

**AGRICULTURAL PRODUCTS MARKETING AND FARM
MANAGEMENT SURVEY
OF
THE TRIAL AGRICULTURAL DEVELOPMENT PROJECT
FOR SEMI-ARID AREAS
IN
THE REPUBLIC OF TURKEY**

**FINAL REPORT
SUMMARY**

JANUARY 1995

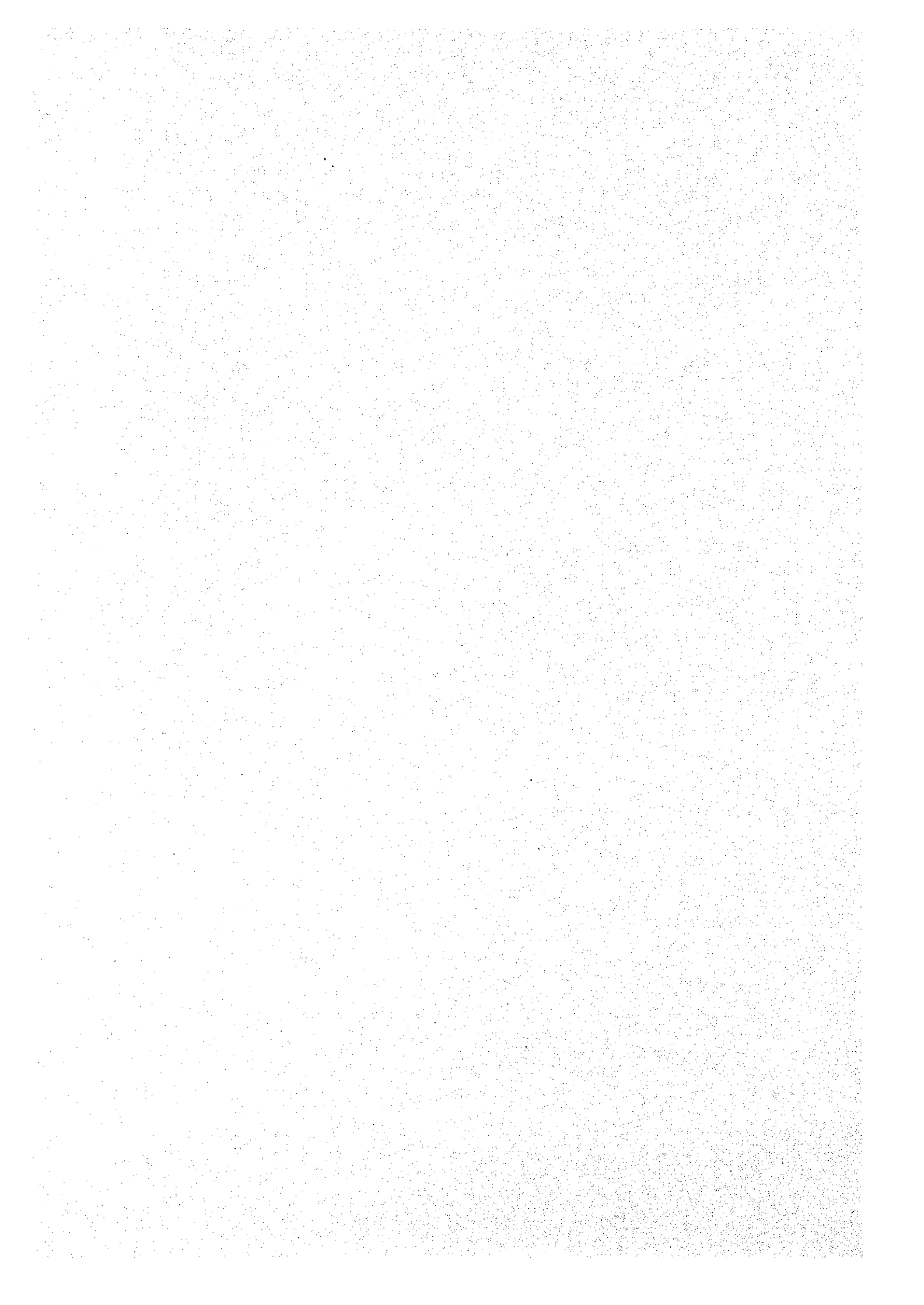
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FINAL REPORT SUMMARY

