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KERMAN I. GEOGRAPHY

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i. GEOGRAPHY

Physical geography. Kerman province is situated in southeast Iran, to the southwest of the Kavir-e Lut (see DESERT). Covering an area of 182,000 km^2 (70,000 square miles), Kerman is the largest province in Persia, constituting 11 percent of its area. The province lies between latitudes 26°29′ and 31°58′ north and longitudes 54°20′ and 59°34′ east; it forms roughly an inverted right triangle facing west, with the side to the north reaching 470 km from east to west and the eastern side running 630 km from north to south. The province is bounded in the southwest by Hor-moz-gān and Fārs provinces, in the northwest and north by Yazd province, in the northeast by Khorasan province, and in the east by Sistān va Balučestān province (Figure 1).

The physical features that delineate the province are primarily deserts. The Kavir-e Lut separates Kerman from historical Qohestān (now South Khorasan province) and Sistan, while the southerly extension of the Kavir encircling the Jāz Murīān marsh (*hāmun*) is a barrier between Kerman and historical Makrān (present-day Baluchistan). In the west of the province there are patches of wasteland, most notably the Kavir-e Namak-e Sirjān, locally known as Kafa-ye Qaṭru (Abbott, p. 66), that form a natural boundary between the two provinces of Kerman and Fārs. However, in the south the last stretches of the Zagros mountain chain provide some natural continuity between southern Kerman and Lārestān district in Fārs.

Bordering the low-lying desert, the province's north and center form a plateau typically 2,000 to 2,500 m in elevation (Figure 1), characterized by mountains that offer shelter to its settlements. The plateau includes a succession of mountain chains with a general pattern from northwest to southeast spanning the province. The northern range has the summits Ḵᵛāja (2,175 m), Čehel Doḵtar (3,084 m), Lakar (2,965 m), Bāḡbālā (3,711 m), and Palvār (4,233 m). To its south runs a parallel, but much narrower, tangled ridge with angular crests and the summit Jupār (4,089 m) overlooking the city of Kerman. Further south, the massif in the center of the province is punctuated with the peaks Čehel Tan (3,765 m), Lālazār (4,234 m), Hazār (4,465 m), and Bahr Āsemān (3,046 m). It is in the foothills of these mountain chains that the upland oases of the province lie (topographic data obtained from online sources, especially satellite images at Google Earth).

The province falls into the arid and semi-arid zones and like much of the Iranian plateau suffers from scarcity of water—a dire condition as the population continues to grow. There are several, but mostly seasonal, mountain streams. The only significant river is the Halilrud, about 400 km long, which is joined by its tributary, the Ābšur river, near Jiroft. The Halilrud river irrigates the vast fertile plain of Jiroft-Rudbār and disappears further south into the marshes of the Jāz Muriān. The latter, originally a lake basin (cf. HĀMUN i), has been reduced to an essentially dry marshland since the Halilrud's water was regulated, after construction of the Jiroft dam. The average annual rainfall is low and decreases towards the southeast, although the topography gives rise to many local variations. Maximum precipitation occurs in winter; the annual average rainfall is 80 mm and 142 mm in the cities of Bam and Kerman respectively (see Table 1 for details). But precipitation is more abundant at higher elevations, and the snow that falls in the mountains refills the aquifers from which manmade underground channels (*qanāt*, *kāriz*) draw water for irrigation, notwithstanding the brackishness of the *qanāt*s' outflow in many places. Most of the older subterranean watercourses have dried up, whether because the flow in the aquifers is entirely consumed or the underground water is sucked out by electric pumps; since the 1940s, the use of deep wells has become prevalent for creating islets of intensive cultivation (Beckett, 1953; English, pp. 30-38, 135-40; Spooner and Salzman, p. 112).

Table 1
KERMAN CITY TEMPERATURE AND PRECIPITATION

Month	Mean Temperature (oC)		Mean Total Precipitation (mm)	Mean Number of Precipitation Days
	Daily Min.	Daily Max.		
January	-4.0	11.8	29.0	5.1
February	-1.1	14.2	26.7	4.6
March	3.4	18.6	32.0	6.0
April	7.9	23.8	19.5	4.4
May	12.0	29.8	8.6	2.0
June	15.6	34.8	0.5	0.3
July	17.0	35.5	0.7	0.3
August	14.2	34.0	0.6	0.2
September	9.8	31.0	0.3	0.1
October	4.8	25.7	0.7	0.3
November	-0.7	19.2	5.1	1.5
December	-3.6	14.1	18.4	3.5
Note: The data are monthly averages for the 30-year period 1961-90. Source: World Meteorological Organization.				

