

ing. Likewise the high amount of anaemia amongst the women reduces their efficiency as an agricultural labour force.

Fishing is another activity which leads to contact with the mosquitoes for the main fishing months when fish are most abundant are also those when most malaria is about. The men-folk fish in the lake, but women commonly fish the rivers where most mosquitoes are; and they also carry the fish to market. Some of the best fishing places are the pools of stagnant water left behind after the flooding of the mouths of the Awach and Oluoch; but these are also mosquito breeding sites.

There is less malaria on the plateau than below the escarpment; but here the land is less fertile, and there are fewer settlements, especially in the higher east. Most of the settlements in the east are of administrative or missionary establishments and there is little agriculture. Most of the agricultural settlement is in the malarial west; but even here the really swampy areas of the Oluoch and Awach are avoided. The greater amount of settlement in the malarial plains is solely the result of the greater fertility of this area. Some plateau dwellers have plots on the 'Pap' (or lowland); but for the most part people prefer to live on the lowlands with their good quality agricultural land in spite of the presence of malaria.

H. M. AROKA.

EXPANSION OF FACILITIES AT EAST AFRICAN SEAPORTS

Port capacity, in as far as it determines a country's ability to engage in external trade, is often an indicator of the country's prosperity. This is particularly true of the new states of Africa, the bulk of whose trade is with overseas areas. In East Africa there exists a very wide variation in terms of capacity between the five ocean terminals of Mombasa, Tanga, Zanzibar, Dar es Salaam and Mtwara. Mombasa is by far the best equipped of the group, and the extent of facilities at Dar es Salaam is much less (Table 1). Tanga and Zanzibar are equipped only as lighterage ports; and although Mtwara has an excellent natural harbour and a deep-water quay, the level of traffic handled there is very low.

At the two larger seaports of Mombasa and Dar es Salaam the level of facilities is not adequate to deal with present-day traffic movements without involving considerable delays, and at the smaller ports some congestion occurs at certain seasons. Problems of congestion at East African seaports arise mainly from the handling of import cargo, and are caused by shortages of railway wagons on feeder lines as well as by lack of berthing space. Except at peak periods the physical and administrative problems of handling export cargoes are much less, since although quantities are large the range of commodities involved is smaller. Serious congestion has occurred at intervals throughout the development of Mombasa and Dar es Salaam. At Mombasa delays became increasingly serious in the 1950's, particularly in 1955 and were only temporarily relieved by the opening of the first phase of the Kipevu extensions in 1961. In the second quarter of 1961 congestion again reached a critical stage, involving some ships in delays of up to ten days before working. Although partly due to the simultaneous arrival of an unusually large number of ships with heavy import cargoes, this difficult period showed clearly that the margin of spare capacity available above that needed for average working conditions at Mombasa is very small. At Dar es Salaam a marked improvement in shipping turnaround followed the opening of the first deep-water berths there in 1956, but ten years later congestion is building up again and extensions to the facilities are badly needed. Pressure on facilities

at Tanga rarely arises, since exports of sisal, the main commodity handled, maintain a fairly even flow throughout the year; the situation at Zanzibar is very similar, although much equipment there stands in need of replacement. Seasonal congestion is a problem at Mtwara as a result of the concentration of the cashew nut and cassava exports in the November-January period, but during the rest of the year facilities of the port are underworked.

Active consideration is constantly given to problems of congestion at the mainland seaports by the East African Railways and Harbours Administration, and plans for major extensions to existing facilities are in hand at Mombasa and Dar es Salaam. Financial problems have hindered the completion of the second pair of berths at Kipevu, but when these are brought into service in 1967 Mombasa will be equipped with thirteen deep-water berths. Work is already in progress on four additional deep-water berths which should be in service by the early 1970's. At Dar es Salaam three additional deep-water berths are under construction and the facilities of the lighterage wharf are being improved. There is at present no case for substantial additional facilities at the three smaller ports. Both Mombasa and Dar es Salaam, however, have recently developed important new facilities for the reception of crude oil, as a result of the construction of oil refineries near the respective port areas. At Mombasa the £15 million refinery project, completed in 1963, involved the building of an oil terminal at Kipevu capable of receiving tankers of up to 65,000 tons dead-weight. In 1966 an existing small oil jetty at Dar es Salaam was rehabilitated to receive crude oil, and is now connected to the refinery by a submarine pipeline. Problems are involved in both these developments. The siting of the Kipevu oil terminal may hinder the future construction of deep-water berths at Mombasa; and at Dar es Salaam neither the harbour entrance nor the oil jetty can receive tankers over 25,000 tons deadweight. In view of present trends in tanker size, oil consumption and port expansion it may prove that neither of the East African oil terminals is suited to more than temporary conditions.

