

**Ç U K U R O V A**  
**FRESH FRUIT AND VEGETABLE**  
**EXPORT MODEL PROJECT**

**A PREFEASIBILITY STUDY**

Prepared by

**AGROTEK LTD.**, as Contractor

and

**TENNECO, INC.**, as sub - Contractor

for

**THE STATE PLANNING ORGANIZATION  
OF THE PRIME MINISTRY  
OF THE REPUBLIC OF TURKEY**

and

**THE AGENCY FOR INTERNATIONAL DEVELOPMENT  
OF THE UNITED STATES OF AMERICA  
(Sub-contract-III, USAID Project No. 298 -0050)**

February, 1986

**AGRÖTEK**

**TARIM SANAYİ VE TİCARET LIMITED ŞİRKETİ**

# AGRÖTEK

TARIM SANAYİ VE TİCARET LİMİTED ŞİRKETİ

ÇUKUROVA

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MODEL PROJECT

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ÇUKUROVA FRESH FRUIT AND VEGETABLE  
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ÇUKUROVA FRESH FRUIT AND VEGETABLE  
EXPORT MODEL PROJECT

PREAMBLE

The Government of Turkey (GOT), acting through the Minister of State and Deputy Prime Minister and the United States of America, acting through the Agency for International Development (AID) have signed a Grant Project Agreement on September 28, 1984. The Grant Project Agreement was published in the Official Gazette of the Republic of Turkey, issue number 18689, dated March 9, 1985.

The project title for this Grant Project Agreement was "Agro-Industry Prefeasibility Studies", and the project number is AID Project No. 298-0050.

One of the prefeasibility studies mentioned in that Grant Project Agreement is the "Model Project to Export Fresh Fruit and Vegetables from the Çukurova Region". The objective is to use the output of this prefeasibility study, if viable, to interest potential U.S. joint-venture partners and investors from the Gulf Countries.

The GOT authorized the Foreign Investment Department (FID) of the State Planning Organization (SPO), which in turn contracted AGROTEK LTD. (AGROTEK Tarım Sanayi ve Ticaret Limited Şirketi, Ankara-Turkey) as Prime Contractor with an agreement signed by SPO and AGROTEK LTD., on March 29, 1985.

AGROTEK LTD. and TENNECO, INC. (TENNECO, INC., Houston-Texas-U.S.A.) signed a Sub-contract on April 22, 1985 (SUB-CONTRACT-1. and have agreed to cooperate in conducting this prefeasibility study on " ÇUKUROVA FRESH FRUIT AND VEGETABLE EXPORT MODEL PROJECT ".

The purpose of this prefeasibility study was to test the viability of an integrated investment by a theoretical company, formed as a joint-venture with foreign capital, in the Çukurova Region of Turkey. The model project was designed to transfer technology in fruit and vegetable production, their grading, packaging and marketing by the same company, and exporting of 30,000 m tons of packaged produce mainly into the Middle-east and Gulf Countries' market.

In October 1985, the Çukurova Region was visited with two TENNECO experts and an AGROTEK specialist, and meetings were held with several of the existing fresh fruit and vegetable packaging and marketing companies (including the two in Hatay and two in Mersin) during October 1985. Discussions were also conducted with the farmers, Union of Exporters and cold storage owners, to produce a study as comprehensive and up to-date as possible by using the latest technical, statistical data and financial indicators available. Five U.S. experts for TENNECO and AGROTEK's staff have contributed their efforts to complete this study during the last quarter of 1985 and in January 1986.

The prefeasibility study carried out has shown that such a project is very viable with an internal rate of return of 29.5 %, capital equity pay-back period of 2 years 10 months and a cash break-even point of 11,617m tons out of the projected 30,000 m tons of annual exports.

A prefeasibility study is of course only the second step in a five-part process for identifying,formulating and implementing a joint-venture project. These are : Opportunity Identification,Prefeasibility Study,Feasibility Study,Joint-venture Company Formation,Project Design and Implementation,respectively. Thus,this study will serve as the starting point of a dialogue among interested investors.

AGROTEK LTD. and TENNECO,INC. believe that the objective of this study is fulfilled and hope ,that it will generate sufficient interest of potential U.S. companies and investors from the Gulf Countries to form a joint-venture company in Turkey and use the findings of this study as a guideline in their negotiations with their Turkish co-partners to complete the next 3 steps,namely the feasibility study, the joint-venture company formation and the project design and implementation.

## INTRODUCTION

Turkey presently produces annually over 20 million m. tons of vegetables and 8 million m. tons of fruits (see Tables 1 and 2). There is still a great production potential that is not utilized to increase production and exports of these commodities. During 1981-1984, exports have averaged 372,927 m tons of fresh fruits and 265,798 m tons of fresh vegetables (See Table 3).

One of the reasons why vegetable exports have not increased to a significant amount is that the emphasis was towards fruit export promotion and thus focusing on fruit packing-houses and orchard establishments. There are presently over 20 citrus fruit packing-houses and not even one packing-house for vegetables.

For a successful export marketing of fresh produce, the first step is of course, to ship varieties which are known to the importing market, ship them continuously and present them in standard packages. The only way to achieve this is to package a good quality commodity in properly organized packing-houses and use a standard brand name which will become known by the consumers in the importing countries.

On the other hand, all vegetable growing in Turkey is a family operation, in small lots except for some of the tomatoes grown for the canning industry. The lack of necessary farm machinery and equipment, topped with market and price insecurities, are the main reasons for holding the development of large scale field operations. This induces

insufficient and dispersed production without proper technology transfer, which in turn causes high production costs and thus,unstable market prices.Another handicap is lack of seeds of varieties demanded by the importing markets.

Due to all of these reasons,the present vegetable growing system in Turkey does not allow a competitive,well programmed and export oriented vegetable production and marketing operation to develop.Especially Middle-East countries that are so close to Turkey create a very good market for vegetable exports,but the lack of organized production and marketing systems are the bottle-necks for the development of the exports to the desired levels.Similar,but not as severe,problems also exist in the fruit export promotion programs developed until now in Turkey.

The " Fresh Fruit and Vegetable Export Promotion Project " of 1971 and the " Fruit and Vegetable Project " of 1981,both supported by World Bank credits,unfortunately did not overcome the above mentioned problems of integrating production with marketing operations. This makes us believe that a new model for integrated operation needs to be developed and implemented. If this model proves to be effective,then it can be implemented in all ecological areas and a big burst in the fruit and vegetable exports will be realized to utilize Turkey's potential in this subsector.

The project will be implemented by a " Fruit and Vegetable Production and Export Company " to be established in the Çukurova Region,which is very near to the Middle-East market,where two or three crops of vegetables can be produced per year.

This area produces most of Turkey's citrus crop and is also a very good deciduous fruit producing region, because of the Taurus Mountain range in close proximity.

The production will be realized through contract farming. The company will supplement production directly by its own production team on leased land. The production technology adapted by the company will also be implemented in the contract farming operations. This will be realized by the technical experts of the company who will act as extension agents to train and control the production of the contract farmers.

The company will establish a multi-purpose packing-house (packing various vegetables and fruits), integrated with a pre-cooling and cold-storage warehouse. Produce received from the contract farmers will be washed, sorted, graded, sized, waxed and packaged with the implementation of modern technology and packing material used will meet the importing countries demands in quality, type and sizes. Shipping or transport of the packed produce will be in conjunction with the market demand. Direct shipment after pre-cooling or after storage will be done by hired airplanes and transport vehicles, such as trucks and/or vessels either with or without refrigeration.

The company will follow strict quality control measures according to international standards. Produce grown by the company or under contract farming will all be shipped under the same brand name, with year-around shipments to the same export market.

The first target in export will be the Middle-East and Gulf countries, however, with some species and specific varieties the European markets will be exploited. Especially in vegetable exports from Turkey, the practice was to try to penetrate the markets with many different brand labels and continuity in standard quality control could never be achieved properly until now. In general, vegetable exports presently is in the hands of small exporters who do not own a packing-house or it is done by fruit exporters, who are trying to keep busy on their off-season and generally as spot sales. Importers on the other hand, would like to operate their business with year-around suppliers who are organized with large scale operations and supplying good quality produce.

In summary, this model project will result in increased yields, low production costs with the large scale field vegetable production, due to the utilization of improved seed, the technical expert team and modern farm equipment. In an organized marketing activity, the company will introduce high quality and year-around standard fruit and vegetable produce under a new brand name to the importing markets and thus, it will contribute considerably to Turkey's export.

TABLE : 1

MAJOR FRUIT PRODUCTION OF TURKEY (1,000 mTons)

<u>FRUITS</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985*</u>
Pear	320	330	384	360	365
Quince	56	62	63	59	62
Mulberry	90	90	97	85	90
Apple	1,450	1,600	1,750	1,900	1,900
Plum	158	168	171	150	150
Fig	250	280	330	330	340
Apricot	152	205	170	200	170
Cornel	16	16	15	15	16
Cherry	95	105	110	105	130
Peach	265	265	270	235	200
Sour cherry	60	62	66	65	85
Grapes	3,700	3,650	3,400	3,300	3,300
Orange	675	656	730	761	550
Tangerine	175	198	230	220	218
Grape fruit	18	26	25	21	23
Lemon	290	311	300	318	250
Sour orange	12	12	14	15	11
Olives	400	1,320	400	800	600
Strawberry	<u>23</u>	<u>22</u>	<u>22</u>	<u>25</u>	<u>26</u>
TOTAL	8,205	9,378	8,547	8,964	8,487

Source : SIS The Summary of Agricultural Statistics, 1984  
State Institute of Statistics (SIS).

(\*) : 3rd estimate for the year by The Ministry of Agriculture,  
Forestry and Village Affairs.

TABLE : 2

MAJOR VEGETABLE PRODUCTION OF TURKEY (1,000 mt/tonne)

<u>VEGETABLES</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985*</u>
Cabbage	425	470	468	500	550
Black cabbage	130	140	160	160	169
Artichoke	7	8	8	8	10
Celery	13	14	15	16	17
Leaf lettuce	21	20	15	20	19
Head lettuce	52	55	57	60	67
Spinach	130	125	128	135	136
Leaf	300	300	300	305	290
Garden Orache	2	4	4	5	5
Purslane	0.5	0.5	0.5	0.5	0.7
Green beans	300	320	350	400	400
Green peas	32	40	41	35	36
Green broad beans	47	50	47	47	45
Calavance	70	65	65	55	50
Melon-Water melon	4,500	4,500	4,610	4,800	5,500
Pumpkin	60	60	70	55	70
Squash	300	310	320	300	310
Cucumber	510	550	600	650	700
Eggplant	700	700	665	670	700
Okra	22	25	24	25	24
Tomatoes	3,600	3,700	3,700	4,000	4,900
Green peppers	600	600	640	665	685
Green garlic	20	22	21	21	20
Green onion	140	140	140	150	150
Dry garlic	75	84	81	77	75
Dry onion	1,090	1,025	1,000	1,100	1,250
Carrot	85	90	100	140	145
Horse radish	21	19	20	25	25
Red radish	14	25	26	26	35
Jerusalem artichokes	2	2	2	3	3
Cauliflower	60	60	53	60	56
Potatoes	<u>3,000</u>	<u>3,000</u>	<u>3,050</u>	<u>3,200</u>	<u>3,600</u>
<b>TOTAL</b>	<b>16,338.5</b>	<b>17,131.5</b>	<b>16,772.3</b>	<b>17,738.5</b>	<b>20,042.7</b>

Source : (SIS) the Summary of Agricultural Statistics, 1984

(\*) : 3rd estimate for the year by The Ministry of Agriculture, Forestry and Village Affairs.

TABLE : 3

## MAJOR FRESH FRUIT AND VEGETABLE EXPORTS FROM TURKEY

FRUITS	1981			1982			1983			1984			1985 (Jan.-Sept.)		
	Q	V	U.P.	Q	V	U.P.	Q	V	U.P.	Q	V	U.P.	Q	V	U.P.
Oranges, Tangerines and Clementines	143,105	58,043	405	91,113	29,115	320	100,301	28,520	284	94,663	21,218	224	60,674	8,859	146
Lemons	119,677	62,726	524	124,514	49,295	372	131,303	42,230	322	136,021	37,250	274	31,584	10,646	337
Other Citrus Fruits	13,674	4,175	305	12,973	2,961	228	9,300	1,850	199	22,302	3,975	178	9,137	1,729	189
Apples	127,697	59,118	463	104,550	40,314	386	101,173	29,202	289	71,065	17,350	253	31,290	7,650	245
Grapes	9,991	3,885	389	12,406	3,585	289	12,899	3,924	304	13,079	4,341	332	9,523	3,102	326
Pears	2,251	1,054	468	1,372	587	428	5,433	1,972	359	3,065	1,593	520	2,094	723	345
Peaches	5,535	2,968	536	5,098	2,372	465	7,496	2,994	399	5,612	2,348	418	3,265	2,036	387
SUB - TOTAL	421,930	191,969	455	352,026	125,229	356	367,945	10,692	300	345,807	88,674	256	143,367	34,745	232
<b>VEGETABLES</b>															
Potatoes	17,723	4,127	233	54,376	8,069	148	36,661	4,772	130	72,958	10,391	149	4,349	883	182
Tomatoes	75,423	19,234	255	108,575	19,530	180	120,085	23,866	199	132,196	27,553	208	88,097	12,152	138
Onions	98,743	19,536	198	183,063	35,373	193	133,931	16,225	121	109,459	15,673	143	69,744	8,622	124
SUB - TOTAL	191,895	42,897	224	346,014	62,972	182	290,677	44,863	154	314,604	54,117	172	162,690	21,657	133
GRAND TOTAL	613,825	234,866	383	698,040	188,201	297	659,622	155,555	226	660,411	142,791	216	312,257	56,403	181

Legend : Q = Quantity in mTons ; V = Value in 1,000 U.S. ; U.P. = Unit Price in \$/mTon.

Source : Undersecretariate of Treasury and Foreign Trade of the Prime Ministry of the Republic of Turkey, 1985.

## 1.0-SITE SELECTION

The project implementation site can be in any one of the three provinces, namely İçel (Mersin), Adana and Hatay (Antakya).

The region is called Çukurova valley, because it is formed of alluvial soils mainly formed by soil erosions from the famous Taurus Mountain Range into the Mediterranean Sea and the three rivers, namely Berdan in Tarsus, Seyhan and Ceyhan in Adana Province.

The three rivers are controlled by three dams with the same names and drainage and surface irrigation systems have been completed. Most of the land is leveled at the farm levels. Çukurova valley furthermore, holds the record in Turkey, for its high percentage of large farm properties which are presently utilized in cotton, maize, soybean and wheat cultivation as well as sub-tropical fruits (citrus mainly) and other horticultural crops.

The ecology permits minimum 2 crops per year and if properly planned, even 3 crops can easily be grown.

The infrastructure is well developed with paved roads to all villages in the valley, water availability, electricity, telephone etc.

The Province of Hatay (Antakya) is in the Syrian border of Turkey. The city center of Adana is about 230 kms from the Syrian border and the city center of Mersin is only 70 kms from Adana.

The farmers are hard working and willing to adopt to new technology, if it is shown to them that it is for their benefit.

## 1.1.GEOGRAPHICAL INFORMATION

The 3 provinces in this region are rather heavily populated as compared to the average density of Turkey.

The main industry is textile.The third largest oil refinery,the Soda Industry ,3 fertilizer plants and a large papermill and the second largest Glass factory of Turkey,several hydroelectric power plants,two main import-export harbours (Iskenderun and Mersin),the international airport of Adana are indicators of a dynamic and industrious region.