The binary climatic division of the Iranian Plateau into warm and cold zones (*garmsir* and *sardsir*; see also CLIMATE) is quintessential in Kerman. The province is divided into two distinct macroclimates, *sardsir* in the upland north and *garmsir* in the lowland south, generally speaking. The upland Sirjān has a temperate climate, while Kerman, Rafsanjān, Zarand, and Rāvar have hot summers and mild winters. The southern districts of Jiroft, Kahnuj, and Manujān, as well as Bam, are characterized by having warm climate with an increasing humidity towards the Sea of Oman and the Indian Ocean. At the city of Kerman, with an elevation of 1,762 m, the average high temperature in January is 11.8° C, and the average low is -4.0° C. In July the average maximum and minimum are 35.5° C and 17° C, respectively. Put in a national perspective, with consideration of temperature and precipitation combined, the district of Kerman lies within a “steppe” climate, compared with the desert status of Yazd and Zāhedān and the humid status of Bandar ʿAbbās (cf. English, p. 8).

The province's flora reflect its climatic dichotomy. The highlands contain traces of a dry forest of shrubs and trees such as pistachio and almond; the plains and accessible areas of the foothills have been deforested—the natural vegetation has been lost due to charcoal making and overgrazing by goats and sheep (see FORESTS AND FORESTRY). Nevertheless, there still survive several wild species that are used as dyes in the carpet weaving industry of Kerman (English, p. 14). The lowlands are covered thinly with steppe-like flora, most notably species of lotus (*konār*), myrtle, oleander, tamarisk, and acacia (see FLORA). A clear-cut demarcation line between these two climatic zones reveals itself in agriculture. While in the upland districts temperate horticulture is the norm, citrus and date palm farming prevail in warm zones.

Despite the favorable conditions that the mountains provide for human settlement, they are also the cause of destructive earthquakes (see Afsari for historical earthquakes). Modern documentation (Table 2) reveals an average return period of five to ten years for significant seismic events. The highest seismic activity belongs to the fault system called Gowk along the longitudinal edge separating the Kerman plateau from the Kavir-e Lut. It extends some 100 km approximately from Šahdād to Golbāf, traversing Čahār Farsak̲, Sirč, Ābgarm, Jowšān, Fandoqā, Zamānābād, and Golbāf (Berberian et al.; Nalbant et al.). A shorter fault in the south, also running longitudinally, was responsible for the devastating Bam earthquake in December 2003; its destructiveness was not so much due to the earthquake's (moderate) magnitude as it was to the poor quality of the physical infrastructure. With adobe as the chief construction material, the Bam citadel (Arg-e Bam) was susceptible to even moderate earthquakes and therefore could not have been an ancient construction, given the relative frequency of seismic events in the region.

Table 2
MAJOR EARTHQUAKES OF KERMAN PROVINCE

Location	Epicenter		Date	Magnitude (Mw)	Casualties (approximate)
	Latitude	Longitude			
Golbāf	29.86°	57.68°	11 June 1981	6.6	1,400
Sirč	29.99°	57.79°	28 July 1981	7.1	1,300

Golbāf	29.90°	57.72°	20 Nov. 1989	5.8	
Fandoqā	30.08°	57.58°	14 Mar. 1998	6.6	
Čahār Farsaḵ	30.32°	57.53°	18 Nov. 1998	5.3	
Bam	29.10°	58.35°	26 Dec. 2003	6.6	30,000
Zarand	30.73°	56.85°	22 Feb. 2005	6.3	602
Kahnuj	27.95°	57.70°	15 Jan. 2011	5.3	2
Sources: Berberian et al.; Nalbant et al.; IIEES.					

Table 3
COORDINATES AND ELEVATIONS OF MAJOR CITIES OF KERMAN PROVINCE

City	Latitude (North)	Longitude (East)	Elevation (m)
Bāft	29.233	56.602	2,267
Bam	29.106	58.357	1,060
Bardsir	29.928	56.572	2,042
Jiroft	28.678	57.741	679
Kahnuj	27.951	57.698	502
Kerman	30.280	57.067	1,762
Manujān	27.426	57.735	530
Rafsanjān	30.407	55.994	1,513
Rāvar	31.269	56.808	1,175
Šahr-e-Bābak	30.114	55.122	1,848
Sirjān	29.452	55.681	1,744
Zarand	30.815	56.569	1,659
Sources: SCI, pp. ii-iii; Jaʿfari, III, p. lxi; Veloroutes.org.			

