

# 7.4 Cote d'Ivoire



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<b>Capital city</b>	Yamoussokro (political capital) Abidjan (economic capital)
<b>Population (2005 est.)</b>	18,600,000 (1.8% growth)
<b>GDP per capita (USD 2005 est.)</b>	\$1 648
<b>Life expectancy at birth (2005 est.)</b>	47.4 years (male - 46.5, female - 48.3)
<b>Land and water area</b>	322,460 km <sup>2</sup> (land - 318,000, water - 4 460)
<b>Length of coastline</b>	515 km
<b>Mangrove area (2005 est.)</b>	9 900 ha
<b>Marine protected areas (2007 est.)</b>	1.32 km <sup>2</sup> (0.01% of total territorial waters)
<b>Capture fisheries prod. (2006 est.)</b>	32,644 metric tones
<b>Aquaculture fisheries prod. (2006 est.)</b>	817 metric tones

**Rivers to the Country's Coast:** The five principle rivers in Côte d'Ivoire are Cavally, Sassandra, Bandama, Comoé and Tanoé. These rivers flow into the coastal lagoons or ocean. River flow has very strong inter-annual variability which has been monitored over many years. For example, the average flow of the Comoé River was 331m<sup>3</sup>/s during the 1960 - 1970 period, 161m<sup>3</sup>/s during the 1970 - 1980 period, and finally 110m<sup>3</sup> during the 1980-1990 period.

**Coastal Climate:** The climate is tropical and characterized by four seasons: - two dry seasons from November to March and August to September; - two rainy seasons from April to July and from September to October. The coastal area has an average temperature that fluctuates between 25°C in August and 30°C in March. The minimum temperatures are between 12°C in December and 21°C in April. The maximum temperatures are between 28°C in August and 37°C in February. During the 3 or 4 months in summer, Côte d'Ivoire experiences the humid monsoon air. The monthly averages are rarely less than 80%.

**Coastal Geomorphology:** The coastal area is characterized by several geological formations: granites, granitoid and metamorphic rocks. The granites are most widespread and vary in composition: leucocratic granite with biotite, microcline with fine grain, sub-alkaline granite,



Figure 1. Map showing annual precipitation for Cote d'Ivoire.



Figure 2. ODINAFRICA National Coordinator for Cote d'Ivoire Dr Sankare with a representative of their embassy in Brussels during a ODINAFRICA seminar.



Figure 3. Map showing coastal drainage of Cote d'Ivoire.

and monzonic, or akeritic granite are present. Generally, the coastal sandy grounds dominate almost all the entire area, but a number of soil types are present, including: rough mineral, brunified, hydro-morphic and ferralitic soils.

**Coastal Habitats:** The coastal area is about 32,960 km<sup>2</sup> between latitudes 4° and 5°30' N and longitudes 2°25' and 7°30' W. Its coast extends from the Cap des Palmes (Liberia) to Cap des Trois Pointes (Ghana) (Abe, 2005). From west to east, the coastal area consists of low, often marshy, plains which narrow gradually. The lagoon system is parallel to the gulf of Guinea between western longitude 2°50' and 5°25'. It is nearly 300 km and covers a total surface area of about 1 200 km<sup>2</sup>. It consists of three distinct lagoons: the Grand-Lahou, the Ebrié lagoon and the Aby lagoon, they are connected by the Azagny channel dug in 1955 and the Assinie channel, built between 1955 and 1957.

**Ports and Harbours:** The two main ports are the Port of Abidjan and the Port of San Pedro. There are many smaller docks on the coast and in the villages bordering the lagoons.

**Coastal Economy:** The principal activities in the coastal area include forestry, plantations, factories, tourism, fishing and various infrastructures (for instance roads, tourist resorts and hotels and houses). The service sector accounts for 50% of the GDP and employs a large portion of the population in industries such as telephone companies, security, general trade and restaurants. Current estimates indicate that there are approximately 6 to 8,000,000 people living in the coastal areas

The coastal area has grown into a tourist destination due to its natural beauty and infrastructure developed. Attractions include:

- Assinie and Assoindé beaches
- Assinie (capacity 200 rooms) and Assoindé (capacity 314 rooms) hotel complexes
- Assinie and Assoindé Marinas

**Fisheries:** Fishing on the Ivorian coast is an important activity which is practised by national and foreign communities. It is the main activity and the principal source of income for the population living in the south

of the country. Indeed, fisheries carried out along the coast in 2000 generated an income of 33 billion Communauté Financière Africaine Francs. All the coastal cities that have marine frontage have fishing centres. There were 3 500 dugouts counted along the coast and in the lagoons in 1996. 14,774 fishermen working at sea and in the lagoons were counted in the year 2000 (DPH, 2000).

Table 1. Distribution of fishermen on the coast. Source: DPH, 2000.