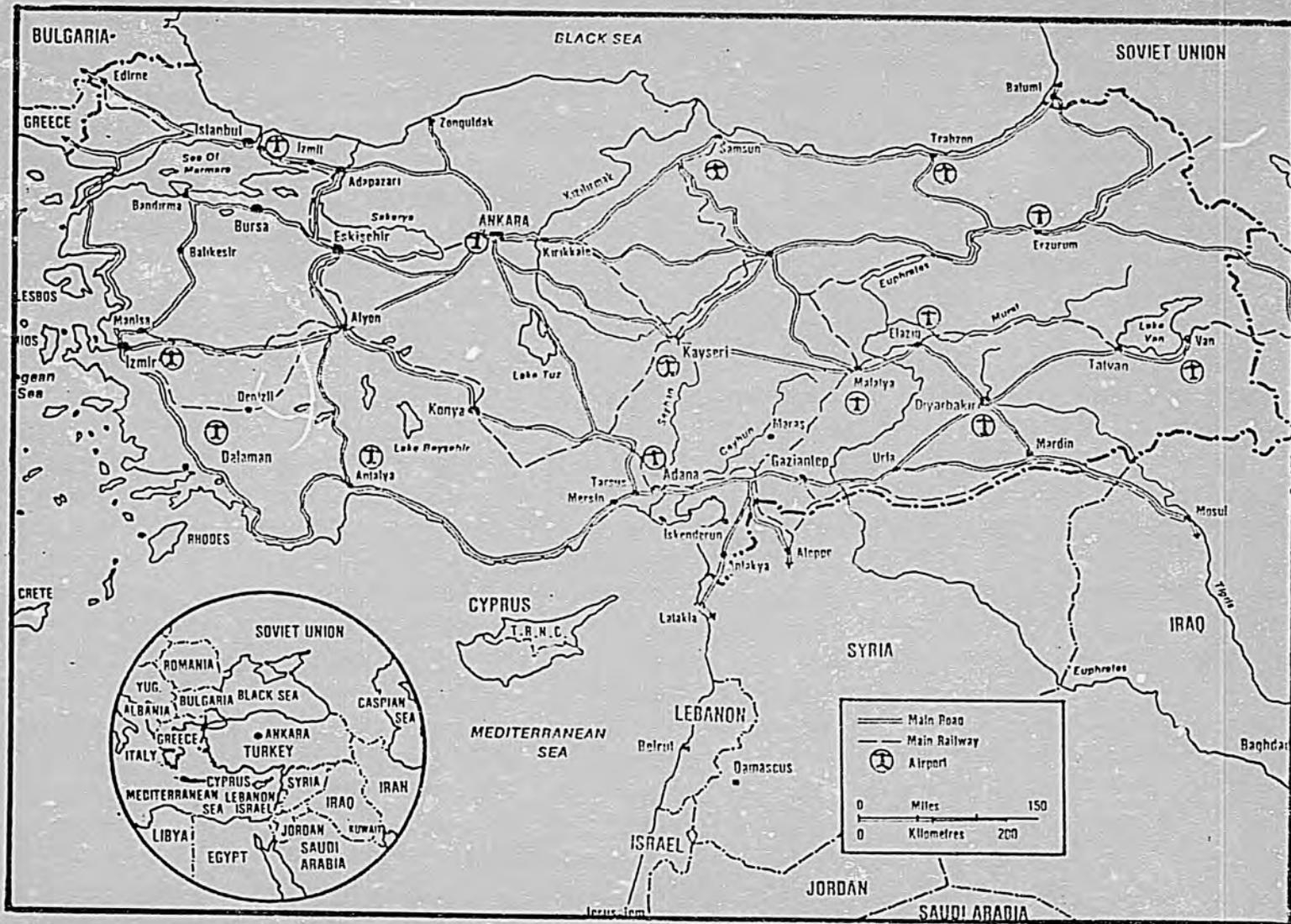
The Taurus Mountain range to the north of the provinces of İcel and Adana and the Amanos Mountain to the west of the Amik valley are the main elevations in the Çukurova valley,which protect the valley from severe freezes and frosts coming down from the Central Anatolia plateau.

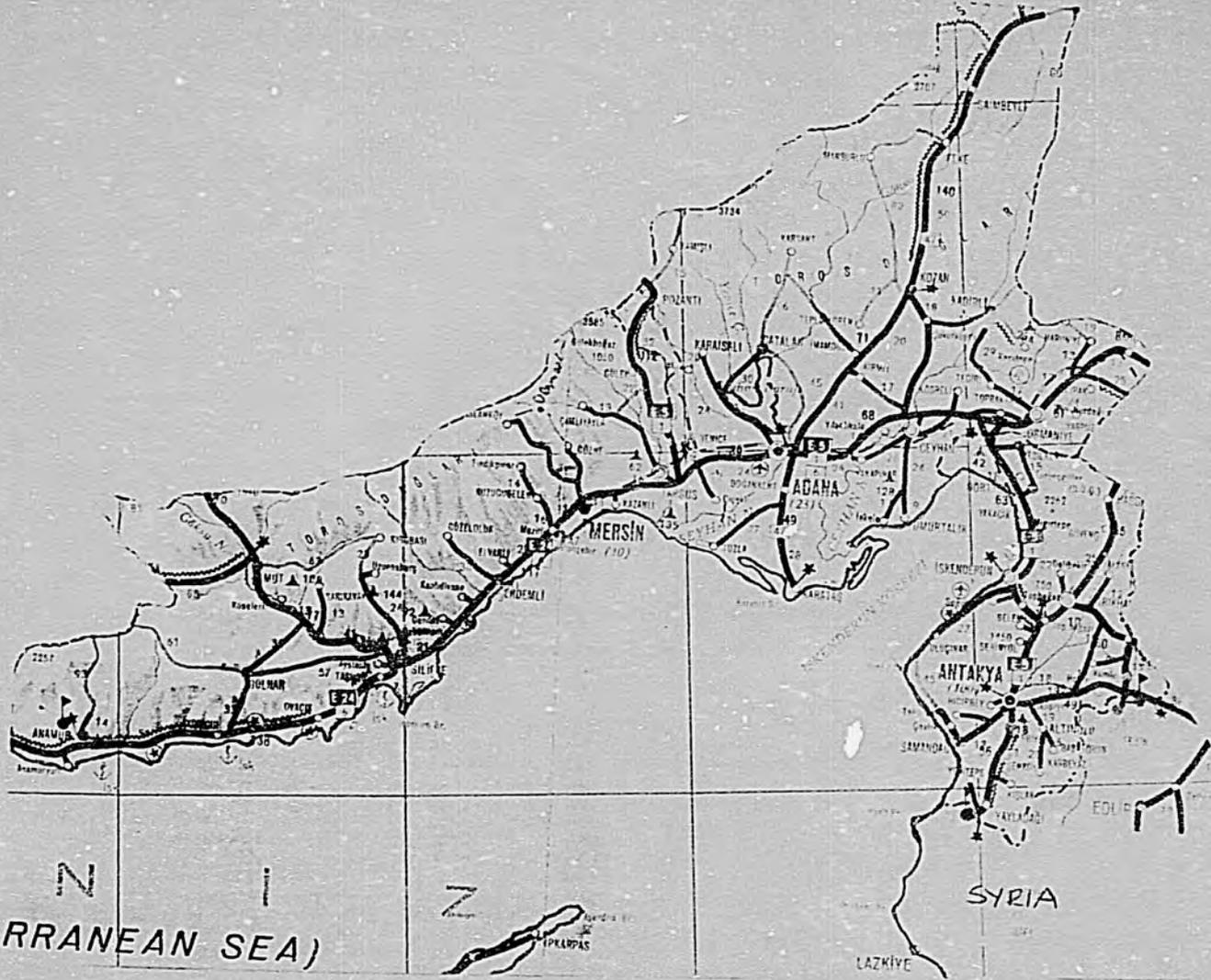
The region is also a touristic site with many historical sites such as the ancient cities of Antioch,Tarsus and Corikos,mountain resorts and excellent swimming conditions on uncommercialized beaches.

The two free-zones,one in Mersin and one in Adana-Yumurtalık which will become operational in the very near future,further add to the importance of this region.

A map of Turkey and a map of the region may be found in the following pages 10 and 11.

Further geographical indicators may be found in Annex (1).





MAP OF THE REGION

## 1.2. METEOROLOGICAL INFORMATION

The climate of the Çukurova valley is classified as sub-tropical Mediterranean and Marine Mediterranean. The valley falls within a median range, with climatic data representative of both classification, however, the high mountain range called the Taurus Mountains add considerable divergence to the project area by its warm temperate zone climatic factors.

Precipitation has an average of 640 mm in the Çukurova valley, but the Antakya area has a value of 1,200 mm per annum.

The mean temperature is  $18.3^{\circ}\text{C}$ , with an extreme high of  $45.6^{\circ}\text{C}$  and an extreme low of  $-14.6^{\circ}\text{C}$ . Mean soil temperature is  $20.9^{\circ}\text{C}$  and mean insolation period is 6 hour and 16 minutes.

The mean relative humidity is 68%. The mean vapor pressure is 15.7 milibars with a mean evaporation of 1,081 mm.

The wind velocity of the region increases in the summer and decreases in the winter. The annual mean wind speed is 2.9 meters/second.

Severe weather phenomena are not a factor in the project area. Freezing and frost conditions are very rare and do not contribute to economic losses. Occasional hail damage has been recorded, but with minimal economic loss.

Detail meteorological data for the 3 provinces in the region is compiled in Annex (1).2

### 1.3. INFRASTRUCTURE OF THE REGION

The Çukurova region is an important transit zone of Turkey. All highways carrying the traffic from Western, Northern and Central Anatolia (including from Europe) to the Southeastern provinces of Turkey (including vehicles to Iran, Iraq, Syria and the Gulf countries) pass through this region. International Highway E-5 passes through Tarsus, Adana and Hatay. The valley is connected to south coastal cities of Turkey, by a highway passing over Mersin. The highway network can be considered good to excellent.

The cities of Mersin, Adana and Iskenderun are connected by railroad to Central and Eastern Anatolia.

The Mersin and Iskenderun Sea-ports are both functioning as import and export ports. A small port at Taşucu-Silifke has hydrofoil connection to Cyprus. Yumurtalık-Adana port exports Iraqi crude oil which comes in with a pipe-line. There are several other small fishing harbours as well.

Adana has an international airport which connects Ankara and Istanbul to the region with twice daily domestic flights. Cyprus and some Middle-East countries are connected with domestic or foreign airlines.

Both industrial and drinking water are available in abundance from surface waters, supplied from dams or small rivers and brooks or from natural springs in the mountains. Underground water is also easily available.

A very good irrigation canal system is established.

Electrical energy in the region is supplied by Çukurova Electric (a private company) mainly and by TEK (Turkish Electric Corp.) and the system is

interconnected to the national network. High voltage lines supply 15,000 or 34,500 KVA energy, which is reduced for utilization down to 220 volts/50 cycles. Hydro-electric and thermal generators are presently the supply source. Recently the negotiations indicate the establishment of a very large thermal power-plant (based on imported coal from Australia) at the Yumurtalık-Adana area. The negotiations for a nuclear power-plant at Akkuyu-Silifke is almost completed.

PTT (Turkish mail, telephone and telegraph Company-State owned) provides mail, telephone, telegram and telex service to all areas in the region. International telephone and telex communication with automatic dialing is established.

#### 1.4. AGRICULTURAL PRODUCTION IN THE REGION

Some of the tropical fruits and vegetables can easily be grown in this region with a little protection. All of the species of the sub-tropical climatic zone are and/or can be successfully produced in the foothills of the mountains and the Çukurova valley. Many of the temperate zone species can and/or are grown in different elevations of the Taurus mountain range where irrigation water is available. A good product-mix can easily be obtained with a proper production program and an efficient extension field staff of the company. One can reach elevations of up to 1,200 m within one hour drive from the Çukurova valley.

The farmers are rather rich as compared to the rest of the country. However, they are quite open to new technology if they see and are made

to believe, it is for their advantage to make the change, yet they are very hard working and serious in their farming operations.

The farmers who are experienced vegetable growers are constructing plastic and/or glass greenhouses to protect their crops from low temperatures in the winter. Since the regional ecology permits the production of early and late season fruits and vegetables, the earnings of such farmers are considerably larger as compared to the rest of the country.

The region presently leads in the production of fruits and vegetables. However, the lack of properly organized processing and marketing companies which are in direct mutual economic link with the farmer, causes a great percentage of loss in the processed and export marketed produce.

Çukurova region presently produces 1,283,165 m tons of fruits and 1,892,225 m tons of vegetables annually. This production can easily be doubled with the implementation of the recent production technology in perennial crops and with introduction of improved seeds together with new technology transfer in annual crops.

Table: 4 illustrates some of the fruits and vegetables and their present productions, which this project may be involved with in the future.

Annex (1).3. contains more detailed information on the agricultural products of the region.

TABLE : 4

PRODUCTION OF PROJECT RELATED FRUITS AND VEGETABLES IN THE REGION (in Tons)

	<u>TOTAL OF PROJECT REGION</u>		
<u>FRUITS</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
Pea	4,995	5,165	5,938
Peach	15,894	18,225	22,836
Apple	26,691	28,352	26,035
Grape	289,010	327,168	232,474
Orange	405,668	373,657	487,916
Mandarin	69,196	66,671	242,141
Lemon	257,687	271,470	269,324
Grapefruit	<u>15,551</u>	<u>73,476</u>	<u>22,698</u>
SUB-TOTAL	1,084,692	1,134,182	1,309,362
 <u>VEGETABLES</u>			
Potatoes	123,952	110,235	85,142
Tomatoes	492,313	488,006	465,758
Onions	<u>57,548</u>	<u>67,442</u>	<u>51,195</u>
SUB-TOTAL	673,813	665,483	602,095

Source : SIS ( State Institute of Statistics )

### 1.5.EXISTING FACILITIES

All of the vegetables grown in the region are graded and packed by hand labor, in a small sheltered area, usually at or near the office of the small wholesale / exporters.

All the fruits produced are also hand graded and packed except some of the apples and most of the citrus that are exported.

There are 3 packing houses, namely M. TURAN ,I. ÖNER and MEYNA that can pack both apples and citrus fruits. The remaining 12 packing houses in the region are only packing citrus fruits.

Most of the citrus fruits grown in the region, packed for the local market are also hand graded and packaged.

All of the lemons which are stored in natural caves to be marketed during the late spring and summer season are also hand packed.

Some of the packing house equipment is produced locally or are imported from Cyprus. Most of them do not wash or wax the fruit when they are processing them through the packing house.

The locations, names, capacities and the presence of a cold storage facility for the existing packing houses in the region are listed in Table : 5.

More detailed information on the existing cold stores in Turkey and in the Region may be found in Annex : I.4.

TABLE : 5

EXISTING PACKING-HOUSES IN THE REGION

Location	Name	Variety	Capacity (m Ton/h)	Cold Store*	Remarks
		Packed		Warehouse	
Adana	Çukurova	Citrus	20	E	--
Adana	--	Citrus	10	NE	--
Hatay	Ernar	Citrus	20	NE	--
Hatay	Güneysu	Citrus	10	NE	Integrated to fruit juice
Hatay	Çelen	Citrus	10	NE	Closed
Hatay	Karalar	Citrus	11	NE	--
Mersin	Tüdaş	Citrus	20	E	Integrated to fruit juice
Mersin	Menas	Citrus	20	E	--
Mersin	Narko	Citrus	20	E	--
Mersin	M.Turan	Citrus+Apple	20	E	--
Mersin	İ.Öner	Citrus+Apples	20	E	--
Mersin	Uzel	Citrus	10	NE	--
Mersin	Polma	Citrus	10	NE	--
Mersin	İ.Yaşa	Citrus	10	NE	--
Mersin	Meyna	Citrus+Apples	10	NE	--

(\*) : E = Exists

NE = Non-existent

## 1.6. OTHER FACTORS FOR SELECTION

### 1.6.1. Production Advantages

Qukurova region is the largest citrus fruit growing area of Turkey.

The earliest table grapes are also produced in the region.

Yumurtalık, Ceyhan and Osmaniye are the counties where very early potatoes can be produced.

Province of Hatay is the earliest onion producing area of Turkey.

Excellent quality very late peaches and very good colored apples are grown in the Taurus Mountains.

Covered cropping can be a mean to produce very early and very late annual crops.

### 1.6.2. Integrated New Technology Transfer

A multipurpose packing house with integration of contract farm operation will bring in new technology to the region.

### 1.6.3. Availability of Experienced Transportation

The Middle-East and the Gulf Countries' markets are very close by. Many domestic and international transport companies have offices in Mersin and Iskenderun with large number of trucks in their fleets. The drivers have gained considerable experience in transit transportation to Iran, Iraq and the Gulf Countries. Most of them know their way around and are bilingual enough to carry on their task without any problems.

## 2.0-EXPORT MARKET SURVEYS

### 2.1. OVERALL POTENTIAL OF THE MARKET

Fresh fruit and vegetable trade holds the large portion of the world food trade volume. \$ 2,800 millions of citrus, \$ 1,500 millions of apples, \$ 767 millions of grapes, \$ 391 millions of peaches, \$ 309 millions of pears, \$ 1,121 millions of potatoes, \$ 530 millions of onions and \$ 1,111 million of tomatoes were imported in 1984 (FAO Trade Year Book, 1984). Total trade value of above mentioned fruits and vegetables was \$ 8,529 millions in 1984.

In 1984, eleven major importing Western European countries have imported 6,899,325 m. tons of the five fruit species and 5,009,211 m. tons of three vegetable species that were mentioned above. Nine Eastern Europe countries who are the major exporters have exported 1,999,120 m. tons of the same fruits and 435,490 m. tons of the same vegetables. Export volume of major exporting countries of Eastern Europe was 8,898,445 m. tons for fruits and 5,444,701 m. tons for vegetables.

