



MAP SHOWING THE HYDROGRAPHIC AND CONVENTIONAL BASINS OF LAKE CHAD

THE BASIN

The hydrographic basin of the lake extends over an area of about 2.4 million km², half of which is desert. This is shared by the four riparian countries, as well as by Algeria, the Sudan and the Central African Republic ⁽¹⁷⁾.

The conventional basin was established in 1964, by convention of the four riparian countries, as the area to be jointly managed by the Lake Chad Basin Commission. It covers an area of 427 300 km² which stretches from latitudes 10° to 16°N and from longitudes 9° to 18°E. Its hydrographic basin is composed of the Chari-Logone-El-Beïd and

Komadugu-Yobé river systems ⁽¹⁴⁾. The term "basin" used in this book generally refers to this area.

When the Central African Republic joined the Commission in 1994, the conventional basin was extended and it now covers an area of about 967 000 km². In 2000, the Sudan also joined the Commission.



USUALLY, 75 PERCENT OF THE ANNUAL RAINFALL IS CONCENTRATED IN JULY AND AUGUST

CLIMATE

Climatic zones in the Lake Chad Basin are mainly determined by rainfall levels, which range between less than 100 mm in the extreme north (Saharan zone), 100–400 mm in the central and largest part of the basin, including the lake (Sahelian zone), and 400 mm to as much as 1 000 mm in the southern edge of the basin (Sudanian zone). This variation greatly contributes to the diversity of vegetation types, agriculture, wildlife, livestock and all types of human activities in the basin.

The seasonal rainfall pattern depends on the movement of the intertropical convergence zone (ITCZ), which is defined as the boundary between the hot dry air masses originating from the north

(harmattan) and the cooler damper masses originating from the south (monsoon). Between November and March the ITCZ is located far south of the basin, the harmattan prevails and the season is very dry. The ITCZ moves northwards in April, reaching its northernmost position, at about 20°N, in July to August, and starting its southward movement in September. Consequently, the first rains appear in May to June, are more consistent in July to August (about 75 percent of the yearly rainfall is normally concentrated in these two months), and decrease in September^[1,10].

Temperatures reach their minimum values in December to January (about 14°C at Bol – monthly mean of minimum daily

temperatures) and their maximum values in April to May (about 38°C at Bol – monthly mean of maximum daily temperatures)^[1,1].

The combination of rainfall and temperature defines three main “seasons”: a cool dry season between October and February, a warm dry season between March and June, and a warm wet season between July and September^[1,11].

The rainfall pattern is far from being constant in the different climatic zones of the basin and over the years. Especially in the drier areas of the north and in years of low rainfall it may be quite different; consequently the actual rainfall pattern for a single year is generally unpredictable.



A MAP PRODUCED IN 1653 BY P. DU VAL D'ABBEVILLE FOR THE KING OF FRANCE LOUIS XIV. LAKE CHAD IS SHOWN WITH THE NAME "LAC DE BORNO" ^[1,13]

HISTORY

The Lake Chad Basin is a sedimentary basin formed in the Mesozoic era. Fluctuations are not new to Lake Chad. Fossils and the landscape of the area show evidence of wide fluctuations in the palaeoclimate, with periods alternating from very arid to very humid. During arid phases the lake dried out completely and dunes were formed.

During humid phases the lake extended over increasingly larger areas, to a maximum of about 400 000 km² (also

known as Megachad). At least three such major cycles have been identified in the period from 55 000 to 6 500 years before present (BP) ^[1,12]. The current climatic arid phase started about 4 500 years BP. It is characterized by the presence of the Sahara Desert in the northern part of the basin and by a lake surface area not exceeding about 25 000 km².

The presence of prehistoric humans in the basin is well documented and is closely linked with these climate fluctuations, as

these humans almost disappear during the most arid periods. Fossil evidence shows that populations relied on fish and other lake and river fauna for food.

Even in recent ages, geological data and historical records show how the alternation of humid and arid periods caused correspondingly wide fluctuations in the lake level. In the second millennium BC, the arid climate caused the population to concentrate in a few scattered oases and led to the development of nomadism.



