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HEALTH PROBLEMS OF NOMADS

Based on Study Visits to the
Sudan, Somalia, Iraq and Iran

by

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INTRODUCTION

There are different patterns of statistical information and reporting systems in the five countries, which this paper is based on. In all countries the systems are rather insufficient and reporting incomplete. Information from one country cannot always be compared with information from another.

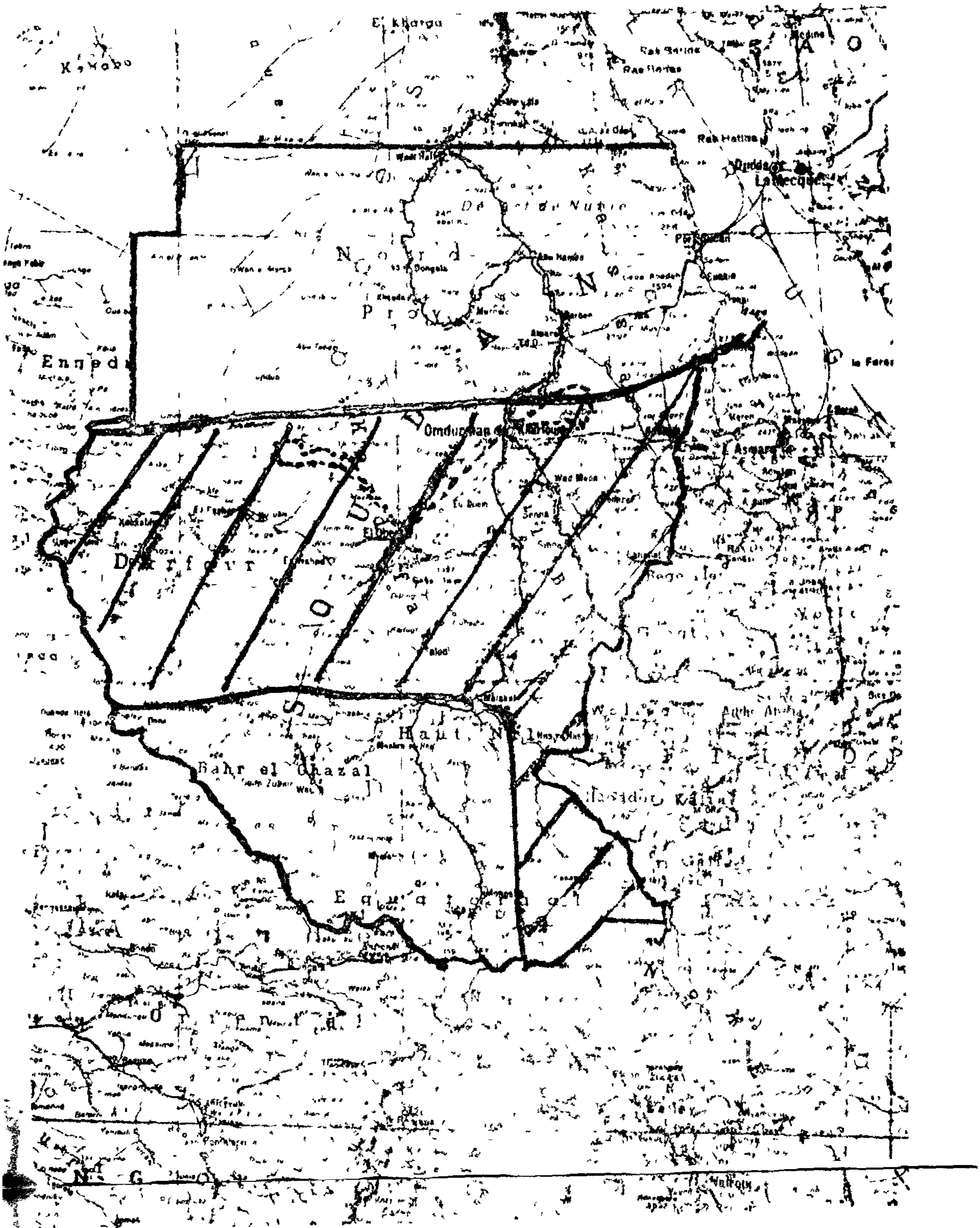
In many cases contradictory information has been received, and in some cases or diseases - smallpox, cholera, etc. - information is not available. The information which this report is based on emanates from hundreds of sources, and figures or "facts" reported here may be sort of average, and therefore seldom any source can be indicated. In some cases information could be classified as "intelligent guesses" based on extensive local experience of national or international personnel.

Each country visited has its own pattern of nomadism, of health problems and health services. However, many features and problems are common. Thus a comparison and discussion of the five countries together is stimulating and fruitful and may give ideas from one country to the other.

In total about 200 papers on nomadism and health problems of nomads have been collected during the study visits in 1972. However, only information which by the writer has been deemed essential for the discussion of health of nomads has been used here.

The concept "health" has been dealt with here in the widest sense of the word, focussing less on pure physical ill-health than on mental and social health, and particularly putting weight on social well-being as the one-third of the WHO definition of health.

11. MAP OF SUDAN



Striped area: the Savan

Dotted line:

SUDAN

Visited by the WHO Consultant from 13 to 27 June 1972.

Sudan became an independent state in 1956, and has since 1969 been a socialistic republic with a military regime. The civil war in the three southern provinces of Sudan has now come to an end and a programme for repatriation of refugees and resettlement has started. United Nations High Commission for Refugees estimates 140,000 Sudan refugees in neighbouring countries. Many of these refugees are nomads or semi-nomads.

I GEOGRAPHY AND CLIMATE

Sudan is the largest state in Africa (Lat. 20-24°N, Long. 24-37°E). It is situated on the dry belt running around the globe north of the equator and characterized by a hot climate with low precipitation. The Sahelian Region in north Africa and most African nomadic populations fall within this area, which in Sudan is referred to as the Savannah Belt.

The country is located on a flat plateau (about 400 metres above sea level), gradually sloping towards the north and interrupted by four mountain ranges: the Red Sea Hills, the Nuba Mountains in Kordofan, Imatong range in the south, and Jebel Marra in Darfur.

The most typical areas for the traditional nomadism of Sudan are the two large provinces of Darfur in the west and Kordofan occupying central Sudan.

The climate is tropical hot, dry and continental, in many areas only permitting nomadic pastoralism, and profitable agriculture without irrigation in only limited areas. The relative humidity is usually low (average 25 per cent over the year).

Mean Max./Min. temp. C°

	Khartoum	El Obeid	Port Sudan
January	32/16	31/13	24/20
June	42/27	37/24	38/26
Whole year	37/22	35/20	34/24

Average rainfall/year mm 164 (August mm 72,) 418 (August mm 145), 110 (November mm 52).

The rainfall ranges from almost nil in the northern fringes to more than thousand milimeters at the southern boundaries.

II POPULATION

The only census so far held in the Sudan took place in 1955/56. A population survey was carried out in 1964/65, and a census is planned for 1973.

The estimated population in 1972 is 15.8 million. Eight per cent were counted as urban in 1955, in 1972 twenty per cent. Khartoum has 170,000 and the "Triple-Capital" which also includesKhartoum North and Omdurman about half a million inhabitants. There are four other large cities in the Sudan: Atbara, Wad Medani, El Obeid and Port Sudan.

More than one-third of the total population - especially living in the north - consider themselves Arabs, and over fifty per cent speak Arabic. "Arab" is a cultural term, related to language and religion, rather than to race. Sixty to seventy per cent belong to the leading religion, Islam.

The population of the three southern provinces are Nilotic or Nilo-Hamitic, Christian or animists. In the westernmost province, Darfur, there are about 300,000 "Westerners" from African countries west of Sudan.

English is the traditional business language and the second lingua franca after Arabic.

Registration of births and deaths is carried out by statistics clerks stationed at hospitals, but the coverage is still incomplete, as only about twenty per cent of all births and deaths are registered.

Of all married men, over twenty per cent are married polygamous (eleven per cent have two wives, 2.5 three, 0.6 four, etc., and 405 husbands, mainly southerners, have ten wives or more). Purdah (veil) is still used in two nomad tribes, the matriarchal Rashaida and the Hadendawa.

In 1970 the literacy rate was thirteen per cent, and in 1972 twenty per cent (male thirty and female nine per cent). Of the actual school-age population 30.4 per cent attend primary school, 6.4 secondary school, and 2.4 high school, while one per cent take post-gymnasial studies. UNESCO assists a literacy project in three areas. In the next phase this project will include nomads.

In a report published in 1972 by the Ministry of Health and Ministry of Cooperation etc., the percentage of population benefiting from certain basic services are as follows:

Education	10 per cent	
Water supply	50 " "	
Electricity	2 " "	(only urban areas)
Modern transport	4 " "	
Health	1 " "	(measured by WHO standards)

III ECONOMY

The gross national product of the Sudan in 1972 corresponds to an average per capita income of about US $ 110 per year. The total government budget in 1971/72 was LS 236 million, with twenty per cent allocated for defence, five for education and three for health services. There is great unemployment in the Sudan.

As sources of income, agriculture and animal husbandry widely dominate, together occupying eighty to eighty-five per cent of the working population, and responsible for fifty-five per cent of the total production and the major part of the export. Sixty-six per cent depend for their livelihood mainly on agriculture cultivation, and fifteen per cent mainly on animal wealth. The high quality Sudan cotton makes one-third of the world's total cotton production, fifty to sixty per cent of the Sudan export value, and forty of its gross national product. Other important agricultural products are durra, groundnuts, sesame, wheat and millet.

Most of the farmers (seventy-five per cent) have small-scale, self-sufficient household economy. In some areas more advanced agriculture with cooperatives and irrigation schemes has lately been started, e.g. in the Gezira area between the two Niles. A similar area is under development in the Butana area, utilized for sedentarization of nomads, and for resettlement of people transferred from the Asswan Dam area north of Khartoum.

So far only about five per cent of the cultivable land - counted with artificial irrigation - is considered exploited.

IV HEALTH AND HEALTH SERVICES

The general policy for preventive and curative health services is handled by the Ministry of Health, while training of health personnel and research are responsibilities of the Ministry of High Education. There is a Post-graduate Medical Education Board for specialist training, inter alia in public health.

For administrative purposes the country is divided into nine provinces, each with a provincial medical officer of health, who in all cases has public health training and DPH. The district medical officers are called medical inspectors, with the main duty to supervise health activities of their district and not necessarily dealing with curative services.

The government health budget for 1970/71 was LS 7.9 million, and the health budget of the local governments was 6 million, making together an average per capita expenditure for health services of roughly LS one per year (US 2.5).

The birth rate is estimated at 51.7 pro mille and the crude death rate 18.5 pro mille. The infant mortality is 96 pro mille. The official figure for the annual population increase is 2.8 per cent. In the 1955/56 census birth rates of up to 85 pro mille are reported. Among Nilotic tribes of south Sudan death rates around 30 pro mille and infant mortality rates up to 300 have been reported.

There are hospitals in all provinces, all districts (with one to two physicians in each), and in some rural areas. In 1972 Sudan had 1,010 physicians (849 in government service) of whom fifty-eight had specialist training in public health. Expatriate doctors were thirty-nine. In 1972 seventy-five Sudanese doctors were on specialist training overseas. Medical assistants are 631, registered nurses 8,052, and registered midwives 2,152.

There is a nutrition division in the Ministry of Health, with two physicians with nutrition training in London. They run nutrition training of nurses and auxiliary health personnel. Creation of regional nutrition units and training of graduates abroad has been discussed. A division for health education has newly been established. There are thirteen trained health educators in the Sudan, of whom only one is full-time. Trained sanitary personnel are about 400.

The geographical distribution of health personnel and health services is uneven.

	Khartoum Province 5.6% of the Sudan pop. 0.8% " " " area	Kordofan Province 18% of the Sudan pop. 16% " " " area
Physicians	64%	5%
Nurses	30	no information
Dentists	10	2.5
Health centres	25	no information
Hospital beds	19	11

The University of Khartoum - the only university of Sudan - has a Medical Faculty with an annual intake of 180 medical students, who are taught in English. One new faculty is planned for Wad Medani and an Institute of Tropical Medicine for training, service and research. This institute will cooperate with the London School of Hygiene and Tropical Medicine. There are also nine teaching hospitals in Sudan.

The medical recording system is considered insufficient and the return rate and coverage of routine reports is rather low. Especially from the southern provinces information has long been scanty. All hospitals and some health centres have statistic clerks trained by the Statistics Division.

Dressing stations, dispensaries and health centres shall report monthly to the medical inspector, who forwards the reports to the provincial medical officer with copies to the Ministry of Health. Hospitals report directly to the Ministry with copies to the PMOH. The PMOH compiles all information material to monthly and annual reports. All is sent to the Ministry, and its Division of Statistics prepares an annual report for all Sudan. The last one available deals with 1970. This annual report is in Arabic and English, all other reports only in Arabic.

Some leading diseases reported in 1970 (return per cent not indicated in the annual report, from which the figures are taken):

Disease	Number reported cases	Deaths	Predominant season or province
Malaria	382,411	3,024	Oct. Kordofan. Equator
Schistosomiasis	161,200	2,989	Darfur. River areas
Tuberculosis. pulm.	35,493	1,614	
Infect. hepatitis	11,818	175	
Typhoid fever	18,363	(691)?	Oct.
Cerebrosp. mening.	6,912	112	May
Kala azar	1,823	53	Blue Nile. Kassala
Smallpox	643	15	
Tetanus	539	84	Blue Nile. Kassala
Dysenterias	205,912	149	
Syphilis (all)	29,067	-	
Gonorrhea	160,288	-	
Leprosy	6,483 treated. Prevalence not known.		
Trypanosomiasis	186 (under-reporting from the endemic areas in south)		

Very high figures reported on several diseases from Khartoum in relation to its part of the total Sudan population indicate a considerable under-reporting from other provinces.

The development plan 1965/70 tried to tackle the problem of unevenly distributed health services, but the programme was delayed, especially in South Sudan. The 1970/75 plan gives priority to water supply and irrigation, to education and communications. On the health sector stress is put on preventive medicine and rural infrastructure with nomadic populations especially mentioned. Diseases which will particularly be combatted are leprosy, bilharziasis and tuberculosis. The United Nations assistance to the Sudan amounts to about US $ 3 - 4 million per year with water supply given high priority. The WHO assistance is concentrated e.g. on malaria and smallpox control.

Human immunization programmes are rudimentary. In big towns BCG, triple, polio, and smallpox vaccinations are offered. Water pollution is a serious problem and a water control programme is run jointly by the Ministry of Health and the Ministry of Cooperation and Rural Development.

V NOMADISM

With an area of 2.5 million sq.kms and 15.8 million population the average population density is only 6 per sq.km., with practically empty desert areas in north-west and north-east. Three pastoral provinces, the Northern, Darfur and Kordofan occupy fifty per cent of the total land area.

In Sudan much planning has been devoted to the development of pastoral areas and nomadic populations, and the two main problems are water and land. The Ministry of Cooperation and Rural Development and the Department of Land and Water Use are occupied by these problems, and have several programmes running.

The Nile rivers are the nerves of life in Sudan, however little of their water is actually utilized in Sudan, and much is evaporated in the swampy areas in the south. For irrigation purposes a dam project in the Blue Nile has been discussed.

Natural lakes and streams are scarce. The three main methods for utilization of surface and ground water are:

- Dug shallow wells, which are today many (755 officially reported), especially among settled populations. These wells often become polluted.
- Bore hole wells are also numerous and go down to great depth.
- For utilization of surface water the extensive "hafir" system has developed with water collected during the rainy season in natural depressions, often to an amount bridging over the whole dry season. These reservoirs, used for drinking by human cattle, now number 845. These are mostly located in the Savannah Belt and utilized by nomads.

The construction cost of a middle size hafir (40,000 m^3) is about £ 1,000. Small hafirs get empty in the dry season, while the bigger ones, 100,000 m^3 or more, cover the whole year. In principle the government pays construction costs. Lately self-help schemes have contributed. The construction has to be preceded by studies of precipitation, evaporation, permeability of the ground, soil conditions, etc.

Hafirs, etc., are distributed in the following way:

Province	No. of hafirs	No. of dams	Dams and large hafirs	Total
Kassala	127	3	8	138
Blue Nile	164	-	12	176
Kordofan	316	4	14	334
Darfur	111	8	16	135
Upper Nile	77	-	-	77
Total	795	15	50	860

The capacity of hafirs varies from 15,000 to usually 50,000 m^3. Forty hafirs are over 80,000 and the largest has a volume of 4.2 million m^3. For purification of hafir water so far £ 609,000 have been invested.

Arrangements with bore hole plus large hafir and dam exist (1972) in sixty-eight places covering all provinces and practically all districts. Around such a place usually the settlement grows rapidly with a village with health centre, mosque, and school.

In some areas in south Kordofan the excavated "tabaldei" trees are used as natural water tanks.

Problems encountered in all these systems are:

- Pollution and water-borne infections.
- Increased spread of bilharziasis and sometimes malaria.
- Saline water. Desalination is not yet in practice, although solar system evaporation plants are studied in Khartoum.