Eight major importing countries of Middle-East and Gulf have imported 1,076,263 m. tons of five fruit species and 738,916 m. tons of three vegetable species in 1984.

Tables 6,7, 8 and 9 illustrate the fresh fruit and vegetables imports of above mentioned countries. Detailed information about major fresh

fruits and vegetables imports of Middle-East and Gulf countries, is given in Table:10. Table:11 illustrates the commodity based imports of the same countries; Turkey's exports of fresh fruit and vegetables to these countries is recorded in Table: 12.

TABLE : 6

## IMPORTS OF FRUITS INTO MAJOR EUROPEAN COUNTRIES (in Tons)

	1984					
	Oranges, Tanj. and Clementines	Lemons and Limes	Apples	Peaches	Pears	Grapes
<u>Western Europe</u>						
Belgium, Lux.	175,903	21,459	161,851	44,730	17,453	21,607
Denmark	40,915	6,666	53,435	7,763	8,115	8,594
Finland	75,212	3,599	47,545	3,693	10,103	11,476
France	912,938	119,939	106,505	32,886	59,373	104,072
F.R. Germany	803,014	118,555	708,994	293,601	125,490	249,953
Italy	631	--	50,697	949	31,159	4,324
Netherlands	392,293	24,098	213,670	26,471	31,880	47,140
Norway	55,687	2,033	39,944	2,973	11,655	15,914
Sweden	101,997	8,516	63,966	14,354	22,166	19,513
Switzerland	103,125	21,020	25,845	31,102	9,264	35,102
U.K.	451,294	49,483	400,967	82,399	65,995	86,217
TOTAL OF W. EUROPE	3,113,009	375,368	1,873,419	540,929	392,683	603,912
TOTAL IMPORTS OF FRUITS INTO WESTERN EUROPE : 6,899,325						
<u>Eastern Europe</u>						
Austria	101,515	27,679	125,537	19,044	12,045	35,644
Bulgaria	28,276	14,549	--	600	--	--
Czechoslovakia	72,000	56,945	67,268	5,000F	1,000F	40,000F
D.R. Germany	100,000F	40,000F	10,000F	5,000F	5,000F	20,000F
Hungary	40,368	19,914	--	--	--	27
Romania	30,000F	30,000F	--	--	--	--
Poland	19,109	8,178	--	2,000F	--	15,000F
Yugoslavia	50,000F	35,000F	--	--	--	--
USSR	346,546	129,944	467,282	2,558	--	16,092
TOTAL OF E. EUROPE	787,814	362,209	670,087	34,202	18,045	126,763
TOTAL IMPORTS OF FRUITS INTO EASTERN EUROPE : 1,999,120						
TOTAL OF EUROPE	3,900,823	737,577	2,543,506	575,131	410,733	730,675
TOTAL IMPORTS OF FRUITS INTO EUROPE : 8,898,445						

TABLE : 7

IMPORTS OF VEGETABLES INTO MAJOR EUROPEAN COUNTRIES (in Tons)

	1984		
	<u>Potatoes</u>	<u>Onions</u>	<u>Tomatoes</u>
<u>Western Europe</u>			
Belgium-Lux	273,831	59,523	9,581
Denmark	48,829	11,173	10,519
Finland	34	1,019	8,519
France	395,673	142,019	238,790
F.R.Germany	1,038,457	354,898	374,846
Italy	402,121	13,944	4,526
Netherlands	304,419	34,996	68,811
Norway	19,650	557	7,338
Portugal	107,064	5,731	--
Spain	61,000*	--	--
Sweden	55,588	19,824	35,205
Switzerland	27,985	3,996	34,586
U.K.	364,609	212,654	235,896
TOTAL OF W.EUROPE	<u>3,119,260</u>	<u>860,334</u>	<u>1,029,617</u>
TOTAL IMPORTS OF VEGETABLES INTO WESTERN EUROPE : 5,009,211			
<u>Eastern Europe</u>			
Austria	30,864	5,604	37,064
Bulgaria	64,351	34,306	--
Czechoslovakia	3,944	1,800F	30,000F
D.R. Germany	35,000F	2,000F	3,000F
Hungary	15,700	--	880
Poland	250	--	10,000F
Romania	20,000F	--	--
Yugoslavia	1,300*	--	--
USSR	10,000F	19,984	82,440
TOTAL OF E.EUROPE	<u>181,409</u>	<u>63,694</u>	<u>190,387</u>
TOTAL IMPORTS OF VEGETABLES INTO EASTERN EUROPE : 435,490			
TOTAL OF EUROPE	3,300,669	924,028	1,220,004
TOTAL IMPORTS OF VEGETABLES INTO EUROPE : 5,444,701			

TABLE : 8

## IMPORTS OF FRUITS INTO MIDDLE-EAST AND GULF COUNTRIES (in Tons)

	1984					
	Oranges Tangerines and Clementines	Lemons and Limes	Apples	Peaches	Pears	Grapes
Iraq	43,000F	--	90,000F	--	--	--
Jordan	134,400F	16,000F	29,731	--	1,000*	5,100F
Kuwait	42,000F	10,000F	23,000F	--	--	8,000F
Oman	20,663	154	9,267	--	--	3,918
Qatar	3,000F	--	1,500F	--	--	1,000F
S.Arabia	222,116	40,000F	124,720	23,820	11,101	37,235
Syria	42,540	15,908	1,890	--	--	--
U.A.Emirates	80,000F	3,000F	24,200	--	--	8,000F
TOTAL	587,719	85,062	304,308	23,820	12,101	63,253

TOTAL IMPORTS OF FRUITS INTO MIDDLE-EAST AND GULF COUNTRIES: 1,076,263

TABLE : 9

## IMPORTS OF VEGETABLES INTO MIDDLE-EAST AND GULF COUNTRIES (in Tons)

	1984		
	Potatoes	Onions	Pumpkins
Iraq	40,000F	20,000F	5,000F
Jordan	27,572	6,162	11,000F
Kuwait	30,000F	20,000F	40,100*
Oman	5,857	--	1,361
Qatar	7,807	3,458	230
S.Arabia	102,290	126,812	139,825
Syria	11,936	--	19,506
U.S.A.Emirates	30,000	70,000F	10,000F
TOTAL	255,462	256,432	227,022

TOTAL IMPORTS OF VEGETABLES INTO MIDDLE EAST AND GULF COUNTRIES: 738,916

F: FAO Estimate

\*: Unofficial Figure

Source: FAO Trade YearBook, 1981

TABLE : 10

TOTAL IMPORTS OF MAJOR FRESH FRUITS AND VEGETABLES OF SOME MIDDLE-EASTERN AND GULF COUNTRIES

Fruits and Vegetables	Quantity (m Ton)	1982			<u>IRAQ</u>			1984		
		Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m/Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	
ORANGES, TANG.,										
CLEMENTINES	38,000*	16,000*	421	43,000F	20,000F	465	43,000F	19,000F	442	
LEMONS and LIMES	1,300*	1,400F	1,076	100*	120F	1,200	--	--	--	
APPLES	90,000*	54,000F	600	94,000*	56,000F	596	90,000F	54,000F	600	
POTATOES	30,000*	8,200*	273	44,000*	11,000*	250	40,000F	11,000F	275	
ONIONS	23,000*	4,800*	209	26,000*	5,300*	204	20,000F	5,000F	250	
TOMATOES	4,400*	1,100F	250	5,000F	1,000F	200	5,000F	950F	190	
<u>OMAN</u>										
ORANGES, TANG.,										
CLEMENTINES	9,011	14,102	1,565	18,673	15,383	824	20,663	18,148	878	
LEMONS and LIMES	37	80	2,162	148	326	2,203	154	348	2,260	
APPLES	4,840	11,620	2,400	7,750	12,546	1,619	9,267	14,524	1,567	
GRAPES	3,323	6,088	1,832	3,329	6,100	1,832	3,918	7,023	1,793	
POTATOES	252	202	802	4,406	2,073	471	5,857	2,538	433	
TOMATOES	48	51	1,063	1,331	976	733	1,361	999	734	

Continued

TABLE : 10 Continued

<u>Fruits and</u> <u>Vegetables</u>	Quantity (m Ton)	1982			<u>JORDAN</u>			1984		
		Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	
ORANGES, TANG.,										
CLEMENTINES	146,894*	37,824*	258	110,280*	26,301*	239	134,400F	31,900F	237	
LEMONS and LIMES	12,189*	3,258*	267	16,100*	4,100*	255	16,000F	4,000F	250	
APPLES	40,440	19,562	484	45,921	23,294	506	29,731	13,760	463	
GRAPES	5,496*	2,750	500	5,027*	1,842*	366	5,100F	1,900F	373	
PEARS	2,627	1,527	581	2,951	1,731	587	1,000*	570F	570	
PEACHES	1,634	1,039	636	72	51	708	--	--	--	
POTATOES	43,178	12,392	287	26,463	5,568	210	27,572	7,020	255	
ONIONS	19,562	4,555	233	19,114	4,409	231	16,162	3,778	234	
TOMATOES	20,100*	5,086	253	10,700*	2,550*	238	11,000F	2,400F	218	
<u>QATAR</u>										
ORANGES, TANG.,										
CLEMENTINES	3,192	1,433	465	2,580	1,325	514	3,000F	1,600	533	
APPLES	1,124	964	858	2,010	1,407	700	1,500F	1,000F	667	
POTATOES	1,171	500	427	3,521	1,544	439	7,807	2,059	264	
ONIONS	6,000F	1,300F	217	2,553	716	280	3,458	618	179	
TOMATOES	284	158	556	643	265	412	230*	90F	391	

Continued





TABLE : 11

COMMODITY BASED TOTAL IMPORTS OF MAJOR FRESH FRUITS AND VEGETABLES OF SOME MIDDLE-EASTERN AND GULF COUNTRIES

ORANGES, TANGERINES AND CLEMENTINES

Countries	Quantity (m Ton)	1982		1983			1984		
		Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	38,000*	16,000*	421	43,000F	20,000F	465	42,000F	19,000F	442
JORDAN	146,894*	37,824*	258	110,280*	26,301*	239	134,400F	31,900F	237
KUWAIT	45,674	21,400	468	35,300*	15,800F	448	42,000F	19,000F	452
OMAN	9,011	14,102	1,565	18,673	15,383	824	20,663	18,148	878
QATAR	3,192	1,483	465	2,580	1,325	514	3,000F	1,600	533
S.ARABIA	234,916	93,378	398	251,930	103,463	411	222,116	76,547	345
SYRIA	60,329	16,887	280	50,974	13,898	273	42,540	13,503	317
U.A.EMIRATES	57,277	17,447	305	74,100*	27,200F	367	80,000F	30,500F	381

LEMONS AND LIMES

IRAQ	1,300*	1,400F	1,076	100*	120F	1,200	--	--	--
JORDAN	12,189*	3,258*	267	16,100*	4,100*	255	16,000F	4,000F	250
KUWAIT	11,000	7,292	663	10,800*	7,200F	666	10,000F	6,000	600
OMAN	37	80	2,162	148	326	2,203	154	348	2,260
S.ARABIA	38,075	14,070	370	44,137	16,332	370	40,000F	14,500F	363
SYRIA	13,470	4,040	297	16,776	4,768	284	15,908	5,350	336
U.A.EMIRATES	2,800*	1,200F	429	2,800*	1,300F	429	3,000F	1,300F	433

Continued

TABLE : 11 Continued

Countries	1982			<u>APPLES</u>			1984		
	Quantity (m Ton)	Value (1,000 \$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000 \$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000 \$)	Unit Price (\$/m Ton)
IPAQ	90,000*	54,000F	600	94,000*	56,000F	596	90,000	54,000F	600
JORDAN	40,440	19,562	484	45,991	23,294	506	29,731	13,760	463
KUWAIT	26,332	13,988	531	21,000*	11,600F	552	23,000F	13,000F	565
OMAN	4,840	11,620	2,400	7,750	12,546	1,619	9,257	14,524	1,567
QATAR	1,124	964	858	2,010	1,407	700	1,500F	1,000F	667
S.ARABIA	106,946	59,996	561	138,009	75,326	546	124,720	66,487	533
U.A.EMIRATES	13,042	7,715	592	37,400*	19,400*	519	24,200*	14,500F	599
				<u>PEACHES</u>					
JORDAN	1,634	1,039	636	72	51	708	—	—	—
S.ARABIA	23,952	9,095	380	29,158	12,084	414	23,820	11,275	475
SYRIA	682	354	519	23	12	500	—	—	—
				<u>PEARS</u>					
JORDAN	2,627	1,527	581	2,951	1,731	587	1,000*	570F	570
S.ARABIA	13,842	7,671	554	15,547	9,639	620	11,101	6,274	565
SYRIA	369	192	520	13	11	846	—	—	—

Continued

TABLE : 11 Continued

Countries	1982			<u>GRAPES</u>			1984		
	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
JORDAN	5,496*	2,750*	500	5,027*	1,842*	366	5,100F	1,900F	373
KUWAIT	8,702	5,282	607	7,500*	3,900*	520	8,000F	4,000F	500
OMAN	3,323	6,088	1,832	3,329	6,100	1,832	3,918	7,023	1,793
S.ARABIA	28,719	18,855	656	36,858	25,055	680	37,235	26,207	704
U.A.EMIRATES	5,694	3,273	575	6,300*	5,700*	905	8,000F	6,400F	800

POTATOES

IRAQ	30,000*	8,200*	273	44,000*	11,000*	250	40,000F	11,000F	275
JORDAN	43,178	12,392	287	26,463	5,568	210	27,572	7,020	255
KUWAIT	28,764	10,047	349	28,000F	9,200F	329	30,000F	10,500F	350
OMAN	252	202	802	4,406	2,073	471	5,857	2,538	433
QATAR	1,171	500	427	3,521	1,544	439	7,807	2,059	264
S.ARABIA	86,362	16,133	187	111,176	21,214	191	102,290	18,316	179
SYRIA	8,985	4,258	474	8,492	2,861	337	11,936	6,115	512
U.A.EMIRATES	31,821	8,806	277	28,000F	8,000F	286	30,000F	9,000F	300

Continued

TABLE : 11 Continued

Countries	1982			<u>ONIONS</u>			1984		
	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	23,000*	4,800*	209	26,000*	5,300*	204	20,000F	5,000F	250
JORDAN	19,562	4,555	233	19,114	4,409	231	16,162	3,778	234
KUWAIT	30,063	7,079	235	27,000F	5,700F	211	20,000F	4,800F	240
QATAR	6,000F	1,300F	217	2,553	716	280	3,458	618	179
S.ARABIA	108,703	20,979	193	117,853	19,386	165	126,812	20,623	163
SYRIA	290	60	207	14	3	214	--	--	--
U.A.EMIRATES	61,669	11,252	183	70,204	9,444	135	70,000F	12,600F	180

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Countries	1983			<u>TOMATOES</u>			1984		
	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	4,400*	1,100F	250	5,000F	1,000F	200	5,000F	950	190
JORDAN	20,100*	5,086*	253	10,700*	2,550*	238	11,000F	2,400F	218
KUWAIT	41,130	16,900	411	48,800*	21,000F	430	40,100*	16,500F	412
OMAN	48	51	1,063	1,331	976	733	1,361	999	734
QATAR	284	158	556	643	265	412	230*	90F	391
S.ARABIA	113,449	20,942	185	135,605	26,193	193	139,825	27,530	199
SYRIA	72,494	9,473	131	19,790	3,307	167	19,506	9,936	509
U.A.EMIRATES	16,963	5,870	346	13,000*	4,600F	354	10,000F	3,200F	320

Source : FAO Trade YearBook, 1984.