EAST OF NGUBMI, THE NIGER

WIDE FLUCTUATIONS IN LAKE LEVELS HAVE BEEN DOCUMENTED THROUGHOUT THE AGES. THE CURRENT ARID PHASE STARTED ABOUT 4 500 YEARS BP

In the first half of the sixteenth century the lake almost disappeared but, by the end of the following century, the lake surface was about 25 000 km² in area. Another significant arid period was recorded in the first half of the nineteenth century^[1,14].

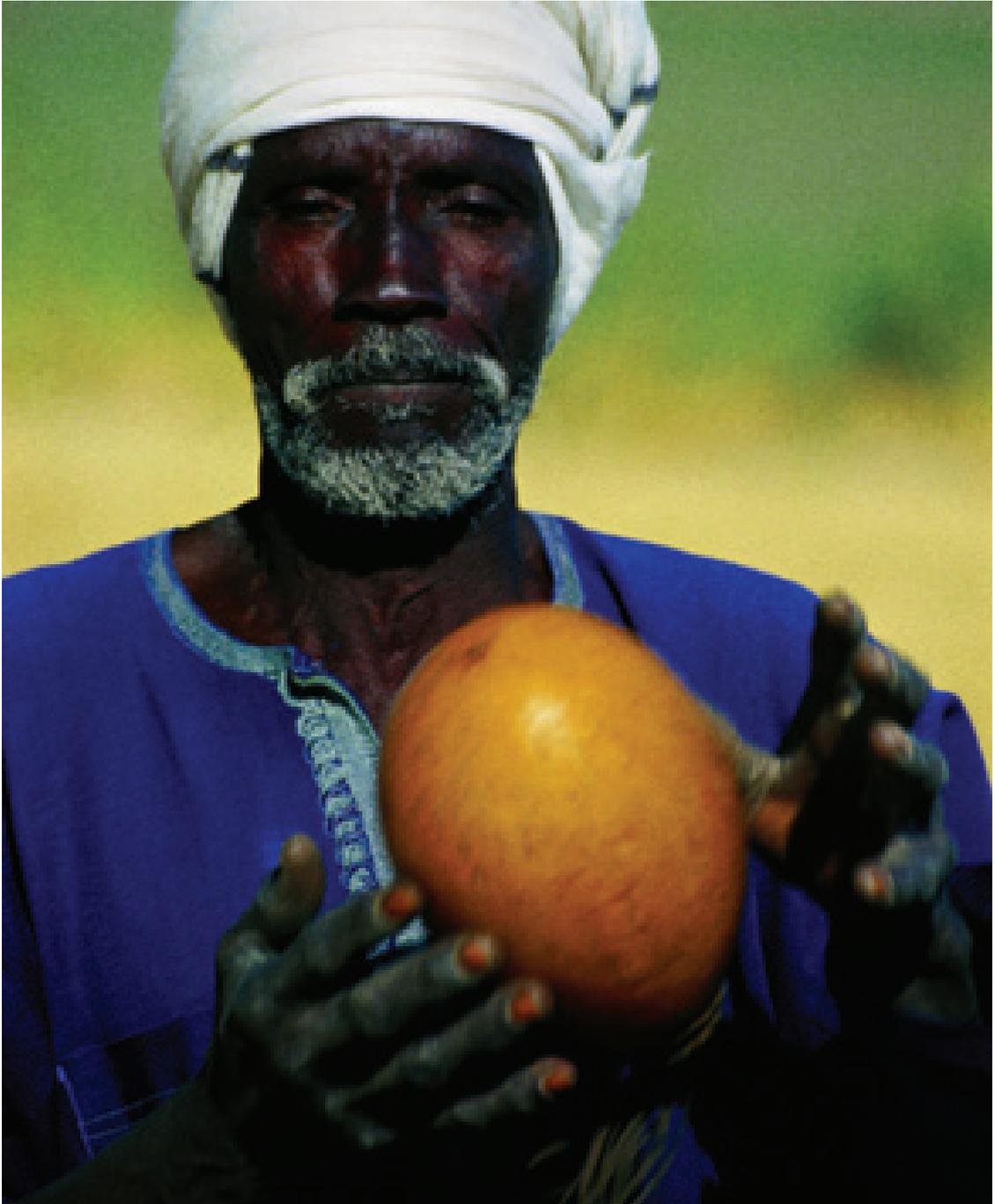
More precise data are available concerning the recent history of the lake, since the beginning of the twentieth century: the highest level was reached in the 1960s (a surface area of 25 000 km² in 1962/63), while the lowest levels were reached during the droughts of the 1970s and 1980s (less than 2 000 km² of open water surface area in 1990). In the last few years there has been evidence of a trend inversion^[1,11], although the lake must still be considered as being in the Lesser Chad condition hydrologically.

