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Iran: Impact of Revolution and War on Agriculture



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An Intelligence Assessment

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September 1981*

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*Information available as of 22 September 1981
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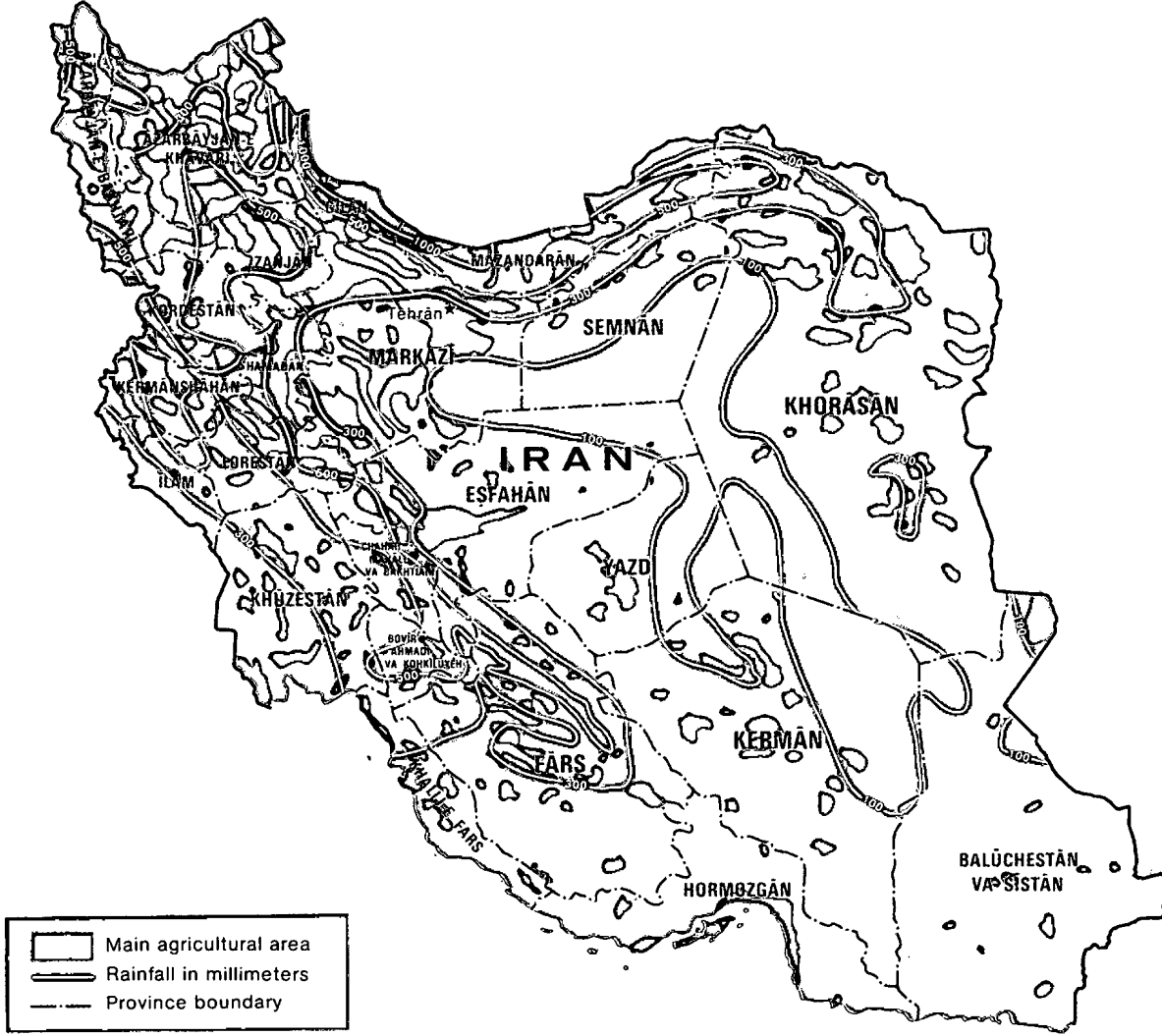
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Figure 1



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**Iran: Impact of Revolution
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Because of unusually good weather this year, Iranian farmers will harvest a grain crop about equal to the average of the past six years. Nevertheless, domestic chaos and—to a lesser extent—the war with Iraq have seriously impeded Iran's agricultural performance and are pushing the country still further from food self-sufficiency.

Domestic food production is inadequate for many reasons, among them:

- Agricultural development took a back seat to industrialization during the Shah's reign, leaving the country poorly prepared to cope with rising food demand.
- Despite an announced intention of emphasizing agricultural development, the revolutionary turmoil in Iran has prevented the current government from adopting—much less implementing—effective and coordinated agricultural policies. Conflicting views about what ought to be done, the complex, volatile political situation, and a lack of administrative experience and agricultural knowledge among government leaders will probably prevent the development and implementation of such policies for some time.
- Although most of the fighting with Iraq has occurred in regions unimportant to agriculture, the war drains manpower from the agricultural sector and has led to a 15-percent reduction in the area sown to crops.
- A domestic marketing system that allows middlemen to reap most of the benefits of rising food prices provides little incentive for Iran's farmers to increase output.
- Even when crop surpluses are generated, the underdeveloped transportation and distribution systems cannot bring much of the extra food to the cities where it is needed.