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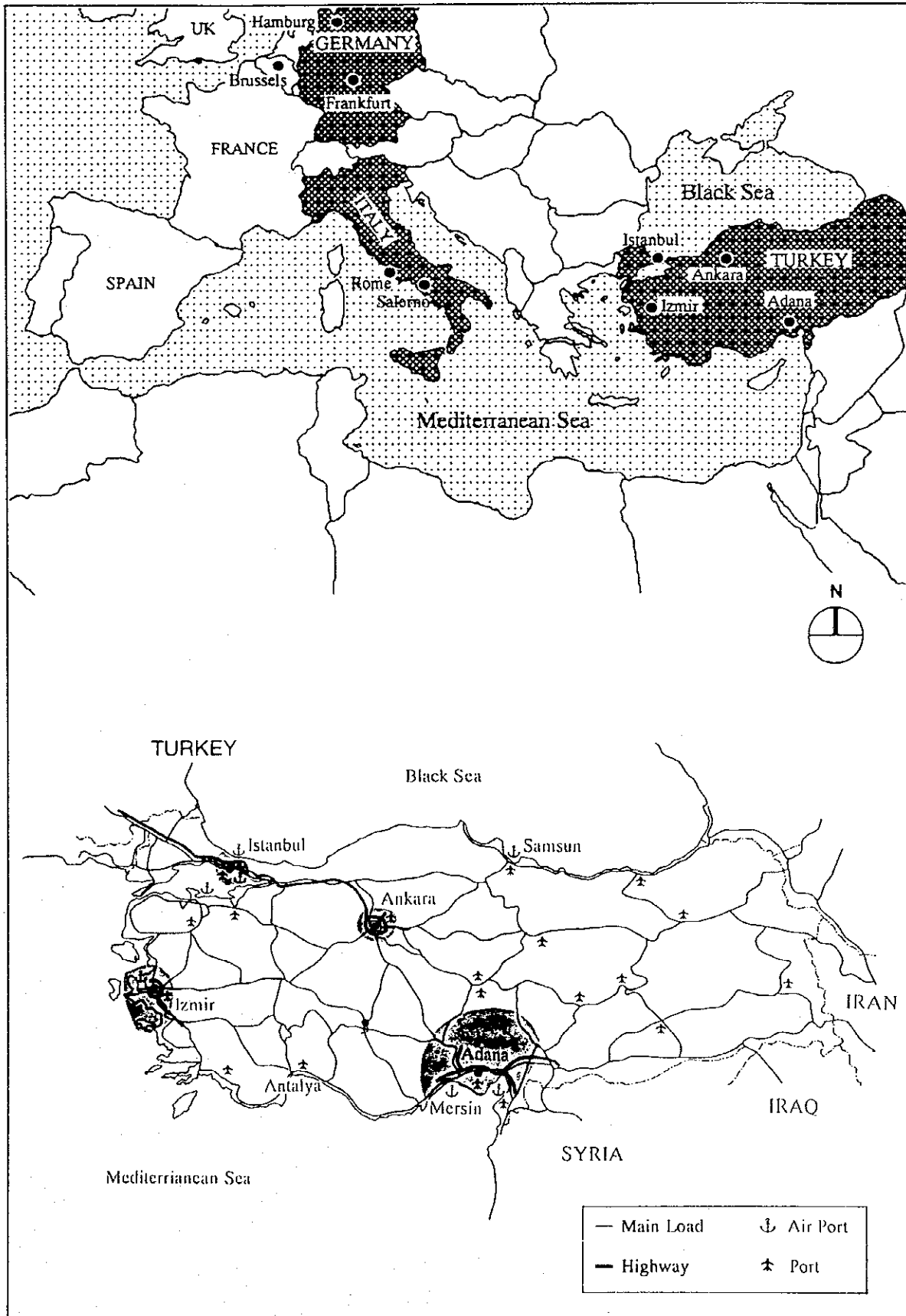
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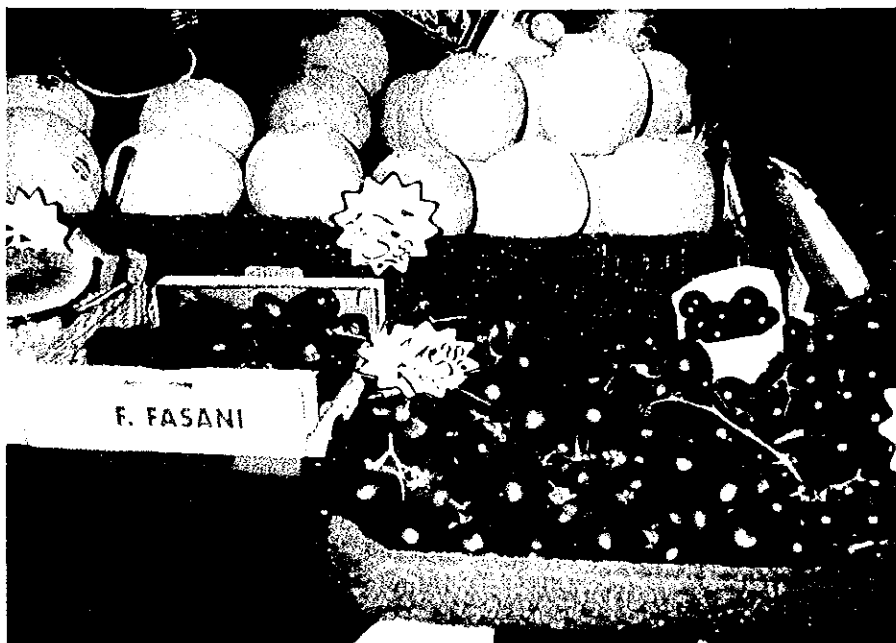
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Location of Study Area