(F) : FAO estimate

(\*) : Unofficial figure

TABLE : 12

TURKEY'S EXPORTS OF MAJOR FRESH FRUITS AND VEGETABLES TO SOME MIDDLE-EASTERN AND GULF COUNTRIES

ORANGES, AND MANDARINS

Countries	Quantity (m Ton)	1983			1984			1985 (Jan-Sept)		
		Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	
IRAQ	567	211	372	251	104	414	215	110	512	
JORDAN	16,816	4,109	244	22,232	4,135	186	9,291	2,095	225	
KUWAIT	17,467	5,484	314	31,420	7,293	232	20,057	4,471	223	
QATAR	81	21	259	148	24	162	20	6	300	
S.ARABIA	5,446	1,399	257	6,177	1,248	202	3,246	902	278	
SYRIA	6,606	1,834	278	49	7	143	624	97	155	
U.A.EMIRATES	879	257	292	871	185	212	194	44	227	

LEMONS

IRAQ	59	26	441	55	24	436	36	18	500
JORDAN	8,175	2,821	345	5,818	1,690	291	1,235	472	382
KUWAIT	6,560	2,273	346	11,988	2,973	248	3,729	1,112	298
QATAR	10	2	200	127	23	181	2	0.7	350
S.ARABIA	1,526	407	267	4,447	1,181	266	400	199	498
SYRIA	44	7	159	5,891	2,055	351	3,598	2,258	628
U.A.EMIRATES	4	2	500	2	0.8	400	1	0.3	300

Continued

TABLE : 12 Continued

Countries	1983			1984			1985 (Jan.-Sept.)		
	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	3,687	1,254	340	357	166	465	307	151	492
JORDAN	38,309	8,402	219	31,012	6,397	206	12,671	3,071	242
KUWAIT	13,314	4,864	365	19,528	5,888	302	12,198	3,085	253
QATAR	23	4	174	78	12	154	34	13	382
S.ARABIA	2,407	692	287	5,488	1,424	260	3,268	686	210
SYRIA	10,050	2,538	252	12	2	167	—	—	—
U.A.EMIRATES	612	219	358	738	192	260	136	36	265
<u>PEACHES</u>									
IRAQ	40	19	475	47	29	617	37	19	514
JORDAN	4,154	1,527	368	2,444	1,048	429	2,089	1,000	479
KUWAIT	2,087	934	448	2,793	1,106	396	2,623	845	322
S.ARABIA	479	171	357	285	151	530	417	124	297
SYRIA	12	6	500	—	—	—	—	—	—
U.A.EMIRATES	11	6	545	35	12	343	6	1	167

Continued

TABLE : 12 Continued

Countries	<u>PEARS</u>								
	Quantity (m Ton)	1983 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1984 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1985 (Jan.-Sept) Value (1,000\$)      Unit Price (\$/m Ton)	
IRAQ	56	28	500	41	38	927	20	14	700
JORDAN	1,096	315	287	85	35	412	927	293	316
KUWAIT	992	495	499	2,693	1,406	522	800	269	336
S.ARABIA	269	197	732	155	79	510	322	141	438
U.A.EMIRATES	29	15	517	2	1	500	8	2	250

Countries	<u>GRAPES</u>								
	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	46	22	478	54	30	556	17	8	471
JORDAN	6,558	1,664	254	3,827	1,205	315	3,051	935	306
KUWAIT	4,252	1,522	358	6,906	2,345	340	4,586	1,530	334
QATAR	3	0.8	267	--	--	--	--	--	--
S.ARABIA	1,062	365	344	877	277	316	821	304	370
U.A.EMIRATES	90	30	333	95	35	368	40	12	300

Continued

TABLE : 12 Continued

Countries	<u>POTATOES</u>								
	Quantity (m Ton)	1983 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1984 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1985 (Jan.-Sept.) Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	10,769	1,016	94	6,803	930	137	712	266	374
JORDAN	12,577	1,504	120	4,092	1,005	246	1,155	181	157
KUWAIT	3,680	496	135	3,365	524	156	724	100	138
QATAR	26	3	115	40	6	150	4	0.5	125
S.ARABIA	3,269	415	127	7,119	878	123	2,099	304	145
SYRIA	—	—	—	5	0.3	60	—	—	—
U.A.EMIRATES	18	3	167	—	—	—	—	—	—
<u>ONIONS</u>									
IRAQ	5,923	1,006	170	3,939	754	191	353	116	329
JORDAN	44,802	5,532	123	22,164	4,540	205	11,631	1,396	120
KUWAIT	19,655	2,471	126	14,799	1,984	134	11,142	1,274	114
QATAR	835	97	116	361	48	133	26	2	77
S.ARABIA	56,329	6,196	110	64,716	7,715	119	43,176	5,505	128
SYRIA	333	54	162	180	21	117	68	9	132
U.A.EMIRATES	3,398	454	134	454	50	110	—	—	—

Continued

TABLE : 12 Continued

Countries	<u>TOMATOES</u>								
	Quantity (m Ton)	1983 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1984 Value (1,000\$)	Unit Price (\$/m Ton)	Quantity (m Ton)	1985 (Jan.-Sept.) Value (1,000\$)	Unit Price (\$/m Ton)
IRAQ	331	139	420	264	129	489	263	112	426
JORDAN	89,029	15,793	177	85,487	15,722	184	46,590	5,115	110
KUWAIT	28,398	7,386	260	39,985	10,276	257	35,958	5,964	166
QATAR	11	2	182	37	5	135	--	--	--
S.ARABIA	1,549	326	210	3,981	894	225	4,757	793	167
U.A.EMIRATES	420	111	264	1,445	229	158	117	14	120

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Source : Undersecretariate of Treasury and Foreign Trade, 1985.

## 2.2. SELECTION OF TARGET MARKETS

It is assumed that 80 % of planned production of the project will be exported to Middle-East and Gulf countries and 20 % will be exported to West European Countries. Lemons, grapefruits , early grapes and some selected early vegetables will be exported to West European Countries and the remaining fruits and vegetables will be aimed at first to the Middle-East and then to the Gulf countries.

Adana-Incirlik Air-Base and the U.S. 6th Fleet can also be the potential target markets of the project.

Major target countries for lemons, grapefruits, early grapes and some of the early vegetables are; northern European countries such as Finland, Sweden and Norway due to high import prices and W. Germany, U.Kingdom and Netherlands for their large volume of imports . For the other commodities, target countries will be Iraq, S. Arabia and Kuwait.

## 2.3. TRADE BEHAVIORS OF IMPORTERS

The expectations of fresh fruit and vegetable importers from another trading party are:

- Same trade mark for the delivered goods each time the delivery is made,
- Standardized and constant quality of the produce,
- High quality produce,

- Preferably, products packaged in good quality corrugated boxes,
- Proper application of washing-cleaning, waxing, grading and packing operations,
- Planned and scheduled delivery of the products,
- Stable and regular supply capacity each year,
- Long-term contract and cooperation instead of seasonal independent short-term contracts and/or spot sales,
- Flexibility to supply varieties and species of fresh fruits and vegetables in accordance with the demand of the market.

#### 2.4. COMMODITY BASED IMPORT QUALITIES, QUANTITIES AND PRICES IN THE TARGET MARKETS

Target market countries of the project are importing a variety of fresh fruits and vegetables varying in quantity, quality and price from various sources. Equilibrium price of a product in the market depends primarily on its quality and packaging system.

For example, S.Arabia and Kuwait are importing double-red Starking apples from Washington State (U.S.) for 900 \$/m. ton (CIF).

These products are well processed and packed in packing-houses. If the same quality products are not processed properly and only manually packed the price is only 400-500 \$/m ton. At the same market, price of washed-cleaned, graded and properly bagged potatoes is 400-500 \$/m ton, while it is only 200 \$/m ton for field bagged potatoes.

In summary; in every target market (Gulf, Middle-East or Western Europe) high quality commodity can easily be marketed for a higher price if it is processed properly and packed in good quality and attractive packages.

Table : 13 illustrates the minimum and maximum fresh fruit and vegetable import prices for some Gulf, Middle-East and Western European countries.

TABLE : 13

MINIMUM AND MAXIMUM IMPORT PRICES OF SOME MAJOR FRESH FRUIT AND VEGETABLES

A) In Some Gulf and Middle-East Countries\* (1981-1984)

<u>Fruits and Vegetables</u>	<u>Min.Price(\$/m Ton)</u>	<u>Max.Price(\$/m Ton)</u>
Oranges and Mandarins	237	1,565
Lemons and Limes	250	2,260
Apples	463	1,567
Peaches	417	708
Pears	520	609
Grapes	373	1,832
Potatoes	179	1,131
Onions	163	296
Tomatoes	190	1,160

(\*) : Iraq, Jordan, Kuwait, Oman, Qatar, S. Arabia, Syria, U.A. Emirates.

B) In Some Western European Countries\* (1981-1984)

<u>Fruits and Vegetables</u>	<u>Min.Price(\$/m Ton)</u>	<u>Max.Price(\$/m Ton)</u>
Oranges and Mandarins	307	605
Lemons and Limes	271	718
Apples	129	813
Peaches	547	1,822
Pears	376	748
Grapes	519	1,096
Potatoes	101	559
Onions	162	762
Tomatoes	483	1,369

(\*) : Belgium-Lux., Denmark, Finland, France, F.R. Germany, Italy, Netherlands, Norway, Sweden, Switzerland, U.K.

Source:FAO Trade YearBook,1984.

## 2.5. MAJOR COMPETING COUNTRIES

Major competing countries based on produce are listed below ;

Oranges	: Spain, Morocco, Israel, Egypt
Mandarins	: Spain
Lemons	: Italy, Spain
Apples	: France, Italy, Hungary
Peaches	: Italy, Greece
Pears	: Italy, France
Grapes	: Italy, Greece, Spain, Bulgaria
Potatoes	: Netherlands, France, Egypt
Onions	: Netherlands, Spain
Tomatoes	: Netherlands, Spain, Bulgaria

Israel can not be a competing country in the Middle-East and the Gulf market because of its political interrelations with those countries. In addition to the above mentioned countries, U.S.A. for oranges and apples, and Chile and Argentina for apples are the major competing overseas countries. Major competing countries and their exports in 1984 are illustrated in Tables 14 and 15.

TABLE : 14

## EXPORTS OF FRUITS FROM MAJOR COMPETING COUNTRIES 1984

	Oranges, Tangerines and Clementines		Lemons and Lime		Apples		Peaches		Pears		Grapes	
	(m Ton)	(\$/m Ton)	(m Ton)	(\$/m Ton)	(m Ton)	(\$/m Ton)	(m Ton)	(\$/m Ton)	(m Ton)	(\$/m Ton)	(m Ton)	(\$/m Ton)
<u>Western Europe</u>												
Italy	144,303	250	99,092	239	390,573	339	391,761	536	116,912	394	365,615	463
Greece	101,507	216	53,146	272	15,900	304	68,434	487	2,708	502	108,401	536
Spain	2,011,926	310	361,594	282	41,000 <sup>M</sup>	320	16,742	670	24,100 <sup>M</sup>	349	94,552	430
France	28,026	432	1,527	417	615,660	337	30,062	565	85,094	320	23,107	576
Netherlands	64,518	504	8,766	449	153,225	477	1,353	842	54,830	523	9,925	1,029
Belgium-Lux.	18,988	379	848	479	93,945	542	726	753	34,018	489	1,638	1,353
Total of W.Europe	2,369,268		524,973		1,310,353		509,078		317,662		603,238	
<u>Eastern Europe</u>												
Hungary	--	--	--	--	339,509	174	3,451	281	4,435	222	1,480	223
Poland	--	--	--	--	160,000 <sup>M</sup>	200	--	--	--	--	--	--
Yugoslavia	180	444	--	--	72,000 <sup>M</sup>	106	6,000 <sup>F</sup>	500	1,400 <sup>M</sup>	300	10,000 <sup>F</sup>	400
Bulgaria	--	--	--	--	93,762	320	8,114	397	1,279	516	42,388	349
Romania	--	--	--	--	19,200 <sup>X</sup>	375	5,000 <sup>F</sup>	500	--	--	40,000 <sup>F</sup>	330
Total of E.Europe	180		--		684,471		23,265		7,114		93,868	
<b>TOTAL OF EUROPE</b>	<b>2,369,448</b>		<b>524,973</b>		<b>1,994,824</b>		<b>532,343</b>		<b>324,776</b>		<b>697,106</b>	
<u>Other Countries</u>												
Israel	393,412	201	22,839	283	--	--	323	542	--	--	3,059	1,340
Morocco	536,000 <sup>M</sup>	245	1,360	213	--	--	200 <sup>M</sup>	800	--	--	60 <sup>F</sup>	666
Egypt	183,00 <sup>M</sup>	519	1,000 <sup>F</sup>	600	--	--	--	--	--	--	300 <sup>F</sup>	666
U.S.A.	374,058	575	147,912	639	214,957	557	23,931	629	31,697	509	115,019	810
Chile	--	--	1,111	360	208,370	358	23,322	810	27,947	408	178,419	923
Argentina	35,705	248	16,727	232	194,000 <sup>M</sup>	309	400 <sup>M</sup>	750	62,000 <sup>M</sup>	355	1,800 <sup>M</sup>	611
<b>TOTAL OF OTHER COUNTRIES</b>	<b>1,522,175</b>		<b>190,949</b>		<b>617,337</b>		<b>48,176</b>		<b>121,644</b>		<b>298,657</b>	

(F): FAO Estimate. (M): Unofficial Figure.

TABLE : 15

EXPORTS OF VEGETABLES FROM MAJOR COMPETING COUNTRIES (1984)

<u>Western Europe</u>	<u>Potatoes</u>		<u>Onions</u>		<u>Tomatoes</u>	
	<u>(mTon)</u>	<u>(\$/mTon)</u>	<u>(mTon)</u>	<u>(\$/mTon)</u>	<u>(mTon)</u>	<u>(\$/mTon)</u>
Belgium-Lux.	311,819	1.5	9,097	338	64,812	776
France	404,054	181	36,911	364	10,489	614
F.R.Germany	236,633	104	5,515	313	2,329	561
Italy	329,849	334	54,812	330	14,793	493
Netherlands	1,663,215	206	447,119	224	461,083	736
Spain	128,888	255	272,606	193	365,449	416
U.K.	177,989	219	15,580	294	6,833	856
Greece	102,348	230	771	161	532	414
<b>TOTAL OF W. EUROPE</b>	<b>3,354,795</b>		<b>842,411</b>		<b>926,320</b>	
<u>Eastern Europe</u>						
Hungary	18,987	71	27,775	138	3,076	194
Poland	72,316	83	57,100 <sup>x</sup>	158	1,200 <sup>x</sup>	292
Bulgaria	9,094	165	--	--	98,375	254
Romania	50,000 <sup>F</sup>	130	10,000 <sup>x</sup>	280	80,000 <sup>F</sup>	400
USSR	20,069	149	--	--	--	--
<b>TOTAL OF E. EUROPE</b>	<b>170,466</b>		<b>94,825</b>		<b>182,651</b>	
<b>TOTAL OF EUROPE</b>	<b>3,525,261</b>		<b>937,286</b>		<b>1,108,971</b>	
<u>Other Countries</u>						
Israel	43,309	271	16,004	354	4,121	434
Morocco	53,000 <sup>x</sup>	275	7,200 <sup>x</sup>	278	85,000 <sup>x</sup>	353
Egypt	136,115	287	15,000 <sup>x</sup>	420	10,000 <sup>x</sup>	400
U.S.A.	67,586	291	125,718	318	72,816	590
Argentina	1,000 <sup>F</sup>	430	1,500 <sup>F</sup>	193	--	--
Chile	--	--	25,264	261	--	--
<b>TOTAL OF OTHER COUNTRIES</b>	<b>301,010</b>		<b>190,686</b>		<b>171,937</b>	
<b>GRAND TOTAL</b>	<b>3,826,271</b>		<b>1,127,972</b>		<b>1,280,092</b>	

(F) : FAO Estimate

(x) : Unofficial Figure

Source : FAO Trade YearBook, 1984.

## 2.6. EXPORT POTENTIAL OF THE COMPANY TO THE TARGET MARKETS

As mentioned previously, total import potential of the Western European market is 8.9 million m. tons for fresh fruits and 5.5 million m. tons for fresh vegetables while the Middle-East and the Gulf countries are importing 1 million m. tons of fresh fruits and 0.7 million m. tons of fresh vegetables.

Turkey is one of the major exporting countries into these target markets. Turkey has been exporting 352,026 m. tons of fruits and 346,004 m. tons of vegetables in 1982, 400,675 m. tons of fruits and 290,592 m. tons of vegetables in 1983, and 323,505 m. tons of fruits and 314,604 m. tons of vegetables in 1984.

It will be possible to export more than the targeted quantity of 30,000 m. tons of fresh fruits and vegetables annually, if the export oriented company to be established, successfully produces high quality products and properly processes and packs the commodities.

As can be seen in the capacity selection section, (section 6) packing lines have to operate only one shift (10 hrs) a day in order to produce 30,000 m. tons of finished product annually. After penetrating into the market by establishing a reputable brand name and if the demand for this company's products increases, the company will be able to produce an annual volume of 60,000 m. tons of fresh fruits and vegetables by operating the packing lines two shifts /day.

## 2.7. STRATEGIES AND RECOMMENDATIONS

High quality fresh fruits and vegetables, if properly processed and packed, can always be marketed with higher prices to the target markets of the project. In general, Turkey produces high quality and tasty fruits and vegetables because of its good ecological conditions.

The initial marketing strategy of the company must be to market extra high quality products that are well processed and packed in lesser quantities, instead of large quantities of average quality products, hence, maximizing the profit margin on sales.

After the company's brand name gets well established in the target market and the extension team gains more experience in contracting orchards, whose owners are living in other areas, in larger acreages, high quality produce can be secured in larger quantities and thus, volume of exports can be increased without any deterioration to the brand name.