In the face of these constraints, rapid population growth—especially in the cities—has resulted in an increasing demand for food that can only be met through rising imports. During 1981 Iran is expected to import a record

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\$3.3 billion in agricultural products, including more than a million tons of US grain, which Iranian consumers prefer to grain from other foreign sources. Next year, Iran is likely to import some \$3.8 billion in agricultural products, as much as 15 percent of which might come from the United States. As long as the country's oil revenues continue at their present levels, Iran can afford to pay for these imports, but only at the cost of forgoing imports of other goods the country also needs.



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Iran: Impact of Revolution and War on Agriculture

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The call for revitalization of agriculture, a major theme in Iran since the overthrow of the Shah, is an outgrowth of discontent with the Shah's faltering agricultural policies and Iran's growing dependence on food imports. A net food exporter in the 1960s, Iran became a major importer by the mid-1970s. The increase in grain imports was especially pronounced, reflecting burgeoning demand and slow growth in production. With population increasing at a rate close to 3 percent annually, agricultural growth must accelerate if a continuing rapid increase in import requirements is to be averted.

Although the Iranian revolution was primarily an urban-based movement, it drew attention to the political implications of Iran's agricultural problems. Under the Shah, agricultural growth lagged far behind that of industry, resulting in a widening income gap between the two sectors. This disparity contributed to a rural exodus, estimated at 500,000 annually in the early 1970s, that eventually was to swell the ranks of those who participated in the mammoth urban street demonstrations in the revolutionary period.

Background

The environmental conditions in most of Iran are not favorable for farming. Less than a quarter of the country has the potential to produce crops, and less than 10 percent of the land is in crops at any one time. Each year, 40 to 75 percent of the total cultivated area is left fallow to permit the soil to absorb moisture and regain fertility. Only the Caspian coast and the western mountain ranges receive enough rainfall to support nonirrigated agriculture. The most productive croplands are in the northern and western provinces. In the west, most of the precipitation falls in the winter and early spring, in a pattern advantageous to winter grain production.

Staple Crops. Iran's principal crops are wheat and barley, predominantly winter varieties. These grains are usually grown on three-fourths of the available

land and account for approximately two-fifths of the total value of crops produced. Wheat is the country's basic food, accounting for at least half of the energy value in the diet; of late, it has become even more important because shortages and higher prices of other foods are increasing the demand for bread. Barley is the major feedgrain.

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Livestock. The livestock industry plays an important role in the Iranian economy, normally contributing approximately 40 percent of the value of total agricultural output. Historically, the wealth of many peasants was primarily in the form of animals, and Iran exported many sheep products. Animal products contributed only 8 percent of the energy value in the Iranian diet in 1975-77, compared with 12 percent in Pakistan and 10 percent in Turkey, but demand has been rising sharply, especially in the cities. Production of meat—other than poultry—has not kept up, and Iran has become a net importer of meat. Poultry production expanded rapidly in the 1960s and 1970s, and by 1979 accounted for about a third of total meat production.

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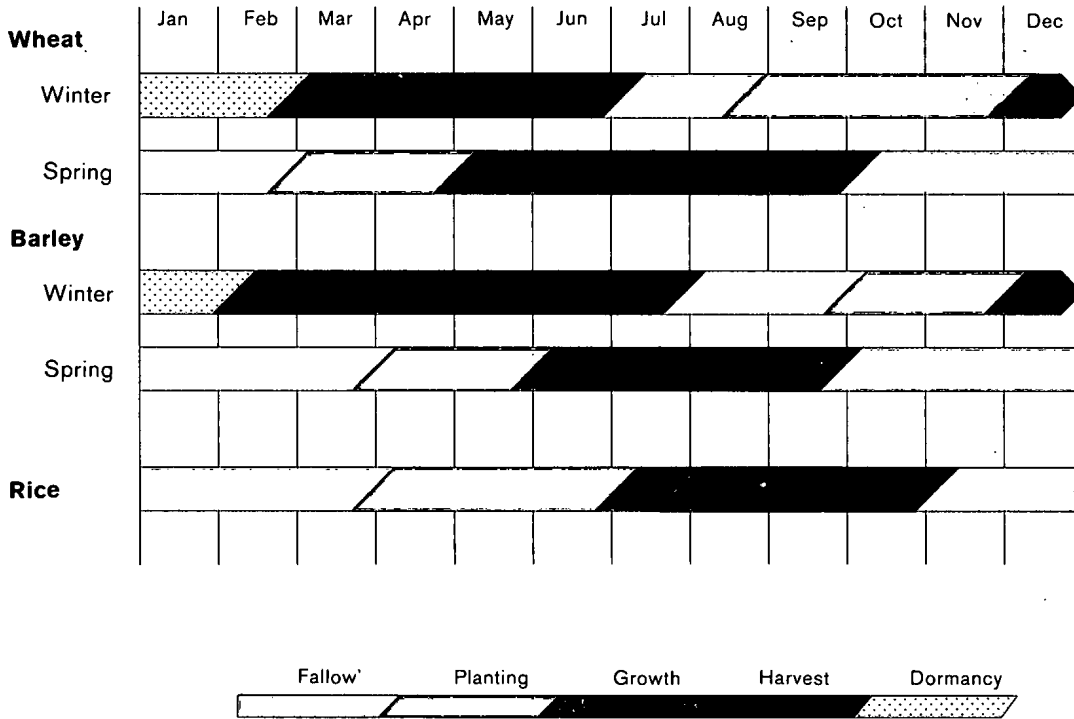
The performance of the livestock sector in recent years reflects poor feeding and shelter conditions, which make the animals susceptible to disease. By the mid-1970s, 80 percent of the pasturage in Iran was overgrazed, reflecting the fact that it was supporting more than twice the livestock population that proper range management would dictate. Former nomads who had been encouraged to settle in permanent locations increased the animal density on the lower, better quality rangelands. The remaining nomadic herders were forced to use the more marginal land at higher, drier altitudes and to take longer treks with their animals—factors that caused higher mortality and lower breeding rates. To maintain production levels, these herders increased the size of their flocks, accelerating the deterioration of the range.

