qaraoun, is hilly at both ends. To the north, after rising to about 1 100 m in the Baalbeck region, the central valley falls and opens out northwards in the direction of Lake Homs. This is followed by the Nahr-el-Asi (Orontes) which runs along the bottom of a deep valley. To the south, the Bekaa plain is suddenly blocked by the plateaux and heights of Jebel el Aarbi (1 508 m) and Bir-el Dahr (1 221 m) which the Litani crosses through deep gorges. The interior of the Bekaa plain is bordered to the east by a second range of mountains which form a natural border with Syria. The Northern part is made up of the Anti-Lebanon mountains. The southern part, which is separated from the Anti-Lebanon mountains by a series of depressions used by the Beirut-Damascus road, comprises Mount Hermon, which peaks at 2 814 m and then declines very steeply into the Hasbani valley which runs southward, parallel to the Litani.

2.02 The climate of the project area is semi-continental, the Siberian air from the northeast easily penetrates while the sea air from the west only manages to penetrate after having lost much of its humidity on the mountain. The continental influence is at its peak on the edge of Baalbeck where temperatures range from 23°C-47°C and the rainfall averages 400 mm a year. The other parts of the interior zones have a less sharply contrasting climate because the sea air penetrates more easily through the breaches at Homs and Marjeyoun and through Dahr-el-Baider pass. There are only 11 days of frost at Fakhe (near Ras-Baalbeck), but rainfall is reduced to the level of 200 mm. In the rest of the Bekaa (from Rayak to Qaraoun) the rainfall is between 600 and 800 mm, with about 25 days of frost. The Anti-Lebanon Mountains and Mount Hermon are quite arid. On the whole, this climate is not very favourable for vegetation and agriculture because of the summer drought but the presence of rich underground water has made it possible to use irrigation to make the land productive.

2.03 Water has been the dominant feature in the development of the semi arid land of the Bekaa. Within the project area, sources of water are either from the rivers, from the artisanal wells or from the aquifer where this occurs. Thirty percent of the total cultivated land is irrigated.

B. Land Utilization and Cropping Patterns

2.04 Although the Bekaa occupies 37.5% of the national territory and the largest and most fertile plain, it has only 34.8% of the total arable land in the country. It also has 53.1% of the country's woodlands, 38.7% of the rangelands and 43.9% of the prairie lands.[1]. Because of the

---

1/ IFAD: Lebanese Government's Proposal for the Financing of Agricultural Development Projects, Working Paper 2, 1991

comparatively low rainfall, water and wind erosions, over 51% of the surface area cannot be farmed. The soil suitability studies conducted by the LARI show that Hermel is suitable for forestry and agriculture, Baalbeck is suitable for agriculture, pastoral activities and forestry, and Zahle, Bekaa West and Rachaya are suitable for agriculture and pastoral activities.

2.05 Arable land accounts for more than 80% of the total cultivated area and was known for its important cereal growing and certain vegetable crops, especially in the central region (Appendix 2). Fruit growing accounts for less than one-sixth of the total cultivated area. Irrigated by the Litani and Berdawni rivers, the caza of Zahle with its vineyards, and to a lesser extent, apple trees, represents the largest fruit growing area in the country. Vineyards also predominate in the caza of Baalbeck.[1/]

2.06 Crop rotations practised in the Bekaa can be classified as follows.[2/] On irrigated land, the rotation applied to the same parcel of land consists of a winter crop produced between November and July. Wheat is the most common followed, to a lesser extent, by barley as a second priority crop. Local vetches (e.g., bakieh and kursanni) usually take third priority in the farmers' order of preference, despite their beneficial effect on soil fertility and structure. The winter crop is followed by one of the following summer crops: onions, potatoes, other vegetables, sugar beet (in limited areas) or maize. In some cases, farmers plant only summer crops in consecutive years. On non-irrigated land or rainfed land, however, the following rotation is usually followed. A wheat or barley crop is grown between November and July followed by lentils and chickpeas grown during the same period of the following year. With the increased use of chemical fertilizers, farmers are gradually avoiding the practice of leaving the land fallow for one whole year. Some adopt only a seasonal fallow of seven months (usually from July till May) and then plant watermelon between May and October. Fruits in the Bekaa are mostly of the perennial type and consist of apples and grapes, on well irrigated land or, whenever suitable, farmers would grow apricots, cherries, peaches, pears and plums. Non-irrigated perennial crops include olives, figs, pistachios and walnuts.

2.07 Livestock Production Systems Dairy cattle production systems in the Bekaa differ mainly by herd size and land ownership. Integrated mixed farming systems are practised by large farmers in the central and western Bekaa. Typically, these farmers produce up to 60% of their feed requirements. The main livestock feeds are concentrates, cereal or legume straw, maize - fresh or chopped for silage - some winter vetch and barley, fodder beets, discarded potatoes and vegetable residues. Small livestock farmers, with typically 2-5 heads of cattle with limited access to land depend for feed on purchased concentrates, straw, by-products and residues of the main crops available in the area. Maize stubbles and vegetable residues are often rented to small farmers and forage is sometimes produced on small plots of land.

1/ ICARDA/FAO: World Conference on Agrarian Reform and Rural Development, Country Review Paper of Lebanon, 1978

2/ ICARDA/FAO. Ibid.

2.08 Semi-sedentary pastoral sheep production systems prevail in the Bekaa, especially in the North. In earlier times, the herders tended to move their flock to Syria during the winter months returning to the Hermel area in the spring, and subsequently moving up to higher altitude on the slopes of the mountains. This movement is now less evident but sheep still tend to move over many kilometres. In the winter grazing is supplemented with barley, bran and straw and in summer, many herds are to be found in the rich farmlands of the Bekaa where they graze on crop residues. Lambs are sold between 2-3 months of age although in some cases they are fattened up to as much as 40 kg live weight.

2.09 Practically all goats belong to the local breed. In the southern Bekaa there are large flocks of goats, mostly owned by rich farmers, who employ herders to look after them. Typically such flocks are enclosed at night in barns and move up the mountains during the day to graze. Smaller flocks of goats - crossbreds or pure Shamis - either by themselves or mixed with sheep are found around the richer parts of central Bekaa feeding on farm residues. Demand for improved breeds is high in the Bekaa due to abundance of residues, stubbles and forage that can be cut and carried from fruit tree and other plantations.

C. Infrastructure

2.10 Infrastructure is very well developed in the project area. The road network is good and most areas are served with electricity. Services are unevenly distributed within the district. History of settlement, population density, availability of water sources, viability of economic base, and political influence are among the factors that have affected the distribution of services such as schools and hospitals. Zahle, the regional capital has most number of the hospitals, schools and a concentration of government services, whereas the cazas of Hermel and Rachaya are the most disadvantaged.

D. Population

2.11 The resulting internal and external migration during the period 1975 onwards has had great impact on the population of Lebanon. Estimates from various studies indicate that the total residents of Lebanon in 1990 were about 3 080 000 of which 12.8%, or 395 000, live in the Bekaa. Table 2.1 shows the population distribution by Caza (district).

2.12 Apart from the regional centre - Zahle - the rest of the Bekaa appears relatively socially deprived (para 2.10). Twenty five percent of the population are engaged in agriculture compared with 7.5% for the whole of Lebanon. Of the population, 33.4% are illiterate, and the cazas of Hermel and Rachaya are particularly deprived of Government services, such as Health and Education facilities. Bekaa has 10% of the non-profit hospital beds in the country and the hospitals lack the basic equipment, drugs and personnel. Most of the private schools are in Zahle, the regional capital, where the schools are better equipped and staffed.

Table 2.1: Distribution of Resident Population in the Bekaa by Caza

Caza	No. of Residents	No.of families	Average Size
Zahle	132 000	25 385	5.2
West Bekaa	56 000	10 560	5.3
Baalbeck	169 000	29 650	5.7
Hermel	27 000	5 025	5.5
Rachaya	11 000	2 560	4.3
Total Bekaa	395 000	73 180	5.4
Total Lebanon	3 080 000	620 000	5.0

Source: Unpublished preliminary estimates by Consultation and Research Institute.

2.13 A recent survey conducted for IFAD has put the number of agricultural workers at 30 000 (see Table 2.2), with the majority working on their own farm with the help of family members.

Table 2.2: Estimate of the Agricultural Labour Force by Sex

Type of Enterprise	Economically Active Population	Male %	Female %
Farms	14 500	95	5
Agric. employees and family labour	12 500	60	40
Agricultural entrepreneurs	3 000	97	3
Total	30 000	80	20

E. Rural Women

2.14 Women comprise about 49.5% of the project area population, of which about 25% are 9 years or below. In general, they are less well educated than the male population. Under traditional inheritance laws, women can own commercial and business enterprises and land, however their holdings are much lower than those of men. Women are actively involved in agriculture and livestock production in addition to their other domestic, social and reproductive roles. They are involved in harvesting of agricultural products, water collection, livestock raising and processing of milk products and in the marketing of the items they produce. In the project area, women make up 20% of agricultural labour force. Generally, in formal discussions relating to agriculture and livestock, rural women generally defer to men, however they do exercise a lot of control on household decisions. On discussion during field visits, it became clear that married rural women would rather leave important decisions to the

male members of their household. There was, within the cross section of the project area, a concensus that the major constraints faced by women are: lack of opportunities to improve their welfare and that of their families; lack of training; access to credit; and access to land for those who are landless.

2.15 Within the project area, several NGOs are helping small groups of women with training and credit for income generating activities. In one village, a cleric has organized a group of widowed women to produce garments for sale. Throughout the project area, the SCF, with a grant from USAID, has assisted in the training of women on off-farm income generating activities and has extended credit and technical advice, including budgetting and accounting procedures to women for these purposes. Most of the loans have been for activities such as rehabilitation of land, clothing stores, greenhouses, knitting and sewing machinery, handicrafts and livestock - goats, sheep and cows, as well as dairy processing.

F. Government Services in the Area

2.16 Some rudimentary level of service has been maintained throughout the difficult war period by the government, private veterinarians, as well as by private profit motivated companies active in the field. There are also many localized private firms engaged in milk collection, marketing and processing and some attempt has been made by farmer groups to organize cooperatives for the purpose of collecting milk. However, these private firms do not address the weaknesses of the institutional framework for the delivery of livestock services.

III. THE PROJECT

A. The Target Group

3.01 The rural population of the Bekaa valley is neither homogeneous in nature nor readily classified into discrete socio-economic groups. The interdependence of Zahle, the regional capital, with the rural areas of the Bekaa, the internal migration caused by recent events, the traditional mode of living in family groups, the move towards concentration of land ownership, past Government policies relating to public services - education, health and extension services are all contributory factors. The target group profile shows an average household size of 5.4 persons with the average size of the holding being 8.1 ha compared to 4.6 ha for Lebanon. (Table 3.1) The agricultural census of 1970 showed that 50.9% (or 16 419 families) of the total land owners were smallholders with 3 ha and less and about 62% had holdings of 5 ha or less. Given the move towards concentration of land ownership, it can be deduced that most of the target group would fall within the category owning 4 ha or less of non-irrigated land or less than 0.8 ha of irrigated land, or a combination of the two.

Table 3.1: Number of Holdings[a/]

	Lebanon	Bekaa	Bekaa/Lebanon (%)
Total area in ha	1 017 100	381 000	37
Number of holdings	142 371	32 261	23
Area of holdings in ha	685 678	260 290	40
Average size of holdings in ha	4.6	8.1	180

a/ Available land in Bekaa compared with whole Lebanon.

Source: Census of Agriculture, 1970

3.02 Income Level The overall income situation is less clear due to a wide range of other outside source of income available to farm families. Many work as seasonal labourers and some receive income from relatives living either in Lebanon or abroad. Almost all houses are permanent structures, most of which are connected with electricity and contain durable goods which may not be expected from rural families in other parts of the world. However, these items may have been purchased with income from non-resident family members. Visual evidence suggests that many rural families are poor, undernourished and that landless households, particularly those headed by women, are the most disadvantaged. The IFAD financed socio-economic study indicated that the farm derived income from small farms is low in comparison to farm households income requirements. This point is illustrated in Appendix 2.

