

Figure 3.1 – 3 Division of Cote d'Ivoire
Based on River Basins, Detail (4/6)

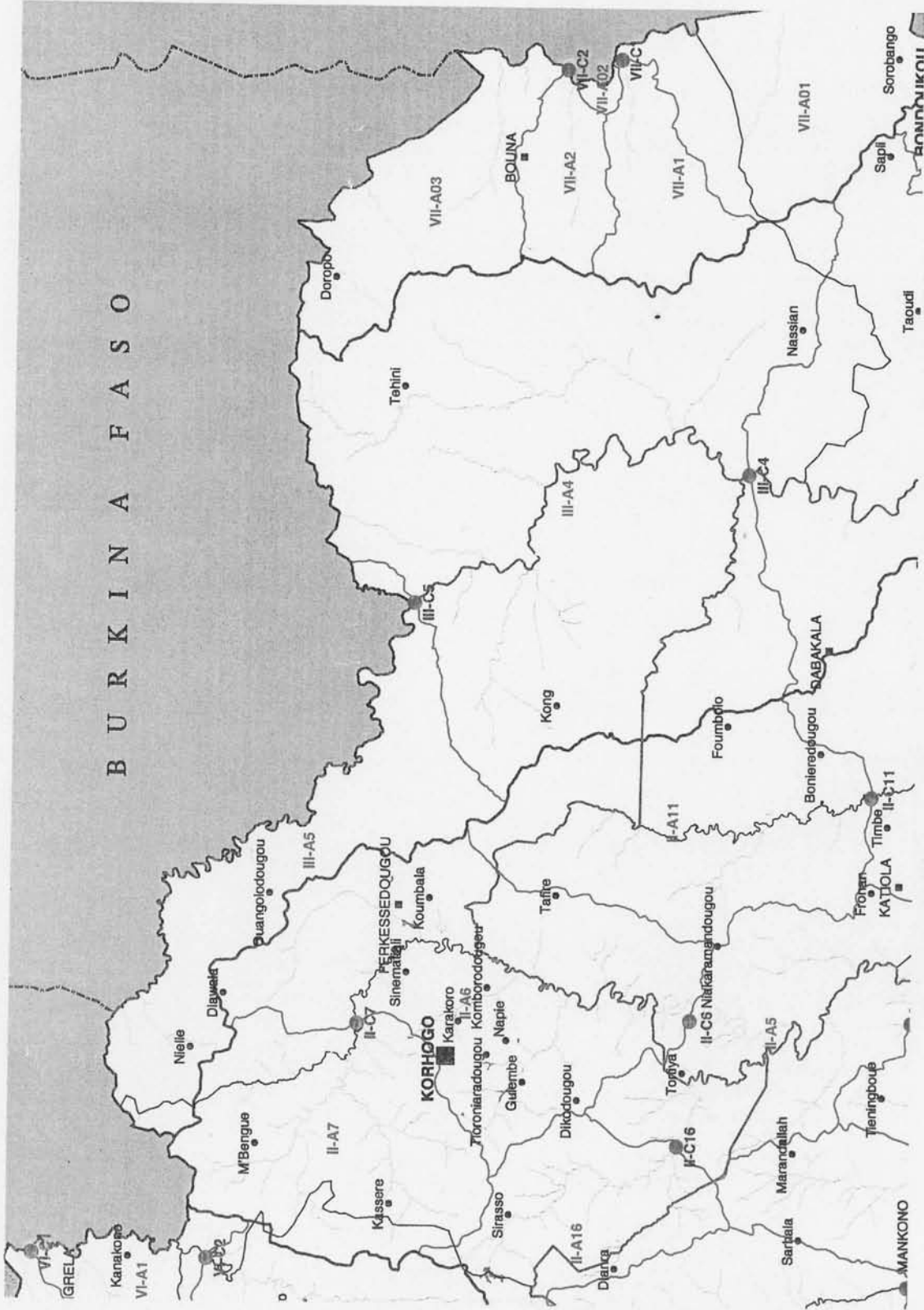


Figure 3.1 – 3 Division of Cote d'Ivoire
Based on River Basins, Detail (5/6)

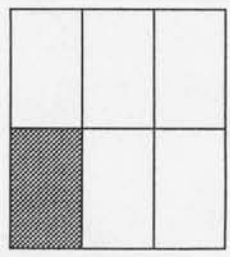
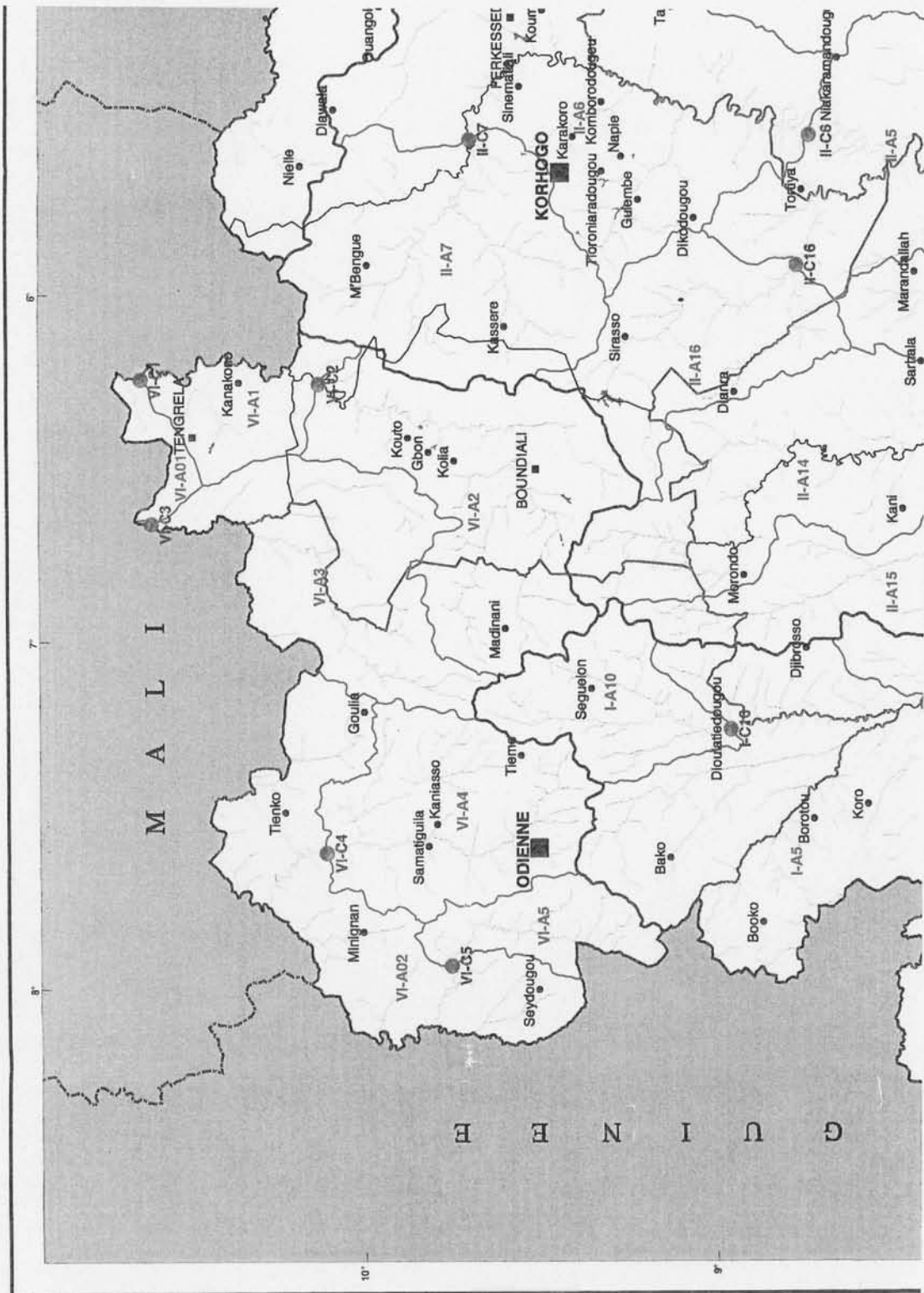


Figure 3.1 – 3 Division of Cote d'Ivoire Based on River Basins, Detail (6/6)

CHAPTER 2 DESCRIPTOINS OF RIVERS IN ELEVEN DIVISIONS

2.1 Sassandra River

The Sassandra River (Division I) with the Buyo dam reservoir is one of four large and important rivers in Cote d'Ivoire. The general map of the basin (in Cote d'Ivoire) is shown in [Figure 3.2-1](#). The main features of Sassandra River are presented as follows:

Location

The river basin is located in the western side of Cote d'Ivoire and some upstream basins (Bafing and Bagbe/Feredougouba) in Guinea. The Basin is located in a range of $5^{\circ} 41'$ to $8^{\circ} 15'$ in west longitude and $9^{\circ} 41'$ to $4^{\circ} 52'$ in north latitude.