Administrative boundaries and divisions. Although the geographical concept of Kerman in its narrow sense pertains chiefly to the cold highlands or the northern plateau that covers the current province, in a wider sense, at least in modern history, Kerman was one of the four *eyālat*s or super-provinces (together with Azarbaijan, Khorasan, and Fārs) that formed four quadrants over the map of Persia, an arrangement perpetuated by the law of territorial divisions of 1907 (Wadiʿi). In this setting, Kerman province, also known as Kermān va Makrān or Kermān va Balučestān, extended eastward up to the Indo-Persian border and southward to the Sea of Oman (Keyhān, II, pp. 244-57). The administrative reforms of 1934-38, which divided Persia into ten provinces, made little change in the borders of the former Kerman province, which was now called the "Eighth Province" (constituting Kerman, Bam, Bandar ʿAbbās, Ḵāš, and Zābol; see Wadiʿi). The territory of the Eighth Province shrank over the subsequent decades, to what is now called Kerman province, due to two major secessions. The eastern half of the historical province was incorporated into the new province of Sistān va Balučestān, and the southern coast was carved off to form what is known today as the province of Hormozgān.

The administrative mosaic of the province has increasingly become finer over the decades. Kerman province, within its present borders, began with five sub-provinces (Kerman, Bam, Jiroft, Sirjān, and Rafsanjān; Razmārā, 1953, pp. 430-31; cf. SCI, 1970), and grew into a dozen in the 2000s and to more than twenty by 2011 (see KERMAN iii. POPULATION). The number of districts within each sub-province has grown in a proportional manner. In spite of all these variations, the city of Kerman (1,038 km distance to Tehran) remains the most important provincial capital in the southeastern quarter of Iran.

Economy. Having economically ranked low among Iranian provinces and cities for most of the 20th century, Kerman became engaged in the national economy through exploitation of its rich mines, expansion of transportation infrastructure, and establishment of educational and tourism services. Kerman city, although still the commercial center of the province, no longer monopolizes urban development: Rafsanjān has joined the competition thanks to political favoritism toward the Rafsanjāni clan, who have roots in the booming town of Rafsanjān.

Agriculture still plays an important role in the economy of Kerman province.

The upland regions have diversified subsistence farming of cereals, potatoes, cotton, sugar beets, oilseeds, vegetables, and a large variety of fruits, including peaches, cherries, apples, pears, persimmons, as well as nuts (English, pp. 117-20; WAP, II, pp. 951-54). Kermani cumin, mostly cultivated in Bāft, enjoys such a nationwide reputation that it has led to the proverb *zira ba Kermān bordan* (lit. "carrying cumin to Kerman"), much like the phrase "carrying coals to Newcastle" in English. Pistachios, another famous product of the province that is farmed in Rafsanjān, has in recent decades become subject to semi-mechanized agronomy and is produced in such a large quantity that it is exported abroad after saturating national markets. Production of another labor-intensive crop, sugarcane, is rapidly expanding, especially in Bardsir (Razavi). Poppy farming was an important cash crop for Kermani farmers, but, ever since its ban in the mid-20th century (see AFYUN), the high amount of opium consumed in the province is smuggled from Afghanistan. In the warm lowlands of the province, rice, cereals, fruits, and henna are grown. The agriculture of Bam has come to be dominated by date palm and citrus farming, the produce of which is marketed throughout Iran (SCI, 1970). Banana cultivation had been introduced in the *garmsir* regions by the end of the 20th century.

Animal husbandry has lost its edge in the province. Tending large flocks of sheep and goats was partly an occupation of various nomadic groups throughout the province (Razmārā, 1944, pp. 144-53), including the Afšārs who wintered in Jiroft and summered in Bāft (see ʿAŠĀYER). They produced wool, including down wool (*kork*), which was used in weaving the famous shawls of Kerman. Erosion of the traditional nomadic and rural base and destruction of the grassland through overgrazing has resulted in a sharp decline in animal herding, while mechanical raising of livestock has gained very little success (English, pp. 107-8; WAP, p. 954).