As for the populations, during the first millennium BC the Sao and Daima civilizations were already present in the south of the Lake Chad Basin and Nok people were found in the southwest. Agriculture, fishery and pastoralism were the main activities.

According to legends, there was a flourishing civilization to the south of the Lake Chad Basin from 700 to 1050 AD. Textiles and pottery have been found, as well as defensive walls, built probably against the Kanembu. Trade flourished after the fourth century as a result of the introduction of camels, which enabled connections between the Mediterranean Sea and the Lake Chad Basin. The caravans used to carry products from the north, as well as weapons and precious fabric. On the

way back, they would carry slaves captured in the southern part of the Kanem-Bornu kingdom. More recently, this trade continued with wheat and natron, etc.

A people called Zaghawa ruled Kanem until 1075, when the dynasty of Sefuwa became dominant. From 1210 to 1248, King Dunama Diboldami brought the Kingdom of Kanem to its peak. The kingdoms of Bornu and Kowar were unified under Kanem and trade was very active. Between 1382 and 1387, Kanem was annexed to the territories of Bulala, and the Bornu Empire dominated the region. Until the mid-nineteenth century, Kanem-Bornu remained a powerful state but, after European occupation, the population and its wealth decreased rapidly^[1,14].



A TOTAL OF 11 MILLION PEOPLE LIVE IN THE LAKE CHAD BASIN. IN CHAD, ALONE, MORE THAN 130 LANGUAGES ARE SPOKEN



MALAM FATORI (BAGA), NIGERIA

THE LAKE CHAD BASIN IS A MOSAIC OF PEOPLE FROM DIFFERENT ETHNIC GROUPS, CULTURES AND RELIGIONS

PEOPLE

Today the Lake Chad Basin is a mosaic of peoples, each with different cultures, habits, skills and needs. For generations, farmers, pastoralists and fishermen have lived and worked in equilibrium with the fluctuations and uncertainties of their environment, developing a combination of different agricultural traditions, fishing skills and pastoral movements in order to make maximum use of the resources. Therefore,

the peculiar biodiversity of the Lake Chad Basin ecosystem has been formed not only by its great variety of flora and fauna but also by the diversity of populations and their complementary skills.

People living in the Lake Chad Basin are drawn from several ethnic groups and tribes, such as the Kanuri, Mobber, Buduma, Haoussa, Kanembu, Kotoko,

Shewa Arabs, Haddad, Kouri, Fulani and Manga. Over the years, interactions between these tribes and their cultures, their religions and the mobility of herders have led to a mixing of races and a blurring of roles. Herders have become farmer-herders and farmer-fishermen. Farmers have added fish to their diet and, in turn, gone on to become traders.

PASTORALISTS

Pastoralists and their cattle are a vital part of the ecosystem and often have a positive impact on the management and propagation of biodiversity and the maintenance of water resources. If sufficient resources are available, nomadic herding contributes to the sustainable use of grasslands and prevents the degradation and desertification of the region's poor and fragile soils.

Pastoralists fall into three main groups: the Toubou and Arabs, who are camel breeders and herders and sometimes agropastoralists; the Fulbe, including the Peul and the Wodaabe (or Bororo), who normally do not farm but are nomadic herders; and the Buduma, who raise and herd the white Kouri cattle on the remote islands of the lake.