Origin of mainstream

It may be a little confused about the mainstream of Sassandara River. But, the mainstream originate its source near Beyla in Guinea country at approximately 750 m in altitude. The upstream river is called FéréDougouba River and the name of Sassandra is taken only after receiving Boa River at Dabala. The FéréDougouba River drains a basin surface area of approximately 6,850 km² by 250 km long mainstream.

River basin area and river length

The total basin has 74,500 km² in area and 650 km in length.

Course and profile of main stream

The Sassandra River originated in Gunea flows to the east approximately 250 km and turns to south after joining with Boa River. Then the river continuously flows down to the south as far as the sea. The river collects some major tributaries on the way. The Bafing and Koue Rivers join from the mountainous west areas. The river enters to the large Buyo reservoir, which receives N'zo River from the west, and then receives Lobo River from the left. The river slope is increased in the stretch near Soubré and some rapids are seen in comparatively wider river course with many small islands. Before reaching to the sea, the mainstream recieves Davo River from the left. The river gradient is classified into four sections as follows:

- From the origin to Boa River confluence : Rapid slope
- From Boa confluence to Buyo Reservoir : Gentle slope
- From Buyo Reservoir to Debo River confluence (Soubre stretch) : Rapid slope
- From Debo confluence to the sea : Gentle slope

River mouth

The mouth of Sassandra River is narrow although the river in the lower reach is wide. The long sand bar from the east extends along the coastal line and clogs the river mouth flow. The flowing section of river mouth looks 30 to 40 m wide, while the sand bar creates a kind of lagoon with a width of nearly 1 km.

Hydrological Features

The Sassandra River is the largest river in Côte d'Ivoire in term of water discharge. The flow discharge is comparatively regular in whole year. The annual mean discharge is 513 m³/s at the Gaoulou Pont (70,550 km²). The monthly discharge is high (1,090 to 1,160 m³/s) in September and October. And the low months are from January to May (210 to 300 m³/s). The annual specific discharge is 0.73 m³/s/100 km² at Gaoulou Pont, which is lower than Cavally River but higher than Bandama and Comoe Rivers.

There are 28 stream gauging stations in the river basin.

Natural conditions of the basin

Approximately 15 - 20% of the basin spreads out on west mountainous area. The remaining area is comparatively flat and gently decreases the altitude from the north to the south. Almost a half of the basin is lower than El. 300m and only 20 % is above El. 500m. The base geology is mostly composed of granite.

Administrative divisions and major cities in the basin

The Sassandra River basin includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
	<u>Whole area of Sub-prefecture</u>	
Worodougou, Montages, Bas-Cavally, Haut-Sassandra	Dioulatiédougou, Booko, Booko, Borotou, Kono, Guinteguela, Touba, Ouaninou, Koonan, Sipilou, Sifié, Bangolo, Gbonné, Man, Logoualé, Facobly, Kouibly, Duekoué, Zoukougbeu, Daloa, Gboguhé, Grand – Zattray, Saiuoa, Issia, Guiberoua, Gagnoa, Guéyo, Sassandra.	Touba Man Daloa
Note : Each region generally spread over plural river division areas.		

<p><u>Only a part of Sub-prefecture</u></p> <p>Seguelon, Bako, Djibrosso, Worofla, Biankouma, Vavoua, Sanguiné, Bloléquin, Guiglo, Bédiala, Buyo, Ouragahio, Sinfra, Bonon, Zuenoula, Séguéla .</p>
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Dam and Reservoir

There is the Buyo dam & reservoir for hydroelectric power, which is the second largest in Cote d'Ivoire and has reservoir capacity of 8,300 million m³ at HWL. There are some other dams located in the basin for water supply or agriculture, but the scale is comparatively small and located in tributaries.

Tributaries

The major tributaries of Sassandara River are briefly explained as follows:

(A) Boa River

The Boa River springs up in the northeast of Beyla at 700 m in altitude. After 130 km running, the width becomes larger at the confluence with Sien River, which is 120 km long and 2,100 km² in basin area.. At 20 km down from the Bountou town, the Boa River with 5,770 km² of catchment area receives Tyemba River, which drains 4,040 km². Near Dabala village, the Boa River joins FéréDougouba River, from where the name of Sassandra is used.

(B) Bafing River

The Bafing River coming from Guinea runs to east. A river stretch before joining Sassandra river is called “Bafing depression” by geologists. The river has high potential of hydroelectric power generation. A part of mainstream (20 km) and a tributary (35 km) form a boundary to Guinea.

(C) Koué River

The Koué River runs to east on the north of Man-Seguella road. The river is less meandering and joins Sassandra River after receiving Qua River from the right.

(D) N’zo River

The N’zo river springs up in Dan mountains in the northeast of Man. The N’Zo River flows down along Man-Danané road on the west and flows into the Buyo

reservoir at Guigio town. Man is located in a basin of the tributary.

(E) Lobo River

The Lobo River joins to the mainstream of Sassandra River from the left bank at approximately 40 km downstream of the Buyo dam. The river originates in the southwest of Seguela town and runs down to the south almost in parallel to the mainstream of Sassandara River. Daloa City is located in the middle reach basin, where the river meanders extensively. The Gore River is the main tributary, which runs down through the eastern side of Daloa city and joins to Lobo River in the south of Issia town.

(F) Davo River

The Davo River is the most downstream tributary and joins to the mainstream from the left bank at approximately 12 km from the river mouth. The river originates in the northwestern area of Sinfra town and runs down to south until the confluence with the mainstream of Sassandara River.

2.2 Bandama River

The Bandama River (Division II), with Kossou dam and Taabo dam, is one of four large and important rivers and is the only large river having its whole catchment area entirely in Côte d'Ivoire. The general map of the basin is shown in [Figure. 3.2 - 2](#). The main features of Bandama River are presented as follows:

Location

The river basin is located in the central zone of Cote d'Ivoire and the whole basin is located in Cote d'Ivoire. Some sections of these two tributaries become the boundary of Guinea. The Basin is located in a range of $3^{\circ} 51'$ to $7^{\circ} 01'$ in west longitude and $10^{\circ} 13'$ to $5^{\circ} 08'$ in north latitude.

Origin of mainstream

It springs up in the high plateau in the north of the country located near Korhogo, at the altitude of nearly 500m.

River basin area and river length

The total basin has approximately 97,000 km² in area and 1,050 km in length. The basin is the largest in the country.

Course and profile of main stream

The Bandama mainstream, after originating near the northern national boundary, runs down to south continuously, but with some slight changes of direction on the way. The average slope is gentle, around 0.4 m/km. The comparatively steep slope is seen in the upstream-end stretch and also in a stretch including the confluence with N'zi River. The general introduction of river course in upper, middle and lower reaches is respectively presented as follows:

(Upper reach)

The river collects Tyakpo , Badénou, Badéni Rivers in Sirasso region located at 50 km south–west of Korhogo and at the altitude of approximately 400 m. The Badénou and Badéni Rivers spring up near the boundary to Mali. The river flows down more than 40 km in the southeast of Ferké town, decreasing the altitude from 310 m to 280 m. Before reaching Ferké, the river meets a narrow and long schistose unit, which is called “the Bandama north gutter”. Then the river turns the direction from the west-to-east direction to the north-to-south direction. After this turn, the river goes down with very gentle slope in a distance over 150 km and reaches to the confluence with Bou River at approximately 250 m in altitude. The mainstream receives La Figureué and Solomougou Rivers from the right bank and Lokpo and Silue Rivers from the left bank. The extensive meandering is seen in the section between the confluence with Solomougou River and the confluence with Bou River.

(Middle reach)

The term of Middle reach is applied to the river section from the confluence with Bou River to the Kossou reservoir. After receiving Bou River, the river makes a large left-round loop of approximately 30 km wide. The river-bed descends to less than 160 m in altitude before entering to the Kossou reservoir. The Kossou reservoir is the largest in the country and has the distance of nearly 130 km from the upstream end to the downstream outlet through the shortest water route.

(Lower Reach)

After going out of the Kossou dam, the river receives Marahoué River at the right-bank. From the confluence, the river section becomes larger and some isolated islands are seen in the stream of nearly 140 km long until Tiassalé (28 m altitude). On the way, there is Taabo dam & reservoir, which is not large as Kossou but has the distance of nearly 15 km from the upstream end to the

downstream outlet through the water route. Between two large dams, Yamoussoukro and Toumodi towns are located on the east. The N'zi River joins from the left at approximately 50 km downstream of Taabo dam. Then it goes down to the south with gentle meandering for entering to the sea at Grand-Lahou.

River mouth

The Bandama River flows into a part of lagoon. And the outlet to the sea is narrow and only one from a combined Lagoon group (Lagoon Tagba, Lagoon Tadio and Lagoon Nyouzomou).