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Figure 2

Iran: Simplified Grain Crop Calendar



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Table 1

Thousand Metric Tons

Iran: Production of Selected Crops

	Average 1970-75	1976	1977	1978	1979	1980 (estimated)
Wheat	4,081	5,500	5,000	5,300	5,000	4,750
Rice, paddy	1,173	1,276	1,051	1,288	1,212	1,163
Barley	933	1,150	1,100	1,000	970	1,000
Cotton	183	155	180	150	100	100
Sugar, raw	606	687	633	630	640	600

This table is Unclassified.

Agricultural Practices. Mechanized equipment is concentrated on larger farms and in agricultural cooperatives. Elsewhere, most Iranian farmers use primitive methods. Traditional animal-drawn and hand-operated tools are common, and much of the grain is planted, harvested, and threshed by hand. Fertilizer and pesticides are not widely available.

Except in the northern and western provinces, agriculture depends mainly or exclusively on irrigation. Much of the surface water used for irrigation is obtained from rivers and reservoirs built in the late 1960s and early 1970s during the Shah's third and fourth five-year plans. In many areas, however, irrigation water is still supplied by the traditional *qanats*—subterranean conduits leading from a well or spring located at the base of a mountain to the fields surrounding a village. During the last two decades many *qanats* fell into disrepair while the government emphasized development of surface water supplies.

Infrastructural Problems. Inadequate transport hampers Iran's agricultural output and the marketing of what is produced. In 1976 two-thirds of Iran's villages were not in the transport network used by trucks or trains, and more than a third were rarely accessible to any wheeled vehicle. Iranian farmers unable to sell their surplus output beyond their own isolated villages have little motivation to produce surpluses; they cannot even take advantage of guaranteed minimum prices by selling to the government. Even farmers who

can get their products to urban markets, however, receive little of the money urban consumers pay for food, for on their way to the cities agricultural products pass through many levels of traders, and each middleman gets his cut. Thus both the rural economy and the urban economy are losers: the rural sector does not benefit from rising demand—met instead by imports—while rural stagnation limits the market for products of the urban sector.

Agriculture Under the Shah

The Shah's government gave priority to industrialization over agricultural development. Agricultural investment fell short of goals, and measures designed to modernize the sector did little to improve overall agricultural performance. Agriculture remained largely traditional, with subsistence farm families composing most of the farm population. Fewer than 15 percent of the families owning farms produced most of the marketed surplus. The number of tractors in use expanded rapidly after 1975, but by 1978 there were still only eight tractors per 1,000 hectares of harvested grain area, compared with 27 in neighboring Turkey. At the time the Shah was overthrown, half of the Iranian population lived in rural areas and 40 percent of the labor force was employed in the agricultural sector, but it contributed only 9 percent of the gross national product.

