REPUBLIC OF LEBANON

GREEN PLAN

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

REQUEST OF THE UN/FAO WORLD FOOD PROGRAM FOR ASSISTANCE IN A PROJECT FOR ECONOMIC AND SOCIAL DEVELOPMENT

Country: LEBANON

Title of Project: INTEGRATED DEVELOPMENT OF THE LEBANESE MOUNTAIN AREAS

Location: HIGHLAND AREAS

Date of Request: September 1969

Presented by: THE GREEN PLAN

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1. Description of Project and the Role of W.F.P.

a) The aim of the project is to increase the agricultural output of Lebanon by:

- developing new arable land
- developing abandoned agricultural land
- intensifying agricultural production by developing infrastructures and ameliorating the cultural practices.

These actions are concentrated in the under privileged highland areas of the country, where obsolete cropping techniques are practiced by an impoverished rural population. Present cropping techniques, are contrary to basic methods of soil conservation and should be stopped promptly if the areas concerned are not to become for ever unproductive deserts of stones.

Vast areas of barren watersheds have resulted in the depletion of the natural underground water reservoirs and in periodic floods that are washing away the remaining fertile soil cumulated at the bottom of the valleys. Massive rural migration is taking place at increasing rates.

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The problem of rural migration, with the consequent abandoning of arable lands in the mountainous regions of Lebanon, started after World War I. It became a real exodus after World War II as a result of an abnormal development of the coastal cities, mainly Beirut which now accounts for two fifth of the total population of the country.

Statistical data on the overall population of the country and provisional figures to illustrate the increase in the rural migration are impossible to provide - since the last census dates back to 1932. Detailed socio-economic situations were available only since the French "Mission IRFED" called upon by the Lebanese Government, started its works in 1959. Even then detailed figures on internal migrations do not exist. However overall figures on urban V/S rural population are given as follows for the year 1959: (table I).

Table I - Rural V/S Urban Population in Lebanon in 1959(estimates)(1)

District	Rural Population	%	Urban Population	%	Total
Municipal Beirut			450 000	100	450 000
Mount Lebanon	180 000	55,6	150 000	44,4	338 000
North Lebanon	302 000	81,1	70 000	18,9	372 000
South Lebanon	163 000	68,5	75 000	31,5	238 000
Bekaa'	163 000	71,5	65 000	28,5	228 000
TOTAL	816 000	49,25	810 000	50,75	1 626 000

(1) Besoins et Possibilite de Developpement du Liban - Mission IRFED - LIBAN ; Tome I - (1960)

The total area of Lebanon is 10 000 km^2. The population density in 1959 was as high as 160 inh./km^2. The rate of the population growth being 2.5%, the population density in 1975 will be 239 Inh./Km^2. This figure does not include some 150 000 palestinian refugees and 200 000 syrians now permanently living in Lebanon.

This means that only in order to keep the same standard of living, Lebanon must, each 15 - years period, increase its national revenue by 50% (at constant prices). Moreover all the population pressure is concentrated in the urban coastal cities. For example the growth of the population of Beirut was as follows:

Table II - Population growth of Beirut

Year	1922	1952	1960	1966
Population	160 000(1)	296 000(2)	400 000(1)	770 000(3)

Specific figures on rural migration are not available. However any tourist travelling through certain rural villages of the Lebanese highlands can easil notice that around 50% of the houses are either abandoned or even demolished.

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(1) Mission IRFED - Besoins et possibilites de Developpement du Liban - Volume annexe - (1960 - 1961).

(2) A.U.B - The City of Beirut, a Socio-Economic Study by Ch. W. Churchill - (1954)

(3) For Beirut and its suburbs - UNDP/GREEN PLAN - Present consumption of wood products and future requirements in Lebanon - (1966).

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This drastic and rapid change in the geographic and social distribution of population of the country, not being paralleled by a change in the corresponding sectors of production, has resulted in the following:

- Impoverishment of the rural population with general discontent leading to social and political unrest.

- Expansion and proliferation of city slums with consequent moral and health degeneracy.

- Unemployment with waste of human and natural resources.

- Increased dependency on imported foodstuffs resulting in an over increasing deficit in the balance of trade.

The deficiency of the agricultural sector as compared to the other sectors of activity in Lebanon is evidenced when comparaison is made between table III and table IV.

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Table III - Gross Domestic Product in 1964 & 1965
(in 1 000 000 LL) (1)

Sector of activity	1964		1965		Variation
	Value	%	Value	%	65/64 %
Agriculture	381.0	11.9	409.2	11.6	7.4
Energy& water	69.4	2.2	77.8	2.2	12.1
Industry & handycraft	410.6	12.8	462.4	13.1	12.6
Construction	178.3	5.6	200.4	5.7	12.4
Transport & communication	258.2	8.1	290.8	8.3	12.6
Housing	250.0	7.8	269.1	7.6	7.6
Financial services	108.0	3.4	124.5	3.5	15.3
Other services	271.5	8.5	320.2	9.1	17.9
Trade	1 028.2	32.1	085.2	30.8	5.5
Administration	244.8	7.6	283.8	8.1	15.9

One of the most salient facts, by comparing table III & table IV, is that 55% or more than half of the active population of Lebanon which is rural is producing only 11.9% of the national gross product.

(1) Republique Libanaise - Ministere du Plan - Direction Centrale de la Statistique - "Receuil de Statistiques Libanaises"; Volume 3 - (1967) .

Table IV - Distribution of active population in % (in 1959)(1)

Sector of activity	Population	
	Active, permanent 450 000	Permanent and temporary 580 000
Agriculture	49.0%	55.0%
Industry & handycraft	18.5%	17.5%
Services	32.5%	27.5%

The per capita income in the agricultural sector is only 93 U.S. dollars, whereas the per capita income of the non agricultural sector is 743 U.S. dollars (G.D.P. at factor cost)(2).

The deficiency of the agricultural sector, besides causing an intolerable social disparity, has its bad repercussion on the national balance of trade, thus rendering the political and economic situation of Lebanon of extreme precariousness. The future situa is not likely going to ameliorate.

(1) Republique libanaise - Ministere du Plan - Mission IRFED - "Besoins et Possibilites de Developpement du Liban "Tome I - 1960 - 1961.

(2) FAO - Committee on Commodity Problems (Forty first session) "Indicative World Plan For Agricultural Development, (1965-85) - Near East -" Subregional Study No. 1 - Volume II.

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Table No. V. illustrates the ever increasing deficit of the balance of trade

Table V. Trends for the Balance of Trade (in millions LL) (1)

Year	1964	1965	1966
Overall balance of trade	- 1 358	- 1 360	- 1 545
- Overall exports	216	324	369
- Overall imports	1 576	1 684	1 914
Agricultural balance of trade	- 250	- 248	- 282
- Agricultural exports	152	180	178
- Agricultural imports	402	428	460

THE SITUATION OF AGRICULTURE IN LEBANON

To understand the Agriculture of Lebanon one needs to differenciate between two situations of agriculture in the country: the Mountains Agriculture and the Plains Agriculture. The media relative to the Mountains situation are so specific and of different nature that a brief description of the land-water -climate relationships of the country together with the corresponding particu social features is imperative:

(1) Ministere du Plan - Receuil de Statistiques Libanaises - (Annee 1967) - Vol 3.

Lebanon is essentially a mountainous country stretching North-South along the eastern shores of the Mediterranean. It consists of a coastal plain and two mountain ranges: the Mount-Lebanon and the Anti-Lebanon, separated by the Bekkaa valley (or plain).

Table VI gives the areas of the different geomorphologic regions of Lebanon:

Table VI - Distribution of the Geomorphologic Regions of Lebanon (1)

Region	Area in hectares	% of total area
(a) Coastal plains (including hills up to 250 m and the lower part of the plain of Akkar up to 500 m)	130 000	13 %
(b) The Bekkaa' Valley	150 000	14 %
Total non mountainous	280 000	27 %
(c) Mount-Lebanon	250 000	54 %
(d) Anti-Lebanon (Lebanese territory only)	187 000	19 %
Total mountainous area	737 000	73 %
Total area of the country	1 017 000	100 %

(1) UNDP - FAO - Rapport final, Leb/78, "Developpement de la montagne Libanaise"

The coastal plain is an extremely narrow strip, except in the North where it widens out to form the plain of Akkar. The soil is alluvial, deep and fertile and benefits partially from the water streams running down from the adjacent mountains. The bulk of this water is lost to the sea during the winter season.

The Mount- Lebanon starts at the northern frontier of the country. It rises and widens into a dome reaching its maximum altitude of 3 083 m. South - East of Tripoli . Then it slopes down as it stretches southwards where it blends into the hills of Galilee. The summit zone of the southern half is made up by the streched crest of Jabal Niha (1 700m. - 2 000 m.) The western slopes of this chain falls in tiers towards the Mediterranean with frequent narrow gorges opening out on the coastal strip. The eastern slopes are more uniform but steeper at high altitudes. They become gentler as they dip into the Bekkaa' valley.