Hydrological Features

The Bandama River has the biggest catchment area (97,000 km²) against Comoe (78,000 km²), Sassandra (75,000 km²) and Cavally (30,000 km²). But it comes to the third position from the viewpoint of discharge volume, after the Cavally and the Sassandra.Rivers.

The river basin is located from the tropical transition zone to the mitigated equatorial transition zone. In the upper reach basin, the annual rainfall is 1,300 –1,400 mm. In the middle reach basin, it ranges 1,150 – 1,300 mm. In the lower reach basin, the rainfall is increased from 1,200 mm in the northern area to 1,800 mm in the southern coastal area.

The annual mean discharge at Tiassale (95,500 km²) is 249.0 m³/s, which is equivalent to the specific discharge of 0.40 m³/s/100km². It is noteworthy that the specific discharge is 0.37 m³/s/100km² at Bada (24,050 km²) and 0.27 m³/s/100km² at Tawara Amont (5,375 km²). And in the tributaries, 0.35 m³/s/100km² at Boufle (19,800 km²) of Marahoue River and 0.18 m³/s/100km² at Zienoa (35,000 km²) of N'zi River.

There are 42 stream gauging stations in the river basin.

Natural conditions of the basin

For more than half of the surface area, the Bandama River basin is located in the altitude of 250 – 500 m. Approximately 5% is higher than 500 m and 45% is lower than 250 m in altitude. The topography is gentle almost in the whole basin.

The upper and middle reach area is generally covered with pasture-land or agricultural land. The lower reach area is generally covered with agricultural land and forest.

Administrative divisions and major cities in the basin

The Bandama River basin includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Sud-Sassandra, N'zi-Comoe, Lacs, Marahoué, Worodougou, Vallée du Bandaman, Savanes	<u>Whole area of Sub-prefecture</u>	Bouake, Yamou- ssoukro, Korhogo
	Taabo, Tiémélékro, Kokoumbo, Toumodi, Bocanda, Dimbokro, Yamoussoukro, Bouaflé, Tiébissou, Didiévi, Kouassi Kouassikro, Ouélé, Mbahiakro, Tiè-Ndiékro, Djébonoua, Sakassou, Gohitafla, Brobo, Bouaké, Diabo, Béoumi, Kounahiry, Kongasso, Massala, Bodokro, Botro, Satama-sokoura, Satama-sokouro, Katiola, Mankono, Dualla, Sarhala, Tiéningboué, Marandallah, Fronan, BoniéréDougou, Niakaramandougou, Tortiya, Dianra, Kani, Morondo, Dikodougou, Tefiré, Sirasso, Guiembé, Napié, Komborodougou, Karakoro, Sinématiali, Korhogo, Niofoin	
Note : Each region generally spread over plural river division areas.	<u>Only a part of Sub-prefecture</u>	
	Grand-lahou, Tiassalé, Hiré, Oumé, Mbatto, Bongouanou, Sinfra, Bonon, Daoukro, Prikro, Bédiala, Zuénoula, Vavoua, Basswa, Séguéla, Foubolo, Worofla, Djibrosso, Kong, Séguélon, Boundiali, Koumbala, Kasseré, Ferkessedougou, Diawalla, Mbengué, Nielle, Sikensi	

Dam and Reservoir

There are two large dams located in the mainstream. The Kossou dam has a power station with the hydroelectric power capacity of 174 MW and a reservoir with storage capacity of 30,211 million m³ at HWL. The Taabo dam has a power station with the hydroelectric power capacity of 210 MW and a reservoir with storage capacity of 630 million m³ at HWL. It is noted that the Kossou reservoir has never reached to HWL since its completion in 1972.

There are more than 250 dams in the basin. Most of them are generally small and used for agricultural purposes including irrigation, livestock, water supply and fishery. Some dams for water supply are located near populated centers. Dams are mostly located in the upper reach area, although not a few dams are located in the middle and lower reaches.

Tributaries

There are two major tributaries in the Bandama River basin as briefly explained as follows:

(A) N'zi River

With a total length of 725 km and a basin area of nearly 35,000km², the N'zi River is a tributary but one of major rivers in the country. It springs up in a north-center

plateau located at the east of Kong town. The average altitude is 300 m. The river receives some tributaries such as Foro-Foro River from the right, M'bé River from the left and Kan River from the right.

The first half of the river flows towards the south in a dry uninhabited area. Then the river flows into a mountain area called Fétékro range composed of schistose and with Nangbion mountain (631 m high). The river continues to Toumodi direction in the “Baoulé hills”. At the end of this range of mountains, it reaches to a plain.

The second half goes in plains with meandering and changing direction in a stretch of 30 to 40 km long. The river section becomes wider in a stretch from Fétékro to Tiassalé, where the N'zi River joins to Bandama River. This stretch has a distance of approximately 200 km and the river slope is gentle. The most courses of N'zi River has less gradient than the mainstream of Bandama River.

(B) Marahoué River

The Marahoué River is called Red Bandama, while the mainstream is called White Bandama. The river is 550 km long and is the second largest tributary with 24,300 km² of the basin. It springs up in the southwest mountainous area near Boundiali town. After crossing the mountains with general altitude of 600 m (El.800 m at the peak), the river flows on the granite old plateau with the height of 400 to 300 m in altitude. From there, two rivers run down to the south almost in parallel, keeping 30-40 km distance and joins near Zuenoula town. One located on the east is the mainstream of Marahoué River and another one on the west is Bananoni River. It is noted that the name of river is changed on the way as follows:

- Yarani River becomes Banoroni River after crossing Seguela city
- Kahoua River becomes Marahoué River after passing near Mankono City.

The Marahoué River of the lower reach flows in a plain and spreads out its meanders till Bouaflé town (167 m in altitude) after passing Zuenoula town. It receives Béré's River from the left before reaching Bouaflé. At 30 km down from Bouaflé and around 15 km far in the south of Kossou dam, the river rushes into Bandama River at 147m in altitude. It is noted that after extensive meandering in the south of Zuenoula, there is an approximately 22 km long straight stretch. According to the information from some government engineers, this section is also a natural river and is not man-made channel.

2.3 Comoe River

The Comoe River (Division III) is one of four large and important rivers in Cote d'Ivoire. The river is the longest while the basin area is the second in rivers of Cote d'Ivoire. The general map of the basin (in Cote d'Ivoire) is shown in Figure 3.2- 3. The main features of Comoe River are presented as follows:

Location

The river basin is located in the eastern region of Cote d'Ivoire, but a part of upstream basin of the mainstream in Burkina Faso. Some sections of the mainstream and tributary (Leraba River) become the boundary to Burkina Faso. The Basin is located in a range of $2^{\circ} 45'$ to $5^{\circ} 58'$ in west longitude and $10^{\circ} 29'$ to $5^{\circ} 10'$ in north latitude.

Origin of mainstream

The Comoé River springs up at 500m in altitude in the Banfora region located in the southwest of Burkina Faso.

River basin area and river length

The total basin has 70,140 km² in area and 1,160 km in length.

Course and profile of main stream

The Comoe River doesn't have large tributary like N'zi River in Bandama River. The basin is relatively narrow comparing with Bandama River. The river runs down approximately from the north to the south.

After entering Côte d'Ivoire at approximately 220m in altitude, the river runs down to south-east direction for nearly 200 km with meandering and the first 50 – 60 km is the national boundary to Burkina Faso. At the entrance to Cote d'Ivoire, a tributary (Leraba River) joins to the mainstream from the west. The Leraba River also forms the boundary to Burkina Faso for more than 100 km long. The mainstream collects Kolonkolo River and Tobourougou River from the right-bank and Kodoun River, Bawe River and Boin River from the left-bank before turning the general direction to the south.

After tuning to the south, the river continues its meandering but keeping the direction to the south with some large roundabouts on the way. The mainstream collects tributaries of Iringou River from the left, Segbono River from the right, Baya and Ba Rivers from the right, and Beki and Manzen Rivers from the right.

The river gradient is very gentle (1m down per 5-6 km long) from the national boundary

to a stretch nearly 200 km from the river mouth. From there, the gradient become a little increased. At around 100 km from the river mouth, the gradient becomes steep and the altitude decreases from 76 to 16 m in this zone of 14 km long, where rapids are provoked by granite outcrops. That means an average slope of 4m per kilometer. After the rapids, the last stretch of nearly 100 km to the sea becomes gentle again.

River mouth

The Comoe River flows into a part of lagoon, which is also the one end of Assinie canal. The actual outlet to the sea is located approximately 50 km east from the outlet to the lagoon. After running through the canal and entering a part of Aby lagoon, the water goes out to the sea from a narrow outlet.

Hydrological Features

In the upper reach basin, the annual rainfall is 1,100 –1,300 mm. In the middle reach basin, it ranges 1,100 – 1,200 mm. In the lower reach basin, the rainfall is increased from 1,300 mm in the north of coastal zone to 2,000 mm in the southern coastal area.