There are also agropastoralists or farmer-herders, including tribespeople from the Manga (the Niger) and Kotoko (Chad and Cameroon). These communities own relatively small herds of between ten and 30 head of cattle, and follow the transhumance routes of traditional herders.

However, even these ethnic distinctions are not definitive. Many of the farmers, such as the Manga or the Mobber, are also breeders, herders and agropastoralists, and some have settled on the edge of the pasture lands, where they coexist with the Peul and the Wodaabe. By the same token, Fulbe tribespeople may also be farmers. Unlike their nomadic counterparts, they are sedentary and, most important, they drive herds that are not their own.



PORT OF BLANGOUA (KOUSSERI), CAMEROON

PEUL WOMAN AT THE MARKET TO SELL SOUR MILK



KABELEWA VILLAGE (NIGER); THE NIGER

WODAABE YOUTH AT THE WELL NEAR KABELEWA



TAL DESERT (NIGER); THE NIGER

ARAB PASTORALIST AT THE WELL NEAR LOWA

FARMERS

Almost all of the communities in the Lake Chad Basin grow crops to some extent. Among these tribes are the Haoussa, Mobber (Kanuri), Kanembu, Buduma, Shewa Arabs, Dadjo, Kouri and Sara.

Most farmers have limited land and labour. Soils are generally of marginal quality and rainfall is unpredictable. In addition, markets are scattered and difficult to reach and the population is scattered and mainly rural. As a consequence, farmers adopt subsistence strategies. Rather than looking for high yields, they select their seed according to its capacity to resist drought and disease, to produce on poor soils and to leave sufficient amounts of residues that can be used as animal feed or left on the ground to increase soil fertility. Market prices for agricultural products are generally low, so farmers have no interest in producing a surplus for sale at market, which would require additional input in terms of labour and fertilizers.

As a result, although there is great potential for increasing food production in the Lake Chad Basin, most of the production is still for household consumption, and only a small portion of the cereals produced in the area reaches the marketplace. Taste also plays an important role and most farmers select and grow cereals that best suit their processing and cooking habits.

The livelihood of farmers depends to a great extent on the crops that they are able to grow. At rainfall levels of 250–500 mm per annum, millet and sorghum are predominant. At rainfall levels of 500–750 mm, cereals, groundnuts and vegetables may be grown. Where levels reach 1 000 mm, cultivated crops include rice, wheat, maize, sorghum, groundnuts, cotton and forage crops.



DUMBA VILLAGE (BAGA), NIGERIA

KANEMBU WOMAN



DANOUWANE VILLAGE (IN GOUZUMI), THE NIGER

ABOVE AND BELOW: SOME FARMERS PRODUCE MOSTLY RAINFED CROPS, WHILE OTHERS ARE ABLE TO GROW TWO OR EVEN THREE CROPS USING RECESSONAL LAND