Early and/or late harvesting of fruits and vegetables in the Çukurova region provides a competitive advantage for the company in the market. The company must aim to produce and export its early/late fruit and vegetable varieties in off-seasons of the competing countries in order to have higher returns.

### 3.0-ASSESSMENT OF DELIVERED PRICES AND PROFIT MARGINS

According to the results of the market survey maximum and minimum import prices of fresh fruits and vegetables into some Gulf and Middle-East countries, differ largely due to quality of the products and the level of processing and packaging. Major fresh fruit and vegetable import prices (CIF) into some Gulf and Middle-East countries (Iraq, Jordan, Kuwait, Oman, Qatar, S.Arabia, Syria, U.A.Emirates) are :

	<u>Min. Price</u>	<u>Max. Price</u>
	<u>\$/m. ton</u>	<u>\$/m. ton</u>
Oranges and Mandarins	237	1,565
Lemons and Limes	250	2,260
Apples	463	1,567
Peaches	417	708
Pears	520	609
Grapes	373	1,832
Tomatoes	190	1,160
Onions	163	296
Potatoes	179	1,131

Source : FAO, Trade Year Book, 1984

Taking the above prices into consideration, the delivered fresh fruit and vegetable export (CIF) prices assumed for the project were calculated. In order to quantify the project in a more realistic way, expected

export prices have been held lower than the average market prices. This will increase the competitive strength of the products of the project. Actual export prices of the company's high quality products, will probably be higher than the assumed prices. Expected CIF export prices of the project are calculated based on Table: 13 and Table : 17 to be as indicated in Table : 16.

TABLE : 16

EXPECTED COMMODITY EXPORT PRICES (CIF \$/m Ton)

<u>COMMODITY</u>	<u>VALUE</u>
Oranges	450
Grapefruits	400
Lemons	500
Mandarins	550
Apples	500
Peaches	600
Pears	600
Grapes	500
Potatoes	350
Onions	225
Tomatoes	500
Other Vegetables	500

The project's average profit margin, based on these export prices, was calculated to be 13.82 % for the credit amortization period and 19.71 % for the period after that (see Financial Analyses; Section 10.0)

#### 4.0-CONTRACT FARMING

##### 4.1. CONTRACT FARMING OPERATION

Vegetables and annual crops will be produced through the implementation of contract-farm operations. Citrus and other fruit production will be contracted for at least one crop year and cultivation, irrigation, fertilization, pest and disease control and harvesting will be practiced under the control and technology transfer of the company's farm management team, preferably to farmers who would like to contract their orchards for longer years. The company will also lease land where it will directly produce especially new and high priced crops necessary for its operations. The production technology and programmes will be set up by the company and transferred to the contract farmers through the horticultural experts (extension team) of the company. Farmer training and control of orchards and fields will be the main responsibility of the company's extension team. Vegetable seeds and reproduction material suited to the export market demands, will either be imported or domestically obtained by the company and distributed to contract farmers. Fertilizers, pest and disease control chemical compounds will be similarly obtained and/or partially financed by the company. The company will also establish a farm machinery pool suited for large field operations of vegetable and fruit production. The machinery and equipment will be operated by the company on a lease basis to the contract farmers.

The contract with the farmers will include a minimum base price guarantee and will further give incentives and premiums to those farmers who are successful in yield and in quality production. The contract farmers may also be given an extra bonus as a premium in addition to the guaranteed base price if the company may realize a very successful export programme with large profit margins.

There are many orchard owners who reside in large cities such as Istanbul, Ankara and Izmir who can not take care of their plantations themselves, but hire a manager on a monthly pay or on a percent of income from the sale of the crop. It will be possible to include many of these orchards into the contract farming system. Hence, management of these orchards will be implemented by the company and 10-15 % of gross income will be deducted from the payments to the orchards owners as management fee. This type of leasing will improve yields and quality of crops considerably, since high technology will be implemented.

#### 4.2. SIZE AND CAPACITY

Project is planned to export 30,000 m. tons of fresh fruits and vegetables annually. In order for this product to be at demanded quality standards, contract farmers and the company should produce 36,320 m. tons of fresh fruits and vegetables. 15,830 m. tons of this produce will be vegetables and the remaining 20,490 m. tons will be fruits.

There will be 180 to 200 contracted farmers. Each contract farmer should on the average, be able to produce 200 m. tons of produce, but this

quantity depends on the variety of the product to be planted. Each potential contract farm can produce 400 or 500 m. tons of potatoes or onions, however just 40 or 50 m. tons of early vegetables.

#### 4.3. SYSTEM

##### 4.3.1. Incentives

In addition to the base payment, a promotion premium will be paid to the contract farmers who are well adapting to contract farming system, properly applying the technology transferred and producing high quality products which will increase the export volume and sales price, committing to the contract terms, working in cooperation with the company's extension team and being a good example to other contract farmers.

\$ 294,136 premium for contract farms is recommended in the annual operating costs for the export capacity of 30,000 m tons of the product. (See ANNEX III, Table :1)

##### 4.3.2. Supports

Supports to the contract-farmers will consist of:

###### 4.3.2.1. Procurement of Seeds and Plantlets:

In order to produce high yields and specific varieties demanded by the export markets, high quality seeds and/or plantlets non-existent in Turkey, will be imported and distributed to contract farms on credit. Cost of seeds and plantlets will be deducted from the payments to the contract farmers for their produce.

#### 4.3.2.2. Procurement of Fertilizers and Plant Protection Chemicals:

Special fertilizers, such as liquid fertilizer, and plant protection chemicals non-existent in Turkey will be imported and distributed to contract farms on credit. Cost of fertilizers and chemicals will be deducted from the sale price of delivered produce.

#### 4.3.2.3. Procurement of Special Agricultural Farm Equipment:

Special seeding, planting, spraying, hewing, and harvesting machinery and equipment will be procured in order to maximize the quantity and quality of the crops obtained from the unit area, to maximize the cultivated lands and to minimize the harvesting and transportation (from farm to the plant) losses. These machineries will either be imported or be ordered from domestic manufacturers by the company. Machineries will be leased to the contract farmers who are not able to purchase them and rent will be deducted from the payments to the contract farmers.

In order to finance the supports explained in sections 4.3.2.1. and 4.3.2.2., \$ 188,500 is reserved from the annual operating costs as a cost of finance (section 10.2.3.).

\$ 150,000 expenditure is allocated for the procurement of special agricultural farm equipment within the total investment costs. (section 9).

#### 4.3.3. Extension (Technology Transfer):

Production of high-quality crops, maximization of yield, introduction and adaptation of new varieties are the objectives of the extension work. Technology transfer will include soil tillage for the preparation of the seed-bed, seeding-planting, hewing, spraying, irrigation and harvesting techniques.

The field team of the company headed by a field manager, consisting of five field specialists and ten field technicians and six farm machinery mechanics will implement the technology. For the operations of the field team, ten 4-Wheel Drive vehicles will be purchased and this item is included in the investment budget (section 9). Annual personnel costs to provide this extension service, will be \$ 107,782 (section 10).

#### 4.3.4. Model Contract:

In general, the following articles will be included in the contract.

##### 4.3.4.1. Undertakings of the Company

- a- Company will guarantee to purchase all the crops produced from the contracted area.
- b- Declaring that crops will be purchased at a guaranteed price announced before seeding.
- c- Contract farmers producing high quality crops (identified by the company) will be paid an additional premium or a bonus.

- d- Technology related to production will be transferred.
- e- Special seeds will be distributed to the farmers and cost of seeds will be deducted from the payments to the farmers.
- f- Special fertilizers and spraying chemicals will be distributed to the farmers and cost of fertilizers and chemicals will be deducted from the payments to the farmers.
- g- Special agricultural farm equipment not available on the market will be leased to the farmers and rent will be deducted from the payments to the farmers.

#### 4.3.4.2. Undertakings of the Farmer:

- a- All the crops cultivated on the contracted area will be guaranteed to be delivered and sold to the company.
- b- No claims will be made, above the announced price at the time of delivery to the company. The purchasing price may be higher than the guaranteed price.
- c- Technology transferred by the company's extension team will be practiced to full extent.
- d- Costs of seeds, fertilizers and chemicals supplied by the company will be paid when the crops are sold to the company.
- e- Rent of leased equipment will be paid to the company when the crops are sold.

## 5.0-TRANSPORT AND STORAGE FACILITIES

### 5.1. TRANSPORTATION

In Turkey, there exists a considerable number of trucks and trailers both refrigerated and normal. Many countries have international transportation passing through Turkey, because of the country's geographical position between Middle-East, Asia and Europe. These trucks and/or trailers are also available for hiring when they are returning back to their countries. Thus, no investment is necessary for establishing a transport fleet for the company.

Some technical information about transport vehicles are as follows:

Number of Axles: Vehicles generally have 5 axles, but some have 4 axles according to the type of vehicle.

Maximum Transporting Capacity: 22 Tons.

Maximum Speed: 120 km.s/hr.

Weight (unloaded): 16 Tons.

Net volume: differs between 55-66 m<sup>3</sup> according to the thickness of isolation matter.

Cooling systems: Mainly Thermoking coolers are used. Minimum cooling temperature is -29°C

### 5.2. COST OF TRANSPORTATION

Generally, fresh fruits and vegetables are transported in trailers up to an amount of 22 tons and the transporting companies quote prices per truck bases, independent of quantity. Hence, it does not differ whether the truck is full or not, charging constant prices between 0-22 tons.

Prices from Çukurova region to West European and Gulf countries are illustrated in Table: 17 (December, 1985 prices).

TABLE : 17

TRUCK RENTAL PRICES FROM THE ÇUKUROVA REGION TO SOME  
WEST EUROPEAN AND MIDDLE-EASTERN COUNTRIES

<u>Countries</u>	<u>Standard(\$/truck-trailer)</u>	<u>Refrigerated(\$/truck-trailer)</u>
Kuwait	1,500	2,400
Iraq	900	1,400
Iran	1,000	1,400
S.Arabia	1,900	2,900
U.A.Emirates	2,700	4,000
Qatar	2,400	3,500
France	1,050	1,800
W.Germany	1,000	1,600
England	1,600	2,200
Holland	1,200	1,700

These prices obviously do change according to the supply and demand and also if the trailers are available at the locations where loading will take place by chance, prices then fall about \$ 200-300 below the above mentioned rates.

Prices also depend on the quantity and the continuity of the job, target country conditions, etc. and can differ within a range of \$ 100-400.

Additionally, trucks and trailers belonging to Kuwait, Bulgaria and some other countries can transport quite cheaper than the Turkish companies, if they are turning back unloaded to their countries through Turkey.

Considering these facts an average of \$ 1,500/truck-trailer, has been considered as the cost of transportation of the fresh fruits and vegetables exported by the company in this project.

Turkish transporting companies are not easily willing to transport to some countries which are listed below:

Syria has high transit costs and penalties. Besides, the trucks can enter only in groups of fifty, sometimes causing 2-3 days of delay for the formation of a 50 truck convoy.

For Jordan, because of the above-mentioned problems in Syria, trucks and trailers prefer to go through the Iraq route, causing additional costs due to longer distance and transit cost from Iraq (about 500 \$/truck)

In Denmark, foreign truck-trailers can not enter into the country, but the load is transferred to Danish truck-trailers at the border, which is a discouraging factor for transporters as well.

### 5.3. STORAGE COST

The Meat and Fish Corporation (E.B.K), which is a State Economic Enterprise, charges 25 \$/T for storing fresh fruits and vegetables for a month in 1985.

However, the price charged by E.B.K. is lower than the private sector. The storage price of the private sector is more than two fold of the price of E.B.K.

In spite of the high price of private sector, customers prefer them due to the bureaucracy applied by the public sector, mainly based on the difficulties when removing the produce from storage.

#### 5.4. EXISTING STORAGE FACILITIES

In Turkey, the total capacity of cold stores having capacities of more than 100 tons is 686,504 tons and the total number is 653. In addition to the existing cold stores there are also 39 cold stores with a total of 53,410 ton capacity which are under construction and 54 cold stores with 33,618 tons capacity which are closed. For more detailed information see Annex I.4.

The distribution of cold stores with respect to their legal structure are summarized in Table :18.

TABLE : 18

#### DISTRIBUTION OF COLD STORES BASED ON LEGAL STRUCTURE

	TURKEY				REGION			
	No.	%	Cap. (m Ton)	%	No.	%	Cap. (m Ton)	%
Municipalities	223	33.9	101,494	14.8	9	18.4	3,190	3.9
The Meat and Fish Corp. (EBK)	39	5.9	31,895	4.6	3	6.1	3,750	4.5
The Turkish Milk Ind. Corp. (SEK)	36	5.5	11,200	1.6	1	2.0	640	0.6
Other Public Enterprises	18	2.7	20,245	3.0	1	2.0	200	0.2
Cooperatives	41	6.2	63,270	9.6	3	6.1	8,500	10.3
The Private Sector	301	45.8	458,400	66.8	32	65.4	66,170	80.3
TOTAL	658	100.0	686,504	100.0	49	100.0	82,450	100.0

Source : Fruit and Vegetable Master Plan, SPO, 1985

## 6.0- CAPACITY SELECTION

### 6.1. EXPORT PLANNING

The availability of raw material and realized exports over the years from this region are no constraints for the realization of an integrated and properly organized exports of 30,000m tons of fresh fruits and vegetables. The objective in selecting a volume of 30,000 m tons is to supply sufficient quantities throughout the year to the various countries in the Gulf area, which imports over 1.8 million tons of fruit and vegetables, so that the new brand name introduced, will be presented to the customers continuously, as a supplier of high qualities commodities. Furthermore, efficient use of selected processing lines with optimum capacities and with a maximum utilization for some commodities and for some of the lines, yield a volume of exportable 30,000 m tons of fruit and vegetables.

Export of 30,000 m tons of fresh fruits and vegetables is projected and this projected volume will be realized in the third year of operation. The reasons of this transition stage are the adaptation and training need of the personnel and the period necessary to accomplish maximum efficiency in the contract farming system and to penetrate into the market with a new brand name. Project will operate with 50 % capacity for the first year and with 75 % capacity for the second year of operation. Export plan for fruits and vegetables varieties is illustrated in Table : 19.

TABLE : 19

EXPORT PLAN UNTIL FULL CAPACITY IS REACHED(m Tons/Year)

<u>COMMODITIES</u>	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>
Oranges	1,500	2,250	3,000
Lemons	500	750	1,000
Grapefruit	1,500	2,250	3,000
Mandarins	500	750	1,000
Apples	3,000	4,500	6,000
Pears	250	375	500
Peaches	750	1,125	1,500
Grapes	500	750	1,000
Tomatoes	1,000	1,500	2,000
Potatoes	2,500	3,750	5,000
Onions	1,500	2,250	3,000
Others*	<u>1,500</u>	<u>2,250</u>	<u>3,000</u>
TOTAL	15,000	22,500	30,000

(\*) : Cherries,apricots,figs,carrots,red radish,cauliflower,  
squash,eggplant,etc.

It is expected that 80 % of the products will be exported to the Middle-East and Gulf countries and 20 % will be exported to the West European countries. Early or late maturing varieties of lemons, mandarins,grapefruits,potatoes and other vegetables will primarily be exported to Western Europe.

Table 20 illustrates the projected annual export schedule. Some of the citrus fruits and apples,grapes,potatoes and onions will be exported immediately after the harvest and the remaining portion will be kept in cold store until the market prices increase up to the desired level.

TABLE : 20

EXPORT SCHEDULE

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Oranges	X X	X X	X X	X								X X
Lemons	X X	X X	X	X	X	X	X	X	X	X	X X	X X
Grapefruits	X X	X X	X X	X							X	X X
Mandarins	X X	X	X								X X	X X
Apples	X	X	X	X				X X	X X	X X	X X	X
Pears								X X	X X	X X	X X	
Peaches						X X	X X	X X	X X			
Grapes	X	X	X			X X	X X	X X	X X	X	X	X
Tomatoes	X	X	X	X	X	X X	X X	X X	X X	X	X	X
Potatoes	X	X	X		X	X X	X X	X X	X X	X X	X X	X
Onions	X	X	X		X	X X	X X	X X	X X	X X	X X	X
Others						X	X X	X X	X X	X		

X = 15 Days

## 6.2. PRODUCTION PLANNING

36,320 m tons of fresh fruits and vegetables should be produced by contract farms in order to obtain 30,000 m tons of packaged produce. Projected production volumes of fresh fruits and vegetables for the first three years of operation is illustrated in Table : 21. The project will be able to handle different species other than those listed below, in order to meet the changes in demand of the target market.

Detailed information about production inputs are given in section 7.3. Harvesting schedule for the produce is illustrated in Table : 22.