The soil is mostly of calcareous origin (Cretaceous and Jurassic) and of variable depth and fertility. The hydrology consists of numerous water springs and torrential streams many of which dry up during the summer.

Rainfall occurs only during the winter season ranging between 800 mm at low altitudes and 1 200 mm in the summit zone. The climate is mild except on the higher altitudes (1 000 m. and above) where snow falls every year. The vegetation is typically mediterranean.

The Anti-Lebanon from the orographic view point is roughly a replica of Mount-Lebanon. But with rainfalls averaging between 300 mm and 400 mm per annum, falling exclusively in the cold season, Anti-Lebanon is in most cases a semi-arid zone of stones lying on cretaceous limestone.

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The Bekkaa' Valley is a plain lying between the two mountain ranges at an average altitude of 900m. It is narrow in its southern part but widens gradually as it opens out northwards on the plain of Homs in Syria. It measures 120 kms in length with an average width of 10 kms. The alluvial soil of the Bekkaa' Valley is rather deep and fertile except in the North.

Two rivers originate in this valley near Baalbeck: The Orontes that runs northwards 15 km in the Lebanese territory and the Litani that runs southwards before it reaches the artificial lake behind the hydro-electric dam of Karaoun.

Annual rainfalls averages vary between 600mm. in the South and 300 mm. in the North. An underground water table lies at variable depths under some parts of the valley.

The most important fact to bring out from this brief description of natural agricultural media in Lebanon is that the mountainous part of Lebanon where agriculture is most difficult covers 73% of the total area of the country.

It is in these regions that are concentrated the Green Plan activities for agricultural development and where W.F.P. aid is mostly needed.

The following paragraph on farming methods describes the unfavorable conditions of the farmers dealing with Mountains agriculture.

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FARMING PRACTICES IN THE MOUNTAINOUS REGIONS OF LEBANON

The hindering factors in farming practices in the Mountain area of the country may be grouped as to their nature into three groups: social factors, physical factors and economic factors.

The hindering factors of social origin are mostly due to demographic pressure. The population density today is as high as 200 persons per square kilometer. The total area presently under cultivation (as it will be shown later) is no more than 260 000 ha. The average holding per family in the Mountains is only one hectare. On a nation-wide basis the average area cultivated is a mere 0.12 hectare per capita. This man/land ratio is far below the minimum required for a sound economy in an agricultural country like Lebanon. It is therefore imperative under such situation that:

- All possible arable land be put under cultivation

- More intensive cultural methods be practiced.

The present situation is far from being so. Statistical figures computed by UNDP Project Lebanon - 6 show that(table XIII) there are 70 000 hectare of abandoned old terraces and 390 000 of undeveloped land, potentially productive.

The hindering factors of physical origin are due to the broken topography of the land and its rockyness, to the concentration of rainfall exclusively in winter time and to the lack of permanent rivers for irrigation. Calcareous soil covers 3/4 of these areas. Generations of hardy Lebanese farmers spent incredible amount of time and energy to convert, manually, uncultivable steep slopes into terraces suitable to agriculture. The extent of these terraces that, once covered the whole country constitutes in itself a unique example in the world and, a testimony of man's struggle for life

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But, today ..... with the development of logistics and farm mecanisation, with the establishment of new agricultural policies in the industrialized countries to support their own agriculture, the Lebanese farmer on his old fashioned, inaccessible, non irrigated terraces is no more able to face alone the world competition.

Refashioning his old narrow terraces into broader terraces that can be mechanized, supplying him with small tractor at moderate price, producing compost to substitute for the scarce and expensive barnyard manure, constructing access roads, studying the world market prices tendencies for agricultural products in order to organize the production and the marketing, developing irrigation water ... these are the most important functions the Lebanese Government has entrusted the Green Plan with, in order to save the desperate situation of the Lebanese farmer in the Mountains.

And finally the lack of capital investment, mainly long term credit, has contributed a great deal to the pitiful situation of the mountain farmer. We shall see later on how the Green Plan and W.F.P. are going to help in this respect.

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THE SITUATION OF THE RURAL POPULATION

The situation of the rural population was surveyed in detail in 1960 by the Ministry of Planning (Mission IRFED). A brief summary is given hereafter. For more details the reader is referred to the volume II of "Besoins et Possibilites de Developpement du Liban". - Mission Irfed - (Ministry of Planning).

IRFED Survey pointed out major deficiencies in all aspects of the standard of living in the rural area:

The sanitary equipment is deficient in all rural areas. The number of doctors is very insufficient, hospitals and disponsaries are inexistent or far away from the reach of the Mountain people.

The standard of education is one of the most deficient in the rural areas. This is due to the fact that any person, having a minimum of education is migrating away from these areas where job opportunities of certain levels are inexistant, and also because of the poor quality of teachers and teaching. Leisures equally reflect the low standard of culture in the rural localities such as the lack of urbanisation in the villages (cinemas), the tendency for the traditional culture to disappear (festivities, displays, folk dances etc..), the lack of proponsity of the people towards collective activities (sports, meetings etc..).

The social standard, also, is very deficient. It is charactorized by an accentuated individualism that hinders many aspects of collective life such as cooperatives or associations. Family and political groupings however are exceptionally strong and, in some cases, constituto probloms against progress.
Domestic water, electricity and communications (roads, mail, telephones) are generally deficient.
Housing, in some villages, is primitive (earth roofs) and unsanitary.

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THE JOINT ACTION OF THE LEBANESE GOVERNMENT AND THE UNITED NATIONS TO FACE THE DETERIORATING SITUATION OF THE LEBANESE MOUNTAINS

In order to face this deteriorating situation, the Lebanese Government has created several automonous offices in order to intervene promptly and efficiently. Among the most important offices recently established are:

- "The Executive Council for Major Engineering Works ", for roads and electricity.
- "The Litani River Office", for national hydro-electric works
- "The Office of Social Development", for rural animation
- "The Specialised Offices for price support such as the Wheat Office the Silk Office etc....
- And the "Office of Land Reclamation", known as the GREEN PLAN.

Parallel to those offices the Government of Lebanon has requested and obtained the aid of the Specialised Agencies of the United Nations in the following:

" Underground Waters", Animal Health", "Milk Production",

" Crop Fertilization", "Pedology", "General Agriculture Development and Afforestation", "Hydrology".

World Food Program aid was also requested and obtained but on a rather small scale. More details on this topic shall be discussed later.

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THE GREEN PLAN AND THE UNDP/FAO PROJECT FOR THE DEVELOPMENT OF THE LEBANESE HIGHLANDS

The GREEN PLAN is an official automonous authority responsible for the development of agriculture in Lebanon through land reclamation and the other related activities. It is headed by an Executive Committee of three, a chairman and two members - appointed by presidential decree - under the trusteeship of the Minister of Agriculture. The appointment of the Executive Committee of the GREEN PLAN took place in September 1964. Six months later, in February 1965, the GREEN PLAN was operating, aiming always on the long run at:

- Stopping or reducing the rural migration to the absorbing capacity levels of the other sectors of production in the country.

- Encouraging a number of leader farmers to return to their villages and work their previously abandoned land.

- Increasing the per capita income of small farmer

- Reducing unemployment by creating new jobs in the rural areas

- Ameliorating the balance of trade by increasing the overall agriculture production of the country.

In order to reach this goal the GREEN PLAN has been entrusted with many functions that can be grouped under the following major topics:

1- Applied research in the field of agricultural development

2 - Economic surveys and agriculture market research

3 - Execution of development works both on private, and on communal and government land.

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1 - Applied research for agriculture development

The Lebanese Government realizing the importance of the fact that sound techniques are, besides proper planning, behind the success of any development project have alloted a big part of its budget as well as one third of its technical personnel to the field of applied research and field trials. Moreover it has requested and obtained the technical assistance of FAO. On the 7th of February 1963, the UN/SF - FAO Project for the Integrated Development of the Lebanese Highland started its operations, More than 60 technical reports on agriculture development were issued. It is on the basis of the technical reports prepared by FAO experts and their Lebanese counterparts in this project, that the GREEN PLAN works are being or will be executed, and it is for the sake of implementing those works that W.F.P. aid is now requested. The technical and economic justification for the works for which W.F.P. aid is requested hereby, shall be summarized later on. For the details, reference is made subsquently to the corresponding technical reports prepared by FAO experts in collaboration with Lebanese counterparts.

2 - Economic surveys and agriculture market research

Planning the agricultural production is the key to modern marketing. Following this line of thoughts, the Economic Section of the GREEN PLAN together with the French Bilateral Assistance (SEMA of Paris) have surveyed the tendencies of the potential market for Lebanon in more than 30 countries in West and East Europe, in the Middle East and in North Africa. Reference is made later on to the results of these studies.