The annual mean discharge at Abaradinou (74,350 km²) is 107.2m³/s, which is equivalent to the specific discharge of 0.14 m³/s/100km². The specific discharge is 0.27 m³/s/100km² at Kafolo (21,200 km²) and 0.19 m³/s/100km² at Akakomoekro (57,000km²). And in the tributary, 0.09 m³/s/100km² at N'dakro (6,222 km²) of Ba River.

The monthly discharge varies remarkably. At Abaradinou, the discharge from January to April is very low (2.0 to 8.0 m³/s) and the discharge from June to October is comparatively large (50 to 400 m³/s).

There are 16 stream gauging stations in the river basin.

Natural conditions of the basin

The most area of the basin is located in a comparatively flat land of less than 300 m in altitude except some mountainous areas, which are not so high and at most 500 m in altitude. Nearly 40 % of the basin is above 250m and nearly 95 % is above 125m.

The upper and middle reach area is generally covered with pasture land, agricultural land or forest. It is noted that a large national park (Comoe National Park) is located in the northern up-to-middlestream area. The lower reach area is generally covered with agricultural land and forest.

Administrative divisions and major cities in the basin

The Comoe River basin includes the following administrative divisions, Region and Sub-Prefecture:

Region	Sub-Prefecture	Major City
Sud-Comoé Lagunes Agneby Moyen-Comoé Zanzan N'zi-Comoé Vallée du Bandama Savanes	<u>Whole area of Sub-prefecture</u>	Abengourou Bondoukou
	Bonoua, Abengourou, Niablé, Ettrokro, Agnibilékrou, Kouassi-Datérokro, Koun-Fao, Transua, Assuefry, Tanda, Sandégué, Ouangolodougou,	
Note : Each region generally spread over plural river division areas.	<u>Only a part of Sub-prefecture</u>	
	Grand-Bassam, Alépé, Yakassé-Attobrou, Béttié, Adzopé, Arrah, Daoukro, Prikro, Bondoukou, Bassawa, Dabakala, Nassan, Foumbolo, Kong, Bouna, Tehini, Kounbala, Ferkessedougou, Diawala, Niéllé, Mbengué	

Dam and Reservoir

There is no large dam in the basin. But there are nearly 100 dams in this division. They are mostly located in the upper reach of each river and used for cattle breeding.

Tributaries

In the basin of Comoe River, the tributaries are generally not large in comparison with those in Sassandra River and Bandama River. Major tributaries are listed in order from the upstream side of the mainstream as follows:

- (a) Leraga River (From the right, Coming from Burkina Paso, Boundary river)
- (b) Bawe River (From the left, Coming from Burkina Faso)
- (c) Kolonkoko River (From the right)
- (d) Iringou River (From the left, Coming from Burkina Faso)
- (e) Kongo River (From the left)
- (f) Kinkene River (From the right)
- (g) Segbono River (From the right, Upstream located near Dabakala)
- (h) Diore River (From the left)

- (i) Ba River (From the left)
- (j) Beki River (From the left, Abengourou is in the basin)
- (k) Manzen River (From the left)

2.4 Cavally River

The Cavally River (Division IV), with a large part of the basin in Liberia, is one of four large and important rivers in Cote d'Ivoire. Although the basin is much less than the other three major rivers, the river is the second largest from the viewpoint of flow discharge. The general map of the basin (in Cote d'Ivoire) is shown in Figure. 3.2 - 4. The main features of Cavally River are presented as follows:

Location

The river basin is located in the western end of Cote d'Ivoire and the upstream end of the mainstream is in Guinea. Some tributaries including the largest one are located in Liberia. Some sections of the mainstream become the boundary to Liberia. The Basin is located in a range of $6^{\circ} 47'$ to $8^{\circ} 27'$ in west longitude and $7^{\circ} 47'$ to $4^{\circ} 21'$ in north latitude.

Origin of mainstream

The Cavally River springs up into Guinea in the north of Mt. Nimba at a height of approximately 600m in altitude.

River basin area and river length

The total basin has approximately 30,000 km² in area and approximately 700 km in length. The basin in the territory of Cote d'Ivoire is 15,000km².

Course and profile of main stream

From the origin to the stretch near Danané town, the Cavally River flows down straight through Mt. Dan over 50 km. Afterwards it runs down with meandering over the plateau to the Liberian boundary, around 100km, in parallel to Nuon River (National boundary) from the north to the south.

After the river reaches to the boundary to Liberia, near Touleupleu town, the river turns to southeast direction from where the river becomes the boundary to Liberia. The boundary-river continues to the sea, but the direction turns on the way near Tai town to the south.

The average slope is 0.85m per km on an average.

River mouth

The river mouth section is more or less clogged by extension of sand bar along the coast but constant throughout a year. The river mouth is 50 to 100 m wide and it looks deep. The river mouth looks like an outlet from a lake as the river become extensively wide at the end of river course.

Hydrological Features

In the upper reach basin, the annual rainfall is 1,600 –1,800 mm. In the middle reach basin, it ranges 1,600 – 2,000 mm. In the lower reach basin, the rainfall is increased from 2,000 mm in the north to 2,500 mm in the southern coastal area.

The annual mean discharge at Tate (28,800 km²), 60 km upstream from the river mouth, is 484.1 m³/s, which is equivalent to the specific discharge of 1.68 m³/s/100km². The specific discharge is also 1.68 m³/s/100km² at Toulepleu (4,670 km²).

The monthly discharge varies but not remarkable. At Tate, the discharge from January to April is comparatively low (100 to 210 m³/s) and the discharge is high in September and October (1,100 m³/s).

There are 10 stream gauging stations in the whole river basin.

Natural conditions of the basin

The southwest area is dry and covered with a compact forest. The coastal area is widely used by plantations. The national park (Tai) is located on the left bank near Tai town. The basin area of approximately 16 % lies above 400m, 27 % above 300m, and more than 50% above 200m in altitude.

Administrative divisions and major cities in the basin

The Cavally River basin includes the following administrative divisions, Regions and Sub-Prefectures:

<u>Region</u>	<u>Sub-Prefecture</u>	<u>Major City</u>
Bas-Cavally Montagnes	<u>Whole area of Sub-prefecture</u>	Tabou Guiglo Danané
Note : Each region generally spreads over plural river division areas.	3-26	

<p><u>Only a part of Sub-prefecture</u></p> <p>Tabou, Grabo, Méagui, Buyo, Tai, Guiglo, Bloléquin, Toulepleu, Bin-Houyé, Zouan- Hounien, Bongolo, Sangouiné, Danané</p>

Dam and Reservoir

There is no large dam in Cavally River. Only one small dam is located in a tributary.

Tributaries

In the territory of Cote d'Ivoire, there is no major tributary. But, the representative tributaries are listed as follows:

- (a) Doui River (From the left)
- (b) Goin River (From the left)
- (c) N'ce River (From the left)

Hana River (From the left, Largest tributary in the Cote d'Ivoire side.)

2.5 Inland Rivers

(1) Nuon River (Division V)

The general map of the basin (in Cote d'Ivoire) is shown in Figure. 3.2 - 5.

The river basin is located in the western end of Cote d'Ivoire. The river originates in Mt Nimba (1,752 m high) which is located in the boundary to Guinea as well as Liberia. The upper mainstream formulates a boundary to Liberia for nearly 120-130 km. This river stretch is called Nipoue River as well. Then the river runs down through the territory of Liberia and flows into the sea. The river name is called Cestos in Liberia. There is no detailed data of this river as most part is located in Liberia. In addition, the basin is occasionally neglected in the divisions of basins in Cote d'Ivoire possibly due to an isolated narrow zone.

This zone has annual rainfall at approximately 1,800 mm. There is no stream gauging station and no dam exists.

The Basin is located in a range of $8^{\circ} 06'$ to $8^{\circ} 36'$ in east longitude and $6^{\circ} 27'$ to $7^{\circ} 43'$ in north latitude.

The Nuon River basin includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Montagnes Note: Each region generally spread over plural river division areas.	<u>Whole area of Sub-prefecture</u>	Danané
	<u>Only a part of Sub-prefecture</u> Toulepleu, Bin-houyé, Zouan- Hounien, Danané	

There are some short tributaries running into the Nuon River from the east. Only representative tributary would be Boan River, which is the largest and runs through the western side of Danane town.

There is no stream gauging station in rivers of this division.

(2) Niger River Tributary (Division VI)

The general map of the Division (in Cote d'Ivoire) is shown in [Figure. 3.2 - 6.](#)

The river division is located in the northwest of Cote d'Ivoire. All rivers are tributaries of Niger River. That is, all rivers go out of Cote d'Ivoire from the boundary to Mali or Guinea.

The Basin is located in a range of 6° 05 ' to 8° 10' in west longitude and 10° 48' to 9° 10' in north latitude.