International loans are used for development of rural water supply, and a joint project with the Ministry of Health and the Department of Land and Water Use is occupied with improvement of water quality. A UNSF/FAO water project, which is considered a pilot project for all Africa, has been operating in the western parts of the Sudan Savannah Belt and is now working in Kordofan. Only in a few cases filtration and chlorination of water has been introduced. Investment costs for purification of an ordinary hafir (over 80,000 m^3) is calculated at £ 15,000, and of an ordinary surface water well £ 1,500. In addition the running costs come.

The needs of water have been calculated according to the following figures: for human sixteen litres per day, camel forty, cow twenty, sheep or goat eight litres. A normal walking distance to the water hole for a cow is five kilometers.

In 1972 a symposium, "Man and his Environment", was held in Khartoum dealing with water supply, simple conservation methods for water, and the Savannah nomads.

Three main vegetation areas are utilized by nomads:

- The North Region: two almost empty provinces with desert and semi-desert, scarcely populated by Semitic (Arab) tribes. In the eastern part are the Red Sea Mountains, reaching an altitude of 2,000 metres.
- The Savannah Belt, which is part of the African Sahelian nomad region. There are three provinces in this region, Blue Nile and the two main provinces inhabited by nomads, Darfur and Kordofan. All fifteen tribes in this area are Arabs. The area ends west with the forested Djebel Marra mountain massive, and has in its centre the Nuba Mountains.
- The South Region of three provinces with tropical rain forests, swamps and mountains (Mount Kenyeti 3,200 m). Inhabited by thirteen Nilotic tribes, mostly practising transhumance, e.g. the Dinka, Nuer and Shilluk.

In principle all Sudan land is owned by the Government, and can be leased to some people. Each tribe by tradition has the right to utilize certain areas. This may be settled through agreement or court case. Contrary to the nomads of Somalia for example, the Sudanese nomads are largely organized as centralized societies with recognized leadership of Shiekhs and Chiefs. However, the power of these traditional leaders has successively been reduced, as the Government administration has been strengthened.

In the 1955/56 census thirty-nine per cent of the total population considered themselves belonging to a tribe, but only about fifteen per cent depend for their livelihood mainly on animal wealth.

There are thirty-four paramount tribes, 572 tribes and many sub-tribes registered in Sudan. The nomads and semi-nomads together make thirty to forty per cent of the total population (= 4.7 - 7.3 million). About half of this group are full "extensive" nomads, the others semi-nomads. Of the remaining and settled sixty to seventy per cent of the Sudan population, over half have animal husbandry as their main source of livelihood.

The 1955/56 census obtained figures on nomadic populations of the vast rural areas by sampling methods, and it is generally felt that there was an under-estimation of nomadic movement, e.g. in south Sudan. The major part of the 3.6 million inhabitants of the Southern Region are transhumance practising, e.g. the Nuer tribe, moving sometimes irregularly but mostly according to a strict pattern between the highlands in the rainy season and the river-side areas in the dry season .

Other mobile population groups in Sudan are seasonal workers and pilgrims.

Nomadism in the Sudan is practised in a variety of areas ranging from desert to savannah. The only province in the Sudan with no full nomads is Khartoum. Many Sudan nomads migrate outside the country three to four months every year, e.g. Beni Amer, Rashaida, Dinka and Nuer.

The nomadic population groups of the Sudan are roughly distributed as follows:

Kassala province	36%
Kordofan	28%
Darfur	19%
Northern province	4.5%
Blue Nile	9%
Khartoum	3.5%

Of domestic animals the Sudan has about eleven million cows, mainly in less arid areas in the south; goats and sheep nine million found all over the Sudan; camels two million mainly in the arid zones in the north. Although sheep are seen in all climatic zones of the Sudan, they prefer less arid areas, where they grow bigger. There are also horses, donkeys, dogs and chicken as domestic animals among nomads. Over ninety-five per cent of cattle and sheep in the Sudan are owned by pastoralists, and 100 % of the camels.

Although the diet of the nomads varies from one tribe to another, there are common features and staple foods. Milk is always an important source of calories and protein. Meat is occasionally eaten and bread is baked of corn flour and water. No dietary taboos of importance exist among nomads in the Sudan. Dry seasons, when milk is scarce, are bridged over with durra.

For development of health services in pastoral areas and among nomads, the statement made by the President in 1971, is of interest: " ... treatment shall be a common right of every citizen wherever he is and whatever his resources may be."

Still there is a great maldistribution of services, as the nomads have much less access to services than other population groups. The distribution of hospitals, health centres and dispensaries can to some extent be understood by the following figures:

Province	Pop.-72 '000	Area sq.km '000	Hosp. nos.	Area/hosp. '000 sq.km.	Hosp. beds
Khartoum	899	21	9	2.3	2,403
Kordofan[1]	2,882	381	13	29.3	1,344
Total Sudan	15,782	2,506	98	25.6	12,762

Province	Pop./bed	Health centres nos.	Dispensaries nos.	Dressing stations nos.
Khartoum	365	28	34	50
Kordofan	2,092	11	73	151
Total Sudan	1,235[2]	109	583[3]	1,079

1) Population density 7.4 per sq.km.
2) Compare: Ethiopia 2,430, Kenya 775, Canada 92
3) There are also 2,260 beds in dispensaries

The geographical distribution of health personnel is also uneven:

Province	Doctors nos.	Av. pop/dr	% of all doctors	% of all dentists
Khartoum	645[1]	1,400	64	18
Kordofan	52[2]	54,000[3]	5	2.5
Total Sudan	1,010	16,000	100	100

Province	% of all nurses	Av. area sq.km./dr	% of all hospital beds
Khartoum	30[4]	32	19
Kordofan	-	7,300	11
Total Sudan	100	2,500	100

1) In government service, 631
2) In government service, 42
3) For Darfur province the figure is over 100,000
4) No figure available.

Basic health services do not serve a reasonable number of the rural population. It is apparent that the uneven distribution of service units leads to a low accessibility rate in many pastoral areas and in turn this condition adds to the uneconomically low utilization rate of these units - a low profitableness, which makes authorities reluctant to construct service units in some places. In order to improve conditions and provide some remote areas with physicians, there is a regulation ordering physicians to do two years of service in remote districts before they are allowed to have private practice.

Mobile units have been used in several provinces and also a hospital steamer for the Upper Nile Province. It has been experienced that for successful operation of mobile units, the distribution of population and supervision of the activity have to be considered carefully.

No special study on the incidence or prevalence of diseases among nomads has been done in the Sudan. In reports, nomads are counted as part of the rural population or of the total population of districts and provinces. Thus disease patterns are greatly unknown and for information one has to rely on impressions of professional people who have extensive experience of nomadic populations. The reporting system is insufficient, particularly for pastoral and remote areas.

As important diseases among nomads e.g. in Kordofan, are counted: tuberculosis, gastro-enteric diseases caused by poor water supply, and infant malnutrition. There have newly been serious outbreaks of polio and meningitis in Kordofan. Mass vaccinations or routine vaccinations have been carried out to a very small extent, and the resistance against certain infectious diseases is regarded as low.

Trachoma is endemic especially in the hot and dry Northern Province, from where over fifty per cent emanate of all (631,269) cases reported in the Sudan in five years (1965/66 - 1970/71).

Malaria is widely spread in Kordofan. Lately increase of bilharziasis prevalence has been reported, explained by the great increase of open water through construction of hafirs and through new areas cultivated with irrigation, e.g. in Gezira and along the rivers in Kassala.

In a country of pastoralists like the Sudan, zoonoses could be expected to be widely spread. In many areas, especially in the south, people live in intimate association with animals.

Much interest has also been devoted to this problem, especially by the National Laboratory under the Ministry of Health. In 1970 a conference was held in Khartoum on zoonoses, resulting inter alia in a number of informative papers.

The National Laboratory is occupied with medical research, which includes zoonoses, chemical analyses and cancer registration. There are no registers in the Sudan for tuberculosis or venereal diseases. The cancer register is based on reports from pathologists, but post mortem examinations are seldom carried out in Sudan.

Rabies has been diagnosed in all species of domestic animals, and three to four cases of human rabies are reported per year. Villagers burn bite sores to avoid the disease. Vaccine is produced at the National Laboratory.

Hydatidosis (echinococcus granulosis) is rather common, especially in the south. It affects human liver and lungs. At the abbatoir in Omdurman about fourteen to fifteen cases are found in 1,000 cows slaughtered. In all Sudan 7,812 human cases were treated in hospitals in 1970.

Of anthrax 112 cases were reported in 1970, with seventy-five per cent occuring in Darfur. Consumption of raw camel liver has resulted in many cases of cysticercosis and also serious staphylococcus infections. Trypanosomiasis in humans and among cattle, Nagana, are common in the south. Yellow fever comes in waves of about twenty years' interval, mostly in the Savannah Belt and along the Ethiopian border.

Bovine tuberculosis is seen mainly in east Sudan, where milk is not boiled. It is seldom seen in other areas (where milk is boiled). Brucellosis, Q-fever (from camels), Rickettsia, Rift Valley Fever, New Castle virus infection (from chicken) are also common zoonoses. Salmonelloses is a big problem, and found in all wild and domesticated animals. Human kala azar is acquired from rodents (bush babies, etc.), and ringworm from sheep and goats. Camels are resistant against most diseases, but cysticercosis.

Field visits in the Sudan carried out by the writer covered one desert area with camel nomads, the Kababish in Kordofan province, and one savannah district dominated by cows and nomads in a transmission period. Several nomad camps, water posts, administrative centres and health service units were visited.

A 1,100 km. travel was made by trucks from El Obeid in Kordofan, ending in Umm Sunta in the Kababish area, crossing through the Savannah Belt, acacia and scrub semi-desert and finally pure desert with moving sand.

Rainfall in this area does not exceed 20 mm. per year, and falls in July-September. There is no permanent running water.

Kordofan province covers 381,000 sq. km. and has an estimated population of 2.8 million, and an average population density of 7.4 per sq. km. There are only two municipalities, the capital El Obeid (73,000) and En Nahud, and nine rural councils.

Tribal and nomadic peoples in Kordofan province:

Nomads of Sudan belong to tribes. Some tribal people are settled cultivators and have, in some cases, been nomads. A natural way of dividing the nomads is in cattle nomads and camel nomads. Cattle nomads of Kordofan with Baggara as the major group of tribes; three tribes dominate:

1. Hawazma with an estimated number of 45,000 individuals, of whom 35,000 are settled cultivators and 10,000 nomads with a total of 100,000 heads of cattle. Besides cattle rearing, they practise cultivation of durra (sorghum vulgare) and cotton in the area covered by their migratory route between the summer and the winter grazing areas. While moving northwards they sow the crops, and on moving back next autumn, they harvest. Their monetary economy is based on selling of cattle, milk and cotton, and their yearly income is estimated at an average of LS 5.00 per capita. The average number of cattle is eight per individual, for which LS 2 is paid per year in tax.

   Their seasonal movement is between Baher El Ghazal, White Nile, Lake Kailek and the South Juba Mountains in the dry season to the area south of El Obeid in the wet season, and vice versa.

Through migration they avoid the tse-tse flies and also the wet surface in the rainy season, which causes infections of hooves.

This tribe originally came from Arabia or Tunisia via Darfur in the 12th century. They were pushed south and to cattle rearing by other tribes, and left areas where they had camels. The wet climate does not suit camels. In the 18th century they occupied Kordofan.

The big tribe is divided into "omodiyas", and each omodiya into many sheikhdoms.

2. Messeriya tribe has two administrative units, El Zurug (= Falayta tribe) and El Humr, with 65,000 resp. 90,000 individuals and together about 600,000 heads of cattle. Their history and mixed economy is about the same as those of the Hawazma tribe. Their migratory route takes thirty to forty-five days each migration.

3. Habaniya tribe has 39,000 population and 10,000 cattle. They are semi-nomads and cultivators.

Camel nomads of Kordofan are divided into the following three groups:

1. Hamar has 300,000 members, of whom only 10,000 practise nomadic economy. They are full nomads with camels and cattle. They sell about one sterile she-camel (LS 30) and ten sheep (LS 3 for each) per year, giving each family as an average an income of LS 80. They buy sugar, coffee, salt, clothes, tea, onions, cooking oil and sometimes water.

2. Shanabla with 13,000 people, have together 15,000 camels and 30,000 sheep. They sell, as an average, five camels and ten sheep per year, giving an income of LS 180 per family.

3. Maganeen with 5,000 members have 7,000 camels and 13,000 sheep. They sell three camels and ten sheep, giving a cash income of about LS 100 per family and year. They also sell woolen mats and gum.

Kordofan has 316 hafirs, four dams and fourteen hafirs with dams. There are 310 dug wells (in Darfur only twenty-eight). There are twelve large hafirs (over 80,000 m^3), the biggest with a capacity of 4.2 million m^3, Each of the nine councils has at least one large hafir, with bore hole and dam. There are also some seasonal rivers and natural surface waters, khor.

Kordofan has fourteen hospitals, with one to two doctors in each, and a public health trained provincial medical officer. For health administration purposes the province is divided in four districts with a medical inspector in each. For the northern district, he is stationed in El Obeid.

Dar (council) Kababish has only one hospital with a single doctor, eight dispensaries staffed with medical assistants and male nurses, and sixteen dressing stations with nurses. There are two public health officers.

It may be estimated that the Kababish nomads have reasonable access to curative services during about fifty per cent of the year. Apart from the static units, there are twenty-three rural midwives (village girls trained one year) with a simple instrument box. As a curiosity should be mentioned the only one camel-borne mobile unit with a male nurse, following the main tribal migration of the Kababish. He is employed by the council, with drugs from the government and riding his own camel.

Occasionally vaccination programmes visit the area. There are also motorized veterinary services providing vaccinations against anthrax, New Castle, rabies and plague. This service is very popular.

The Kababish have tribal medicine men: Faki, who are religious and deal with mental disorders, Bazir who deal with fractures, eyes, etc. There are also native midwives. All tribes practise circumcision of boys and girls and in some cases infibulation of girls. Tatoo is widespread.

The diet during the dry season (December-May) is dominated by durra porridge and bread (Assida or Kisra), and dried powdered meat. Sometimes dried vegetables are cooked. In the wet season milk is the dominating food. Wine, Mariza, is produced from durra.

The dark woolen tent is the traditional house. The Kababish council has one boarding school, but practically no nomads attend the school. Only few roads are all-weather roads. There are no radiotelephones.

As leading health problems are counted malaria and malnutrition, syphilis and morbilli. Trachoma, anthrax and hydatide cysts are not common. Gastro-enteritis epidemics are common, and caused by pollution of hafir water. In 1971 there was a cholera epidemic.

According to 1958 census, the council had 113,000 pastoral nomads (of whom 68,000 Kababish) and 22,000 cultivators. In 1972 Dar Kababish has an estimated population of 250,000, of whom ninety per cent are nomads and belong to five tribes: Kababish (the leading tribe), Hawawir, Kawahla, Nuba and Zagowa. Their migratory routes are up to 1,000 km. each way. In some cases they cross the Libyan border or lead to Darfur. The Kababish tribe has about twenty sub-divisions with Nurab as its most important and ruling branch. A nomad extended family, living and moving together, often has 100 - 200 members.

The Kababish economy is a pure animal economy with no cultivation. Originally they had only camels, but lately goats, cows and sheep have been introduced. They have also donkeys, dogs and chicken. Wild game is scarce, only some small gazelles. The combination of two or more species of animals in any nomadic zone or system has its intelligent and practical basis.

Legally every Kababish has right of access to any pasture and water point within the council, but each clan has no right to any territorial resources.

In general the Kababish move south at the end of the dry season, May-July, when the rains have already come in the south. By October-November they again move north.

There are about 200,000 Kababish camels and it has newly been declared that the "ratio Kababish animals to usable land has not reached saturation point, and there is no human overpopulation in relation to existing animal resources." However, the last few dry years have been hard - many dead animals where seen along the travel route.

According to reports the animal population in the Sudan increases with 4.2% per year, while the grazing areas are shrinking.

The camel is the most tolerant animal when it concerns food and water. Goats eat all vegetation, including grass roots, bushes and trees. They climb the trees and eat the bark. Nature is not given a chance to recover after exploitation by goats, and it is believed that goats are partly responsible for the annual growth of the desert.

Butana is the name of a wide grazing district east of Khartoum and parts of four provinces: Khartoum, Northern, Kassala and Blue Nile. The Gezira agricultural area and the new agricultural settlement area in Kassala are close to this district. Some fields in Butana have, due to fertile soil, been set aside for cultivation of durra, etc.

All stages of development are represented in this area, from full nomads, to semi-nomads and sedentarized nomads, all types of economy from old-fashioned self-sufficient household economy, to mixed and pure cash economy. The dominating animal is the cow, but all traditional nomad animals are held by the population. Consequently housing varies from woolen tents, Patt Birsh, to combinations of tent and small mud house, to only one big house built with clay, water, grass and cow dung. Usually the nomads return to exactly the same spot each season for camping, leaving poles and store-houses behind when they move.

The dominating tribes of Butana are Shukria and Batahin. Their diet is durra porridge, milk and meat. In the wet season they sell milk, and in the dry season they sell cattle and buy fodder (grain and cakes after pressing oil from beans, simsim and cotton).