3 - Execution of development works, location, kind and amount of works, schedule of execution, technical and economic feasibility

Each category of these works shall be described in a separate paragraph hereafter. However, due to differences in the ways of budgeting these works and to differences in the procedures followed during the course of execution, these works shall be separated for convenience, into two main categories throughout this request manely:

- WORKS ON PRIVATELY OWNED LANDS
- WORKS ON COLLECTIVE AND GOVERNMENT LAND

Because sound agricultural development should be integrated both vertically and horizontally, the GREEN PLAN Authority has been entrusted with a wide range of functions related directly and indirectly to farm development. For this purpose the GREEN PLAN has two separate budgets:

A first budget of LL 30 000 000 (1) to be spent over a ten-years period (1964 - 1975), is to cover the following:

- Administrative expenses.
- The cost of planning designing and controlling the development works.
- The cost of research and trials
- The cost of executing all works on non private land (roads, nurseries, afforestation etc...)

A second budget of LL 40 000 000 (2) to be spent over a ten-years period (1964 - 1975) for the purpose of providing funds intended solely for loans (cash or material or works) to the farmer, for the development of his privately owned farm.

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(1) Decree No. 12216 of Feb. 22, 1963 and decree No. 13335 of July 10, 1963.

(2) Decree No. 13787 of Sept. 1963

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NATURE OF WORKS ON PRIVATELY OWNED LAND

The slopes of the Lebanese Mountains, in order to become suitable for agriculture, need to be treated physically. Following is a list of the physical land treatments and the other complementary works, the GREEN PLAN is helping (or planning to help) the farmers in their execution:

1- The removal of rocks with dynamite

2- The loosening of the soil with a ripper

3- The shaping of the terraces and the levelling

4- The construction of internal farm road

5- The removal of stones

6- The construction of retaining walls

7- The construction of water reservoirs and other irrigation devices

8- The construction of trellices for vineyards.

9- The fencing of the farm

10- The basic manuring

11- The preparation of soil for plantation and the plantation of trees

12- The mecanisation of cultural practices

13- Farm utility constructions (silos, warehouses, barns etc..)

14- The housing of the farmer

This terminalogy and the corresponding numbering will be used throughout this request. The same numbering will be used subsequently for references.

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The proocdure of oxecuting the abovo montioned works is as follows:

For works No. 1,2,3 and 4 the interested farmer is required to present a written request, in terms specified by the administration, furnishing all information on the actual state of his land such as: total surface area, whether it is irrigated or not, whether it is planted or abandoned, the type of works requested and the presence or absence of access roads.

Consequently, the GREEN PLAN will instruct one of its technicians to survey the land and establish a preliminary design of works actually needed on the land according to a plan ad hoc, which will inform the administration of the physical description of land, the type of soil, the extent of erosion, the area of the terraces, the possibilities of improving the irrigation system and finally, the estimation of hours of earth and rocks moving engines and the appropriate type of the engines needed to accomplish the specific tasks.

The administration of the GREEN PLAN, on the basis of this information and after preliminary analysis of the soil, and on the light of the results of market research studies, would advise the farmer on the nature of works needed and on the type of crops he should grow.

The GREEN PLAN then, with the consent of the farmer, draws an outline specifying the cost of each type of work to be carried out, as well as provision for expenses representing the cost of such complementary work as: construction of dry rocks retaining walls removal of stones and other finishing works. A map of the project is included with the outline.

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In 1965 , the land owner was required to guarantee the payment of the loan (the 40 millions budget) by securing a first mortgage on his land that is reclaimed by the GREEN PLAN. In addition, he had to make a cash payment amounting to 18% of the total cost of the works.

The repayment of these debts is made without interest in ten annuities from the seventh to the sixteenth year. In the beginning of 1967 a new decree was issued ... authorizing the farmer to replace the land mortgage with bank deposits. In this case the money deposited by the farmer in the BECAIF(1) is blocked for n years at the end of which this deposit plus its compounded interest equals the total cost of land reclamation which is paid by the GREEN PLAN to the contractor of the earth moving heavy machinery immediately upon completion of the works on the private farm. The money paid by the GREEN PLAN to the contractor is drawn from the 40 000 000 LL budget lent to the GREEN PLAN by the Treasury for n years without interest.

The contractors are paid by the hour. The hours considered reimbursed by the administration are those registered on the record of a special service recorder fixed on each machine showing the time of operation with a normal output. A delegate of the administration is permanently present at the site of work.

Works No. 5 - 8 - 9 are manually done by the farmer and his family, with additional hired labor. No government aid is given here Works No. 6 are paid the same ways as works No. 1 to No. 4 but in this case the contractor is the farmer himself. Technical clearance of GREEN PLAN is requested.

Works No. 7.F the earth moving and earth reservoir the procedure is same as works No. 1 to 4. For construction of cement reservoirs

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(1) Banque de credit Agricole Industriel et Foncier.

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and the plastic lining of earth reservoirs the procedure is the samos as work No. 5. For the other irrigation devices such as deep wells, pumps etc.. the procedure will be the same as No. 1 to 4. Technical clearance of the GREEN PLAN is requested.

For works No. 10 ; the GREEN PLAN in collaboration with the Municipality of Beirut (who will be starting very soon the construction of two compost factories have come to an agreement for the sale of compost at low prices at the start, in order to extend the use of this fertilizer. Details on this subject are given subsequently.

For works No. 11, the farmer can obtain from the GREEN PLAN selected varieties of seedlings at nominal prices.

AMOUNT OF WORKS ON PRIVATELY OWNED LAND. ROLE OF WFP AID

The amount and program of works are not determined according to the needs of the country, but according to the possibilities of the Government. Although the GREEN PLAN is the first and unique official authority in Lebanon to be budgeted for a 10-years period at once (the GREEN PLAN works being on top of the priority order list), its total budget (30 000 000 LL + 40 000 000 LL) - is far from covering the actual needs and potentialities of Agriculture in Lebanon. (Tables No. IX, X & XI give the needs and potentialities of fruit and forage production).

The present budget of the GREEN PLAN is insufficient to carry out land improvement on all land capable of reclamation, (namely 270 000 ha). Even those to be reclaimed, will not be entirely developed. Hence the farmers will have to relay on their own resources for the completion of the works.

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The ceiling of 10 000 LL (40 000 000 LL budget) allowed per farmer is not enough to complete the development of the individual farm. In many cases this amount of money (of which the farmer pays a part of it as discussed earlier) covers only the expenses of mecanical works (heavy machinery) and partial construction of retaining walls and of water reservoirs. Until the date of full production the farmer has to invest in his land two times and a half- on the average - as much as the contribution of the GREEN PLAN and fifteen to twenty five times as much as the WFP aid he now receives. A great majority of the farmers do not possess enough capital to finance the cost of supply of irrigation water or the price of a small cultivator or the cost of basic manuring.

Table VII gives, for a hypotetical average case, the total investment expenses on one hectare of farming area.

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Table No. VII. Investment Expenses on One Hectare of Farming Area in the Mountain (in LL/ha) through the Green Plan (1)

Item	For basic land reclamation	Additional costs for irrigation, equipment etc.)
Earth and rocks moving	1 500 - 2 000	
Removal of stones, leveling, walls	1 500 - 2 000	
Basic manuring	1 500	
Irrigation water (supply, storage, drainage		15 000
Installation of the orchard (first year)	800 - 1 300	
Consolidation (4 - 5 years)	4 000 - 6 000	
Mobile equipment:		
- Irrigation		1 500
- Farm mechanization		800
Immobile equipment (Farm utility construction)		2 000
TOTAL	9 300 - 11 300	19 300

It should be reminded here that one hectare is the average holding in the mountain regions of Lebanon and that the ceiling of credit per farmer is only 10 000 LL.

(1) GREEN PLAN II - Proposals for the Extension of GREEN PLAN 1969.

The investment expenses listed in table VII are quite high as compared to similar ones in the plain areas of Lebanon or in other countries. This - as discussed earlier - is due to the difficult media in which Mountain agriculture is situated, to the scarcity of easily reclaimed lands and, to the will of the Government to use maximum labor per unit area of land through intensive agriculture production (fruit orchards, silk, tobacco, irrigated forage production, vegetables etc..) Also is it fair to think here that any land reclaimed is gained - as in the case of the Poldors - for ever.

Therefore the role of W.F.P. can be summarised as follows:

W.F.P. COMMODITIES WILL BE DISTRIBUTED TO THOSE FARMERS OR GROUP OF FARMERS AND WORKERS WHO ARE ENGAGED IN LONG TERM DEVELOPMENT SCHEMES TO HELP THEM LIVE DECENTLY DURING THE STARTING PERIOD WHILE INCURRING HEAVY INVESTMENT EXPENSES.