The River Division VI includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Denguele Savanes Note : Each region generally spread over plural river division areas.	<u>Whole area of Sub-prefecture</u> Minignan, Tienkro, Goulia, Tengrela, Kanakono, Kouto, Mainani, Tiémé Odienné, Seydougou, Kaniasso, Samatiguila, Gbon, Kolia.	Odienné
	<u>Only a part of Sub-prefecture</u> Kasseré, Boundiali.	

The hydrologic zone is classified as a tropical transition type. The flood season is in August to

October. Then it follows a transition season in November and December and a long dry season continues from January to May.

The annual rainfall is in a range of 1,400 mm in the east and 1,600 mm in the west. The annual mean discharge at Papara (8,950 km²) of Bagoé River is 38.6 m³/s, which is equivalent to the specific discharge of 0.43m³/s/100km². The specific discharge is 0.38 m³/s/100km² at Debete (5,550 km²) of Kankelaba River, 0.84 m³/s/100km² at Iradougou (1,990 km²) of Kouroukelle River and 0.77 m³/s/100km² at Djirila (3,970 km²) of Baoulé River .

The monthly discharge varies remarkably. At Papara, the discharge from January to June is very low (0.6 to 4.3 m³/s) and the discharge from August to October is comparatively large (85 to 180 m³/s).

The major rivers in the division are listed in order from the east to the west as follows:

(a) Bagoé River (To Mali)

The most important river in the division as it is the largest in this division and Bondiali town is located in the upstream basin. The river source lies in near Kokoum. The Niangboué River is the main tributary. At Papara, located near the boundary, the river basin has 8,950 km².

(b) Kankelaba/ Mahandiabani River (To Mali)

At Debete, located near the boundary, the river basin has 5,550 km².

(c) Degou River (To Mali)

(d) Baoulé River (To Mali)

The river has its source near Odiénne at 600m in altitude. Main tributary is Douni River. The river length is 330 km.

(e) Sankarani / Kourou Kele River (To Guinea)

There are 17 stream gauging stations located in these five major rivers.

(3) Tributary Basin of Black Volta River (Division VII)

The general map of the Division (in Cote d'Ivoire) is shown in Figure. 3.2 - 7.

The river division is located in the northeast of Cote d'Ivoire. The Black Volta River forms the boundary to Ghana. The river has the catchment area of 111,500 km² at Kontodou gauging station located near Buona town. All tributaries flow into Black Volta River.

The Basin is located in a range of 2° 27' to 3° 37' in west longitude and 9° 56' to

7° 56' in north latitude.

The River Division VII includes the following administrative divisions, Region and Sub-Prefecture:

Region	Sub-Prefecture	Major City
Zanzan	<u>Whole area of Sub-prefecture</u>	Bondoukou
	<u>Only a part of Sub-prefecture</u> Bondoukou, Bouna, Doropo, Tehini	
Note : Each region generally spread over plural river division areas.		

The annual rainfall is in a range of 1,100 to 1,200 mm. The specific discharge is very low in this area due to low runoff coefficient. Many small tributaries are dried up in the dry season.

There are three stream-gauging stations in this division, located in Black Volta River, Koulida River and Kolodio River. And more than 40 dams, but small in scale, are located in this division.

The representative rivers are presented as follows:

(A) Koulida River

The Koulida River springs up in Angai hills near Téhini town and flows towards the southeast. Then at 10km in the north of Bouna town, it turns towards east at Samantou village. The Koulida River enlarges nearby its confluent with Black Volta River.

(B) Kolodio River

The Kolodio River springs up in southwest side of Bouna at 350 m in altitude and goes to east direction. The river crosses Bondoukou-Bouna road at 21km in the south of Bouna town and then flows down through a large flat valley.

(C) Kohodio River

The Kohodio River springs up in 35 km east of Nassian town on granite bed rock. It flows down to the east and, at 7 km from the boundary, it receives a tributary called Zola River from the right-bank. Then the river becomes large near the confluence with Black Volta River.

2.6 Coastal River

(1) Bia River Division (Division VIII)

The general map of the Division VIII, including Bia River and Tano River (in Cote d'Ivoire) is shown in [Figure. 3.2 - 8.](#)

The river division is located in the southeast of Cote d'Ivoire. That is, it faces to Ghana on the east. There are two representative rivers in this Division. Both rivers come down from Ghana.

The annual rainfall is in a range of 1,800 to 2,000 mm. The annual mean discharge at Bianouan Aval (6,800 km²) of Bia River is 16.5 m³/s, which is equivalent to the specific discharge of 0.24m³/s/100km².

The monthly discharge varies remarkably. At Bianouan Aval, the discharge from January to March is very low (0.4 to 1.6 m³/s) and the discharge in June, August and October is comparatively large (35 to 40 m³/s).

The division is located in a range of 2° 41' to 3° 48' in west longitude and 9° 56' to 7° 56' in north latitude.

The River Division VIII includes the following administrative divisions, Region and Sub-Prefecture:

Region	Sub-Prefecture	Major City
Sud-Comoé Moyen-Comoé	<u>Whole area of Sub-prefecture</u> Adiaké, Tiapoum, Maferé, Aboisso, Ayamé	Aboisso
	<u>Only a part of Sub-prefecture</u> Bettié	

Note : Each region generally spread over plural river division areas.

The representative rivers are presented as follows:

(A) Bia River

The Bia River is one of significant rivers in Cote d'Ivoire as Ayama I and Ayame II dams with hydroelectric power stations are located there. The Bia River originates in Ghana. There is a stream gauging station in the river.

(B) Tano River

The Tano River also originates in Ghana. The river basin is bigger than Bia River. A part of the river stretch formulates the boundary to Ghana. The river flows into the Aby lagoon.

(2) Agneby River Division (Division IX)

The general map of the Division IX, including Agneby River and Me River, is shown in Figure 3.2 - 9.

The are of this division is located in the coastal area including Abidjan. There are two representative rivers in this division. The division is located in a range of $3^{\circ} 29'$ to $4^{\circ} 50'$ in west longitude and $6^{\circ} 55'$ to $5^{\circ} 11'$ in north latitude.

The annual rainfall is in a range of 1,400 to 2,000 mm. The annual mean discharge at Agboville (4,600 km²) of Agneby River is 7.6 m³/s. The discharge at Lobo Akoudzin (1,274 km²) of Me River is 7.6 m³/s, which is equivalent to the specific discharge of 0.6 m³/s/100km².

The monthly discharge varies remarkably. At Agboville, the discharge from December to April is very low (0.2 to 1.9 m³/s) and the discharge in June, July and October is comparatively large (18 to 22 m³/s).

The River Division IX includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Lagunes Agneby Nazi-Comoé	<u>Whole area of Sub-prefecture</u>	Abidjan Agboville
	Affery, Rubino, Agboville, Azaguié, Abidjan, Jacquville, Bingerville, Agou	
Note: Each region generally spread over plural river division areas.	<u>Only a part of Sub-prefecture</u>	
	Arrah, Bongouanou, Akoupé, Mbatto, Sikensi, Dabou, Alépé, Grand-Bassam, Yakassé- Attobrou, Adzopé	

The representative rivers are presented as follows:

(A) Agneby River

The Agneby River with a basin surface area of 6,110 km² at Kassiguié is significant river due to its location near Abidjan.

The Agneby also called Agbo River springs up in northeast of Bongouanou. It flows

down from the north to the south and receives several tributaries on the way of meandering. Then the river flows into the Ebrié lagoon at east Dabou. There are five stream gauging stations in the river basin.

(B) Me River

The Mé River springs up in Akoupé and grows bigger by tributaries. The river takes southwest direction and turns to the south from the confluence with Mofou River coming from the right-bank. Then the river flows into the Potou lagoon, which is connected with Aghien lagoon on the upstream side. There are four stream gauging stations in the river basin.

(3) Buobo River Division (Division X)

The general map of the Division X, including Buobo River and Niouniourou River, is shown in **Figure. 3.2 – 10.**

This division is located in the coastal area. There are three representative rivers in this division. The division is located in a range of 4° 56' to 6° 05' in west longitude and 6° 20' to 4° 57' in north latitude.

The annual rainfall is in a range of 1,600 to 1,800 mm. The annual mean discharge at Grand-Lahou (3,144 km²) of Buobo River is 10.2 m³/s, which is equivalent to the specific discharge of 0.30 m³/s/100km². And at Dahiri (1,791 km²) of Niouniourou River is 10.5 m³/s, which is equivalent to the specific discharge of 0.59 m³/s/100km².

The monthly discharge varies remarkably. At Grand-Lahou, the discharge from January to March is very low (0.3 to 1.3 m³/s) and the discharge in June, July and October is comparatively large (20 to 24 m³/s).

