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IRAN

AGRICULTURAL PRODUCTION AND TRADE



ABSTRACT

Iran's economy is growing rapidly, exceeding 14 percent in both 1971/72 and 1972/73. Increasing oil production dominates export revenue. Agriculture's share of GNP continues to decline but it still employs the largest share of the labor force. Agricultural exports comprise about 7 percent of total exports and consist mainly of cotton, fruits and nuts, and hides and skins. Major agricultural imports are cereals, especially wheat, fats and oils, sugar, tea, and dairy products.

Wheat is the most important food grain. Production fluctuates substantially from year to year depending on the weather and Iran may be either self-sufficient or in need of imports. On occasion, wheat has even been exported. The growth of the livestock sector has been slow, due mainly to severe winters and lack of feed.

The land reform program, begun in 1962, is now substantially completed and is expected to stimulate agricultural development. Expanded irrigation facilities and increased productivity are major goals of agricultural development. In addition, efforts are being made to improve Iran's marketing and distribution systems.

Keywords: Iran, crop and livestock production, farm policy, marketing, farm inputs, land reform, trade, oil.

PREFACE

U.S. interest in Iranian agriculture stems from the trade between the two countries. From 1960 to 1970, U.S. agricultural exports to Iran nearly tripled, and Iran relies rather heavily on U.S. wheat during years of reduced domestic supplies. The United States imports a considerable amount of Iranian hides and skins, pistachio nuts, and other commodities. The United States Agency for International Development (USAID) was instrumental in a U.S. technical and economic assistance program in Iran, in existence from 1951 to 1967.

An important aspect of U.S.-Iranian cooperation in agriculture has been the training of Iranian personnel in the United States. These people now form the nucleus for many of Iran's projects to improve agricultural production and marketing.

EXPLANATORY NOTES

Monetary units	Before February 1973: 75.75 Iranian rials = 1 U.S. dollar. After February 1973: 68.13 Iranian rials = 1 U.S. dollar.
Weights	All tons are metric at 2,204.6 pounds unless otherwise stated.
Trade year	The Iranian trade year and budgetary year begin on March 21 and end on March 20.
Land measure	1 hectare = 2.471 acres.
Statistical reliability	As in any developing country, the reliability of the data is questionable. Iranian agricultural statistics have been collected under loosely controlled conditions. Iran is just now beginning to establish a reliable agricultural statistical collection system.

CONTENTS

	<u>Page</u>
Summary	v
The People	1
Inhabitants have varied origins, speak many languages	
The Government	1
Country ruled by constitutional monarch	
The Economy.	3
Rapid development is spurred by increased oil revenues... agriculture's share of GNP is declining	
The Climate.	4
Weather is major factor in agricultural production, especially for livestock and food grains	
Land Characteristics and Uses.	5
High percentage of cropland lies fallow...potential for expanding cropland is great	
Land Reform.	8
Private land has been redistributed to former tenants	
Crop Production.	9
Wheat is most valuable crop, followed by cotton and rice	
Livestock and Livestock Products	23
Overgrazed rangeland impedes progress in improving livestock production	
Consumption.	28
Only half of households meet minimum caloric requirements... food grains make up two-thirds of diet	
Farm Practices and Cropping Patterns	29
Farming methods are primitive but farmers are receptive to change	
Selected Agricultural Inputs	30
Increases in irrigation, fertilizer, and machinery use are emphasized	
Marketing, Transportation, and Storage	35
Numerous marketing problems encourage high food prices	
Farm Organizations	37
Government has largest role in agriculture but cooperatives are growing rapidly	
Agricultural and Trade Policy.	38
Exports of processed farm products are promoted to reduce Iran's dependence on oil revenues and agricultural raw materials	
Agricultural Trade	41
Agriculture has small share of trade...cotton is exported, wheat and vegetable oils imported	
Foreign Assistance	47
Technical assistance and bilateral arrangements benefit Iran	
Fifth 5-Year Development Plan.	48
Although agriculture is emphasized, its growth is expected to be below that of the general economy	
Literature Cited	49

TABLES

<u>Table</u>	<u>Page</u>
1. Population and rate of growth.	3
2. Land use	6
3. Area cropped, area irrigated, and percent irrigated.	7
4. Selected data on the land reform program and rural cooperatives	10
5. Production by commodity and indices of total and per capita agricultural production . .	11
6. Planting and harvesting calendar for selected crops	14
7. Cotton area, yield, and production	16
8. Livestock numbers.	25
9. Agricultural exports, quantity and value	42
10. Agricultural imports, quantity and value	44
11. Major U.S. agricultural imports from Iran. . . .	46
12. Major U.S. agricultural exports to Iran.	46

CURRENT SITUATION IN IRAN

As this report goes to press, a number of changes taking place in Iran will significantly alter the future of the country. As the leading exporter of crude oil in the world, Iran is benefiting greatly from the increased prices. Its earnings from oil exports in calendar year 1974 are likely to total around \$18.5 billion, compared with \$2.4 billion in calendar 1972.

The tremendous increases in oil revenue will most certainly affect a further reconsideration of the Third 5-Year Development Plan, which began in March 1973. Already at that time, the Plan was under revision due to the revaluation upward of the Iranian rial.

Now further extensive revisions are being formulated for utilizing the dramatic increases in foreign exchange earnings.

Overall development spending, originally planned for \$35.8 billion during the 5-year period, will be increased by at least \$10 billion. While ample resources will be available to the Government of Iran to fund development outlays of even greater magnitude, spending will be held down to some extent by fears of mounting inflationary pressures and because of numerous bottlenecks in the economy, such as limited port facilities, a strained internal transportation system, and inadequate development of water resources for agriculture.

This report was basically completed before the oil embargo began and before the sudden and steep price increases and before a full revision of the present 5-Year Plan was complete. It therefore does not cover the most recent period. The short section on the Third 5-Year Plan is a result of the original Plan and does not reflect any of the planned revisions.

SUMMARY

Agriculture is the mainstay of Iran's employment, yet its share in the Gross National Product (GNP) is declining. Agriculture accounts for only about one-seventh of GNP, compared with one-fourth in the mid-1960's and 90 percent at the turn of the century. One important factor in this decline is the high growth rate of other sectors--particularly oil, which dominates the economy. Over the Fourth Development Plan period, 1968/69-1972/73, agriculture's annual growth was 3.9 percent, compared with an overall annual growth rate of 12 percent.

Wheat is Iran's principal grain. It is grown more extensively than any other crop and is by far the most valuable crop. Cotton and rice are the next most valuable crops. Fruits and nuts account for about 15 percent of total crop output and are used primarily by the domestic market, although almonds, pistachios, dates, and raisins are relatively important export crops. Production of oilseeds, dry legumes, and fodder crops is increasing. Sugarbeets, tobacco, and tea are important cash crops.

Livestock contributes 25 to 30 percent of the value of all agricultural production. Until recently, very little was done to improve livestock production. Now, a gradual shift from nomadic livestock to organized large-scale production is being pursued. The Government is encouraging foreign investment in the livestock sector.

Despite increasing use of irrigation, insufficient water remains a major constraint in agricultural development, causing much fertile land to lie undeveloped. If the population continues to grow at the present rate of about 3 percent annually, Iran will need to make better use of its water resources to meet expanding food requirements. The country's productive capacity can also be improved by adopting more modern technology, by improving cultural practices, and by increasing yields on presently cultivated areas. Efforts are now being made to make more farm machinery and fertilizer available to farmers.

The Iranian land reform begun in 1962 is now virtually completed. The goals were to remove undue political and social power from the landlord class, improve the social and economic status of the peasant class, and increase agricultural production by encouraging farm-level capital investment. These objectives were supported by organizing farmers' cooperatives, supplying more credit, and extending improved genetic stocks and technologies to farmers. While at the outset the program tended to stifle investment and productivity, in general it has been implemented smoothly, and hopefully will stimulate agricultural development.

Recent increased interest in Iranian agricultural marketing is a result of rapid growth of urban communities with expanding aggregate demand, together with the development of large agricultural enterprises seeking markets for

their commodities. The lack of efficient marketing and distributing systems has resulted in high transportation costs, large wholesale and retail margins, very low producer prices, and high retail prices. Present inefficient marketing and production methods are sustained and protected by import taxes and prohibitions and restrictions on cheaper imports. The Fourth Development Plan sought to improve the marketing system by establishing an organization to teach modern marketing techniques, expanding storage capacity, and in other ways. Much progress has been made in improving the transportation system and providing farmers access to markets. However, further reduction of transportation costs is essential for continued commercialization of Iran's agriculture.

Iran's total exports amounted to \$2.7 billion in 1971/72, of which \$2.3 billion was from petroleum and \$170 million from agriculture. Leading agricultural exports are cotton, fruits and nuts, and hides and skins. Skins gained an increasingly large share of the value of farm exports through 1969/70 but declined in 1971/72. Carpets, an important nonagricultural export, depend on the livestock sector for raw material. U.S. agricultural imports from Iran in calendar 1972 totaled \$38 million and consisted primarily of hides and skins and pistachio nuts.

Agriculture's share of total imports has been declining. Leading agricultural imports are wheat, rice, fats and oils, sugar, tea, and dairy products. Wheat imports depend on domestic production and have been substantial at times. Imports of live animals, meat and meat preparations, animal feed, and natural fibers have been increasing. U.S. agricultural exports to Iran totaled \$76 million in calendar 1972; major items were wheat, rice, corn, vegetable oil, and inedible tallow.

Iran's trade policy seeks to protect and expand local industry, regulate the balance of payments, and promote exports. Import substitution through domestic production of certain crops and processed foods is encouraged. The Government is attempting to reduce dependence on oil revenue by promoting exports of processed farm products.

The Fourth 5-Year Development Plan, ended March 1973, was highly successful in industrial advancement but less successful in agricultural development. Output of petrochemicals, basic metals, and textiles continues to grow, accompanied by a rise in industrial employment and a substantial hike in industrial wages. Government efforts to stimulate greater efficiency in local industry are continuing. The Fifth 5-Year Plan (1973-77) gives greater attention to agricultural development, such as expanding wheat acreages and increasing yield.

IRAN: AGRICULTURAL PRODUCTION AND TRADE

by

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THE PEOPLE

Iran's population numbered slightly over 31 million in 1972 and was growing at an annual average rate of about 3 percent (table 1). The population density was 48 persons per square mile in 1971. Ninety-eight percent of the people are Moslem. Smaller religious groups include Armenians, Bahajis, Nestorian Christians, and smaller groups of Jews and Parsis (Zoroastrians).

The Iranian people are a product of centuries of invasion. Most are of Aryan stock, much diluted by centuries of intermarriage with other groups. While most people speak Farsi, the national language, many dialects prevail. Other tongues spoken are Kurdish, Baluchi, Arabic, Armenian, Turkish, and Aramaic. French, long a favorite European language, has been replaced by English. Around the central core of Farsi-speaking peoples are other ethnic groups overlapping Iran's frontiers. Thus, in the southwest of Iran (fig. 1) an area of Arab population merges with one of Iraqi population and in the northwest, as well as in Iraq and Turkey, there are Kurds. The inhabitants of the province of Azerbaijan came from Central Asia and speak a form of Turkish known as Azeri. East of the Caspian Sea, there are Turkomans on either side of the frontier between Iran and the Soviet Union. In the southeast, there are Baluchis on the Iranian-Pakistani border (31). 1/

THE GOVERNMENT

The Government of Iran is a constitutional monarchy headed by a Shah-anshah--"King of Kings." The present reigning sovereign is Shah Mohammad Reza Pahlavi, the second ruler of the dynasty. He succeeded his father, Resa Shah Pahlavi, in 1941 and was officially crowned in 1967. The Shah is the Chief of State and Commander of the Armed Forces. Under the Iranian Constitution, enacted in 1906, he has the power to call special sessions or dissolve Parliament. He appoints the Prime Minister and Cabinet members.

1/ Underscored numbers in parentheses refer to items in Literature Cited at the end of the report.

Table 1--Population and rate of population growth, Iran, 1956, 1966, 1972, and projected 1982

Year	Population			Annual rate of growth of total population
	Total	Rural <u>1/</u>	Urban <u>2/</u>	
	- - - - <u>1,000 people</u> - - - -			<u>Percent</u>
1956 <u>3/</u> . . .	19,321	13,221	6,100	---
1966 <u>3/</u> , <u>4/</u> .	26,090	16,232	9,858	3.10 (1956 to 1966)
1972	31,169	17,922	13,247	2.96 (1966 to 1972)
1982	41,394	20,040	21,354	2.8 (1972 to 1982)

1/ Under 5,000 people.

2/ 5,000 or more people.

3/ Adjusted for under-enumeration.

4/ Including tribal.

Source: (13).

The Parliament consists of two houses--the Majlis (National Assembly) with 219 popularly elected seats and the Senate with 60 seats, half appointed by the Shah. Legislation must pass both houses and be signed by the Shah to become law.

The judicial system is modeled after the French system. A Supreme Court, Courts of Appeal, Primary Courts, Justices of the Peace, Municipal Courts, and Special Courts comprise the administrative structure of the judicial system. There are also local courts in towns and Arbitration Councils in rural areas which handle local civil and petty criminal cases. The Shah, with the recommendation of the Ministry of Justice, appoints the judges (17).

THE ECONOMY

Iran was an extremely underdeveloped country until recently. Within the past 40 years--and mostly within the past 15 years--it has been transformed into a country with a large, dynamic, and increasingly modern economy. The significant progress in development has been due to the substantial increase in oil revenues.

In the early 1960's, Iran's growth performance was not outstanding. Gross National Product (GNP), excluding the oil sector, grew at an annual rate of 5.1 percent during 1959/60-1964/65. Agricultural production grew at only half the population rate, a significant lag. But this period saw the reversal

of the country's balance-of-payments deficit and, through its repayments of foreign loans, it became a net exporter of capital.

