

3.9 LIBERIA

Introduction

Liberia has an area of 111 370 km², a population of 1 990 000 (1982) and thus, a mean population density of 17.9 persons/km². It is situated on the Gulf of Guinea, being bounded by Me d'Ivoire in the east, Guinea in the north and Sierra Leone in the west. The country extends between 4°21' and 8°34'N and between 7°27' and 11°31'W. It is 510 km wide from NW-SE, and has a maximum depth of 275 km from SW-NE. The coastline is 680 km long, measured up inlets to the point at which their width diminishes below 1 km.

The coast is low and sandy in the west, but over most of the central and eastern sections it is sandy/rocky and of moderately high relief, broken by numerous river mouths. The land rises from the sea into a lowland coastal belt and reaches the 100 m contour some 50 km inland in the west. However, between Monrovia (6°20'N/10°46'W) and Buchanan (5°57'N/10°02'W) highlands approach to within 25 km of the coast. East of Buchanan the lowlands reach nearly 100 km inland, in the Cestos Valley, but narrow again to 30 km towards the eastern border. Farther inland the ground rises more steeply, often with scarps, to an interior plateau between 300-400 m asl. This is dissected by the valleys of the major rivers which flow in parallel across the country from NE-SW. Several hilly ridges, also trending NE-SW, rise from the plateau between rivers to heights of 500-600 m asl, while the plateau itself rises into mountains along the northern and northwestern borders. In these places several peaks exceed 1000 m asl, the highest point in the country (1194 m) being located in the far north (8°10'N/9°55'W) in the Wologizi Range.

Drainage of the entire country is directly to the sea. The major rivers rise in the northern highlands, or in Guinea, and are from west to east, the Mano, Lofa, St. Paul, St. John, Cestos and Cavalla (Cavally) Rivers. The first forming part of the border with Sierra Leone and the last part of the border with Cote d'Ivoire. Numerous lesser streams rise in the interior and either join the major streams as affluents, or find their own way directly to the sea. Almost without exception, the rivers are full of cataracts in their lower courses, mostly to within 30-40 km of the sea.

Climate

Liberia is one of the wettest countries in Africa. The coast is oriented at right angles to the prevailing SW Trade Winds and most of the coast receives more than 4000 mm of rain/yr. Only at the eastern border does it receive less, c. 2800 mm. Precipitation decreases progressively in passing inland, but even the northern border receives over 2000 mm. The climate is almost continuously wet. There is no discernible dry period along the central part of the coast, but on the western border January is dry, while on the eastern border February is dry. Greenville (5°01'N/9°03'W) has no dry month and

experiences 185 rainy days/yr. Along most of the northern border January is dry, and there are 170-180 rainy days/yr.

Temperature regimes are remarkably constant across the country. Along the coast, e.g. at Bendaja (7°16'N/11°13'W), Harbel (6°19'N/10°20'W) and Greenville the mean temperature of the coolest month is 24°C and that of the warmest month 27°C. Along the northern border corresponding figures are 24 and 26°C for Voinjama (8°25'N/ 9°42'W) and 24 and 27°C for Sanniquellie (7°24'N/8°45'W).

Wetlands

Liberia does not have any extensive wetlands, which is surprising in view of the humidity of the climate, but this is a consequence of the fact that the terrain slopes fairly constantly from the high northern border to the sea, and that the coast is mostly of high relief. The only part of the coast which is consistently flat is the stretch from the western border, eastwards to Monrovia, and in this forested sector there are lagoons and coastal swamps. Another substantial wetland occurs to the east of this, around the lagoon at Bassa Bwa, but from this point eastwards the coastline becomes rocky or rocky/sandy. Mangroves occur at all river mouths and there is a substantial swamp at the mouth of the Sehnkwehn River. There are no important wetlands inland, although narrow zones of inundation are found along some rivers, but since precipitation is not markedly seasonal, major floodplains do not occur here.