Water is exploited through dug wells, twenty-five to fifty meters deep, bore hole wells offered by the government, natural and dug hafirs.

The health service network in Butana is somewhat better developed than in other pastoral areas of Sudan. There are several dressing stations with male nurses and a simple set-up with about ten remedies available. The hospital in Abu Deleig was visited by the writer. It has one doctor, who is there on compulsory service. His family lives in Khartoum. The hospital has forty beds, no X-ray, but radiotelephone and one truck for transport. About seventy to eighty out-patients are seen per day. A clerk is responsible for statistics reports.

Respiratory diseases are leading problems. Malaria is a minor problem. As a whole the settled people are considered as having better health, as they are coming earlier for treatment. Important diseases among nomads are malnutrition and anaemia, tuberculosis and syphilis.

There is an elementary boarding school in Abu Delelg. Among settled people about sixty per cent of boys and thirty per cent of girls go to school. There are only a few nomad children attending school, almost only boys.

The government takes the view that total integration of nomads can only be achieved through sedentarization, which however has to come in stages, over semi-nomadism to settlement. At the same time the present situation of nomads must be improved. Thus there are three stages and programme types:

- To stabilize animal husbandry under present nomadic conditions and improve the economy.
- To make nomads semi-nomadic with improvement of stockbreeding as well as offering of agriculture, stimulating creation of cooperatives, etc.
- Large scale agricultural projects designed for sedentarization of semi-nomads.

Kababish nomads, when asked about settlement, replied that they want to become settled, but in their own area and with continuation of cattle breeding. They stressed that they are not agriculture people but cattle people, and that this is their land and that they do not want to move to other places.

As part of the five-year development plan, a government settlement programme for nomads has been planned by the Ministry of Cooperation and Rural Development. It aims at integration of several measures in order to solve the socio-economic problems of the nomadic population.

The basic unit will be the ranch, where crop production and cattle grazing will be practised. Agricultural holdings will be given to each family, and provisions for housing, social services, education, etc. offered. Existing family and tribal linkages will be considered.

Initially four pilot projects and ranges will be run, two in Kordofan and two in Darfur, with fifty nomadic families on each ranch, and with a limited number of animals according to the grazing capacity. Efforts will be done against over-grazing and "desert creep" through a rotational grazing system. Fattening centres, cooperative societies and organized marketing are other ideas to be introduced.

Another scheme based on combined crop and animal production has been started on the Jur River in the Southern Sudan.

Settlement in most of the Kababish nomads' areas seems unrealistic as irrigation projects in this place would have low priority compared with some other districts in the Sudan. Without irrigation agriculture would not be profitable. The vast northern pastures of the Kababish have a rainfall making this area inadequate for any permanent cultivation, while some marginal land in their southern area could, through a comparatively small capital outlay, be converted to cultivated land with agriculture and thus improvement of the nomads' standard of living. This would imply a step in the direction of semi-nomadism, settlement and finally integration of the group into the Sudanese national community - as wanted by the government.

After three dry years 1968 - 1971, the Kababish area seemed (1972) a rather inhospitable place even for nomads, and it is tempting to believe that much of especially the northern parts will in the future become empty areas. It seems already now a problem to get service personnel to stay in the area, as their families in many cases refuse to move there.

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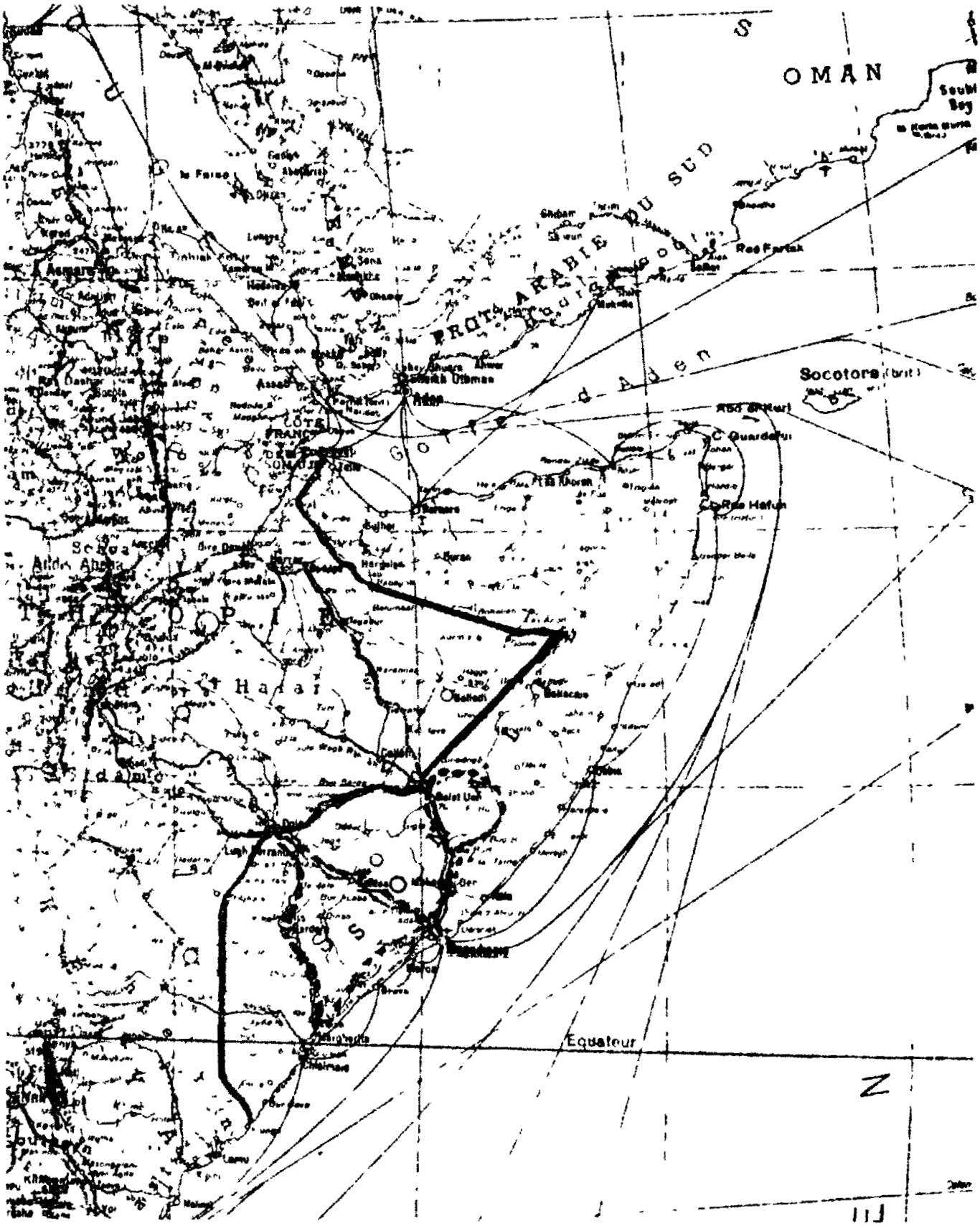
VII MAP OF SOMALI



Dotted line: travel routes of the Writer

SOMALIA

Visited by the WHO Consultant from 26 June to 7 July 1972.

Somalia became independent in 1960, when amalgamation took place of the former British Somalia with the United Nations Trusteeship Territory of Somalia, administered by the Italian Government. In a revolution in 1969 the armed forces took over the leadership of the republic and established a socialist society, aiming at a maximum use of national resources through self-help schemes and community development projects.

I GEOGRAPHY AND CLIMATE

The land area is 638,000 sq. km. The soil is mostly arid, often calcareous and chalky. Bush and desert cover about eighty per cent of the land area.

Somalia occupies the Horn of Africa and is cut by the Equator. There is as yet no formal agreement between Somalia on the one hand and Kenya and Ethiopia on the other on the definition of their frontier lines. The ruler-made frontiers cross ethnic groups, and Somalis live in five different areas: the former British Somalia, the Italian Somalia, French Somalia, Kenya and Ethiopia. The main part of Somalia is a large plateau. Physically the country can be divided into the following regions: the northern pastoral steppes lying on a highland with the highest point 2,400 m; the Bossaso arid highlands in north-east; the central arid plateau of Mudugh, with an altitude about 600 m.; the areas between the only two permanent rivers of Somalia, Shebelle and Juba, a fertile agricultural area; finally, the south region with thick bush, small forests and wild game.

The climate is dominated by a south-west monsoon March to October, and a north-east monsoon during the rest of the year. The temperature is moderate tropical, with maximum 43°-47°C, and a high humidity in coastal areas during the rainy seasons. The rainfall varies from up to 100 cm. in the south to almost negligeable precipitation in the north. In the years 1966 - 1970 Bossaso had no rains. Mogadishu gets an average of 4.4 cm. and Galcaio 1.5. Nomads count with four seasons, of which two rainy, one called Gu (April-June) and one Dhair (October-December), and two dry seasons, Jilal (January-March) and Haga (July-September).

II POPULATION

Population census has never been carried out in Somalia, but is planned for 1975. The official estimate (in 1972) is 3 million total population, with annual increase estimations from 1.3 to 2.8 per cent per year. The distribution of the population geographically and on regions is not known. The average population density is about five per sq. km. Birth rate has been estimated at fifty-six per thousand and death rate thirty-four. About twenty-eight per cent are estimated to live in urban areas. One million Somalis are found in Ethiopia and one quarter of a million in Kenya.

Infant mortality may exceed 500 per thousand newborn, and has been estimated as high as 526 (by Ferroluzzi in a report from 1953).

Northern parts are more sparsely populated, however. About twenty-five per cent of the total Somali population live there as compared to seventy-five per cent in the south. The capital, Mogadishu, has 173,000 inhabitants.

A great homogenity as regards race, religion, profession and livelihood characterizes the Somali population. However, a large group of Bantu negroes - probably aboriginals of Somalia - live along the rivers. The Somali culture is heavily influenced by the Arabic.

Official languages are English, Arabic and Italian, and the official religion Islam. The local language, Somali, is only spoken, but a script is under preparation. Thus, the language confusion is complete.

The President has proclaimed that the "Government will achieve its objective of 100 per cent school-going children." Of the total school-age population, about ten per cent presently attend schools. About twenty-five per cent of the students are girls.

III ECONOMY AND WATER

The national economy is based on livestock and agriculture, together occupying eighty-five per cent of the total population. The agriculture is mostly consisting of subsistance farming, but cultivation and factory production of sugar cover the whole domestic demand.

Other groups of importance are high quality cotton, bananas, sesame, grapefruit and other fruit. Fishing resources are practically unexploitable.

Of the total export value, live animals and animal products, hides and skins, stand for seventy per cent of the value, and bananas for twenty-four per cent. Somalia has only small deposits of iron, uranium and very small water power resources.

About eighty per cent of the total outlay, according to the three-year development plan 1971 - 1973, are from foreign resources.

In principle pasture land is not owned by specific groups, but open to all Somalis for grazing. Cultivable land, in contrast, is held by specific clan groups.

Water resources, apart from the two rivers, consist of bore holes and dug wells constructed privately or by the government. The present development plan has allocated 119.5 million So. Sh. for water resources and thirty-nine million for irrigation projects. The plan takes up construction of 175 new wells and 1,500 cement tanks or reservoirs.

Artificially created water points are generally assigned to specific clans or individual constructors, who can sell water. However, with deep wells and specially those provided by the government, right and access to water are usually freely granted to alien groups, in some cases in return for payment in money or kind. Wells and cement tanks for water are often constructed on self-help basis.

In a number of areas the ground water is brackish, and the water table is sometimes found on an excessive depth, especially in the north and central regions, 150 - 250 m.

Presently water points are readily accessible, one for each 50 sq. km. and this network will be improved to one for each 25 sq. km. area.

The road connections are poor with a total of 16,000 kms. or roads, of which sixty per cent "undefined", meaning dry season roads for trucks, etc. Thus, road construction is given high priority in the development plan, and a 1,000 km. inland road between Belet Uen and Burao will be constructed through Chinese bilateral assistance.

IV HEALTH AND HEALTH SERVICES

For administrative purposes Somalia is divided in eight regions with a military Governor in each, under the Ministry of Interior. Each of the forty-eight districts has a District Development Affairs Officer (DDO).

The Ministry of Health is headed by the Secretary of State of Health and a Director General of Health. Each region has a Regional Director of Health who is in all cases a qualified doctor. Each district has a Health Administrator, who in ten of the forty-eight districts is a medical officer.

The recurrent health budget (1972) is about 23 million So. Sh., making an average expenditure of 8 Sh . per capita and year for health services. The development plan takes up (for 1972) 22.6 million So. Sh. for development of health services. In principle all services are free. All drug import is nationalized, and all physicians full-time in government service.

Health services (1970) include fifty-six hospitals with a total of 4,517 beds. In addition, foreign missions are running a 400-bed leprosarium (Gelib) and three mission hospitals. In rural areas are infirmaries with beds, headed by dressers or medical assistants.

The total number of university trained Somali doctors (in 1972) was ninety-seven, all trained overseas, ninety-three of whom practising in Somalia. No doctor has DPH or MPH degree. In addition there were sixty-four expatriate doctors, employed by the government or on bilateral asssistanc programmes. This makes a total of 157 doctors practising in Somalia, or an average of one for 20,000 population. The number of nurses was 757 (in Mogadishu 260) and midwives 110 (in Mogadishu sixty-four).

The Mogadishu region has six to seven per cent of the population and about 550 of a total of 1,300 medical personnel, six hospitals and fifty-three per cent of all hospital beds in Somalia, fifty-three per cent of all doctors. The north region has only four Somali doctors (and fifteen others).

The shortage of health personnel is regarded as urgent, as only about fifty per cent (2,364) of all approved posts (4,429) are actually staffed (in 1972).

There is a Health Training Institute for auxiliary health personnel in Mogadishu, and nursing schools in Mogadishu and Hargeisa. A School of Medicine for under-graduate studies is due to be opened in 1972/73. The incomplete university of Mogadishu has a veterinary college and one for agriculture.

Major health problems are malaria and tuberculosis, which together are given highest priority and fifty per cent of the development allocations for health in 1972. Bilharziasis, in the riverine areas, malnutrition and anaemia come next, and venereal diseases in urban areas. In 1971 there was a cholera emergency situation in Somalia.

In the development, great attention is given to prevention, maintenance of existing services, and to decentralization of services. Thus, several new health centres and also mobile units are planned.

The Government has appointed a Health Consortium of doctors for planning and research in health. The WHO Representative coordinates bilateral assistance in the field of health. WHO assists programmes for malaria pre-eradication, tuberculosis control, smallpox eradication, basic health services and training of personnel. In addition, assistance in health services are offered by UNICEF, FAO and the World Food Programme.

V NOMADISM

According to an Italian estimation (1953), nomads occupied and utilized fifty to fifty-five per cent of the country for grazing of their herds. Not cultivable land was estimated at thirty per cent, and twenty per cent cultivable, of which however only half was actually cultivated. Due to a successive growth of cultivated areas and of desert areas, available pasture area is slowly shrinking. The pasturage is mainly of two kinds: grasses, and trees and shrubs of the acacia family.

The Somali population can roughly be divided into three equal portions: nomads, semi-nomads and sedentary population. Usually sixty to seventy per cent of the population are classified as nomads. In 1959, ninety per cent of the population in British Somaliland were reported as nomads. The largest constituent grouping of nomads are six clans or tribes. By far the largest is Darod with over one million, mainly occupying the northern regions. Rahanwin occupy the inter-riverine area together with Digil, while Hawiye live on the central plateau, and also occupy territories south of Juba River together with the Darod. Other tribes are Dir, Isaq and Jiddo (related to Danakils).

Nearly always one member of a nomad family lives in town, keeps in touch with his family and preserves the spirit and outlook associated with his original environment. This explains the status of superiority of nomads in Somalia. The family may even camp on the outskirts of the town, where relatives live. An individual may periodically be nomadic or sèttled, a kind of semi-nomad.

The total Somali population of domesticated animals includes 2.5 million horned cattle, 2.5 million sheep and goats, and twelve million camels. Most of these animals belong to nomads. An estimation (1952) in south Somalia estimated an average of eight large and twelve small domestic animals per sq. km. Camels are found all over the country, while cows are mainly seen in the south, and sheep and goats dominate the picture in the north.

Camels need watering once every two to three weeks during dry seasons and can consume 130 litres at a time. Cows, sheep and goats need water two to three times per week. Men go with camels, usually long routes, while women and small boys take cows, sheep and goats shorter distances. A few animals are kept for milking in the vicinity of the camp.

The typical nomad house is the portable "agal" hut, which is a cupole-shaped construction of tree branches covered with grass mats. It is frequently dismantled - always by women - transported during migration on camels, and re-erected in the new camping site. A camp usually consists of a few "agals" for two to three related families. Every married woman has her own "agal", where she lives with her children.

Between the rivers many families of the Rahanwin tribe practise trans-humance or semi-nomadism, growing crops near their permanent dwelling during the rainy season and spending the dry season with their animals on the riverside. Many old people remain in the static home for the whole year.

Practically no nomad children attend schools. During the British period, boarding schools for nomad children were tried in the north. Presently this idea is again being discussed.

As a whole the health of nomads is not regarded as different from that of sedentary people. Possibly infantile malnutrition and tuberculosis are more prevalent among nomads. No reports or statistics give information in this field.