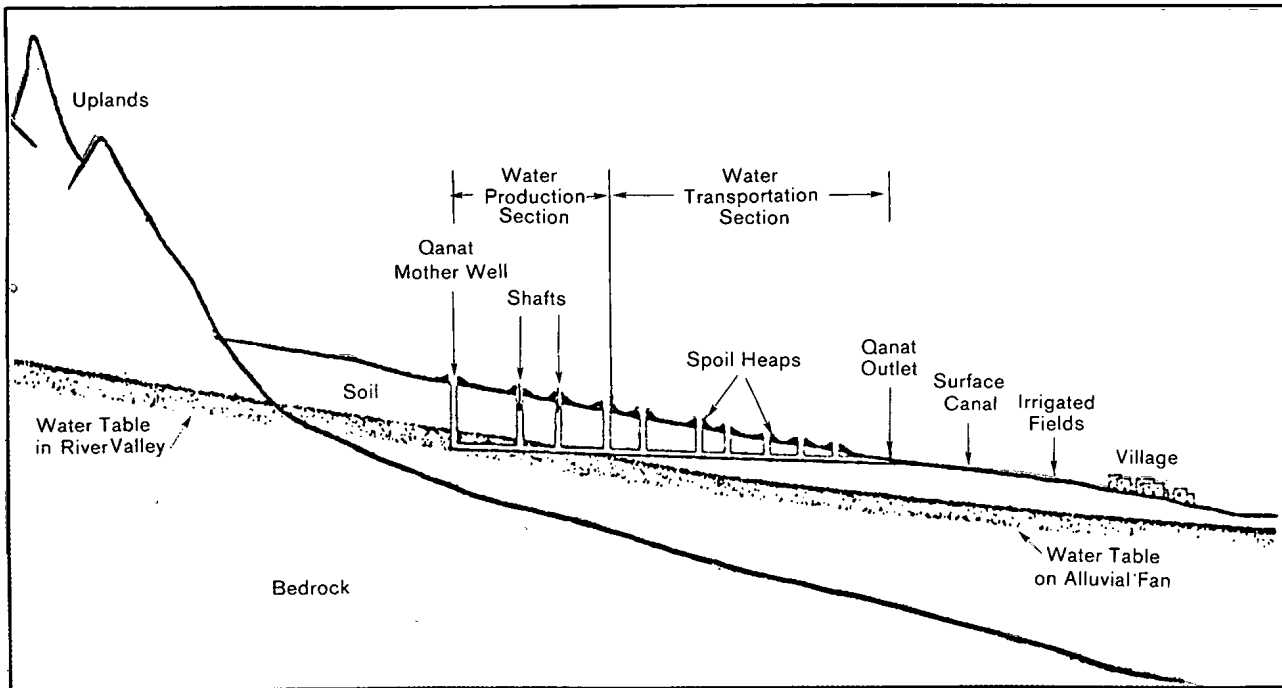
Figure 3

Iran: Traditional Irrigation System (near Tehran)



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Functioning qanat in operation. Water is flowing out of the conduit into a canal which leads to the fields. The abandoned qanat, adjacent and parallel to the active one, probably taps the same mother well. The diagram gives a cross-section of the qanat irrigation system.



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Slow Growth. During the Shah's rule, growth in agriculture was heavily concentrated in industrial crops, tree crops, and intensive poultry production. The overall rate of growth apparently was considerably lower than the official figures and probably lower than the rate of population growth. The return to most farmers from selling their surplus was not sufficient to encourage adoption of improved technology. Grain yields continued to compare unfavorably with those of other Middle Eastern countries, and increases in output were due largely to increases in land under cultivation. The government did encourage development of agribusiness enterprises to take advantage of the economies of large-scale commercial agriculture and to attract foreign investment and technology. By the time of the revolution, however, most of these projects had folded, mainly because they were mismanaged, but also because they were unsuited to local physical and labor conditions [redacted]

Under the Shah, more than a dozen large reservoir dams were constructed. Most of the land developed below these dams was leased to domestic and foreign agribusiness for the production of industrial crops. The dams were used primarily to generate electricity for industrial purposes, however, and in any conflict irrigation needs were secondary. Normally, water was released through the dams during the peak electrical seasons of midsummer and midwinter, rather than in spring and early summer when the farmers most needed water for irrigation. [redacted]

Construction of grain storage facilities did little to improve the linkage between typical farmers and the urban sector. A number of grain elevators were built, but most of them were located in or near large cities; a lack of roads and high transportation costs precluded use of these elevators by most farmers. There were few government storage facilities in the villages. (In arid areas, it must be noted, grain and other storable produce may be kept in relative safety for long periods in primitive storage facilities. [redacted])

Land Reform. The Shah's government sought to achieve a major impact in the agricultural sector with the land reform program of the 1960s and early 1970s. During the 10 years of the program, large

Table 2

100 Kilograms Per Hectare

Iran and Neighboring Countries: Wheat Yields

	1961-65	1975	1976	1977
Iran	8.0	7.6	9.1	8.0
Afghanistan	9.5	11.9	12.3	11.3
Iraq	7.0	6.0	8.8	8.1
Pakistan	8.3	13.2	14.1	14.3
Turkey	10.8	15.9	19.2	17.8
USSR	9.6	10.7	16.3	14.8
Armenian SSR	9.7	19.8	^a	21.2
Azerbaijan SSR	8.4	15.3	^a	18.1
Turkestan SSR	5.9	17.5	^a	13.7

^a Unknown.

This table is Unclassified.

amounts of land owned by the Iranian Crown or Government—or acquired by compelling large landowners to sell—were turned over to private families under long-term mortgages at low interest rates. Although successful in reducing the social and political power of the semifeudal landlord class, which was viewed as obstructing modernization and economic development, the reforms disrupted agricultural output. By the mid-1970s many peasants had become small landowners or leaseholders, but the institutional framework was inadequate. Implementation of measures intended to complement land redistribution by fostering rural cooperatives, credit and extension services, and increased supplies of inputs, was haphazard and largely ineffective, partly as a result of a dearth of qualified administrative and technical personnel. [redacted]

The reforms also provided for establishment of farm corporations made up of farmers who had agreed to consolidate their holdings and pool their resources to mechanize their operations. These corporations proved unpopular, however, because individual farmers could not retain title to their land. Those that were formed were unable to recruit experienced managers and were largely unsuccessful. [redacted]

Belated Emphasis. Just before the Shah's overthrow, the government's agricultural modernization program was revamped, and new objectives were outlined in the sixth five-year plan (1978-82). A major goal of the plan was to put the country on the road to achieving self-sufficiency in grain production by 1990. Among other provisions, the plan gave greater emphasis to agribusiness and tagged substantial funds for rural road construction in the hope that a better farm-to-market road network would allow small farmers to market their crops directly and thus receive a higher profit. []

Food Demand

Under the Shah, domestic food production was inadequate to meet the sharp increase in food demand spurred by rising incomes in a rapidly growing urban population. The result was a remarkable rise in imports of food (and other agricultural products). Although the Shah's overthrow was followed by economic recession, food consumption continued at a relatively high level, as did population growth, especially in the cities. []