The mid-1960's marked a turning point in Iran's economic growth. GNP growth averaged 10 percent annually and, more importantly, per capita income increased by 40 percent during the 5 years ending in 1969/70. Manufacturing output grew more than 14 percent annually.

In real terms, the GNP increased at an annual compound rate of 10 percent during 1968/69-1970/71, 14.3 percent in 1971/72, and 14.7 percent in 1972/73. This especially sharp increase reflects the rapid rise in value of the oil sector due to financial agreements with oil companies and the substantial increase in petroleum production.

Agriculture continues to decline as a component of GNP. It represented 15 percent of GNP in 1971/72, compared with 25 percent in the mid-1960's. On the other hand, the oil sector's contribution to GNP (value added in domestic production less profit remittances by foreign-owned oil companies) increased from about 12.6 percent in 1963/64 to about 17.7 percent in 1969/70, an annual compound rate of 16.2 percent (15).

Despite efforts of the Iranian Government to diversify its industry and emphasize growth in all sectors of the economy, the oil industry remains the primary source of income. Oil revenue supplied 50 percent of the combined receipts of the treasury and funding for the Plan Organization during 1965-69. 2/ Furthermore, oil provided just under 90 percent of Iran's export earnings in 1971/72.

The country's growing and increasingly diversified industrial base is being spurred on by Government credits and incentives. There is a gradual shifting into the manufacture of intermediate and finished products and an expanding of export markets. Industry continues to be plagued by high costs, especially the lack of economies of scale.

THE CLIMATE

Weather is a major factor in agricultural production, particularly for food grains and livestock, despite the gradual increase in irrigated areas. Droughts are not uncommon; the last severe one occurred in 1971.

2/ The Iran Plan Organization--since 1973, known as the Plan and Budget Organization, with the Minister of State as its director--is in charge of preparing the Master Plan for the 5-year development plans. It is also charged with supervising the implementation of smaller plans within the framework of the Master Plan, and with financing the Plan.

Within recent months, some aspects of the Plan implementation have been transferred to the respective ministries responsible for certain sections of the Plan. The foreign loan section once within the Plan Organization is now within the Ministry of Finance.

Iran's climate is characterized by hot summers (except in the northwest along the Elbruz Mountains and the Caspian Sea), generally cold winters, and frequent high winds. Summers are marked by the dry monsoon winds which blow from Pakistan and the Indian Ocean. Winters are marked by cold air streams from Siberia. But most of the country (with the exception of small parts barred by mountains) receives modifying warm, damp air from nearby seas.

The Elbruz Mountains just north of Tehran form a great climatic divide, producing the most significant contrasts in Iranian climate. To the north of the mountains, there is year-round warmth with abundant moisture. To the south, there is a desert with frigid winters and hot summers. In July and August, the mean monthly temperature in the north can rise to 79° F along the Caspian Sea, and it is between 77° F and 82° F on the northern part of the plateau. At Tehran, the temperature sometimes reaches 109° F but falls rapidly at night due to the city's high altitude. The southern coastal region is very hot from May to September. In Abadan, on the Persian Gulf, temperatures as high as 123° F have been recorded, but the mean temperature there for the months of July and August is under 100° F.

LAND CHARACTERISTICS AND USES

Iran separates the Soviet Union in the north from the Persian Gulf in the south. It comprises the western part of the Iranian Plateau, a vast upland region bounded on the west by precipitous ranges and on the east by the mountains and hills bordering the Indus Valley. The climate and terrain of Iran and the southwestern part of the United States are similar, except that Iran is generally more arid. Its area is slightly less than the combined areas of Texas, Oklahoma, New Mexico, Arizona, and Nevada--165 million hectares (628,000 square miles). Approximately three-fourths is wasteland suitable only for sparse grazing. Only 4 percent of the total area is under crops in any 1 year (tables 2 and 3).

The Gilan Plain, which ranges from 15 to 60 miles wide, lies between the Elburz Mountains and the Caspian Sea. This area, the country's most densely settled rural area and one of the oldest cultivated regions in the world, is by far the best agricultural area in Iran. Cotton, grains, tobacco, tea, fruits, and vegetables are produced there.

In the Elburz range near Tehran is the 18,934-foot Mount Damavand, Iran's highest peak. Cropland is scarce in this range, but the lower grass-covered slopes support the considerable number of livestock owned by pastoral people. As the mountains extend to the east, they gradually decrease in height and are broken by relatively broad valleys.

As in many developing countries, cadastral surveys often present conflicting or questionable data. The amount of land lying fallow and the amount under permanent pasture is debatable. Of the total 19.0 million hectares of cropland officially reported in 1967/68, 7.1 million hectares were under cultivation and the rest (61 percent) was temporarily fallow. This is a rather high percentage of cropland lying fallow, yet it is considerably below the commonly reported figures ranging from two-thirds to three-fourths. Some rangeland is classified as fallow since it is cultivated in years of good rainfall.

Table 2--Land use, Iran, 1967 and 1972

Land use	1967		1972	
	Area	Total land area of country	Area	Total land area of country
	<u>1,000 ha.</u>	<u>Percent</u>	<u>1,000 ha.</u>	<u>Percent</u>
Total cultivated land, including fallow:	19,000	11.5	19,000	11.5
Area under annual and permanent cultivation:	7,100	--	7,650	--
Irrigated.	(3,150)	--	(3,450)	--
Prepared for cultivation beneath dams	--	--	(100)	--
Dry farmed	(3,950)	--	(4,100)	--
Area temporarily fallow.	11,900	--	11,350	--
Permanent pastures and meadows <u>1/</u>	10,000	6.1	10,000	6.1
Forests and woods <u>2/</u>	19,000	11.5	19,000	11.5
Uncultivated land capable of reclamation and development <u>3/</u>	31,000	18.8	31,000	18.8
Uncultivable land including mountains, deserts, lakes, cities, roads, etc.	86,000	52.1	86,000	52.1
Total.	165,000	100.0	165,000	100.0

() = estimated.

1/ Includes only relatively good pasture land

2/ Includes some permanent pasture.

3/ Includes depleted pasture lands.

Source: (13).

Table 3--Area cropped, area irrigated, and percent irrigated, Iran, 1960

Area	Area cropped	Area irrigated	Percent irrigated
	<u>Hectares</u>		<u>Percent</u>
Wheat	3,663,200	1,183,100	32.3
Barley	1,058,200	280,100	26.5
Rice	313,000	313,000	100.0
Millet	21,670	12,100	55.8
Corn	11,390	9,080	79.7
Other cereals	11,620	5,200	44.7
Pulses	122,850	67,770	55.2
Potatoes	15,880	15,880	100.0
Cotton	283,740	146,720	51.7
Fiber crops	7,420	7,420	100.0
Sugarbeets	35,130	35,130	100.0
Tobacco	27,940	20,560	73.6
Sesame	46,140	22,670	49.1
Vegetables	28,340	22,370	78.9
Melons	93,240	37,300	40.0
Saffron	1,000	1,000	100.0
Spices	54,010	48,010	88.9
Alfalfa	85,760	83,160	97.0
Other field crops	62,250	39,130	62.9
Tree crops	197,462	160,931	81.5
Grapes	81,587	66,412	81.4
Tea	11,874	11,874	100.0
Sugarcane	125	0	0
Nurseries	35,818	25,981	72.5
Total cropped	6,266,646	2,614,899	41.7

Source: (11).

Four-fifths of the cropland is planted to wheat, barley, and rice. Commercially important crops are cotton, tea, sugarbeets, dates, pistachios, apricots, oranges, grapes, and almonds.

Iran has a potential for expanding its cropland by 30 to 50 million hectares (10, 13). Food and Agriculture Organization (FAO) projections show Iran's planted cropland at 9.5 million hectares by 1985 (13). Any such expansion would require a significant investment in improved agricultural technology and use of better crop rotation patterns. For the near future, the country's productive capacity can be improved by the use of more existing technology and improved cultural practices to increase yields on presently cultivated areas.

LAND REFORM

Historically, property rights to agricultural land in Iran have never been secure. In many areas, several people shared ownership of the same land. Whole regions were dealt out by the ruler to favored individuals at a fee with other obligations attached.

In 1950, the Shah took the first step in land reform by divesting himself of more than 2,000 villages. About 200,000 hectares of this land have been sold to about 25,000 former tenants. Distribution of certain Government-held lands was decreed in 1955 and implemented in 1958. Under this program, 100,000 families became owners of land sections of about 10 hectares of irrigated or 15 hectares of nonirrigated land.

The first serious effort to redistribute private land occurred in 1960, but much protest from landowners impeded progress. In 1962, a new law, referred to as "the Original Law," limited land ownership to one village. Mechanized farms, plantations, tea gardens, and orchards were exempt from this decree, but all other land had to be sold to the Government. The Government then resold the land to the farmers who were actually working the land, on the condition that they would supply their own draft animals, plows, and seeds, and would become members of the farm cooperatives organized as part of the reform program.

Since 1962, three phases of the land reform program have been implemented. The first was primarily aimed at carrying out the provisions of the Original Law. It is difficult to precisely assess the effectiveness of the first phase, but it is estimated that some 600,000 farmers became owners of the land they had previously held as tenants. Payment for the land was spread over a 15-year period. No effort was made to equalize the amount of land to which each farmer was entitled. This phase was officially completed in October 1963.

The second phase was begun in January 1963 when the Government put forward proposals affecting the landlord-peasant relationships not previously affected by the Original Law. Implementation of this phase did not begin until February 1965. Sharecropping was abolished and farmers were required to pay hired labor in cash rather than in kind. Land holdings were restricted to a maximum of 30 to 200 hectares, depending on the location and productivity of

the land. As in phase I, however, certain land holdings were exempted from the total amount of land allowed one owner. As of September 1967, officials working on the land reform program had distributed 92.8 percent of the properties classed as distributable under the ownership limitations (phase I) and had eliminated cropsharing tenancies on 99.5 percent of the properties not subject to distribution (phase II).

In 1968 the Distribution and Sale of Rented Farms to Farmers Act was passed, initiating the final phase of the land reform program under which areas previously rented had to be sold to the farmers or divided. By March 1973, 16,593 villages had been purchased by the Government and distributed to 787,000 farm families (see table 4).

In addition to the land redistribution aspects, the land reform program sought to stimulate agricultural growth by increasing productivity and to replace old subsistence farms with new, market-oriented enterprises. Also, a joint stock Farm Corporation Bill passed by Parliament in December 1967 sought to merge small holdings into large units. Although this program has developed slowly, it could result in significant increases in farm productivity and commercialization of Iranian agriculture.

The land reform program has also provided for various secondary rural improvements. New feeder roads are being opened, electricity is being extended to more and more villages, water systems are being built, and public paths are being constructed. The major weakness of the reform is that it has not provided land for those landless farm workers who were not farm operators (23).

CROP PRODUCTION

Iran's agriculture consists primarily of crop production (table 5). The livestock sector accounts for slightly less than one-third of the gross value of farm output and for about one-seventh of that of agricultural exports. Despite the expansion of the livestock industry, its share in agriculture declined during the Fourth 5-Year Plan (1968-72) (15).

Wheat and barley are the principal grains, together accounting for three-fourths of the land in crops and some two-fifths of the value of all crop output. By value, however, barley is only the fourth most important crop, and its share of the total value of farm output is about 5 percent. Wheat is the basic food grain and barley is used mostly as feed. Rice is important in terms of quantities produced but not in terms of area. It accounts for approximately one-eighth of the total value of crop production and vies for second place with cotton as the most valuable crop following wheat.

Cotton is the main cash crop and the major agricultural export. Fruits and nuts account for about 15 percent of crop production and are produced primarily for the local market. Almonds, raisins, pistachios, and dates are relatively important export crops. Sugarbeets, tobacco, tea, and other cash crops are of some importance. Production of oilseeds, dry legumes, and fodder crops is increasing.

Table 5--Production by commodity and indices of total and per capita agricultural production, Iran, average 1961-65, annual 1964-73

Commodity	Average 1961-65	1964	1965	1966	1967	1968	1969	1970	1971	1972	Preliminary 1973
	<u>1,000 tons</u>										
Wheat	2,801	2,600	2,900	3,190	4,000	4,400	3,900	3,800	3,870	4,034	4,000
Rice, paddy	766	860	845	875	954	1,000	1,046	1,138	1,046	1,015	1,023
Barley	980	949	1,000	1,000	1,020	1,160	1,200	1,200	800	800	900
Other grains	70	70	80	69	90	95	95	95	90	95	96
Beans, dry	35	40	39	35	63	63	63	63	63	63	64
Lentils	23	25	25	23	17	17	17	17	17	17	18
Chickpeas	49	50	50	50	25	25	25	25	25	25	26
Tobacco	16	19	25	20	22	20	17	17	18	20	22
Cotton	117	115	140	115	118	160	155	150	148	208	200
Cottonseed	258	257	312	230	233	320	352	341	280	320	300
Flaxseed	7	7	7	7	4	5	6	6	3	3	3
Sesame seed	6	6	6	8	7	8	8	8	3	4	5
Castor beans	8	8	9	9	9	9	9	9	9	9	10
Vegetables	1,002	1,000	1,100	1,110	1,110	1,150	1,200	1,250	1,275	1,300	1,400
Oranges and tangerines	41	40	42	45	48	50	52	54	55	57	60
Almonds, in shell	23	20	23	6	20	29	22	40	27	19	37
Walnuts, in shell	5	3	4	3	4	6	6	5	4	4	3
Filberts, in shell	16	13	13	13	13	13	12	12	12	12	12
Pistachios, in shell	7	8	7	15	4	16	7	16	8	16	9
Other fruit	997	1,100	1,005	995	1,000	1,100	1,100	1,200	1,150	1,200	1,200
Grapes	257	250	250	265	260	270	260	270	260	260	270
Tea	10	12	13	15	18	18	19	19	19	19	19
Olives	15	15	15	15	15	15	12	15	12	15	13
Sugar, raw	189	195	217	357	424	478	540	566	580	625	666
Raisins	50	35	43	63	45	60	35	60	60	45	50
Dates	302	285	285	290	280	280	290	310	280	300	285
Apricots, dried	9	7	8	3	7	9	4	12	7	10	12
Meats	193	189	199	210	226	240	252	240	239	263	276
Milk	1,554	1,350	1,600	1,700	1,900	1,900	1,800	1,900	1,900	1,900	1,900
Wool, greasy basis	18	18	19	19	19	19	20	20	19	19	17
Indices of production	<u>(1961-65 = 100)</u>										
Total agriculture	100	97	105	110	122	133	128	131	127	133	135
Per capita agriculture	100	94	99	101	109	115	108	107	100	102	101

Source: (26).