MALAN KOURNADI VILLAGE (DIFFA), THE NIGER

FISHERMEN

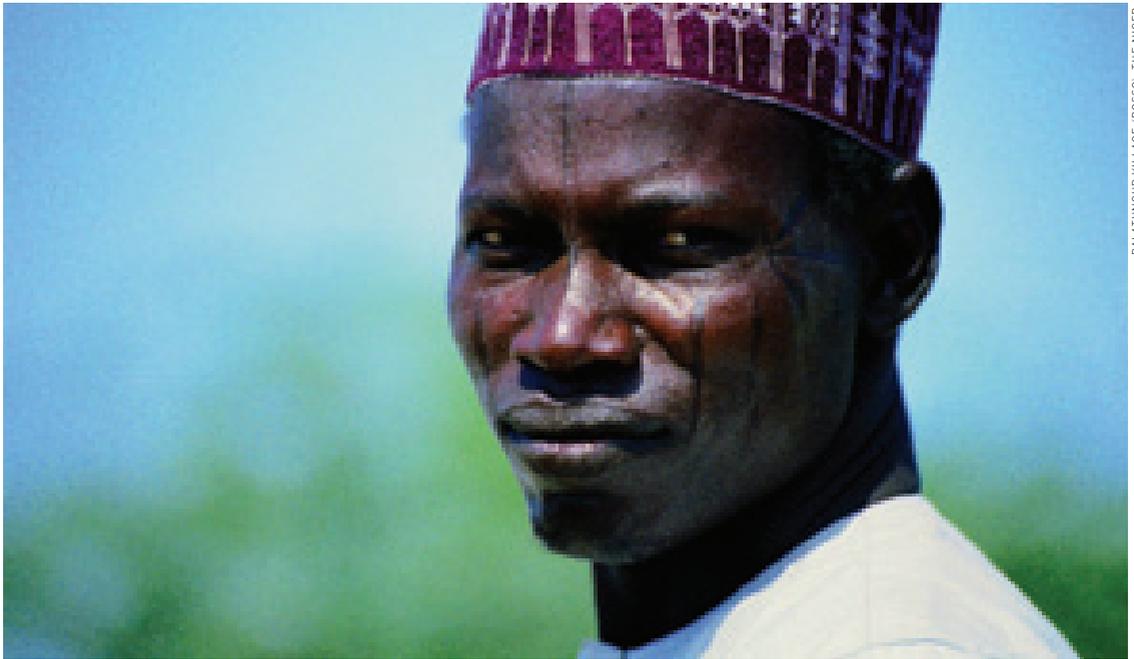
Around the islands of Lake Chad, people from communities such as the Buduma, Kanembu, Haoussa, Kotoko, Masa, Kanuri, Kim and Kabalay all make their living by fishing. There are estimated to be at least 20 000 professional fishermen in the lake basin, with the highest numbers concentrated in Chad and Cameroon, although over 300 000 people fish as a part-time activity. As well as in the lake itself, fishing is also practised along the Chari and Logone rivers and within the floodplain areas of the lake and rivers.

Many people fish the waters of the lake, the rivers and the wadis or pools for domestic consumption – fish is an important source of protein in the region. Fish is also an important trading commodity, and many people are involved at different stages of the fish marketing operations. So far, fishing has been practised according to seasonal fluctuations of the water basins, and there appears to be room for developing this important economic asset.



DORO LELEWA VILLAGE IN GUIGMI, THE NIGER

FISH IS AN IMPORTANT SOURCE OF PROTEIN FOR THE INHABITANTS OF THE LAKE CHAD BASIN



BALATUNGUR VILLAGE (BOSSO), THE NIGER

FISH TRADER AT THE MARKET IN BALATUNGUR PORT



DORO LELEWA VILLAGE (NGUIMBI), THE NIGER

OVER 300 000 PEOPLE FISH IN THE LAKE CHAD BASIN AS A PART-TIME ACTIVITY

People and societies of the Lake Chad Basin

by **Pierluigi Agnelli** *

Names of the people

The names given to different ethnic groups often reflect historical situations or how the groups are viewed by their neighbours. For example, the inhabitants of the islands, who used to hide themselves in the thick island vegetation to protect themselves from other groups, call themselves “Yedna” but are more commonly known as “Buduma”, which in Kanembu language means “people living in water grasses”. Mobber people – farmers who have settled in the Komadugu-Yobé area – are called “Doho”, meaning “they have arrived and we have also arrived”, by the Tumagri Kanembu of the Niger. Kotoko people make a distinction between Saway Arabs (*la gadi*, meaning “Arabs coming from the east”) and Suwa Arabs (*saway gogi*,

meaning “curdled milk Arabs” or “small Arabs”). The Kanuri are distinguished as “big Bornu” and “small Bornu”; the first term refers to those who live in Bornu, and the second to those who live temporarily in the Kotoko fishing zones.

Kanembu and Kanuri societies

These societies have only recently accepted state organization, and some aspects of the former Kanem–Bornu Empire social structure are still apparent.