Higher Incomes. During the booming 1970s Iran's per capita food supplies increased more than 5 percent a year, rising from 2,339 calories per day in 1969-71 to 3,193 calories per day in 1975-77—only 5 percent below the average for developed countries. Rising per capita income resulting from petroleum price hikes, together with food subsidies and price controls on food, helped to make possible a substantial increase in food consumption, at least in urban areas. Between 1970 and 1974 Iran's per capita intake of poultry and red meat almost doubled. Higher urban incomes, however, did not bring small farmers higher prices for their produce; changes in the urban-rural terms of trade during the mid-1970s went against the farmers, as retail food prices were held down while prices of other commodities were permitted to rise. []

Population Growth. In addition to the impact of higher incomes, food requirements increased because of rapid population growth. After slow expansion in the first half of this century, Iran's population doubled in the past 25 years. During the same period the urban population more than tripled, increasing from

about a fifth of the total population in 1900-40 to roughly half of the present population of about 40 million. Despite high fertility in rural areas, internal migration holds down the annual rate of increase there to less than 2 percent, while the urban population—the segment most dependent on food imports—is currently growing about 5 percent a year. By 1985 the urban population is projected to increase to 54 percent of the total population, which by then is likely to exceed 45 million. []

Rising Food Imports. During the 1970s the inability of domestic production to keep up with the growth of food demand was reflected in soaring imports. Between 1970 and 1975 the value of food imports rose from less than \$70 million to \$1.5 billion. In 1976 severe port congestion and logistical problems contributed to a temporary decline in food imports, forcing a drawdown of stocks. After expansion of port facilities, however, imports in 1977-78 approached the 1975 level. []

The most dramatic rise came in grain imports, which increased from 10 percent of total food imports in 1970 to 43 percent in 1978. In the latter half of the 1970s imports accounted for about 18 percent of wheat consumption, even though wheat is Iran's primary staple crop. Overall, Iran has come to depend on imports for about a third of its total food supply—and for about half of the food supply in Tehran and other large cities. []

During the 1970s Iranian consumers came to prefer grain of the types and quality supplied by the United States. Led by grain sales, the US share of Iran's total agricultural imports increased until it peaked at about 40 percent in 1975. Following the overthrow of the Shah, it dropped to 20 percent in 1979 and to less than 1 percent in 1980. []

Impact of the Revolution

After the overthrow of the Shah, the new government cut back sharply on all food imports—not just those from the United States. The revolutionary regime apparently assumed that, freed of the Shah's restraining hand, Iran's farmers would quickly increase their

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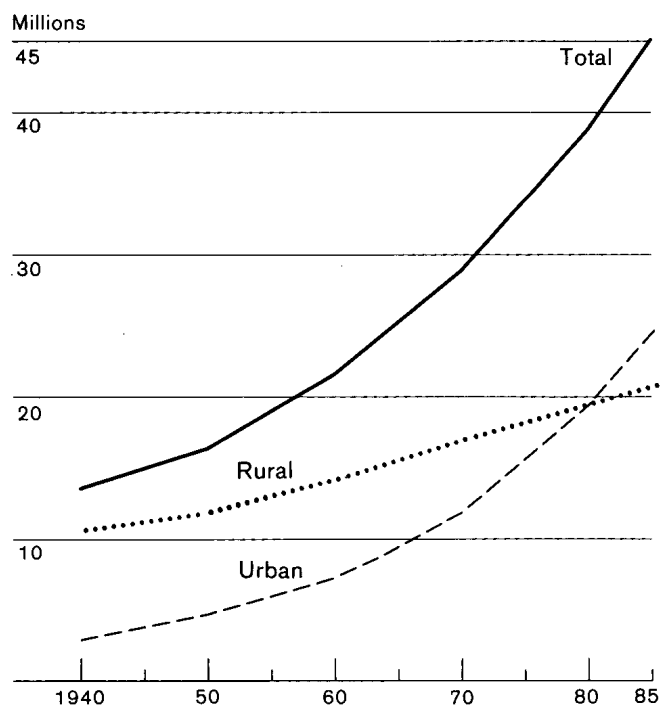
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Figure 4

Iran: Population Growth, 1940-85



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output to the degree necessary to replace the imports. In 1979 and 1980, however, domestic food production was well below average as public disorder interfered with agriculture, especially with harvesting. The resultant food shortages made Iran's dependence on imports painfully clear. Livestock numbers dropped sharply as breeding stock was slaughtered for food. Anger over skyrocketing food prices erupted into street demonstrations in Tehran. Finally, the government relaxed its import restraints, and food imports reached a new high in 1980. Despite these imports, however, food shortages continued and many items were rationed—or available only at high prices.

~~**Feeble Leadership.** While current conditions have forced Tehran to follow a more realistic policy with regard to food imports, the regime is committed to~~

Table 3

Thousand Metric Tons

Iran: Selected Agricultural Imports

	1977	1978	1979	1980 (estimated)
Wheat	1,277	1,206	1,200	2,000
Wheat flour ^a	45	52	56	42
Rice	630	367	440	470
Barley	334	467	200	600
Corn	328	283	600	897
Other cereals	233	283	50	100
Total cereals	2,797	2,709	2,546	4,109

^a In wheat equivalent.
(1 ton of flour equals 1.39 tons of wheat equivalent.)