Since years the malaria control in Somalia has been regarded crucial, mainly due to the mobility and irregularity - of nomads, and the temporary character of their dwellings. Movements over frontiers of Kenya and Ethiopia and lack of health infrastructure add to the difficulties. Pending invention of a reliable repository, long-acting anti-malarial drug, it has been considered necessary (Visser) to run contemporary malaria control in Somalia, Kenya and Ethiopia, and to strengthen the rural health infrastructure. Supplementary methods with drugs added to salt have been regarded unrealistic, as salt is little used by nomads.

The smallpox eradication programme intends to complete covering of the whole Somalia population in 1972. Presently it gives special attention to border areas. Nomads make the maintenance crucial, and it has been regarded necessary to utilize special radio propaganda, and brief training of local health aides for reporting of non-vaccinated persons. Finally, gatherings at water-points with colour slide shows and offering of vaccination has been tried. Some reluctance among nomads against smallpox vaccination has been reported. To cover the borders' transient population is regarded as urgent.

Milk from camels, cows and goats is the everyday diet and staple food of nomads, and sometimes the only food consumed for long periods. Herders away from their families are reported to consume five to ten litres of camel milk per day. The nutritional value of camels' milk is 690 Kcal/litre, the fat content is 4.2, and protein content 3.7 per cent. Compare:

Cows' milk: fat ab. 4%, protein 3.4% and 760 Kcal/litre
buffaloes' milk: fat 4.5%, protein 3.4% and 1,030 Kcal/litre

The average milk production per family (Burao 1968) was found as 20.7 litres, making an average of 2.6 litres per day and person, as the average size of family was eight persons. Milk is kept in tight baskets or calebasses, "sterlized" with burning charcoal. This gives all milk a smoked flavour. Milk is consumed fresh or after it has become sour. It can also be processed to a kind of cheese, "ghee." Both milk and ghee are sold to settled neighbours.

A camel produces about 1.5 litres of milk per day, goats and sheep 0.2 to 0.3 litre, and cows varying quantities in different seasons.

Meat is served occasionally, for family celebrations and to guests. Eggs are produced for marketing and seldom for own consumption. Fruit and vegetables are hardly eaten by real nomads, but are common parts of semi-nomads' diet, who grow or buy it. Finally, some products are regularly purchased, such as durra (sorghum), rice, sugar, tea and dates.

In spite of the high intake of animal fat by Somali nomads, repeated investigations have discovered absence of arteriosclerosis and cardiovascular diseases among these people. Non-existence of other factors important for development of these diseases may explain this condition.

Due to, among other things, shrinking pasture land, the nomad population of Somalia is slowly diminishing. Some nomads settle spontaneously, in many cases over the intermediate stage of semi-nomadism and transhumance. The government has a policy for sedentarization of nomadic groups, as a long term objective, and through the techniques of community development.

The ILO draft report (1972) on "The Integrated Development of the Nomadic Zones" analyses the nature of the problems of Somali nomad areas, makes provisional recommendations and suggests a programme of action. As motivations for the suggested programme are mentioned:

- overgrazing of some pasture land;
- the standard of the nomad is "very primitive", "exceedingly hard life", etc.;
- absence of social services and felt need for health services and education of their children;
- uncontrolled rural-urban drift and unplanned settlements,
- increasing sale of cattle for export.

It is also stressed that cattle-raising is the nomads' chief activity, the country's greatest source of wealth, and that extensive grazing is the only possible livelihood and utilization of large areas of Somalia with a low annual rainfall. It is also suggested that the nomads could earn more than they do now from cattle raising with simple modifications and improvements.

The following recommendations are presented:

- A coordinating high level national body for nomad affairs, directly answerable to the Cabinet or as a department of the Ministry of Planning. The body should coordinate actions by ministries such as Health, Education, Agriculture, Industry and Trade, propose regulations and actions, supervize the execution of programmes and provide up-to-date information regarding nomad problems.

- Successively settling of the problem of land ownership and boundaries between grazing and agricultural land.

- A livestock-raisers' association for organizing and ensuring proper use of pasture land, improvement of cattle quality, training of local instructors and model stockbreeders. Improved preventive and curative veterinary services.

- Devise of a marketing system, including distribution, transport and prices.

- Improvement of health services through dispensaries and mobile units. Improvement of educational facilities through boarding schools, and functional literacy programmes, better use of radio with programmes devised for nomads.

All actions should be preceeded by census of nomads, livestock, watering-points, villages and hamlets, registration of usual migratory routes, studies of traditional patterns and rights.

In a first phase, two pilot areas should be selected, one in the lower Juba and one in the Hargeisa/Baraо area. Both places are characterized by large concentration of herds in the dry season. With international assistance a general policy should be designed for development of nomad areas, local leaders should be trained, sales of livestock products organized, and small-scale industries and handicrafts stimulated.

In a second phase, three years later, the programme should be intensified and extended to other areas. The last phase (another three years later), should concentrate on settlement of nomads and semi-nomads, establishment of dairy farms and controlled range management, with rotation of grazing.

This is all discussed in the draft ILO report.

Census is planned of villages, hamlets, nomadic groups, wells, etc. and pilot studies of population, agriculture and livestock has been carried out in the Mudugh region.

For the future development of nomad population in Somalia, the following things should be considered:

1. Nomadism is imposed on the major part of the Somali population by the aridity of the physical environment - it is an ecological consequence. Thus, nomadism may be the optimal adaptation to their milieu.

2. No other livelihood or source of income than pastoralism is possible in large areas of Somalia, since these areas cannot be utilized in other ways without considerable investments in irrigation systems.

3. Animal husbandry plays a predominant role in the national economy, and live animals and animal products are responsible for sixty to seventy per cent of the total export value.

4. The pattern of nomadism in Somalia differs essentially from that of most other countries with nomad populations. The Somali nomads are dispersed in small groups over wide areas - often in more than one country - and the range and direction of their routes are continuously changing, presenting to the outsider and to public health people an inscrutable picture.

5. The situation in Somalia is unique, as the major part of the population are nomads. Thus nomadism is not, as in some other countries, a local or regional problem affecting a minority population, but a national problem. Increasing unemployment in Somalia should be considered. Work for people leaving nomadism may be a crucial problem.

6. Finally, Somali nomads lack formal instituted authorities, and are independent and extreme individualists with an extraordinary sense of pride and superiority.

For improvement of existing conditions in the field of health, the lack of census and statistics as well as the great shortage of health infrastructure are hampering factors, which need to be tackled.

Other means of improving nomad peoples' conditions are, e.g. suggested cooperative societies, social welfare stations near main water-points. Mobile dispensaries have earlier been tried, but did not adequately meet the needs of the nomad population. Inter alia, for malaria and smallpox control, "travelling dressers" have been discussed, with trainees taken from the actual tribe.

It will also be necessary to design less conventional schools. Work oriented schools would have more attraction for nomads.

Somalia has been represented at several international seminars, etc., where problems of nomadism have been discussed, at the 1966 study tour arranged by the International Labour Organization (ILO), the ILO meeting on Nomadism in 1968, and the study tour on settlement of nomads organized by the Food and Agriculture Organization in 1969.

During a five-day field visit, the WHO Consultant studied conditions of nomads of the Hawiya tribe in El Bur and Dusa Mareb districts of the central Mudugh region. Apart from health services and their administration, malaria control, water supply and veterinary services were studied. As leading health problems were mentioned malaria, malnutrition among infants, anaemia and in some areas bilharziasis and tropical ulcers. Several cases of severe malnutrition were seen, and were explained by shortage of rains during two years.

The Consultant visited the Darod and Sab tribes of nomads in s uth Somalia during the flood catastrophe in 1962.

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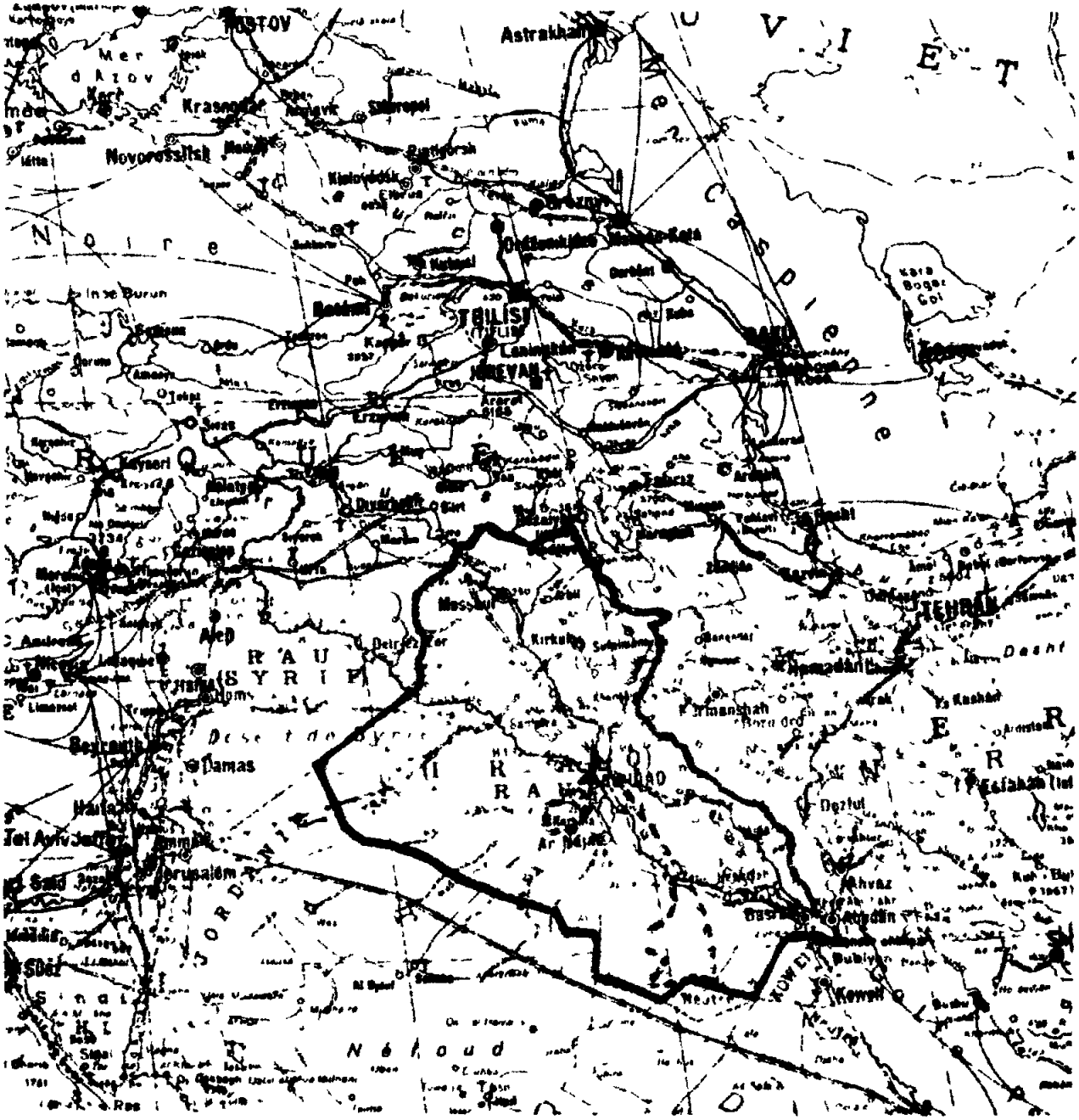
VII MAP OF IRAQ



Dotted line: travel routes of the writer

IRAQ

Visited by the WHO Consultant from 7 to 16 July 1972.

Since 1958, Iraq is a republic with military and socialistic regimes.

I GEOGRAPHY AND CLIMATE

Iraq has a total area of 445,000 sq. kms. It is divided geographically into three different zones, i.e. the northern mountainous region, the intermediate alluvial plain region and the south and south-western plain region with deserts, semi-deserts and some marshes. The country is crossed from north to south by the twin rivers Tigris and Euphrates and their tributaries.

Of the total land area, thirteen per cent are mountainous, forty per cent plains, and forty seven per cent desert land. As cultivable land is counted seventeen per cent of the total area, mostly along the rivers. Less than half of this area is utilized for cultivation. Deserts are mainly stony, but some areas in the north-west and south have moving sands and sand storms are common.

Iraq has a sub tropical inland climate with very hot summers, especially in its desert areas and along the Persian Gulf. Generally, the relative air humidity is low. Apart from the mountain areas, the rainfall is low, and the agriculture is therefore more based on irrigation than on precipitation.

II POPULATION

The last census was carried out in 1965, and reported a total population of 8.3 million. In 1972 the estimate is ten million, making an average population density of twenty-two per sq. km.

The rate of population increase is among the highest in the world, and estimated to be 3.7 to 4.0 per cent per year. This is a consequence of very high birth rates and a relatively low crude death rate. In 1963 1964 life expectancy at birth was estimated at 52.5 years.

About sixty per cent of the population live in the agricultural, central areas around the rivers, and over twenty per cent - over two million - live in the Baghdad area, which has tripled its population since 1955. There is a marked migration of people from rural to urban areas, but the Iraqi rural areas are still among the most crowded rural areas in the world, because the cultivable land is only partly inhabited and cultivated.

Seventy per cent of the population are Arabs and twenty per cent are Kurds. There are other minorities of Turks, Armenians and Iranians. Kurds are of Indo-European origin and their total number is given as eight to twelve million, of whom two million live in north-east Iraq, and the others in Iran, Turkey and Syria. Frictions between the Kurds and the Iraqi Government are reported as straightened in a "complete and constitutional settlement of the Kurdish issue" (1971). Kurdish is now an official language, and one of the vice presidents shall be a Kurd. Education is planned to be improved in their area.

Ninety-five per cent of the population speak Arabic and are Moslems, Sunnites and Shiites, fifty-fifty. An illiteracy rate of seventy-four per cent is reported, and it is higher among females. Less than half of the school-age population attends school.

III ECONOMY

The back-bone of the national economy is oil industry, since 1964 nationalized. Iraq has about seven per cent of the world's total oil reserves. However, seventy-five per cent of the population are occupied with agriculture. Since hundreds of years, this is based on artificial irrigation. Yet, the farming is hampered by primitive methods and a complicated land ownership situation. South Iraq has one of the world's largest date belts.

Industries, including oil refineries and power stations, have problems because of shortage of qualified manpower.

The average per capita income (in 1969) was ID 84.7 (about US $ 250) per year. Presently international assistance is offered inter alia by UNDP, FAO, ILO, UNESCO, WFP and WHO.

IV HEALTH AND HEALTH SERVICES

The country is administratively divided into sixteen provinces (Mohafazas or Muhafadhas), divided into seventy districts (Quadhas), which in turn are divided into 180 sub-districts (Nahias).

The Ministry of Health has, among other divisions, special departments for nutrition and health education. In each province is a chief medical officer of health.

The total health budget is about ID twelve million, corresponding to an average expenditure of about US $ 3.6 per capita per year. Three of a total of six universities have colleges of medicine. There are also three schools of nursing, and one college of nursing, offering the degree of bachelor of science in nursing.

Due to incomplete reporting, the infant mortality rate is not known, but is estimated to be over 100 per thousand. The dominating causes of infant deaths are pneumonia and gastro enteritis (together responsible for thirty per cent), while tuberculosis and measles each contribute with one per cent. In 1971 37,000 cases of measles were reported in Iraq.

Very high figures on diseases reported from the Baghdad area, compared with other areas, indicate an insufficient reporting system. As leading endemic diseases are reckoned malaria, tuberculosis, bilharziasis and malnutrition. In the past, bejel was endemic in the south, but has been brought under control by WHO-assisted projects. One to two thousand cases of typhoid fever are reported annually, and in 1971 about 7,000 cases of malaria, with over half of the cases from the north-eastern province of Sulaimaniya. Of tetanus 500 to 800 cases are reported per year, the majority being infants. About 20,000 new cases of tuberculosis are reported per year. In 1971 there were only thirty-eight cases of leprosy, 417 kala azar, while 2,372 cases of amoebic dysenteria were reported. Rabies, sixteen cases in 1971, seems to be a minor problem. The prevalence of smallpox is not published.

Lately a mercury poisoning epidemic caused by consumption of mercury treated grain seed is believed to have caused thousands of cases of illness and death, especially in southern Iraq.

WHO-assisted projects are, inter-alia, dealing with malaria eradication and rural water supply.

Direct health services are (in 1970) provided by 151 hospitals with a total of 16,945 beds, sixty five maternal and child health centres, urban dispensaries, rural primary health centres and sub-centres, (total 180). The bed/population ratio is one for 500, but the geographic distribution is uneven, and the Baghdad area is especially favoured by all health services.

Most provinces have mobile units carrying out immunizations, preventive and curative work, drug distribution, etc., and transportation. In the south-east lake district mobile units are based on boats.

The total number of physicians is 2,656 (1971). Nurses (including midwives) are 1,150, which means a marked disproportion between these two groups of medical workers, in addition to the general shortage of health manpower. The doctor/population ratio is one for 3,500. The about twenty public health trained physicians are mostly utilized in high level administration.