Grains

Wheat is the main food staple, providing an estimated half of the caloric intake of Iranians. It is grown on virtually every farm, except the very small ones on which only vegetables and other high-priced cash crops are raised. Wheat usually provides about one-third of total farm income.

The main areas of rain-fed wheat are in Eastern Azarbaijan, the Gorgan Plain, and, to a lesser extent, in Khorasan. Over the remainder of the country, most cereals are grown under irrigated conditions. Due to the oasis-like character of much of Iran's agriculture and to the crop-fallow system, only a small percentage of land is cultivated each year.

Several varieties of both winter and spring wheat are grown. The Azar variety is a drought- and rust-resistant winter wheat which grows well in the colder areas of the country. The Aqua Turkey variety, grown in the Caspian region, is a hardy wheat that can tolerate local conditions. The Akova variety, also grown in the Caspian area, has helped reduce losses from rust diseases. A few of the many other varieties are the Sho'leh or Flame, planted in the south in the spring on both rain-fed and irrigated land, and the Tabas and Rowshan, planted in the central part of the country in the spring.

Wheat production has increased significantly over the last decade, yet the increase has not been steady. Since most of Iran's wheat is grown under rain-fed conditions, there have been sharp declines in wheat output in years of particularly poor rain. For example, wheat production dropped from a record 4.4 million tons in 1968 to 3.8 million in 1971.

Wheat acreage has increased, and some progress has been made in increasing yield by using better cultural practices and more efficient inputs. The Government has introduced an "impact programme" (a package of supplies of agricultural materials and services to farmers) to improve the efficiency of production. High-yielding wheat varieties have also played a significant role in increased production. The first sowings of high-response varieties were made in 1969. One of these new "miracle" wheats is Penjamo 62. The seed, developed from Mexican strains, was imported from Turkey. Progress in expanding acreage of high-yielding wheat was delayed by dry weather and the total area sown to improved wheats was only 19,200 hectares in 1969/70 and 130,000 hectares in 1971/72. Plans call for increasing the sowings of high-response varieties to a half million hectares in 1974.

The Government's policy is to continue increasing wheat production. Iran estimates that at the beginning of the 1980's, it will require approximately 5.3 million tons of wheat for domestic consumption. Prior to the Second World War, it was a net exporter of wheat. Following the war, the situation changed dramatically and substantial imports have often been required. Generally, small net imports of wheat were required until 1964, and then quite sizable amounts were imported in 1964 and 1965. Consequently, great efforts were made to increase wheat production. Considerable amounts of new land were planted and bumper harvests in 1967 and 1968, resulting from favorable weather conditions, again reversed the wheat supply situation and Iran became a net exporter. This was partly prompted by the lack of storage facilities. Commercial silo capacity was estimated at 500,000 tons in 1970. For the

foreseeable future, Iran should continue to import wheat at an average of 500,000 tons annually. It is possible that once Iran is self-sufficient in wheat production, the emphasis of the agricultural program may switch to the increased production of barley necessary to supply feed to the growing livestock industry (19, 28).

Barley

Barley is planted in roughly the same regions as is wheat, but on a much smaller area and on much less productive land. In general, barley is a low priority crop. Compared with wheat, it gives a lower return to applications of fertilizer. Since barley requires less water than wheat, farmers frequently plant it as insurance against drought and failure of the wheat crop. Because of low prices, barley is holding its own only on really marginal dryland areas.

With the exception of the 1971 crop, barley production has trended up since the beginning of the 1960's. Annual production averaged 980,000 tons for 1961-65 and 1,116,000 tons for 1966-70. Iran is normally a net exporter of barley but has had to import on occasion, as in the mid-1960's.

The total area planted with barley has recently been between 1.5 and 1.7 million hectares, compared with 900,000 to 1.1 million hectares a decade ago. Yield has remained approximately the same, quite low at 800 kilograms per hectare in 1969 and 1970. It dropped to 570 kilograms per hectare in 1971 and 1972 because of extremely dry weather.

Winter varieties of barley predominate. In the colder northern areas, the Zafar Joe (Barley of Victory) is common. In the warmer south, Zar-Joe (Golden Barley) is more prevalent.

The use of barley as a food has declined in recent years. About 15 percent of total production is now used for food, and this is mostly in the rural areas where barley is used to make bread. Less than 2 percent goes for brewing and other industrial uses. The rest is used as livestock feed and as seed. Demand for barley as livestock feed is expected to increase (28).

Rice

Rice production increased significantly in the 1960's. Annual production of paddy rice averaged 766,000 tons in 1961-65 and rose to 1 million tons in 1966-70. The increased output is attributed both to increased yields and expanded acreage. Among factors contributing to the higher yields are the availability of better varieties of seed, improved cultural practices, expanded irrigation, and increased use of fertilizers and insecticides. Land area used for rice production is estimated to have increased by about 12 percent during the 1960's. An estimated 290,000 hectares were planted in 1973, compared with 280,000 hectares the previous year.

Rice production is concentrated in the Gilan and Mazandaran provinces. Soil preparation for rice planting begins in the winter and early spring (table 6) when the fields are saturated with water. Seeds are sown in May, sometimes in nurseries and sometimes directly in the fields. A constant flow of water is maintained throughout each paddy system. Weather is an important

Table 6--Planting and harvesting calendar for selected crops, Iran

Crop	Planting season	Harvesting season
Grains:		
Barley	October-May	April-August
Corn	April-May	July-September
Grain sorghum	April-mid-June	July-September
Rice	April-June	August-October
Wheat	October-April	May-September
Fibers:		
Cotton	Mid-March-May	September-November
Fruits:		
Apples	--	June-October
Apricots	--	May-August
Dates	--	September-October
Grapes	--	June-September
Lemons	--	September-December
Oranges	--	October-February
Pears	--	July-October
Nuts:		
Almonds	--	June-August
Pistachios	--	September-November
Walnuts	--	September-November
Oilseeds:		
Flaxseed	April-June	July-September
Sesame	April-mid-June	July-October
Sugarbeets	March-April	September-December
Tobacco	April-May	September-October
Vegetables:		
Broadbeans, dry	November-April	March-July
Broadbeans, fresh	November-mid-April	February-June
Beans, dry	March-May	July-September
Chickpeas	April-May	July-September
Lentils	March-May	July-September
Onions	April-May	August-October
Peas, fresh	March-June	May-September
Potatoes	March-May	May-November

Source: (27).

factor in the rice harvest. Should the harvest run into October, the chance of rainstorms increases and losses are common. Rice is cut by sickles and usually stored in the sheaf, but part is threshed at once to meet the farmer's immediate needs for food and cash.

Rice is the principal food in the Caspian coastal regions and is consumed by the more prosperous Iranians throughout the country. Within recent years the average per capita consumption of rice has been estimated at about 25 kilograms annually (compared with 34 kilograms in 1971 in the United States). In 1972/73, an estimated 750,000 tons of rice was consumed domestically. With the rapid population growth and increased income of the average consumer, consumption of rice will continue to increase steadily.

In the past, rice--purchased mainly by the Soviet Union--was a significant export of Iran. But within the last 10 years, Iran has required imports of rice to meet domestic requirements. The United States has been the main supplier. Still, rice exports have averaged around 1,000 tons annually.

The potential for expanding rice production is good. The expanded irrigation facilities in Gilan and Mazandaran, which produce 90 percent of the country's rice, will increase rice acreage by about 50,000 hectares. And the new varieties of rice released by the Ministry of Agriculture, with their higher yields and greater resistance to disease and insects, are quite promising (28).

Other Grains

Millet, corn, sorghum, rye, and oats are grown in small quantities. Livestock and poultry feeding are not yet developed enough to bring substantial acreage into production of feed grains. Some feed grains are imported and apparently are used by the dairy and broiler industry near Tehran.

Cotton

Iran ranks eighth in Free World production of cotton. In 1973, it produced 200,000 tons of cotton, second only to the record 1972 crop (table 7). Yields averaged quite low in 1971 and production totaled only 148,000 tons. Cotton exports are among Iran's largest earners of foreign exchange.

Acreage and yield have both increased substantially within the last 25 years. Between 1948 and 1962, area increased from 105,000 to 405,000 hectares. This was followed by some decline and area has generally fluctuated between 320,000 and 380,000 hectares annually since 1964. Yields, which averaged 2.5 quintals per hectare in 1954-58, increased to an average of 4.8 quintals per hectare in 1967-73.

The relative importance of major cotton-producing areas has shifted sharply during the past quarter century. The Gorgan-Conbad-e Kavus area, near the coast of the Caspian Sea, produced less than 10 percent of total cotton output in 1947/48. In 1970/71, this area produced nearly two-thirds of the total crop. Acreage was reduced in the Mazandaran and Khorasan areas, west and east of the Gorgan-Conbad-e Kavus area.

Table 7--Cotton area, yield, and production, Iran, average 1954-58, 1959-63, and 1964-68, and annual 1962-73

Year	Area	Yield	Production
	<u>1,000 hectares</u>	<u>Quintals/hectare</u>	<u>1,000 tons</u>
1954-58 Av.	256	2.5	63
1959-63 Av.	365	2.8	101
1964-68 Av.	354	3.6	127
1962	405	2.3	96
1963	400	2.9	115
1964	380	3.0	115
1965	380	3.7	140
1966	360	3.2	115
1967	290	4.1	118
1968	360	4.4	160
1969	380	4.1	155
1970	320	4.7	150
1971	320	4.6	148
1972	340	6.1	208
1973	340	5.9	200

Sources: (22, 28).

Two types of cotton are produced. Upland cotton--derived from U.S. upland varieties--accounts for over 98 percent of the crop. The remainder is an Asiatic type known locally as Boomi cotton. Parent stocks of Iranian cotton include American varieties (Coker 100 Wilt and Acala 1517), two local varieties (Filistania and Boomi), and a long staple Egyptian variety (Giza 31). The most important upland variety now produced is Coker 100 Wilt. It was introduced in the mid-1950's, and accounted for about 95 percent of total cotton production by 1970.

Most cotton farming operations are mechanized except for harvesting, which is done entirely by hand. Cotton may be transported to the gin by pack animals, by animal-drawn carts and wagons, or by large diesel trucks. Per unit production costs vary among farms within a farming area and are closely associated with yield differences (19, 22, 28).

Fruits and Nuts

Iran's climate is well suited to a wide variety of fruits and nuts. The most valuable fruits are grapes (including raisins), dates, citrus, and apricots. Other fruits include apples, peaches, cherries, pomegranates, plums, pears, quinces, figs, persimmons, strawberries, and mulberries.

Peaches and apricots are produced in every region of Iran, but the greatest concentration is in eastern Azarbaijan and Khorasan. These areas account for some 70 percent of total production.

Oranges and tangerines are grown mostly along the Caspian. Ninety percent of production is in the area of the Mazandaran between Ramsar and Behshar. Some oranges and grapefruit are grown in the inland southern belt, which consists of a patchwork of low valleys extending from central Beluchistan, through central Kerman and Fars, and ending in Khuzestan. These hot, humid areas produce over 60 percent of all citrus grown in Iran.

Citrus production in 1972 was roughly estimated at around 120,000-150,000 tons (13), about half of which was lemons and limes. 3/ A substantial expansion in fruit production is expected because the large number of trees planted since the start of the land reform are just now coming into full bearing. Many orchards were planted to avoid expropriation of land, since orchards were exempt from land reform.

3/ USDA figures show orange and tangerine production for 1972 at 57,000 tons--no figure is given for lemons and limes (26). The Fourth Development Plan gives an estimated figure for citrus for 1972 at 110,000 tons, with no breakdown (13). LeBaron gives production data showing oranges and tangerines for 1967 at 48,000 tons and lemons and limes for 1966 at 62,000 tons (19). LeBaron's extrapolation of total citrus production, based on estimated increase in numbers of trees of bearing age, shows 1965 at 160,000 tons, 1975 at 340,000 tons, and 1980 at 430,000 tons.

Iran produces over 30 varieties of grapes, several of which are dried. The most important in the raisin industry is the Sultana, a seedless variety closely related to the Thompson seedless of California. The Bidaneh, Askari, and Shahani varieties are also common. Seeded grapes are also produced in substantial amounts, but their export volume is insignificant.

Grapes are used primarily for fresh consumption and as raisins, but they are also used for pekmez (grape sugar), juice, and wine. Wine production is not large since Iran is a Moslem country and the religion prohibits the consumption of alcohol. But wine production is a growing industry, and the Kazvin and Shiraz wines are well known in West Asia.

Grapes are grown throughout Iran. The main regions with surplus production are east and west of Lake Urmia. About half of the raisin output stems from these areas. Other important production areas are northwest of Tehran, near Hamadan, and west of Meshed.

Fresh grape production has changed little from 30 years ago. Throughout the 1960's, grapes produced for fresh consumption only (not for drying) remained at around 260,000 tons. Total production figures for grapes are widely debated. The 1960 Agricultural Census reports some 337,000 tons of fresh grapes (11). This figure is quite low compared with data in studies done during the 1960's (19), which have enumeration errors both in yield and area. These studies estimated total production at about 436,000 tons in 1965.