Kerman has long excelled in manufacturing textile and weaving carpets (see below KERMAN xv). The Kerman carpet is as famous as its cumin and is the subject of a Persian metaphor *meṯl-e qāli-e Kermān* ("like a Kerman carpet"), implying the idiomatic expression "the older, the better." Carpet manufacture remains one of the main industries of Kerman city and its neighboring districts, although its international market is far less promising than it used to be (see CARPETS vii. PAHLAVI PERIOD). Hand-woven carpets have increasingly given way to the much cheaper machine-made rugs, which are produced in large factories. There were also many textile factories that

produced Kerman's famous shawls, brocade (*terma*; see CLOTHING xxvii), and *ʿabāʾ*, but these are no longer flourishing, while *pata-duzi*, an embroidering art (see CRAFTS), still survives as a cottage industry (WAP, p. 957).

Since Kerman sank to a city of second rank for most of the 20th century, other manufacturing sectors were not highly developed there. Modern industries of some significance are the construction industry, producing cement and brick; sugar refining; and the food industry—all producing for local consumption (WAP, p. 958; Wezārat-e defāʿ, pp. 31-32). In the 1960s, in a project to develop a national steel mill, Kerman province was considered as a site because of its iron ore and coal mines, but insufficient water sources in Kerman made Isfahan (see ISFAHAN xiv. MODERN ECONOMY AND INDUSTRIES) the choice candidate, to which Kerman's coal and iron ore are now shipped. There is little heavy industry in the province as of 2017.

No business engages Kerman with the national networks to a greater extent than mining does. Extensive mining of coal, iron ore, and copper is being carried on in various parts of the province. Coal deposits extend in the mountains from Zarand to Rāvar, yielding most of national coal consumption in Iran; the mines are operated chiefly by Iran National Steel Mill Corporation (see also COAL). The iron ore deposits of Gol Gowhar in Sirjān sub-province are one of the largest worldwide. The mined ore is pelletized in a local plant, yielding up to five million tons of iron ore annually (see STEEL INDUSTRY IN IRAN). Copper deposits of Kerman province extend along a beltline from Šahr-e Bābak southeastwardly (see COPPER ii). The richest copper mine, one of the largest in the world, is at Sarčašma, located 50 km south of the city of Rafsanjān. Systematic mining operations were begun in 1972 by the Sarčašma Copper Company, operated since 1976 under the auspices of the National Iranian Copper Industries Co. The company's prosperity is evident from the presence of its football team, Ṣanʿat-e mes-e Kermān, in the national league, as well as the construction of a stadium with a capacity for 35,000 fans (NICIC). All these mining operations in Kerman province are supported by a gas pipeline from Bandar ʿAbbās to Kerman and a network of electricity transmission lines.

The service sector has been growing rapidly in the province, especially in higher educational infrastructure, which has seen an enormous growth since the establishment of the Rāzi Nursing School (1962) and the Institute of Technology (1969). The reemergence of Kerman on the national stage was sought through the founding of a full university in the 1970s. At present, the

University of Kerman and Kerman University of Medical Sciences, both in the city of Kerman, rank among national universities; Rafsanjān, too, has its own general and medical universities established during the administration of ʿAli-Akbar Hāšemi Rafsanjāni (president of Iran, 1989-97). Additionally, the Islamic Āzād University has a range of campuses (see EDUCATION xviii. HIGHER EDUCATION), operating in sub-provincial capitals at Kerman, Bāft, Zarand, Jiroft, Bam, Bardsir, and Kahnuj. These institutions attract a large number of students from all over the country, with symbiotic effects that used to be entirely unknown in the province. Moreover, tourism has been on a sharp rise thanks to promotion of the province's architectural attractions. These include the Safavid-period complex built by Ganj-ʿAli Khan, the 19th century Bāzār-e Wakil (see below KERMAN ii), and Zoroastrian fire temples, all in Kerman city; Šāh Neʿmat-Allāh's mausoleum and Bāḡ-e Šāhzāda in Māhān; the renowned fort of Bam; and the prehistoric excavations in Jiroft.

Modern transportation infrastructure has been the most essential means in bringing Kerman out of its historical isolation caused by deserts and mountains. In addition to the grid of modern highways that connect urban centers within and without the province, the Yazd-Kerman line of the trans-Iranian railway extends as far south as the city of Kerman and is anticipated to reach Zāhedān in future. Another railway branch from Yazd, to Bāfq and Bandar ʿAbbās, bypasses Kerman city but cuts across the western parts of the province to reach the copper mines of Sarčašma and iron ore mines of Gol Gowhar. The railroad also gave rise to the idea of a Sirjān Free Trade Zone, designed to become a nodal point on a commercial transit grid between the southern seaport terminals and the inner plateau. Last, but not least, is air transport: In 1992, a group of Kermani businessmen undertook the surprising initiative of establishing Mahan Airline, which has grown to one of the largest airline companies in the country.

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