According to plans, there will be sub health-centres in the future, staffed with physicians, primary health centres with specialists and mobile units with medical assistants and public health nurses.

V NOMADISM

In the 1947 census, the nomad population of Iraq was estimated at 250,000. It is not known, if this figure included semi nomadic people. After 1957, nomads have not been separated from other rural populations in statistics, etc. Thus no official figure is available today on the number of nomads in Iraq. It is, however, estimated that there has been a considerable reduction of the number of nomads. The total nomad problem is not considered as a great one, and estimated to be solved in a rather short period of time through settlement programmes. In the province of Mosul, the estimated number of nomads in 1947 was 125,000, and in 1965 the figure 3,603 was suggested. As a whole, the decrease has been most marked among steppe nomads, and less among desert nomads, the Bedouins. Nomads occupy about half of the total land area of Iraq. Deserts make about thirty-five per cent of the total land (167,000 sq. km.).

In spite of the accelerating urbanization in Iraq, the general population density in rural areas is high, and only the desert areas in south and south west are very sparsely populated - especially the two provinces Samawa and Ramadi, each with an average density of two per sq. km. All other provinces have figures above fifteen (1970).

In the past, experiments have been done with mobile schools, but today hardly any nomad children go to school.

In general Iraqi parlance, one speaks about Bedouins and nomads. Bedouin is an Arabic word meaning primitive and refers to nomadic Arabic tribes living in deserts. Nomads are other Arabic and nomadic tribes, e.g. the steppe nomads in central, and the Kurds in north-east Iraq.

Of the two million Kurds living in Iraq, only a few are counted as full nomads, and less than half of them as semi nomads.

There are in Iraq three geographically well separate groups of nomads, Bedouins in the desert areas with camel as the dominating domesticated animal, the steppe nomads in central and western Iraq with goats and sheep dominating, but also cows. In the north, finally, we have the Kurds. The total livestock of Iraq has been estimated at seventeen million heads, of which nine million in natural and cultivated grassland, and eight million in desert lands.

In the Bedouin areas surface water, lakes and rivers are scarce as the average annual rainfall here, and in seventy-five per cent of all Iraq, is below twenty-five centimetres. One-third of this area has less than 12.5 centimetres. The remaining north-eastern corner of Iraq has over forty centimetres per year.

Underground water is exploited through probably some thousand dug wells and over 300 drilled wells. Water from wells is elevated by hand or by motor. In the Nefud desert in the south the average distance between water posts is about twenty kms., but in dry years many wells are empty. In rainy years the mobility of the Bedouins is reduced and they can stay in the same camp for more than one year.

A WHO-assisted water supply project (1972) is occupied with a survey of all the 14,000 rural villages in Iraq, including the nomads. Generally the water table is low in the mountainous areas, and higher below the mountains. In the deserts it is found at a depth of 100 to 200 metres. In many places the ground water is brackish and has a salinity which makes it non-acceptable for drinking (over 800 parts per million). The widespread, small-scale irrigation system has been made responsible for the salinity.

As leading health problems of nomads are mentioned tuberculosis, malnutrition and trachoma. In 1971, 62,538 cases of trachoma were reported and 142 cases of anthrax. Hydatide cysts are frequently seen in south Iraq, in the province of Samawa about fifty cases per year and in the province of Kerbala 100 cases. Six cases of rabies were seen in Kerbala in 1971. Smallpox is found in eastern parts of Iraq and believed to be brought into the country by nomads.

Generally the health of the nomads is not considered differing from that of their settled neighbours. However, in the malaria control project great problems are created by temporary settlements and mobile populations, as these contribute to an incomplete coverage of the spraying of residual insecticides. These problems are caused, apart from real nomads, by transhumance practising farmers, as well as a large group of seasonal labour in temporary camps, and people in pilgrimage or trade. The problem is aggravated by the fact that nomads seasonally cross frontiers to Iran, Syria and Turkey.

In Iraq there are two periods for malaria transmission, one in June-July and one in October-November.

Government health services are provided in pastoral areas by a scarce network of rural dispensaries, staffed with medical assistants and having a poor diagnostic set-up and no transportation means of their own. The radio-telephone of nearest police post is utilized for consultations. Transportation of sick people to hospitals is complicated and implies very high costs for the patients. In pastoral provinces, professional health personnel are concentrated to a few urbanized places. Mobile units with auxiliaries, however, reach many nomad camps. Bedouins have their own village midwives.

The main staple food of the nomads is milk from goats, camels and cows, with varying amounts available in different seasons of the year. Meat is mainly from sheep. Finally, purchased food is getting more common, rice, wheat, corn, sugar, vegetables, coffee and tea. Bedouins like a soup of tomato and onions, in which bread baked of corn is dipped. Occasionally sheep meat together with rice and raisins is served. Steppe nomads make bread of wheat and occasionally meat from sheep or chicken is added to their diet.

Nomads fire with dried camel or other animal droppings.

A committee of high level government officials has been working with problems of nomadic populations in Iraq, studying socio-economic conditions, collecting data for planning and formulating an administrative policy for development of pastoral areas. Up to 1965 about ID 10 million had been allocated for improvements and development, inter alia resulting in construction of wells.

The long-term plan is to settle nomads. For sedentarization it is relevant that about two-thirds of the cultivable land in Iraq is still not utilized for farming. However, cultivation of the remaining cultivable land will imply great investments in artificial irrigation.

SUMMARY

The exact dimension of the nomad population of Iraq is not known, as nomads are dealt with as rural populations in general. As a whole the problem seems to be rather small and rapidly diminishing in all areas but in the south. Health conditions of nomads do not differ noteworthily from those of settled populations. There seems to be good soil resources for sedentarization programmes.

Presently there is a marked maldistribution of health services in Iraq with pastoral areas unfairly treated. There seems to be good economic resources for improvement of the infrastructure of health services.

(The Kurdish area has not been visited by the Consultant).

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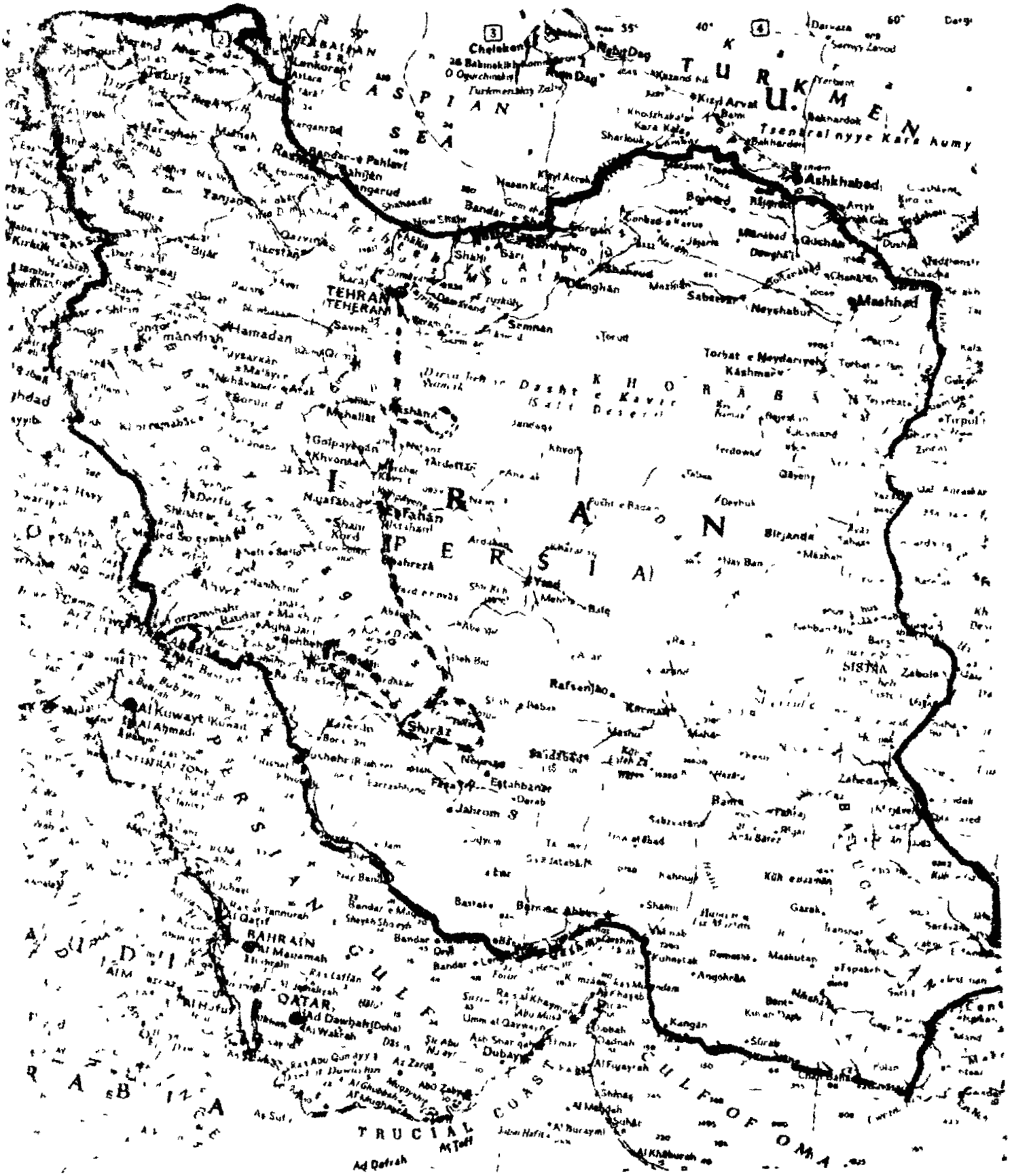
VII MAP OF IRAN



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IRAN

Visited by the WHO Consultant from 16 to 27 July 1972.

Iran is a kingdom - ruled by the Shahanshah - with a long history and a feudal system, which has during the last decade through reforms considerably changed its structure.

I GEOGRAPHY AND CLIMATE

Iran is located on a high plateau in the Middle East (Lat. 25°-40°N, Long. 44°-63.5°E). It is characterized by three mountain massives: Zagros in the west, Alborz in the north and Lakhzer in the south-east with peaks reaching a height of 5,670 meters. Between the mountain ranges are two great deserts: Dasht-e-Lut and Dasht-e-Kavir, partly salty.

The area of Iran is 1.65 million sq. kms. It is known as an earthquake-prone area, with three major earthquakes in 1952-1970.

Geographically the country can be divided into six regions: north-western, northern, the central plains, Zagros and the central mountains, eastern region, and the Persian Gulf and Oman Sea coastal line area.

The large area and different altitudes cause great climatic variety, from desert climate to Mediterranean, steppic and almost alpine climatic types. Central Iran has inland climate with hot summers, cold and snow-rich winters.

The estimated annual precipitation is about 30 cm. As only nine per cent of the land area gets fifty cm. rain per year, the country is mainly arid to semi-arid land. Seventy per cent of Iran, central and eastern parts, have an annual precipitation below twenty-five cm. Apart from the Persian Gulf area, the humidity generally is low.

II POPULATION

Last census, in 1966, gave a total population figure of 25,781,000, of whom forty-five per cent below the age of fourteen years. The estimated population in 1972 is thirty million, making an average population density of sixteen per sq. km. However, in south-east the density is much lower, 2.5 to 5.3

From the first census, 1956 up to 1966, the urban population increased by eighty per cent, and in 1972 forty-three per cent live in conglomerations with over 5,000 population.

The capital, Teheran, has 3.6 million inhabitants, and four other cities have a population from 350,000 to half a million: Tabriz, Isfahan, Meshed and Abadan.

Two million Kurds, many of them nomadic, live in western and north-western parts of Iran.

The leading religion is Islam, the majority being Shiites.

Primary school is in principle compulsory, but only fifty-three per cent of the school-age population attend school. Thus, the literacy rate above ten years of age is only thirty-six per cent (acc. to other sources 20 per cent). High school graduates may convert their compulsory military service to work with the Literacy corps. This is a popular programme with a great rural reach. Conscripts act as primary school teachers and multi-purpose village level workers in rural areas, combating illiteracy, ignorance and superstition.

Iran has eight universities.

III ECONOMY

The gross national product of Iran is rapidly growing, and was in 1970 645.5 billion Rials (equiv. US $ 900 million), making an average per capita income per year equivalent to US $ 420 (in 1967 it was US $ 280). There has been an accelerated diversifying of the economy lately.

The current government expenditure corresponds to about US $ 1,500 million. The economy is based primarily on oil, which is responsible for seventeen per cent of the GNP, over fifty per cent of the state income, and twenty-five per cent of all oil exported from the Middle East.

Although less than ten per cent of the land surface gets over fifty cm. rain per year, and only four per cent is actually under cultivation, agriculture is still the main livelihood, occupying about seventy per cent of the country's population, especially in northern parts of Iran. Remaining cultivated land is arid and requires artifical irrigation for cultivation. Forests cover twelve per cent. About fifty per cent of the cultivated land is used for growing of wheat. Other important crops are cotton, sugar, rice, fruit and tea.

The "White Revolution" in 1963 broke the traditional feudal landowner/peasant system and a quarter of a million farming tenants became landowners. Successively also agriculture cooperatives have been launched (in 1969 there were some 6,000).

Traditionally there has been a strong centralization of administration and economy. There are now tendencies of decentralization.

Industry still is in an early stage. Natural gas is a valuable resource, presently responsible for ten per cent of the GNP.

Oil stands for eighty-five per cent of the export value, followed by cotton, dried fruit and carpets.

The road network and its quality is poor, especially in eastern provinces. Iran has one motor-car and one telephone per 100 population.

The fourth development plan, 1968 - 1974, gives priority to agriculture, machine industry, education and vocational training. In 1972 the United Nations had 143 experts in Iran and programmes dealing with water resources, dams and irrigation, agriculture, etc.

IV HEALTH AND HEALTH SERVICES

Administratively Iran is divided into thirteen provinces or governorates (Ostan), nine Farmandarikols, and the Teheran area. There are 150 districts. Each province and district has a health council with a medical officer of health.

Total health expenditure anticipated for 1972 was 10,663 million Rials, of which 5,063 recurrent budget, corresponding to a per capita expenditure of US $ two per cent for government health services. However, voluntary organizations play important roles in health services, and their annual budget in total is about 20,000 million Rials in addition to the government budget.

Iran has no complete registration of births and deaths. The estimated birth rate (UN) is forty-six per 1,000 population (1970 est. 39.6) and the crude death rate fourteen to fifteen. Expectation of life at birth has been suggested forty-six to fifty-five years. Infant mortality has been estimated (1970) at 68.7 per 1,000 newborns (160 according to Iran Almanac 1971).

The natural growth of the population is estimated at 3.2 per cent. There is a clear family planning policy and programmes for family planning are run all over the country.

Iran has (1970) 7,320 physicians, making an average doctor/population ratio of 1/3,700. In government service are 7,069 doctors. There are about 4,000 medical assistants, 4,500 nurses and midwives (6,600 assistant nurses). Medical training is available at seven universities, with a total number of graduates about 600 per year. Iran has special training for health educators, hospital administrators and sanitary engineers.

In 1969 Iran had 499 hospitals (of which 164 are run by the government) with a total of 33,855 beds (20,257 government beds). Bed/population ratio was 1.3 per 1,000. A considerable part of health services are run by charity and social security organizations and by private groups.

There is an imbalanced distribution of all health services from province to province, with Teheran much favoured.

In addition to the hospitals, there are thirty "rural hospitals" with a total of 622 beds, sixty-seven health centres (twelve with limited hospitalization facilities) and 2,766 dispensaries (ninety-five with in-patient facilities).

Much of the health services in remote areas are run by the Health Corps organization, with mobile units (see under Chapter V, "Nomadism").

Classification and recording of morbidity data as well as maintenance of hospital statistics are insufficient. The main causes of death were studied in seven cities in 1970 on 41,909 cases. Cardiovascular diseases were the leading cause of death, followed by pneumonia, "ill-defined diseases" and malignant neoplasms.

In 1969 or 1970 the following new cases of diseases were reported in Iran:

Infectious eye diseases (incl. trachoma), 1970	30,832
Respiratory tuberculosis, 1969	11,941
Infectious hepatitis, 1969	10,518
Typhoid fever, 1969	10,053
Syphilis, 1969	1,579
Leprosy, 1970	393

The estimated total number of leprosy cases in Iran is 15,000.

In 1970 were reported seventy-nine schistosomiasis cases, fifty seven trypanosomiasis, but no cases of cholera, plague, smallpox, yellow fever.

As serious health problems are regarded: tuberculosis, venereal diseases, dysentery and trachoma. The estimated number of trachoma in one year (1969/70) was 26,000. There are specialized centres for control of trachoma.

There is no clear information as to the geographical distribution of reported diseases.

Control of tuberculosis and venereal diseases is integrated in the routine activities of health centres.

The FAO-assisted Iran Nutrition and Food-Stuff Institute in Teheran estimated (1969) the average daily consumption of calories at 1,650, and of protein fifty gm. Malnutrition of children is reported as frequent and deficiency of vitamins and minerals, Ca and Fe, widespread. The main staple food is bread.

Rural health services, presently relatively scarce, are rapidly being improved. WHO assists inter alia programmes on training of personnel, mental health and malaria control. (Malaria control: see under Chapter V, "Nomadism").