Payment modalities of WFP commodities for each particular kind of job will be discussed subsequently.

Inspite of the heavy initial investment, the economic rentability of a Mountain orchard is rather good as can be seen in table VIII. Once the initial major investment costs born by the individual farmer is overcome with the help of the GREEN PLAN and that of W.F.P., the farming enterprise can go by its own and no more GREEN PLAN or WFP aid will be needed.

Table No. VIII. shows that one hectare of land, if managed according to the GREEN PLAN scheme and with W.F.P. aid, can provide a decent livelyhood to the average farmer's family in the Mountain i.e. around 4 500 LL/ha (1 ha = average holding in the Mountain).

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Table No. VIII. Return to Family, Labor and Management for some Major Fruit Species(1) (in LL/ha)

Crops	Location	Slope		
		0 - 10 %	10-20%	20 %
Peaches (Babcock	Mt. Lebanon	4 170	4 050	3 870
Cherries (Bonny)	" "	5 560	5 440	4 260
Pears	Akkar	4 370	4 250	4 070
Almonds	Aqali	5 200	5 080	4 900
Apricots (Ajami)	Akkar	5 950	5 830	5 650
Tobacco (Bulgarian)	Mt. Lebanon	4 020	3 900	3 720
Mulberry (Silk)	" "	2 750	2 630	2 450
Forage production	" "	3 500	3 000	2 800

As seen earlier (page 6) the farmer's yearly income before the GREEN PLAN intervention was only 1 395 LL (income per capita (39) US dollars x number of persons in a family (5) x ratio US dollars/LL (3)

Figures of table IX computed by SEMA of France on the basis of the Market Research Studies undertaken by the Green Plan economists in collaboration with French bilateral assistance exports show the potentials of exports of fruits on to the Middle - Eastern markets which now accounts for more than 80% of Lebanon's exports of fruit. The remaining 20% is for Africa, East and West Europe.

(1) UNDP/SF/FAO - Project Lebanon 6 - Rendements compares de quelques cultures au Liban - Juin 1966.

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Table No. IX. Projections on Net Imports of Fruits in the Middle-East (1) (in 1 000 tons)

Species	1965	1975		1975	Increase
	Net imports	Consumption	Production	Net Imports	1965-75
Apples	81,6	308 0	94,6	213,4	161,5
Other summer fruits	3,6	231,0	176,0	55,0	-
Oranges	75,9	792,0	670,0	122,0	60,7
Other citrus	14,9	313,0	270,7	47,3	217,4
Grapes	- 3,1	550,0	547,5	2,5	
Almonds	2,5	27,0	12,5	14,5	480,0
Bananas	23,7	193,0	104,8	88,2	272,2
Total fresh fruits	199,1	2 419,0	1 876,1	542,9	172,7

On the basis of past trends, it is assumed that Lebanon's share of 1975 net imports of fruits in the Middle Eastern countries is around 70%. To the projected increase of Lebanese fruit export, another increase of domestic fruit consumption of 2 to 3% per year (due to population growth) is to be taken into consideration.

(1) Etude de la demande des fruit dans les pays du Moyen-Orient - 1968 - GRUEN PLAN/SEMA (Paris)

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And finally, if we admit a rate of orchard replacement of the magnitude of 1/50 per year, the corresponding increase in orchard surface for the period 1969 - 1972 (1) should be as in table X.

Table No. X . Total Orchard Area to be installed in 1969 - 1972 (2)

Category of orchards (all areas in hectares)	Total area to be installed before 1972	Area already installed by the Green Plan 1964 to 1968	Area to be installed 1969 to 1972
Irrigated Orchards Min:	5 400		3 700
Average:	8 600	1 700	6 900
Max:	11 800		10 100
Non irrigated Orchard Min:	9 200		5 400
Average:	13 100	3 800	9 300
Max:	17 000		13 200
TOTAL (Average)	21 700	5 500	16 200

(1) 1972 and not 1975 : because 1975 production comes from orchards installed in 1972.

(2) GREEN PLAN II - Proposals for the extension of the GREEN PLAN-1969

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Table XI gives the new areas to be reclaimed for major annual crops for the period 1970 - 1975

Table No. XI . Trends in Supply and Areas of Major Annual Crop in 1975 (1)

Commodity	Internal consumption in 1975 (tons)			Net exports 1975 (tons)	Total supply 1975 (tons)
	Maximum	Minimum	Average		
1- Meat	73 150	68 475	70 812	-	70 812
2- Sugar	73 975	70 400	72 187	-	72 187
3- Potatoes	67 925	64 625	66 275	30 000	96 275
4- Onions	36 300	34 650	35 475	5 000	40 475
5- Other vegetables	277 750	264 275	271 012	10 000	281 012

Commodity (repetition)	Yield (tons/ha)	Area needed to cover supply(ha)	Area in 1965 (ha)	Area to be planted in 1975 (ha)	Possible yearly rate of plantation 70 - 75
1- Meat	0.57	123 921	?	3 000	500
2- Sugar	8	9 023	1 500	3 000	500
3- Potatoes	15	6 418	4 460	2 000	334
4- Onions	15	2 698	2 250	450	75
5- Other vegetables	15	18 734	20 213	-	-
TOTAL				8 450	1 409

(1) GREEN PLAN - Litani Office: Outlook for the Plantation of Annual Crops - 1968.

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The total area to be reclaimed in the period 1965 - 1975, in order to meet the needs of 1975 for only the major fruits and crops mentioned in table X and XI, is 16 200 ha (for perennials) + 8 450 ha (for annuals) = 24 650.(1)

The financial possibilities of the GREEN PLAN will enable him for the period concerned to recalim only 10 000 ha.(1970 - 1974).

Table XII gives the time schedule for the execution of this works by the GREEN PLAN.

The other complementary development works, discussed subsequently in this request are (in most cases unless otherwise specified) function of the annual areas to be reclaimed as specified in table XII.

Table No. XII . Time Schedule for the Establishment of New Farming Areas by the GREEN PLAN 1969 - 1974

Year	1969	1970	1971	1972	1973	1974	Total
Area in ha	2 000	2 000	2 000	2 000	2 000	2 000	12 000

(1) It is estimated that 80% of the area of perennials and 30% of the area of annuals will occur in the Project's Mountainous zones. The rest will occur on plain lands that do need physical treatment. Those lands and parts of the mountainous lands will be irrigated by the Litani Irrigation Scheme.

Table XIII. gives the pattern of the present land use in Lebanon and the possibilities for land reclamation. It shows the scarcity of good soil that can still be reclaimed and hence the necessity of concentrating upon intensive agriculture suitable to the mountainous conditions, namely fruit production.

Table XIII. Land Use in Lebanon in 1967 (1)

Categories	Area in ha	% of table area
Cultivated soil	260 000	25
Forests	70 000	7
Bad forests	65 000	6
Abandoned land (could be productif soil, old terraces)	70 000	7
Unutilized soil (marginal and partially productif (2)	390 000	39
Uncultivable soil (2)	135 000	13
Roads and buildings	27 000	3
Total area of Lebanon	1 017 000	100

(1) FAO/FS : Project 78/LEB - Final Report.

(2) Amended definitions by GREEN PLAN.

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PROGRAM OF WORKS ON PRIVATELY OWNED LAND

The reader is referred to the paragraph on nature of works on privately owned land for the terminology and means and ways of executing those works. Only works for which W.F.P. is requested are considered here.

Table No. XIV gives the program of work for those categories of physical land treatments requiring manual labor and for which W.F.P. aid is requested (works No. 5 & 6).

Table XIV . Program for Labor Intensive Physical Land Treatment: Construction of Walls and Removal of Stones

Year	1969	1970	1971	1972	1973	1974	To
Hectares treated with machinery	2 000	2 000	2 000	2 000	2 000	2 000	12
Construction of walls (m2)	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	12 00
Construction of walls (man/days)	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	2 000 000	12 00
Removal of stones (man/days)	160 000	160 000	160 000	160 000	160 000	160 000	9
Total man/days	2 160 000	2 160 000	2 160 000	2 160 000	2 160 000	2 160 000	2 9

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Following are figures and details on physical land treatment and the contribution of the GREEN PLAN to it:

- The average power of earth moving machinery is 180 HP. As explained earlier, these engines are operated by private contractors. They are paid in cash by the GREEN PLAN for the work they perform on the private land.(40 000 000 LL. budget). The farmer pays only a fraction of this cost (18% to 39% of the total cost).

  This fraction of the cost, paid in chash by the farmer, is blocked at the BCAIF (1) for n years. At the end of n years this capital plus its compounded interest equals the amount of cash paid by the GREEN PLAN to the contractor for the works performed on the private land. The GREEN PLAN (the Government) looses only the interest of the money.

- The average price per hour of the above mentioned engines is 30 LL (10 U.S. dollars).

- The number of hours of earth and rocks moving machinery is 70 hrs/ha.