The River Division X includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Sud-Bandama Marahoué	<u>Whole area of Sub-prefecture</u>	Divo Lakota Oumé
	Fresko, Guitry, Divo, Zikisso	
Note: Each region generally spreads over plural river division areas.	<u>Only a part of Sub-prefecture</u>	
	Sassandra, Grand-Lahou, Hiré, Lakota, Diégonéfla, Oumé	

The representative rivers are presented as follows:

(A) Buobo River

The Buobo River has the basin of 5,100 km². The river originates in the north of Divo town and runs down to south. The river collects Lonyo River from the right and flows into Tadio lagoon, which is located in west Grand-Lahou. There is one stream gauging station.

(B) Niouniourou River

The Niouniourou River has the basin of nearly 2,000 km². The river originates in the west of Divo town and runs down to the south. The river collects Diogoro River from the left and flows into a canal before joining the sea. There are two stream gauging stations in the river.

(C) Bolo River

The Bolo River originates from a classified forest of D'okromodou and flows into Nyi lagoon located near Fresco town. The Krokro River is the main tributary.

(4) San Pedro River Division (Division XI)

The general map of the Division XI, including San Pedro River and some other rivers, is shown in Figure. 3.2 - 11.

The river division is located in the west coastal area. There are 5 representative rivers in this division. The division is located in a range of 6° 17' to 7° 29' in west longitude and 5° 35' to 4° 22' in north latitude.

The annual rainfall is in a range of 1,600 mm in the east and 2,500 mm in the west. The annual mean discharge at San Pedro (3,300 km²) of San Pedro River is 37.1 m³/s, which is equivalent to the specific discharge of 1.12 m³/s/100km². The annual mean discharge is 10.4 m³/s at Weoulo (640 km²) of Dobo River, 26.9 m³/s at Yaka (810 km²) of Tabou River and 15.5 m³/s at Rte Grand Berreby (1,210 km²) of Nero River. They are respectively equivalent to the specific discharge of 1.62 m³/s/100km², 3.32 m³/s/100km², and 1.28 m³/s/100km².

The monthly discharge varies but not remarkable. At San Pedro, the discharge from December to April is comparatively low (13 to 21 m³/s) and the discharge in June is the highest (95.2 m³/s). The other months may be a transition period (25 to 60 m³/s).

The River Division XI includes the following administrative divisions, Regions and Sub-Prefectures:

Region	Sub-Prefecture	Major City
Bas-Cavally	<u>Whole area of Sub-prefecture</u> Grand-Bereby, San-Pédro	San Pedro Tabou
	<u>Only a part of Sub-prefecture</u> Tabou, Méagui, Grabo.	
Note : Each region generally spread over plural river division areas.		

The representative rivers are presented as follows:

(A) San Pedro River

The San-Pédro River has a Faye (Grah) dam with hydroelectric power station at 25 km north from San Pedro City. The river basin is approximately 3,300 km². The river mouth is located in San Pedro City. There are 3 stream gauging stations in the river.

(B) Brime River

The Brime River is located in the east of San Pedro River. The Nonoua River is the main tributary.

(C) Nero River

The Nero River is called Niero River as well. The river originates in the south of Tai national park. The river flows into the sea at east Grand-Bereby. There is a stream gauging station.

(D) Dobo River

The Dobo River is a small river located between Nero River and Tabou River. But there is a stream gauging station.

(E) Tabou River

The Tabou River is located on the east of Cavally River. The river mouth is located in the Tabou town. There are two stream gauging stations in the river basin