Germany



Display of Tomatoes & Melon at Hamburg Wholesale Market



Tomatoes in boxes at Hamburg Wholesale Market

Germany



Display of Peaches at
Hamburg Wholesale
Market

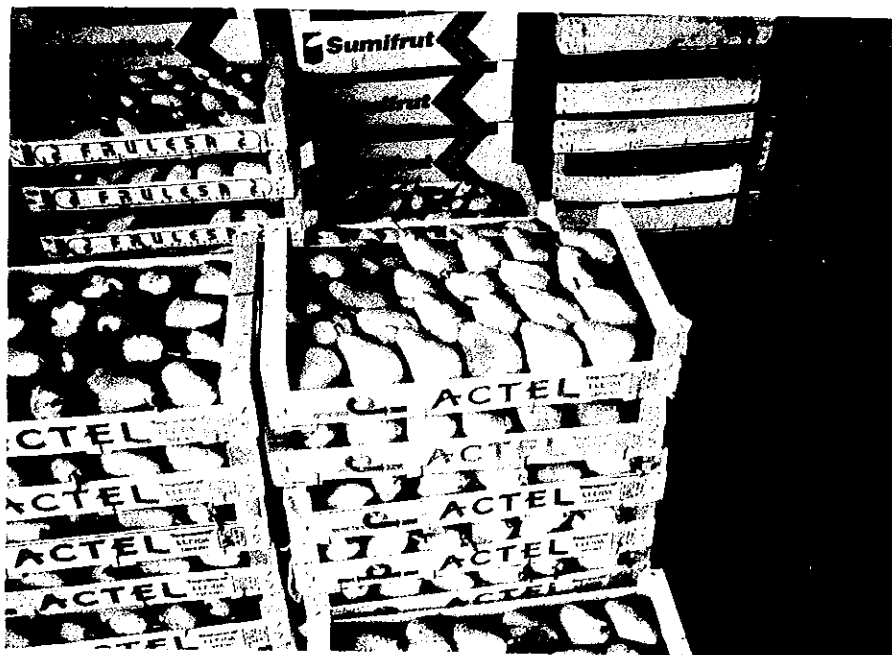


Display of agricultural
produce at Hamburg
Wholesale Market

Italy



Stacks of agricultural produce at Rome Wholesale Market



Display of Pears at Rome Wholesale Market

Italy

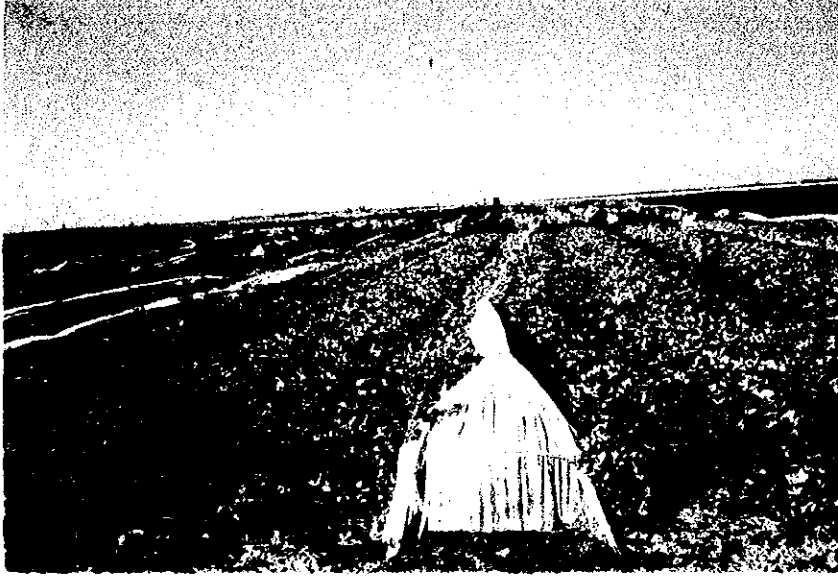


Display of Peaches at Rome Wholesale Market



Display of Tomato at Rome Wholesale Market

Turkey



Experimental Melon
Field at JICA Farm
in Adana Region



Peach Orchard in
Adana Region

Turkey



Harvesting of
Tomatoes in Adana
Region



Sorting & Packing
Pears in Adana Region

Turkey



Display of Tomatoes
on a truck at Adana
Wholesale Market



Display of tomatoes at
Adana Wholesale
Market

Turkey



Istanbul Wholesale Market (European Side)



A retail market in Istanbul

Turkey



Display of produce at a retail market in Istanbul



Izmir Wholesale Market

Turkey



Display of kiwi fruit
at Izmir Wholesale
Market



Sorting & packing
operation in a
factory in Izmir

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ACRONYMS

CAP	:	Common Agriculture Policy
DM	:	Deutsche Mark (German Currency)
EC	:	European Communities
ECU	:	European Currency Unit
EFTA	:	European Free Trade Area
EU	:	European Union
FAO	:	Food and Agriculture Organization
FIRR	:	Financial Internal Rate of Return
GAP	:	Southeastern Anatolia Project (Turkey)
GATT	:	General Agreement on Tariffs and Trade
GDP	:	Gross Domestic Product
GNP	:	Gross National Product
ha	:	Hectares
IGEME	:	Export Promotion Center of Turkey
ISTA	:	International Seed Testing Association
JICA	:	Japan International Cooperation Agency
MARA	:	Ministry of Agricultural and Rural Affairs (Turkey)
NPC	:	National Productivity Centre (Turkey)
OECD	:	Organization for Economic Cooperation and Development
SIS	:	State Institute of Statistics (Turkey)
SPO	:	State Planning Organization (Turkey)
TEBD	:	Turkish Seed Industry Association
TIGEM	:	General Directorate of Agricultural Enterprises (Turkey)
TL	:	Turkish Lira (Currency)
TSI	:	Turkish Standards Institution
VAT	:	Value Added Tax

SUMMARY

1. BACKGROUND AND OUTLINE OF THE STUDY

1.1 Background of the Study

Japan International Cooperation Agency (JICA) has been implementing a "Trial Agricultural Development Project for Semi-Arid Areas" since September 1989 for five years in the Republic of Turkey. The objective of this project is to promote Japanese investment through the collection of technical data and information of marketing and farm management. The techniques of cropping are being developed but a study on marketing and farm management has not been conducted.

In 1994 JICA carried out "Agricultural Products Marketing Survey of the Trial Agricultural Development Project for Semi-Arid Areas in the Republic of Turkey". As this study was conducted in Japan, the data and information collected were limited. Although a conclusion on marketing potential was reported in the study, the necessity of further survey in Turkey and EC countries was recommended.

1.2 Objective of the Study

The objectives of the study are to analyze the export potential of selected agricultural produce, to compile financial data/information for investment promotion of Japanese firms and to propose a business development scheme in Turkey.

1.3 Study Area

The study area covered Turkey, Germany (net importer), Italy (net exporter), and EC headquarters in Brussels (Belgium).

1.4 Study Items

The selected agricultural products for the survey are indicated below.

Fresh Vegetables	Tomato, Net melon, Other melons, Lettuce, Broccoli, Daikon (Japanese radish)
Fresh Fruits	Plum, Peach, Kiwifruit, Nashi (Japanese pear), Kaki (persimmon)
Vegetable Seeds	Daikon (Japanese radish), Tomato, Melon, Lettuce, Nashi (Japanese pear), Broccoli
Processed fruit & vegetables	Canned/Bottled fruit/vegetables: Peach, Plum, Tomato Juice: Peach

2. SOCIO-ECONOMIC STRUCTURE AND AGRICULTURE

2.1 National Economy and Agriculture

- (1) Turkey has maintained its GDP at an average annual growth rate of 3.7 percent for the last five years from 1988-1992. During the same period inflation reached 50 to 60 percent resulting in a serious condition for the national economy and the livelihood of its people.
- (2) The share of the agriculture sector in GDP has been decreasing and it was 16 percent in 1992.
- (3) Agricultural products including processed products occupies 24 percent of the total export in value and agriculture accounts for 44 percent of the total labour force. Hence agriculture still plays an important role in the socio-economy of Turkey.