List of Wetlands Described

Coastal Wetlands

- (a) The Mano River
- (b) Lake Piso
- (c) The Lofa River
- (d) The St Paul River
- (e) Bassa Bwa Lagoon
- (f) St John River & Buchanan District
- (g) The Cestos River
- (h) The Sehnkwehn River to Greenville
- (i) Greenville to the Cavalla River

Coastal Wetlands

(a) The Mano River

Country: Liberia

General: This river descends 15 sets of rapids above the parallel 7°N. Close to this latitude it receives several small tributaries from the east which all carry narrow strip swamps, notably the Maa River, which has swamps 100-200 m wide for 15 km above its confluence with the Mano, while other swampy patches occur around the sources of these streams. A sand-bar partly obstructs the Mano River mouth on the Liberian side, while the Sierra Leone side carries a mangrove swamp.

(b) Lake Piso

Country: Liberia

General: This is an open lagoon rather than a lake and is the largest such inlet on the Liberian coast with an open water surface close to 11 000 ha at low tide. Mole Creek empties into the lagoon, while the Mafa River discharges very close to the mouth of the lagoon. This latter stream and its affluent Mani Creek drain a series of swamps above the lagoon, the lower ones of which are tidal and support mangrove vegetation. The upstream mangroves on the Mafa River, some 7 km from the sea, are separated from the mangroves at the mouth by a block of terrestrial forest. Other mangrove swamps occur behind the dune ridge on the west side of the Piso Lake mouth, and at several sites around the lake itself. Here the mangroves are best developed at creek mouths and are then backed in most places by *Raphia* swamps, while elsewhere palm-pandan swamps provide the frontal swamp system. A series of small lakes occurs on the sandy forested spit which separates the south shore of Lake Piso from the sea, and most of these have swampy margins.

(c) The Lofa River

Country: Liberia

General: Swamps occur on either side of the mouth of the Lofa River, in a belt 37 km long and 2-3 km deep along the coast immediately behind the beach. A small lake, Lake Mama, is enclosed by these swamps on the west of the river (6°36'N/11°06'W). Swamps and mangrove swamps also occur on the Wain River, which shares a mouth with the Lofa River, and on Mando Creek, an affluent of the Wain. Some way eastwards along the coast a small mangrove stand occurs at the mouth of the Po River (6°31'N/10°56'W), but no swamps spread laterally behind the sand beach at this point.

(d) The St. Paul River

Country: Liberia

General: The river descends many rapids before reaching the coast and is rocky right to its mouth. There is a small mangrove stand behind the beach on the west bank. However, close by at Monrovia, there is an extensive mangrove swamp in the bay behind the peninsula on which the city is built. Mangroves also occur on the Mesurado River, and its affluents, Stockton and Warner Creeks, which enter the bay. There are at least 6000 ha of mangrove swamp here, with other wetland types behind. To the southeast of Monrovia a series of un-named swamp-fringed lakes occurs behind the beach.

(e) Bassa Bwa Lagoon

Country: Liberia

General: Some 1400 ha of periodically inundated forest occurs on the Junk River, between Monrovia and Bassa Bwa, below which, behind the beach at the confluence of the Junk and Bo Rivers, there are mangrove swamps 6 km long and 0.5 km wide. Thereafter the Junk River flows SE, behind the beach, to enter the west end of Bassa Bwa Lagoon at Snafu (6°10'N/10°23'W). The swampy lagoon at Bassa Bwa lies parallel with the coast. It is 17 km long, nearly 4 km wide at maximum, and opens to the sea centrally on the south side. It is almost entirely occluded by tidal swamps, backed by freshwater swamp forests on tributary streams. The Farnington River enters the lagoon on its northern side and the Little Bassa River enters the eastern extremity. The lagoon mouth is permanently open and the open water area is usually about 600 m wide and 10 km long.