3.03 There are no current income distribution figures for Lebanon. Most households, as indicated, would have outside income. The amount of home grown products consumed is not known. Many women make their own bread and

produce their own yoghurt and some cheese. It is, however, estimated that the average off-farm family income is about LBP 750 000 per year, or about USD 852.3; and represents about one third of the total income of farm households. From this estimation, it could be deduced that the total income of a small farm family would be in the neighbourhood of about USD 2 560 per annum for a family of 5.4. In effect, the per capita income of the average target group family would be about USD 474 per annum. The target group could therefore be said to have an income equivalent to 40% of the average per capita income of Lebanon. On the assumption that rainfed land, as indicated in para 3.01, is cropped with wheat, barley, and chickpeas, the annual income from these crops per hectare in 1990 is equivalent to USD 645[1/] or USD 2 580 if the farmer has 4 ha. This figure is consistent with the above estimation.

3.04 Taking into account the latest figures for the GDP, considering the population distribution in the Bekaa, and examining the number of landholdings with an area of 4 ha or less, as well as the number and location of farmers operating small farms of 2 cows or less,[2/] it was established that the number of beneficiaries would be in the order of 8 500 farm families (45 900 persons). The actual number of families who will be receiving the credit for livestock will be around 2 400 farm families and a further 500 rural women who will receive intensive training and credit for dairy processing or related income generating activities (carpet weaving, textile-wool, apiary, embroidery work, handicrafts, bakery and cheese processing). The rest of the households would benefit from the extension activities, artificial insemination, and improved breed of animals. This translates into some 25% of the population of the Bekaa if the large urban centres of Zahle, Baalbeck and Chtaura are excluded. In actual fact, the livestock extension services, veterinary services, cooperatives, breeding program and forage development programs would all result in benefits that would reach farmers other than just those receiving animals from the project.

3.05 In identifying those who receive credit, several criteria have been considered. Families that will benefit from the project would:

(a) have an indirectly combined income not higher than LBP 200 000/month or USD 225 per month;

(b) have access (i.e., own, lease or access for grazing) to land for fodder production. These lands would vary in size, due to differences in fertility, rainfall and other conditions, depending on the type of animal production activities to be undertaken in association with the fodder to be produced on these lands; and

(c) have had experience in the past in raising animals or are now involved in such activity but in a less efficient way and without securing enough income.

1/ IFAD: Rural Development in the Bekaa, Working Paper 2, September 1991.

2/ It is estimated that a farmer with 2 cows will need 11 du of rainfed land or 1.8 du of irrigated land.

B. Project Rationale, Objectives and Strategies

Rationale

3.06 The seventeen years of civil war had devastated the livestock sector in the country as well as the infrastructure and essential services, and aggravated the country's dependence on imported food, especially meat and dairy products. Cattle numbers in the project area went down by 22% during the last decade and cattle keepers was also considerably reduced. Many other small farmers were compelled to sell their animals and resident agricultural activities decreased in favour of share cropping. Sheep and goat numbers remained constant but the number of small ruminant farmers decreased by about 30%. Insecurity of life, high inflation, land ownership concentration and exploitation by strong intermediary marketeers have contributed to a sense of resignation on the part of small farmers. The breakdown of Government services such as disease control and eradication programmes, research and animal management, breeding, nutrition, forage production, extension service, etc., have lowered the productivity of the livestock. These services are in need of rehabilitation. It is equally important that the existing stock be replenished and improved. The Government has begun to partially restore some essential services. Roads, communication and other services are being restored in the rural areas. It is the Government's intention to assist small rural farmers to resume their activities, to improve their income and to increase the country's self sufficiency in food production.

3.07 The financial resources particularly foreign exchange at the disposal of the Government are extremely limited given the magnitude of the developmental needs of the country. Consequently, the Government has approached multilateral and bilateral donors to provide financial assistance for all sectors including agriculture and the livestock sub-sector. Given IFAD's mandate to focus on projects that particularly benefit the rural communities, and specifically the poor including rural women, the Government has expressed strong desire for IFAD to assist it in its effort to address the needs of the small rural livestock farmers many of whom are women. The proposed IFAD's intervention would not only increase the livestock sector's contribution to the economy but would assist the Government to meet its objective of increasing the income potential of rural families, particularly women, and it would free its limited foreign exchange resources for other essential services in the rural areas including those outside the project area.

Project Objectives

3.08 Conforming to the Government's strategy and IFAD's criteria of addressing the needs of the poor and the disadvantaged, the proposed project aims at improving the livestock production, rehabilitating extension services, increasing the income of the poor farm families including women who derive most of their income from livestock and livestock related activities. The project would assist in removing major obstacles to increased productivity in the livestock sector - the lack of inputs, inadequate farm management practices, inadequate service delivery in the rural areas and poor feeding practices. It would strengthen the Ministry of Agriculture's capacity to provide essential services to the farmers - through financial support to increase the number as well as train service delivery agents, improved animal nutrition through the

promotion of forage crop production and range land development, research and extension efforts in the area of animal genetics and reproduction, adaptive research for the generation of improved technological packages for forage production and the Ministry's capacity to meet the credit needs of the smallholders including women who are presently denied credit because of lack of collateral. The project would support better farm management practices to encourage environmentally safe use of land, labour and inputs.

Project Design

3.09 Recognizing that the country is just emerging from a long period of unrest, and that most of the infrastructure and important Government services to the rural farm families no longer function, or exist on a very limited scale, the project has been designed to ensure that the minimum requirements in terms of human resource and infrastructure are provided at the initial stages of project implementation. Given the Government's limited financial resources, recurrent expenditures have been kept at a minimum to ensure that the Government meets its financial commitment in a timely manner and to ensure the sustainability of the project. Since there is a parallel UNDP project which is concentrating on the reorganization of the Ministry of Agriculture's headquarters, particular effort has been made not to duplicate efforts but to restrict the intervention of this project to extension development and research activities not covered by the UNDP project. Thus the regional offices in the project area would be strengthened by using line Government departments - Animal Production and Extension Departments and the LARI - to build up local management capability rather than create new organizational entities. In the absence of a viable agriculture credit delivery institution in the country at present, at the early stages of the project execution, the credit delivery would be through an international non-Governmental Organization (NGO) operating in the country and which has had about 14 years experience in the delivery of rural agriculture credits. This NGO would assist in building up the institutional capacity of the Ministry of Agriculture to deliver and administer agricultural credits to smallholder farm families. It will also be responsible for the organization of training and administration of credit, specifically directed to women for off-farm income generating activities. The rationale for choosing this NGO is provided in Appendix 5.). Constant monitoring and evaluation of the effect of the Credit would be carried out and a mid-term review in the third year of the project would assess the impact of the project on the beneficiaries, the performance of the credit delivery institution as well as the replicability of the design of the project.

3.10 The project recognizes the value of group development in providing assistance to the rural farm families who would otherwise have little access to goods and services necessary for improvement of their livelihood. However, the constraints encountered in Lebanon to date with cooperatives require that the approach to group mobilization and involvement in the project implementation be modified. During the initial stage of project implementation, funds have been made available for clearly identified cooperatives to meet their expressed and felt needs. In order to foster further movement towards group formation, the project provides for a cooperative/credit study to explore ways of helping to foster group spirit among the small farmers in the project area. As groups emerge, provision has been made to assist them.

C. Project Components

3.11 The proposed project would have six main components: (i) smallholder livestock production; (ii) agricultural credit, management and operating costs; (iii) development of forage production program; (iv) strengthening of support services including establishment of a central breeding, demonstration and training station and a distribution centre for imported breeding stock; an artificial insemination service and five sub-extension centers; (v) assistance to cooperatives in the areas of milk collection, processing, and marketing, as well as off-farm income generating activities for women; (vi) project management support to the MOA in the areas of financial management, credit mechanism, monitoring and evaluation, procurement etc.

D. Detailed Features

Smallholder Livestock Production (USD 6.9 million)

3.12 Establishment of Smallholder Dairy Cattle Farms. The project would provide for the establishment of about 1 000 small dairy cattle units. Each farm unit would be assisted to purchase two imported pregnant Friesan/Holstein heifers. In addition, funds would be provided for the construction of 15 m^2 of animal sheds per unit and for the purchase of feed for the first three months. The total cost for each farm will be about USD 3 600. Farms would be established in the irrigated areas of the Bekaa and on drylands receiving more than 350 mm of annual rainfall. The main sources of feed would be concentrates, straw, agricultural crop residues and by-products and forage produced on arable land (green material, hay or silage). It is estimated that each farm would require 11 du of dry land area to produce forage or 1.8 du of irrigated land, double cropped with vetch/cereal in the winter and forage maize in the summer. Access to land for forage production is considered necessary.

3.13 Smallholder Shami Goat Farms. The project would provide for the establishment of about 700 Shami goat units. Each farm unit would be assisted to purchase a minimum of three and a maximum of ten imported female goats and one male goat. Additionally, funds would be made available for the construction of up to 17 m^2 of medium quality shelter and for purchasing some equipment. Estimated cost per farm unit would vary between USD 1 050 (3 female goats) and USD 8 860 (10 females and one male goat) with an average of USD 2 800 (seven females and one male goat). The average estimated cost per farm unit is about USD 3 860. Shami goat farming would be established in the same area as those for cattle. Each unit would be expected to increase in size by one goat in each subsequent year. About 40% of the feed requirements would be met through grazing on crop residues and by-products and through cut-and-carry forages produced in tree gardens and other non-accessible plantations. It is estimated that each farm would require 11 du of arable dry land receiving 350 mm or more rainfall per year to produce forage, or 1.8 du of irrigated land, double cropped with vetch/cereals in the winter and forage maize in the summer. Again, access to arable land is considered very important.

3.14 Smallholder Awassi Sheep Farms. The project would provide funds for the establishment of about 200 units of Awassi sheep. It would not be advisable to increase the stocking rate on the poor range lands of the

northern Bekaa. Given the absence of a secure source of improved Awassi sheep, the emphasis of this component would be on improving housing, nutrition and management and on integrating crop and livestock production. Sheep production development would be further supported through the breeding and improvement activities of the Central Station para 3.20) in order to provide a sizeable number of better quality breeding rams; and by promoting fattening operations (para 3.15), especially in the northern and southern areas of the Bekaa to relieve the range and increase meat output. Each farm would be assisted to purchase an average of 20 imported female sheep and one ram and some equipment as well as provided with funds to construct about 30 m^2 of medium to low quality shelters. The total investment per farm family would be about USD 3 800. Each unit would be expected to increase in size by 2 sheep in each subsequent year, stabilizing in Year 6. The feeding and management system would be semi-extensive. Sheep would graze outside for most part of the day, sometimes in a radius of several kilometres. About 6 du of arable land would be needed (perhaps rented) to produce forage or for grazing.

3.15 Fattening of Lambs/Kids. The project would support semi-intensive lamb/kid fattening operations in the whole area of the Bekaa valley with emphasis on the cazas of Hermel and Rachaya. The objective of this component would be to increase the output of meat from the area, to relieve the range and other shrub lands from over-grazing, and to better utilize whatever agricultural by-products and crop residues are available. The project would fund the purchase of a maximum of 50 lambs for each of about 500 fattening units, the construction of up to 30 m^2 of shelters and the purchase of equipment. Cost per farm unit would vary between USD 1 300 for fattening 50 lambs from the owner's flock, 30 m^2 of shelters and USD 3 000 (purhcase of 50 lambs, 30 m^2 of shelters). Assuming that on average, farmers would fatten 25 lambs from their own flock, purchase another 25 and construct 30 m^2 of shelters, the cost to the project would be about USD 2 150 per unit. Subsequent year purchases of lambs would be supported to a lesser extent. It is assumed that 60% of the units established in each year will continue fattening in each of the subsequent years of the project.

Credit Management and Operating Costs (USD 0.94 million)

3.16 The purchase of imported animals and feed for 180 days, the construction of shelters for the animals, as well as equipment for income generating activities would be provided to the farmers and the rural women on credit. A credit management and administration institution would be contracted to manage and administer the credit as well as carry out the necessary training of the rural women groups. The project would fund the management fee, the operating expenses of the selected institution or provide the same financial support to MOA to establish and manage the project credit activity.. Operating costs to be funded include vehicles, renting of office space, recruitment of loan officers, supervisors, technical staff and trainers.