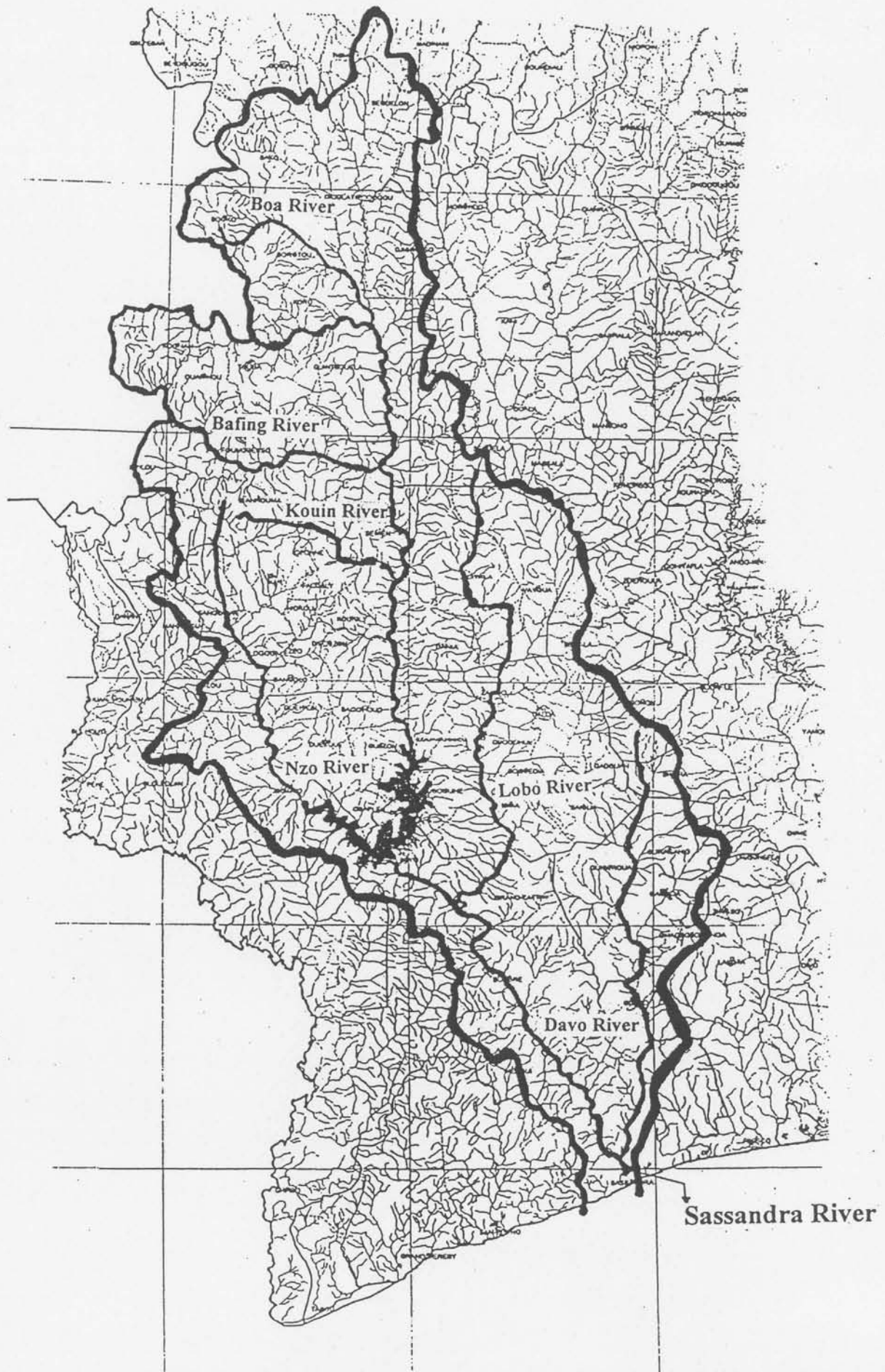


Figure 3.2 - 1 River Division I : Sassandra

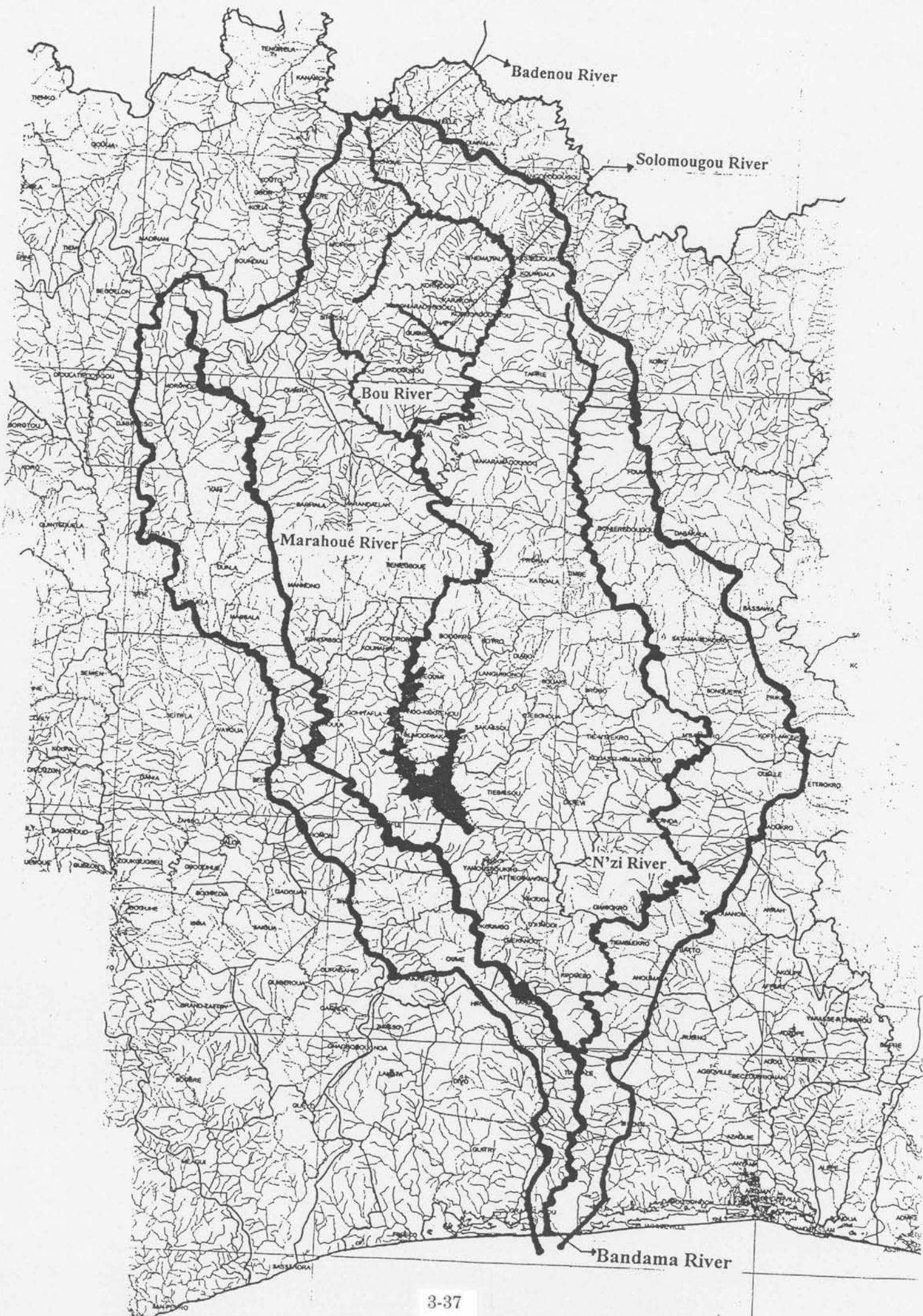


Figure 3.2 - 2 River Division II : Bandama

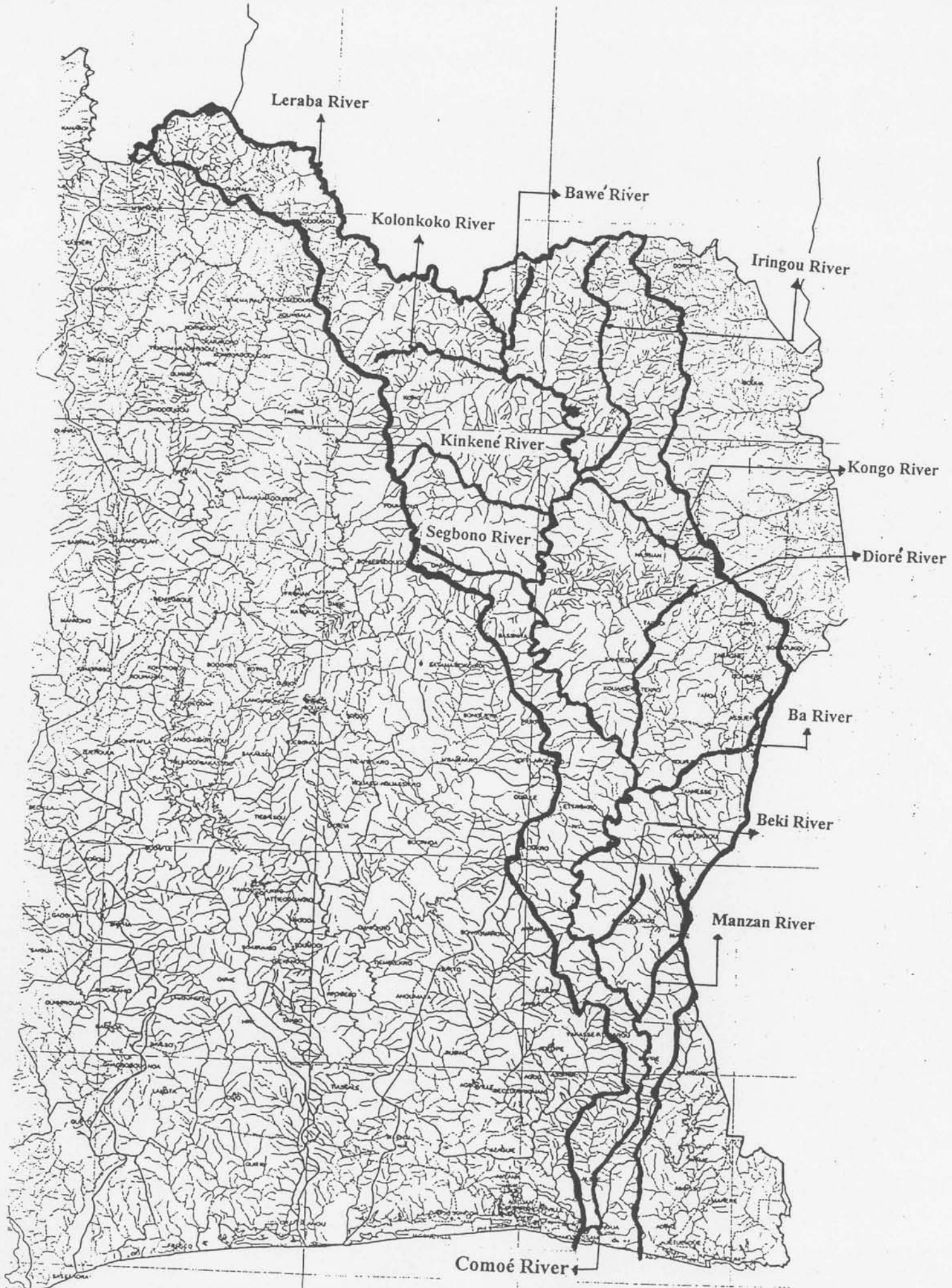


Figure 3.2 – 3 River Division III : Comoé



Figure 3.2 – 4 River Division IV : Cavally