Iran is the world's fifth largest producer of raisins after the United States, Turkey, Greece, and Australia. It also ranks fifth among exporters. The Soviet Union now ranks first as the market for Iranian raisins with West Germany, formerly the largest importer, second. East European countries are other important outlets (20).

Iran is the world's fourth largest producer and second largest exporter of dates. Its exports, however, are only about one-tenth those of Iraq, the leading exporter. Iran's main market is the United States. Dates are produced primarily on the Persian Gulf coast, in the southeast part of the country. They are a staple in this area, but a luxury in the rest of the country. By-products of date production--such as fodder, matting, ropes, and fuel--are important to the economy of the Persian Gulf region.

There are some 400 varieties of dates in Iran varying in quality, time of ripening, growth habits, and yield. Mazafteh (or Muzaafti) is famous throughout the country for its taste and size. Sair (or Sayir) is important in the export trade.

Age-old methods of packing dates in baskets made of matting are still frequently used. However, producers have recently begun to realize that to increase sales of dates, they must improve their marketing methods. In some places, modern packing equipment has been installed. Two major problems facing Iranian date exports are low world market prices and stiff competition from Iraq.

A variety of nuts are grown, of which pistachios and shelled almonds are the most widely exported. In the past decade, pistachios replaced almonds as

the leading nut crop. Walnuts and filberts are also grown, and black walnut trees are found throughout the country. Walnuts and hazelnuts are important for domestic consumption--exports are mostly to nearby Persian Gulf states.

The Rafsanjan-Kerman area accounts for most of the pistachio production and about 98 percent of the exportable crop. Although there are many wild species of pistachio only one--Pistachia vera--is cultivated. Pistachio trees produce cyclically, bearing a heavy crop of nuts one year and few the following year. Most pistachio groves are irrigated and fertilized. Grading is done by visual observation or by use of a coarse sieve.

Both sweet and bitter almonds are grown in all parts of Iran, except in the Caspian region and the Khuzestan Province. The best quality almonds are from the Tabriz area, and the next best are found east of Tehran. Almond production in shell has remained basically static over the last decade, although there have been wide year-to-year fluctuations, ranging from 6,000 tons in 1966 to 40,000 tons in 1970. Average annual production for 1961-65 was 23,000 tons.

Measures are being taken to improve domestic and international marketing of fruits and nuts. Some progress is being made in grading, selecting, and packing, and the requirements and standards of overseas markets are beginning to be met. Increased export earnings can be expected from improved commercial practices. There is also considerable interest in expanding processing facilities.

Sugar

Iran produces both beet and cane sugar. Beet sugar production is much the larger, accounting for over 90 percent of output. Almost the entire sugarbeet area is irrigated. Khorasan accounts for almost half of total beet production. Other production areas are Fars, Esfahan, and the Azarbaijan region.

Sugarbeet area and production have both substantially increased within the last decade. Area tripled between 1960 and 1969, from 51,000 (1959-63) to 150,000 hectares. Beet production increased from an average of 895,000 tons annually during 1959-63 to 4,575,000 tons in 1973. This very sharp production increase was due to a strong Government push and promotion by cooperatives and other private organizations.

Sugarbeet yields remain low. This is primarily due to poor cultivation methods such as seed broadcasting and insufficient weeding and thinning. Pest damage also contributes to low yields. Yield is also low because goats and sheep eat the leaves of the beets before the harvest, reducing the sugar content. Average yield in the early 1960's was 14 to 18 tons per hectare. With improved farm practices, this could be increased by 50 percent. The Fourth Development Plan rather optimistically called for yields to increase to 30 tons per hectare by 1972 (19). The 1971 yield was just over 23 tons per hectare and the yield in 1972 and 1973 was 26 tons per hectare (28).

Iran has 28 sugar mills, 15 of which are state-owned and 13 privately owned. These plants supposedly have the capacity to produce all the sugar needed by the country and can presently handle any foreseeable increased input.

Total processing capacity per day is 40,000 tons of beets or cane. With a 110-day work period, this totals 4.4 million tons of beets annually (14).

Sugar consumption was about 720,000 tons in 1973. The average for 1967-71 was 611,000 tons. The beet factories can refine 600,000 tons annually and it was thought that the difference could be made up through the production and refining of cane sugar. Thus, the Government's policy was to terminate sugar imports in 1972. However, this did not occur and 1973/74 imports are forecast at 250,000 tons, mostly due to increases in domestic consumption. The Soviet Union and Cuba have been the largest sugar suppliers.

Sugar byproducts have so far been largely wasted. A program is underway with U.S. technical assistance to make better use of these byproducts.

Tea

Iran is a tea-drinking nation and tea has been cultivated there since the beginning of this century. Until the 1950's domestic production supplied only 10 to 15 percent of total consumption. But within recent years, the Iranian tea industry has made great strides. By the mid-1960's, half of the domestic demand was met by tea produced locally. Tea production has about doubled since the early 1960's, from 10,000 tons yearly during 1961-65 to 19,000 tons in 1972.

To supplement domestic production, Iran has had to import some tea. As production has increased, imports have declined, although about 7,300 tons were imported from India and Sri Lanka in 1971/72.

Almost all Iranian tea is grown in the Gilan area near the Caspian Sea coast. In recent years, competition for land from fruits and vegetables has driven tea cultivation to higher elevations in the mountains. As of 1972, about 30,000 growers cultivated approximately 31,000 hectares of tea, grown on areas ranging from 1 to 5 hectares in size. Both Assam and Chinese tea varieties are cultivated.

Soil and moisture conditions are not ideal for tea cultivation. The tea-growing season is between April and August, but most of the moisture falls in the fall and winter months, when moisture content is low. The hot, dry summer causes severe damage to young tea plants. Consequently, tea cultivation in Iran differs considerably from that in other major tea-producing countries. The plants are planted 120 centimeters apart in rows which are 80 to 100 centimeters wide to preserve moisture and promote leaf growth. The leaves are picked 10 to 20 times a season, according to local conditions.

Tobacco

Tobacco production increased to a high of 25,000 tons in 1965, then declined and leveled off to about 20,000 tons in 1972 and 1973. Iran produces enough tobacco to meet domestic consumption and exports about 1,000 tons annually. Leaf tobacco produced in Iran is used mainly for domestic cigarettes and leaf export has been very small. Plans are to keep oriental-type tobacco acreage at about the same level as in 1971, while increasing acreage of other types of tobacco.

Due to the improved standard of living, the domestic consumption of cigarettes--especially filter cigarettes--is increasing. Total tobacco consumption was 17,500 tons in 1972, somewhat down from 1971, due to use of filter cigarettes which require less tobacco. Despite increased production and sales of Iranian cigarettes, smuggled American-type cigarettes are still in demand (28).

Tobacco is grown in West Azarbaijan and Gorgan by the use of supplemental irrigation. Rain-fed cultivation is confined mainly to Gilan. Iran produces an oriental tobacco, Basma, in the northwest, Terabusan in the Gorgan area, and a variety similar to Terabusan in Gilan. In recent years, blue mold has been a serious problem in the Caspian coastal region. However, with the use of better management techniques, this disease has been brought under control.

Tobacco leaves are produced by farmers under special contracts with the Iranian Tobacco Company (ITC), which controls the marketing and trading of tobacco products. The ITC determines the total acreage of land under tobacco cultivation. Each farmer's contract specifies how much tobacco to plant and which variety to grow. All the necessary work for production including seed-bed preparation, transplanting, harvesting, sorting, and baling is done by the farmers.

The ITC supplies free seed to the farmers. Seeds of various tobacco varieties are produced by the ITC in its Tobacco Research Centers and the experiment stations located in different parts of the country. Farmers also receive financial assistance from the ITC for constructing curing barns; purchasing irrigation equipment, pesticides, fertilizers, and farm machinery; and other expenses encountered during the growing season.

After harvesting, the crop is processed and baled by the growers. The company warehouses receive and grade the baled tobacco. The ITC purchases all tobacco output, paying the farmer according to 12 quality classes. It is kept in the company warehouses for required aging and fermentation.

Oilseeds

The production of oilseeds during the 1971/72 crop year is estimated at 336,000 tons, compared with an output of 445,000 tons the previous year. The low production was due to reduced planted acreage and the prolonged severe drought. In 1972/73, production rose to an estimated 568,000 tons ^{4/} due to attractive cotton prices offered the previous year, and improved conditions which induced farmers to increase the cotton acreage.

Cottonseed is the most important oilseed produced in Iran, usually accounting for 90 to 95 percent of the total oilseed output. Other oilseed crops produced in the country are flaxseed, castor beans, sesame seed, peanuts, olives, soybeans, and sunflowerseed. The production of castor beans remained nearly steady during 1966-70 but has declined in recent years. However, the

^{4/} This includes production figures for groundnut oil, sunflowerseed oil, and safflower and soybean oil, as well as the oilseed figures shown in table 5.

reported figures for area, yield, and production did not change once during 1966-70 and are thus questionable. Sunflowerseed appears to be the oilseed crop best adapted to Iran's soil and climate. Also, sunflowerseed--with an oil content of about 40 percent--seems to be well suited to the growing demand for oil. However, during the last 4 years, sunflowerseed production has shown little increase. Farmers are not satisfied with the yields and have shifted toward cotton production, which provides more labor for the family in planting and harvesting the crop.

Industrial plants have been built to process imported crude vegetable oils and to crush both domestic and imported seed. Oil production from domestic seed averaged about 37,000 tons during 1965-69. This met only about one-third of domestic requirements. Total production of vegetable oil from crushing during 1972/73 has been estimated at about 84,000 tons, compared with an unusually low level of 60,000 tons the previous year. The production of cottonseed oil rose to an estimated 50,000 tons in 1972. Nearly 95 percent of the seed is crushed with an oil extraction rate of 16.5 percent.

The consumption of vegetable oils has increased at an annual rate of 6 to 7 percent since 1950. Previously, animal fats accounted for almost all the fat in the Iranian diet. The improved standard of living and the increased population are factors in the rising consumption.

Pulses

Pulses are grown under both irrigated and rain-fed conditions throughout Iran. Production in 1972/73 is estimated at about 145,000 tons, compared with an average annual production during 1961-65 of 107,000 tons. Beans, chickpeas, and lentils comprise about 75 percent of total production.

Approximately 55 percent of the pulses are grown under irrigation. The largest producing provinces are Mazandaran, Gilan, East Azerbaijan, Khorasan, Fars, and Kermanshah, which produce approximately 80 percent of all pulses produced in Iran.

Dry beans are the most important and most widely grown of the pulses. Broadbeans probably have the most limited production area, with concentration in Khuzestan and in the Caspian coastal area. Except for broadbeans, crops are planted in the spring and either harvested in the spring as green vegetables or left to mature for harvest as dry beans.

Chickpeas are widely grown. There are three main types: (1) A large white-seeded type used for cooking, (2) a small black-seeded type which is called a split pea when the seed coat is removed, and (3) a medium-to-small brown-seeded type used for roasting, somewhat like popcorn.

Lentils, planted in the fall and early spring, are widely used in soups. Cowpeas are planted on small acreages, often on the borders of irrigated fields used for other crops. Mungbeans are not widely grown, but are planted in many areas in the wheat stubble.

Pulses are more important as a source of protein in Iran than in many other countries. Efforts are being made to increase production by such

methods as introducing new and more adaptable seeds with higher protein levels. More modern cultivation methods are being encouraged, such as the use of chemical fertilizers and furrow rather than flood irrigation.

Other Crops

Fresh vegetable production approximated 1.3 million tons in 1972, a significant increase over the 1.0 million tons averaged during 1961-65. Approximately one-third of all fresh vegetables are grown under rain-fed conditions. Substantial quantities of onions and potatoes are grown on irrigated areas. Melons and watermelons are grown throughout Iran almost totally for domestic consumption. During the summer months, some poor people live almost exclusively on bread and melons.

Kenaf production was between 5,000 and 6,000 tons at the end of the 1960's. Some efforts have been made to increase production of kenaf along the Caspian coast.

Both black and green cumin seeds are produced. The black variety grows wild and is of little commercial importance. The green variety is the one commonly known as cumin and Iran exports about 10,000 tons in a normal year. The United States, Sri Lanka, and Pakistan are the main markets. Aromatic seeds and spices are important import as well as export items, although statistics on these commodities are either nonexistent or unreliable. A substantial amount of gum tragacanth is exported annually. It is estimated that about half of the caraway production is exported.

In past years, Iran was one of the major opium-producing countries in the world, with about 30,000 hectares in production. In 1955, the Government banned the production, processing, import, and use of opium and opium derivatives. In 1969, however, it again authorized opium cultivation, partly to offset opium smuggling from neighboring countries.

LIVESTOCK AND LIVESTOCK PRODUCTS

Livestock and livestock products are extremely important to both the national and rural economies of Iran. The livelihood of more than 3 million people depends on livestock. The rural people derive many important services--such as pack and draft power--and animal products from livestock. A substantial share of Iran's agricultural exports is derived from some form of livestock products. Livestock numbers are increasing, and will continue to increase despite annual fluctuations caused almost exclusively by weather conditions.

Meat and dairy products account for probably four-fifths of the total value of livestock products. Milk production is currently estimated at 1.9 million tons. Cows provide about 55 to 60 percent of the milk produced, sheep about 20 to 25 percent, goats 15 percent, and buffalo 5 percent. The Iranian diet remains seriously deficient in dairy products despite the consumption of some raw milk, pasteurized milk, cream, dried milk, condensed sour milk, ghee (a clarified butter used for making oil), and butter.

Very little has been done to improve livestock production. In the mid-1960's, Iranian livestock producers were considered to be at about the same stage of development and handling as U.S. producers were in 1820-50. Iran, like other Middle East countries such as Turkey, suffers from herd sizes much too large for the available pasture and rangeland. Eighty percent of the rangelands are overgrazed. Overstocking of the range causes losses of animals from starvation each year. The natural range plays an important role in the country's livestock economy, but mismanagement has depleted this resource to the point where it is an acute problem in the development of satisfactory livestock industries.