2.2 Present Conditions in Agriculture

- (1) Land use
 - 1) The cultivated area of crops was 27.32 million hectares in 1992. Although this area has not increased since the 1970's, both the cultivated area for fruits and for vegetables has expanded to 1.5 times.
 - 2) The area of cultivated land exclusively for vegetables is approximately 0.66 million hectares which is located in the coastal areas of the Mediterranean and Aegean seas due to favorable climate conditions.
- (2) Agricultural production
 - 1) The main crops are basic food crops such as wheat, barley and pulses.
 - 2) Leafy vegetables such as cabbages and leek, and fruit bearing vegetables such as tomatoes and cucumbers are cultivated traditionally. In recent years floriculture in-doors have been increasing mainly in the coastal area of the Mediterranean region.
 - 3) Traditional fruits are olive, grapes and apricots. The production of temperate zone fruits such as apples, pears and peaches has increased in recent years.
- (3) Systems related to agriculture
 - 1) An agricultural financing system is available through the Agricultural Bank.
 - 2) A system of registration, inspection and certification for seeds has been established according to the international standards.

2.3 Environment for Foreign Capital Investment

- (1) Foreign capital investment is allowed for five sub-sectors including seed production, fresh fruit and vegetables production for export and the food industry which exports more than 30 percent of the products.
- (2) The Turkish government has provided investment incentives, including customs exemption for machinery, equipment, raw materials, investment allowance (corporate tax exemption), export incentives, remittance, reinvestment.
- (3) In Turkey the unemployed population exceeded 2.6 million and the unemployment rate reached 13 percent in 1992. There is an abundant potential labour force. The minimum wages are low, corresponding to one eleventh of the average in EC countries in 1989.

3. MARKETING CONDITIONS OF FRUITS/VEGETABLES MARKET

3.1 Marketing Conditions in Turkey

3.1.1 Trends in Supply/Demand of Fruit and Vegetables

- (1) The total production of vegetables in Turkey in 1992 was about 19.05 million tons, which was equivalent to four percent of the world's total production, ranking fifth in the world. The total production of fruits in 1992 was 9.35 million tons, which was equivalent to three percent of the world's total production, ranking ninth in the world.
- (2) Among the study items, the production of tomatoes and melons were the second largest in the world; and plums, peaches and pears ranked eighth, respectively.
- (3) Turkey has achieved one of the world's highest food self-sufficiency levels (vegetables 110% and fruits 107%). Many kinds of agricultural products have been exported in raw or processed form, in addition to being consumed domestically.
- (4) Of the total production volume of fresh fruit and vegetables, 2.5 percent (487,000 tons) and four percent (407,000 tons) were exported respectively. Major destinations were Saudi Arabia, Germany, Iraq and the export volume to Romania has been increasing recently.
- (5) In Turkey, fruit and vegetables are mostly consumed raw. The consumption of processed fruit juices, tomato paste and canned fruit and vegetables is comparatively low.

3.1.2 Distribution of fruits and vegetables

- (1) Present conditions of related infrastructure
 - 1) Trunk roads are in comparatively good condition. Trucking mainly using open trucks, is the major means of transport in Turkey. In addition, expressways are being developed rapidly.
 - 2) There are two kinds of wholesale markets: traditional markets and newly developed ones. In Ankara, Istanbul and Adana, new wholesale markets have been constructed in recent years, but there are no related facilities, such as refrigerated warehouses and packaging facilities. Transactions (buying and selling process) at the wholesale market is by negotiation rather than auction.
 - 3) Refrigerated warehouses are generally owned and operated by private companies and are also used for stocking fruit and vegetables. Major exporting firms have their own refrigerated warehouses, which are sometimes rent to smaller companies. There is no public refrigerated warehouse even in an export port.
- (2) Present conditions of domestic distribution systems
 - 1) Major activities related to domestic marketing are carried out in the coastal cities in the western and southern regions, such as Bursa, Istanbul, Izmir, Mersin, Adana and Antalya.
 - 2) Traditional wholesalers and middlemen, etc. play an important role as distributors in addition to their role as collectors and shippers in domestic distribution.
 - 3) Agricultural products distributed through wholesale markets are generally uniform in quality, but the ones sold in consumer markets directly by farmers are varied in quality.
 - 4) Watermelons, melons, oranges and other products which are distributed over a wide area are often purchased by traders at the fields; and all activities from harvesting to transport are carried out by them.
- (3) Present conditions of export distribution system
 - 1) Exported produce are generally grown on a contract basis between exporters and farmers. In such cases exporters carry out harvesting, selection, packing and transport activities. Furthermore, some exporters provide guidance in cultivation techniques to farmers.
 - 2) The majority of the local small to medium exporters carry out sales transactions on a consignment basis with sales agencies. As a result, developing strategies in export sales has been difficult.
 - 3) First grade produce is exported to Europe, second grade produce is exported to Middle East and the remainder is consumed in Turkey.

- 4) The highway network is well developed in Europe, and the vegetables and fruits are mainly transported from Turkey to Germany using refrigerated trucks.
- 5) The distance from Istanbul to Frankfurt is 1,900 km and it takes three or four days. There are two major routes, which are from Sofia and Belgrade to Zagreb and Munich and from Sofia and Belgrade to Vienna and Prague. But due to the civil war in former Yugoslavia, it takes about one week via detour.

3.1.3 Price trends in fruit and vegetables

- (1) The price of agricultural products fluctuate greatly seasonally. Prices of peaches, which are relatively stable, fluctuate one and half times, and the prices of lettuce four to seven times in a year.
- (2) Consumer prices in large cities such as Istanbul tend to be higher than those in smaller cities and in rural areas, depending on the quality of produce.

3.1.4 Export trends in fruit and vegetables and their evaluation

- (1) Export trends
 - 1) Among the study items, the overwhelming majority of exported produce is tomatoes (77,000 tons or \$33.9 million in 1993), followed by peaches (9,700 tons or \$4.7 million), plums (4,900 tons or \$3.1 million), melons (6,300 tons or \$2.7 million) and pears (3,900 tons or \$1.9 million).
 - 2) Major export destinations of the study items and shares in the total exported volume in 1993 are shown below.