- The average cost of physical land treatment (heavy machinery + dynamite is 2 000 LL/ha.)

- The average number of square meters of retaining walls is 1 000 m^2/ha.

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(1) Banque de Credit Agricole, Industriel et Foncier.

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- The average amount of human labour for the construction of retaining walls is 1 man/day per m^2 of walls or 1 000 man/day per hectare.

- The average amount of human labour for the removal of stones is 80 man/days per hectare.

- The average cost of one man/day is 7LL.

- For wall construction, the contribution of the GREEN PLAN is similar to that of earth moving with heavy machinery except that the farmer in this case is the contractor and he hires the workers, and the GREEN PLAN pay the farmer 1,5LL per square meter of wall constructed.

- No aid Whatsoever is given for the removal of stones.

- W.F.P. aid is requested as follows: 1 ration (1) per square meter of wall constructed and 80 rations per hectare for the removal of stones. Based on table XIV, table XV & XVI give the financial program of physical land treatment and the corresponding W.F.P. aid requested.

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(1) Daily family ration of WFP food as specified by FAO nutritionists and as described subsequently.

Table XV. Financial Program for Construction of Walls and Corresponding WFP Aid Requested

Year	1970	1971	1972	1973	1974	Total
Construction walls(m^2)	2 000 000	2 000 000	2 000 000	2 000 000	1 000 000	9 000 000
Cost to the farmers(LL)	14 000 000	14 000 000	14 000 000	14 000 000	7 000 000	63 000 000
Cash contribution of Groen Plan (LL)	3 000 000	3 000 000	3 000 000	3 000 000	3 000 000	15 000 000
W.F.P. aid in rations	2 000 000	2 000 000	20 000 000	2 000 000	1 000 000	9 000 000

Table XVI . Financial Program for the Removal of Stones and Corresponding W.F.P. Aid Requested

Year	1970	1971	1972	1973	1974	total
Hectares treated with machinery	2 000	2 000	2 000	2 000	2 000	10 000
Total cost to farmers in LL	1 120 000	1 120 000	1 120 000	1 120 000	1 120 000	5 600 000
W.F.P. aid in rations	160 000	160 000	160 000	160 000	160 000	800 000

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Table XVII gives the program for the construction of water reservoirs.

Two kinds of water reservoirs are being constructed:

The c ment reservoirs and, the earth reservoirs with or without plastic lining.

Table XVII . Program for the Construction of Water Reservoirs

Year	1970	1971	1972	1973	1974	Total
No. of cement reser-. voirs	200	200	200	200	200	1 000
No. of earth reservoirs	300	300	300	300	300	1 500
Capacity of cement R(m^3)	40 000	40 000	40 000	40 000	40 000	200 000
Capacity of earth R.(m^3)	450 000	450 000	450 000	450 000	450 000	2250 000
Ha irrigated by C.R.	400	400	400	400	400	2 000
Ha irrigated by E.R.	150	150	150	150	150	7
Man/days C.R.	57 000	57 000	57 000	57 000	57 000	285 000
Man/days E.R.	16 000	16 000	16 000	16 000	16 000	80 000
Total man/days	73 000	73 000	73 000	73 000	73 000	365 000

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Following are average figures and details concerning the construction of water reservoirs:

- The cost of storing one cubic meter of water in cement reservoir is 20 LL (10 LL for materials and 10 LL for hand labor)

- The cost of storing one cubic meter of water in concrete reservoirs in 15 LL (7 LL for materials and 8 LL for hand labor).

- The cost of storing one cubic meter of water in plastic lined earth reservoirs is 7 LL (3,5LL for materials and 3,5LL for hand labor)

- The cost of storing one cubic meter of water in earth reservoirs is 1, 25 LL

- Cement and concrete reservoirs are almost always smaller than earth reservoirs, however they are usually fed by permanent sources of water and for the same capacity they can irrigate more area than earth reservoirs. Earth reservoirs are usually fed by winter rain water.

  Table XVIII gives the financial program for the construction of water reservoirs and the corresponding W.F.P. aid requested.

- The contribution of the Government is

W.F.P. aid shall be dispensed at the rate of 2 ration/m3 of water stored in cement reservoir and $\frac{1}{2}$ ration/m^3 of earth reservoirs.

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Table XVIII . Financial Program for the Construction of Water Reservoirs and Corresponding W.F.P. Aid Requested

Year	1970	1971	1972	1973	1974	Total
No. of cement reservoirs	200	200	200	200	200	1 00
No. of earth reservoirs	300	300	300	300	300	1 50
Cost of C.R. (LL)	800 000	800 000	800 000	800 000	800 000	4 000 0
Cost of E.R. (LL)	562 000	562 000	562 000	562 000	562 000	28 000 0
W.F.P. rations for C.R.	80 000	80 000	80 000	80 000	80 000	400 0
W.F.P. rations for E.R.	225 000	225 000	225 000	225 000	225 000	1 125 0
Cost of CR + ER (LL)	1 362 000	1 362 000	1 362 000	1 362 000	1362 000	6 810 0
Total W.F.P. rations	265 000	265 000	265 000	265 000	265 000	1 325 0

Table No. XIX gives the program for the extraction of underground water. Depending upon the depth of the underground water table, either pumps or (to a lesser extent) deep well turbines are envisaged.

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Table XIX. Program for the Execution of Wells for Irrigation

Year	1970	1971	1972	1973	1974	Total
No. of wells	50	70	70	70	70	3
Pumps power (H.P)	5 000	7 000	7 000	7 000	7 000	33 00
Output (m^3/year)	3 750 000	5 250 000	5 250 000	5 250 000	5 250 000	24 750 00
Hectares irrigated	500	700	700	700	700	3 30
Man/days	50 000	70 000	70 000	70 000	70 000	330 00

Following are explantory notes on the execution of wells for irrigation purposes:

- Most of the wells will occur in those areas of South Lebanon, on the hills surrounding the Bekka Valley and in the Akkar Plain - that will not benefit from the national irrigation schemes.

- The area presently irrigated in Lebanon is 70 000 ha, 22 000 ha of which are devoted to fruit production.

- The national Irrigation Schemes plan to irrigate some 20 000 ha starting on 1970 and ending on 1978 in the following main areas: Akkar, Zghorta, the Western Slopes of South Lebanon. The North and the South of the Bekka. This represents a big part of the Lebanese irrigation potential from rivers and the known underground water tables.

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- The average cost of a well plus its pump in the South is 30 000 LL, in the Bekka 25 000 LL and in the Akkar Plain 15 000 LL. The difference in the cost price is mainly due to differences in the depth of the underground water tables.

Table XX gives the financial program for the execution of wells and the corresponding W.F.P. aid requested.

Table XX. Financial Program for Wells and Corresponding W.F.P. Aid Requested.

Year	1970	1971	1972	1973	1974	Total
No. of wells	50	70	70	70	70	330
Cost of wells (LL).	1 250 000	1 750 000	1 750 000	1 750 000	1750 000	8 250 00
W.P.F aid in rations	50 000	70 000	70 000	70 000	70 000	330 00

Table XXI . gives the program for the construction of inside farm irrigation canals. Those canals are made of cemented concrete stones. They serve to transfer irrigation water from terrace to terrace.

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The average length of these canals is 1 200 meters per hectare of farming area.

The average cost of constructing such canals is 4 LL/meter. One worker can construct 10 meters of canals/day.

Table XXI . Program for the Construction of Irrigation Canals

Year	1970	1971	1972	1973	1974	Total
No. of Hectare irrigated	700	1 000	1 000	1 000	1 000	4 700
Length of canals (m)	840 000	1 200 000	1 200 000	1 200 000	1 200 000	5 640 000
Man/days	84 000	120 000	120 000	120 000	120 000	564 000

Table XXII gives the financial program for canals and the corresponding W.F.P. aid requested.

Table XXII . Financial Program for Inside Farm Canals and Corresponding W.F.P. Aid Requested.

Year	1970	1971	1972	1973	1974	Total
Meters of canals	840 000	1 200 000	1 200 000	1 200 000	1 200 000	5 640 000
Cost in LL.	3 360 000	4 800 000	4 800 000	4 800 000	4 800 000	27 360 000
W.F.P.rations	84 000	120 000	120 000	120 000	120 000	564 000

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Table XXIII gives the program for the construction of trellices & fences and the corresponding W.F.P. aid requested.

Table XXIII.	Program for the Construction of Trellices & fences and Corresponding W.F.P. Aid Requested					
Year	1970	1971	1972	1973	1974	Total
Number of trellice	200 000	200 000	200 000	200 000	200 000	1 000 000
Ha covered	200	200	200	200	200	1 000
Total cost	1 800 000	1 800 000	1 800 000	1 800 000	1 800 000	9 00 000
Man/days	200 000	200 000	200 000	200 000	200 000	1 000 000
W.F.P.rations	200 000	200 000	200 000	200 000	200 000	1 000 000

- Trellice density per ha varies between 600 and 1 000.