Sheep and Goats

Sheep and goats are the predominant livestock, with sheep the more important (table 8). They are the principal sources of meat in Iran, and they contribute a substantial share of the diet in the form of yogurt and cheese. They also provide wool, hair, and skins for domestic needs and for export.

Sheep are raised throughout the country, but are especially concentrated in the northwest, northeast, and southwest. Sheep and goat husbandry practices are divided into two categories--tribal sheep and goat owners and village sheep and goat owners. Village sheep flocks average 200 head and tribal flocks are about one-third larger. Of the 43 million sheep and goats in Iran in 1966, about 18 million were kept by tribal herdsmen (3).

The tribes make two migrations a year. In the summer, the flocks are on high altitudes, grazing on summer ranges which usually offer a plentiful supply of good quality grass. During the winter and part of the spring, the tribes take their herds to the winter ranges. Because of mismanagement, drought, and overgrazing, Iran's winter ranges are very poor. Heavy animal losses occur from diseases and malnutrition, and frequently during migration sheep lose most of the weight that was gained during summer grazing.

Sheep and goat owners in the villages use antiquated livestock management practices. Animals are usually of low quality and undernourished.

The native fat-tailed sheep is a very hardy animal. It produces wool, meat, and skins that can be readily marketed. The white-bodied Makou breed is prevalent in the Azarbaijan region. The Baluchi (white body with black markings on its head and legs) is found throughout the eastern part of the country. The Karakul breed is well known for its lambskins, which are used in the fur pelt industry. This Persian lambskin was once Iran's most important export but is no longer important, partly because of competition from skins from Southwest Africa (Namibia) and Afghanistan.

Rambouillet rams have been introduced into native Moghan herds in an attempt to produce fine wool for clothing manufacture, which would enable Iran to reduce wool imports. The results so far are promising. Iran also has the Afshari and Awassi breeds which are used primarily for meat and milk, respectively.

Iran has a large goat population, of which the Raini is one of the most important breeds. The Raini produces from its undercoat a down known as

Table 8--Livestock numbers by type, Iran, 1954-72

Year beginning March 21	Sheep	Goats	Cattle			Horses	Hogs
			Total	Cattle and calves	Buffalo		
				<u>1,000 head</u>			
1954. . . .	17,750	10,000	5,120	5,000	120	370	13
1955. . . .	20,000	10,000	5,240 ¹	(5,050)	190	(407)	14
1956. . . .	(21,750)	(11,350)	(5,246)	(5,100)	(164)	(444)	(19)
1957. . . .	23,500	13,700	5,295	5,200	195	480	34
1958. . . .	24,000	14,000	5,500	5,300	200	480	35
1959. . . .	24,000	14,000	5,455	5,250	205	470	37
1960. . . .	23,700	13,900	5,403	5,200	203	450	38
1961. . . .	22,000	13,000	4,700	4,500	200	416	30
1962. . . .	22,436	13,260	4,794	4,590	204	424	31
1963. . . .	22,400	13,262	4,805	4,600	205	424	31
1964. . . .	20,195	12,599	4,805	4,600	205	424	31
1965. . . .	20,195	12,599	4,805	4,600	205	424	31
1966. . . .	29,500	13,500	5,430	5,200	230	428	35
1967. . . .	31,000	14,000	5,640	5,400	240	425	38
1968. . . .	33,000	14,500	5,750	5,500	250	425	40
1969. . . .	34,000	14,700	5,855	5,600	255	420	42
1970. . . .	32,000	14,000	6,080	5,800	280	420	46
1971. . . .	32,000	14,000	5,980	5,700	280	400	47
1972. . . .	32,000	14,000	5,980	5,700	280	---	47
1973 <u>1/</u> . .	32,000	14,000	6,530	6,250	280	---	48

() = estimated. -- = not available.

1/ Preliminary.

Source: (28).

Persian cashmere. Most of the country's goat population is nondescript and faces a constant and continuing threat to its fertility and stability.

Cattle

Little information is available concerning cattle and buffalo raising in Iran. Buffalo--and cattle in many cases--serve as draft animals and are eventually slaughtered for meat. Beef is less popular than mutton and consequently sells at substantially lower prices. Still, cattle herds are slowly increasing both for meat and milk production. The cattle are small and produce only small amounts of meat and milk--cattle carcasses average 200-220 pounds, and milk production usually ranges from 1,300 to 2,000 pounds per lactation period. There were an estimated 1.7 million milk cows in 1969. Most commercial dairy operations are concentrated near Tehran, where about 90 percent of Iran's bottled milk is processed (3).

Cattle are scattered throughout the northwest section of the country, with particularly heavy concentrations on the Caspian coast. They are raised by villagers on what are essentially open ranges, since villager groups control common lands. During the winter, the cattle are sometimes given supplementary maintenance rations, but most frequently they have to fend for themselves. During severe winters, huge numbers of cattle have starved on overgrazed ranges. Feedstuffs which could be used as supplementary feeds are being wasted (sugarbeet byproducts) or exported (cottonseed cake).

Donkeys, Horses, and Mules

As in any Middle East country, Iran has a large number of donkeys and some horses and mules. Donkeys are valued for their ability to subsist on meager forage and withstand adverse conditions. While modern transportation is expanding, donkeys are still used throughout the country as pack transport and as cart animals for short distances. Donkeys are particularly useful in the mountainous areas for hauling agricultural produce to market and returning with commercial products for the village.

Horses in Iran are small and are used for pack transport. Larger Arabian mixtures are used for some agricultural purposes and for riding by the nomads.

Hogs

Some hogs are raised in Iran. There have been small increases in the number of hogs, in hog slaughter, and in pork production, but increases are limited because pork consumption is prohibited by the Moslem religion. Consumption is confined to Christian minorities and a small group of foreigners.

Poultry

Iran's commercial poultry industry began in 1952 under the National Livestock Organization, which provided technical assistance to encourage poultry raising near urban areas. As a result, many people entered the poultry business. The growth of commercial poultry production has been spectacular. Poultry establishments have been continuously growing, both in size and in number.

In 1971, production totaled 75 million birds, compared with 30 million in 1967 and 5,000 in 1952. The current 5-year plan calls for an increase to 150 million birds by 1977. While the greatest expansion in the poultry industry has been near the cities, poultry production in small villages accounted for perhaps 10 million birds in 1967 and is also expanding.

Small domestic birds are being replaced by European and U.S. breeds including New Hampshires, White Rocks, and White Leghorns. Iran imported about 2 million baby chicks from Israel in 1967/68 and in 1968/69 but this trade has decreased. In 1971/72, Iran imported a total of 934,000 baby chicks, with 20 percent from Israel, 33 percent from Italy, 21 percent from the Netherlands, and the remainder from various other sources (4, 12, 28).

Wool and Animal Hair

The Foreign Agricultural Service, USDA, estimates that Iran's wool production in the 1960's averaged between 18,500 and 19,500 tons (greasy basis) (28). Most wool produced in the country is a coarse type and is used for carpets.

Iran is a net importer of wool, mostly fine wool used for textile manufacturing. Imports--mainly from Australia and Argentina--have increased steadily in recent years.

Annual wool exports in the early 1960's averaged around 5,000 to 6,000 tons, but dropped dramatically in 1965/66 to less than 1,000 tons. No exports are forecast for 1973/74. Exports depend greatly on the demand from the Soviet Union, for years Iran's only customer.

Iran produces Persian cashmere from the Raini goat and hair from other breeds of goats. Production in the 1960's was normally between 2,000 and 3,000 tons annually, but has since declined. The United States was the major customer for this product and imported the cashmere as a raw product until 1969, when Iran established a processing plant and banned export of the raw cashmere. The processed product is now exported to the United States.

Hides and Skins

Domestic production of hides and skins is roughly estimated to have averaged about 15,000 tons during the last few years. Although the natural quality of Iranian hides and skins is good, most of the value is lost during the different stages of production and processing. Most hides produced in the country are used in domestic manufacturing. However, Iran does export some of its finest skins to glove and bag industries in Europe and the United States. Between 1965 and 1968, total export of skins averaged around 12,300 tons, more than twice the average 10 years earlier. The 1971/72 exports totaled slightly over 20,000 tons, with most going to the United States, the Soviet Union, and Italy.

The domestic production of hides and skins is supplemented annually by nearly 5,300 tons (1967-69) of imports, mainly from the Republic of South Africa. Iran imports most of the quality hides it needs as well as some lower quality dried hides from East Africa. In 1971/72, Iran imported 2,500 tons of hides and skins, about 40 percent coming from South Africa (28).

The composition of skin production and export has changed considerably. Karakul pelts were once Iran's most important export. Until 1959, approximately 750,000 to 800,000 pelts were exported annually. By 1963/64, the number of pelts exported dropped to 150,000 and in 1966/67 to 32,000. Reasons for this dramatic decline include the change by many breeders from Karakul to native meat- and wool-producing breeds because of low prices received for the low-quality Karakul pelts; several bad production years, due to feed shortage and drought; and the development of better quality Persian lambs and of Afghani high-quality pelts, which decreased the demand for lower quality Iranian pelts.

Outlook

While the outlook for increasing meat production is good, Iran will need to continue importing meat and live animals for some years--perhaps at least another 10 years. The Government has forecast that by the end of the Fifth 5-year plan (1977), overall meat production will reach 700,000 tons (28). The major problem of meat production is the high price of animal feed. High meat prices and the large imports resulting from the growing demand have forced the Government to take concrete measures to increase meat production. This includes giving technical and financial assistance to the livestock growers. The Government hopes to reduce the price of feed by bringing more land into forage crops. Also, expansion of large-scale livestock farming in the south and other areas is expected to result in more meat and dairy products.

In addition, there is a gradual shift from a nomadic livestock industry to organized large-scale production. The Government is helping nomads settle on farms and encouraging them to grow more feed and other agricultural products. Also, the Government is encouraging foreign investment in livestock.

CONSUMPTION

Although Iran is one of the more advanced countries in the Middle East, daily caloric intake tends to be low. According to a survey conducted by the Iranian Food and Nutrition Institute in 1962 and again in 1968, with the assistance of the Food and Agriculture Organization of the United Nations (FAO), average daily per capita caloric intake is 2,450 calories. In both studies, only 55 percent of the households surveyed met the minimum caloric requirements.

The per capita level of consumption is thought to be lower in the cities than in the country. Caloric intake in the rural areas falls approximately 10 percent during the winter months, due primarily to a shortage of food caused by lack of preservation facilities.

Malnutrition and undernourishment are not uncommon. Food grains make up two-thirds of the diet, with wheat making up 50 percent. Bread is the basic food for much of the country and accounts for half of the calories consumed daily by most Iranians. Bread and tea with sugar are consumed at every meal. Approximately 8 percent of the caloric intake is supplied by fruits and nuts, 11 percent by sugar, 7 percent by milk, and 5 percent by fats and oils.

Annual per capita consumption of meat is estimated at about 18 to 20 kilograms in towns and 6 to 8 kilograms in villages (3, 18). The nationwide average per capita consumption is about 14 kilograms per year. Meat consumption is gradually shifting from fresh to frozen meat. Iranians prefer fresh meat but are learning to consume frozen imported meat. More cold storage space is now being used for meats, especially during seasons when production is large and must be stored for use in the winter.

Preliminary figures for the late 1960's report the following amounts of red meat produced (4):

	<u>Tons</u>	<u>Percent</u>
Mutton, lamb, and goat	186,980	78.3
Beef, veal, and buffalo	50,628	21.2
Pork	1,200	0.5
Other	<u>54</u>	<u>---</u>
Total	238,862	100.0

However, figured on the basis of estimated per capita consumption with allowances for trade, total meat production should be close to 400,000 tons. Part of the discrepancy may stem from unreliable statistics. In addition, the official estimates may not take into account ritual slaughter for holidays and may include only slaughter figures from state abattoirs.

Estimated annual per capita consumption of eggs averages about 38 in urban areas and about 34 in rural areas. In comparison, annual U.S. consumption was 313 eggs per capita in 1971.

FARM PRACTICES AND CROPPING PATTERNS

Farm practices still tend to be primitive. Inadequate use is being made of fertilizer and new varieties of seeds, and irrigation is frequently haphazard.

In the 1960's, the Government introduced a "package" program in areas with high agricultural potential. This included not only the use of better seed, fertilizer, machinery, and pesticides but also improved extension services, credit, and storage and marketing facilities. The program was first applied to rice and is now being applied to other crops such as wheat, cotton, sugarbeets, pulses, tea, tobacco, fruits, and vegetables.

Most crops are still broadcast and the crops are inadequately thinned and weeded. However, since the land reform program took effect, farmers have become more receptive to change and new cultivation methods.

The basic Iranian cropping pattern is for wheat or barley to be planted every second year, with the land lying fallow in the intervening period. However, other crop rotations are also common. In one 3-year rotation, one-third of the land is sown with winter grain, one-third is sown with clover, and

one-third is plowed in preparation for sowing but left fallow. In another area using a 2-year rotation, half the land is planted to winter grain and half to clover or spring wheat. Rice planted on irrigated areas is not rotated with other crops but does lie fallow during the winter. In the southern part of the country, wheat and barley are interspersed in date groves.

There is a high crop failure in dryfarmed areas when the land is sown annually. On irrigated land where water is insufficient, a crop is planted 2 out of 3 years, or sometimes every other year. Even if there is sufficient water, the land may be left fallow to restore soil fertility. As the use of fertilizer increases, the fallow period in irrigated areas may be eliminated completely, or at least reduced. In general, leguminous crops have not been used to build up soil fertility.

In autumn, when water supplies are generally adequate, only wheat and barley are in the ground with the exception of late crops of sugarbeets and alfalfa. Often other crops could be interplanted with them to make optimum use of the water available.