This table is Unclassified.

giving greater emphasis to domestic agriculture. Nevertheless, strong direction and a coordinated policy are lacking. Primary responsibility for agricultural policymaking lies with the Ministry of Agriculture and Rural Development. The top positions of the ministry, however, have been taken over by mullahs who lack agricultural expertise. For ideological reasons, the mullahs support a move away from the Shah's ideal of large centralized agricultural units toward support of small holdings and traditional farming. Although the Planning Authority opposes this shift, as do many technocrats within the ministry, agribusinesses and large capital-intensive projects have received little government support since the revolution, and projects under construction at the time of the revolution have been dropped or are in disarray.

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In the absence of clear national policy, confusion over land ownership is widespread. Land tenure committees have been set up in several areas to redistribute land that is underutilized. It is not certain whether they are taking land only from the large landholders who did not redistribute their land during the Shah's land reform programs, or from medium and even small farmers as well. Many farmers who have not yet

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lost their holdings fear their land may be expropriated, which inhibits them from trying to expand production. Meanwhile, mullahs—many of whom lost land as a result of the Shah's reforms—reportedly are regaining or extending their holdings [redacted]

Ineffective Programs. In contrast to previous practice, the government has given the provinces substantial economic autonomy, allowing them to establish their own banks and devise independent development budgets. In addition, the government has raised procurement prices, made credit available to farmers, and facilitated increased imports of seed, fertilizer, and farm machinery. Despite these measures, commercial agriculture is depressed. In 1980/81 output of cottonseed, soybeans, and sunflower seeds—produced primarily by commercial farmers—dropped to less than half of that in 1979/80, probably because of the reluctance of farmers to invest and plant at previous levels. The drop led to a sharp decline in Iran's vegetable oil consumption in 1980. [redacted]

The government reportedly plans to promote grain production in rain-fed areas at the expense of expanding irrigated agriculture. Such a policy will heighten dependence on weather and aggravate the existing problems of wide annual fluctuations in yields and output. At the same time, the government is encouraging poultry and livestock production, which will greatly expand feedgrain requirements. Breeding stock are to be imported to replace stock killed for food, even though shortages of fodder have already been reported. [redacted]

Finally, the government is encouraging reverse migration from the cities back to the villages, but without much success. The population of Tehran and its suburbs, for example, has already ballooned to an estimated 6.7 million and is continuing to grow rapidly. A lack of incentives for farmers to stay on the land and the perception that they can make more money in urban areas—even if only in illegal activities—continue to spur migration to the cities. [redacted]

Impact of the War

The war with Iraq has depressed Iranian agriculture in a number of ways. Although most of the Iraqi-occupied region in western Khuzestan is normally not

cultivated, in areas near Abadan, Ahvaz, and Dezful at the eastern edge of the war zone, fields usually planted to industrial crops had to be abandoned. Sugar beet fields west of Ahvaz were intentionally flooded. Croplands near Kermanshah suffered some damage. Overall, however, the war has caused relatively little harm to agricultural areas. Most farmland could easily be returned to production if the war were to end. [redacted]

In addition to the cropland lost or damaged, about 1 million hectares (15 percent of the total farmland) reportedly were not planted last fall because of the war. Many farm workers have been called into military service, which could result in a rural labor shortage. The war has also created fuel shortages that may limit distribution of the harvest. ~~The closure of several major ports at the northern end of the Persian Gulf has disrupted the normal flow of imports. Food rationing, imposed even before the war, had to be expanded~~ [redacted]

Current Status of Crops

In general, the weather this year has been favorable for crops. In particular, precipitation has been above normal. The main problems have occurred in the eastern provinces of Kerman and Khorasan, which normally produce about 12 percent of the total grain crop; extensive flooding in early May reportedly damaged 25 percent of the summer wheat crop and 30 to 40 percent of the winter wheat crop in those areas. Elsewhere, however, Iran has enjoyed weather conditions similar to those of neighboring Turkey and Iraq, both of which are expecting good winter grain crops. [redacted]

Despite the war, this year's winter grain production is likely to be better than that of the last two years and near the average of the past six years. Satellite imagery has revealed good crop vigor levels in most of Iran's major agricultural regions. Lodging, an indication of healthy grain and good yields, was prevalent both in western and northeastern Iran. Harvesting apparently proceeded on schedule, for the most part.