- The average cost of one trellice plus wires is 9 LL.

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Table XXIV gives the areas planted with orchards the cost of consolidation(1) of these ordhards, and the number of farmers involved.

This kind of works is already covered by W.F.P. Project No. 438 effective as of 1969. The program given here in for the establishment of mountain orchards is a mere take over of Project 438. It is proposed that Project 438 will stop upon approval and implementation of the present request. Farmers engaged in the establishment of new orchards in the mountainous regions of Lebanon will have to start with unproductive expenses during a seven years consolidation period for orchards until the trees come into their initial production Aid from W.F.P. is requested only for a starting period of 3 years.

The number of farmers selected will be around 2 000 per year.

To be eligible for entry into this scheme the farmer must: First, allot a minimum of 0.1 ha and a minimum of two hectares of his newly developed land for improved fruit production. Second, accept the overall guidance of the Green Plan experts in selecting the fruit tree to be planted and in the further development of the orchard

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(1) All non investment costs necessary to bring the orchard into production. This period varies between 4 to 7 years according to species.

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Table XXIV. Program for consolidation of orchards and W.F.P. Aid Requested.

Year	1970	1971	1972	1973	1974	Total
Area of orchards	2 000	2 000	2 000	(1)	(1)	6 0
Farmers involved	2 000	2 000	2 000	(1)	(1)	6 0
Cumulative No. of farmers	2 000	4 000	6 000	4 000	2 000	18 0
Cumulative cost of consolidation(2)	2 000 000	4 000 000	6000 000	4 000 000	2 000 000	18 000 0
W.F.P.rations	500 000	1 000 000	1 500 000	1 000000	500 000	4 500 0

Concentration of production and of future marketing operations is achieved as a result of the following measures:

- Reclamation has been done for larger plots belonging to several proprietor enabling the economic employment of resources, particularly machinery.

(1) No W.F.P. is requested for farmers who will start in 1979 & 1974 since distribution of W.F.P. commodities should stop by the end of 1974.

(2) See table VII.

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-The Green Plan has undertaken a zoning of the mountains according to suitability of ecological conditions for the various fruit species involved. The zoning is based on the land capability map established under the UNDP/SF Project; Lebanon - 6. In each zone endeavours are made to plant a maximum of two or at the utmost three kinds of fruit trees, according to the suitability and in conformity with the findings of marketing studies.

Table XXXIX gives the annual distribution of tree-crops among different species and the number of each.

Farmers who plant during the usual planting season (November - February) will be eligible for a three years food distribution period starting on the following first of March.

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Table XXVII - gives the number and categories of tractors needed as the first stage for the introduction of farm machinery into the mountainous regions of Lebanon.

Table XXVII - Number and categories of farm tractors for the implementation of farm mechanization in the mountains of Lebanon (1)

Category	Number	Use
8-13 HP cultivators	2000	7500 ha of mountain orchards
22-30 Hp track-type tractors	400	3000 ha of mountains fruit orchards 1000 ha of mountain fruit orchards 1000 ha of tobacco on terraces 500 ha of vineyards on hills
25-35 HP four weels articulated tractors	600	5000 ha of mountain fruit orchards 2000 ha of olive orchards on terraces
Total	3000	20000 ha

(1) Based on : UNDP project, Lebanon 6, "Mechanization of Mountain Agriculture in Lebanon" (June 1969)

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Table XXVIII - gives the program for the implementation of the tractors mentioned in table XXVII

Table XXVIII - Program for the implementation of farm mechanisation in the mountainous area

	1970	1971	1972	1973	1974	Total
N° de cultivateurs	400	400	400	400	400	2000
Cost of cultivators	1200000	1200000	1200000	1200000	1200000	1200000
N° of track-type T.	80	80	80	80	80	400
Cost of track-type T.	800000	800000	800000	800000	800000	4000000
N° of 4 weels T.	120	120	120	120	120	600
Cost of 4 weels T.	1200000	1200000	1200000	1200000	1200000	6000000
Total coast of tractors	3200000	3200000	3200000	3200000	3200000	16000000
Ha mechanized	4000	4000	4000	4000	4000	20000
Farmers involued	600	600	600	600	600	3000

Following are some explanations on table XXVIII. The total area mechanized in the 5 years plan is 20.000 ha. Priority order shall be given to farms developped by the Green Plan (approximately half of the tractors). The average unitary cost of the tractors plus the necessary attachments is as follows : 8000 LL. for the cultivator (two weels garden type

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tractor) and approximately 10.000 LL. for the other types of tractors (18 - 45 HP).

Table XXIX - Gives the financial program for the implementation of farm mechanisation and the corresponding WFP. aid requested.

Table XXIX - Financial Program for Farm Mechanization and corresponding WFP. Aid Requested.

	1970	1971	1972	1973	1974	Total
Total N° of tractors	-	600	1200	1200	-	3000
Ha mechanized	-	4000	8000	8000	-	20000
Farmers contribution	-	3200000	6400000	6400000	-	16000000
Cumulative N° of farmers		600	600+1200	1200+1200	1200	8400
Total WFP. rations	210000	630000	840000	840000	420000	2940000

WFP. aid is requested for farmers who will be owners of tractors and who follow the regular one year training course on "how to use and how to maintain farm tractors and farm machinery". WFP. aid is requested for each of these farmers for 350 days/year during the one year training course to compensate for their enforced stoppage of work and for another 350 days/year for the following year to enable them to face the first instalments on the price of the tractor.

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In table XXIX it is proposed that three groups of farmers (400 + 1200 + 1200) will enter the scheme of WFP aid - each group for a 2 years period. The Green Plan contribution to farm mechanization shall be in buying the tractors from the constructor in one deal and selling the tractor to the farmer against long term instalments with nominal interest or not interest at all.

Table XXX gives the program for farm utility constructions (works N° 13) such as store houses, work shops, small barns, etc.. and the corresponding WFP. aid requested.

Table XXX - Program of Farm Utility Constructions and corresponding WFP. aid requested.

	1970	1971	1972	1973	1974	Total
N° of units	80	80	80	80	80	400
Total capacity(m3)	40000	40000	40000	40000	40000	200000
Total cost (LL.)	1200000	1200000	1200000	1200000	1200000	6000000
Total man/days	200000	200000	200000	200000	200000	1000000
WFP. rations	200000	200000	200000	200000	200000	1000000

The average volume of one unit is 12,5m X 10 m X 4 m = 500 m3. Actual size of units may vary widely according to particular cases. No financial aid from the Green Plan is foreseen for this type of construction. However construction plans and designs are offered by the Green Plan free of charge to the farmer. WFP. commodities will be supplied to farmers upon completion of works and under the control of the Green Plan.

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THE "SUN FLOWER" PROJECT:

The aim of this project is to replace the cultivation of Indian Hemp in the Northern part of the Bekka'a valley against other non prohibited crops, namely sunflower.

The Northern part of the Bekka'a valley (Baalbeck and Hermel district is a semi desertic plain (300 mm of rain) geographically isolated, and endowed with insignificant natural resources. The standard of living of this population is among the lowest in the country, and the meagre pastures that still exist in the area is of no help in reducing the ever increasing social disparity between this fraction of the population and the other relatively more priviliged fractions of the Lebanese population.

Urged by a bitter social situation and encouraged by malicious smugglers, a fraction of the inhabitants of the isolated villages in that part of the country were driven into the cultivation of Indian hemp, one of the few crops that can grow under such difficult soil and climate conditions and the unique "cash crops" that can be grown successfully in the area without price support policy.

Realizing the moral responsibility, Lebanon is assuming towards the consumers of such products in different parts of the world (Lebanon being not a consumer of Indian hemp), the Government of Lebanon under the guidance of the President of the Republic decided to eradicate the cultivation of Indian hemp, not only through enforcing laws (which did not give positif results in the past) but also through providing decent means of living for the concerned population.

The 21rst March 1966 the council of ministers nominated a special .. with the task of finding out the best solution to the problem.

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The members of the committee are the Director General of the Internal Security Forces, the President of the Green Plan, and the Director General of the Ministry of Agriculture. The Director of the Wheat Office joined the Committee lately. Studies and trials started in April 1966.

The Committee then entrusted the Green Plan with the execution of the project. The "collaboration" of the armed unities of the internal security forces, although foreseen, was never needed. France's collaboration, through her bilateral aid field crops expert, was valuable. Among the different crops considered for the replacement of Indian hemp, Sunflower was selected because of the following reasons.

1 - It can grow well under the difficult physical conditions prevailing in the area.

2 - It is not unknown to the local population

3 - It gives/a rather non perishable product (seed or oil) that is imported/to Lebanon in large amounts.

4 - Its cultivation can be mechanised and its production easily controlled.

