

3.15 TOGO

Introduction

Togo has an area of 56 785 km², a population of 2 963 000, and a mean population density of 52 persons/km². It lies on the Gulf of Guinea and is bounded by Ghana in the west, Burkina Faso in the north and Benin in the east. It is 551 km long, some 100 km wide and is roughly rectangular, reaching inland along its long axis from the Gulf of Guinea. The coast is just 75 km long, and behind the continuous dune barrier there is a lagoonal system which has only tenuous connection with the sea and is essentially a freshwater system. The water bodies are situated in a littoral depression which was inundated at the time of the last marine transgression, but are now semi-permanently isolated from the sea. The coast is thus one of submergence, but it is sandy, with pronounced longshore drift to the east. The coastal plain, of some 5400 km², is also sandy and rises gently to the 100 m contour some 40 km inland. The undulating slope then continues northwards, over an equivalent area, until the 200 m contour is reached some 100 km inland, where a chain of mountains (Chaine du Togo) enters the country from the west and crosses the interior obliquely, being oriented SSW-NNE. The mountain range extends for 350 km up and across the centre of the country. This comprises a string of isolated peaks, rising to a maximum altitude of 1000 m asl (7°20'N/0°42'E), although Baumann Peak (6°52'N/ 0°46'E) at 986 m asl is often cited as the highest point. The southern and central mountainous sector is drained by the Mono River and its tributaries, the Mono reaching the sea in swamp land on the Togo Coast where it forms the border with Benin. The north of the country is traversed by the broad valley of the Oti (Pendjari) River, a tributary of the Volta, which crosses the country from Burkina Faso to Ghana. The valley floor is flat and the river meanders so that its course across Togo, a straight line distance of 80 km, is almost doubled. In this valley the Oti receives several tributaries draining the northern part of the Togo Mountains, and other tributaries from the high plateau which intrudes into the extreme northwest of Togo from Burkina Faso.

Climate

Togo lies between the two per-humid rainforest blocks of the Guinean region and has two wet and two dry seasons at the coast, but a single wet and single dry season inland. At Lome (6°10'N/1°21'E) on the coast, the principal wet season is from March-July, with a short dry period during August and September. This is followed by a brief rainy period in October before the major dry season sets in from November-February inclusive. Some 100 km inland, in the mountains, Kpalime (6°55'N/0°44'E) is wet for 10 months of the year, and only December and January are dry. From here the climate becomes progressively drier in passing north as the dry season extends, reaching 5 months at Sokod6 (8°59'N/1°11 'E) in the central highlands and 6 months, November-April, at Mango (10°23'N/0°35'E) in the valley of the Oti River. At the coast, insolation varies from maxima close to 220 hrs/month in October to minima close to 90 hrs/month in June. A

regular sea breeze blows from the SW during the day, with wind speeds of 3-4 km/hour, and from June-September there is a permanent haze. In the north, the dry Harmattan wind begins to blow during November and persists until March.

At the coast mean annual precipitation is 850 mm/yr, but this has varied between extremes of 600 mm in a dry year and 1200 mm in a wet year. Over the mountains mean annual precipitation ranges from 1300-1500 mm/yr, with wet and dry cycle maxima and minima of 1750 mm and 1000 mm. Here maximum falls are in June and minimum falls in January. Over a decade mean coastal temperatures varied from 24°C in July to 29°C in March. Rainfall is sufficient to support tree savanna, which includes baobabs along the littoral.

Wetlands

The coast is sandy and exposed and there are no mangrove stands of significance. The coastal lagoons are enclosed by reed swamps and seasonally inundated lands. Lakes Togo and Vogan are the only major lakes and they are not normally tidal. Floodplains occur on most rivers because of the highly seasonal nature of the rainfall. In the mountainous central part of the country, the floodplains are narrow, often mere strips 25-50 m wide, but in the north, the floodplains are much better developed and occur in wide valleys at low altitudes. Isolated dambos are found in the highlands of the savanna zone in the north. There are some 70 small agricultural impoundments and a large dam is being built at Nangheto on the Mono River.

List of Wetlands Described

1. Lakes Togo & Vogan & the Coastal Lagoons
2. Riverine Wetlands
 - (a) Wetlands of the Mono River
 - (b) Wetlands of the Oti River
3. Minor Wetlands

1. Lakes Togo & Vogan & the Coastal Lagoons

Country: Togo

Coordinates: 6°15' -6°33'N/1°17'-1°47'E

Area: 6400 ha (open water) + 38 000 ha inundated land

Altitude: 0-99 m asl

Nearest Towns: Lome (15 km W); Vogan (10 km E)

General: The system comprises Lake Togo, some 15 km long and up to 6 km wide, the smaller Lake Vogan, and a lagoonal system behind the coastal dunes, which links them, and continues eastwards to the Mono River on the Togo/Benin border. This lagoonal system opens to the sea at Anecho.