3-39

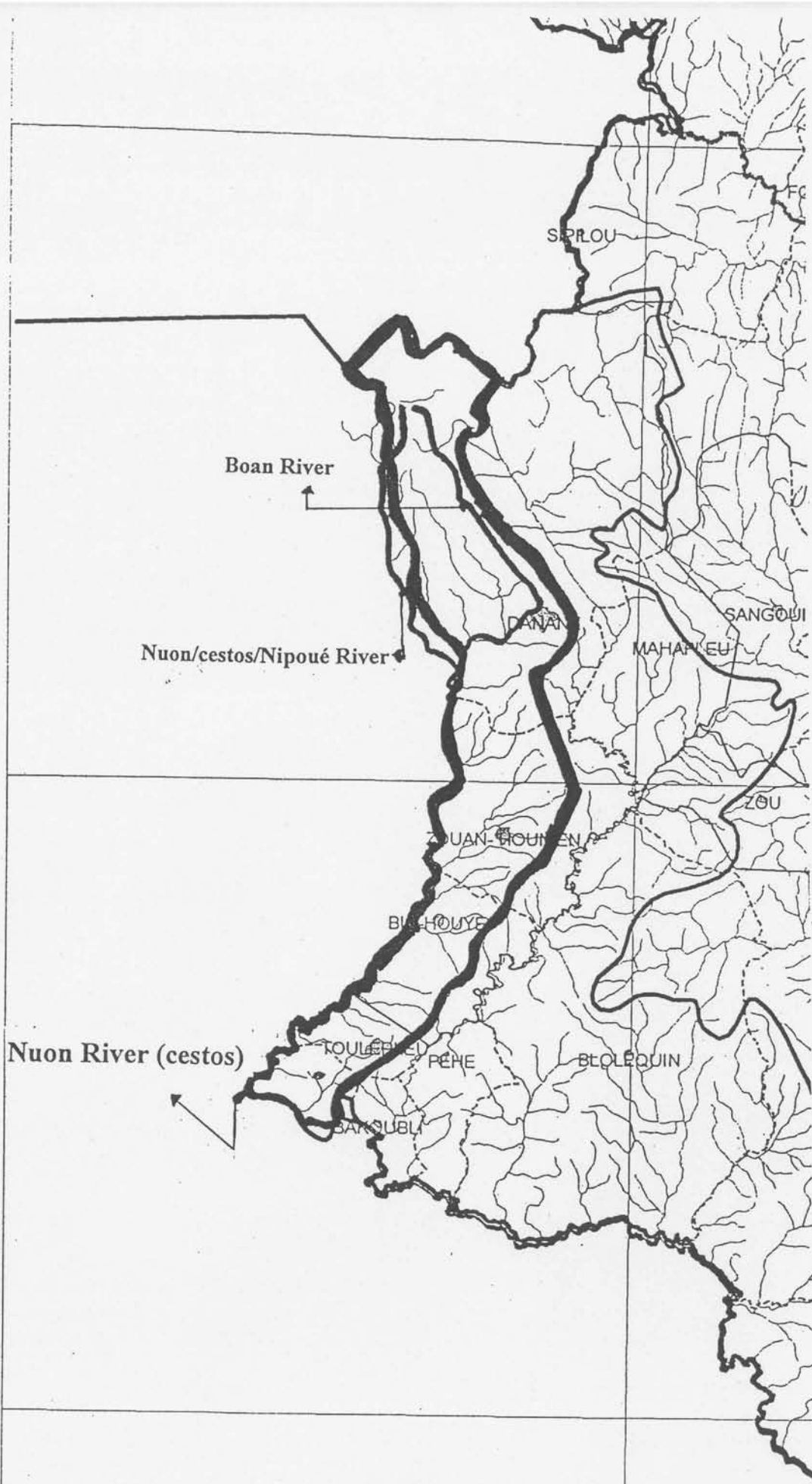


Figure 3.2 - 5 River Division V : Nuon

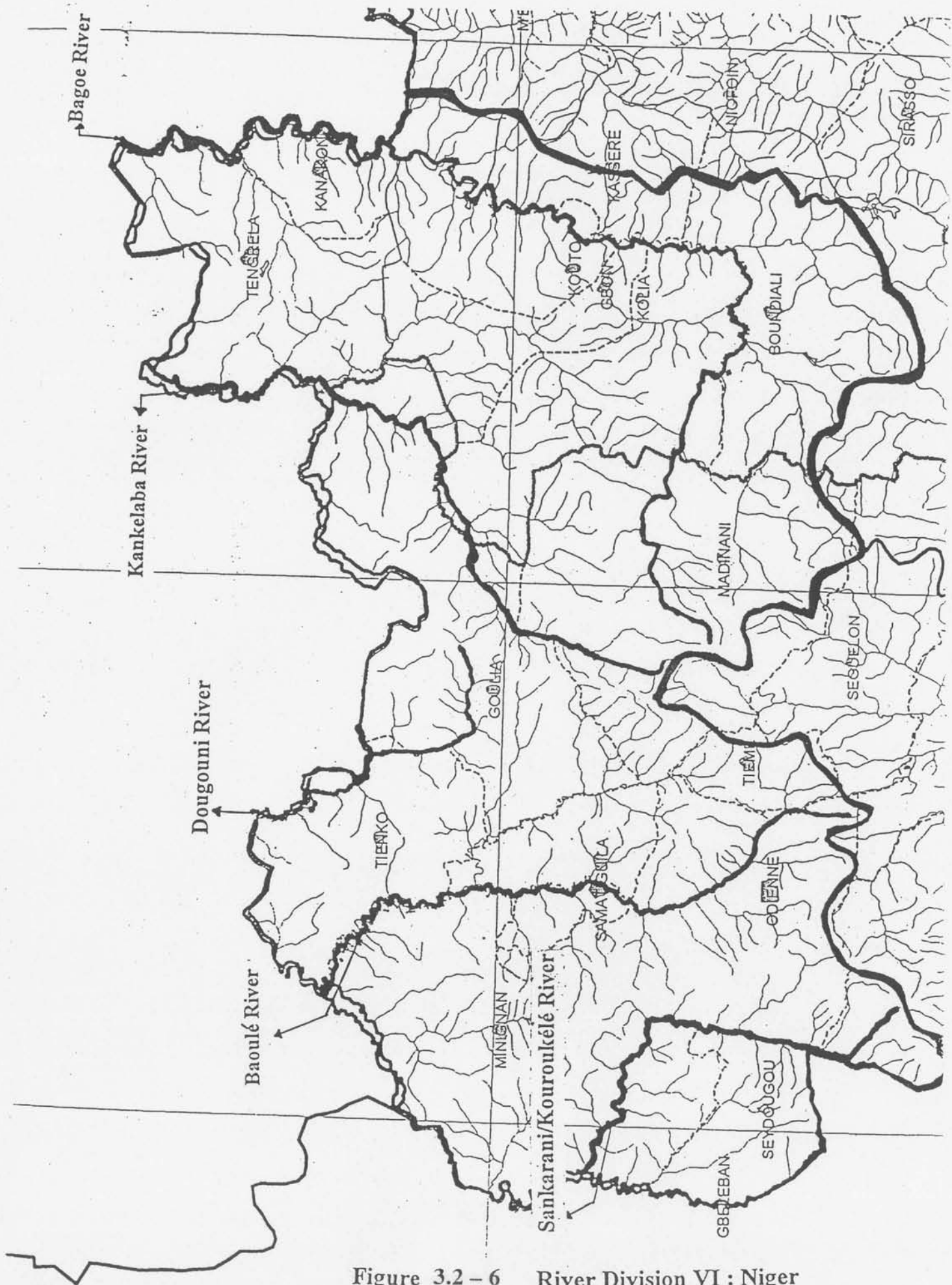


Figure 3.2 - 6 River Division VI : Niger

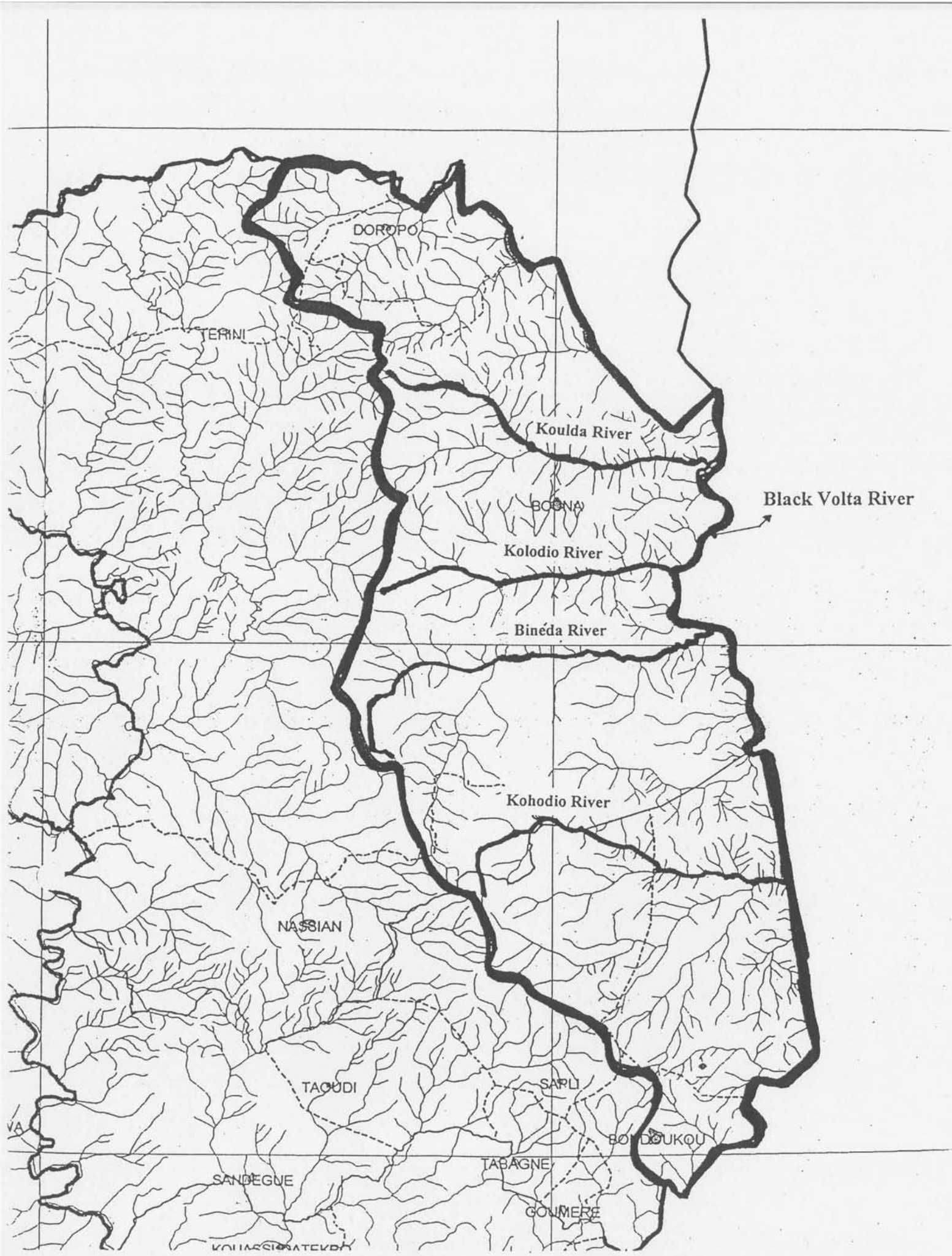


Figure 3.2 – 7 River Division VII : Black Volta