In the Kanem (Chad) each member of the village obeys a village chief (*Marama* in Kanembu and *Buluma* in Arabic). His title is hereditary, but he is sometimes elected by the heads of families. A group of villages is ruled by the *Maï*, or *Chef du canton* (formerly called “sultan”), who is the representative of central administration. He is generally chief of an ethnic group, although a “canton” is not always ethnically homogeneous. Finally, at the top of the pyramid, there is the *Alifa of Mao*, supreme

chief of the Kanembu people. He collects part of the village taxes and is the depositary of land titles for his territory.

In the Bornu (Nigeria) the village chief is also called *Buluma*, and a group of ethnically homogeneous villages is called a *Lawanat* and is ruled by a *Lawan* (race chief). A group of *Lawanats* is ruled by an *Adji* or *Adja* assisted by a counsellor. The *Adji* is nominated by the *Shehu* of Maiduguri who is the highest authority in the entire territory of the ancient Kingdom of Bornu. The authority of the *Shehu* is also recognized by other people. When the *Katchella* (chief) of the Mobber of Bosso pays a visit to the *Shehu*, he does not wear the traditional *boubou* but a goatskin on his shoulders as a sign of respect.

In Chad, the Haddad people are an example of what was once a caste. They used to be blacksmiths (*haddid* in Arabic means “iron”), but they now undertake a variety of manual jobs, forming socioprofessional rather than ethnic

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BLANGOUA VILLAGE (MOUSSERI), CAMEROON



HADDAD BLACKSMITHS IN THE MARKET AT BLANGOUA VILLAGE



GAOUI VILLAGE (N'DJAMENA), CHAD

THE HISTORICAL HOUSE OF THE KOTOKO SULTAN IN GAOUI

groups. They generally marry within their own group. Haddad people are shoemakers, hunters, farmers, natron extractors, butchers, *griots*, musicians, masons, and radio- and watch-repairers. In addition, Haddad women carry out artisanal work such as pottery making, *dihé* extraction and midwifery. All these jobs are often considered degrading activities, but this neglected group of people is now slowly gaining social recognition thanks to education and their highly prized work. Most of the Haddad people live in the areas of N’Gouri and Massakori.

Kotoko society

Kotoko people live in two large territories, Mandegé in the north and Lagwané, which lies south of a line from Kousseri (Cameroon) to Ndufu (Nigeria).

The Kotoko developed an urbanized society because the villages in their territory were generally larger than those of their neighbours from different ethnic groups. The various Kotoko principalities are relatively independent. The main political power rests with the *Mé*, or prince. From the capital city, the *Mé* rules over several groups of villages, each governed by a *Mra*, who is selected directly by the *Mé*. Each village is ruled by a *Buluma*, who is nominated by the *Mra*. In the Mandegé region, the *Buluma* also takes the role of land chief (*Msitani*, or *Chef de terre*). The *Buluma* are elected by free men, grouped by age, and therefore their role is very important.

In the larger agglomerations (over 1 000 people), such as Makari and Goulfey, the class

division is quite marked. At the top of the caste system are the *Fanawn* people, who are members of the prince’s family and hold the political and economic power. They own large homes and horses, and wear expensive clothes. Then there are the *Mirwada*, or “land people”, who produce goods for the city, and are responsible for the traditional religious ceremonies. At the lowest level are the *Furukay*, or “children from the west”, who are descendants of slaves captured in the west (i.e. in the Mousgoun or Moulouï), and have the humblest jobs. This hierarchy, although not so well defined as in the past, still influences social relationships among people.

THE COUNTRIES

The four countries sharing Lake Chad, Cameroon, Chad, the Niger and Nigeria, are among the largest nations in Africa. Between them, they cover a total area of little less than 4 million km², i.e. 13 percent of the total surface of the continent ^[1.4]. Their total population of about 145 million people is not evenly distributed: about 77 percent live in highly populated Nigeria, 10 percent in Cameroon and the rest in the two northern and more arid countries, Chad and the Niger. The population in the Lake Chad Basin area is estimated at about 11 million people ^{[1.4], [1.15]}.