Lake Togo receives water from several streams. The Sio or Atiegou River enters at the southwestern extremity. This stream has a broad floodplain for many kilometres upstream of the lake, and some 10 km west of it, it divides to form two distributaries which enter the lake through a marshy delta. Several small lakes are situated on the lower floodplain. Some minor streams enter Lake Togo along its western flank, and at the northern extremity, having traversed an extensive floodplain, the Haho River enters, again through a lakehead swamp. Other short coastal streams enter the lake along its eastern border. At its southern extremity it comes within 1 km of the sea and abuts the coastal sand-bar, thereafter turning due east and continuing as a narrow lagoon or canal to a point north of Anecho where it receives the effluent from Lake Vogan.

The main body of Lake Vogan is 7 km long and 1.5 km wide, oriented SW-NE, with an open water surface of 1600 ha. It has several deep arms extending northwards, into which affluent streams discharge, the most important of which is the Boko River. A narrow canal carries water from the southern extremity to the lagoonal system along the coast, and some 2.5 km east of this junction the lagoon/canal branches. One branch extends 3 km to the sea at Anecho, the other, the Gbaga Canal, continues east to Grand Popo on the Mono River in Benin, and over this stretch it is navigable. The mouth at Anecho frequently closes due to the development of a sand-bar in the dry season, and is unblocked artificially every 2-3 years.

The lagoonal sediments are mainly very fine, and quicksands occur near the banks, but there are outcrops of beach rock near the sand-bar. The catchments of the affluent streams are the Haho, 3400 km²; the Sio, 2800 km²; and the Boko, 1000 km².

Wetlands stretch back up the tributary rivers, above Lake Togo. Periodically inundated land occupies 19 800 ha on the Sio, reaching 60 km upstream, and 12 000 ha up the Haho, reaching 40 km upstream. The swamps on the Sio ascend to an altitude of 99 m, while those on the Haho reach 50 m. Smaller swamps occur on the Elio and Boko Rivers which enter Lake Vogan. Other swamps accompany the canal along the landward side of the coastal dunes to the mouth of the Mono River. Small areas of high swamp forest occur on the Sio and Haho Rivers, but most of the wetland is occupied by grassy floodplain with isolated trees, and some small isolated herb swamps.

Hydrology & Water Quality: Spring tidal range is 3.05 m and salt-water penetration occurs when the bar is breached, however, the lake is predominantly a freshwater body. The mean annual discharge from the Sio River, which is perennial, has ranged from 3.9 to 26.3 m³/sec. We have no information regarding volumetric discharge for the other streams, but flow in the Haho River is intermittent. The lagoon is oligomictic and there is usually a difference of about 1.5°C between the surface and bottom water. The lowest recorded surface water temperature was 23°C during the flood season in July 1982, and the highest was 34.8°C at low water in March 1982. The lowest transparencies are reached during the floods, when Secchi depths are about 25 cm, and the highest values, up to 1.2 m, are obtained at the height of the dry season. The pH varies from 8.21 downstream at low water, to 6.75 in the affluent streams at high water. Sodium ion concentrations have been recorded as varying between 14 mg/l upstream during floods, to 6000 mg/l in the lagoon at low water. There is a diurnal variation in dissolved oxygen when the lagoon is calm with a saturation range of 76-91% at the surface and

78-93% at depth.

Flora & Fauna: Peripheral areas of the lake, subject to inundation, are occupied by swards of *Acrostichum aureum* and *Paspalum distichum*. There are no mangroves because the lagoon is not normally tidal. Freshwater macrophytes, e.g. *Pistia stratiotes*, appear in the lagoon at times of high flood. Swamp forest, containing both Guinean and Soudanian species occurs on the rivers, while the floodplains are covered by the typical spectrum of floodplain grasses. Some *Phragmites* and *Typha* occur in permanent water in depressions. The fish fauna includes both marine and riverine species, but is dominated by the genera *Chrysichthys* and *Tilapia*. Invertebrate populations are dominated by the molluscs *Pachymelania* sp. and *Tympanotonus* sp., and the crustaceans *Callinectes latimanus* and *Penaeus duorarum*.

Human Impact & Utilisation: A main international road passes along the Togo beach front, to seaward of the Lake Togo System, connecting in Togo, the towns of Lome and Anecho, while other main roads ring the lake between Lome, Tsevie, Tabligbo, Vogan and Anecho. Population density around Lake Togo is not great, but the coastal lowlands are possibly the most populous part of the country. Scattered villages around the lake combine extensive agriculture with fishing, and fish are sold in the nearby towns. Seine nets are principally used, but there are to date, no collective fishing enterprises. Coconuts are grown on the sand-bar to seaward of the lagoonal swamps, especially in the west, and other plantations, of coconut and oil palm, have been established on the floodplain of the Sio River just above Lake Togo. There is little tourism in the area.