Development of Forage Production (USD 0.54 million)

3.17 The project would promote mixed crop/livestock systems of production by the beneficiaries in order to minimize malnutrition symptoms which may result from low quality feeding of the improved animals to be introduced.

Taking into consideration the diversity in the crop production systems prevailing in the project area, the main objective of this component would be to increase the forage supply at the farm level to meet, as much as possible, the demand of the introduced herd. To achieve this objective, the project would support several closely linked programs and activities comprising: (i) the promotion of forage production on irrigated and rainfed land through the distribution of improved seed for demonstration purposes; and (ii) the provision of the technical back-stopping and training required to increase production, including the generation of improved technological packages for increased forage production which would be developed under an adaptive research program carried out by the LARI and supported by the project. (See Appendix 4.)

3.18 Support to the Lebanese Agricultural Research Institute (LARI). The project would provide support for the LARI to reactivate its research activities on forage crops and the testing of low cost improved technological packages readily applicable by small farmers. For this purpose, the LARI would cooperate with ICARDA which maintains a research station in Terbol. Funds would be provided for incremental staff salaries for one agronomist/range management scientist, four research technicians, and six labourers; a set of laboratory equipment; agricultural machinery; vehicles and power generators; office equipment and furniture, as well as operation and maintenance costs.

3.19 Adaptive Research Programme. The technical packages to be tested and promoted by the LARI would vary according to the agro-climatic zone in the project area. They would include the use of improved varieties, recommendations on planting dates, seeding rates, fertilizer requirement, cultivation practices, soil conservation techniques, crop rotations and crop protection. In addition, experimental work would be undertaken on improved range management practices, collecting data on the carrying capacity of the rangeland in various regions of the project area and testing land treatment measures such as range reseeding, control of undesirable plants and fertilizer levels.

3.20 On-Farm Trials and Farmers' Training. The project would finance a programme of demonstrations and on-farm trials to disseminate the improved technologies generated by the adaptive research programme. Low cost production packages would focus on the use of improved production techniques and the introduction of new technologies adapted to the ecological conditions in the project area. Small quantities of improved seeds would be provided as part of the technological package for on-farm trials by the beneficiaries. Field days for groups of farmers would be organized in the different regions of the project area and throughout the year, during which the recommended production technologies, crop rotations and on-farm forage conservation methods would be demonstrated.

Strengthening the Support Services (USD 4.3 million)

3.21 Establishment of a Central Breeding, Demonstration and Training Station (at TERBOL). The project would support the establishment of a central station with 400 Awassi sheep, 300 Shami goats and 15 dairy cattle in order to: (a) implement an up-to-date breeding and selection program to improve the Awassi breed of sheep and to produce a sizeable number of better quality rams for sale to private sheep owners, especially the

beneficiaries; the same program would also be implemented for imported Shami goats as from Year 5, subject to confirmation at mid-term review, that land would be available at Terbol to meet the forage requirements of the stock (assurance to this effect would be obtained at negotiation); (b) provide for demonstration of improved breeding, feeding, management and other husbandry techniques and for intensive training of technicians and farmers on these methods; (c) allow for limited feeding and management trials and for some research on the genetics of the Awassi breed; and (d) provide for a source of breeding stock free of infectious and contagious diseases.

3.22 The major emphasis of the central station would be on breeding Awassi sheep and improving them by selection based on measured production characteristics. The number of sheep required to implement this program is estimated at 400 heads. This number would permit the station to produce and sell over 75 good quality rams per year (selected 1 out of 2) and to have tangible impact on breed improvement in the project area. The Central Station would provide the following: (a) 400 highly selected imported and local ewes (USD 150 per head); (b) 300 imported Shami goats (USD 300 a head); and (c) 15 imported pregnant heifers (at USD 1 200 a head). The project would further support the rehabilitation of: 780 m^2 of sheep sheds with yards; 105 m^2 of cow sheds; 60 m^2 of storage space for concentrates; 75 m^2 of hay and straw barns; 80 m^2 of dormitory space for labourers; and 80 m^2 of office space for technical personnel. In addition, the project would support rehabilitation of the milking parlour and the purchase of milking installations and milk cooling facilities, hay and silage making machinery, a 5 ton truck and one 4 wheel drive vehicle, a power generator, a dipping facility, computers, as well as ancillary equipment for the station. The project would rehabilitate 200 m^2 of dormitory space for the trainees and 150 m^2 of training space. The total investment required to rehabilitate and equip the station would amount to about USD 400 000, including USD 168 000 for the purchase of stock. The staffing requirements will be: one manager, and 4 technicians. It is assumed that goats will be imported at the end of Year 5 and will be housed in the facilities of the Distribution Centre (section ii), after completion of the component providing for the import and distribution of animals. Assurance would also be sought at negotiation that the existing occupants of barns are at Terbol would vacate by project start up.

3.23 Establishment of a distribution center for imported breeding stock. The project would fund the construction of a housing facility on Government land to the east of the Terbol station proper, about 1 000 m away from the main housing facilities, to accomodate imported animals before distribution to the beneficiaries. This would provide for flexibility, proper management, control of diseases and proximity to the project area. The project would support the construction of about 1 300 m^2 of cow sheds with yards, sufficient to accommodate over 500 heifers at any one time. A hay barn (150 m^2), a concentrate store (100 m^2), dormitory space for 4 workers (60 m^2), and office space for the manager (30 m^2) would also be constructed. Three lorries of 8-10 tons each would be provided. The total investment cost would be about USD 194 000. Upon completion of the project, the distribution centre would be used for animal breeding.

3.24 Artificial Insemination. In order to minimize costs on small dairy cattle holdings and to improve the dairy cow population, the project would support the establishment of a strong field artificial insemination service. Three rural centers will be established (Baalbeck, Zahle and Anafar), properly equipped and staffed with 3 technicians each, who will be supervised by a veterinarian from headquarters. Equipment for the headquarters would consist of 3 large liquid nitrogen containers, communication equipment, one 4 wheel drive vehicle for semen transportation, and a small laboratory for semen evaluation and testing. Eight thousand doses of semen would be imported annually from countries with superior dairy cattle population, stored in the liquid nitrogen containers and distributed to the rural centers. Private veterinarians would have access to the semen at cost, provided they meet the required technical standards. Each of the rural centers would be equipped with liquid nitrogen containers, communication equipment, a 4-WD vehicle, 2 inseminators' kits and other materials. Liquid nitrogen would be purchased from the open market. The rural centers would be housed within the premises of the respective local extension offices. Estimated investment costs for vehicles and equipment would be in the order of USD 97 000. Training of inseminators would be undertaken by a local expert. Regular monitoring and retraining would be provided. Imported semen would cost an estimated USD 40 000 per year and would suffice for breeding 70% of all cows in the Bekaa, including project animals.

3.25 Extension Services. The success of the whole project depends heavily on the ability of the Government to provide strong technical back stopping at the farm level in the areas of breeding, nutrition, management, disease control and treatment, forage production, as well as off-farm income generating activities for rural women. Consequently, necessary staff would be stationed in the field and provided with training to equip them for the tasks required of them. The project, therefore, would support the training and hiring of additional staff who will provide the beneficiaries with the needed support. In addition, funds would be provided for construction or renting of the required office spaces (a total of about 400 m^2) at five locations (Hermel, Baalbeck, Zahle, Anafar and Rachaya). Each office would be manned by an animal production specialist, a veterinarian and two extension agents - one in an animal production and one in forage production - a woman extension officer and a daily paid labourer. One extension agronomist supervisor, the national agronomist scientist and a woman extension supervisor would be posted at headquarters. Each of the five rural extension offices would be provided with 2 4-WD vehicles. Assurance would be sought at negotiation that all necessary staff would be seconded by the Government.

Milk Collection, Distribution and Processing and Off-Farm Income Generating Activities for Women (USD 2.3 million)

3.26 The project would fund the following studies:

(a) Milk Marketing Study. In order to better absorb the milk and meat to be produced as a result of the project in an un-organized market, the project would finance a study that would examine, among others, the following: (a) milk collection, processing and marketing in the project area; (b) milk marketing and processing on the national level; and (c)

demand for, and consumption of, dairy products. The study would set the basis for the establishment of an milk collection system for the project area incorporating cooperatives, farmer groups, small farmers and women involved in artisanal cheese production. It would also elaborate marketing networks and systems beneficial to project beneficiaries. The study would also establish in detail a program of implementation of its recommendation, including activities to be undertaken and a time table for these activities. The implementation of the study would begin towards the beginning of the third year of the project (see Appendix 6, for Terms of Reference).

(b) An Agricultural Credit/Cooperative Study (duration 3 months). This study would determine the factors affecting formation of cooperatives and provide recommendations on how groups formation could be encouraged in the Bekaa. (Appendix 6 for Terms of Reference)

(c) Assistance to Small Farmer Cooperatives. Two to three smallholder animal production and milk collecting cooperatives already exist in the Bekaa and, at present, their very existence is threatened by competition from private operators. Therefore, the project would provide funds to expand milk collection, establish a small dairy processing plant or purchase machinery for forage production (balers) and conservation on a group basis. In addition, the credit and cooperative adviser to be located at the Project Management Unit (PMU), (para 3.27), would assist in organizing other cooperatives who may be helped through the credits. Furthermore, the study on cooperatives would assist in this endeavour.

(d) Support for Off-Farm Income Generating Activities For Women. The long civil war in Lebanon has created several women heads of households. The actual number is not known. Furthermore in the Bekaa itself, most livestock activities are carried out by women (para 2.14). At present, the Save the Children Federation as well as other NGOs have been giving small assistance to women within the IFAD target group to start small businesses such as knitting, apiary, carpet weaving, fence mending, livestock and food processing for sale but because of limited funds, these efforts are only reaching a small number of women needing assistance. The proposed project would complement the activities of these NGOs by utilizing their services to train or give financial assistance to rural women in clearly identified income generating activities specifically in apiary and carpet making utilizing the wool from the animals funded by the project, garment knitting and embroidery, various types of handicrafts, food processing for sale, toy making, pottery and ceramics, etc. On graduation, those women who met the credit criteria would be granted a loan to start their own production unit. Marketing assistance would be provided through a link with the proposed United Nations Fund for Women (UNIFEM) Centre in Beirut. UNIFEM expects this centre to be established by April 1992 for promotion of handicrafts and products by women. At project completion, about 500 women would benefit from this component of the project.

Project Management Support (USD 2.2 million)

3.27 Technical Assistance. Internationally recruited technical assistance would be required to assist with project implementation. The experts would include a chief technical livestock adviser (48 man months) for the PMU, one animal breeding specialist (24 man months), one agronomist/range manager/adviser (12 man months), a credit/cooperative adviser (12 man months), and a monitoring and evaluation specialist (12 man months). This specialist would be required at the initial stage of project implementation (4 man months) to set up the unit and to return from time to time as required (see para). The Terms of Reference for each adviser are contained in Appendix 6.

3.28 Local Staff. The project would provide for a nationally recruited project manager and a financial controller/procurement officer to help set up financial systems for budgetting and recording project expenditures and to assist with international procurement and IFAD procedures with which the MOA has limited experience. In addition, the project would fund four national counterparts for the technical assistance personnel (72 man months each) and one local adviser on women's program (72 man months) to work with the institution responsible for the organization and training, and supervision, of the credit activities directed to women, and three clerical staff and three technicians (432 man months), for the project unit. Funds made available under the project would only meet incremental salary costs of local staff. Funds would be provided for construction of an office, for transport, office equipment and incremental operating costs. The project would also finance monitoring and evaluation expenditures for which funds have been provided for a Monitoring and Evaluation Specialist who will set it up (see para 4.36). Funds would be provided for a Base Line Survey of beneficiaries during the first year of project implementation, and including an impact study at the end of the project period (total time allocated is six man months). The Terms of Reference for the studies are in Appendix 6.