Name of produce	Major Destination and Share (%)
Tomato	Saudi Arabia (80%)
Peach	Saudi Arabia (80%)
Plum	Saudi Arabia (72%), Germany (19%)
Melon	Germany (45%), Saudi Arabia (16%), Jordan (12%)
Pears	Saudi Arabia (69%), Germany (13%)

- (2) Evaluation of fresh fruit and vegetables produced in Turkey
 - 1) Produce exported from Turkey to EC target mainly Turkish immigrants living in Germany. As a result, there are no serious complaints about quality and they are satisfactorily competitive in price.
 - 2) Producers in Turkey attach little importance to quality, because they are able to sell the produce in Turkey where price is preferable to quality when exports to EC are unsuccessful.
 - 3) In Germany consumers attach much importance to quality including the shape of produce as well as the brand. In addition, they are interested in whether packaging materials can be recycled or not. Enterprises therefore are motivated to show consideration for environment.

- 4) German markets presuppose Turkish produce to be of cheaper price and lower quality.
- (3) Problems in export procedure
 - 1) Exporters have to be equipped with a refrigerated warehouse. This is one of major reasons why producers and traders in Turkey, excluding some big traders, lack zeal in export.
 - 2) Practical business affairs in export is rather slow and payment of export credit is apt to be delayed.

3.1.5 Production and export of processed vegetables/fruits

(1) General

Turkey produces a wide variety of processed vegetables and fruits in the form of bottled, canned, dried, juice, jam and frozen vegetables and fruits. However, the annual production volume of these processed products is only about 100,000 tons and a extremely small quantity of raw vegetables and fruits is processed, excluding tomatoes.

(2) Processed tomatoes (tomato paste)

- 1) Turkey produced 225,000 tons of processed tomatoes, mainly paste, in 1992 and was ranked third in the world. The export volume was 125,000 tons which were shipped to more than 35 countries.
- 2) Approximately one fourth of the total production volume or 1.0 to 1.5 million tons of fresh tomatoes are earmarked for the processing market. An increased production of processed tomatoes affects the stable supply of tomatoes. The cultivation of tomatoes for processing is concentrated in the coastal area of the Marmara and Aegean Sea.

(3) Canned fruits and vegetables

The production volume of canned fruits and vegetables in 1987 was about 40,000 tons of which about 30,000 tons were exported to EC countries such as Germany. A small amount of canned peaches and canned plums (about 1,500 tons each) was exported.

(4) Fruits juice and concentrates

- 1) The production volume of fruits juice in 1990 was about 53,000 tons and this volume has been gradually increasing, in conjunction with increased production capacity.
- 2) The export volume was at its peak in 1991; and it decreased to one third in 1993.

3.1.6 Production and export of vegetable seeds

- (1) Due to a dry summer climate which is suited to seed production, lower production costs, and incentives for foreign capital, Turkey is seen as a promising production region for vegetable seeds. European and Japanese seed firms have entered the Turkish market in recent years.
- (2) In Turkey 29 seed firms, with technical collaboration with foreign enterprises, produce cereal and vegetable seeds.
- (3) The production volume of vegetable seeds in 1993 was 940 tons.
- (4) Demand for vegetable seed in Turkey has been rapidly increasing and the domestic consumption volume reached 1,025 tons in 1993, followed by an increase in the import volume of vegetable seeds, which was 225 tons in 1993. In contrast, the export volume was 140 tons, of which 500kg was hybrid varieties. (Data source: MARA)

3.2 Border Measures and Trends of Demand and Supply in EC Countries

3.2.1 Border measures in EC countries

- (1) Border measures
 - 1) EC established a policy for agricultural protection in CAP (Common Agricultural Policy) and maintains prices of agricultural products in EC higher than the targeted levels.
 - 2) Accordingly EC enforces price keeping actions as border measures by applying reference price, levies and custom duties in order to prevent internal market support being weakened by lower-priced imports.
- (2) Quality requirement and standard
 - 1) The requirement and standard for quality have been established for imports from outside EC. There are quality requirements and standards for tomatoes, lettuce, daikon (Japanese radish), kiwifruits, peaches and plums.
 - 2) However, the quality requirement is operated with flexibility. It is operated loosely in a period of short supply in order to increase the import volume, and it is operated rigorously during periods of surplus supply.
- (3) Changes in EC agricultural policy based on GATT Uruguay Round and probability of alliance of Turkey
 - 1) The GATT Uruguay Round was agreed in December 1993. The EC's agricultural policy, however, has remained unchanged for fruit and vegetables.

- 2) Turkey submitted duly an application for participation to EC alliance in 1987. However, the probability of acceptance in recent years is rather low due to various reasons.

3.2.2 Demand and supply of fruit and vegetables in EC countries

- (1) EC has nearly achieved self-sufficiency in fruit and vegetables. Among the study items, they are self-sufficient in fruits excluding citrus, dried fruits and fresh tomatoes. Moreover, EC is an export region for processed tomatoes.
- (2) EC countries excluding Germany and Switzerland have attained a high ratio of self-sufficiency in vegetables. Spain, Greece and Italy have surpassed 100 percent self-sufficiency in fruits.
- (3) The total import volume of vegetables in the EC for 1990/91 was 2.8 million tons, an increase of 36 percent from 1988/89. In addition, the total import volume of fruits was 5.83 million tons for the same year, an increase of 12 percent from 1988/89.

3.2.3 Demand and supply of fruits and vegetables in Germany

- (1) The German self-sufficiency in vegetables is a low 38 percent, particularly in fresh tomatoes at four percent. In addition, the self-sufficiency ratio in fruits excluding citrus fruits is 22 percent and peaches are all imported.
- (2) The Turkish share of the import volume of fresh tomatoes from ex-EC countries is 12.6 percent during the winter period from November to May, which was equivalent to four percent of the total import volume during the same period. In contrast, the Turkish processed tomatoes held a higher share and the shares of steamed & cooked tomato, concentrates of 12 - 30 percent and concentrates of more than 30 percent, of the import volume from ex-EC countries are 38 percent (8 % of the total import volume), 78 percent (11 % of total import volume) and 86 percent (4 % of total import volume), respectively.
- (3) During the months from October to June, plums from Turkey comprise 22 percent of the import volume from ex-EC countries and eight percent of the total consumption in Germany.
- (4) Melons from Turkey comprise 40 percent of the import volume from ex-EC countries and eight percent of the total consumption in Germany.
- (5) The shares in the import volumes of lettuce, broccoli and peaches from ex-EC countries is less than one percent.