An interesting repercussion of recent political developments in Central Africa has been the extension of the hinterland of Dar es Salaam to include the Zambia copperbelt, and in due course the hitherto restricted hinterland of Mtwara may be affected in the same way. For some years the economic and political orientation of Zambia towards East Africa has become increasingly obvious, and the establishment of more reliable surface communications between Tanzania and Zambia has been widely discussed. As far as East African port developments are concerned the problem posed by Zambian traffic is that of utilizing existing port capacity more fully and of developing new port facilities in the most economical way. If Zambian copper exports were to be moved entirely through Dar es Salaam, by means of the proposed Tanzania — Zambia railway, the export traffic of the port would be trebled and the total cargo traffic would increase by about 75 per cent; in addition, oil and general cargo imports to Zambia through Dar es Salaam would probably become significant. Zambian traffic is thus providing a stimulus to the early expansion of port facilities at Dar es Salaam. The possibility of a link from Zambia to Tanzania, using Mtwara as an ocean terminal, is also being actively considered. This would have the advantage of utilizing the spare capacity that is currently available at Mtwara for most of the year, but would involve either a ferry across Lake Malawi or a devious route around the head of the lake. In the long run, however, the fuller utilization of Mtwara would probably prove less expensive than the large-scale expansion of Dar es Salaam.

EAST AFRICAN SEAPORTS

East African Seaports : Facilities and Equipment, 1965

		Mombasa	Dar es Salaam	Tanga	Mtwara
Deep-water berths:	number	13	3	—	2
	total length (ft.)	7,690	1,800	—	1,248
Lighterage Wharves:	number	2	4	2	—
	total length (ft.)	1,350	1,929	1,250	—
Transit sheds:	floor area (sq. ft.)	1,159,084	545,904	235,867	80,000
Stacking grounds:	area (sq. ft.)	619,835	491,934	81,832	50,000
Total storage area:	(sq. ft.)	1,778,919	1,037,838	317,699	130,000
Cargo lighters:	number	30	37	30	1
	capacity (tons)	6,695	6,810	5,980	200
Cargo-handling appliances:	crane capacity (tons)	485	218	68	29
	forklift trucks (number)	83	30	13	2

Source: East African Railways and Harbours, *Annual report, 1965* (Nairobi, 1966), p. 56. Recent data on Zanzibar are not available, but in broad terms the port is comparable to Tanga.

The chief problem of expanding port facilities is that of obtaining financial provision for expansion before the need becomes extremely pressing. Whilst the dangers of over-capitalization must be avoided, the cost of making available at all times a reasonable margin of spare capacity needs to be compared with the delays and traffic losses which inevitably result if serious congestion is allowed to occur repeatedly.

B. S. HOYLE.

RECENT INDUSTRIAL DEVELOPMENT IN THE DAR ES SALAAM AREA

During the past few years the fastest growing sector of the Tanzanian economy has been manufacturing. In 1965 alone, the net value of manufactured products increased by 16 per cent. Dar es Salaam continues to be the centre of much of this new activity. A paper in an earlier issue of this journal (Dato, April 1965) commented on new processing industries in and around the capital. The purpose of this note is to illustrate both the expansion and the diversification of Tanzania's manufacturing sector by reporting on the establishment of two major industries in the Dar es Salaam area, each the first of its kind in Tanzania.

The most impressive addition to Dar's industrial scene is the £5 million oil refinery located at Kigamboni, just across the harbour from the city. Owned by TIPER (the Tanganyika and Italian Petroleum Refining Company Limited), a joint venture between the government of Tanzania and the Italian state-owned ENI (Ente Nazionale Idrocarburi), the refinery began operations in June 1966 and reached full production in October. At capacity, the plant could supply 600,000 tons of refined petroleum products annually. About two-thirds of the production consists of industrial fuel oil for furnaces and diesel oil for heavy machinery; the other products are petrol (both regular and premium grades),