3.29 Training. Institution building is a major objective of the project. Training of key personnel must therefore start as early as possible and continue throughout the project period. Existing staff, as well as new recruits, would be trained in the execution of certain project components. The training would be done both externally and internally. The services of the expatriate technical advisers (such as the Chief Technical Adviser, as well as the livestock breeder, forage production and credit/cooperative advisers) would also, to a limited extent, be utilized for training purposes. The training of trainers would also be given priority. Funds for external training include provision for three animal production staff for short-term training, 12 extension agents and three animal production technicians, for Terbol, to undertake short courses totalling 24 man months. All staff associated with the animal production, extension and forage development components would undergo, at the beginning of project implementation, at least three weeks of orientation/technical workshop. Subsequent workshops would be organized annually and all field teams would be regularly supervised by the coordinating units. Training in environmental aspects, with particular reference to soil and water conservation and the safe use of chemicals, would be provided to project staff and farmers.

E. Project Costs and Financing

Total Project Costs

3.30 Total project cost, including physical, and price contingencies, but exclusive of taxes and duties on imported items is estimated at USD 23.3 million (LBP 30.5 billion). The foreign exchange component is USD 12.3 million (LBP 15.5 billion), representing 52% of total costs. Base cost has been derived using recent quotations and prevailing November 1991 costs and prices. Base line project cost, excluding contingencies would be USD 17.2 million (LBP 15.2 billion).

3.31 Physical contingencies of 5% have been applied to most items except civil works and feed for which 15% contingencies were applied. Price contingencies for foreign costs have been applied at the rate of 4.5% per annum throughout the project life. For local costs, the following rates were applied for each year of the project as follows: 40%, 35%, 30%, 25%, 20% and 20%. The implicit exchange rate reflects price contingencies based on constant purchasing power parity of the Lebanese pound.

3.32 Project costs are summarized in Table 3.2 and details given in Appendix 3. On the basis of 8 500 households benefitting from the project, total costs would amount to USD 2 761 per beneficiary.

Table 3.2: Project Cost Summary

	USD ('000)			% Foreign	% Base
	Local	Foreign	Total	Exchange	Costs
A. Smallholder Livestock Production					
Holstein Cattle Farms	960	2 640	3 600	73	21
Awassi Sheep Farms	137	623	760	82	4
Shami Goat Farms	382	1 690	2 072	82	12
Lamb Fattening Farms	43	384	427	90	2
Sub-total	1 522	5 337	6 859	78	40
B. Agricultural Credit	647	296	943	31	6
C. Forage Development	373	166	539	31	3
D. Support Services					
Central Station	514	364	878	42	5
Extension Services	1 202	794	1 996	40	12
Distribution Centre	350	233	583	40	3
Artificial Insemination	484	340	824	41	5
Sub-total	2 550	1 731	4 281	40	25
E. Milk Coll/Dist/Prcs & IGA	607	1 233	2 225	55	13
F. Project Management Unit	992	1 313	2 305	57	13
TOTAL BASELINE COSTS	6 690	10 422	17 113	61	100
Physical Contingencies	254	458	713	64	4
Price Contingencies	4 167	1 332	5 489	24	32
TOTAL PROJECTS COSTS	11 111	12 202	23 314	52	136

Financing

3.33 The project would be financed by a loan of USD 10.0 million equivalent from IFAD. The Government of Lebanon and as yet to be identified donor, would contribute USD 13.5 million equivalent of which local costs would amount to USD 6.2 million. The IFAD contribution would fund 52% of foreign exchange costs, and 48% of local costs. Because of the innovative nature of the rural credit provision, the beneficiaries would be requested to contribute 20% of the costs of the animals, feed, implements, etc. they would receive. The total estimated contribution from the beneficiaries would be USD 1.4 million (LBP 3.3 billion). The total recurrent cost to be borne by the Government would amount to USD 2.8 million, and would be mainly for salaries of local staff.

3.34 Because of strong emphasis on institutional building and the Government's lack of experience in rural credit management, the Government would be requested to execute a management agreement with a credible NGO (SCF) to manage the credit component, train Ministry officials in rural credit management and administer the training of rural women in income generating activities. The rationale for the choice of this NGO is given in Appendix 5. Assurance that this agreement would be signed would be received at negotiation. This management agreement would be on terms satisfactory to IFAD.

Special Account

3.35 To facilitate smooth implementation, and to ensure that funds for the project would be readily available, the Government would open a Special Account in foreign exchange, in which IFAD would make initial deposit of USD 600 000 equivalent upon loan effectiveness. The Special Account would be used to finance IFAD's share of eligible expenditures. IFAD would periodically replenish this account upon receipt and approval of withdrawal applications, together with satisfactory evidence that the expenditures paid out of the Special Account were eligible for financing under the project.

Revolving Fund

3.36 The MOA would establish a Revolving Fund to which all repayments of short- and medium-term loans, under the project would be credited on the basis of the terms and conditions of a loan agreement signed by credit recipients in the Bekaa valley. The fund would be placed on an interest bearing account and would be utilized for financing similar activities. (The Revolving Fund is described in Appendix 5). The estimated amount of the Revolving Fund, by year and cumulatively for a 14 year period is given in Appendix 5. Assurance would be sought that the establishment and use of the Revolving Fund would be satisfactory to IFAD.

3.37 A Special Insurance Fund to meet eventualities, such as mortality of cattle, would be established. The insurance premium has been calculated on the basis of 3% mortality rate, and that the indemnity would cover only two thirds of the replacement value of the animal while the project absorbs the administrative cost of extension services to the farm family. The proposed premium to the farmer would be 2.5% per annum on the value of the imported animal. The insurance fund which would be put in a special interest bearing account is fully described in Appendix 5. Assurance to this effect will be obtained at negotiation.

3.38 The insurance fund would be viable provided that no administrative costs are charged to livestock owners. It is expected that at the end of the 6th Year of the project, the proposed fund would contain a reserve fund of about USD 45 300. During the mid term review, the PMU can change the terms of insurance on the basis of the experience gained during the first three years. The changes would affect the premium or the coverage of the risk (increase or decrease of the amount of the indemnity), or the reserve or a combination of both.

Procurement

3.39 Project goods and services financed by IFAD would be procured in accordance with the provisions contained in the IFAD'S guidelines for such activities. Civil works contracts for rehabilitation of farm and office buildings would be awarded through local competitive bidding in accordance with current standard procedures which are acceptable to IFAD. These items are not suitable for international competitive bidding because of size, location and phased construction. Purchase of office building for the PMU will also be subject to local competitive bidding.

3.40 Comparative international shopping, based on at least three quotations, would be followed for the procurement of vehicles, equipment and agricultural inputs for contracts exceeding USD 100 000, while contracts exceeding USD 300 000 would be procured under international competitive bidding procedures. Contracts for less than USD 100 000 up to an aggregate total of USD 200 000 would be procured through competitive bidding advertised locally. Local shopping would be used for contracts (fodder, feed and seeds) under USD 20 000 to an accumulated total of USD 100 000 per each implementation agency. Engagement of consultants under the project would be in accordance with IFAD's guidelines, with qualifications and conditions of employment acceptable to IFAD. A category breakdown is provided in Table 3.3. All imports related to the project would be duty free. Assurance to this effect would be obtained at negotiation.

Table 3.4: Procurement Arrangements, (USD, million)a/

	ICB	LCB	OTHER	TOTAL
Investment Costs				
Civil Works		2.215		2.215
		(2.215)		(2.215)
Vehicles & Equipment	3.153			3.153
	(2.522)			(2.522)
Purchase of Animals	6.673			6.673
	(2.48			(2.48)
Studies	0.829		0.296	1.125
	(0.829)			(0.829)
Recurrent Costs				
Staffing	1.3		5.37	6.67
	(1.3)		(0.654)	1.954)
Feed and Animal Health			1.68	1.68
Operation and Maintenance			1.794	1.794
Total Costs	11.96	2.215	9.14	23.31
IFAD Contribution	(7.13)	(2.215)	(0.6536)	(10.00)

a/ Figures in parenthesis are IFAD's contribution.

Disbursement

3.41 Disbursement in respect of incremental operating costs, local training and payments made under contracts costing less than USD 20 000 would be made against Statement of Expenditures (SOE). Disbursement for all other eligible expenditures would be made against receipt of full documentation. Supporting documentation for the SOEs should be retained by the Project manager for IFAD's review during supervision missions. The SOE would be subject to a special audit each year. Establishment of the Special Account on terms and conditions satisfactory to IFAD would be a condition of loan effectiveness.

3.42 The Government's contribution towards local operating costs would be required to be disbursed annually, during the beginning of each fiscal year, in the project account in amounts of LBP 2.0 billion equivalent for project Year 1, 2 and LBP 3.0 billion for project Year 3, 4, 5 and LBP 3 billion for project Year 6. To ensure the availability of counterpart funds, the Government would open a project account and deposit in this account an initial amount of USD 100 000 equivalent from its annual contribution to be replenished periodically upon submission of adequate supportive SOEs. Assurances to this effect will be obtained during negotiation. Opening of the project account would be a condition of loan effectiveness.

Table 3.4: Disbursement Schedule (USD million)

IFAD FY	1992	1993	1994	1995	1996	1997
Annual	1.9	1.6	1.7	1.9	1.6	1.3
Cumulative	1.9	3.5	5.2	7.1	8.7	10.0

Accounts and Audits

3.43 Separate project accounts and records would be maintained for all project related activities. A Management Information System would be put in place at the PMU for its accounting system and areas of internal control and reporting. This would involve close control of all its operating units. The proposed system would include budgetary control and cost accounting aspects and would ensure proper accountability and reporting standards by each section head. The locally recruited financial controller/procurement manager would be responsible for operating the system with technical advise from external consultants. The project accounts including the statements of expenditures would be audited by independent auditors acceptable by IFAD. The Audit Report would be submitted to IFAD not later than six months after the end of the fiscal year. Assurance on the above would be obtained at negotiation

Impact on Rural Women

3.44 The project would have specific benefit for rural women. Ten percent of the credit for livestock producers would be women. Women in livestock farm families are responsible for the care of animals. The forage component would also establish seed production gardens for on-farm pasture development. In addition, rural women and their families would directly benefit from the training program and credit for off-farm income generating activities.

Environmental Impact

3.45 The project would contribute to environmental conservation in two important ways: firstly by promoting semi-fattening activities for lambs and kids, it would reduce stocking rates on the poor range and shrubland in the northern and southern Bekaa; secondly the introduction of improved Shami goats to the Bekaa would gradually reduce the number of low yield Baladi goats in favour of less but much more productive Shami goats, and which will mostly be fed indoors and grazed on residues around the farm, by promoting more intensive production systems, the forest and range lands would then be preserved. Under the adaptive research program, particular attention would be given to orienting the LARI work program towards giving priority to the sustained utilization of resources. Research would thus emphasize the testing of measures to protect the range lands from uncontrolled exploitation. In addition, the generation of improved technological packages for forage crop production would take into consideration soil and water conservation measures by focussing increasingly on rainfed farming systems and the prevention of erosion.

The use of chemicals would be minimal and the extension services would promote technologies and production packages which would contribute to improving soil structure and fertility.

3.46 The project would have a positive impact on the environment. The forage development activity associated with increased availability of animal manure would reduce soil erosion, improve drainage, increase farm land potential for water harvesting in zones with low rainfall and improve the soil texture. The latter would maximize farmers' use of the limited water resources since organic materials increase soil water retention and meet crop requirements as well. In addition, the increased amount of organic manure would not only improve soil fertility, it would also be a substitute for chemical fertilizers.

IV. ORGANIZATION AND MANAGEMENT

A. Project Coordination and Management

4.01 The MOA would have the overall responsibility for coordination and implementation of the project. The Animal Production Department within MOA would have the direct responsibility in coordinating the participation of other Ministries and Departments in implementing related project components and ensuring that the five districts (cazas) of the project area benefit from project goals and activities.

Project Coordinating Committee (PCC)

4.02 The MOA would establish a Project Coordinating Commitee (PCC) within MOA and serviced by the Project Management Unit (PMU). The PCC would be chaired by the Director General of the Ministry of Agriculture and would include the Head of the Animal Production Department, the Director of LARI, representatives of the NUCC, and SCF - institution managing the credit. Others concerned with project implementation would be invited, as warranted. The Committee would meet at least half yearly and would have the responsibility for approving annual work programs and budgets, reviewing annual accounts and audit reports and resolving policy issues. The project manager, apart from being the chief executive of the Committee, would also act as the secretary of the Committee.