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Table XXXI gives the costs of producing sunflower in the Baalbeck Hermel region.

Table XXXII Production Costs of Sunflower in the Bekka'a Baalbeck - Hermel Region (in LL/ha)

	Semi Irrigated	Dry
Fertilizers:		
- Nitrates 200 kgs/ha	50	-
- Phosphate 400 kgs/ha	56	-
- Handling of fertilizers	7	-
Rent of land and water	300	100
Plouphing & harrowing	40	40
Seeding	17	15
Irrigating (16 times)	40	-
Harvesting	23	20
Threshing	5	5
Bagging	12	10
Transporting	10	10
Total	560	200

Following are some important data on sunflower cultivation:

- Semi - irrigated production: 1 000 kgs/ha
- Dry production: 350 kgs/ha
- In 1966 - 67 - 68, seeds, fertilizers and threshing were offered free by the Government.
- In 1969 fertilizers were paid by the farmers.
- The wheat office buys the seeds at 75 pl/kg.

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- The International price of sunflower seeds in 1968 was 41 pl/kg.

- Table No.XXXIII gives a comparaison of cost and profit between Sunflower and Indian hemp.

Table XXXIII . Comparative costs & profits of Sunflower V/S Indian Hemp

Crops / Costs & Profits (LL/ha)	Sunflower		Indian hemp	
	Semi-Irrigated	Dry	Semi-Irrigated	Dry
Cross profit	7 50	260	1 000	400
Costs	5 60	200	465	160
Net profit	1 90	62	535	240

The result of the 1966 - 1967 compaign are presented in table XXX

Table XXXIV , Indian hemp area V/S Sunflower area (in ha)

Year	1966	1967	1968	1969
Ha of Indian hemp	4 500	4 200	3 200	2 000
Ha of Sunflower	80	1 000	2 800	4 200
Production of sunflower(tons)	42	530	1 670	2 700

The number of villages concerned in 1966 was 14. It went, in 1969, up to 41 villages.

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Kinds and amount of work to be performed:

Table No. II gives the kind and amount of works to be performed and the cofresponding W.F.P. and requested in terms of W.F.P. rations.

Table XXXVI . Time for the Sunflower Plantation and Corresponding costs and W.F.P. Aid Requested.

Year	1969	1970	1971	1972	1973	Total
Ha of sun-flower	4 200	5 400	6 300	6 900	7 200	-
Number of farmers	1 200	1 500	1 700	1 800	1 800	-
Number of WFP family rations	438 000	547 500	620 500	657 000	657 000	2 920 0
Value of WFP aid (LL)	928 560	1 160 700	1 315 460	1 392 840	1 392 840	6 190 4
Cost to Gvt. (LL)	1 223 000	1 400 000	1 650 000	1 870 000	2 000 000	8 143 0
Cost to farmers (LL) (1250 LL/ha)	1 050 000	1 350 000	1 575 000	1 725 000	1 800 000	7 500 0
Production (tons)	2 700	3 400	4 090	4 700	5 000	19 8
Value of Production at 41pl/kg (LL)	1 107 000	1 394 000	1 676 900	1 927 000	2 500 000	8 154
Total cost of operations (LL)	3 201 560	3 910 700	5 540 460	4 987 840	5 192 840	21 833

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NATURE AND KIND OI WORKS ON MUNICIPAL AND GOVERNMENT LAND

Three categories of these works are envisaged:

1) The construction of feeder rural roads
2) The production of seedlings
3) The production of compost

THE CONSTRUCTION OF FEEDER RURAL ROADS

The expenses of constructing these roads are entirely born by the Green Plan. The private owners must offer the land free, which becomes Government property through a presidential decree. Appendix No. is an example of the final file for a typical feeder rural road.

The average cost of constructing such roads are detailed as follows:

a) Costs of earth moving + retaining walls + lateral ditches + pipes:
   - on earth lands : 8 000 LL/km
   - on semi-rocky lands : 10 000 LL/km
   - on rocky lands : 22 000 LL/km
   - Average : 13 000 LL/km

b) Costs of stabilization + asphalting : 15 000 LL/km
c) Costs of studies and designs : 2 000 LL/km
d) Total average cost : 30 000 LL/km

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The value of human labor in the construction of each square meter of feeder roads is given in the following table:

Kind of work	Lebanese Pounds /M^2
Levelling	
Lateral ditches	0.50
Breaking the stones (including transport)	0.50
Lining with stones	0.35
Breaking stones into gravels	0.55
Spreading gravels & sprinkling with water	0.20
Spreading asphalt	0.30
Miscellaneous	0.30
TOTAL	3.00

The wage of one man/day being 7 LL, therefore 1/2 man day is needed for each square meter of rural road constructed.

Table No. XXXVII gives the program for the construction of Government farm road with the corresponding W.F.P. aid requested.

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Tablo XXXVII . Program of Construction of Gvt. Farm Roads and Corresponding W.F.P. Aid requested.

Year	1970	1971	1972	1973	1974	Total
Length (meters)	50 000	50 000	50 000	50 000	50 000	250 000
Area (m^2)	400 000	400 000	400 000	400 000	400 000	2 000 000
Cost to G.P. (LL)	1 500 000	1 500 000	1 000 000	1 500 000	1 500 000	7 500 000
W.F.P. Rations	200 000	200 000	200 000	200 000	200 000	1 000 000

Appendix No. gives the location of these roads.

../F.

PRODUCTION OF SEEDLINGS

According to the Green Plan market research studies already completed (around 35 countries were visited and studied in West and East Europe in North Africa and in the Middle-East) and according to data and information so far available, main conditions on the distribution of seedlings of fruits and other tree-crops to be planted in the areas developed by the Green Plan are formulated as follows:

The following factors that affect the profitability and market outlets of the various tree-crops have been considered:

- Comparative cost and return.
- Present and projected demand in the domestic market
- Present and projected import demand in the foreign markets.
- Lebanon's imports of these crops like almonds, pistachios, apricots and its preparations, industrial grapes and olives.
- Potential and capabilities for processing

Table No. XXXIX gives the annual number of seedlings to be distributed annually in order to meet the increase in demand for both local consumption and exports.

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Table XXXIX . Annual Distribution of Fruit Seedlings in Lebanon

Crop	Total Number	To be produced by the Green Plan
Table grapes	180 000	70 000
Industrial grapes	225 000	100 000
Citrus	70 000	40 000
Olives	300 000	100 000
Pistachios	15 000	7 000
Almonds	200 000	60 000
Apricots	45 000	20 000
Cherries	70 000	40 000
Pears	40 000	15 000
Quince	15 000	6 000
Plums	20 000	12 000
Miscellaneous	30 000	15 000
TOTAL	1 250 000	500 000

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Table No. X gives the program of production of seedlings, the cost to government and the corresponding W.F.P. aid requested.

Table X ..... Program of seedlings production, and corresponding W.F.P. aid requested

Year	1970	1971	1972	1973	1974	Total
No. of seedlings	500 000	500 000	500 000	500 000	500 000	2 500 00
Total cost (LL)	250 000	250 000	250 000	250 000	250 000	1 250 00
Man/days	36 500	36 500	36 500	36 500	36 500	182 50
W.F.P. rations	36 500	36 500	36 500	36 500	36 500	182 50

Following are some figures on the production of seedlings:

- One grape seedlings costs 0.5 LL (one of the cheapest). One olive seedlings costs 1 LL. One pistachio seedling costs 2 LL (one of the most expensive).

- Around 100 workers are working in the nurseries of the Green Plan.

- Farmers are requested to pay 10 to 20% of the cost of the seedlings.

- Forest seedlings are also produced in the Green Plan nurseries. They are distributed free of charge or (for certain species) at nominal price.

  The Green Plan on his four nurseries of 42 hectares (in Choueifat, Tyr, Hadeth & Minieh) will produce 500 000 seedlings. The rest is bought from private - Green Plan controlled nurseries or imported from Europe. Importation from Europe is restricted to new varieties that are not known to local nurseryment.

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THE PRODUCTION OF COMPOST

Soils in Lebanon are very poor in organic matter (less than 1%). The recent expansion of intensive cultural practices has resulted in an even greater shortage of organic fertilizers.

Table XXXV gives the total quantity of manure produced in Lebanon in 1966.

Table XXXV . Production of Manure in Lebanon in 1966

Category	Number	Tons of manure/ year/head (1)	Total quantity (tons)
Cattle	104 000	3	312 000
Sheep	213 000	0.15	31 950
Goats	442 000	0.15	66 300
Pigs	9 000	3.5	31 500
Horses	3 000	1	3 000
Mules	4 000	1	4 000
Donkeys	37 000	1	37 000
Camels	840	1	840
Rabbits	24 000	0.08	1 920
Poultry	17 000 000	0.011	187 000
		TOTAL	675 510

1) with 35% moisture.