SELECTED AGRICULTURAL INPUTS

Irrigation

Scarcity of water has been a major problem facing Iranian agriculture and has led to substantial investment in irrigation facilities. Much fertile land is undeveloped because of insufficient water. Average annual rainfall is approximately 9 inches; it varies from heavy rainfall near the Caspian Sea to practically none in the central plateau and desert areas.

Despite the fair number of permanent rivers, their locations and seasonal variations in water flow have caused the Iranians to seek other water supplies. Where ground water is close enough to the surface and not too salty, wells have been dug. Most of the water has been obtained, however, by digging underground channels (qanats) to collect groundwater from higher ground or from a mountain-side and conduct it down to villages and farms in the valleys and plains below.

Qanats are started with a "mother well" dug to a water-bearing strata. They have supplied Iran with a large percentage of its water since the Achaemenid era (500 B.C.) and probably long before. Some qanats are 25 to 35 miles long and some have mother wells of great depth. The number of qanats in Iran is estimated between 20,000 and 40,000, with total length exceeding 100,000 miles.

Qanats must be cleaned annually to remove silt. This is a costly operation, and some qanats are abandoned when flash floods fill their wells and tunnels with soil and silt. Although many are in use today and will continue to be used, fewer and fewer will probably be dug. Iran's water needs are increasing substantially and more use is being made of river water and drilled wells.

Modern irrigation systems in Iran were begun during the reign of the former Reza Shah in the 1930's when an irrigation department was established

and several dams were built. These activities were interrupted by the outbreak of World War II, but were begun again in 1955 under the present Shah.

In recent years, the Government has become increasingly interested in the development and management of water resources. Iran has a Ministry of Power and Water, with an Irrigation Bongah or department. In all, 14 or more agencies have some jurisdiction over water. This is indicative of the considerable official interest in water, but it complicates administration. Water has been given a paramount place in the Government's development plans with a sizable budget earmarked for irrigation work (8).

Iran has received significant foreign assistance in all phases of water resources. Some of the important contributors have been FAO, the Economic Commission for Asia and the Far East, the United States (through the Agency for International Development and predecessor agencies), the Ford Foundation, and the Near East Foundation.

Irrigation is important for agriculture and two regions, the Khuzestan and Sistan, were considered of particular importance for irrigation complexes. In 1957, a dam was completed west of Iranshahr on the Bampour River (fig. 2). It has raised the potential amount of land with adequate water in this area from 140 to 5,000 hectares. This irrigation system is still being extended. In the Sistan area, two barrages were built on branches of the Helmand River. An irrigation canal system with 60 miles of main canals and 665 miles of feeder canals waters the Dasht-Moghan area in northeastern Azerbaijan.

Equally as important as the irrigation water they supply to surrounding farm areas, Iran's water control projects supply water to large population centers. In fact, the following major irrigation schemes are used or planned as multi-use projects:

Nain Irrigation Project--In Nain and its surrounding lands, which are some of the driest inhabited sections of the country, the irrigation project, qanats, and deep wells supply the city water system and irrigate farmlands.

Jahrom Irrigation Project--This project in the Fars area of southern Iran provides 3,200 kilowatts of electricity for about 4,000 homes, and water for 100,000 palm and 230,000 citrus trees.

Karkhek Dam--This dam on the Karkhek River west of Ahwaz was completed in 1955. It provides water to farmland on both sides of the river and has ended the consequences of drought by making available an assured supply of water. In earlier years, these rich farmlands grew fine crops if rains were timely but a series of droughts turned the otherwise productive land to wasteland.

Golpayegan Dam--Located on the Akhtekan River and completed in 1957, this dam increased the cultivated area in Golpayegan by 3,000 hectares and provides a constant water supply.

Shahnaz Dam--This project on the Yalfan River was completed for the primary purpose of supplying drinking water for the city of Hamadan. In addition, it supplies enough water to irrigate at least 1,000 hectares of farmland.



IRAN: GENERAL LOCATION OF MAJOR DAMS, 1970

<ul style="list-style-type: none"> Completed reservoir dams, 1970 Construction of reservoir dams started 	<ul style="list-style-type: none"> Completed diversion dams Diversion dams to be constructed
--	--

Figure 2

Iran is planning and has completed numerous small irrigation projects and dams such as the Latian Dam on the Jajerud River east of Tehran, the Kuhrang Dam near Isfahan, and the Shabankareh Dam, which all help conserve and store water.

The largest water control projects--three of which are discussed below--were directly funded by the Plan Organization and constructed by independent private firms under the direction of foreign consulting firms:

Amir Kabir Dam--This dam, some 50 miles west of Tehran, was completed in 1961. The multi-use project has alleviated the water shortage in Tehran, supplies water for irrigation in the area, supplies electricity to Tehran and the locale, and prevents seasonal flooding. It has also become a popular recreation area.

Empress Fareh Dam--Built at the confluence of the Safid Rud and Ghezel Ozan Rivers in northern Iran, this is one of the world's highest buttressed dams. Of first importance, this multipurpose dam controls irrigation water for some 450,000 acres--much of it excellent rice land--assuring water whenever it is needed. It also supplies electrical power for operating irrigation pumps in the Oazvin area, for local industries such as the Lushan cement plant, the Shomal tea mill, and the Shilat fish-freezing plant, and for the towns and villages of Gilan.

Mohammed Reza Shah Dam--Located in the oil-rich province of Khuzestan on the Dez River some 15 miles north of Dezful, this dam is part of a five-river complex which aims at multipurpose development of the Khuzestan Plain. The dam--the highest in the Middle East--has the capacity to irrigate over 300,000 acres of farmland and produce around 520,000 kilowatts of electrical power per year. The overall project includes dams on five rivers and is estimated to open up for cultivation at least 2.5 million acres, to provide 6.6 million kilowatts of power, and to prevent flood damage formerly amounting to over \$1 million a year.

Development of water resources must be of highest priority if progress in agriculture is to be made. Hydrographic experts believe that the water resources still being wasted in Iran would be sufficient to irrigate several million more hectares of land, enough to double total food production (8). However, there are many and varied problems involved with water development. There is a pressing need for plans, surveys, and research in such areas as the relationship of climate, soil, crops, and water. Farmers must be taught the efficient use of irrigation--when to irrigate and the amount of water to apply. The country's ground water potential must be studied, water laws established, and resources managed. This involves a wide area of domestic policy including cooperation among groups of people, water rights, flood control, power generation, watershed management, and relative shares of urban-industrial-agricultural use.

Fertilizer

The Fourth Development Plan projected that fertilizer use would more than double from 72,000 nutrient tons in 1967/68 to 158,000 nutrient tons in 1972/73. The area receiving fertilizer was expected to rise during this period from over

0.5 million hectares to almost 1.4 million hectares. The proportion of arable land suitable for fertilizer use (all irrigated land, plus about 240,000 hectares of high rainfall area under wheat, tea, and tobacco) was expected to rise from 16 to 38 percent (13).

It is not yet possible to determine if this objective was reached. However, increases of such magnitude are not easily achieved. Inadequate credit and poor distribution facilities have been two of the major obstacles despite many Government steps aimed at increasing fertilizer use, such as the establishment of a fertilizer plant in Shiraz and several thousand demonstration plots.

The Fertilizer Distribution Company (FDC) was established in 1967 to improve the distribution system. This new Government-controlled company is expected to supply about one-third of the fertilizer needed, with private traders and cooperatives distributing the rest. Despite Government involvement, it is doubtful that the distribution system could have moved the projected volume of fertilizer.

Iran imports most of its fertilizer from Japan, the United States, South Korea, and Morocco. With the construction of a new fertilizer plant in Bandar-e-Shahpur, Iran's two fertilizer factories were expected to produce about 158,000 nutrient tons of fertilizer by 1972. If production reached this level, nitrogenous fertilizer would have been in surplus and available for export. Imports of potassic and phosphatic fertilizer would still have been necessary.

In addition to the chemical fertilizers mentioned above, natural waste products are used to some extent. Animal manure is used chiefly as a fuel; however, animals, when grazed, fertilize the land with their droppings. Household waste is mixed with soil and used as fertilizer after a long drying period. Pigeon waste is used to fertilize melons and fruit trees around Isfahan, and is also used in other areas of Iran for other crops. Waste products from a fish-canning factory in Kerman are used locally to fertilize pistachio trees.

Machinery

During recent years, there has been a rapid increase in the number of tractors and other farm equipment in Iran, part of which is reportedly underutilized. Use of tractors and other types of powered machinery in agriculture advanced at an extremely slow pace during 1900-55. Between 1958 and 1968, there was a significant rise in the mechanization of agriculture. This followed the passage of a law in 1956 providing a new system of credit to farmers.

In a few localized areas of the country, agriculture is becoming highly mechanized. At the eastern end of the Caspian Plain, 85 to 90 percent of the land is cultivated by tractors and wheat is harvested primarily with combines. Japanese-made power tillers are used on about 70 percent of all land used for planting rice, primarily in the Caspian area.

But over most of the country, the vast majority of farmers continue to use traditional animal-drawn or hand-operated tools which are virtually unchanged

since ancient Persian times. At the beginning of the 1960's, mechanical power was used on less than 10 percent of land holdings, and only about 4 percent were fully mechanized. About 75 percent of all land holdings used animal power while 15 percent used human power alone. Farmers on about 40 percent of all land holdings possessed their own draft animals. On other holdings, farmers rented or borrowed animals, and 75 percent of these animals were used on holdings of under 5 hectares. The main draft animals were the ox and the donkey, accounting for 85 and 10 percent, respectively, of all draft animals (2).

Most Iranian farmers still use the iron-tipped wooden plow, which does little more than scratch the soil. It is estimated that steel plows are used by less than one-tenth of the farmers. Few implements besides the plow are in use. A primitive harrow is used in some areas. Weeding is done by hand. Although the methods of harvesting grain are improving, the scythe and the sickle are still widely used for reaping. Grain is still largely threshed by antiquated methods.

The Government is making vigorous efforts to mechanize its agriculture. A 1966 agreement with Romania called for the importation of some 20,000 tractors (45-60 hp) over a period of several years. In addition, this agreement called for the construction of a tractor assembly plant at Tabriz, which should now be turning out some 5,000 tractors per year. There were 5,000 tractors in Iran in the early 1960's, compared with 15,000 in 1966 and 17,500 in 1967 (2). Current tractor numbers are unavailable but there may be roughly 35,000.

MARKETING, TRANSPORTATION, AND STORAGE

When implementation of the land reform program began in 1962, the exchange economy quickly penetrated into rural areas. Rapid growth of urban communities with expanding aggregate demand, together with the development of larger agricultural enterprises with marketable commodities, suddenly brought agricultural marketing into prominence in official and public thinking (23).

Iran is burdened with numerous marketing difficulties. They include (a) lack of uniformity in the types and varieties of produce grown. For example, a single orange grove contains many varieties of oranges, such as thin and thickskinned and seeded and seedless; (b) failure to harvest at the appropriate stage of maturity to assure that the product reaches the consumer in prime condition; (c) neglect of cultural practices so the produce is insect or fungus damaged; (d) use of improper containers so the produce is damaged; (e) mixing of grades so the good quality produce often becomes contaminated by the poor grades; and (f) poor hygenic conditions which result in spoilage of produce. For instance, meat is generally transported to the retail shops in unrefrigerated trucks. The produce coming to market is therefore not of very good quality, and this is one factor affecting the pricing situation (7).

Prices of a number of agricultural commodities in Iran are high compared with those prevailing in other producing countries. Low productivity results in high per unit production costs. Prices for domestic goods in Iran are sometimes even higher than prices in countries which import the commodity from a

distant supplier. The high prices are sustained and protected by import taxes and by prohibitions and restrictions on cheaper imports, which are often of higher quality than the domestic product.

Livestock are purchased from the tribal areas and villages by middlemen who truck the animals to the cities for fattening or slaughter (only 5 to 7 percent of the animals slaughtered are fattened) (7). Sometimes the animals pass through several middlemen before slaughter.

The principal buyers of slaughter animals in Tehran are the Tehran Mutton Syndicate and the Tehran Beef Syndicate. These are associated with prominent butchers engaged in livestock purchasing, slaughtering, and retailing. The purchase system is based largely on dressed carcass weight and most beef is purchased from the middlemen on this basis, but about one-quarter is purchased as live animals. The sale price includes hides and offals, which are not weighed. Consequently, buyers prefer lean, range-fed animals to fat ones, since by purchasing the same amount of meat, they get a larger amount of unweighed skins and offals.

There is no price differential for varying qualities of meat--lamb brings the same price as old ewes and rams. Although the Tehran Municipality has set retail prices for red meat for many years, there are still wide seasonal price fluctuations. Prices for beef have been approximately two-thirds those for mutton. Prices for mutton and goat meat are lower in summer than in winter (3).

A 1967 survey of 300 widely scattered villages revealed that producers received substantially different prices for the same commodity. Price differences were as much as 100 percent for rice, potatoes, and certain dry legumes, and 60 percent for wheat and barley. Livestock and crop producers have little knowledge of prices prevailing in the market. In addition, sellers are at the mercy of the buyers since they have no way to check the weights computed by the buyers. The uncertainties of price and the low profit margin have made the farmer wary of increased investment to expand output.

The Fourth Development Plan (1968-72) sought to improve the marketing system in Iran in numerous ways. An organization was to be established to gather statistics, conduct marketing studies, and teach and promulgate modern marketing principles. Organizations investing in the improvement and expansion of marketing and distribution facilities were to be given credit and technical aid. The limited marketing role of cooperatives was to be expanded (13). Information is not available on the progress of these objectives.

Improvements in the transportation system are continuing and all major population centers are linked by rail or all-weather roads. Several thousand miles of feeder roads have been constructed to link agricultural villages and open up agricultural areas. These new roads are helping develop agriculture by providing farmers access to markets and encouraging investment in farming. Despite much progress, many areas still lack access to markets and transportation consists of pack animals. Reduction of transport costs is essential for the commercialization of Iran's agriculture.