NEAR BDL, CHAD

FOOD SECURITY AND POVERTY ALLEVIATION ARE IMPORTANT OBJECTIVES OF SUSTAINABLE DEVELOPMENT POLICIES IN LAKE CHAD BASIN COUNTRIES

TABLE 1 POPULATION DATA OF THE COUNTRIES SHARING LAKE CHAD

| COUNTRY | Total population in 1999 (MILLIONS) | Population in the conventional basin in 1999 (MILLIONS)* | Annual population growth rate for 1999–2015 (%) | Adult literacy rate (%) | Population not using improved water sources (%) | Population without access to essential drugs (%) |
|-----------|-------------------------------------|--|---|-------------------------|---|--|
| Cameroon | 14.6 | 2.9 | 2.1 | 74.8 | 38 | 34 |
| Chad | 7.6 | 3.8 | 3.0 | 41.0 | 73 | 54 |
| Nigeria | 110.8 | 3.7 | 2.5 | 62.6 | 43 | 90 |
| The Niger | 10.5 | 0.25 | 3.6 | 15.3 | 41 | 34 |
| World | 5 862.7 | – | 1.2 | 79.2 | – | – |

* 1999 population data extrapolated from 1992 data ^[1.4] by applying growth rates ^[1.15] in the four countries

Sources: UNDP, 2001 ^[1.15] and CIRAD/CTA, 1996, for population data in the Conventional Basin ^[1.4]

TABLE 2 HUMAN DEVELOPMENT DATA OF THE COUNTRIES SHARING LAKE CHAD

| COUNTRY | Human Development Index (HDI) | HDI rank (out of 162 countries) | Gross domestic product per capita (PPP* US\$) | Population below national poverty line (%) |
|-----------|-------------------------------|---------------------------------|---|--|
| Cameroon | 0.506 | 125 | 1 573 | 40 |
| Chad | 0.359 | 155 | 850 | 64 |
| Nigeria | 0.455 | 136 | 853 | 34 |
| The Niger | 0.274 | 161 | 753 | 63 |
| World | 0.716 | – | 6 980 | – |

* PPP = purchasing power parity

Source: UNDP, 2001 ^[1.15]



Papyrus canoes on Lake Chad

9 March 2002

In open waters, Lake Chad

Returning to Bol by boat, we encounter on the way a number of fishermen. These days, their boats are all made of plywood, called *madré*; a factory-made material that comes from Nigeria. The famous papyrus canoes, *hadey* in the Buduma language, once the only mode of transport on the lake, belong to the past or probably to the poorest fishermen living on the most remote of the islands. From a distance, we make out the shape of just such a vessel on the shores of the island of Goergilom, half hidden by the reeds. It belongs to a very elderly looking fisherman, who, as we later find out, lives by himself in a hut a few metres from the lake shore.

The bearded old man moves very slowly and is helped by a young boy who looks about ten years old. Together, they prepare a fish for the market, splitting it down the middle and placing it over a rudimentary grill. Smoke rises slowly

from the makeshift fire. It is all very simple, but it appears to be effective as well.

The “mythical” papyrus canoe turns out to be extremely small and very old. It is pulled up on the shore; we want to try it out, but it hardly floats any more. It is a far cry from the huge vessels that once took to the open waters, their great prows curved to look like an elephant’s tusk. André Gide wrote about just such a boat in his *Voyage au Congo* and *Retour au Tchad* in 1925. “They don’t use wood to build their boats. Using thick mats made out of papyrus, they make long rafts with a curved prow, a bit like a gondola,” wrote the French author. “These extraordinary vessels are propelled by long poles, which are often imported from far away.” Gide’s travelling companion Allégret took a superb photograph of the vessel.

These papyrus boats are the same as the ones still found, even today, on Lake Titicaca in Peru and on Lakes Tana and Zwai in Ethiopia. They also bear a striking resemblance to vessels depicted in the paintings and bas-reliefs of the

ancient Egyptians, more than 4 000 years ago. This was the method of transport used by the pharaohs. In fact it was believed that a crocodile would never attack a boat made out of papyrus, since this was the material used to make the boat in which the goddess Isis travelled, on her search to find the dead body of her beloved Osiris.