Project Management Unit (PMU)

4.03 The MOA would establish an autonomous PMU at Zahle headed by the Project Manager who would be responsible for: preparation of yearly work plans, coordination and preparation of project progress and completion reports; identifying and resolving factors hindering project implementation, processing tender documents for project procurement, overseeing staff recruitment, keeping consolidated project accounts, supervising the studies to be carried out under the project and liaising with other government agencies on matters concerning the project. The Project Manager will be hired prior to negotiation.

4.04 The Project Manager would be assisted by a Chief Technical Advisor (CTA) - a Livestock Specialist - and long term consultants in the field of animal breeding, forage production and credit/cooperatives and a Monitoring and Evaluation Specialist. In addition, the Project Manager will have the technical support of short term consultants to carry out the two aforementioned studies and baseline survey to be funded under the project. The Baseline survey would provide important informtion on the beneficiaries as well as informtion on existing rangeland. It would be the basis on which to measure the impact of the project on completion. Terms of Reference are found in Appendix 6. Apart from the externally recruited consultants, the PMU will have locally recruited personnel and/or seconded from MOA as follows: an administrative officer, and his assistant, a financial/procurement officer, counterpart personnel for the consultants and other lower level administrative staff. All technical assistant personnel, as well as all the local staff of the PMU would be recruited as soon as the credit becomes effective. All annual work plans must be approved by the PCC before they are sent to IFAD. The location of the Project Management Unit at Zahle is justified on the grounds that

Zahle is the administrative centre of the district and is centrally located. The List of staff and Terms of Reference for the Project Management and Financial/accountant Officer are in Appendix 6.

B. Project Implementation

Smallholder Livestock Production

4.05 The implementation of this component would be the responsibility of the PMU in cooperation with the Credit Management Institution SCF. The selection of the beneficiaries would be based on criteria laid down in Appendix 6. The implementation schedule is given in Appendix 6. Beneficiaries would be selected one year in advance of the delivery of animals. By that time they should have cosntructed shelters for the stock and have received some initial training and advice. Delivery of animals would begin in Year 2.

4.06 In the case of lamb/kid fattening operations, which are relatively straightforward, beneficiaries would only be provided with on-farm advice. Lambs/kids would be purchased on the open market at the age of 2.5 to 3 months. Farmers fattening their own lambs would be supported only for the purchase of feed. It is expected that about 60% of the farmers undertaking fattening for the first time would continue to do so in subsequent years.

The Credit: Lending Policies and Procedures

4.07 As indicated in para 3.16, the management of the credit component would be handled by SCF under a management agreement with MOA (the rationale for choosing SCF is presented in Appendix 5) and described fully in paras 1.42 - 1.46. In making the loans, for the livestock operations and investments and other activities under the project, the SCF would ensure that the following terms and conditions apply:

- check is made of the individual's background.
- guarantee of his creditworthiness and honesty is obtained from his village group.
- promissory note is countersigned by the beneficiary and two guarantors - one of whom must be in paid employment.

4.08 Qualifications.. In order to qualify for the loan under the project, each applicant would have to satisfy the lending criteria as agreed between the Government and SCF. In addition, the applicant should not have simultaneously borrowed for the same purpose under the existing programme of SCF.

4.09 Borrowers' Contribution. Each borrower would be required to contribute not less than 20% of the investment costs, either in cash or in kind, including family labour. The loan would cover the balance of the cost. For the equipment required by women beneficiaries for income generating activities, the loan would cover the full cost.

4.10 Loan Size. For the livestock production component (cows, sheep and goats) and fattening units, the maximum loan per family would be USD 3 000 or LBP 2.64 million. The maximum loan per income generating activity for women is estimated to be around USD 500.

4.11 Security. Before receiving the animals or equipment financed by the loans, the following security arrangements would be required. These would be similar to those outlined in para 4.07. The guarantor must be acceptable to SCF and MOA. For loans issued through cooperatives or groups, joint responsibility of the members would be considered sufficient and thus no collateral would be required. A penalty clause must also be inserted in the agreement. In the credit system currently implemented by SCF, there is a clause (article 8 in the loan contract) stipulating that when repayments are overdue, all promissory notes and instalments immediately fall due and the farmer must pay the total amount including interest on the loan plus 15% collection expenses. This system would also apply.

4.12 Loan Maturities. Medium term loans would be repayable within a maximum period of five years. Short-term loans would be repayed in seven months and long-term loans (cooperatives) in 12 years, including a one year grace period.

4.13 Proposed interest rate under the project. Interest rate on deposits with commercial banks in Lebanon are about 15% and on short-term loans, the rate is 27%. Given the inflation rate in the country and the fact that it is the objective of this project to make capital available to small farmers, it is proposed that the interest rate charged for the credit under this project should not exceed 12%. This rate is well below inflation rate which at present is running at the rate of 40% but it will, however, cover the estimated 6% management fee and the proposed 4% cost of the IFAD loan to the Government. Flexibility must be built into the whole credit system in order to allow for periodical reviews of the interest rates in response to changes in the economic situation. For loans which would be issued and recovered through the cooperatives or other groups (such as loans for establishing collecting centres and processing units, or loans to groups to be reissued to individual members), the suggested interest rate is 10% since this is a long-term loan carrying minimum management fee.

4.14 Supervision. The farmers and women receiving loans through the project would be constantly supervised by the staff of the project and the staff of the cooperating credit institution. For certain loan activities, such as the lamb fattening operation, the loans might be given in more than one installment according to the progress of work of each farmer/cooperative.

Development of Forage Production

4.15 Staff Recruitment and Support to the LARI. Staff recruitment and the putting in place of the physical facilities for the support of the LARI would begin immediately upon loan effectiveness. It is expected that the recruitment of the agronomist/range management specialist and his national counterpart as well as the recruitment or secondment of the forage production/range management scientist who would lead the adaptive research program at the LARI, and the two research technicians would have been completed by the end of the first year of the project. Furthermore, during the same period the LARI'S main experimental station in Tel-Amara would have received the laboratory and office furniture as well as the agricultural machinery provided by the project. In addition, the

LARI would have assigned the office and laboratory space required. Simultanuously, the recruitment of the extension agronomist and the five forage extension agents would have been completed. The forage research and extension teams would as such work closely together, headed by the agronomist/range management in the PMU, to implement the forage production development program in the project.

4.16 The Adaptive Research Program. Under the adaptive research program, the project would promote the testing and introduction of appropriate low-cost and simple technologies which, while fitting into the present farming systems would require some changes in current practices. An agreement would be signed between the LARI and ICARADA to implement this programme. Under the direct supervision of the agronomist/range specialist in the PMU, the forage production scientist in Tel-Amara, in cooperation with ICARDA's Pasture, Forage and Livestock Programme (PFLP), would develop adaptive research programmmes that would promote forage production both under rainfed and irrigated conditions. Many of the new packages and crop rotations proposed have already been developed in neighbouring countries with similar ecological conditions. Experimental work would take place in Tel-Amara and Kfardan stations as well as in field trials in locations representing the different cropping system in the project area. Since many of the new technologies which would be promoted by the programme have already been adopted by a limited number of farmers in the project area, it is expected that by the beginning of the third year of the project, the packages would be ready for widespread dissemination to small farmers who would be benefitting from project activities. Experimental work on improved range management would also be undertaken by the LARI. During the six years of the project life cycle careful testing of appropriate management systems would determine the future possibility of this established but fragile resource base to be put into effective use for improved livestock production. To achieve this goal two 10 ha experimental ranges would be established in each of the cazas of Hermel in the North and Rachaya in the South of the project area. The LARI forage research team in cooperation with ICARDA would collect data on range productivity, proper season for grazing and proper stocking rates and would also test measures for the control of undesirable plants, range fertilizer level and reseeding.

4.17 On-Farm Trials and Farmers Training. On-farm trials and the farmers training programme would be implemented by the extension service in close collaboration with LARI. Through the extension agents and upon the purchase of animals, each beneficiary will receive, on an annual or seasonal basis, seeds of improved varieties of crops promoted by the project as a source of fodder for the introduced herd. This would be accompanied by an intensive extension programme which would promote the new packages developed by the research programme. It is expected that the combined impact of seed distribution, the technological packages promoted and the introduction of improved animals by the project would constitute enough incentive for beneficiaries to adopt the production of fodder (green material, hay or silage) at the small farm level, thus contributing to the overall availability of feed in the project area. Due to the level of technical know-how in the project area, as well as on the part of the Lebanese farmer, and in order to minimize recurrent costs, the farmers training programme would consist of regular demonstraiton sessions during the growing season(s). For this purpose, extension agents would select among the beneficiaries at the village level those farmers who have

successfully integrated forage crop production in their operations. Group visits and discussions would thus be organized locally to demonstrate the impact of the improved production techniques and the benefits which would be derived from a mixed crop/animal production system at the farm level.

Support Services

Breeding Demonstration and Training Station

4.18 The PMU in cooperation with LARI would ensure that civil works and purchase of equipment machinery and vehicles for the Terbol Station are completed during the first year of the project so that the station would be ready to receive the animals during the second year. The staff for the station (manager and four technicians) should be recruited at loan effectiveness so that the training by the consultant animal breeding specialist can be initiated at early stage. In addition, Government and ICARDA must agree on sharing the facilities and part of the land. An assurance to this effect would be received at negotiation. A list of equipment, machinery, vehicles and the specification of the required civil works is presented in Appendix 3. The importation of the livestock would begin during the second year of project implementation when all the preparatory activities have been completed. For further details on the numbers of animals, the selection criteria, and the operation of the station, see Appendix 6. A summary of the implementation schedule as regards the activities of the Central Station by project year, is also provided in Appendix 6.

Distribution Centre

4.19 Management and implementation of the import and distribution to farmers of pregnant Friesian/Holstein heifers, Shami goats and Awassi sheep would be the responsibility of the PMU and the manager of the distribution centre at Terbol, with the assistance of the expatriate Chief Technical Adviser and the Animal Breeding Consultant. Facilities for housing 500 heifers or 1 000 sheep/goats at any one time would be constructed on Government land to the east of Terbol Station proper during the first year of the project. Details on the facilities and vehicles to be provided to the Distribution Centre are shown in Appendix 3.

4.20 The Distribution Centre would be manned with a manager, four labourers and three drivers The mode of operation is described in Appendix 6. Also included is the schedule of importation. The project manager and the animal breeding consultant would travel to the country of purchase to select the stock. If necessary, local consultants would be hired for short periods to assist in locating and selecting the best available stock.

Extension Services

4.21 Construction of office facilities and equipement for the five extension offices (Hermel, Baalbeck, Zahle, Anafar, Rachaya), as shown in Appendix 6, would be completed by the end of project year one. construction work and purchase of equipment would be supervised by the PMU. The ratio of project beneficiaries per extension agent at full development would be around 1:100, but at the initial stages it would be

much less. Existing livestock units would be served too, and the ratio may increase up to 1:200, depending on how many existing holders would participate in the project.

4.22 Extension officers would spend most of their time in the field offering on-the-spot advice to project beneficiaries and other farmers. They would select participants for the practical training and demonstration courses to be conducted at Terbol. They would also assist in identifying potential project beneficiaries and in collecting and evaluating applications. Particular areas of training would be animal housing, preventive hygiene, balanced least-cost feeding, milking and clean milk production, early weaning and fattening and curative treatment of sick animals. Disease control and eradication programmes, and vaccination of stock would be carried out in cooperation with headquarters veterinarians. It would be the specific responsibility of the field veterinarians to implement the yearly vaccination programme against Brucella melitensis, for which the project is providing funds. All young animals retained for breeding would be vaccinated at the age of about 6 months for sheep/goats and 18-20 months for cattle. Vaccines recommended would be REV1 for sheep/goats and B19 for cattle. It would further be the specific responsibility of the forage production specialist to guide and supervise the forage technicians in order to implement an intensive campaign to hasten the production of forage on dry or irrigated land and to integrate crop and livestock production systems. Improved seeds for the main forage crops would be available for purchase at the rural extension offices and demonstration plots would be established on selected farmers fields. Fifty demonstration plots will be arranged annually, spread all over the project area. Field days would be organized for farmers in the different regions and throughout the year to demonstrate the recommended production techniques, crop rotations, forage conservation methods, etc. Support in planting and implementing the demonstration exercise will be provided by the PMU in collaboration with the forage production specialist and LARI.