V NOMADISM

Iran occupies the major portion of the Iranian plateau, stretching between Ganges and Euphrates, with an average altitude of 1,000 metres, and with thirty-six per cent of Iran over 1,500 metres. Uncultivated land and impediments are 49.7 and pastures six per cent of the land area. Two large deserts cover seventy per cent of the area and are almost totally uninhabited land.

Due to the low rainfall (seventy per cent under twenty-five cm./year) and dry winds - eighty-one per cent of the precipitation evaporates - there is a general shortage especially of surface water resources in Iran. Distribution of population varies widely, determined primarily by the terrain and availability of water. For nomads in mountain camps, this problem is small, as melting snow provides abundant water.

Underground water is exploited through dug or drilled wells, and also to a great extent through the traditional Qanat system, with subterranean aquaducts leading to a common well. In many places, however, water is brackish or salty.

There are three main types of mobile populations in Iran:

1. Pure nomadic tribes, including long-distance transhumance.
2. Short-distance agricultural transhumance, with a permanent house in the village and tents in a place some kilometres away and near the fields. This is a very extensive custom concerning about ten per cent of the rural population (or two million people), mostly in western Iran.
3. Temporary, seasonal workers in farming, etc.

The 1956 census reported 241,189 nomads, and in the 1966 census the figure was 641,937 (of whom 125,000 non-tribal). None of these figures are considered accurate, and the official figure for nomads is one million (1972). Other estimates are higher, two million (Barth), over two million (the malaria programme), and three to four million tribal people (Petrosian).

Tribes are classified on the basis of the language spoken by them. In total there are over 400 tribes, divided in the following main groups:

1. Iranian-speaking tribes including Kurd, Lor, Luristan, Bachtiari and Beluchi tribes, etc.
2. Turkish-speaking tribes including Turkman, Shahsawan, Afshar, Qashqais (= Ghashghai), Khamsi, etc.
3. Arabic-speaking tribes, and
4. Iranian gipsies.

The structure of the tribal system is as follows: Each tribe is divided into several clans, and each clan into various numbers of sects. Each sect has its definite summer and winter camping site, to which it migrates. Furthermore, each sect is sub-divided into different numbers of Bonkouhs, and each Bonkouh into a few Bors, each Bor consisting of one to five families. The sites of camping for these sub-divisions may not be constant but vary within the area special to the sect. In some cases (Qashqais)

some tents of the sect have occupied exactly the same spot for two to three generations, and migration has followed the same route. In the summer most nomads have open black tents made of goat s hair, and in the winter factory-made closed tents or mud houses. Sedentarized nomads often prefer to remain living in tents and in outskirts of villages during the whole year.

Petrosian et al. (1963) found the median age at the time of marriage for Quashqais women fifteen years, and twenty-five per cent of marriages were between cousins. Infant mortality was 113 and literacy rate over the age of fifteen years twenty per cent.

Most nomads occupy land in south and west Iran, but they are found all over the country and in all provinces.

Apart from the traditional leadership system, the government has now representatives and police stationed in each community. The government assists the nomads with their migration, and no tax has to be paid by nomads. In the government, particularly the Ministry of Land Reform and Rural Cooperatives deals with nomad problems.

The estimated livestock in all Iran (1966) was:

4.9 million cattle
28.99 million sheep
13 million goats
0.25 million buffaloes
0.192 million camels

There are 1,002 veterinarians in Iran (1970) and a school of veterinary medicine. The Razi Institute works with control of animal diseases. There is also a special rabies clinic in Iran (with forty beds).

Schools for tribal and nomadic people are available as follows:

1. There are about 1,700 tented and mobile primary schools. The teachers follow the tribal migration all over Iran, but all nomad children are not yet covered. There are plans for increasing to 2,000 such schools.

2. There are secondary tribal schools, e.g. in Shiraz.

3. The tribal normal school in Shiraz is a teachers training college, started in 1956. A boarding school with a twelve-month course for tribal boys and girls who have made primary or secondary school and are between thirteen and thirty years old exists. The school, run by the government, is free for the students. It is the only school of its kind in Iran. The number of students (1972) is 354 coming from all Iranian tribes. In 1973 the number will be 400. The annual number of applicants is about 2,000. The aim of this school is to train young tribal people, give them cultural self-confidence and send them back to work as teachers in their own tribes. The training is run in the Persian language and has the following curriculum: review of all primary school subjects and some supplementary subjects. Methods of teaching and psychology. Tribal customs and values, handicraft, music and songs. City life values.

4. In Shiraz there is a carpet-weaving school run by the government.

In addition, the Literacy Corps, mentioned above, works among nomads.

There is - as in most countries - a marked geographic maldistribution of all health service facilities. Especially, the supply of physicians for small urban and rural areas remains a serious problem. Most tribes have their own village midwives, and only ten per cent of all deliveries in Iran are institutional.

Medical care in rural areas is provided by some 1,000 rural clinics, of which 800 are run by the Ministry of Health and the rest by the Imperial Organization for Social Services. During the third plan, a significant development was the formation of the Health Corps, formed by young people drafted for two years in the military service. Each Health Corps unit consists of a physician and three to four auxiliaries who, after six months' training, serve in rural areas. Each unit, provided with a vechicle and adequate supplies, operates on a mobile basis, giving service to an average of about 15,000 rural population, including nomads.

There are about 400 Health Corps units in function, which together with the static units cover about forty-five per cent of the rural population. Rural clinics serve as base for the mobile units, when they are in the field. Stations for the units of a province are thirty provincial medical centres. Presently (1972), 1,435 physicians are enrolled in the Health

Corps. In addition 922 women Health Corps officers (of whom sixty-five are physicians), serve in health and family planning projects all over Iran. The budget for all these units and 1,450 family planning clinics amounts to 250 million Rials.

Apart from snake bites, there seem to be no special health problems among nomads. They have about the same disease pattern as sedentary people. Their nutrition is satisfactory, consisting mainly of milk ("Mast"), butter, cheese, meat, eggs and bread made of wheat. Some food is bought, rice, tea, etc.

Some diseases, which used to be more common among cattle-herding people, are: anthrax, with 1,347 cases reported in Iran in 1970; tetanus, with 360 cases; and hydatide cysts, with 236 cases.

By 1957, when the malaria eradication programme started, malaria was the most serious health problem of Iran. However, in 1970 64.8 per cent of the population (north Iran) were in the consolidation phase with an infection rate as low as 0.03 per thousand. In areas with attack phase, the infection rate was 0.24. In 1970 no mortality in malaria was reported.

The first goal of the programme was to control malaria, decreasing the transmission level, making normal life possible. To some extent transmission is a question of altitude and surface water for mosquito breeding. In the high altitude summer camps of nomads, there is practically no transmission, and in winter on the dry coastal plains it is out of transmission season for malaria. The risk for acquiring the disease and spreading of it is during migration through villages in transmission periods. Vivax and falciparum dominate.

The main difficulties of the malaria eradication programme have been those connected with the movement of tribal peoples and their occupance of temporary shelters. This is particularly a problem in Fars and Khusistan Ostans. Some people migrate over the Persian Gulf. However, also the shortage of infrastructure add to the difficulties in the consolidation phase. Trials with cloroquin in salt have been done, but the results have not been encouraging.

Most information and impressions emanate from the Quashqais and Basseri tribes in Fars Ostan in south-west Iran, visited by the writer in July 1972, and from the Bachtiari in the Isfahan area studied in 1963.

The Fars Ostan province has an area of 148,660 sq. kms. and an estimated population in 1970 of 1.9 million (in 1966 1.4 million). Thus the average population density is thirteen per sq. km. Urban population is forty-five per cent. The area is known for frequent earthquakes, the latest having taken place in 1971 with 175 killed and thirty-three villages destroyed.

There are thirteen administrative districts, of which Shiraz is one.

The majority of the population are sedentary, but over ten per cent are nomads. 200,000 to 400,000 are counted as tribal people. There are several ethnically different tent-dwelling tribes with similar, pastoral economy. The biggest tribe, and one of the biggest in Iran, are the Quashqais, of Turkish origin and Turkish-speaking, who make over fifty per cent of all nomads in Fars Ostan. Another dominating tribe is the Khamsi confederacy of Arabs, Turks and Persian-speaking Basseri (with about 3,000 tents - in 1958 - a total of about 2,000 families and 16,000 tribesmen.)

The Basseri of the Khamsi tribe migrate in north-southerly directions east of Shiraz. The name Khamsi is derived from the Arabic number five, alluding to a collection of five clans. The Lor tribe utilize the north-west corner of Shiraz district, the Quashqais occupy a time-glass shaped area with summerland in the Zagros mountains north-west of Shiraz city. Winterland is on the plains near the Persian Gulf south-west of Shiraz, the centre being Pol Ab Guineh in the Kazeroun area. The narrow passage between the two bulbs of the time-glass is the migratory route about 360 kms. long. The claimed pasture and migratory land is called "il-rah."

The tribe has fifteen clans and an estimated total of 20,000 families. Each clan has 150 to 6,000 families. The Dareshouli clan has 6,000 families and Kashkuli (visited by the consultant) has 3,000. This latter clan is divided into the Big Kashkuli (16,000 people) and the Small Kashkuli (35,000).

The Quashqais rely for their livelihood mainly on their herds of sheep and goats, but near their high altitude camps (2,000 to 2,800 metres) where water is found everywhere, they cultivate rice, corn and beans. They have also made themselves heavily dependent on trade with sedentary villagers, selling milk products, livestock, wool and carpets, and buying processed food and industrial products. Some poor nomads seasonally work with the farmers. About ten per cent of all domesticated animals in Iran are found in Fars Ostan, and the Quashqais have sheep, goats, camels, cows, horses, donkeys, chicken and dogs. There are also wild animals such as wild pigs and even tigers.

The climate of Fars Ostan is hot and suitable for wine production. Shiraz, at the altitude of 1,491 metres, has an average max./min. temperature of 25°.1/9°.6 (1951 - 1961) and absolute max./min. temperature of 41°.0/-8 .0.

Fars Ostan has thirty-four hospitals (of which twenty are government hospitals) and a total of 2,044 beds (of which 1,765 are government beds), including health centres and dispensaries, making an average of one bed for 10,000 population. There is a total of sixty-five dispensaries and health centres.

The Health Corps has two main stations in Fars Ostan, one in Shiraz with eighteen mobile units, and one in Jahrom with ten. About 450,000 rural population is considered covered by their service. Apart from curative work, the Health Corps has health educators and mobile cinemas. The mobile unit consists of a car with driver, one doctor, three to four trained assistants and some "corps daughters" mainly dealing with family planning. Sometimes a health educator joins the group. They also carry out drug distribution. The weekly programme is made up of four days' travel to different villages and camps, and two days' fixed in villages with rural clinics.

The following treated diseases were reported in Fars Ostan (about two million population):

1. To the Provincial Health Office (for one whole year 1971/72):

Malnutrition (all kinds, incl. avitaminoses and 7,524 anaemias)	15,702
Eye diseases, including trachoma	7,423
Dysenteries (all kinds)	1,397
Typhoid fever	466

Tuberculosis pulm.	435
Hepatitis	304
Syphilis (including 14 congenital)	316
Gonorrhea	565
Malaria	174
Paratyphoid fever	395

Brucellosis 64, anthrax 29, polio 14, leprosy 9, tetanus 5, schistosomiasis 2, endemic goitre 68, etc. No cases reported of cholera, filaria and typhus. Figures on smallpox are not available.

2. To the Health Corps of Shiraz (northern Fars Ostan) covering 450,000 population, mainly rural and nomadic, reported during four months in 1972 and including about 60,000 first visits (with 300 admitted to hospitals):

Anaemias	2,700
Avitaminosis (incl. 230 rachitis)	1,186
Kwashiorkor	129
Trachoma	544
Malaria	43
Tuberculosis pulm.	37
etc.	

For vaccinations 107,000 doses had been given (cholera, measles, triple). Smallpox vaccinatin is carried out by the malaria team.

The writer visited (1972) a Kashkuli clan in the Homayjan Valley of the Zagros mountains, in Shiraz district of Fars Ostan with camps located at altitudes of 2,000 to 2,800 metres. For health services the following facilities were here available: a police is stationed in each camp, radiotelephone and a jeep for transports are available at distances between three and twenty kms. The nearest health centre, with doctor and inpatient facilities, was in Ardekan, thirty to forty kms and two hours by jeep away. The hospital in Shiraz, 100 kms., could be reached in five to six hours. All roads are very rough. Some camps have weekly vists by the Health Corps mobile units.

Some camps have visiting primary school teachers.

SUMMARY

The nomads of Iran make a "minority" of a considerable size. Although the government has a long-term plan for settlement of nomads, sedentarization can only be effectuated slowly and on a small scale. In an intermediate stage, families will be sedentary while herders still travel with the animals.

Apart from this programme, it is apparent that Iran deliberately has a well developed programme for guided nomadism, intending to improve conditions, economy, health, education, etc., for nomadic groups, which are expected to practise nomadism for many years to come. In no other place have mobile units, for health services and education, been so well organized and survived for such a long time. This system ought to be studied by other countries with nomad problems.

Iran has a relatively good national economy, mainly based on oil production, permitting a development of pastoral areas, which may not - due to lack of funds - be possible to the same extent in other countries with nomadic populations.

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GENERAL DISCUSSIONS

These notes are based on some information concerning nomadic populations all over the world, but particularly on information and observation collected during a WHO assignment from June to August 1972 dealing with nomadic groups in five countries, Sudan, Somalia, Iraq, Iran and Afghanistan. The travel covered in total about 28,000 kms. 23,000 by air and 5,000 by trucks, etc. All the countries had previously been visited by the WHO Consultant, and in Somalia, Iran and Afghanistan nomads had been studied before.

The Annex gives some general information on the countries visited and included in the WHO study.

I DEFINITIONS

The word "nomad" is of Greek origin - nomas ados - and refers to people who graze cattle, wander about and have no fixed place of residence.

Pure nomads have been defined as people who do not own or cultivate lands; who have no permanent houses and live in tents; who subsist on animal husbandry and are entirely or mostly dependent on this source of income; who move from place to place in search of grazing grounds for their animals.

A wider definition, which includes also non-cattle-breeding nomads, is: those who depend on movement for survival. Migration is a necessity, an ecological consequence. However, mostly pastoralists are the dominating groups among nomads and also mostly referred to as nomads. As pure or true nomadism is classified moves dictated exclusively by the need to find water and pasture. The typical representatives of this group are the desert nomads with camels and extensive migrations. There are, however, many variations of the patterns, as some "pure" desert nomads, e.g. in the Sudan, practise seasonal agriculture on their migratory routes.

Hunters and collectors are also nomads, but have no animal husbandry: Australian aborigines, Bushmen of the Kalahari, Kukukukus of New Guinea, jungle nomads of Amazonas, and some Eskimoes. The house of the nomad may vary from improvised shelters and caves, to portable tents and may be mud houses on the migratory route.

Semi-nomadism and transhumance involve movements of people from their permanent dwelling with cultivated lands adjacent to them to summer grazing grounds. The permanent house and settlement may be occupied throughout the year by some members of the group or family. As transhumant nomads are counted people with limited nomadism and moves, according to predetermined and very regular patterns. They have mostly two fixed places, one for the wet season and one for the dry.

Cattle breeding is only one of the sources of their income, and agriculture is always practised.

Next step in development towards settlement is when only men go with the animals in search for pastures and water, and the rest of the family stays behind permanently doing cultivation (e.g. the Bomi in south Iran).

The most "mobile" animals are the camels and goats, which are the beasts of true nomads, while sheep prefer to walk shorter distances and also are more dependent on regular watering.

Nomads are only one group of populations which could be characterized as mobile, a term which also includes other migrants, such as seasonal labour, merchants, refugees, pilgrims, etc. The concept "scattered populations" includes all mobile people and also isolated, small and remote hamlets and villages. The common characteristics of all these people are: low average population density, small and isolated population units - mobile or static - long distances between units and to urbanized centres with social and other services. The consequences of these conditions from a cost-benefit point of view when it comes to planning of health services, etc., are obvious.

The problem of definition creates problems of how to enumerate nomads. The mobility and crossing of frontiers add to this problem.

II PREVIOUS INTERNATIONAL ACTIVITIES

The International Labour Organization (ILO), started discussions on problems of nomads in 1954, and in 1957 was adopted Convention No. 107 "to improve the living and working conditions of indigenous and tribal peoples", eg. by health services, education and vocational training. Recommendation No. 104 by ILO deals with land ownership, modern cooperatives,

etc. Thesefirst activities were followed by a series of study missions in the Middle East and North Africa on settlement and integration of nomadic and semi-nomadic tribal groups, e.g. 1958 in Egypt, Syria, Jordan and Iraq, in 1961 in the Sudan and Libya, in 1958 and 1961 in Iran. A first session and panel of consultants was held in Geneva in 1963, a technical meeting in Geneva in 1964.

A FAO conference was held in Cairo in 1971, and a FAO travel seminar went to USSR in 1969. Other conferences, etc., are organized by agencies such as the Arab League, UNESOB in Beirut, and OMNES in Niger. Other agencies, which have contributed to the discussion on nomad problems are UNICEF, the World Food Programme and a multitude of papers and reports are available from all these activities, which have mainly been focusing on the problem of sedentarization of nomads.