The expansion of grain elevator capacity is taking place with aid from the Soviet Union. Present total capacity is estimated at 700,000 tons. 5/ Storage of durable products, especially cereals, has been developed to quite a high degree, particularly by the Government and private millers in an expanding network of silos. Semiperishable goods such as apples, oranges, onions, and potatoes are only beginning to be stored under technically acceptable conditions and perishable produce moves into immediate consumption at maturity with scarcely any storage. Cold storage facilities are concentrated in Tehran and Abadan. Iranian plans call for an expansion of storage facilities with ample capacity to be available by 1985.

Private enterprise as well as the Government has helped develop Iran's marketing system. Private enterprise is important not only because of its work in distribution, but also because it supplies a large proportion of the production credit necessary to small farmers and carries out much of the retailing of fresh products. However, it is not uncommon for the moneylender to take a lien on the farmer's crop, forcing the farmer to sell the crop to the lender at below-market prices. It is widely believed that merchants have the power to hoard and create artificial scarcities, whereby they reap speculative profits.

There has been a great deal of talk about the unnecessarily high costs of marketing in Iran. 6/ For many years, almost all workers in agricultural production, marketing, and economic planning have pointed out the crippling handicap to development caused by the serious gaps and deficiencies in the quantity and quality of information available. However, these deficiencies are not easily corrected.

FARM ORGANIZATIONS

Agriculture in Iran is controlled more by Government agencies than by non-governmental farm organizations. The Ministry of Agriculture is primarily responsible for farm development activities, including research and extension. Attached to the Ministry are several bongahs (autonomous or semi-autonomous Government organizations) with wide administrative and financial power. The Seed and Plant Improvement Bongah implements research, development, and production of seeds and seedlings for distribution throughout the country. The Livestock Bongah is responsible for a number of livestock projects and demonstration research centers. The Veterinary Bongah carries out most of the

5/ For a discussion of some port and storage facilities in Iran, plus a proposal for construction of an import-export grain terminal at Bandar Shapour, see: "Preliminary Engineering Report for Import-Export Grain Terminal at Bandar Shapour." Report to the Imperial Government of Iran, Ports and Shipping Organization, by Technolog, Inc., Engineering and Industrial Consultants, Tehran, Iran. Oct. 1972.

6/ For an indepth discussion of some marketing problems, both from the consumer and producer standpoints, see: Samuel F. Ashelman, Jr., "Creating a Distribution Reform Catalyst for Economic Development." Report on a study of the feasibility of establishing chainstores in Iran. Survey was made in Iran May-June 1966. International Cooperative Development Association, 1012 14th St., N.W., Washington, D.C.

disease control and breeding programs. Other bongahs include those for cotton and for farm machinery, the Plant Protection Institute, the Plant Pest and Disease Research Institute, and the Soil Institute.

The Ministry of Water and Power has primary responsibility for developing the country's water and power resources. Under it is the Irrigation Bongah, responsible for developing irrigation water supplies. The Ministry of Natural Resources works to conserve grazing lands, forests, and fisheries. A recently formed Ministry of Agricultural Products and Consumer Goods oversees marketing, storage, price stabilization, and the supply of consumer goods in general.

The Central Organization for Rural Cooperatives, under the Ministry of Land Reform and Rural Cooperatives, is responsible for organizing local societies and federations and channeling credit to them, as well as providing other services and overall supervision. This organization aids in creating joint stock farming companies whose shareholders are generally small farmers.

Except for the associations dealing with specific crops--such as sugar-beets, raisins, and dates--the forementioned agricultural cooperatives are the only farmers' organizations in Iran. By the end of the 1950's, there were about 100 such cooperatives in Iran. By 1963, the number had grown to 1,400 with a total of 300,000 members. By 1970, there were about 8,900 cooperatives with membership in excess of 1.5 million (see table 4).

The primary purpose of cooperatives is to provide credit for their members but this is not their only function. These organizations market an increasingly large share of their members' produce and supply them with farm inputs and goods for consumption. Although management of the cooperatives needs much improvement, these organizations offer opportunities for their members to increase and improve their economic status and to learn better farming techniques.

AGRICULTURAL AND TRADE POLICY

Iran, in its Fourth Development Plan (1968-72), sought to:

- (1) Increase agricultural production by 5 percent annually;
- (2) Increase farm productivity through expansion of modern techniques;
- (3) Create more rural employment by developing cottage industries, diversifying occupations, and expanding other economic activities;
- (4) Expand marketing facilities and improve distribution systems through extending feeder roads, storage facilities, and electric power;
- (5) Simultaneously develop and conserve natural resources such as water, pastures, soil, fish, and wild game; and

(6) Establish more cooperatives and promote self-help activities (13).

During the Fourth Development Plan, there was some shift in investment orientation from larger irrigation projects and other infrastructure projects to smaller ones with more immediate impact. The emphasis was on quick-yielding investments. Priorities were given to developing specific crops such as wheat, rice, oilseeds, sugar, tea, and cotton. There were also plans to expand the supply of fertilizer, seed, and other inputs, and to improve extension services. However, continued expansion of larger projects was not neglected.

The land reform program, a broad redistribution program initiated by the Shah in 1952 but begun in earnest in 1962, has been virtually completed in its essential phases. While at the outset the program had some negative effects on investment and productivity, by and large it has been carried out smoothly and should stimulate agricultural development. Another major reason for expected further development in agriculture, in addition to the incentives given to the previously landless farm operators, is that farmers who acquired land have been organized into rural cooperatives.

With the land reform program and the development of cooperatives, the stage has been set for the emergence of modern, commercially oriented agriculture. It is being increasingly realized that a major investment in irrigation systems and other development projects will be necessary to increase agricultural output. In this effort, the Government is putting increased emphasis on agricultural development programs and substantially increased allocations for the agricultural sector in the current Fifth Development Plan (1973-77).

The Government is making a major effort to encourage private investment in fertilizer and pesticide factories and agribusiness enterprises. Measures are being taken to increase agricultural credit facilities through the Agricultural Bank, through the recently established Agricultural Development Fund, and through factories buying agricultural produce.

Iran has not made extensive use of support prices for agricultural commodities. Price supports fall into two categories: Set prices for Government-purchased items such as wheat, and prices paid for commodities which are controlled under Government monopolies such as sugar, tea, and tobacco.

Bread presents a continuing pricing problem. The Government's interest in controlling wheat and bread prices began in the early 1930's when the Bread Administration was established. This later became the Bread and Cereal Administration under the Ministry of Finance and was later transferred to the Ministry of Agriculture. The support price for wheat changes from year to year but is set at a relatively low level. The Government's objective is to buy large quantities of wheat at a fixed price to prevent holding and speculation, thereby keeping the price of bread lower. The free market price is sometimes on a par with the Government-set price and sometimes lower. Although the Government sells wheat to bakers at a set price, the bakers often need to make supplementary purchases from grain merchants (24).

Tea farm prices are set by the Government. Producers may sell their produce to the Tea Organization (a monopoly) or directly to tea factories. In either case, the tea is stored with the Tea Organization. A semi-autonomous cooperative controls the marketing of tobacco and tobacco products. Sugar factories enter into annual contracts with sugarbeet producers at set prices. Milk producers contract annually with Government pasteurizing plants which sell the processed milk at fixed prices. These outlets represent only a small portion of the milk supply, however, since much of the milk is consumed on the farm.

Iran's trade policy seeks to protect and expand domestic industry, regulate the balance of payments, and promote export trade. Further, Iran's policy is to reduce its dependence on revenue from oil exports and agricultural raw materials by promoting exports of processed farm products. Another major policy effort is to encourage import substitution through domestic production of certain crops and processed foods (24).

The Government uses two principal administrative controls to implement policy objectives. At the beginning of each trade year, the Government publishes an import list which, on the basis of current conditions and development requirements, designates goods as "authorized" or "unauthorized" for import subject to prior approval by the Ministry of Commerce. Most authorized commodities can actually be imported without prior Government approval, but on certain items, a Government permit is required before the order is placed. Authorized agricultural imports usually include wheat, rice, other grains, butter, ghee, dried milk, sunflower oil, and soybean oil. These are most of Iran's principal agricultural imports (17).

Unauthorized imports are commodities not deemed essential by the Government. They are prohibited in order to protect domestic industry or producers. In 1969/70, commodities on the unauthorized list included fruits and nuts, certain vegetables, pork, hydrogenated fats and oils, most prepared meats, and some other prepared foods.

Iran's tariffs are nonpreferential and consist principally of specific ad valorem rates generally confined to special imports such as chemicals and industrial machinery. Essential items such as foodstuffs, raw materials, and machinery and parts are duty-free or subject to a low duty rate. A commercial profit tax, the most significant of the taxes and fees levied, is used to protect the domestic economy by curtailing imports. Monopoly taxes are assessed on a few imports, including sugar, confectionery items with 40 percent sugar, and tobacco and tobacco products (17).

Export controls are administered by the Ministry of Economy and are non-discriminatory as to country of destination. Export incentives include the payment of subsidies. Exporters are also eligible for loans from the Export Development Bank.

Iran has a number of bilateral trade agreements which assure a market for its products--among them cotton, skins, and wool--and favorable terms on some imports such as butter and vegetable oils. These agreements are with the Soviet Union, Czechoslovakia, Hungary, Poland, Romania, and Bulgaria.

The European Economic Community (EEC) grants Iran preferential tariffs on some exports, such as raisins and dried apricots. Iran is not a member of the General Agreement on Tariffs and Trade (GATT). Iran, with Turkey and Pakistan, belongs to the Regional Corporation for Development, which seeks to promote free trade among member countries.

Iran is considered an agricultural country. Yet it is sitting on one of the world's great oil pools and, consequently, its foreign exchange stems mainly from the export of oil.

AGRICULTURAL TRADE

Agriculture's contribution to the country's balance of trade and overall balance of payments is small. The share of agricultural products in the total value of exports and imports has declined considerably in the past several years, even though the absolute value of both has trended upward. In the 1971/72 Iranian trade year, agricultural exports accounted for slightly less than 50 percent of the value of all exports (excluding petroleum) and agricultural imports for 12 percent of the value of all imports (tables 9 and 10).

Total exports in 1971/72 amounted to \$2.7 billion, of which \$2.3 billion was from petroleum and \$170 million was from agriculture (12). Leading agricultural exports are cotton, fruits and nuts, and hides and skins. Carpets, an important nonagricultural export, depend on the livestock sector for raw materials. The composition of exports of livestock products has changed in the past decade. Skins have gained an increasingly larger share of the value of farm exports, while wool, which accounted for about one-fifth of the total value in the early 1960's, is no longer important.

Agricultural imports averaged 14.3 percent of total imports during 1958/59-1964/65. The percentage dropped to only 6.4 percent in 1969/70, the lowest level since 1963/64. Iran's main agricultural imports are wheat and vegetable oils; imports of these items are now larger in value than traditional imports such as sugar and tea. Wheat imports depend on the amount of local crop production and have at times been substantial, such as in 1971/72 and 1973/74, when yearly imports totaled about 1 million tons. There has been a substantial increase in the import of live animals, meat and meat preparations, dairy products and eggs, animal feed, and natural fibers.

U.S. trade with Iran was relatively small before 1971, averaging below \$50 million annually. It has increased steadily since then. The United States has been a regular customer for Iran's pistachios, dates, raisins, hides and skins, and gums. In 1972, the United States was the third largest importer of Iranian commodities, behind the Soviet Union and West Germany. U.S. purchases of Iranian farm goods for that year amounted to \$38 million and trended up (table 11).

U.S. shipments of agricultural products to Iran in calendar 1972 amounted to \$76.0 million and consisted primarily of wheat (\$36.0 million), rice (\$16.0 million), vegetable oil (\$12.9 million including \$8.2 million of soybean oil), inedible tallow (\$3.7 million), and corn (\$1.6 million) (table 12). FY 1974 exports are estimated at close to \$300 million.