4.23 Annual extension programs outlining targets and goals to be achieved and monthly schedules of activities would be drawn up by the PMU with the assistance of the expatriate consultants. The consultants and their national counterparts would offer regular back-stopping to the extension agents organizing frequent short courses on important topics, writing manuals and accompanying them to the field to offer on the spot training and advice.

Artificial Insemination

4.24 The artificial insemination (AI) service would be operative by the middle of the second year. Detailed cost estimates, including a list of equipment, is provided in Appendix 3. A total of nine artificial insemination technicans would be recruited for the purpose and be placed under a veterinarian in charge of the service. There would be three field AI centres (at Baalbeck, Zahle and Anafar), and an office at the PMU headquarters. Semen would be imported from countries operating advanced breeding programmes. Semen should derive from progeny-tested bulls and international semen comparisons would follow the FAO INTERBULL Committee recommendations. Requirements in terms of breeding value of the bulls and other technical and veterinary specifications would be prepared by PMU on

the advice of the expatriate animal breeding specialist. A total of 8 000 doses of semen would be imported every year, sufficient to breed over 70% of all cows in the Bekaa, including project animals at full development. Each field centre would be manned with 3 Artificial Insemination technicians (inseminators) and would thus be able to operate in the afternoon and at two weekends. Communication equipment is to be provided for the offices and all four-wheel drive vehicles to be provided to the service would be equipped with similar equipment. However, it may prove necessary to organize a daily route and contact point in each village to obtain information about insemination requirements. Farmers would be charged USD 5 for each insemination. The first repeat insemination would be free but the second, if required, would be charged at the normal rate. The number of inseminations per conception would be about 1.8 on average.

Milk Collecting, Processing and Income Generating Activities for Women

4.25 The milk marketing and collection study is an important study. The recommendations of the study would be reviewed at the mid-term period of the project. At that time, a decision would be taken on whether or not it would be essential to assist livestock farmers to organize milk collecting and processing themselves; whether or not collecting trucks should be purchased; whether or not small processing centres should be constructed to service remote livestock farms. A sum of about USD 1.0 million has been set aside for the implementation of the study. Terms of Reference are in Appendix 6.

4.26 Cooperative Support. As indicated in para 3.26, the project would assist, on a pilot basis, three existing cooperatives in the Bekaa which are involved in milk production through loans for:

- organizing milk collection (milk collection trucks, milk cans and milk testing equipment);
- dairy processing;
- purchasing of equipment for forage production (disc mowers, balers and maize choppers).

The investment costs would be incurred during the first two years of project implementation. The repayment period would be within 12 years with one year period of grace. The interest rate would be around 10%. The same agency administering and managing the credit for the small farmers would manage the distribution and collection of these loans. (see para 4.13)

4.27 Cooperative Credit Study would determine whether farmer group formation is viable in Lebanon and whether existing cooperative organizations (NUCC) is the best vehicle for delivering credit to small farmers. it would also assist the project in identifying other groups requiring assistance.

4.28 Income Generating Activities for Women. This activity would be implemented as follows: The Government would be required, during the first year of project implementation, to sign a management agreement with SCF to manage the training and organization of the 500 women who are to benefit from this project. The selection of women would be on basis of need and interest to engage in off-farm income generating activities.

Training would be in the following areas: business management, budgeting and accounting procedures, inventory procedures, group organization especially for those interested in carpet and embroidery activities. At completion of the training, which would not last for more than three weeks, those women who meet the credit criteria would be given a loan of about USD 500 to start their business. The loan procedure is described in paras 4.07-4.14.

Technical Assistance and Training

4.29 Engagement of technical assistance personnel under the project would be in accordance with IFAD guidelines with qualifications and experience acceptable to IFAD. Selection of consultants is the responsibility of the project manager in association with the personnel section of the MOA. Institutional building is a major objective of the project. The cooperative and credit adviser who is to be associated with the project from the outset is expected to strengthen the formation of cooperatives within the project area.

4.30 Local Project Staff. Training of key personnel must therefore start as early as possible and execution of certain project components and the trainers skills must be replenished to ensure their effectiveness. All local professional and technical staff working within the project unit would receive special in-service training. These are described within the individual components. Overseas study tours of approximately two to three weeks duration would be provided for the project manager and the credit adviser's local counterpart, 12 extension agents and three central station technicans. They would study in a country similar to Lebanon where extension services and animal breeding are more advanced. For the local credit personnel, the Near East North Africa Rural Credit Association in Amman, Jordan may be the best place for this type of attachment. Local training courses of four weeks duration would be provided for all extension staff working on the project. All training of key personnel would take place during the first year of project implementation.

4.31 The staff of the rural extension offices (five veterinarians, five animal production specialists, five women extension officers, one forage specialist and one women's extension supervisor) would be seconded from Government departments. New staff would be hired if necessary to undertake these tasks. During the first year of the project they would receive intensive training in all aspects of animal and forage production by the Chief Technical Advisor, the Animal Breeding Consultant and the Forage Production Consultant. Three designated animal production specialists would receive short-term training at a suitable external university in the first three years of the project. A further twelve extension agents would benefit from short practical training courses, to be conducted in a nearby country (four in each of Years 1, 2 and 3.). It would be the responsibility of the PMU to select the candidates and to make necessary arrangements with universities and other authorities abroad.

4.32 Training for the AI technicians would be provided in Lebanon by an experienced consultant currently employed by the NCSR and the FAFS of American University in Beirut (AUB). A three week Course would be conducted for all technicans at the beginning of the second year, followed by a refresher course of one week during all subsequent years. The

consultant would also offer on-the-job training for one additional week in each of Years 3 to 6. He would further cooperate with the expatriate animal breeding consultant to devise a suitable cattle identification system and to prepare an efficient computerized storage and retrieval system for artificial insemination and herd fertility record.

4.33 Beneficiaries Training. Livestock keepers would receive training in all aspects of the animal production from the extension staff (as described in para 4.29). A considerable number would also visit the Terbol Station and receive training for a few days. With regard to the women benefiting from income generating activities, initial training would be carried out through an NGO which would receive, through the project, funds for equipment etc. This training would be of two to three weeks duration. It would include training in budgeting and accounting.

4.34 Cost Recovery. The establishment of a central breeding station, distribution centre for imported breeding stock, setting up three artificial insemination centres and five animal health extension units, are considered a public investment to enhance Lebanon's productivity and efficiency of its livestock sector, and improving the living conditions of the rural population. The seasonal and medium term loans extended to farmers and rural women would be recovered in full. In addition, the long term credit provided to cooperatives would be totally recovered. Payment would be deducted from proceeds of cooperative members' sale of milk to the cooperatives. The artificial insemination would be provided to farmers at cost, as stipulated in para 4.26. The project would provide forage seed to farmers who would meet the main costs of establishing forage production through the provision of land, labour, farm inputs and irrigation water. The project would make maximum use of existing staff and facilities within and outside MOA.

C. Reporting, Monitoring and Evaluation

4.35 Annual Work Programmes covering all project activities would be prepared by each section head. The work program would include:

(a) a detailed description of progress achieved so far and of the work to be performed during the ensuing year, including goals and objectives, a schedule of activities, equipment requirements, proposed staffing arrangements, training plans and distribution of responsibilities for each task. Under the credit arrangements, progress would be monitored against targets set in the annual work plan and particular attention would be paid to inclusion of rural women among the target group. Under the forage development component, special emphasis would be given to monitoring the progress in reaching semi-nomadic pastoralists;

(b) a budget for the period, including proposed capital and recurrent expenditures, a comparison of the proposed and actual expenditures for the previous years;

(c) financing plan with cash flow projections, including government contribution to the project account.

4.35 The annual plan would enable the Project Management Unit (PMU) and the Project Coordinating Committee (PCC) to review progress, examine proposed activities, and make the necessary arrangements for budgetary support. Draft annual work plans would be submitted to IFAD for review and acceptance not later than two months before the beginning of the government fiscal year. The final version approved by the PCC would be submitted to IFAD by the PMU as soon as the budget for the Government is approved each year. The initial work plan for the first year would be prepared and submitted to IFAD once the project becomes effective.

4.36 Monitoring and Evaluation. A monitoring and evaluation system would be set up at the first year of project implementation by the specialist engaged for that purpose. Monitoring of animal diseases throughout the country would be planned by the Director of Animal Production in coordination with the Project Manager. Extension workers would report diseases on monthly basis and map out the pattern of epidemics in each district. The Forage Development Adviser would monitor forage development focussing on the volume and location of seed distribution, and the increase in areas of improved forage production pasture under different farming systems. Income and well being of the smallholder farm families - the beneficiaries - would be monitored at the beginning of the project through a base line survey of the socio economic status of the target group. The credit adviser would monitor the repayment rate of the credit recipients. The research component both for the breeding of animals and for the seed production would be judged by the extent to which improved forage seeds and new animal breeds are made available to small rural farmers. Input prices would also be monitored to determine the effect of Government policies and project activities on reducing production costs, improving producer prices while maintaining consumer prices stable. Quality of dairy products, quantities and prices of imported powdered milk would also be monitored to evaluate the combined effect of the increased output of fresh milk and Government policy on improvement of food security and ensuring supply of agricultural products at competitive prices (Draft monitoring and evaluation indicators are provided in Appendix 6).

4.37 Reporting. The project manager would prepare and submit semi-annual progress reports to IFAD based on reports received from the section heads. The semi-annual progress reports would compare actual progress with the proposal in the annual work program and budget. Progress reports would be sent to IFAD within two months of the end of the reporting period. The first report would be due six months after credit effectiveness.

4.38 Interim and mid-Term Reviews. An interim review would be made 18 months after project initiation, to assess progress and determine whether any components should be adjusted.

4.39 A project mid-term review would be conducted jointly by the Lebanese Government and IFAD no later than the middle of the third year of the project. The mid-term review would, among other things, review the constraints and bottlenecks which may at that time be affecting the project implementation. Issues to be covered include: progress in establishing improved forage crop production under various farming systems, assessment of impact of the project on the income of the target group, (this would include movements in the prices of milk and milk

products as well as imported inputs), Government policies as they affect the importation of milk and milk products. Special importance would be given to assessing the cost to the farmer of improved preventive (drugs, vaccines) and extension services as measured by the mortality rates, calving rates, the progress in improved extension services to the small farm families; the progress in establishing credit and small marketing cooperatives and the rate of recovery of the credit scheme. The Lebanese Government would submit a mid-term progress report to IFAD covering these areas not later than two months prior to the scheduled date. Assurance to this effect would be agreed upon at negotiation. Terms of Reference for the preparation of the follow up project would be agreed upon at the mid-term review.

V. TECHNOLOGY AND PRODUCTION SPECIFICATION

A. Farm Models, Yields and Incremental Production

5.01 The project aims at introducing a technological package, which includes: improved animal stock, improved animal husbandry methods integration of crop and livestock production systems, infrastructures to achieve continuous genetic improvements of livestock populations and disease prevention, treatment and control practices.

5.02 These practices are not necessarily new to Lebanon. Pure and crossbred black and white cattle are prevalent, although their numbers have declined considerably during the last decade. Shami goats exist in the Bekaa and are highly valued. Fattening of lambs/kids is practiced to some extent by sedentary and semi-sedentary farmers. Before the war, artificial insemination was practised extensively and the Terbol Station was one of the most successful breeding, training and research centres in the region. Farmers in the Bekaa are quite progressive and with the prospect of increased income from high yielding stock, the adoption rate is expected to be high.

5.03 Farm models describing the "with project" and "without project" situation were developed for all types of project units including the Central Station. Since all these farms would be established using imported stock, all their production would be incremental to existing levels. Hence the comparison between the "with project" and "without project" situation aims at demonstrating the advantages of the proposed production systems, rather than at estimating incremental production. Technical parametres and projected development, input and output charts for the various models are shown in Appendix 7.