III REASONS FOR DEALING WITH HEALTH PROBLEMS OF NOMADIC POPULATIONS

Populations living in remote areas, near borders and often crossing frontiers, are likely to be neglected in development programmes, especially as any investment in these areas may be less profitable. It also claims special knowledge and techniques to plan for scattered and nomadic groups. There is often a reluctance among tribal people to accept new ideas and changes, they have in many cases been the losers in confrontation with the settled world.

The fact that nomads have during the last decade attracted more and more interest has to some extent its origin in humanitarian feelings based on the United Nations declaration on Human Rights and on WHO statements. Every group and individual has the right to education and health services. Although in some cases governments have promised that all inhabitants, independent of place of living, shall have the same opportunities, for example, health services, anyone will understand that there will - for practical reasons - always be a geographical maldistribution of these resources especially in poor countries, where most of the nomads live.

Lately nomads have become more interesting as objects for development. In the global control and eradication programmes against epidemic diseases, any population group left out of the campaign will serve as foci and reservoirs for diseases, spreading it to neighbouring countries and in the home country when the programme is regarded as successful and finished. Thus, of pure self-defence, the sedentary humanity has become increasingly interested in nomads, especially when it concerns the control of malaria,

Governments in general want to have all tribes and population groups under administrative and political control, ensure their loyalty, remove smuggling over frontiers, etc., but also provide them with at least "minimum care" facilities. In order to watch the health of nomads, and especially values included in the term "social well-being", it is necessary and urgent that medical people are involved in the discussion of present conditions and also of the future of nomads.

IV REASONS FOR NOMADISM

The basic reason for nomadism is a climate with a precipitation which does not permit agriculture. For collection of water, human food and animal grazing, the people must cover wide areas and can therefore not be settled. Basically the cattle are "nomads", and the owners follow their animals and become nomads. In several cases tribes have through inter-tribal frictions been forced to occupy inhospitable areas, where cultivation was not profitable, and have successively adapted themselves to strange conditions, developed a nomad culture, accepted the harsh conditions and finally defended their territory against other intruders.

Thus, nomadism is principally an ecological consequence and necessity and must be dealt with as such.

The immediate reason for migration is searching for water and feeding grounds. The dimension of migration, time-table and routes are dictated by the need to find water and pasturage. Struggle for life is struggle for water.

However, other factors may also influence the migration such as: trading of own products or transitted goods, avoiding of harmful mosquitoes, tsetse flies, malaria infection and other pests and epizootics. Movements may also be induced by avoidance of bad weather, too heavy rains, which may be harmful e.g. to the hooves of the animals. Ceremonial, traditional and religious needs may influence the migration. Finally inter-tribal frictions may be important for routes chosen, etc. Other factors are heat tolerance and ability to withstand thirst by human and animals.

Finally, it has been reported that some grazing-areas are deficient in trace elements (Baggara tribal area in the Sudan), which are available in other parts of the migratory land. It is a well-known fact that the meat from nomads' animals have different flavour in different seasons - probably a consequence of variations in minerals and other nutrients in their food.

Practically always nomads have one dry season or summer camp area and one for the wet season, the winter, the latter on a lower altitude. Thus, the migration mostly takes place between two altitudes. In some cases migration can be short and yet a result in the wanted change of altitude - "vertical nomadism" such as among the Kurds, some tribes in Iran and Afghanistan. In desert and steppe areas with flat lands, long distances have to be covered between summer and winter lands - "horizontal nomadism", such as in large areas of Sudan and Iraq "nomadism desertique."

The nomad lands of the countries visited are located within the world's largest dry belt, running from Central America through North Africa and south-west Asia. Parts of this belt are the Sahelian grass region in Africa, where the Savannah Belt of Sudan lies, continuing in the desert areas of south-west Asia up to Iraq. Then the Iranian high plateau from Ganges to Euphrates comes, with the nomad areas of Iran, Afghanistan and West Pakistan. Principally, this high plateau with an average of 1,000 m. altitude differs ecologically and culturally from the more desert-like areas from Iraq to the Sudan - the Arabic desert.

In total this dry belt of Africa and Asia probably houses eighty to ninety per cent of all nomads of the world.

Climatically, this whole area with steppes and deserts of stone, sand and some times salt is very dry, it has a precipitation below 125 cm. per year and usually four months below ten cm. of rain each. The landscape may be interrupted by "burned" mountains.

The average precipitation of the whole world is eighty-six cm. Below fifty cm. agriculture is mostly not profitable and below twenty-five cm. people are principally forced to migrate for water and sufficient feeding for themselves and their animals.

To the nomads, water means economy, standard of living, health. Water is life.

Surface waters, permanent rivers and lakes are seldom seen in nomad areas, but through utilization of natural depressions in the terrain hafirs in the Sudan - large quantities of water can be collected during the rainy season, often bridging over the dry season.

The under-ground water can be exploited through dug wells (often drying up in the summer season), drilled wells and some times artesian wells. In some countries great investments are placed in development of water supply for pastoral areas.

Among the most problematic areas from the point of view of water supply are the Nile valleys and Afghanistan. If we include evaporation in our calculations, some places have a serious, negative water balance with water problems during the whole year, e.g. Iraq, Pakistan and Syria. The Director-General of WHO in his report, 1972, on a study of ninety countries revealed that the water supply situation in general for the rural population of the world is slowly deteriorating. Nomads are not specially dealt with in this report.

Even when sufficient amounts of water are available, problems such as water pollution, brackish or salty water may create problems. For drinking purposes, humans may accept a salt concentration up to 500 mg. per litre of water. In Iraq, the figure of 800 mg. was experienced.

Goats and especially camels need less regular watering and can survive on very poor grazing, while cows and sheep need regular watering and better pastures. They also move shorter distances than camels.

V SIZE OF THE PROBLEM

Practically nowhere has a census covered nomadic people, but estimations and sampling methods have been utilized in census takings to give an idea of the number of nomads in a particular country. A new method is serial air photography. The difficulty in defining the term nomad naturally adds to the problem.

However, it could be estimated that there are about fifty million nomads in the world today, and probably 100 million if all categories of semi-nomads are included. As there are only small groups of nomads in Europe and the Americas, nomadism is largely an African-Asian problem and perhaps ninety per cent are located in North Africa and South-west Asia, the major group being found within the Eastern Mediterranean Region of WHO.

Once, in prehistoric times, 100 per cent of the world's population may have been nomadic - hunters and collectors - and today one to two per cent remain as nomads, a group which in some areas is rapidly shrinking, in some cases with a "half-life" of only one generation.

In the five countries visited in 1972 by the writer, the total population is about seventy-six million, of which a considerable fraction, or roughly twelve to thirteen million, is nomadic. In Somalia the majority of the population, sixty to seventy per cent, are nomadic or about two million with a very slow decrease of the number from year to year - due to ecological conditions and limited financial resources. Iraq has a rapidly diminishing nomad population, probably a quarter of a million, of a total of ten million inhabitants in Iraq. In the three other countries, the nomad problem - as in Somalia - has a considerable size and problems which will remain in the future. In Iran, there are two to three million nomads out of a population of thirty million; in Afghanistan three million out of seventeen million; and in the Sudan about four million of a total of sixteen million Sudanese.

The vast majority of all these nomads - and of all nomads of the world - are Arabs and Moslems.

Characteristic for the nomads of Somalia are the small units migrating irregularly over vast areas, and thus difficult to map and reach. The government of Somalia has abolished the term "tribe" in order to integrate the nomads in the general national communion. In Iraq, statistics etc., are not mentioning nomads, but include them under the term "rural population" - reducing the opportunity to collect special information on nomads. Iran, the Sudan and Afghanistan count with the problems of remaining nomadism for many years to come and plan accordingly for guidance of nomadism. All the five countries studied have nomads in all their provinces.

The terms tribe and tribal are used with different content in different places. It may mean nomadic people or newly settled nomads, who count themselves as belonging to certain ethnic groups, but in other places the terms have nothing to do with nomadism but only with traditional and racial divisions of the population. Usually nomads are ethnically distinct from the sedentary segment of the population of the same area.

There seems to be a spontaneous reduction in the number of nomads everywhere, as people themsleves settle down, with or without pressure from governments. A contributing factor in this development is the slowly but implacable reduction of pastoral and grazing areas which takes place in the world, on the one hand caused by the "desert creep" and on the other hand because more and more of marginal cultivable land is exploited through artificial irrigation.

VI ECONOMY AND DIET

The economy and wealth of nomads is based on animal wealth and availability of water. The domesticated animals to the nomads not only mean wealth and capital but are also symbols of status and in some tribes symbols in their spiritual life.

Originally and primarily nomads had a self-sufficient household economy, independent of the outside world. Successively trading, marketing and buying have found their way to most nomadic tribes, a mixed or monetary economy. They sell animals and animal products, meat, milk, cheese, butter, hides, wool, and may produce rugs and carpets for sale. Their own food is derived mainly from their own herds, some agriculture along the migratory route, and to a slowly increasing extent from purchased food. Natural manure from the animals is used for fuel or fertilizing of soil.

The economic level and wealth of nomads is difficult to estimate, and so is the importance of nomadic pastoralism in the total national economy of a certain country. In a larger sense nomadism is a phenomenon to balance meagre agricultural and inadequate water resources. Nomadism as an ecological consequence may be the only means of utilization of certain regions.

Unlike arable lands, grazing areas of nomads are both held and exploited in common, although all unsettled and unregistered lands in most countries ipso facto are government land.

The diet of the traditional nomad is uniform and varies little from tribe to tribe as the dominating staple food is milk, from cows, camels, goats or sometime buffaloes. As milk is a relatively well balanced food rich in protein, etc..., there was less malnutrition among pastoralists than among the settled people of the countries discussed here. In the dry season practically all people lose weight in these countries, and also the nomads have during "hungry seasons" often insufficient intake of calories. However, normally nomads consume rather enormous amounts of milk, often providing two to three times more protein per day than is required. Thus, even a reduction of the milk intake in the dry seasons, when the cattle give less milk, will secure an intake of protein above the minimum requirement.

This is especially true for adults, while it seems likely - from information gathered - that malnutrition among infants and children of nomads is rather common, and in some places believed to be more frequent than among infants of their sedentary neighbours. This infant malnutrition seems to be particularly common now after two to three years of drought in many countries with nomadic populations, where malnutrition has been practically unknown before.

The second important staple food of nomads is meat, although the intake is often reduced to certain family occasions and feasts. The consumption of meat guarantees an even higher intake of protein, and also of minerals and vitamins.

The nearness to their animals secures the permanent availability of fresh meat - "hot meat" - all the year round. Some nomads (Masai) drink blood from cows. There are few dietary taboos among nomads.

In the past, and still in some nomadic tribes - reindeer nomads - all food for family consumption came from their own products. However, few nomads today are entirely self-sufficient in supply of their food, but buy grain and flour of wheat, durra, corn, millet, rice, etc., as well as sugar, salt, tea, coffee and sometimes vegetables. These and other food stuffs have crossed the cultural barriers and found their way to the nomads' cooking pots. Nomads have become more and more tied in relations of dependence and reciprocity to sedentary communities, with trading partners and "middle-men" in villages and towns.

The contents of milk are seen below:

Content		Cow milk	Camel milk	Buffalo milk
		%	%	%
Fat	ab.	4.0	4.2	7.5
Protein		3.4	3.7	4.3
Carbohydrate		3.8	4.1	4.5
Kcal/100 gms.		60-70	69	103

In spite of the high intake of animal fat (milk) with saturated fatty acids, cardiovascular diseases and coronary disorders have virtually been unknown among momadic tribes, as has been found in studies of e.g. Masai and Somalia nomads.

VII HEALTH CONDITIONS AND HEALTH SERVICES

The magnitude and complexity of health problems of nomadism has often been stated. The problems can be divided into those which are their own concern and those which are of general public health interest to their neighbours, the whole nation or sometimes of international interest.

In many countries it is a popular belief that nomads are unhealthy, malnourished people encumbered with infectious diseases and a poor hygiene. This opinion contrasts glaringly with the impression received by people - including the writer - who have studied nomadic groups. There is no doubt that nomads as a whole are physically healthier than their settled neighbours, probably due to a better diet all the year round, physical activity and fresh air. Scientific studies, e.g. of Masai nomads, have discovered surprising physical conditions. Likewise there are good reasons to believe that the nomads' mental and social well-being is better than those of sedentary people. They are more independent, and appreciate their freedom, their tribal and family communion. Barth in his paper on Nomadism in the Mountain and Plateau areas of South West Asia, says: "A comparison of nomadic and settled communities in their present forms reveals a clear difference in the average standard of living in favour of the nomad camp. Even in spite of recent great advances in public health in the villages of the region, the diet, hygiene and health of all but the poorest nomad communities is better than that of most villages."

From a general public health point of view all mobile populations create problems, whether it concerns seasonal workers or traders, semi-nomads or pure nomads. The control of diseases such as malaria, smallpox, typhoid fever and tuberculosis has in many places been jeopardized by difficulties experienced in the attempts to control mobile groups. Thus, much of the interest now directed towards nomadic tribes emanates from the fact that nomads have not been possible to include in control of pestilences. Nomads are difficult to find and to reach, and you reach only small groups at a time; it is difficult to spray their tents. The whole programme may become very expensive - with low profitability. When a certain area is sprayed or treated, the nomads may be in another place. They move from controlled to uncontrolled areas or vice versa and pass frontiers. They may not be cooperative, refuse treatment and interrupt initiated treatment.

It all results in foci and reservoirs left behind. When a programme at high cost is considered successful, an endemic or epidemic disease may flare up again. It is a consequence of nomadism that nomads cross natural barriers, and areas with different disease endemicity. Each passage through a village can result in an exchange of contagious diseases.

Several malariologists (Visser, Prothero etc.) have stressed the problems created by nomads particularly during the attack phase of malaria control programmes, adding significantly to the costs of operations, in terms of money, personnel and time, and through reduction of the effect of programmes.

Much of nomadic migration - deliberately or not - takes place so that transmission of malaria is avoided. During November to April, when there is no transmission of malaria the Quashquais in Iran stay in their winter camp and leave the place when the transmission period starts. They pass successively through areas during their migration, where the transmission has not yet started and reach their high altitude summer camps where there is no malaria transmission, thus escaping the infection. The main risk for infection is on the migration back to the winter camp. Consequently this movement is rapid, avoiding longer periods in villages and temporary camps. Long-lasting migrations in the Autumn, as by the Basseri of Iran, considerably increase the malaria transmission rate. The main source of malaria infection are the sedentary villagers on the route.

It has become necessary and urgent to design special programmes for malaria control among nomads. Opportunities for studies and checking could be offered at well-known places for regular gatherings and markets. Every summer there is a three-week bazaar in Chaghacharan in the highlands of Afghanistan, where thousands of nomads from all over the country gather each year.

There are usually a limited number of narrow, geographic bottle-necks, bridges, etc., through which nearly all migration must take place twice a year and where medical and veterinary checkpoints could temporarily be established (in Afghanistan: Pul-i-khumri bridge, Saidabad-wardsk, Dalaram/ Oulestan in Farah, etc.). Most tribes have very orthodox routes, and at the known routes of their migration opportunities for control of malaria, smallpox, tuberculosis, etc., are offered, as well as census-taking and general health services.

In Afghanistan, checkpoints have been tried at such points, taking blood slides for malaria control of nomads, offering treatment of diagnosed cases. However, the benefit did not reasonably correspond to the costs, and the activity was discontinued.

In a similar way the epidemiological significance of seasonal migrations and their impact on eradication programmes have been obvious also in the worldwide smallpox eradication programme.

Due to their close contact with domesticated animals, nomads are more prone to contract zoonotic diseases. Hydatide cysts among humans exist in all countries studied and are common e.g. in south Iraq. Brucellosis is less common, but seen, e.g., in Iran and Iraq. Rabies and tetanus exist in all countries with varying incidence. According to WHO statistics anthrax is found in Sudan with almost 200 cases reported per year, Iraq over 100 and Iran over 1,000 cases per year.

Due to the dry and hot climate characteristic for most areas with nomadism, trachoma is often considered a special nomad disease. However, in none of the five countries visited, it seems likely that nomads have more trachoma than the settled population. From south-west Iran was reported in the 50th an infection rate of seventy to eighty per cent among settled people, and below ten per cent among nomads. Due probably to lack of early treatment and discontinued treatments, it seems that nomads have more tuberculosis and venereal diseases. Sleeping sickness is reported as endemic among the semi-nomadic tribes of south Sudan.

As a whole accidents and accidental deaths are more common among people living in the nature, such as nomads. The obstetrical insecurity, caused by long distances and lack of transport facilities, does not seem to worry nomads much. In some smaller tribes, inbreeding and cousin-marriages are common, although incest rules often are very strict on this point. There is nothing known indicating any harmful effect of such a situation in the five countries visited by the writer, while effects of inbreeding are well-known and studied among some arctic-nomads.

In very few places one has designed and established health services in nomad areas taking the special conditions of these regions into consideration. Mostly the general pattern of health service network has been applied also in pastoral areas, but usually with a scarcity of the

network which makes services insufficient. The accessibility rate may be very low due to distances and lack of transportation and consequently the utilization rate will be low - the profitability rate will be low and make authorities hesitate to provide services in these areas.