Table 9--Agricultural exports, quantity and value, Iran, average 1960/61-1962/63 and 1965/66-1967/68, annual 1969/70 and 1971/72

Commodity and major destination	1960/61-1962/63		1965/66-1967/68		1969/70		1971/72	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars
Live animals	2.2	581	11.4	5,179	14.2	1,873	8.4	3,575
Dairy products and eggs	.1	25	<u>1</u> /	27	<u>1</u> /	10	.1	7
Cereals and preparations:	1.0	115	32.9	2,852	3.5	636	.5	102
Rice . . . . .	.3	66	2.0	398	.4	146	.2	61
Kuwait . . . . .	.2	63	.3	68	.2	67	.1	42
USSR	0	0	.9	156	.2	71	0	0
Wheat and flour . .	<u>1</u> /	1	.4	31	1.7	173	.2	29
Dubai	0	0	<u>1</u> /	1	1.2	122	.1	19
Fruits, vegetables, and nuts	125.9	23,328	110.9	23,343	128.3	39,260	121.6	38,641
Almonds	5.7	4,389	2.2	2,396	6.9	8,312	6.6	8,079
USSR . . . . .	.5	658	.4	545	3.0	4,470	1.9	3,283
West Germany . .	1.4	1,200	<u>1</u> /	14	1.1	1,413	.8	1,036
U.K. . . . .	.6	455	<u>1</u> /	1	.1	82	<u>1</u> /	57
Dates	28.1	2,421	25.5	2,292	32.7	2,546	29.4	3,046
U.K.	1.9	255	2.5	308	4.5	504	4.0	642
Oman	2.5	139	3.6	190	9.3	402	1.3	66
Canada	1.7	203	3.0	263	3.2	393	1.9	313
Raisins	39.0	7,246	30.3	7,408	30.0	8,025	40.2	8,423
USSR	9.0	1,782	8.9	2,150	17.9	5,013	23.5	5,043
U.K.	3.4	624	3.8	871	2.2	523	4.7	928
West Germany . .	12.2	2,220	3.6	877	1.4	432	2.9	580
Apricots, dried . .	7.4	1,971	5.2	2,088	6.9	3,823	6.4	2,488
USSR . . . . .	.5	154	.5	258	4.0	2,331	2.4	974
West Germany . .	2.6	654	.9	359	1.1	533	1.2	443
Pistachios	3.0	2,941	6.2	5,611	9.3	12,367	10.0	13,670
USA	2.2	1,824	4.1	3,789	5.5	7,441	5.2	6,490
Lebanon . . . . .	.3	264	.4	316	.4	658	.7	1,162

Continued

Table 9--Agricultural exports, quantity and value, Iran, average 1960/61-1962/63 and 1965/66-1967/68, annual 1969/70 and 1971/72--Continued

Commodity and major destination	1960/61-1962/63		1965/66-1967/68		1969/70		1971/72	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars
Coffee, tea, cocoa, and spices	8.3	2,415	7.2	3,482	12.9	3,220	7.2	3,217
Animal feed.	19.7	756	57.3	2,898	99.7	5,427	87.2	4,462
Hides and skins.	10.6	6,317	12.3	12,009	16.5	16,779	20.3	17,140
USA.	3.8	1,951	6.4	6,330	5.2	6,105	7.7	7,610
Italy.	2.4	1,174	2.1	2,213	3.2	3,221	4.8	3,928
Natural fibers	64.0	35,254	89.2	41,525	103.4	50,716	116.5	68,427
Cotton	56.3	29,059	86.1	38,579	101.9	49,457	115.7	67,088
USSR	7.5	4,879	8.7	5,137	25.7	14,790	21.6	15,326
Hungary.	4.6	2,433	6.2	2,885	13.8	7,072	6.7	4,474
Romania.	0	0	6.7	3,263	10.3	5,389	5.0	3,216
U.K.	16.9	7,953	13.3	5,685	5.1	2,468	5.4	3,386
Crude animal & veg. mat.: Gums and resins.	22.1 4.6	6,930 3,909	20.8 5.5	8,720 4,518	32.1 4.7	11,821 5,672	34.5 5.5	14,830 5,894
Animal and vegetable fats and oils	32.5	2,128	3.7	1,479	10.0	4,037	14.7	5,937
Total.		77,849		101,503		133,779		156,838
Other agricultural exports		1,375		1,307		824		12,708
Total agricultural exports		79,224		102,810		134,603		169,546
Other exports (excl.oil): Oil exports.		57,800 748,565		92,317 1,211,323		119,727 1,939,006		179,933 2,327,128
Total exports.		885,589		1,406,450		2,193,336		2,676,607

43

1/ Insignificant.

Source: (12).

Table 10--Agricultural imports, quantity and value, Iran, average 1960/61-1962/63 and 1965/66-1967/68, annual 1969/70 and 1971/72

Commodity and major source	1960/61-1962/63		1965/66-1967/68		1969/70		1971/72	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars
Live animals.	0.5	483	1.1	1,812	9.1	5,863	12.1	8,034
Meat and preparations	.8	699	.8	677	6.0	4,415	6.8	5,260
Dairy products and eggs	4.6	3,602	8.5	7,214	10.6	8,303	13.8	15,580
Dry milk.	2.7	1,956	3.7	3,046	3.1	3,611	3.9	5,839
Netherlands . . .	.5	677	.7	1,099	1.3	1,814	2.3	3,590
Switzerland . . .	.2	343	.2	274	.4	555	.3	561
Cereals & preparations	275.3	19,967	194.2	15,873	6.7	1,890	1,320.8	103,368
Wheat	183.0	10,687	157.4	10,832	.5	109	993.4	75,951
Australia	42.5	3,394	48.8	3,925	0	0	441.9	33,171
USA	139.5	4,085	91.4	5,491	0	0	546.0	42,251
Rice.	12.4	1,922	23.8	3,279	1.8	287	60.5	11,649
Dubai	2.4	257	6.5	890	.8	131	13.4	2,466
Kuwait.	1.5	281	11.3	1,456	.8	101	13.5	2,551
Corn.	3.3	230	3.2	306	.1	47	.01	6
Wheat and flour . .	73.9	6,488	8.5	832	.2	52	4.4	463
Fruits, vegetables and nuts	5.0	1,491	3.0	886	1.8	766	9.9	2,636
Sugar & preparations.	318.6	30,352	279.3	19,307	72.3	5,898	90.2	11,474
Coffee, tea, cocoa, spices	10.5	14,080	12.2	15,140	10.4	13,560	15.9	15,793
Animal feed	1/	1/	9.1	1,888	18.6	4,356	24.9	7,467
Netherlands	1/	1/	2.1	653	3.3	850	1.8	678
Israel.	1/	1/	1.2	208	3.9	741	6.3	936
USA	1/	1/	.2	70	.3	434	5.6	2,320

Continued

Table 10--Agricultural imports, quantity and value, Iran, average 1960/61-1962/63 and 1965/66-1967/68, annual 1969/70 and 1971/72--Continued

Commodity and major source	1960/61-1962/63		1965/66-1967/68		1969/70		1971/72	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars
Miscellaneous food preparations	1.0	531	0.7	1,390	1.2	1,986	7.7	1,550
Hides and skins	3.1	2,050	3.2	2,043	4.2	2,612	2.5	1,781
Oilseeds . . . . .	.6	324	.7	291	5.8	771	1.0	874
Natural rubber	3.9	1,882	11.3	5,753	18.5	9,440	23.4	10,363
Natural fibers	1.4	2,917	9.3	11,006	12.5	14,082	12.1	14,306
Crude animal and vegetable material.	1.6	400	2.2	844	1.8	1,042	1.0	395
Fats and oils	36.0	10,605	100.2	28,168	126.8	27,995	122.6	45,136
Soybean oil	3.3	1,052	23.2	7,277	32.0	6,980	95.0	35,452
USA	14.7	7,819	21.3	6,781	27.1	5,955	75.4	26,611
Cottonseed oil	8.5	2,890	21.7	7,124	23.5	6,081	3.0	1,067
USSR	0	0	1.2	354	7.5	1,530	1.0	250
Total agricultural imports		89,799		114,730		103,090		246,017
Other imports		531,797		899,966		1,422,547		1,835,278
Total imports		621,596		1,014,696		1,525,637		2,086,295

1/ Insignificant.

Source: (12).

Table 11--Major U.S. agricultural imports from Iran, calendar years 1960, 1965, 1970, and 1972

Commodity	1960	1965	1970	1972
<u>Dollars</u>				
Sheepskin, lambskin. . .	5,829,791	6,229,106	11,712,226	20,514,000
Total hides and skins.	6,908,942	7,120,593	12,342,029	22,624,000
Hair cashmere (goat sort, etc.).	9,228,029	3,530,642	239,047	1,494,000
Pistachios	1,656,421	5,546,127	8,999,332	9,514,000
Cumin seed	567,397	638,698	1,006,504	1,623,000
Licorice root and extract	611,959	314,211	1,336,933	1,649,000
Other agricultural imports:	2,780,403	2,210,640	2,274,578	1,427,000
Total agricultural imports.	21,753,151	19,360,911	25,329,613	38,331,000

Source: (29).

Table 12--Major U.S. agricultural exports to Iran, calendar years 1960, 1965, 1970, and 1972

Commodity	1960	1965	1970	1972
<u>Dollars</u>				
Wheat.	2,764,499	18,403,625	3,176,000	36,034,000
Rice	2,490	7,674	5,064	16,095,000
Corn	249,512	1,538,195	29,493	1,595,000
Total grain.	5,475,543	20,999,636	3,255,582	54,386,000
Tallow, inedible	1,733,785	2,695,525	2,946,741	3,695,000
Soybean oil, crude and once refined	3,455	9,715,376	18,990,162	8,216,000
Cottonseed oil	1,392,023	5,540,705	711,455	4,253,000
Total oils	1,503,686	15,570,044	20,198,101	12,881,000
Other agricultural exports:	2,837,088	3,954,123	4,064,189	5,040,000
Total agricultural exports	11,550,102	43,219,328	30,464,613	76,002,000

Source: (29).

U.S. wheat exports to Iran have fluctuated according to Iran's wheat harvest. During 1960-63, U.S. wheat and wheat flour exports to Iran averaged \$10.5 million annually. During 1965-68, the average yearly value declined to \$6.1 million. In 1969, it was only \$46,000. This precipitous decline resulted from a record wheat harvest in 1968 and an excellent harvest in 1969. Iran actually exported 210,000 tons of wheat in Iranian year 1968/69. But crops were smaller in later years and Iran once again began to import substantial amounts of wheat. In 1970/71, Iran's wheat imports totaled 458,000 tons, of which the United States supplied 36 percent.

A major part of past trade was under the concessional terms of Public Law 480. Virtually all of the 798,000 tons of U.S. wheat and wheat flour shipped to Iran between 1955 and 1964 was under PL 480 agreements. Two-thirds of this was under local currency agreements and the rest was donations and relief. During FY 1965-67, more of the wheat and wheat flour shipments were under commercial sales, including CCC (Commercial Credit Corporation) sales. Of the 727,000 tons of wheat and wheat flour sold to Iran during those years, 24 percent was under commercial sales and 40 percent was under dollar credit (including both Government to Government and Private Trade Agreements (PTA) programs). In FY 1971, wheat and wheat flour imports from the United States totaled 239,000 tons, including 140,000 tons under commercial sales and 99,000 tons under dollar credit. In FY 1973, 90 percent of the 518,000 tons Iran took from the United States was under commercial sales and the remainder, dollar credit.

Edible vegetable oils exports have also been substantial. In 1968 and 1969, almost all oil exports were under PL 480. In 1972, of 86,000 tons exported, all were commercially financed and in 1973, of 40,000 tons exported, approximately 8,500 tons were under PL 480.

Funds from the local currency sales of U.S. products to Iran have gone into a number of development projects. PTA funds have been used to support the developing farm cooperatives in Iran. Such funds were used by Bank Omran of Iran to expand the volume of loans to existing cooperatives and to help additional farm families obtain credit. Loans made by the cooperatives have been mostly used for production inputs such as seed, insecticides, livestock and feed, and agricultural implements and for operations such as plowing, weeding, and planting.

FOREIGN ASSISTANCE

Iran receives aid from a number of countries. Technical assistance and bilateral arrangements are currently the most common forms of external help.

The United States has had a technical and economic assistance program in Iran since 1951. The U.S. Agency for International Development (USAID) was instrumental in providing U.S. aid to Iran but this phase of work was terminated on November 30, 1967. Projects sponsored by USAID covered a number of fields. In the agricultural sector, they included work on horticulture, industrial and field crop development, livestock improvement, range improvement and forage production, plant and insect disease control, and animal disease control.

Since 1951, U.S. economic assistance to Iran has totaled approximately \$1 billion. One of the main projects was the training of thousands of Iranian agricultural technicians in the United States. These technicians now form the nucleus of many of Iran's agricultural projects and have contributed indispensably to the country's economic development. Other U.S. organizations contributing to Iranian development have been the Export-Import Bank and private organizations such as the Ford Foundation and the Near East Foundation.

Many countries have extended credit or given open loans to Iran. Among them are France, West Germany, the United Kingdom, Italy, Japan, the Soviet Union, Poland, Hungary, Czechoslovakia, and Romania. Taiwan, Japan, and Denmark have provided agricultural assistance. Assistance from Communist countries has increased significantly since the mid-1960's. This is particularly true of the Soviet Union and Romania, who have used their assistance programs to expand trade with Iran.

Israeli aid has centered on two aspects: In-country work on projects, and training of Iranian personnel in Israel. The most important training programs are for agricultural extension agents and local government officials. Israel has provided technical help in water-use planning and the development of specific crops, including cotton, sugarbeets, and green forage.

Assistance has also come from the United Nations Technical Assistance Program and the International Bank for Reconstruction and Development.

Iran, Pakistan, Turkey, and the United Kingdom comprise the Central Treaty Organization (CENTO), through which there has been an ongoing program of regional cooperation and development. A CENTO subcommittee on agriculture promotes projects to encourage general development and improve production, credit and banking, forestry, pest control, land classification, and soil surveys. A number of seminars covering subjects such as farm tools and implements, in addition to a symposium of price statistics and a conference on National and Regional Livestock Development Policy, have been held in these countries. Closely allied to agricultural development are programs for the promotion of public health in the CENTO region.

FIFTH 5-YEAR DEVELOPMENT PLAN

The Fifth Development Plan covers the 5 years 1973/74-1977/78. It emphasizes agricultural development and the expansion of social welfare. While total outlay for the Plan is two and a half times larger than for the Fourth Plan, allocation to agriculture will increase nearly four-fold and social welfare allocations five-fold. The overall objectives of the Fifth Plan are to distribute income more equitably, to provide productive employment in all regions of the country, to improve public administration, and to expand trade with other countries.

Investment in the agricultural sector will increase to IR 316 billion (\$4.6 billion), compared with IR 83 billion (\$1.2 billion) allocated over the Fourth Plan period. Agriculture will account for one-fifth of total investment, compared with 16 percent in the previous plan.

Despite the much heavier investment allocation for agriculture, its growth rate is forecast at only 5.5 percent during the Fifth Plan period, compared with 3.9 percent in the previous 5 years and with a forecast 15.3 percent GNP growth rate for the whole economy. Agricultural products as a proportion of total products will continue to decline and industry and mining will rise. Agriculture's share of the Gross Domestic Product is projected at 12.5 percent in 1977/78, compared with 13.9 percent in 1972/73 and 20.0 percent in 1967/68.

The Fifth Plan is presently being revised because of the reevaluation of the rial in February 1973 and oil agreements negotiated since that date.

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