TABLE : 21

### PROJECTED PRODUCTION OF FRUITS AND VEGETABLES

Commodities	Production ( m Ton/Year )		
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Oranges	1,875	2,813	3,750
Grapefruits	1,665	2,498	3,330
Lemons	625	938	1,250
Mandarins	625	938	1,250
Apples	3,750	5,625	7,500
Peaches	835	1,253	1,670
Pears	280	420	560
Grapes	590	885	1,180
Potatoes	2,945	4,418	5,890
Onions	1,665	2,498	3,330
Tomatoes	1,430	2,145	2,860
Others	1,875	2,813	3,750
TOTAL	18,160	27,244	36,320

TABLE : 22

HARVESTING SCHEDULE

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Oranges	X X	X X										X X
Lemons	X X	X X								X X	X X	X X
Grapefruits	X X									X	X X	X X
Mandarins	X X										X X	X X
Apples								X X	X X	X X	X X	
Pears							X X	X X	X X	X X		
Peaches						X X	X X	X X	X X			
Grapes						X X	X X	X X	X X			
Tomatoes					X	X X	X X	X X	X X			
Potatoes					X	X X	X		X X	X X		
Onions					X	X X	X X	X X	X X	X X	X	
Others						X	X X	X X	X X	X		

X = 15 Days

Note : The periods can extend considerably by introduction of new early and late maturing varieties and if production is realized under cover.

### 6.3. CAPACITY OF PACKAGING AND STORAGE UNITS

In order to obtain 30,000 m. tons of exportable produce annually, the project will process 36,320 m tons of fresh produce through four packing lines in the processing plant. 5,000 m. tons capacity cold store has been planned to store some of the produce to extend the marketability of fresh produce, which is quite perishable.

#### 6.3.1. Capacity of Packaging Units

Table : 23 illustrates the produce species and quantities to be packed through each packing line, processing period in accordance with the harvesting period for each line, and daily theoretical and actual processing capacity for each line. It is assumed that the packing lines will operate 25 days a month and 10 hours a day.

#### 6.3.2. Capacity of Storage Units

Some of the washed, graded or packaged produce especially apples, potatoes, citrus and others, will be held in cold storage between (-2 to +10°C) temperature time until the off-season of that product, in order to receive higher prices from the export market without losing its marketable quality.

The monthly capacity utilization of the 5,000 m ton cold storage space is illustrated in the Table given on page 65.

During the summer months precooling is a necessary operation before the shipment of fresh produce by refrigerated trucks. Some of the cold storage area, will operate as precooling unit during the summer months.

TABLE : 23

Packaging Line	Produçè	CAPACITY OF THE PACKAGING UNITS					
		Fresh Material	Packing Period		Required Capacity		Selected Capacity
		Inputs	Per Year		Capacity		
		<u>m.Ton/Year</u>	<u>Months</u>	<u>Days</u>	<u>Tons/day</u>	<u>Tons/h</u>	
No 1	Oranges	3,750					
	Lemons	1,250					
	Grapefruits	<u>3,330</u>					
	TOTAL	8,330	5	125	67	6,7	10
No 2	Mandarins	1,250					
	Apples	7,500					
	Pears	560					
	Peaches	1,670					
	Tomatoes	<u>2,860</u>					
	TOTAL	13,840	6	150	92	9,2	10
No 3	Potatoes	5,890					
	Onions	<u>3,330</u>					
	TOTAL	9,220	5	125	74	7,4	10
No 4	Grapes	1,180					
	Other	<u>3,750</u>					
	TOTAL	4,930	4	100	49	4,9	5

MONTHLY DISTRIBUTION OF MAIN COMMODITIES IN COLD STORAGE

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Citrus	1,000	2,000	1,500	1,000	1,000	750	500	250	--	--	--	--
Apple	2,500	2,000	1,500	1,000	500	--	--	--	--	1,000	2,000	3,000
Potatoes	1,500	1,000	500	--	--	--	--	--	500	2,000	3,000	2,000
Others	--	--	--	--	--	2,000	2,000	2,000	2,000	2,000	--	--
<b>TOTAL</b>	<b>5,000</b>	<b>5,000</b>	<b>3,500</b>	<b>2,000</b>	<b>1,500</b>	<b>2,750</b>	<b>2,500</b>	<b>2,250</b>	<b>2,500</b>	<b>5,000</b>	<b>5,000</b>	<b>5,000</b>

## 7.0-PRODUCTION AND PACKAGING SYSTEMS

As mentioned previously, fresh fruits and vegetables will be produced by the contract farms for the company. The company may also produce annual crops, such as potatoes, tomatoes, and other vegetables on leased land. The company will also produce some vegetable seeds on leased land and will distribute to contract farms.

All fresh produce will be processed through the various lines of the packing house. Some products will be marketed immediately after the precooling operation and some products and/or parts of them will be held in cold stores until they reach their eating maturity (apples, pears) or can be marketed when the demand is high.

### 7.1. PRODUCTION TECHNOLOGY

Field Management Department of the company will establish the most advanced production technology and will implement the transfer of technology to the contract farmers.

Production technology for the contracted orchards will include such topics as appropriate and timely tillage, fertilization, irrigation and spraying the orchards and harvesting and transportation of the produce without losses.

Selection of suitable equipment for proper soil tillage of the seed-bed, seeding-planting, fertilizing, hoeing, irrigation, spraying, harvesting and transportation techniques and practices will be the topics of production technology for the contracted vegetable growers.

Fertilizers, chemicals and farm machinery required by the technology, will be determined by the farm management staff of the company.

In Turkey, tomatoes, potatoes, onions, etc. are presently produced in small plots and production is not yet mechanized, with the exception of soil tillage operations. In order to improve the quality and productivity and to decrease production costs, partially-mechanized large scale production of fruits and vegetables will be realized by the company. Therefore, the farm machinery pool to be established by the company will compile the required specific purpose farm machinery and equipment which will be leased to the contract-farmers who are not able to purchase them.

#### 7.2. PACKAGING TECHNOLOGY

Properly harvested fruits and vegetables will be transported to the packing house in field boxes by tractor trailers or truck trailers. While harvesting and transporting, consideration will be given to reduce handling losses and injuries.

Series of operations to be applied in the packing house will be:

##### A- Cleaning :

Fruits and vegetables may be washed or cleaned by brushing to remove dirt and spray residues.

B- First Sorting :

Cleaned fruits and vegetables are sorted manually and decayed and bruised ones are eliminated.

C- Treatment :

- Sodium-orthophenyl-phenate (S.O.P.P.) is used in combination with hexamine in the soak tank. This treatment is followed by rinsing, in order to keep the chemical residues within the limits authorized and to avoid any phytotoxic effect.

- Thiabendazole (T.B.Z.) is applied after washing of the fruit. This chemical is not rinsed off and acts as a decay preventing agent in storage and/or during transport to target markets.

D- Drying :

Fruits and vegetables are dried while passing through hot air ventilation before and after the waxing operation.

E- Waxing :

Fruits are covered with a thin wax layer in order to preserve their freshness during storage or transport to distant markets. Fruits may either be sprayed with wax emulsion or be immersed in a wax pool for waxing. Waxes may also contain fungicides.

F- Sorting and Grading :

Fruits and vegetables are sorted once again manually and classified into two broad categories for domestic and export markets. Export products can further be classified as extra, first and second quality by electronic eye color sorters to differentiate physiological maturity (lemons) and/or color intensity (apples).

G- Sizing :

In general, products are automatically sized in the packing house. Some other produce such as grapes, cauliflowers and artichokes are sized manually.

H- Packing :

Sized fruits and vegetables are packed in corrugated boxes or bagged. Some citrus fruits are individually wrapped in wrapping paper which may or may not be impregnated with a decay preventing chemical called diphenyl. Other fruits are put in moulded trays and then packed. Packed products are placed on pallets and are either loaded to trailers for delivery or stored.

I- Cooling :

Depending on the export programme, some products are transported immediately after packing and precooling operations, and some are kept in cold storage before or after packing.

Table : 24 illustrates the required storage conditions and optimum storage periods for some species of fruits and vegetables grown in Turkey.

TABLE : 24

STORAGE CONDITIONS AND PERIODS

<u>Product</u>	<u>Temperature (°C)</u>	<u>Humidity (%)</u>	<u>Storage Period</u>
Apple (Golden)	+ 1/+ 2	94-96	5-6 months
Apple (Starking)	+ 2/+ 3	90-95	5-6 months
Pear (Williams)	- 1/ $\bar{+}$ 0	85-95	2-3 months
Pear (Anjou)	- 1/ $\bar{+}$ 0	85-90	5-6 months
Grape	- 1/ $\bar{+}$ 0	90-95	4-5 months
Peach	- 1/ $\bar{+}$ 1	85-90	1-1.5 months
Cherry	- 1/ $\bar{+}$ 1	85-90	15-20 days
Sour cherry	- 1/ $\bar{+}$ 0	85-90	15-20 days
Strawberry	$\bar{+}$ 0	85-90	1-5 days
Melon	+ 5/+10	85-90	3-4 weeks
Lemon	+10/+14	85-90	1-5 months
Grapefruit	+10	85-90	3-10 weeks
Orange (W .Navel)	+ 4/+ 7	85-90	1-4 months
Orange (V.Late)	+ 5/+ 6	75-80	4 months
Orange (Shamouti)	+ 5/+ 6	75-80	4 months
Banana (Green)	+11/+14	90-95	1-2 months
Tomato (Green)	+ 7/+10	90	2-3 weeks
Carrot	- 1/ $\bar{+}$ 0	90-95	4-6 months
Potato (Early)	+ 3/+ 4	85-90	1-3 weeks
Potato (Late)	+ 5	85-90	8 months
Seed Potatoes	+ 2/+ 7	85-90	5-8 months
Onion	- 2/ $\bar{+}$ 0	65-75	10 months

Number and sequence of required operations listed above varies depending on the variety of fruits and vegetables. Also, some products should be stored in SO<sub>2</sub> enriched atmosphere and some citrus fruits should be degreened with ethylene gas application if necessary.

### 7.3. PRODUCTION INPUTS

Fresh fruit and vegetable input required for the production of 30,000 m tons of packaged produce is illustrated in Table : 25.

TABLE : 25

<u>PRODUCTION INPUT-OUTPUT (m Tons)</u>			
<u>Commodity</u>	<u>Usable Material ( % )</u>	<u>Fresh Material Input</u>	<u>Packaged Produce Output</u>
Oranges	80	3,750	3,000
Grapefruits	90	3,330	3,000
Lemons	80	1,250	1,000
Mandarins	80	1,250	1,000
Apples	80	7,500	6,000
Peaches	90	1,670	1,500
Pears	90	560	500
Grapes	85	1,180	1,000
Potatoes	85	5,890	5,000 (1)
Onions	90	3,330	3,000 (1)
Tomatoes	70	2,860	2,000
Others	80	<u>3,750</u>	<u>3,000</u>
<b>TOTAL</b>		<b>36,320</b>	<b>30,000</b>

(1) : These two commodities will be marketed in bags only. All the other commodities are packaged in corrugated paperboard boxes.

#### 7.4. PACKAGING INPUTS

Required packing materials, which were mentioned in section 7.2., are shown in Table : 26. Detailed information about the packing materials is given in Annex (III-Table : 6).

TABLE : 26

<u>PACKING MATERIAL REQUIREMENT</u>			
<u>Item</u>	<u>Produce</u>	<u>Net Produce Capacity (kg)</u>	<u>Required Amount (1,000 Units)</u>
A-Corrugated Boxes	Oranges, Lemons, Grapefruit, Apples, Pears, Peaches	18 - 20	790
	Mandarins, Tomatoes, Grapes and Others	8 - 12	700
B-Synthetic Fibre Bags	Onions, Potatoes	10 - 25	350
C-Moulded Trays	Apples, Pears, Peaches	4 - 5	1,800
D-Other Packing <u>Materials</u>		<u>Quantity/Ton</u>	<u>Total Amount</u>
- Wrapping Paper with/without Diphenyl	Some Citrus	2 kg	16,000 kg
- Wax Emulsion	Citrus, Apple	1.5 lt	21,000 lt
- Chemicals	All products	1.0 lt	36,000 lt
- Labels, Wires, Punches, etc.	All products	--	30,000 kg

## 8.0-MANAGEMENT

### 8.1. CONTRACT FARMING

As stated previously in contract farming section (Section 4), required fresh fruit and vegetable input for the project, will be produced by 180-200 contract-farmers.

Overall production plan will be determined by the participation of the General Manager, Marketing Manager, Plant Manager and Field Manager. In accordance with this plan, the Field Manager and Extension-team, who are responsible for the organization of the contract farming system will establish which crops will have to be planted by which contract farms and when.

The Plantation Program, in accordance with the Packing-house Operation Program, will be distributed to contract-farms by the Extension-team. In order to extend the packaging period and to prevent the accumulation of delivered produce exceeding the packaging capacity, planting and harvesting dates for each crop to be cultivated, will be programmed and dispersed to a period of time within the genetic and ecological limits of that crop and farm, respectively.

An Extension-team consisting of 5 field-specialists, 10 field technicians and 6 farm machinery mechanics will be responsible of the implementation of the production plan and program at the contract farm level and will organize the technology transfer and follow up the distribution of the supports to the contract farms.

The Extension-team will also manage the orchards leased from the owners residing in large cities. Foremen, skilled and unskilled temporary workers that will be employed in these orchards, will be hired by the project. The labor and operating expenses of each such orchard are not included in the annual expenses because these costs will be covered by a management fee set forth with each contract.

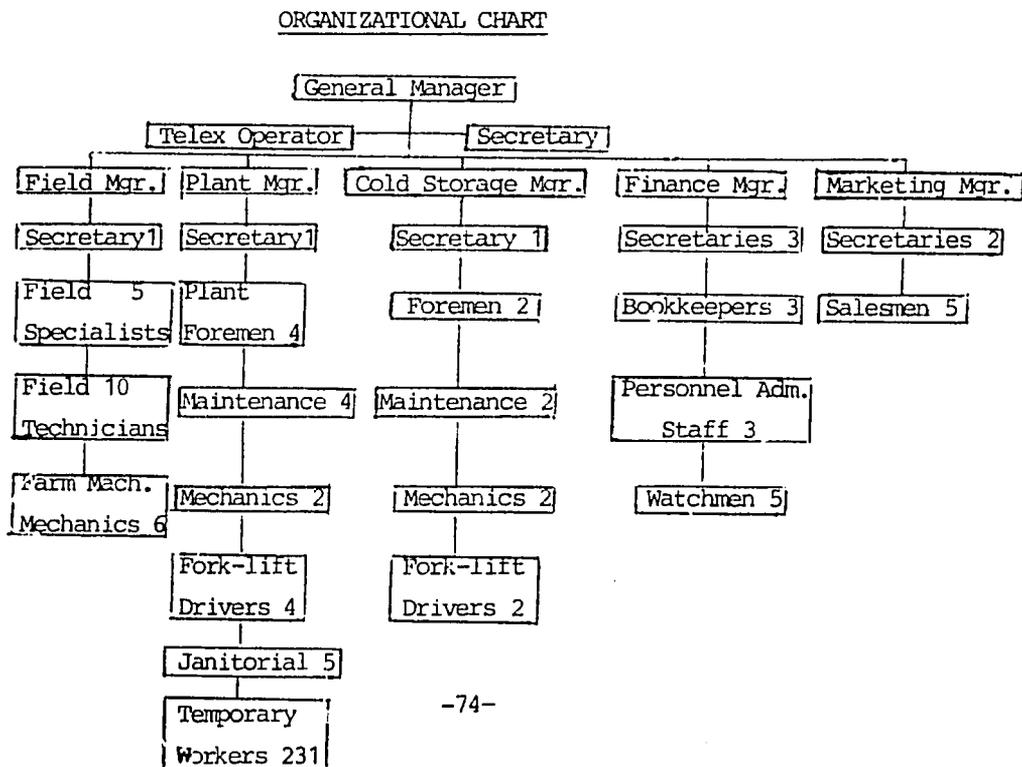
## 8.2. COMPANY MAN-POWER PLANNING

Personnel will consist of two types of employees; permanent personnel (administrative staff) and temporary work-force (seasonal workers).

### 8.2.1. Permanent Personnel ( Administrative Staff )

80 permanent personnel to be employed by the company is shown in Table:27.

TABLE : 27.