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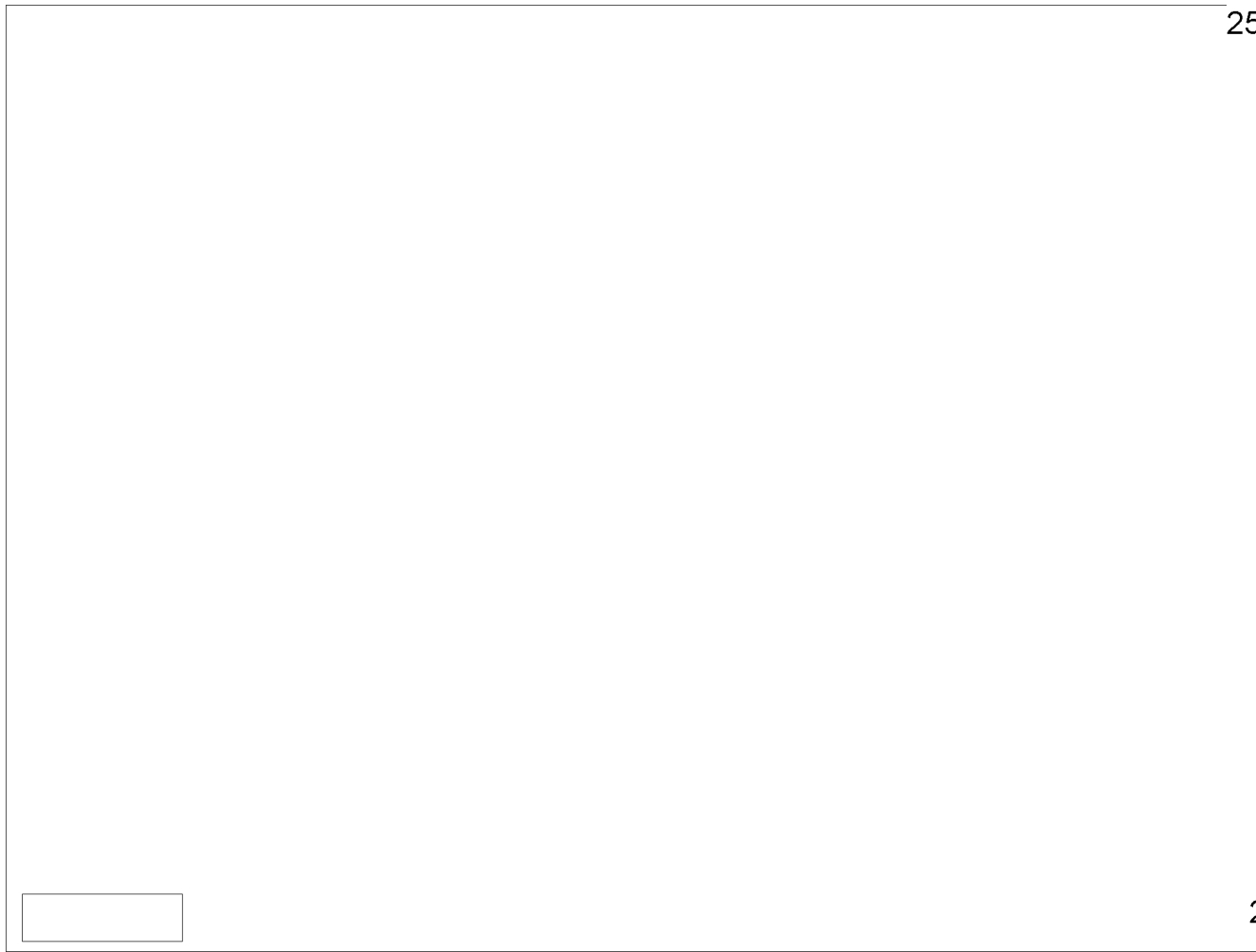
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In harvested fields, shocks were often closely spaced, another indication of good crops. [Redacted]

Outlook

Although the country's agricultural performance may improve somewhat ~~this year~~, Iran will nonetheless continue to rely heavily on imports to meet food requirements, since little of any increased output will reach the cities. ~~Once the surplus from this year's harvest is exhausted~~, probably before the winter is over, food shortages should again intensify. [Redacted]

Having learned its lesson, the government now gives top priority to food imports, which currently account for about 20 percent of total imports. Despite serious port and logistic problems, total agricultural imports

may reach ~~\$3.3 billion in 1981 and \$3.8 billion in 1982. As long as Iran continues to export oil at current rates it can afford them~~, although the government's desire to achieve self-sufficiency in food production suggests it would rather spend the money on other goods. [Redacted]

Since the resolution of the hostage crisis, the US share of the Iranian import market has been rising again, despite the antipathy of the Iranian Government and the availability of grain from other foreign sources. US sales of white wheat are already back to pre-1980 levels, ~~during 1981 the United States is expected to supply more than 1 million tons, about half of Iran's total imports of wheat~~. In 1982 the US