3.2.4 Demand and supply of vegetable seeds and trends of import

- (1) In EC countries the supply ratio of vegetable seeds from ex-EC countries was 49 percent (29 percent in value) in volume in 1990. Although the import volume from Turkey was 1,885 tons, which was equivalent to 15 percent of the import volume from ex-EC countries, Greece imported the highest volume of all (Data source of External Trade, EUROSTAT, 1990).
- (2) In Germany the supply ratio of vegetable seeds from ex-EC countries was 27 percent in volume and 21 percent in value, which was rather low in comparison to other EC countries. The import volume from Turkey was only about one ton.
- (3) Regarding production and sales of vegetable seeds, major international seeds firms are holding higher shares in transactions. Generally, the seed exported from Turkey to a major seed firm in another country is re-exported to third country.

4. PRESENT CONDITIONS OF AGRICULTURE IN ADANA

4.1 Agriculture in Adana

- (1) The Cukurova plain in Adana is one of the prominent agricultural areas in Turkey.
- (2) The climate is mild throughout the year. In the rainy season from November to March when 70 percent of the annual rainfall of 640 mm is concentrated in this plain, non-irrigated farming is popular. In the dry season from April to October, farming is based on irrigation.
- (3) Major crops are wheat, corn, cotton and soybeans. But in recent years, cultivation of vegetables such as tomatoes, cucumbers and lettuce have been increasing in the plain and temperate climate fruits such as citrus, peaches and grapes have been increasing in the mountain area.
- (4) Watermelons are grown in plastic tunnels, that amounts to a share of 25 percent in Turkey (1992).

4.2 Farming Patterns of Fruit And Vegetables Farm Households

Cropping patterns of major farming in Adana are shown below.

- (1) Small scale vegetable farm household (cultivated land: 6.0ha, cropping intensity: 200%)

Crop	Cropping Season	Area	Crop	Cropping Season	Area
Melons	Spring	3.0 ha	Radish	Autumn	3.0 ha
Wheat	Autumn	3.0 ha	Lettuce	Autumn	3.0 ha

- (2) Vegetable farm household
(cultivated land: 90 ha including leased land 50 ha, cropping intensity : 83%)

Crop	Cropping Season	Area	Crop	Cropping Season	Area
Watermelons	Spring	20.0 ha	Capsicum	Autumn	0.5 ha
Melons	Spring	2.0 ha	Radish	Autumn & Winter	40.0 ha
Eggplant	Spring	1.5 ha	Spinach	Autumn & Winter	10.0 ha
Tomato	Spring	0.3 ha			

- (3) Vegetable and fruit tree farm household
(cultivated land: 45.0 ha including leased land 15 ha, cropping intensity : 90%)

Crop	Cropping Season	Area	Crop	Cropping Season	Area
Watermelons	Spring	15.0 ha	Peanuts	Summer	10.0 ha
Radish	Spring	1.2 ha	Peach	Perennial	3.0 ha
Wheat	Autumn	10.0 ha	Pears	Perennial	1.5 ha

- (4) Crops and fruit tree farm household
(cultivated land: 593 ha including leased land 220 ha, cropping intensity: 100%)

Crop	Cropping Season	Area	Crop	Cropping Season	Area
Wheat	Spring	181.0 ha	Watermelon	Summer	23.0 ha
Corn	Spring	186.0 ha	Citrus	Perennial	140.0 ha
Cotton	Spring	63.0 ha			

5. MARKETABILITY OF FRUIT AND VEGETABLES

5.1 Appraisal Based on Farm Household Management

- (1) The production of fruits and vegetables are assessed from the viewpoint of farm household management and the results are shown below.

Especially prominent	Tomatoes, Net melons
Prominent	Daikon (Japanese radish), Peach, Nashi (Japanese pears)
Further study required	Kiwifruits, Broccoli, Kaki (persimmon)
Not adequate	Lettuce, Plum

5.2 Marketability

5.2.1 Marketability of fresh fruits and vegetables for Germany

Melons are concluded to be competitive in the German market among the study items as shown below. Fruit growing is supposed to be less feasible because there is more risk in comparison to vegetable growing and adequate income for risk cannot be expected in the targeted fruit growing.

(1) Fresh tomatoes

- 1) Of the total volume of tomatoes imported in a year, those from within the EC countries comprise about 95 percent. Exported produce from EC countries hold most of the shares during the summer season and ex-EC countries have a 10 - 20 percent share during the winter season.
- 2) Due to border measures, export from Turkey is not favorable in the summer season.
- 3) Because the monthly average temperature in Morocco is higher than Izmir by 3-4°C, export from Turkey is not competitive with produce from Morocco which has the highest share in ex-EC countries.

(2) Melons

- 1) Of the total volume of melons imported throughout the year, those from within EC countries comprise about 85 percent. EC countries such as Spain, hold the most of the shares during the summer season and ex-EC countries hold a share of 30-50 percent during the winter season.
- 2) Turkey has the largest share at 40 percent (about 3,000 tons) in ex-EC countries and exports mainly from August to October.
- 3) Net melons are not popular in Germany. However, those grown at the JICA trial farm are purchased at a higher price than the ordinary ones in the Amsterdam's market.

(3) Daikon (Japanese radish)

Daikon (Japanese radish) is not suitable for export because it is not popular in Germany.

(4) Broccoli

Germany has imported only a small quantity from ex-EC countries. Further studies are required to examine the possibility of export from Turkey.

(5) Peaches

- 1) The import volume from ex-EC countries is less than one percent of the total import volume.
- 2) Major exporters in ex-EC countries are South Africa and Chile, etc., which export peaches from December to April.
- 3) Turkey exported about 100 - 1,000 tons a year from June to September (1991-1993).

(6) Kiwifruits

- 1) The import volume from ex-EC countries is about 10 percent, but it reaches as much as 9,000 tons.
- 2) It is necessary to study the competition in price and quality after adequate data on production and farm management are acquired.

(7) Nashi (Japanese pears) and Kaki (persimmons)

Japanese varieties of pears and persimmons are not found in Germany and test sales for inspection are necessary.

5.2.2 Marketability of processed fruits/vegetables

As Japanese firms are not interested in promoting business for the German market from Turkey, this study assumes these firms will focus or target Japan as the market. Canned and bottled peaches are supposed to be the possible items in the selected study items as shown below.