(f) St. John River & Buchanan District

Country: Liberia

General: There are small patches of mangrove swamp at the St John River mouth, but more extensive stands on two affluents, the Mechlin River which enters on the north bank and the Benson River which enters on the south side. There are probably 2500 ha of mangrove swamp on this system. Passing southeastwards, a small mangrove stand occurs at the Bo River mouth (5°44'N/9°54'W), another lies parallel to the beach at the mouth of the Kola River, while other small stands occur upstream of the sandy mouth of the Timbo River. Yet another small stand is located at the mouth of Fewehn Creek (5°33'N/9°42'W).

(g) The Cestos River

Country: Liberia

General: The mouth of this river is sheltered behind the rocky Cestos Point, and there are extensive shoals, as well as sand, gravel and mudbanks. Mangrove vegetation is restricted to occasional trees, but stands occur up tributary streams on both banks, with a total area of 1200 ha.

(h) The Sehnwehn River to Greenville

Country: Liberia

General: The Sehnwehn River reaches the sea (5°13'N/9°21'W) near the town of that name, where a tidal swamp extends for 6 km on either side of the channel and 5 km upstream. The 5000 ha swamp extends behind the beach. Small mangrove stands occur at the mouth of the stream at Taso Beach (5°07'N/9°12'W) and also at Greenville at the mouth of the Sino River.

(i) Greenville to the Cavalla River

Country: Liberia

General: The section of coast immediately east of Greenville is devoid of wetlands, and there is only a very small mangrove stand at the mouth of the Dubo River (4°44'N/8°28'W). However, a series of tidal swamps occurs between Grand Cess (4°35'N/8°13'W) where the Nuch River reaches the sea, and the mouth of the Cavalla River on the Cote d'Ivoire border. At the mouth of the Joda River (4°32'N/8°03'W), near Juduke, there is a substantial mangrove stand covering some 2400 ha. Another tidal swamp occurs for a distance of 6 km up the small river which enters the sea near Garawe (4°30'N/7°56'W). East of this, Lake Jede (4°28'N/7°52'W), with some fringing mangroves, spreads behind a sandspit at the mouth of a small river immediately to the west of the Decoris River mouth. Mangroves also occur on the the Decoris River, reaching 5 km upstream, and a further 5 km up two affluent creeks. Another tidal swamp occurs on the Hoffman River at Harper (4°22'N/7°42'W), and again reaches 5 km inland. Non-tidal swamps occur behind the beaches at Fish Town, Rock Town and Harper, and to the east of Harper, Shepard Lake extends along shore for 9 km. It has an open water surface about 0.5 km wide. Scanty mangroves occur at the Cavalla River mouth.

Flora & Fauna: As described in the regional introduction for coastal wetlands. *Crocodylus niloticus* and *Osteolaemus tetraspis* occur in the mangroves near Monrovia and in similar sites along the coast, but are uncommon. *Crocodylus cataphractus* is more common, but in freshwaters. Upriver, *Choeropsis liberiensis* still survives, e.g. in forests on the Mano, Lofa, Cestos, Sehnkwehn, Sino, Dugbe and Cavalla Rivers.

Human Impact & Utilisation: Hunting and fishing pressures in the mangroves are intense, as is the exploitation of mangroves for fuelwood. Clearing of mangrove sites for habitation and agriculture (rice) is increasing.

Conservation Status: Presently unprotected, but a national park has been proposed, and is intended to cover a large area between the Cestos and Sehnkwehn Rivers. This will include the mangroves at the mouth of the Sehnkwehn, and a 20 km section of this river above the mouth. It will also include a 60 km upstream section of the Cestos River and several minor streams. In the west of Liberia, a nature reserve has been proposed at Robertsport along the southern shore of Lake Piso. This reserve will include Lakes Mono, Makasa, Jaa, Jukanu, Danu and Zontoni, and a small stream on the forested slope of the hill at the western end of the spit.