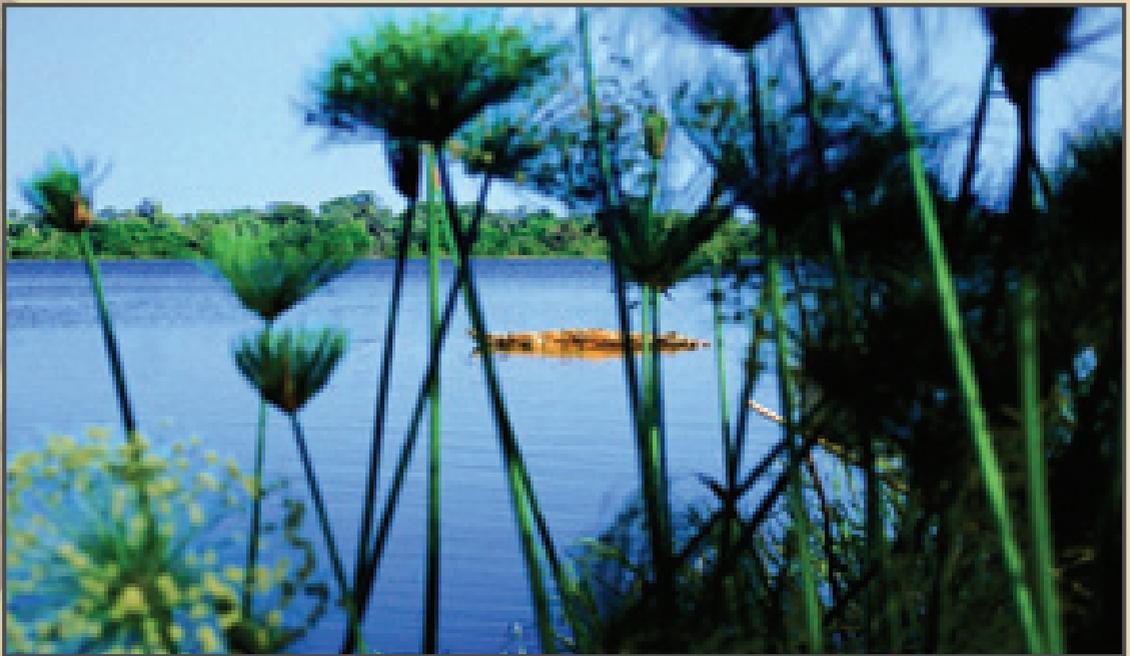
In spite of their apparent fragility, boats made from papyrus (*Cyperus papyrus*) were surprisingly strong and could be used on the high seas. This was amply demonstrated in 1970 by one of the greatest and most intriguing modern-day sailors, the Norwegian Thor Heyerdahl, who created the Kon-Tiki (built from balsawood) and later the Ra II, which was entirely made from papyrus.

Heyerdahl recruited Buduma fishermen from Lake Chad to build Ra II, and in the space of just a few months they had made a magnificent vessel, 12 m long. Heyerdahl used this vessel to cross the Atlantic Ocean, in an effort to prove his theory that ancient African sailors could have reached the coast of the Americas long before Christopher Columbus.

GOERGILOM ISLAND (BOL), CHAD



TRADITIONAL PAPYRUS CANOES ARE BEING REPLACED WITH BOATS MADE FROM IMPORTED PLYWOOD



GOERGULOM ISLAND (BOL), CHAD

ABOVE AND BELOW: DESPITE THEIR FRAGILE APPEARANCE, PAPYRUS BOATS ARE SURPRISINGLY STRONG. THE BOAT USED BY THOR HEYERDAHL TO CROSS THE ATLANTIC OCEAN WAS BUILT BY BUDUMA FISHERMEN



GOERGULOM ISLAND (BOL), CHAD