In the countries where most nomads are found, there is as a whole a shortage of all health services and health personnel. In addition, there is a sometimes shocking maldistribution of these resources, leaving large areas practically without any service. Grave malproportions in the numbers between different categories of personnel make things even worse and the services uneconomic. The usually presented rates of beds, doctors, etc., to population are less applicable in pastoral areas, as a certain rate may in a scarcely populated area result in ten to twenty times lower utilization opportunity. Distances make certain units inaccessible. In the calculations of the needs of health services in pastoral areas, the surface covered should be a decisive factor, in order to secure accessibility.

As a whole it seems realistic that health services in pastoral areas are run by auxiliary personnel, and many small static units, which should be visited regularly by motorized or winged mobile units. These visits should provide not only supervision, but also consultation, assistance with special cases, transportation of sick people and personnel, distribution of drugs, etc. It is likely that regular visits of this kind raises the standard of any remote service unit. In order to make the mobile unit economic it should be multipurpose, serving other ministries, e.g. than public health. All personnel involved in the mobile and static service should be multipurpose-trained and special inducements for work in remote areas must be applied in order to facilitate the recruitment and avoid repeated change of personnel.

In some places short training courses for tribal girls and boys have been tried, returning as health aides to their own people, sometimes equipped with a drug box, instructions and perhaps radiotelephone service. In the maintenance phase of programmes for eradication, e.g. of malaria and smallpox, this method may have to be widely applied.

The environmental hygiene, generally speaking, is a small problem. The extreme climates - very hot and dry or cold - help keeping the germs down, and in the same way works the low average population density in the areas concerned.

VIII THE FUTURE OF NOMADISM

Nomadism is not only a means of livelihood, but a way of life, a philosophy. The nomad is part of a unique socio-economic structure. For the development of nomads' conditions it is of primary importance to consider existing attitudes of authorities and sedentary populations vis-à-vis nomads, and nomads attitudes to a sedentary life.

From reports and literature on nomads one can get an idea of existing attitudes. In one report on nomads of Afghanistan is said: "They are foot-loose, moving within the country and create a problem of employment and manpower planning, but also raising a number of social problems."

Another report says: "Nomads consider their way of life as most suitable and best for them. They are not willing to settle down on land, they find it hard to adapt themselves to a settled life in a community. Some of them are of the opinion, that such a life predisposes them for various illnesses from which they do not suffer if they migrate from place to place." (Tomaszunas).

It is likely that these statements represent wide groups on each side of the "grass curtain", and they also coincide with the impressions which the writer has got during visits in countries with nomad populations.

In another report the following statement can be read: "Tents pitched in the barren fields, away from the villages. There reside rugged people with a primitive life-pattern with more interest in livestock than agriculture." (Chowdhury).

As social well-being is one third of the health concept, it seems unavoidable for health organizations and personnel to keep out of the fundamental question of what is going to happen with nomads in the future and how it will happen. Their social well-being - and perhaps also the physical - may lose if certain steps are taken, and particularly if they are taken in the wrong way and against the wishes of the nomads.

For design of their health services, it is of fundamental importance to know for what conditions we are planning. Once integrated in the settled society, nomads will not need any specially designed services, as they will be part of the rural or urban population which they joined. If they stay in their nomadic life - which will be the case for large groups for generations to come - we have to design services adjusted to the extreme conditions of an extreme population.

Reasons presented by authorities for development planning among nomad populations are:

- To raise their level of living and economy through improved education, public health services, communications, etc.
- Administrative reasons, aiming at integration of nomads politically, economically and legally into the national communion. Partly it is a question of loyalty of marginal people, but some times a question of tax system, military service, control of robbery, theft and smuggling. In their political context, nomadic societies occupy marginal positions, partly outside the influence of the administrative service and political institutions of the country. Nomads have sometimes been regarded as unfitted to play an effective role in labour and production within the nation. Therefore their integration is wanted into the national community on the basis of equality of opportunities and responsibilities. Traditionally, nomads have little loyalty above the tribal, and they occupy areas which are regarded as most vulnerable - along the frontiers.
- Pastoral nomadism may be wasteful of natural resources. Overgrazing denudes the land and gives poor products of meat and milk. More effective use of marginal lands is wanted.
- The conviction that nomadism is a backward kind of existence, and an outmoded way of life, inconsistent with the economy, administration and cultural aims of a modern state. The social objection to nomadism is based on the assumption that civilization starts from cities.

There is certainly some truth in most of these allegations, and all arguments have considerable validity. Nevertheless many counter-arguments can be presented:

- The standard of living of nomads is often underestimated, as it has to be measured with other yardsticks than used among settled people. The seemingly harsh life of the nomad does not appear so to the nomad himself.

  The simplification of life, belongings, dwellings, etc., that naturally characterize nomadic cultures must not be interpreted as low social status or under-development, but rather as a high grade of adaptation to ecological resources and requirements.

  They also accept the harsh realities of life in arid zones and make a sensible compromise with their environment, using resources wisely and mostly ecologically considerately.

- Nomadism means the intelligent use of marginal areas at their best times of the year, an excellent method to use areas with rainfall not enough for crop production. Thus, marginal resources are converted into valuable commodities - milk, meat, hides - and could not be exploited in any other way. Under this system half a million tons of meat are produced per year in the Sudan. Nomads have often developed their nomadic culture to perfection and reached a happy equilibrium with their environment.

- It is generally admitted that nomadism is an earlier stage of development of human society than the settled life of cultivators. However, it is by no means certain that it is mentally and spiritually a more backward or economically less rewarding mode of life. It is mostly regarded as a happier - and more independent - life. The independence of the nomad is a valuable asset, which he is aware of. Therefore, it must not be presumed that nomads want sedentarization.

Nomads often regard settling as a symbol of social decline, and regard themselves as the "aristocracy" and superior group. Less capable people have to stay settled. Sedentarization may create a new proletariat, unable to adjust to urban or village life, and never fully accepted by the already established farming society. A triangle drama of nomads/ government/farmers may be created.

At the same time sedentarization may result in a net loss to the country and to the nomads. "Proletariatization" and pauperization are risks to count with. It is also interesting to note that some nomadic groups (e.g. the Alighial-lou in South-west Iran), had been settled for six years in an area (Takhte-ghapou) with the intention of urbanizing the tribe, but they started again their nomadic life (in 1952) to save the remains of the families experiencing great losses in malaria and trachoma.

There are several ways and steps which can be taken in development of nomadism:

- Improvement and institutionalization of the actually existing pastoral nomadism - "guided nomadism."
- Converting of true nomads into semi-nomads or transhumant existence.
- Sedentarization of semi-nomads. This can be done in agriculture, in ranging or in industry.

Either governments or nomads liking or willing it, changes are slowly taking place also in the nomadic world. By way of an evolution with several intermediate steps at varying levels, even settling may take place spontaneously - but not always in wanted patterns.

"Guided nomadism" means measures aiming at making livestock nomadism economically and socially more worthwhile. This can be done, e.g, through:

- Reduction of the animal population, avoiding overgrazing and improving the quality of animals, meat and milk.
- Circulation system of grazing to allow recovery of overgrazed pastures.
- Keeping of goats may be decreased, avoiding "desert creep". On the other hand, the goat (especially the Nubian goat), is known as the best converter of plant protein to animal protein.
- Veterinary services offered. In many places, twenty-five to thirty per cent of animals are now lost through disease.
- Slaughter houses, deep freezing units, ice cellars, organized marketing, cooperatives, etc.
- Transportation of animals on trucks between summer and winter grazing lands, to reduce loss of weight.

- Stopping cultivation of marginal land, which will give more output when used by the nomads as compensatory grazing land.
- Other methods helping in making pastoralism economically effective are: provision of water-posts, introduction of cottage industries, fodder banks, etc.

There is a stage in the economic development of the country when it is economically more sound and useful to help the nomad continue his nomadism more productively than to sedentarize him. Any steps taken or induced by authorities may take into account the physical, social, political and technological elements of development. It is primarily a question of integration, and the nomads' problems should therefore be tackled within the widercontext of the national economy and development, although special designs will be necessary for the extreme groups represented by nomads.

Usually in a given country only small groups of nomads are ready and suitable for sedentarization. These may be poor nomads, who have lost their flocks and prefer, temporarily or permanently, to become settled. Any wholesale sedentarization policy will raise problems and difficulties:

- How are the marginal areas, presently occupied by nomads, to be used if the nomads are removed and the land depopulated?
- What is the importance of present livestock resources and of a de-stocking, in the national economy, food supply and international trading?
- How will the previous nomads be accommodated after settling? This is a question of land ownership, available cultivable land, artificial irrigation, housing, feeding grounds, etc.
- Are financial resources available for implementation of plans? Will the plans imply better economy, national responsibility, family? Making the desert bloom is well within the reach of man, but the investments required may be enormous.
- Do the nomads wish to become settled? They may regard settled life as a reduced standard of living.

As links in a striving to integrate nomads, some governments have a policy not to use the world "tribe" and to exterminate tribalism in favour of feelings of national communion (Somalia). In other places, the word "nomad" is seldom used, and in reports etc. nomads are counted as part of the rural population, giving no special information on nomads (Iraq).

If sedentarization has to be done, changing from subsistance nomadic herding to commercial livestock production through ranging would be the most considerate step. This has to be done in areas capable of supporting livestock without migration, and can therefore seldom take place in the nomads' own land. The reason for migration was that grazing could only be sufficient if large areas were covered through migration. Nomads prefer not only to stay in their own area but also continue working with animals. They are specialists in livestock and have an overwhelming interest in it.

Settlement in agriculture - often with continuation of a small-scale animal husbandry - has been tried in many places, e.g. in the Sudan, Iran and Afghanistan.

Alternatively, settling in industry, as tried in Saudi Arabia and Libya, may be a better and more neutral solution. Examples from East Africa indicate that nomads will more readily settle as industrial workers than in farming, a field where they have no experience, knowledge or traditions. In farming, they are more likely to become an under-class as there is an established society already in farming. However, in the Sudan it has been shown that it is possible to change the value, orientations and outlook of nomads, and get them to accept agriculture as a livelihood. Yet, the assumption that economic stimuli and inducements are enough is a mistake, as economic values often are no attraction to the nomad.

Settlement of nomads can take place spontaneously, deliberately planned by themselves, but can also be encouraged actively or through limitation of assistance, services etc., or it can be enforced. Any settling by force (in the Soviet Union, in 1920 - 1921, with Turkish nomads east of the Caspian) is likely not to bring success, but to be damaging. Enforced sedentarization of nomads was applied in Iran in the 1925 - 1940 period, reducing the absolute number of nomads.

Principally, authorities should limit themselves to help developing and promoting plans, offer them to the nomads and watch any misuse of them. Enforcement as well as ill-chosen settling methods will create conflict situations. In any case, abundant information, advice and guidance should be offered to the nomads in the planning stage. Nomads should be represented in the planning and the position of their traditional leaders should be defined.

A sound planning has to be based on sufficient information and basic data. Until the necessary information is available, sedentarization schemes will be premature. Furthermore, one has to start with pilot schemes (as in the Sudan) and continuously evaluate the programme. Plans should be flexible. Any dogmatic approach will most likely be harmful. New, elastic and unconventional solutions are needed.

The design of health services for nomads living in their traditional way has been discussed under Chapter VII. In the pure nomadic conditions and in a transitional stage of development, it seems necessary to utilize mobile units if nomads shall be offered a reasonable health service. Radio-telephone is the simplest and most inexpensive method to raise the standard of services in remote places.

Iran has with its mobile units for education and health services, experience in this field. The converting of military service to service in mobile units in remote areas and among nomads has had a considerable success, and may be worthwhile trying in other countries.

In the Sudan, the discussion of the future of nomadism and sedentarization has been extensive and no other country can offer so many reports and papers discussing economic, political, socio-anthropological and other aspects of nomadism.

To sum up: It is generally believed that mobile populations, inclusive of nomads, will present problems to health authorities and health hazards to other population groups for many years to come. There is no easy, quick and definite answer to these problems.

So far, nomadic people in general have received only a small share of benefits, derived from development of health services and other public facilities. This is partly due to the fact that they inhabit less

accessible areas, are mostly on the move and difficult to reach, but also conservative and resistant to influence from outside. Finally, forced by the ecology they have made themselves rather independent of assistance from the outside world.

The ultimate change to sedentarization, which is likely to come everywhere in the long run, has to consider the underlying causes of nomadism, environmental and ecological conditions. Sedentarization cannot be considered as a physical matter, nor a question of land settlement techniques. It is rather a complex and difficult process in which consideration of human and institutional factors must always be paramount.

IX RECOMMENDATIONS

Having studied a multitude of different approaches to problems in the field of health of the nomads, successful and sometimes less successful projects, it is tempting to present some modest general recommendations:

- Some studies of nomads should be done, including two or more countries utilized by the same nomads and their herds. Questions - which in some countries are already answered - such as mapping of migratory routes and grazing lands, ownership of land and water resources, should be studied.

  As in several cases neighbouring countries maintain that certain diseases are introduced through nomads crossing frontiers, it would be worthwhile searching for facts in this issue.

- A complete picture of health problems of nomads in the whole of the WHO Eastern Mediterranean Region would be valuable. To get the world picture complete, also information from the African Region of WHO should be studied.

- Multidisciplinary studies of nomads are wanted, adopting the aims of the International Biological Programme, studying "man's surviving in a changing world." This "big biology" technique focuses on man's adaptation, physically, mentally and socially - genetically, physiologically and behaviourally - to changes in his environment including urbanization.

Other important items for studies would be: diet and nutrition of nomads, mapping of water resources, studies of the economy of nomads and its significance for the national economy, expectations and attitudes of nomads towards development, sociological studies of sedentarized nomads. (Attitudes of true nomads and semi-nomads should be separated.)

- Improved statistical, and more reliable reporting systems, giving better demographic figures and better information in the fields of vital statistics and disease patterns.
- Guided nomadism should be the basic part of any development programme dealing with nomads. Voluntary settlement of marginal groups of nomads will also be a constant project of smaller or larger size in any country with nomad populations.

Even if very modest, a long-term plan for development of health services among nomads should always exist. The "minimum health care" of nomads should be defined. It seems as an infrastructure with many small, static units in remote areas, equipped with radio-telephone and staffed with multi-purpose-trained auxiliary personnel together with motorized mobile units would be a realistic design of services in pastoral areas. Nurses with additional training in "simplified medicine" (à la Venezuela), offering "kraal-side" service are wanted. Special training in "pastoral medicine" has been discussed in some countries.

Another method, used e.g. among Alaska eskimos, is short training of tribal girls as health aides. They go back to their own people, are equipped with drug kits, instruction for use of them, and radio-telephone for consultation of professionals.

- Education - combined with health education - to nomads, should be "work-oriented" in accordance with "functional literacy programmes." Primary school teachers run "kraal-side education" among Iranian nomads. The syllabus must to a great extent deal with animal husbandry to be meaningful to pastoralists.
- In order not to disrupt cultural values too much, it will be necessary to go slowly when developing rare and relatively unknown cultural groups such as nomads. It is no place for itchy fingers.

In a world with rapidly increasing problems of environmental pollution, vastly created through urbanization, it would be advisable not to force pastoral people who are satisfied with their way of living and mostly living in good balance with their ecology, too rapidly into the "civilization."

- In order to coordinate activities concerning nomads, an inter-departmental unit or body of the government should be set up given responsibilities for development of pastoral areas and given economic resources accordingly. Such a body should not only coordinate activities in this field but also be fact-finding, planning, executing, supervising programmes and follow-up and serve other authorities successively with relevant information.

X ITEMS SPECIALLY RECOMMENDED FOR DISCUSSION

- What do we mean by the concepts nomad and health?
- Reasons for nomadism
- Special health problems of nomads Differences between nomads and sedentary people
- Reasons for dealing with nomads' health problems
- Principles for designing of health services in areas with nomadic populations.
- How to improve health conditions and health services among nomads under present living conditions
- Sedentarization and health
- Arguments for sedentarization.
- Arguments against sedentarization.
- Nutrition and health.
- Nomads' attitudes to development, sedentarization.
- Guided nomadism - how?

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Annex I

Information on Five Countries Visited by the Writer in 1972

COUNTRY	Pop. (million)	Area (000 sq.km.)	Precipitation cm./year	Av. pop. density /sq.km.	Nomads		Pop. av./ physican	Infant mortality /mill.	Annual pop. growth %	Av. inc. per capita per year US $
					mill.	% of tot.pop.				
SUDAN	16	2,500	16.4 (0-100)	6	> 4.7	> 30	15,000	> 100	2.8	110
SOMALIA	3	638	0-100	5	2	70	< 30,000	500(?)	1.3-2.8	-
IRAQ	10	445	< 25	22	(?)0.25	3(?)	3,500	> 100	3.7-4.0	250
IRAN	30	1,650	30	16	2-3	< 10	3,700	69-160	3.2	420
AFGHANISTAN	17	655	30	25	3	< 20	20,000	-	2.5	100
TOTAL (Five countries)	76	5,888	-	13	12-13	16-17	6,300	-	-	-