5.04 Small Dairy Cattle Model. A smallholder dairy cattle farm would start with two imported Friesian/Holstein heifers. It would be expected to increase in size to three cows by Year 7 and stabilize at that level. Cows would be bred by AI. Calves would be weaned at about two months of age and surplus females would be sold at 18-20 months of age. Bulls would be fattened to about 550 kg (16-18 months of age). Each project farm would require 9.4 tons of concentrate, 4 tons of hay or equivalent quality dry matter and 8.2 tons of straw or equivalent by-products. Full development output is shown in Table 5.1.

Table 5.1: Output from Smallholder Cattle Farms (kg)

	Without Project	With Project	Increase %
Milk	8 146	12 324	51.3
Liveweight bulls	187	659	353.0
Liveweight cull cows	152	182	19.7
Heifers sold for breeding, no.	0.54	0.60	11.1

5.05 Smallholder Awassi Sheep Model. Project farms would start with 20 females (10-15 months of age) and one male and would be expected to increase in size by two sheep in each subsequent year, stabilizing in Year 7. Sheep would mostly graze outside and would be supplemented with straw and some concentrates, especially in the winter and at peak production periods. Lambs would be weaned at about 2 months of age and fattened to 30 kg liveweight using concentrates and residues. Each farm would require 3.2 tons of concentrates, 1.6 tons of straw or equivalent by-products and about 6 du of land (perhaps rented) for grazing or forage production. At full development output would be as shown in Table 5.2.

Table 5.2: Output from Smallholder Sheep Farms (kg)

	Without Project	With Project	Increase %
Milk	1 855	2 533	36.5
Liveweight, lambs	362	452	24.9
Liveweight, cull ewes	154	162	5.2
Wool	61	64	4.9

5.06 Smallholder Shami Goat Model. Goat farms would start with a maximum of 10 female goats (10-15 months of age) and one male and would be expected to increase in size by one goat in each subsequent year, stabilizing in Year 7 after establishment. About 40% of the feed requirement would be met through grazing on crop residues and by-products. Six du of land would be rented for residues. Indoor feed supplements would be concentrates and forages produced on arable land (green material, hay or silage). Goats would be housed in medium quality shelters. Kids would be weaned at about 2 months of age and fattened to about 30 kg liveweight. Each project farm would require annually 3.8 tons of concentrates, 3.6 tons of hay or equivalent quality dry matter, and 6 du of land rented for residues. During the initial years, each farm would be expected to sell about 70% of its surplus female stock, and 30% of its male stock for breeding purposes instead of slaughter. At full development output would be as shown in Table 5.3.

Table 5.3: Output from Smallholder Shami Goat Farms (kg)

	Without Project (Unimproved)	With Project (Improved)	Increase Percent
Milk	1 698	3 870	127.9
Liveweight, kids	274	482	75.9
Liveweight, cull goats	77	113	46.8

5.07 Smallholder Lamb Fattening Model. Lambs would be fattened to an average weight of about 40 kg over a period of 5 months. Typically lambs would be bought in June and sold in November to capitalize on higher

off-season prices for lamb meat. During the first 3 months fattening would be extensive, based on crop residues and by-products, with about 300 g of concentrate supplement per head daily. This period would be followed by intensive finishing on concentrates (800 g per head daily). Each farm would require an average of 3.7 tons of concentrates and about 3 tons of roughage to fatten 50 lambs. It would also require 6 du of land for residues. Output per farm would be as shown below:

	Without Project	With Project	Increase %
Liveweight, lambs	850	1 960	130.6

5.08 Central Station Model. The Central Station at Terbol would start with 15 heifers, 380 sheep (10-15 months old) and 20 rams in Year 2, and with 288 goats and 12 bucks of similar age, at Year 5. Production would stabilize 7 years later respectively. Sheep would be grazed on the nearby hills for part of the day, but cows and goats would be kept mostly indoors. The feeding system would be designed to take account of the restrictions in availability of land to produce forage due to the current lease of the Terbol Station to ICARDA. Animals would be fed on legume straw and similar by-products from ICARDA's experiments on 50 ha of irrigated land, and on hay and silage to be produced on 70 du (7 ha) of irrigated government land (double-cropped with vetch/cereals in the winter and forage maize in summer). The balance would be concentrates. Calves, lambs and kids would be weaned early and fattened to 550 kg, for calves and 30 kg for lambs and kids. Balanced least-cost feeding would be applied according to actual production, taking account of higher requirements in early lactation, at mating, and late pregnancy. Surplus heifers, 50% of surplus male and female lambs, 80% of surplus female kids and 50% of male kids would be selected and sold to farmers for breeding purposes. At full development, the station would require annually 200 tons of cencentrates, 72 tons of hay, 320 tons of corn silage and 250 tons of legume straw, or equivalent crop by-products. Output from the station would be as shown in Table 5.4.

Table 5.4: Output from the Central Station (tons)

	Output
Cow Milk	65.6
Sheep milk	43.0
Goat milk	74.3
Liveweight, bulls	3.4
Liveweight, cull cows	1.0
Liveweight, lambs	6.8
Liveweight, cull ewes	2.9
Liveweight, kids	3.5
Liveweight, cull goats	2.2
Heifers for breeding, number	3.5
Male lambs for breeding, number	76.0
Female lambs for breeding, number	38
Male kids for breeding, number	91
Female kids for breeding, number	100

5.09 Incremental Breeding Stock. Based on the assumptions spelled out in the various models, a stream of improved animals would become available to establish livestock farms, other than those financed by the project. At Year 6 incremental surplus stock would comprise 335 heifers, 1 200 male and 2 000 female Shami kids and 62 Awassi rams. At full development, surplus stock would increase to 604 heifers, 1 500 males and 2 310 female Shami kids and 76 selected Awassi rams.

5.10 Incremental Production. Incremental production of milk, meat and wool due to the project would derive from farms financed by the project, additional beneficiaries receiving incremental stock as outlined above and as a result of improved extension, disease control and genetic improvement programmes for all existing and incremental stock. Estimates based on these assumptions are shown in Table 5.5.

Table 5.5: Incremental Production

Type of Farm	---Incremental Production (tons)--- Year 6	At Full Development (11 years)
Farms financed by the project		
Milk	9 325	15 479
Meat	502	614
Wool	10	14
Farms receiving surplus improved stock		
Milk	4 614	8 300 a/
Meat	32	189 a/
From existing farms		
Milk	2 000	2 000
Meat	160	160

a/ Potential increase per year.

B. Financial Analysis

5.11 Cash flows for each farm unit were prepared using farm models provided for this purpose. The net income streams and the rates of return of each representative farm unit is shown in Table 5.7.

5.12 Since information on small farm income is scarce, such income was derived using livestock parameters corresponding to the type of animal and feeding systems now in use in the Bekaa. For 'without project' situation, it was assumed that small farmers obtain their starting capital (for purchase of animals, equipment, feed and for constructing shelters) on the local market from local money lenders at the rate of interest of 40%. This capital is payed back in five yearly instalments.

5.13 The animals would be recieved towards the end of the year and operational cost would not be incurred until the beginning of the following year. In each case an opportunity cost of labour was included in the costs. Each of the farm units would require half a day's labour. This labour was assumed free except for the three summer months when labour in the Bekaa is in short supply. During this period, it is assumed that one person in the household forgoes outside employment to tend the animals. For analytical purposes, it was also assumed that the animals would stop producing at the fifteenth year and would be sold for meat at 40% their initial prices.

5.14 The with project situation holds the same assumptions as the without situation with the following exceptions. Starting capital is considered offered under the credit component of the project at 12% interest to be payed back in five yearly installments. The animals are of the improved breed and the feeding system follows closely those prescribed by the models.

5.15 The high rates of return shown in Table 5.6 are due to the high productivity of the imported animals. For instance, at year 7 when herd growth stabilizes, the improved cow farm produces 12.3 tons of fresh milk annually, compared to 8.1 tons for the crossbred cow. That alone accounts for a difference of USD 1 378/year. With the project, and at full growth, family farm income compares as follows:

(a) a family operating a project Awassi sheep farm would net an annual income of USD 1 175, compared to USD 1 078 for a non-project farm. This translates to a higher income for the beneficiary family of 9%;

(b) a project improved Shami goat farm would give the beneficiary family a net annual income of USD 1 342, compared to USD 428 for a non-project farm. This translates to a 213% higher income for the beneficiary family; and

(c) a family benefitting from the project, and operating an improved cattle farm, would see a net annual income of USD 3 466, compared to a net income of USD 689 for a family operating a crossbred cattle farm. The improvement in income is about 400%.

5.16 It is clear from every case that family income will improve under the project. The with project situation compares even more favourably with the without project situation illustrated in Appendix 2, showing incomes of eight small landholdings involved in a mixture of livestock and agricultural activities.

C. Market and Prices

Marketing

5.17 Due to major disruptions to markets and marketing networks, since the 1985 armed conflict, Lebanon's meat and milk marketing systems have suffered. The formal livestock marketing system includes one major weekly market held in the Bekaa and on-farm sales to butchers. Participants in

Table 5.6: Net Benefit and Internal Rates of Return (IRR, %) - Representative Farms (USD)[a/]

Type of Farm Unit	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10	YR 11	YR 12	YR 13	YR 14	YR 15	IRR (%)
Awassi sheep (without project)	-1043.7	-320.0	-417.0	-362.0	-334.7	-299.4	1078.3	1078.3	1078.3	1078.3	1078.3	1078.3	1078.3	1078.3	2371.7	18.04
Awassi sheep (with project) (20 females and one ram)	-1474.4	16.0	50.9	89.4	141.4	182.4	1170.6	1175.4	1175.4	1175.4	1175.4	1175.4	1175.4	1175.4	3444.4	26.64
Cross bred Friesian/Holstein cows (without project)	-1583.9	373.6	-345.1	-195.9	-110.8	-49.6	689.7	689.7	689.7	689.7	689.7	689.7	689.7	689.7	1845.5	11.43
Improved Friesian/Holstein cows (with project) (2 cows)	376.76	1466.82	174.2	2288.2	2863.5	3466.6	3466.6	3466.6	3455.6	3455.6	3455.6	3455.6	3455.6	3455.6	5284.4	500
Unimproved Shami Goats (without project)	-1318.6	664.0	-774.7	-797.2	-803.1	-819.3	428.0	428.0	428.0	428.0	428.0	428.0	428.0	428.0	1464.8	-0.67
Unimproved Shami Goats (with project) (10 females and 1 buck)[b/]	-750.6	589.9	664.5	812	795.7	950.1	1363.9	1342.9	1342.9	134.9	1342.9	1342.9	1342.9	1342.9	3052.9	92.32
Sheep Fattening Units	202.5	878.1	911.7	945.3	978.9	1012.5	612.5	1021.5	1021.5	1021.5	1021.5	1021.5	1021.5	1021.5	1021.5	500

a/ The Year in this table refers to the year of operation of the farm unit and not the project year

b/ Income for goats is calculated for the largest goat farm unit to be financed by the project. The average size of goat farms would be seven females and one male.

these markets are now limited to residents of the Bekaa or to those who have free access to the area. This has served to weaken the meat marketing system by localizing it to the Bekaa. Livestock slaughtering takes place in local butcher shops, in municipal abattoirs, and sometimes on the farm.

5.18 Fresh milk is sold on small farms to milk collectors acting as middle-men who resell the milk to processing plants or directly to consumers. Large farms have their own trucks that transport milk to processing plants owned by them or others. They also collect milk from small farmers. The prolonged interruptions to the supply of electricity (for refrigeration of fresh milk) and the availability of skimmed powdered milk at lower prices have reduced consumption of fresh milk. Powdered skimmed milk is also being used by processing plants to fill the existent gap between fresh milk production and consumption of milk and milk products. Milk processing plants in the Bekaa are now operating under full capacity. With the improvements to the dairy herd, the milk collecting system and the expected implementation of a recent MOA law limiting the use of powdered milk in cheese and yogurt processing, both supply and demand are expected to improve. Anticipated improvement in the economy, as well as the Plan, on the part of EC members to cut milk subsidy is expected to improve prices obtained by small farmers for milk and cheese.