### 8.2.2. Temporary Work-force ( Seasonal Workers )

Qualifications of the required temporary work-force and their respective distribution to packing lines and number of days to be employed are shown below ;

	<u>Unskilled</u>	<u>Packer</u>	<u>Supervisory</u>	<u>Total</u>	<u>Days/Year</u>
Packing Line No 1	20	50	7	77	125
Packing Line No 2	20	50	7	77	150
Packing Line No 3	30	—	3	33	125
Packing Line No 4	10	30	4	44	100
	<u>80</u>	<u>130</u>	<u>21</u>	<u>231</u>	

### 8.3. MARKETING

Marketing efforts of the company will be directed by a marketing manager and five salesmen. Since the project is totally export oriented, there should be direct connection with the large importers and wholesalers of the target market countries. Generating this connection one year in advance and preparing a corresponding production program should be the primary objective of the management. In order to promote and publicize the products and the brand name of the company, and advertisement campaign must be implemented in the target countries. \$ 276,500 annual advertisement and promotion budget is allocated for this effort.

( See ANNEX : III . 7 . ). Also, \$ 207,375 budget is allocated for the marketing operations of the sales-force.

An import company from one of the target countries might be the partner of the company to be established. In this case most of the marketing problems of the company will be solved to a great extent.

## 9.0-COST OF INVESTMENT

Table;28 illustrates the cost of investment.For more detailed information about the cost of investment, see ANNEX : II

TABLE : 28

<u>COST OF INVESTMENT (\$)</u>	
Land	400,000
Infrastructure	260,000
Building	1,281,000
Imported Machinery and Equipment, (CIF)	1,374,200
Local Machinery and Equipment	530,000
Vehicles	244,800
Preoperating Expenses	110,000
<hr/>	
TOTAL COST OF FIXED INVESTMENT	4,200,000
WORKING CAPITAL*	2,300,000
<hr/>	
TOTAL INVESTMENT COST	6,500,000

\* For details see Section 10.2.4.

## 10.0-FINANCIAL ANALYSES

### 10.1. EXISTING FINANCIAL FACTORS

Financial analyses were conducted by considering the current incentives, supports, tax rebates and credit terms of Turkey. Factors related to fresh fruits and vegetables for 1986 are:

#### 10.1.1. Incentives

Incentives announced for the agro-industry investments are:

a- Custom Tax Exemption: All imported machinery and equipment necessary for the investment will not be subject to custom duties.

b- Tax-Exemptions:

b.1. Investment Promotion: Upto 100 % of fixed investment is deductible from taxable corporate income as a promotion of investments in Turkey. Such investments benefiting from the incentive privileges will not be subject to corporate tax until 100 % of the total investment expenditures (excluding working capital and the cost of land) in fully integrated investments and only 40 %, in unintegrated investments, are paid up. This means that in this investment no corporate tax will be paid, until 100 % of total fixed investment cost is recovered through the reduction from the taxable corporate income. That is, no income tax will be paid until \$ 3,800,000 are deducted cumulatively from annual taxable corporate income.

b.2. Corporated Income Tax Exemption on Exports: 20 % of the export revenues will be deducted from the taxable corporate income.

c- Tax Rebates

c.1. Tax Rebates on Export Sales of Over Two Million Dollars: If the annual export sales revenue for 1986, is more than \$ 2 million, for the \$ 2-10 million range only 2.4 % and for the exports over \$ 10 million, 4.8 % tax rebate will be paid back in Turkish liras as a tax rebate to promote exports.

c.2. Tax Rebate From Resource Utilization Support Fund: An additional 4. % premium on export sales will be received from the "Resource Utilization Support Fund".

10.1.2. Supports to Investments

In order to encourage investments, the state is supporting the investors with some special funds. These supports are :

a- Resource Utilization Support Fund: 7 % of the expenditures made by an investor on fixed investments will be paid back from this fund.

b- Export Promotion Fund: 15 % of the value of local machinery and equipment purchased for the investment will be paid back. However, 5 % of the value of imported machinery and equipment must be paid to this fund by the investor.

### 10.1.3. Credits

Commercial credit interest rates normally vary between 59 % and 61 % in Turkey. This increases upto 65 % by the addition of all other expenses and taxes.

If however, the company is granted a promotion and incentive permit, the interest rate will be 45 % including all expenses. The difference is subsidized by the Central Bank of Turkey.

Credit will be allocated upto 50 or 60 % of the total project cost and the remaining 40 or 50 % will be required as capital equity, as determined by SPO.

Credit repayment period is 10 years with 2 years of grace. Repayment will be by 8 equal installments starting from the third year on.

### 10.1.4. Nominal Values of the Incentives, Supports, Tax Rebates and Benefits on Credit Terms:

a- Custom Tax Exemption: All imported machinery and equipment of the project are exempted from custom duties. Nominal value of this support will be;

\$ 1,374,200 x 60 % (Custom Tax Rate) = \$ 824,520

#### b. Corporated Income Tax Exemption on Investment:

Fixed Investment	\$ 4,200,000
(less) Cost of Land	<u>\$ 400,000</u>
Total Subject to Exemption	\$ 3,800,000

c- Corporated Income Tax Exemption From Export: 20 % of the export revenues will be deducted from the income tax base each year. For the 30,000 m tons of export sales volume of the project, amount that will be deducted from the income tax base will be ;

$$\text{\$ } 13,225,000 \times 20 \% = 2,645,000$$

Therefore, nominal value of the earnings will be ;

$$\text{\$ } 2,645,000 \times 47,38 \% = 1,253,201$$

d- Incentives and Tax Rebates on Exports : As indicated in section 10.1.1.c, nominal values of incentives and tax rebates on exports, based on annual export sales volume of 30,000 m tons of fresh fruits and vegetables will be ;

d.1. Tax Rebates on Exports ;

Between \text{\\$ } 2,000,000 and \text{\\$ } 10,000,000

$$\text{\$ } 8,000,000 \times 2.4 \% = \text{\$ } 192,000$$

Over \text{\\$ } 10,000,000

$$\text{\$ } 3,225,000 \times 4.8 \% = \text{\$ } 154,800$$

d.2. Premium of Resource Utilization Support Fund ;

$$\underline{\text{\$ } 13,225,000 \times 4 \% = \text{\$ } 529,000}$$

$$\text{Total Incentives and Tax Rebates} = \text{\$ } 875,800$$

e- Supports to Investment : As explained in section 10.1.2., nominal earnings from the State Supports to investment will be as follows ;

e.1. From Resource Utilization Support Fund ;

$$\text{\$ } 4,200,000 \text{ (Fixed Investments) } \times 7 \% = \text{\$ } 294,000$$

e.2. From Export Promotion Fund;

\$ 530,000 (Local Machinery and Equipment) x 15 % = \$ 79,500

To Export Promotion Fund ;

\$ 1,374,200 (Imported Machinery and Equipment) x 5 % = \$(68,710)

Total Supports to Investment \$ 304,790

f. Credits : \$ 3,250,000 credit will be utilized in order to meet 50 % of the total project cost. Since the project will be granted an incentive permit, as explained in section 10.1.3., 20 % of the interest rate ( 65% - 45% ) will be subsidized by The Central Bank of Turkey. Hence, the annual Central Bank subsidy will be ;

$$\text{\$ } 3,250,000 \times 20\% = \text{\$ } 650,000$$

10.2. CASH FLOW

10.2.1. Export Revenues

Project sales prices (CIF) are assumed to be lower than the average import prices of the target markets in order to overcome the disadvantage of being new in the market and to take the competitive advantage of discounted prices. This will quantify the project in a more realistic way.

Expected average sales prices are calculated as 488 \$/m ton for the fruits and 379 \$/m ton for the vegetables. Detailed figures are illustrated in Table: 29.

TABLE : 29

EXPORT REVENUES

Commodity	Quantity	CIF Value	Total Expected
	(m Ton)	(\$/m Ton)	Revenues(1,000\$)
Oranges	3,000	450	1,350
Grapefruit	3,000	400	1,200
Lemon	1,000	500	500
Mandarins	1,000	550	550
Apples	6,000	500	3,000
Peaches	1,500	600	900
Pears	500	600	300
Grapes	1,000	500	500
Potatoes	5,000	350	1,750
Onions	3,000	225	675
Tomatoes	2,000	500	1,000
Other Vegetables*	<u>3,000</u>	500	<u>1,500</u>
	30,000		13,225

(\*) : Melon, Water Melon, Egg Plant, Squash

10.2.2. Annual Revenues

Total annual revenues are classified into four broad categories ;  
Export revenues, Tax Rebates-incentives on Export, By-products and  
cold storage rental.

a. Export Revenues : It is assumed that, with the export volume of 30,000 m tons, export revenues will be \$ 13,225,000 as indicated in section 10.2.1.

b. Incentives-Tax Rebates : Given the State incentives tax rebates and incentives on export sales of \$ 13,225,000 will be the followings. (See Section 10.1.1.1).

a- Tax Rebates on Exports :

Between \$ 2,000,000 and \$ 10,000,000 of export sales :

$$\text{\$ 8,000,000} \times 2.4 \% = \text{\$ 192,000}$$

Over \$10,000,000 of export sales :

$$\text{\$ 3,225,000} \times 4.8 \% = \text{\$ 154,800}$$

b- Incentives of Resource Utilization Fund ;

$$\text{\$ 13,225,000} \times 4 \% = \underline{\text{\$ 529,000}}$$

Total incentives and Tax Rebates                      \$ 875,800

c. By-products : As explained in section 10.2.3.1, from 20,490 m tons of fresh fruit input, 17,000 m tons of exportable first-quality fresh fruits and from 15,830 m tons of fresh vegetable input, 13,000 m tons of exportable first-quality fresh vegetables will be exported by the company annually. The remaining 3,490 m tons fruits and 2,830 m tons vegetables will remain as discards. However, it will be possible to sell approximately 3,000 m tons of discarded fruits and 2,500 m tons of discarded vegetables into the domestic market at produce factory delivery prices.

Average delivered purchase price from contract farmers will be 110 \$/m ton for fruits and 60 \$/m ton for vegetables. Therefore, annual by-product revenue for the export capacity of 30,000 m tons will be ;

3,000 m tons fruit x 110 \$/m ton	= \$ 330,000
2,500 m tons vegetable x 60 \$/m ton	= \$ 150,000
Total By-Product Revenue	\$ 480,000

d. Cold-Storage Rental : Cold-storage space of the packing-house can be rented during idle periods. As indicated in section 5.3, E.B.K. charges 25 \$/m ton/month for storing fresh fruits and vegetables. 5,000 m tons of fresh fruits and vegetables can be stored by the project. Therefore, in the cold storage rental case, \$ 125,000 income will be earned for each month. It will not be possible to rent cold storage space when the project reaches full capacity. However, for the first two years of operation, cold-storage rental income can be considered. Hence, rental income for the first year can be calculated for 50 % capacity, and for the second year, for 25 % capacity, of the cold-storage space.

First Year ;	125,000 \$/month x 6 months	= \$ 750,000
Second Year ;	125,000 \$/month x 3 months	= \$ 375,000

Total annual revenues are summarized in Table : 30.

TABLE : 30

<u>SUMMARY OF TOTAL ANNUAL REVENUES (1,000 \$)</u>			
Year :	1	2	3 and up
Utilized Capacity :	<u>50 %</u>	<u>75 %</u>	<u>(FULL)</u>
A- Export Revenues	6,613	9,919	13,225
B- Incentives-Tax Rebates	375	587	876
C- By Products	240	360	480
D- Cold Storage Rental	<u>750</u>	<u>375</u>	<u>--</u>
Total Revenues	7,978	11,241	14,581

### 10.2.3. Annual Operating Costs

#### 10.2.3.1. Direct Operating Costs

Direct operating costs for the first three years of the operation are shown in Table : 31. After the third year, these costs will be fixed because of constant export volume of 30,000 m tons of fresh fruits and vegetables annually. For more detailed information see Annex (III).

TABLE : 31

ANNUAL DIRECT OPERATING COSTS (\$)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Raw Materials	3,088,432	4,632,647	6,176,863
Direct Labor	96,378	144,566	192,755
Utilities	366,313	366,313	366,313
Packing	562,000	843,000	1,124,000
Transportation	1,181,250	1,771,875	2,362,500
Administration	449,198	449,198	449,198
Sales Expense	241,938	362,906	483,875
Maintenance	70,038	70,038	70,038
C/F Supports and R/D	94,250	141,375	188,500
	<u>6,149,797</u>	<u>8,781,918</u>	<u>11,414,042</u>
TOTAL DIRECT OPERATING COSTS	6,149,797	8,781,918	11,414,042

## 10.2.3.2. Depreciation

Depreciation was calculated on a straight line basis over the expected economic life of each capital item. Table : 32 illustrates the annual depreciation cost of each item and depreciation costs for each year.

TABLE : 32

DEPRECIATION EXPENSE

Item	Life (Years)	Original Cost (\$)	Annual Depreciation (\$)
Land	50	400,000	8,000
Infrastructure	20	260,000	13,000
Buildings	20	1,281,000	64,050
Machinery and Equipment	10	1,904,200	190,420
Vehicles	5	244,800	48,960
Preoperating Expenses	5	110,000	22,000

Years	1 - 5	6 - 10	11 - 20	21 - 50
Depreciation(\$):	346,430	275,470	85,050	8,000

10.2.3.3. Interest

The total fixed investment is estimated to be \$ 4,200,000 and total investment with working capital would be \$ 6,500,000. It is assumed that 50 % of the total investment will be financed by the credit equity at 45 % interest rate. Credit repayment period will be 10 years with two years grace. Credit utilization will be realized within first three years, because working capital requirement (section 10.2.4) will increase during this period.

TABLE : 33

COST OF INTEREST

Years	Credit at the Beginning (\$)	Amortization Repayment (\$)	Remaining Balance (\$)	Interest Cost (\$)
1	2,173,722 <sup>(*)</sup>	--	2,173,722	978,175
2	2,711,861	--	2,711,861	1,220,338
3	3,250,000	271,715	2,978,285	1,462,500
4	2,978,285	338,962	2,639,303	1,340,228
5	2,639,303	406,250	2,233,053	1,187,686
6	2,233,053	406,250	1,826,803	1,004,874
7	1,826,803	406,250	1,420,553	822,061
8	1,420,553	406,250	1,014,303	639,249
9	1,014,303	406,250	608,053	456,436
10	608,053	406,250	201,803	273,624
11	201,803	134,534	67,269	90,811
12	67,269	67,269	0	30,271
		<u>3,250,000</u>		<u>9,506,253</u>

(\*) Total Fixed Investment - Capital Equity = \$ 950,000

Working Capital Requirement for the first year= \$ 1,223,722

Credit utilization for the first year \$ 2,173,722

10.2.4- Working Capital :

Working Capital Requirement is calculated as follows.

<u>Item</u>	<u>Days</u>	<u>Amount (\$)</u>
Accounts Receivable (*)	30	950,000
Inventory:		
Raw Materials	15	257,369
Packaging	60	187,333
Finished Product (*)	15	475,000
Direct Labor	30	16,063
Utilities	30	29,364
Transportation	30	196,875
Administration	30	37,433
Sales Expense	60	80,646
Maintenance	30	5,837
C/F Supports and R/D	60	31,417
Others		<u>32,627</u>
		2,300,000

(\*) Based on annual total direct operating costs for the third year of operation.

Working capital requirement depending on the capacity of the project for the first four years will be as follows;

Years	Incremental	Total
<u>          </u>	<u>Working Capital(\$)</u>	<u>Working Capital(\$)</u>
1	1,223,722 (*)	1,223,722
2	538,139	1,761,861
3	538,139	2,300,000
4	0	2,300,000

(\*)Fixed working capital requirement(Utilities+

Sales expense + Administration): \$ 147,443

50% of the variable working capital

requirement : \$ 1,076,279

Working Capital Requirement for the First Year: \$ 1,223,279

#### 10.2.5. Cash Flow

In order to analyse cash flow, Revenues/Direct Operating Costs table is prepared (Table: 34). It is assumed that the company will operate with 50 % capacity during the first year and with 75 % capacity during the second year. When calculating the figures of this table, annual operating costs for full capacity (section 10.2.3.1 ) has been taken as a base. Since there is no direct relation between the capacity of the project and utilities, administrative and maintenance expenses, these are accepted as fixed expenses starting from the first year on.

Interest expense of the initial investment will be financed by the utilization of the Resource Utilization Support Fund and Export Promotion Fund. (section 10.1.4/e). Investment costs of the initial investment year will be financed preferably by the utilization of the capital equity.

Credit utilization will be:

\$ 4,200,000 (Fixed Investment) - \$ 3,250,000 (capital equity) = \$ 950,000  
for the initial year, and this will occur at the last 8.5 months of the year.

Therefore, interest expense will be:

$$\text{\$ } 950,000 \times 45 \% \times \frac{8.5}{12} = \text{\$ } 302,813$$

and this will be financed by State Supports to investments.