Area	Number of fishermen				Total number of fishermen
	Ivoriens	%	Non Ivoriens	%	
Abidjan	25	94	4 783	39	4 808
Adiaké	1 736	66	1 524	13	3 260
Dabou	26	98	532	4	558
Grand-Bassam	82	3	549	5	631
Grand-Béréby	1	3	470	4	471
Grand-Lahou	745	28	692	6	1 437
Fresco	22	83	96	80	118
San-Pedro	4	15	1 459	12	1 463
Sassandra	0	0	1 145	9	1 145
Tabou	8	30	875	7	883
<b>Total</b>	<b>2 649</b>	<b>100</b>	<b>12 125</b>	<b>100</b>	<b>14 774</b>

Two types of fishing are carried out in the ocean,

Industrial fishing uses about 38 ships and takes place on the continental shelf not far from the ports of Abidjan and San Pedro. The catch includes tuna (between 58,000 and 62 000 tonnes), crustaceans (trawling about 6 000 tonnes), sardines (between 28,000 and 30,000 tonnes), and shrimp (515 tonnes in 1999 and 1314 tonnes in 2000).

**Mineral Resources:** There are a number of mineral resources exploited in the area, notably gold in the Aboisso region and extraction of various construction materials including stone, sand, gravel, ceramic, and clay. In the Afema mines of the Bassam area extraction produces 800 000 tonnes of ores containing 3 200 kg of gold (approximately 4g/ton).

Table 2. The economic fish operators in a few coastal towns.  
(Sources: Coordination inter-régionale halieutique du Bas-Sassandra, 2000, Rapports DPH, 1996, 1999).

Area	Abidjan	Adiaké	Grand Bassam	Dabou	Grand-Lahou	San Pedro	Sas-sandra	Grand-Béréby	Tabou	Fresco	Total
<b>Operators</b>											
Pêcheurs	4 808	3 260	631	558	1 437	1 463	1 145	471	883	118	14 774
Mareyeurs						13		20		8	41
Revendeurs	3 592					473	438	112	334	3	1 535
Fumeuses						130	261	424	401	51	1 267
Pisciculteurs											445
Autres opérateurs						48	3	9			60
<b>Total</b>	<b>8 400</b>	<b>3 260</b>	<b>631</b>	<b>558</b>	<b>1 437</b>	<b>2 127</b>	<b>1 847</b>	<b>1 036</b>	<b>1 626</b>	<b>172</b>	<b>21 094</b>

**Agricultural products:** Primarily, there are two types of agriculture practised in Côte d'Ivoire: 1) semi-intensive with fields varying between 2 and 10 ha, and 2) modern agriculture with larger fields. The principal products grown for export are coffee (868,000 tones), cocoa (1,000,000 tones), soft bananas (200,000 tones), pineapple (195,000 tones), héveas (55,000 tones), palm tree oil, cotton, cajou, and cereals for local consumption (e.g. rice, fonio, millet, maize, yam, manioc etc).

**Other marine resources:** A number of marine resources can be found in Côte d'Ivoire notably petroleum and natural gas.

### ADDRESSING KEY COASTAL ISSUES AND HOT SPOTS

The coast of Côte d'Ivoire has a number of impediments to its sustainable development. The uncontrolled urban development at the coast has outgrown the waste management systems that were implemented without consideration for the levels of growth that is now being witnessed on the coast. The poor management of solid waste and household refuse has put further pressure on coastal ecosystems and resulted in rapid degradation. The various forests and national parks

are increasingly being occupied by farmers and some forests have been completely converted into villages. For example, the forest of Monogaga has about 28 villages and campsites.

Water ways, and in particular those in the Ebrie lagoon, have been affected by pollution. The water contains heavy metals such as zinc, lead, mercury, most of which comes from the tanneries and factories built on the edge of the lagoon. The lagoon and coastal areas have also been turned into dump sites and the resultant seepage of solid waste compromises the quality of water. Poor collection and treatment of water compromises the quality of the surface water, which is affected by industrial as well as domestic waste.

Another problem is the use of waste water for food crops which are invariably sold in the markets and subsequently pose a potential health risk. Air pollution is also rife in the coastal areas with smoke and dust, posing a serious health risks. Odors from the fish treatment plants located on the beaches are also an issue.

The average erosion rate of the beaches is from 1 to 3m per a year according to available statistics. This is partly due to lack of protection policies as well as to the natural sedimentation processes. However the continued sensitisation of the public by the authorities has led to short to medium term management of this coastal crisis. Indeed, the government has put in place a strategy for the management of erosion at the coast and has proposed to build gabions to reduce or control the rate at which the coastline is receding (PNAE 1996 - 2010).

Agriculture is the engine of the Cote d'Ivoire economy. In 1997, agriculture contributed 26.6% of the GDP (Côte d'Ivoire, éléphant d'Afrique, 1999) but the development of agriculture, particularly agriculture for export, was done in the forest zone which saw the forest's surface decreasing from 12 million hectares in 1960 to approximately 2 million hectares today. Agriculture does not constitute the only cause of forest clearing, but the haphazard clearing of the classified forests and national parks is a major issue in the coastal zone. Thus, the authorities are faced with the problem of protecting agricultural interests on one hand and on the other hand protecting ecological interests. This is exacerbated by the fact that a large proportion of agricultural production is for export. In the south for example, local food crops cover only 25% of the cultivated

area, the remainder being occupied by food grown for export. Arable land is becoming increasingly rare in the coastal zone and various workshops addressing this issue have identified the growing conflicts between the agro-industries and the local farmers in the area.