5.19 Sheep wool is highly valued for carpet weaving and making of bed covers. Although no advanced wool processing plants exist in Lebanon, demand for wool is relatively high to absorb current production and expected incremental production. Wool is marketed on the farm or in the weekly market in the Bekaa. Wool is also exported to Arab countries. In 1990 some 11.8 tons of wool was exported.

5.20 Although the leather industry is still a fledgeling industry in Lebanon, animal skins are not wasted. They are treated and exported to other countries for processing. In 1990 some 6 897 tons of animal skins including re-exports were exported from Lebanon.

Prices

5.21 Although supply and demand freely determine prices for meat and wool, the same is not true of fresh milk. Currently prices favour the milk collector who pays a farm gate price of 150-300 LBP/kg (depending on the season) and sells to processing plants at 300-400 LBP/kg. Since rural isolation in the true sense of the word does not exist in the area, and since the infrastructure is moderately built up, it is expected that a better collecting system (to be implemented as of the third year of the project) involving producers through cooperatives and/or farmer groups, will improve farm gate fresh milk prices. Implementation of the fresh milk law is also expected to shore up fresh milk producer prices. Expected incremental production of 9 325 tons/year at Year 6 of the project and 15 479 tons/year at full development of the project introduced herd (around the 11 year after project commencement) will be easily absorbed by the market.

5.22 The meat market on the other hand is not as punitive to small farmer as the milk market. A highly competitive market exists allowing fair prices for fresh meat. Fresh meat from imported animal for slaughter that

now fill the gap between demand anf local supply of fresh meat will easily be replaced by locally produced fresh meat resulting from the project's activities. Although price differences are large, for instance, locally produced sheep meat now sells at LBP 2 000/kg (live weight), while imported sheep meat sells at LBP 1 350/kg (live weight). Local consumers prefer locally produced meat and would pay a premium price for such meat. Around 11 695 tons of meat were imported in 1990 and the market will absorb the 503 tons annual increase in meat production (at Year 6 of the project which will improve to 614 tons/year at full development around year 11) without much changes to prices.

5.23 On the cost side of the equation importers of concentrates, fertilizers and chemicals are few and some price fixing takes place. The abundance of roughage, hay and straw renders cost of livestock rearing to the farmers reasonable. With the entry into the market of new importers and new sources of imports (especially Syria), cost prices are expected to experience little or no increases.

VI. BENEFITS, JUSTIFICATION AND RISKS

A. Benefits

6.01 The project would provide a range of benefits. The benefits that have been quantified for economic analysis of the project would be:

(a) overall increase in the production of meat, milk and wool, as well as the surplus breeding cows, sheep and goats resulting from improved breeding stock, and availability of fodder and credit;

(b) the overall rise in flock productivity and reduction in mortality rates as a result of strengthening of veterinary and extension services; and

(c) the expected increase in family income from the off-farm income generating activities of women.

6.02 On the whole, some 2 400 small farmers, of whom 10% would be rural women, would benefit from the project loans, and a further 500 women would benefit from the training and credit for off-farm income generating activities. Without the project, these families would experience declining productivity, reduced food security and further soil deterioration, the impact of which would be a further decline in their already low income, and many of them would be forced to sell their land and face the dismal prospect of having to earn their living from poorly paid seasonal labour.

6.03 By the end of the project, it is expected that milk, meat and wool production would increase annually by 9 325, 502 and 10 tons respectively. Surplus stock available to other farmers at Year 6 would comprise 335 heifers, 1 200 male and 2 000 female Shami kids and 62 male and 62 female Awassi lambs. At full development (year 11), annual incremental production directly attributable to the herds imported by the project would be 15 479 tons of fresh milk, 614 tons of meat and 14 tons of wool. Additionally, at full development, the project would have the potential of providing 604 heifers, 1 500 male cows and 2 360 female Shami kids and 76 selected rams for breeding

6.04 The project unquantifiable benefits are substantial:

(a) Institutional Building. Strengthening the institutional structures for service delivery to small farm households is a major objective of this project. The setting up of a rural credit institution would free small farm families from being indebted to private moneylenders. The artificial insemination service, while not free, would ensure that private bull owners would no longer have to bear the full cost of service and at the same time would help to introduce superior cattle stock breed into the country. The setting up of a breeding and training centre would strengthen the country's genetic and reproductive research capability;

(b) A major secondary benefit would be the support of group formation (cooperatives) and extension centres.

6.05 Success in these endeavours would boost the Government's efforts to effectively extend credit and technical services to the country's small livestock producers. The experience gained from this project would be of considerable value in setting up an operation of livestock development in other areas of the country.

Women

6.06 As indicated in para 3.44, women would gain specifically through the credit to livestock producers, and particularly through the credit for off-farm income generating activities component. Women would also benefit from increased income of farm households resulting from the project. The inclusion of female extension workers would ensure that particular attention is paid to the needs or rural women. Holding the training courses in the sub-centres would ensure access to training by breast feeding women and those with small children. Indeed, it is anticipated that the increased production of sheep and goats would lead to production of such products as carpets, and other products, of which wool is an input.

B. Economic Analysis

6.07 The Economic Rate of Return (ERR) for the project is estimated at 32.2%. The ERR has been calculated on the basis of incremental costs, outputs and improved social benefits. The following assumptions were used:

6.08 All economic costs are expressed in constant USD, using October 1991 border prices. Traded goods are valued at their CIF cost less taxes, duties and internal transport costs. Non-tradeable goods are treated in the same way since no divergence exists between the official exchange rate and the shadow exchange rate. Consequently, a standard conversion factor of 1 has been used. This is more so since there are no taxes on import or export of agricultural goods and equipment. In calculating the Economic Rate of Return (ERR), investment costs at their economic prices for all project components were considered. Recurrent costs were treated similarly with the assumption that by Year 6, externally recruited personnel would be replaced by local professionals and the operating costs of the distribution centre, and other operating costs, would have been reduced, rendering annual operating costs USD 900 000 as of Year 7. Additionally, costs incurred by farm units (cattle, sheep, goats and fattening units) receiving credit from the project were included. Farm units established by non-credit recepients but purchasing improved animals which are the progenies of the imported animals were also included in the analysis. Costs incurred to these farms were aggregated and added to the total costs.

6.09 Economic prices for inputs and outputs have been used in the farm models to derive revenues in economic terms. Markets were assumed to be sufficiently competitive for market prices to reflect the value of goods in economic, as well as financial terms. This is also true for the labour market which is also considered competitive.

6.10 Project Benefits. All benefits accruing to farms established by the credit beneficiaries from the project, as well as benefits from farms established by beneficiaries not receiving credit from the project but using progenies of project animals , have been included. Benefits from

sales of improved animals, meat, milk, skins and manure from the Central Station and benefits from the artificial insemination activity have also been included. Improvements in productivity resulting from the extension and other services have also been included. They are estimated at 2% annually, beginning at Year 2 of the project, and stabilizing during Year 6, at a level of 10% increase in milk and meat production over the before-project situation.

6.11 Using the parameters described above, and a period of analysis of 25 years, the Economic Rate of Return (ERR) is calculated at 32.2%. Despite the relatively high cost associated with insitutional building, the high rate of return is due to the high productivity of the imported animals.

6.12 An increase in total project cost by 10% or a decrease in benefits by 10% would result in a decrease in ERR to 28.2% and 27.8%, respectively. The sensitivity of ERR to changes in cost benefit streams was also calculated using switching values, ie percentage change in the cost/benefit streams which would reduce the ERR to the minimum acceptable value, defined as long-term rate of commercial credit set by the Commercial Bank for foreign denominated loans (in this case, we chose 13.5%). This shows that a lag of one, two, three years in realization of project benefits would bring down the ERR to 25.9%, 20.1% and 16.3% respectively. This indicates that the project is fairly resilient and its ERR is not sensitive to adverse movements in costs and benefits. Table 6.1 shows the sensitivity analysis and the results.

Table 6.1: ERR Sensitivity Analysis

	ERR %
Basic Assumptions	32.2
Total benefits up to 10%	36.3
Total benefits up 20%	40.2
Total benefits down 10%	27.8
Total costs up 10%	28.2
Total costs down 10%	36.7
Benefits lagged 1 year	23.5
Benefits lagged 2 years	18.3
Benefits lagged 3 years	14.8

C. Risks

6.13 There are four main risks. These are:

(a) the willingness of the Government to entrust the credit management to an NGO and failing that, the ability of the Government agency to manage the credit component. This risk is minimized by the provision that the NGO train a Government

department, or a cooperative association, to take over the management after Year 3. This commitment is further strengthened by the provision that this arrangement be reviewed during the mid point of project implementation.

(b) The second risk relates to the possibility of a fall in milk prices causing a reduction in the profitability of the proposed livestock production systems. This risk is minimal considering that incremental milk production at the end of the project would not exceed 16 000 tons at the maximum, thus improving Lebanon's self-sufficiency ratio from 23% at present to only 27%. In addition, the Government has recently passed a decree which would increase the demand for fresh milk by the dairy processing units and the project provides for a major study on milk marketing and processing with provision for implementation of the study's recommendations.

(c) The willingness on the part of the beneficiaries to adapt the proposed mixed crop/livestock production system in order to avoid feed shortages resulting from the increase in the animal stock within the project area constitutes the third risk. To minimize this risk, provision has been made in the project for the introduction of low-cost improved technological packages readily applicable by the small farmer for the production of forage crops. These will be accompanied by intensive extension and farmers training programmes and the distribution of improved seed all of which are expected to result in a high adoption rate of the proposed cropping systems. Based on the assumptions proposed in the farm models, the total acreage required to produce the necessary forage for the introduced herd, would not exceed 90 ha of irrigated and 1 500 ha of rainfed land at full development. This represents less than 0.4% and 4% of the cultivated land in the Bekaa, respectively.

(d) The final risk relates to a deterioration of the animal health situation in Lebanon which would reduce the productivity of the imported improved stock. This is a very unlikely event given the programme already underway to improve the situation. Large numbers of vaccines have been received from neighbouring countries and used in the field, refresher courses have been organized, the Fanar veterinary laboratory have been reinstated in its former condition with FAO/UNDP assistance and recent studies have created awareness of the shortcomings of the present situation. Furthermore, the project would put in place a strong field veterinary service, would fund an annual vaccination programme to reduce brucellosis and would promote improved practices, including artificial insemination to prevent the spread of disease.

6.14 Built into the project design is the possibility of modification of parts of the project as situations change. Finally at each stage in the implementation process, the project would be subject to monitoring and evaluation and corrective actions would be taken as necessary.

VII. ASSURANCES AND RECOMMENDATIONS

7.01 The following assurances would be obtained from the Government of Lebanon during loan negotiations:

(a) Government would ensure that all the necessary staff required for the various project components (Terbol Station, the LARI the distribution centre, the field extension officers and the veterinarians) would be recruited by the project start-up (see para 4.04);

(b) assurance that the project manager would be hired prior to negotiation so that he at least would be part of the negotiating team (see para 4.03);

(c) assurance that the existing occupants of the barns, training centre and accommodation buildings in Terbol would vacate by project start-up (see para 3.22);

(d) assurance that a suitable agreement would be negotiated with ICARDA for cooperation in the use of common facilities as well as the utilization of agriculture residues and straw produced by ICARDA after the completion of the yearly experiments (see para 4.18);

(e) assurance that all imports related to the project would be duty free (see para 3.40);

(f) assurance that the Governnment would sign a management agreement with an institution acceptable to IFAD and provide staff to manage the credit component or, alternatively MOA would establish a credit management section in the first six months of PY1 (see para 3.34);

(g) assurance that the Government would request the LARI: (i) to negotiate a suitable agreement with ICARDA for the implementation of the forage and range management research programme; and (ii) to make available the facilities at one or more of its research stations for the implementation of this programme (see para 4.16);

(h) assurance that the Government would open a project account (see para 3.42);

(i) assurance that the Government would submit a semi-annual progress report and annual audited accounts and work plans to IFAD in a timely manner (see paras 3.43, 4.35 and 4.37);

(j) assurance that the Government would open an interest bearing revolving account in which repayment of interest and principal from the short, medium and long term loans would be credited (see para 3.31, as well as establish a special insurance fund for the cattle (para 3.37)