(1) Canned/bottled peaches

- 1) Canned peaches are one of the major canned fruits in Japan and its annual import volume is as much as 50,000 - 55,000 tons. The domestic production in Japan is decreasing, and thus the Japanese market is attractive.
- 2) Major exporters, South Africa, Greece, USA., export mainly canned yellow peaches. The import price from South Africa and Greece is about 100 yen per kg which is the cheapest price. This price is profitable for export from Turkey.
- 3) Turkey is one of the choices for promoting business for Japanese firms and the final decision will have to be made based on assessment of other competitive countries.

(2) Peach juice

- 1) The consumption volume of peach juice is rather small and it is about 5,000 tons. Apple juice is the major item among the fruits juices.
- 2) The manufacturing process of fruits juices depends on machinery more than canned fruits. Therefore, in the fruit juice industry, cheap labour cost does not contribute much to profit in comparison to the fruit canning industry.

- (3) Processed tomatoes
 - 1) Turkey is the biggest exporting country of tomato puree and paste to Japan; and the export volume is not likely to increase.
 - 2) Regarding ketchup, the brand name is important to consumers and any new entry of this item is expected to bring in less return to investment.
- (4) Plums

The market size for plums is small and it is not an attractive item.

5.2.3 Marketability of vegetable seeds

- (1) Features of vegetable seed production
 - 1) Original seeds and the know-how belong the seed growing firms and a firm has to possess original seeds before entry into the business. It is impossible to know the present conditions of original seed development because it is a closely kept secret.
 - 2) Seed production is exceptionally high value-added. Therefore, stable production and quality seeds are more important than production cost.
- (2) Turkey as an area for high quality seed production
 - 1) In general Turkey is suited for seed production.
 - 2) In Turkey a consignment contract for small scale production is available in comparison to California, etc.
- (3) Marketing area

Re-export of imported vegetable seeds is common and therefore the market is not restricted to Japan.
- (4) Probability in short term

Seed production of Daikon (Japanese radish), broccoli, tomatoes and melons of the selected study items are possible except lettuce, since Japanese seed firms are unlikely to possess lettuce seeds. Based on the present circumstances of original seed possession, seed production of broccoli, tomatoes and melons depends on the specified company.

6. MODEL OF FARM HOUSEHOLD MANAGEMENT

6.1 Assumptions

- (1) Models of farm household management were examined and established to clarify the possibility of farm household management in Turkey and to investigate the possibility of vegetables and fruits production on consignment contract.

- (2) The selected items for cultivation are melons, Daikon (Japanese radish) and peaches. The model cropping pattern is set up using watermelons and eggplants in addition to the above mentioned items in order to minimize risk .
- (3) Farm sizes of small, medium and large scale farmers household are set at 6ha, 40 ha and 100 ha, respectively and cropping patterns considered are as follows.

- Single farming household of vegetables

Farm Size	Spring Crop		Autumn Crop		Winter Crop	
Small	Net melons	6 ha	Daikon (Japanese radish)	6 ha	-	-
Medium	Net melons	25 ha	Daikon (Japanese radish)	25 ha	Eggplants	15 ha
Large	Net melons	40 ha	Daikon (Japanese radish)	80 ha	Eggplants	20 ha
	Watermelons	40 ha	-	-	-	-

- Multiple farming household of vegetables and fruit trees

Farm Size	Fruit Trees		Autumn Crop		Winter Crop	
Medium	Peaches	20 ha	Daikon (Japanese radish)	20 ha	-	-
Large	Peaches	40 ha	Daikon (Japanese radish)	30 ha	Eggplants	30 ha

6.2 Financial Analysis

- (1) All types of model farm households make a profit as shown below.
- (2) Multiple farming households of vegetables and fruit trees make the most profit from cultivating Daikon (Japanese radish) and eggplants because profitability of peaches is very low. But diversification of crops reduces risks in price fluctuations and natural calamities.

Unit: \$1000

	Single Farming Household			Multiple Farming Household	
	Small	Medium	Large	Medium	Large
Net melons	28	128	212	-	-
Daikon (Japanese radish)	12	60	205	41	67
Eggplant	-	56	78	-	109
Watermelons	-	-	269	-	-
Peaches	-	-	-	9	25
Total	40	244	763	50	201

7. BUSINESS DEVELOPMENT SCHEME

7.1 Basic Concept

(1) Basis for business

Business development scheme is set on the following basis.

- Fresh fruit and vegetables are produced mainly to promote export to Germany. Some selected items for the domestic market in Turkey are produced to maintain stable farm management.
- Processed fruit and vegetables are destined for Japan.
- Vegetable seeds are mainly targeted for Japan but EC countries are also potential markets.

(2) Business component

- 1) Business is to be developed by combining the three components as shown below. Nevertheless, Nashi (Japanese pears), Kaki (persimmons), kiwifruits, broccoli may be added to the table below dependent on further study.

Component	Items	Sales
1. Fresh fruit/vegetables	Melons Daikon (Japanese radish, etc.*	Export to Germany Domestic consumption
2. Processed fruit/vegetables	Canned peaches	Export to Japan
3. Vegetable seeds	Radish, Tomato**	Export to Japan and others

Remarks * : Includes items such as watermelons and eggplants.

** : Daikon (Japanese radish) and tomatoes are prominent and other items are possible

- 2) Each business shown below can be undertaken independently and the combination of these businesses may contribute to improved efficiency. (Regarding processed fruit and vegetables, the experimental projects of JICA are not applicable to processing factory, which is not considered in this study.)

- cultivation and sales of fresh fruit and vegetables
- cultivation, processing and sales of fruit and vegetables
- production and sales of vegetable seeds

(3) Production and market advancement

- 1) The success of a joint corporation in market advancement is higher than the efforts of one singular firm.
- 2) Most of the fresh fruit and vegetables are produced under direct management but some will be produced on consignment contract.
- 3) A canned peach factory is to be directly managed.

(4) **Scope of the business**

The scale of the business has been examined based on the considerations shown below.