In the area of artisanal, lagoon and fishing in lakes and rivers, there are conflicts between artisanal and industrial fishermen Koffié-Bikpo (2001), states that the leading cause of conflict between, artisanal lagoon and continental fishing are differences on the appropriation and rights to fishing areas by those they consider aliens. The residents assert that the lagoon or coastal areas exploited by the settlers are their property, and that the exercise of fishing rights is subjected to their authorisation. The most serious conflicts were experienced in 1994 on the Aby lagoon in the south east, and in 1998 in Sassandra at the mouth of the river with the same name.

The absence of clear and coherent regulations has had an impact on the coastal area. The situation is exacerbated by ambiguous and often unclear laws and the fact that the laws that are in place are not applied. Lack of comprehensive policies and management tools affect the coast and, with exception to policies that are applied in the tourism sector, no specific measures have been taken to protect the coast. A general framework must therefore be put in place in order to address coastal issues in a comprehensive manner.

## **DEVELOPMENT AND ACHIEVEMENTS OF THE NODC**

The National Oceanographic and Data Centre was first created on 8<sup>th</sup> August, 1958 and was under the control of the Ministry for Agriculture. It was managed until November 1991 by the French Institute of Scientific Research for Development and Co-operation (Ex - O.R.S.T.O.M), until 1991 when it was reorganized into a National Public Corporation, according to Decree n° 91-646 of 9<sup>th</sup> October, 1991. The NODC is presently under the supervision of the Ministry for Higher Education and Scientific Research.

The National Oceanographic Data and Information Management Centre (CNDO-CI) is a newly formed national data centre, which is part of the Oceanographic Research Centre (CRO) in the port area of Abidjan. It is

charged with carrying out nationally, all research on safeguarding and protecting water environments, and implementing sound policies for the management of marine and coastal resources.

The CNDO-CI has the specific role:

- To provide users with oceanographic data and related information
- To encourage the use of national and regional documents available at the centre
- To promote and to facilitate networking between national and regional scientists
- To train and sensitize users and the broader population in its fields of competence
- To contribute to documents within its fields of competence

## **Activities at the CNDO-CI include:**

*Education:* Student activities are integrated within the framework of CNDO-IO implementation. Activities include various collections made with support from INSAAC and the University of Abidjan, Cocody.

*Development of various databases and information tools:* These include the production and dissemination in print form, CD-ROM, and the web of databases on biological diversity, catalogues and bibliographies on coastal environmental studies, contribution to the ASFA Database (Aquatic Sciences and Fisheries Abstracts), and more recently a photo-bank on fish and other marine species

*Website:* Through the web CNDO-CI presents users all the activities carried out and all the products available through the data centre.

The different users of the products and services available include

- University and college students
- Scientific researchers in universities and other research institutes
- Shipping and navigation
- Development agencies
- Diplomatic missions
- International organizations
- Non Government Organizations
- Professional organizations
- Tourists
- The private sector
- Defence and security forces
- Hotel complexes
- Environmental agencies
- Decision makers
- Local authorities
- The coastal population

## MARINE RELATED PROGRAMMES AND ORGANIZATIONS

Institutions	Information collected
Centre de Recherches Océanologiques	Physio-chemical, microbiological and biological – lagoons and ocean
Ports Autonomes (Abidjan et San-Pedro)	Physical-ocean
SOEXAM	Physical atmospheric-throughout the country
CIAPOL	Physio-chemical, microbiological, biological- lagoons- continental waters
Universités et Instituts de Recherche Curat (CRE)	Biotic and abiotic-ocean-continental waters

Laboratoire d'Hydrobiologie	-
Direction de la Faune et des Ressources Cynégétiques (Min des Eaux et Forets-DFRC)	Bio-ecological, ethological-lagoons-continental waters
BNETD	Physical atmospheric - throughout the country
Société de Développement de l'Eau de Côte d'Ivoire (SOCECI)	Physio-chemical and microbiological-Continental and bordering waters
Direction de l'hydraulique Humaine (DHH)	Physio-chemical, information on water resources-Continental and bordering waters
Direction des Productions Halieutiques (DPH)	Production – Lagoons and the ocean
CNTIG	Socio-economic
INS	Population statistics
Marine nationale	Physio-chemical - the ocean
CONARAF (Ministère des eaux et forêt)	Information on humid areas- socio-economic-flora and fauna-physio-chemical atmospheric parameters in the lagoons- Continental waters
ANADER	Socio-economic-Physical atmosphere-Physio chemical- Continental waters
Direction des Politiques et Stratégie de l'environnement (Min. de l'Env. DPS )	Biodiversity and organic pollutants
LANEMA	Physio-chemical- microbiological-Industrial pollution- lagoons- Ocean

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