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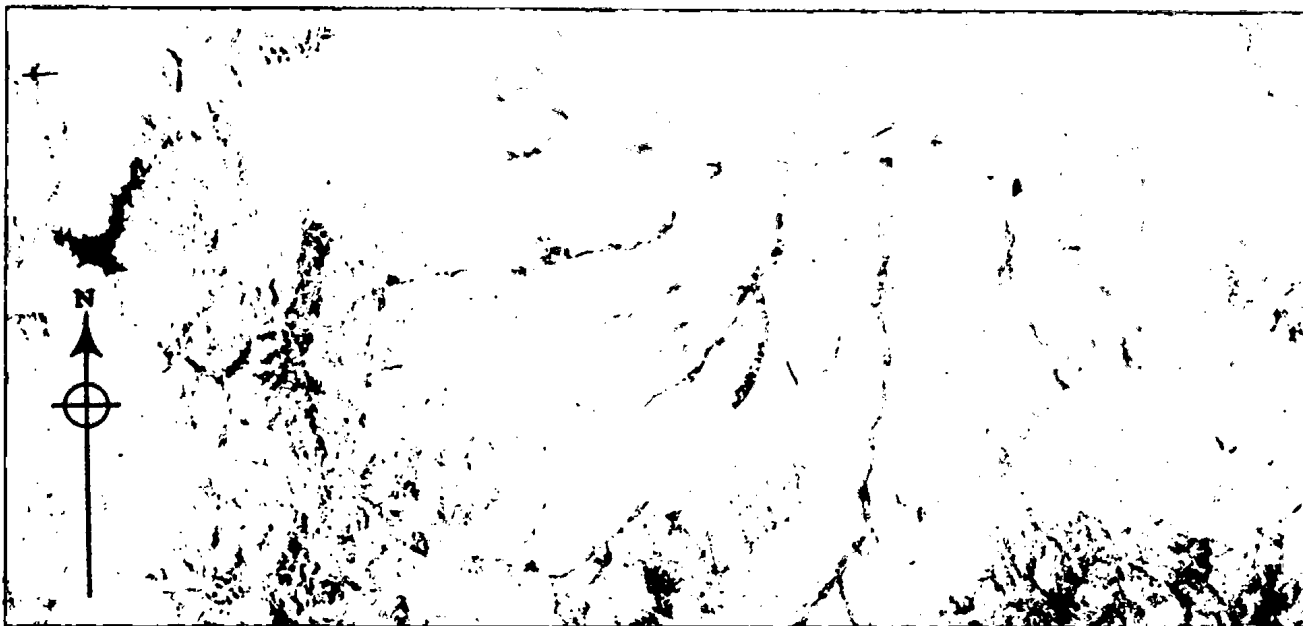
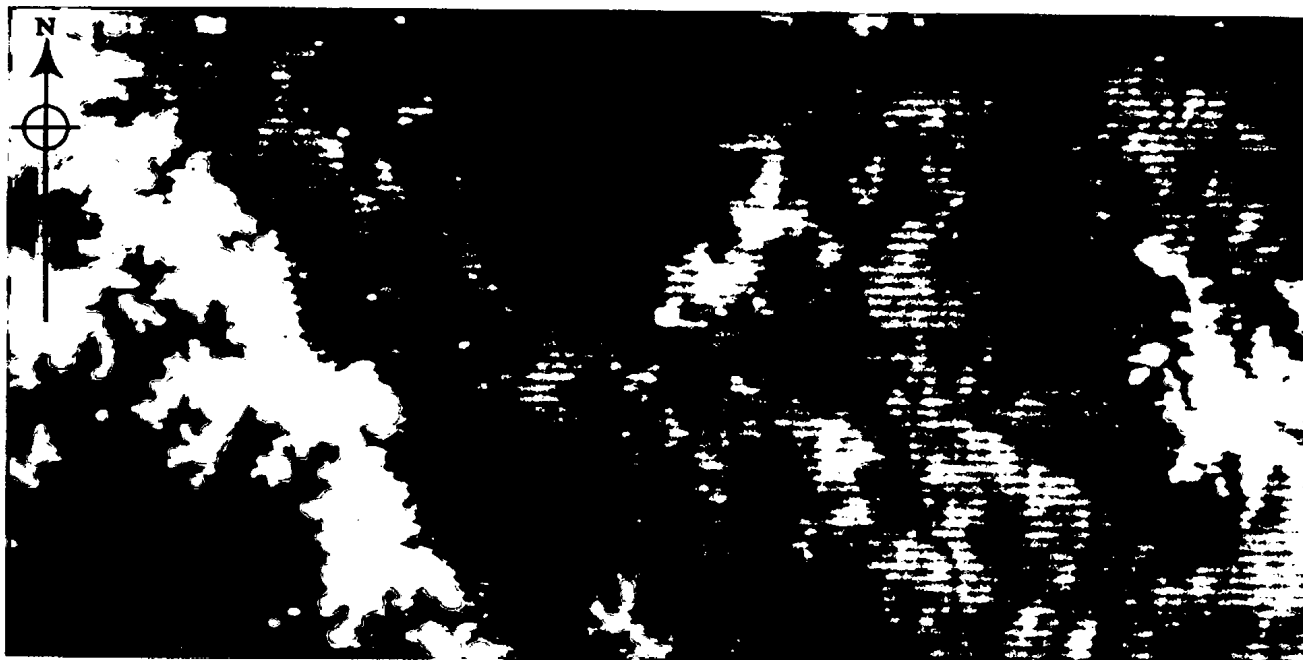
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Figure 6

Iran: Good Yields Expected in 1981 (Northwest Iran)



The dark red on the NOAA-6 imagery and the bright orange on the LANDSAT show examples of the good vigor levels seen throughout Iran. Reservoirs appeared full on the LANDSAT imagery, an indication of more than adequate water supplies.



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share of Iran's total agricultural imports could rise to about 15 percent—worth more than \$500 million—if Iran imports as much as now seems likely.

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Over the longer term, it is unlikely that Iran's domestic production will keep up with growing food demand—much less that Iran will achieve food self-sufficiency—as long as its political and infrastructural problems remain unresolved. Because the growth of the agricultural labor force is slowing, expansion of agricultural production will depend largely on increased productivity. That would require strong (and appropriate) policy direction in a stable political climate. Without these conditions, farmers are unlikely to invest in improved technology, and agricultural development efforts will flounder. In the livestock sector, while resolute destocking and stricter controls on range use could at least ensure a stable (if still inadequate) meat supply, a continued overgrazing of the range can only result in a further diminution of range resources and concomitant declines in livestock production. With increases in population, an emerging urban majority, and likely changes in diet in the years ahead, the outlook is for even greater dependence on agricultural imports.

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