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Table XXXVI gives the minimum requirements of manure in Lebanon in 1966 to keep the soil from degrading in the cases of major intensive crops only.

Table XXXVI . Minimum Requirement of Manure in Lebanon in 1966

Crop	Tons of manure (per ha.)	Area (ha)	Total quantity (tons)
A. Irrigated			
- Fruit trees	20	29 499	589 980
- Vegetables	10	40 937	409 370
B. Dry-Land			
- Fruit trees	10	34 634	346 340
- Tobacco	10	6 603	66 030
			1 411 720

Comaparing figures of tables XXXV & XXXVI the deficit in the production of manure in Lebanon in found to be 736 000 tons/year.

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Table XXXVII shows the potentials of production of organic fertilizers out of the refuse of the city of Beirut.

Table XXXVII . Possible Production of Compost from the Refuse of the city of Beirut.

	Tons
1 - Beirut	
Production of refuse/day	500 (1)
Production of refuse/year	182 500
Production of compost:	
a. Minimum (40% of refuse)	73 000
b. Maximum (65% of refuse)	118 000
2- Beirut & suburbs	
Production of refuse/day(1)	1 000
Production of refuse/year	365 000
Production of compost	
a. Minimum (40% of refuse)	146 000
b. Maximum (65% of refuse)	237 250

(1) Estimations of the Municipality of Beirut.

../6.

Figure of table XXXVII, shows that the production of compost out of the refuse of Beirut will not satisfy the present country's need for organic matter but will fill an important gap and serves as a pilot project for Lebanon as well as for all the Middle East, thus opening a new era of hygenic refuse disposal and a new and cheap source of organic matter badly needed for the Lebanese Agriculture.

The project of installing two plants in Beirut for the production of compost is quite advanced. Auction has taken place in April 1969.

This project will be executed jointly by the Municipality of Beirut and the Green Plan. The municipality of Beirut offers the land and the erection of two plants, collects the refuse and delivers it to the plants. The plants which are the property of the Municipality will be internally managed by the constructor under the direction of the Municipality. The Green Plan will be responsable for the sales of the compost to the farmers at encouraging prices for a starting period of 4 years.

W.F.P. commodities will be given to 2 000 garbage collectors of the Municipality against a small reduction in their salaries. The money thus saved will serve to lower the selling price of the compost.

Tables XXXVIII . gives the approximate cost of building one of the two plants with a capacity of 400 tons/day.

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Table XXXVIII . Approximate Cost of Beirut Compost Plant.(1)

Item	Cost in L.L
Land (50.000 m^2 x 60 LL)	3 000 000
Fixed installation and machines	8 000 000
Mobile machines	1 000 000
Buildings + warehouse	1 500 000
Miscellaneous	1 000 000
TOTAL	14 500 000

Table XXXIX gives the cost of deprociation, management and marketing.

(1) These figures are based on offer transmitted to the Municipality of Beirut during an old auction.

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Table XXXIX . Annual Cost of Depreciation , Management and Marketing in a 400 tons/day Compost Plant

	Years	Total Cost (LL)	Annual Cost (LL)
- Depreciation			
- Fixed installation	15	8 000 000	5 333 333
- Mobile machine	7	1 000 000	142 857
- Civil engineering	15	1 500 000	100 000
- Miscellaneous	10	1 000 000	100 000
TOTAL			-5 676 190
2 - Running Cost			
- Electricity			250 000
- Fuel			100 000
- Replacement parts			300 000
- Personnel			150 000
TOTAL			- 800 000
3- Marketing			- 200 000
4- Miscellaneous		(10% of running Cost+Marketing)	100 000
5- GRAND TOTAL			6 776 190

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In the case of full production, the cost of producing one ton of compost will be: $\frac{6\ 776\ 190}{365\ 400}$ = 46 LL/Ton of compost as compared with 100 LL/Ton of barnyard manure. (both prices at supplier's site)

Table XL gives the amount of W.F.P. ration's requested.

Table XL . W.F.P. Rations for Garbage Collectors.

Year	1971	1972	1973	1974	Total
No. of Garbage collectors	2 000	2 000	2 000	2 000	8
W.F.P. Rations	720 000	720 000	720 000	720 000	2 880

The estimated value of 720 000 W.F.P. rations being 1 440 000 LL, the price of one ton of compost could be reduced by almost: 5 LL if the daily production of compost is 400 tons and by 2.5 LL if the daily production of compost is 800 tons.

It can be said that this reduction in price is approximately equivalent to the cost of handling and transporting the compost from Beirut to the farmers' orchard.

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COMMODITIES	DAILY RATIONS INDIVIDUAL Gr	FAMILY Gr	TOTAL REQUESTED AID MTN
	b/	c/	
Wheat	500	2.500	72.504
Vegetable oil	40	200	5.800
Processed milk	25	125	3.625
Canned meat	25	125	3.625
Canned cheese	25	125	3.625
	615	3.075	89.179

a/ Kind of commodities and relevant daily rations are given as an indicative of possible requirements

b/ Nutritive value of one individual daily ration approximately 2.230 calories, having 69 grammes of proteines and 63 grammes of fats.

c/ Overage family size of 5 persons

NUMBER OF DAILY FAMILY RATIONS TO BE DISTRIBUTED YEARLY
WITH BREAKDOWNS PER KIND OF WORKS

nd of Works	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
p vate Land						
aining walls	2000.000	2.000.000	2.000.000	2.000.000	1.000.000	9.000.000
o of stones	160.000	160.000	160.000	160.000	160.000	800.000
er reservoirs	305.000	305.000	305.000	305.000	305.000	1.525.000
l	50.000	70.000	70.000	70.000	70.000	330.000
ais	84.000	120.000	120.000	120.000	120.000	564.000
el ces/fences	200.000	200.000	200.000	200.000	200.000	1.000.000
eh rds	500.000	1.000.000	1.500.000	1.000.000	500.000	4.500.000
canization	210.000	630.000	840.000	840.000	420.000	2.940.000
l ty constr.	200.000	200.000	200.000	200.000	200.000	1.000.000
lower	438.000	547.500	620.500	657.000	657.000	2.920.000
nc ete roofs	70.000	70.000	70.000	70.000	80.000	360.000
Governm.Land						
rm roads	200.000	200.000	200.000	200.000	200.000	1.000.000
edlines	36.500	36.500	36.500	36.500	36.500	182.500
mpost factory		720.000	720.000	720.000	720.000	2.880.000
TAL FAMILY RATIONS	4.453.500	6.259.000	7.042.000	6.578.500	4.668.500	29.005.500

Project 026/Ext 2

mmodities	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
eat	11.134	15.648	17.605	16.446	11.671	72.504
ge able oil	890	1.252	1.409	1.316	933	5.800
ocessed milk	557	782	880	822	584	3.625
nr d meat	557	782	880	822	584	3.625
nned cheese	557	782	880	822	584	3.625
O T A L	13.695	19.246	21.654	20.228	14.356	89.179

Details on staff Expenditures		Monthly individual Salary L.L.	Yearly Cost L.L.
1	Project Manager	600	7, 200
1	" " assistant	1,000	12, 000
2	Inspectors	500	12, 000
1	Accountant	800	9, 000
1	Secretary	600	7, 200
4	Store Keepers	500	24, 000
4	" " assistant	350	16, 800
4	Guards	150	7, 200
2	Drivers	350	8, 400
	Total yearly cost	LL	104, 400
	Total Project expenditure	LL	522, 000
		$	174, 000
	Rounded to		180 , 000

All personnel intended at full time, except for the project Manager are half time basis.

Project 076/ext. 2

ESTIMATED GOVERNMENT EXPENDITURES RELATED TO FOOD DISTRIBUTION

PERSONNEL	180 000
UNLOADING AND CLEARANCE	
MTN 89, 176 at $1.50 per ton = $133,764 rounded to	135 000
HANDLING AND TRANSPORT	
MTN 89, 176 at $3.50 " " = $312,116 " "	315 000
REPACKING	10 000
STORAGE	200 000
	75 000
NCR	915 000

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

3. a) The Government will designate the Executive Committee of the Green Plan to execute the project on behalf the Government. It is a semi-autonomous agency of the Government.

b) (i) The President of the Green Plan Executive Committee will serve as channel of communication between the Government and W.F.P. in respect to policy matters.

(ii)(iii) In regard to details of operation the Co-Manager of the Special Fund Project for the Development of the Lebanese Mountains will be designated as the channel of communication.

4. a) Food habits are quite similar to these of the other mediterranean countries except that a part of the population does not eat pork or pork derivatives.

b) Beneficiaries will receive these commodities as an addition to their regularly consumed diet.

c) Hard wheat, vegetable oil, dried milk, canned meat and cheese are requested. No change forseen during the period of assistance. Wheat is to be received in 50 kilos strong jute bags, other commodities in the smallest available containers.

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