- Production volumes required to keep a fixed share of the market
- Appropriate scale of production in terms of profitability
- Appropriate amount of investment for experimental projects
- Appropriate production volume for new varieties of vegetables to be recognized on the market

7.2 Business Scheme of Fresh Fruits and Vegetables

(1) **Summary**

- 1) Target produce : melons and daikon (Japanese radish)
- 2) Form of business : joint venture with local firms
- 3) Form of production : direct management
- 4) Scale of production : melons 2,400 tons, radish 3,200 tons (farm area 80ha)
- 5) Sales : melons : export to Germany \$510,000
: domestic consumption \$1,026,000
: daikon (Japanese radish : domestic consumption \$640,000
- 6) Financial status : investment \$1,470,000
: net profit \$356,000 (3 years after implementation)
: net profit after tax \$181,000 (3 years after implementation)

(2) **Sales scheme**

- 1) Target items include net melons exported to Germany, which are expected to earn higher profits for the business.
- 2) Daikon (Japanese radish), which is only aimed for domestic consumption, is cultivated in autumn in order to increase the cropping intensity. Because it is not familiar in Turkey, some amount of Japanese radish should be shipped to the market. The volume of its shipment, therefore, is targeted at 4-5 percent of the total domestic production of Japanese radish.
- 3) The export volume of melons is planned at 600 tons, which is equivalent to 20 percent of the present export volume from Turkey to Germany. Melons are pre-cooled and transported by refrigerated trucks.

(3) **Production scheme**

- 1) Because cultivation of net melons requires a lot of skill, it is not suited for cultivation on a consignment basis and therefore, it has to be carried out under direct management.
- 2) The area of the farm is set at 80 hectares to produce 3,200 tons of Daikon (Japanese radish) and 2,400 tons of melons to be produced in the same field.
- 3) The farm is leased. The site for the facilities is purchased by the joint venture firm.

(4) Financial scheme

- 1) This business scheme brings \$356,000 of profit and \$181,000 of net profit after taxes annually. For about \$1.5 million of the total investment cost, invested capital will be recovered in ten years.
- 2) The financial internal rate of return (FIRR) after taxes is equal to 14.3 percent and the business scheme is feasible.
- 3) When sales revenue reduces by 5 percent, FIRR is 10.1 percent. When operation costs increases by 5 percent FIRR is 11percent. The business scheme is still feasible even if circumstances are changed to some degree.

7.3 Business Scheme of Processed Fruit And Vegetables

(1) Summary

- 1) Target produce : canned peaches
- 2) Form of business : joint venture with a local firm
- 3) Form of production : Canning factory : direct management
: Production of peach : direct management & consignment
- 4) Scale of production : Canned peaches, 10,000 tons
Fresh peaches, 1,,200 tons (direct management - 100 ha farm)
- 5) Sales : Japan, \$11,560,000
- 6) Financial status : investment \$3,910,000
: net profit \$1,120,000 (14 years after implementation)
: net profit after tax \$570,000 (14 years after implementation)

(2) Sales scheme

- 1) 10,000 tons of canned peaches, which is equivalent to 20 percent of the total imported volume, is exported from Turkey to Japan. White peaches are preferable to yellow ones in that region and therefore white peaches are produced and canned.
- 2) Canned yellow peaches and canned white peaches are exported at Yen100/kg and Yen120/kg, respectively. The total export value reaches around \$10.7 million in the 14th year from implementation.

(3) Production scheme

- 1) Young white peach trees are imported from Japan to replace yellow peaches.
- 2) Canned yellow peaches are mainly produced until imported young trees become productive. Then white peaches are increased gradually and finally white peaches attain the share of 80 percent of the total production, i.e. 10,000 tons of canned yellow peaches are produced at the initial stage, and 2,200 tons of canned yellow peaches and 7,800 tons of canned white peaches are produced 14 years after implementation.

(4) Financial scheme

- 1) This business scheme operates in the red for the first seven years because it takes more than five years for young trees to become productive. Accumulated deficit is dissolved after 12 years from the commencement of the business and 18 years are required before investment is recovered. The profitability is therefore not good.
- 2) The financial internal rate of return (FIRR) after tax is equal to 4.7 percent for the base case of the business scheme. The business scheme is therefore not feasible by the usual bank financing.
- 3) It is possible to improve the feasibility of this business scheme and to increase the FIRR up to 9.4 percent by means as shown below;
 - In the base case, buying price of white peaches is assumed to be 15 percent higher than that of yellow peaches but this case is not financially attractive. If the buying price of white peaches from contract farm households is assumed to be 10 percent higher than of yellow peaches it would be financially attractive. As there is no difference in the growing cost between white and yellow peaches, the 10 percent higher price assumption may be realized.
 - All the production of yellow peach cans are replaced by white peach cans, which are more profitable, as soon as possible. In Japan, white peaches are favorable to yellow ones and the retail price of white peaches cans is higher than that of yellow peach ones by 20-25 percent. But the production cost is the same.
 - Overhead cost is cut down by 5 percent compared with the base case. Investing company wins customer for that and sales cost can be decreased.

8. RECOMMENDATION

(1) Promotion of business scheme

- 1) The business scheme of fresh fruit and vegetables attains the FIRR of 14.3 percent. As for that of processed fruit and vegetables, the FIRR of about 10 percent can be attained through cost savings and earlier replacement of yellow peaches by white peaches.
- 2) These results indicate the business schemes are feasible and it is expected that those are realized hereafter.

(2) Accumulation of data related to farm management

Data related to farm management of items such as kiwifruits, nashi (Japanese pears), kaki (persimmons) and broccoli should be accumulated continuously.

(3) Test sales

- 1) Test sales of nashi (Japanese pears), peaches and kiwifruits should be executed at some proper markets to examine marketability including taste, quality and price.
- 2) It is expected that accurate data on distribution is collected through test sales.

(4) Counterpart of joint corporation

- 1) The seventh five year plan of Turkey is under preparation and the agricultural development plan should be in line with this plan. The contents of these plans should be grasped.
- 2) The Turkish government have been encouraging privatization as a fundamental policy. The operation policy of TIGEM may highly affect the business scheme because TIGEM becomes a candidate of counterparts of joint corporation depending on TIGEM's policy.

(5) Selection of site for seed business

The most suitable site for seed production in Turkey differs according to the items. It is necessary to decide the appropriate counterpart and to select the suitable site item by item throughout Turkey, and not restricted to just Adana region.

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