Conservation Status: Unprotected.

2. Riverine Wetlands

(a) Wetlands of the Mono River

Country: Togo

General: A swampy floodplain occurs over the lower reaches of the Mono River, between the rapids section (6°48'-6°56'N/1°37'E), where there are 6 separate rapids, and the coast. The wetland extends from Lake Alago (6°44'N) to the dune barrier, but it is at first discontinuous. The lower continuous section measures 30 km in length and 6 km in width and covers some 18 000 ha. A larger area of contiguous wetland, perhaps amounting to 26 000 ha, lies across the border in Benin. The area comprises permanent herb swamp, patches of swampy forest, and areas of grassy floodplain.

Flora & Fauna: *Phragmites* and *Typha* are present, together with lower growing sedges and grasses, and a spectrum of Guineo-Soudanian swamp forest trees. The area has a rich wildlife, typical of a West African tropical coastal wetland. Most of the truly dependent wetland species cited in the regional introduction are present. Manatees, crocodiles and *Hippopotamus amphibius* occur in the river. The avifauna is both rich and prolific.

Human Impact & Utilisation: The area is fished, but not intensively, small scale agriculture occurs on the margins of the floodplain, and cattle are grazed on the floodplain margins.

Conservation Status: Unprotected. However, an area of flooded gallery forest and some 20 km of river frontage is protected above the rapids on the Mono River in the Togodo National Reserve.

(b) Wetlands of the Oti River

Country: Togo

General: The Oti (Pendjari) crosses Togo in the north, in a savanna covered valley, some 40-50 km in width, situated between the co-ordinates 10°00'41"00"N/0°27'-0°55'E. The river banks are cloaked by strips of gallery forest and substantial areas of this are subject to periodic inundation. A floodplain accompanies the river and its tributaries for over 80 km from the northern border to the town of Mango, reaching 10 km in width across the main river. There are in total some 48 000 ha of wetland in this locality. In the south of this valley the Oti receives a tributary, the Koumongou River, which flows west from the Chaine du Togo to join the Oti on the Togo/Ghana border. A floodplain occurs along the lower reaches of the Koumongou in a belt 25 km long and 4 km wide, occupying 9500 ha, and covered by ox-bows and meanders. This plain floods to depths of 5 m in the wet season. Both Oti and Koumongou Floodplains are parched during the dry season, except for some ponds and lakes which persist in depressions. Water levels on the Koumongou Floodplain respond very quickly to rain in the hills during the May-October period. Upstream, on the Koumongou, gallery forests, characterised by a mixture of Soudanian and Guinean species and subject to periodic inundation, extend for 70 km along the river in a strip some 300-500 m wide.

Farther downstream the Oti receives two other tributaries which also have small floodplains above their confluences. These are the Kara River, with a floodplain of 1500 ha immediately above the confluence (10°01'N/0°25'E) and strips of swamp forest upstream, and the Mo River, with a discontinuous and rather narrow floodplain between the co-ordinates 8°52'-9°05'N/0°31'- 0 °54'E. Both of these streams drain the central highlands of the Chaine du Togo, and their floodplains are floristically and faunistically similar to those of the Oti and Koumongou Rivers.

Flora & Fauna: These floodplains are all situated in Soudanian savanna country and are dominated by typical floodplain grasses. Most of the trees cited as occurring in Guineo-Soudanian transitional swamp forests, and in Soudanian swamp forests, occur along the rivers, and there is a levee forest community.

Human Impact & Utilisation: Cattle graze the floodplains in the dry season, and are often to be found in the Keran National Park. There is some settled agriculture and much hunting on these floodplains.

Conservation Status: Much of the floodplain of the Koumongou River is protected in the Keran National Park, and a 30 km section of the upper Mo River, with a narrow floodplain, is included in the Fazao-Malfakassa National Park. Poaching is a problem in the Keran National Park, as is the presence of domestic cattle which compete with wildlife. The Oti Floodplain is unprotected.

3. Minor Wetlands

Country: Togo

General: A small strip of floodplain and inundated forest, occupying about 150 ha,

occurs on an un-named ephemeral stream on the far northern border near to the small town of Zambende, situated almost due north of Dapaong ($10^{\circ}58'N/0^{\circ}07'E$).

Semi-permanently inundated depressions occur in the high savanna zone on the north-eastern border, west and south of the town of Tandjoare. These depressions are centred on a point $10^{\circ}44'N/0^{\circ}05'E$, and are mostly associated with minor watercourses. They are peaty, dominated by grasses, but support swamp forest trees along the watercourses. In this area there are perhaps 2400 ha of these depressions.

4800 ha of periodically inundated land occur on the Yamboul River, just inside Togo and 20 km WNW of Mango ($10^{\circ}23'N/0^{\circ}35'E$), and other small areas occur on the Gambara River, an affluent of the Yamboul River.