Funds flow of the project for 20 years, is illustrated in Table : 35

TABLE : 34

REVENUES/DIRECT OPERATING COSTS (1,000\$)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
<u>REVENUES</u>				
A- Export Revenues	6,613	9,919	13,225	13,225
B- Incentives	375	587	876	876
C- By-Products	240	360	480	480
D- Cold-Storage Rental	750	375	--	--
TOTAL REVENUES	7,978	11,241	14,581	14,581
<u>DIRECT OPERATING COSTS</u>				
A- Raw Material	3,088	4,633	6,177	6,177
B- Direct Labor	96	145	193	193
C- Utilities	366	366	366	366
D- Packaging	562	843	1,124	1,124
E- Transportation	1,181	1,772	2,363	2,363
F- Administration	449	449	449	449
G- Sales Expense	242	363	484	484
H- Maintenance	70	70	70	70
I- C/F Supports and R/D	94	141	189	189
TOTAL DIRECT OPERATING COSTS	6,148	8,782	11,415	11,415

TABLE: 35

PROFORMA INCOME AND FUND FLOW STATEMENT (1,000 \$)													
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13-20</u>
REVENUES	7,978	11,241	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581
(Less) DIR. OPER. COSTS	6,148	8,782	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415
(Less) DEPRECIATION	346	346	346	346	346	275	275	275	275	275	85	65	85
(Less) INTEREST EXPENSE	978	1,220	1,463	1,340	1,188	1,005	822	639	456	274	91	30	--
TAXABLE INCOME	506	893	1,357	1,480	1,632	1,886	2,069	2,252	2,435	2,617	2,990	3,051	3,081
(Less) C. INCOME TAX (47.38%)(*)	--	--	--	--	--	--	--	--	--	--	163	192	207
NET INCOME AFTER TAX	506	893	1,357	1,480	1,632	1,886	2,069	2,252	2,435	2,617	2,827	2,859	2,874
(Add) DEPRECIATION	346	346	346	346	346	275	275	275	275	275	85	85	85
NET INCOME	852	1,239	1,703	1,826	1,978	2,161	2,344	2,527	2,710	2,892	2,912	2,944	2,959
(Less) AMORTIZATION REPAYMENT	0	0	272	339	406	406	406	406	406	406	135	68	--
FUNDS FLOW	852	1,239	1,431	1,487	1,572	1,755	1,938	2,121	2,304	2,486	2,777	2,876	2,959
CUMULATIVE FUNDS FLOW	852	2,091	3,522	5,009	6,581	8,336	10,274	12,395	14,699	17,185	19,962	22,838	46,510

(\*) : 20 % of the export revenues (\$ 13,225,000 x 20 % = \$ 2,645,000) will not be subject to tax.

This amount is deducted from taxable income in calculation of income tax.

### 10.3. PROJECT VIABILITY INDICATORS

Project capital equity pay-back period is 2 years 10 months and total investment pay-back period is 4 years 11 months of operation (see Table : 35).

Project internal rate of return is 29.5 % (see Table : 36 ).

Export of 14,197 m tons of fresh fruits and vegetables constitutes the project's break-even quantity, and the project reaches its cash break-even point with the export of 11,617m tons. (See Tables:37 and 38)

Table:39 illustrates a break-even chart for this company's operations.

Net income after tax and Net income after tax/Revenues ratio are increasing steadily because of the changing interest, depreciation and income tax expenses during the credit repayment period. Therefore, two separate profit margins were calculated. These are 13.82% for the credit amortization period and 19.71 % for the period after credit amortization (See Table : 40 ).

Thus, this investment is very viable and should be considered interesting for both domestic and foreign investors.

The project has been prepared by calculating the economical indicators based on U.S. Dollar values. This calculation method was selected to generate a project which will carry its viability for a long period of time. Thus, the domestic inflation rate risk is overridden.

TABLE : 36

## CALCULATION OF INTERNAL RATE OF RETURN (IRR)

Years:	Initial	1	2	3	4	5	6	7	8	9	10	11	12	13-20
CASH OUTFLOWS (1,000 \$)	4,200	1,224	538	538	--	--	--	--	--	--	--	--	--	--
Fixed Investment	4,200	--	--	--	--	--	--	--	--	--	--	--	--	--
Working Capital	--	1,224	538	538	--	--	--	--	--	--	--	--	--	--
CASH INFLOWS (1,000 \$)	--	852	1,239	1,703	1,826	1,978	2,161	2,344	2,527	2,710	2,892	2,912	2,944	2,959
Revenues	--	7,978	11,241	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581	14,581
(Less) Dir. Oper. Costs	--	6,148	8,782	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415	11,415
(Less) Interests	--	378	1,220	1,463	1,340	1,188	1,005	822	639	456	474	91	30	--
(Less) C. Income Tax	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NET FLOWS (1,000 \$)	(4,200)	(372)	701	1,165	1,826	1,978	2,161	2,344	2,527	2,710	2,892	2,912	2,944	2,959
Discount Factor : 28 %	1.0	0.781	0.610	0.477	0.373	0.291	0.227	0.178	0.139	0.108	0.085	0.066	0.052	0.159
Present Value of Net Flows	(4,200)	(251)	428	556	681	576	491	417	351	293	246	192	153	470
Net Present Value of Net Flows = \$ 363,000														
Discount Factor = 30 %	1.0	0.769	0.592	0.455	0.350	0.269	0.207	0.159	0.123	0.094	0.073	0.056	0.043	0.126
Present Value of Net Flows	(4,200)	(286)	415	530	639	532	447	373	311	255	211	163	127	373
Net Present Value of Net Flows = \$ - 110,000														

IRR Interpolation Formula:

$$\text{IRR} = \text{Lower discount rate} + \frac{\text{Difference between two rates} \times \text{NPV of Net Flows at lower discount rate}}{\text{Difference between two NPV's of Net Flows}}$$

$$\text{IRR} = 28 + 2 \left( \frac{363,000}{473,000} \right)$$

$$\text{IRR} = 29.5 \%$$

TABLE : 37

BREAK - EVEN ANALYSISFixed Costs :

Administration	\$ 449,198
Depreciation <sup>(1)</sup>	\$ 310,950
Interest Exp. <sup>(2)</sup>	<u>\$ 950,625</u>
Total Fixed Costs	\$ 1,710,773

(1) : Arithmetic mean of the first ten years' depreciation expense.

(2) : Total interest expense divided by ten years (credit repayment period).

Unit Variable Costs :

Raw Materials	\$ 205.9/m. Ton
Direct Labor	\$ 6.4/m. Ton
Utilities	\$ 12.2/m. Ton
Packaging	\$ 37.5/m. Ton
Transp. and Insurance	\$ 78.8/m. Ton
Sales exp.	\$ 16.1/m. Ton
Maintenance	\$ 2.3/m. Ton
C/F Supports	<u>\$ 6.3/m. Ton</u>
Total Variable Costs	\$ 365.5/m. Ton

Unit Revenues : \$ 486 m Ton

Continued Table : 37

$$\text{Break-even Quantity} = \frac{\text{Total Fixed Costs}}{\text{Revenues-Variable Costs}}$$

$$\text{Break-even Quantity} = \frac{1,710,773}{436-365.5} = 14,197 \text{ m tons}$$

$$\text{Cash Break-even Quantity} = \frac{\text{Total Fixed Costs-Depreciation}}{\text{Revenues - Variable Costs}}$$

$$\text{Cash Break-even Quantity} = \frac{1,710,773 - 310,950}{436 - 365.5} = 11,617 \text{ m tons}$$

TABLE : 38

VARIATION IN COSTS-REVENUES AND PROFITS BASED ON QUANTITY

<u>Quantity (mTons)</u>	<u>Fixed Cost(\$)</u>	<u>Variable C.(\$)</u>	<u>Revenue (\$)</u>	<u>Profit (Loss) (\$)</u>	<u>Cash Gain (Loss) (*) (\$)</u>
0	1,710,773	0	0	(1,710,773)	(1,399,823)
2,000	1,710,773	731,000	972,000	(1,469,773)	(1,158,823)
4,000	1,710,773	1,462,000	1,944,000	(1,228,773)	(917,823)
6,000	1,710,773	2,193,000	2,916,000	(987,773)	(676,823)
8,000	1,710,773	2,924,000	3,888,000	(746,773)	(435,823)
10,000	1,710,773	3,655,000	4,860,000	(505,773)	(194,823)
12,000	1,710,773	4,386,000	5,832,000	(264,773)	46,177
14,000	1,710,773	5,117,000	6,804,000	(23,773)	287,177
16,000	1,710,773	5,848,000	7,776,000	217,227	528,177
18,000	1,710,773	6,579,000	8,748,000	458,227	769,177
20,000	1,710,773	7,310,000	9,720,000	697,227	1,010,177
22,000	1,710,773	8,041,000	10,692,000	940,227	1,251,177
24,000	1,710,773	8,772,000	11,664,000	1,181,227	1,492,177
26,000	1,710,773	9,503,000	12,636,000	1,422,227	1,733,177
28,000	1,710,773	10,234,000	13,608,000	1,663,227	1,974,177
30,000	1,710,773	10,965,000	14,580,000	1,904,227	2,215,177

(\*) : Cash Gain (Loss) = Total Revenues , (Total Cost - Depreciation)

TABLE : 39

BREAK-EVEN CHART

Revenues/Costs  
(\$ 1,000,000)

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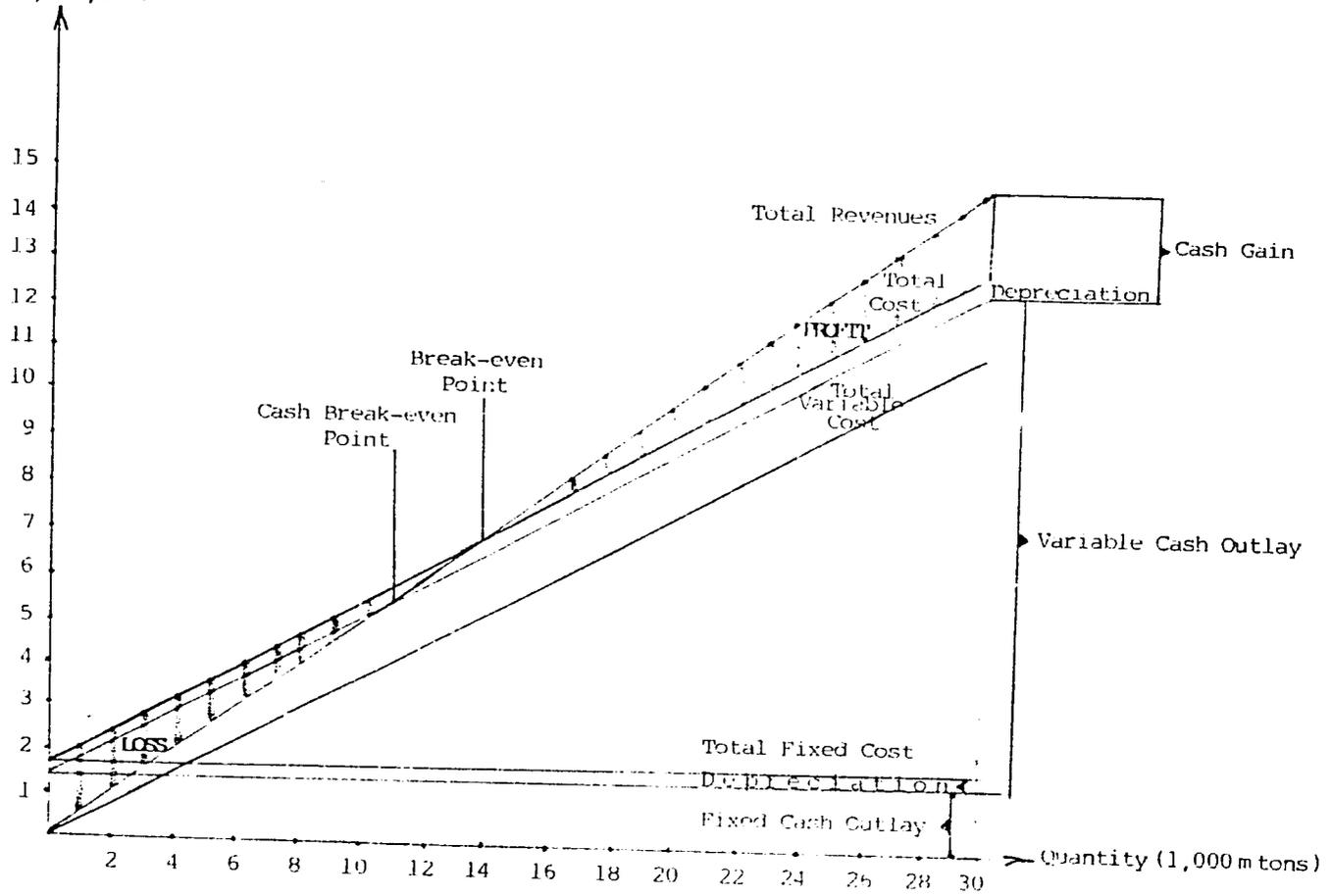


TABLE : 40

CALCULATION OF PROFIT MARGIN

1- Average Profit Margin for the Credit Amortization Period

$$\begin{aligned} & \text{(1-12 Years) :} \\ \text{Profit Margin} &= \sum_{1}^{12} \frac{\text{Net Income After Tax}}{\text{Revenues}} = \frac{22,813,000}{165,029,000} = 13.82\% \end{aligned}$$

2- Average Profit Margin for the Period After the Credit Amortization

$$\begin{aligned} & \text{(13-20 Years) :} \\ \text{Profit Margin} &= \sum_{13}^{20} \frac{\text{Net Income After Tax}}{\text{Revenues}} = \frac{22,992,000}{116,648,000} = 19.71\% \end{aligned}$$

10.4. CAPITAL SOURCES

10.4.1. Company Establishment Models

There are three alternative establishment models of the company that can implement such a project.

- a- All Turkish Partners
- b- All Foreign Partners
- c- Combination of Turkish and Foreign Partners

Combination of Turkish and foreign partners seems to be the best alternative model.

Local farmers (preferably contract farmers), international transporters and large export marketing companies as partners may form the Turkish party.

Foreign partners preferably should be the producers of fresh fruits and vegetables to supply know-how, and/or importers and marketing companies of such produce, and/or financial institutions. A large fresh produce importing and marketing company from one of the Gulf Countries should be selected also an equity partner.

In summary, ideal partners of such a foreign capital joint stock company to be established for the realization of this project should be one or more of the following groups :

Probable Turkish Partners :

- Contract Farmers producing fruits and/or vegetables in large scales,
- A local International transportation company,
- Individuals and/or a company experienced in fresh produce exports.

Probable Foreign Partners :

- A company producing and internationally marketing fresh fruits and vegetables.
- An importer and whole sale marketer from one of the target countries.
- A financing institution ( such as IFC ).

10.4.2. Capital Sources

Partners of the company will supply the equity capital that the company will invest in assets. Turkish partner(s) can put their land as a capital in kind for the project. Some foreign partners can bring the machinery and equipment that will be imported for the project as capital in kind.

#### 10.4.3. Credit Sources and Cost of Credit

Investment credit necessary for the project can be borrowed from the Turkish banks using the incentive privileges. Cost of credit will be 45 % due to incentive privileges as explained in the previous sections.

Project is totally export oriented, therefore, it will be also possible to utilize foreign credit sources. Foreign partner or foreign financing institutions can supply this credit. In this case cost of credit will be lower, such as LIBOR + 3/4 percent.

#### 10.4.4. Equity/Credit Balance

It is planned to finance the total investment cost (fixed investment cost plus working capital) 50 % by the capital equity and 50 % with credit. In order to grant the incentive privileges to bank credits in Turkey, at least 40 % of the investment should be the capital equity. Given certain conditions this portion increases up to 60 %. However, if it will be possible to utilize foreign credit sources, credit equity portion can be reduced down to 30 %.

#### 10.4.5. Sensitivity Analysis

Fresh fruit and vegetable export is quite a sensitive business and requires very close following up of all the links of the process until the produce is delivered into the market. Thus, a sensitivity analysis has been conducted to demonstrate this. The following data is given to show the changes in viability indicators.

<u>DIFFERENCE IN UNIT EXPORT REVENUES</u>	<u>- 4.2 %</u>	<u>+4.5 %</u>
Unit Export Revenues	466 \$/m ton	507.5 \$/m ton
Total Export Revenues (1,000 \$)	12,675	13,825
Capital Equity Pay-Back	4 yrs+2 months	2 yrs+2 months
Total Investment Pay-Back	7 yrs	3 yrs+4months
Internal Rate of Return (%)	22.40	37.65
Break-Even Quantity (m tons)	17,023	12,048
Cash Break-Even Point (m tons)	13,929	9,858
Profit Margin (1-12 years %)	10.4	16.9
Profit Margin (13-20 years %)	17.5	24.5