

UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA
THE REPUBLIC OF ZAIRE

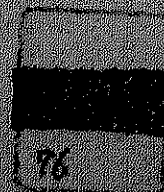
TRANSAFRICAN HIGHWAY
FEASIBILITY STUDY
KISANGANI-BANGASSOU

FINAL REPORT

VOL. 2

NOVEMBER 1976

JAPAN INTERNATIONAL COOPERATION AGENCY



532
36
SDF
14305

JICA LIBRARY



1018331E7J

国際協力事業団	
受入 月日 '84. 9. 25	532
登録No. 09979	737
	KE

UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA
THE REPUBLIC OF ZAIRE

TRANSAFRICAN HIGHWAY
FEASIBILITY STUDY
KISANGANI-BANGASSOU

FINAL REPORT

VOL. 2

NOVEMBER 1976

JAPAN INTERNATIONAL COOPERATION AGENCY

Currency Equivalents

Currency Unit = Zaire (Z) & Makuta (K)

Z 1 = K 100

US\$ 1 = Z 0.50

Z 1 = US\$ 2

System of Weights and Measures : Metric

1 meter (m) = 3.28 feet (ft)

1 cubic meter (m³) = 35.29 cubic feet (ft³)

1 kilometer (km) = 0.62 mile (mi)

1 square kilometer (km²) = 0.39 square miles (sq mi)

1 hectare (ha) = 2.47 acres (ac)

1 metric ton = 2.204 pounds (lbs)

= 1.1 US short ton

In all figures decimal is indicated with a dot and thousand,
million and billion are marked off with comma.

Fiscal Year

January 1 - December 31

Abbreviation (1)

AASHO	:	American Association of State Highway Officials
ADT	:	Average Daily Traffic
ADB	:	African Development Bank
AIZR	:	Association International Zaire-Routes
B/C	:	Benefit/Cost Ratio
BCEOM	:	Bureau Central par des Equipements d'Outre-Mer
CAR	:	Central African Republic
CBR	:	California Bearing Ratio
CFL	:	Office National de Chemins de Fer et des Grands Lacs
EDF	:	European Development Funds
GDP	:	Gross Domestic Products
INS	:	Institut National de la Statistique
INEAC	:	Institut National pour l'Etude Agronomique du Congo
IBRD	:	International Bank of Reconstruction and Development
KPH	:	Kilometer per Hour
LI	:	Liquid Index
MTRAT	:	Ministère des Travaux Publics et de l'Aménagement du Territoire
O-D	:	Origin-Destination
OTCZ	:	Office des Transports en Commun au Zaire
ONC	:	Office National du Cafe
ONAFITEX	:	Office National des Fibres-Textiles
ONRD	:	Office National de la Recherche et du Développement
ONATRA	:	Office National des Transports
OR	:	Office des Routes
PK	:	Kilometer Points
PI	:	Plastic Index
PC	:	Pre-stressed Concrete
R	:	Region
RC	:	Reinforced Concrete
RD	:	Consultants Research & Development
S/R	:	Sub-Region
SONAS	:	Société Nationale d'Assurances

Abbreviation (2)

SNCZ	:	Société Nationale Chemins de Fer du Zaire
SGA	:	Société Generale Alimentation
TAH	:	Transafrican Highway
UNDP	:	United Nations Development Programme
UN-ECA	:	United Nations Economic Commission for Africa
Vici-Zaire	:	Chemins de Fer Vicinaux du Zaire

C O N T E N T S

1. ECONOMIC ANALYSIS OF PROJECT AREA	1-1
2. TRAFFIC ANALYSIS	2-1
3. TECHNICAL ANALYSIS	3-1
4. EVALUATION OF PROJECT	4-1

	Page
1. ECONOMIC ANALYSIS OF PROJECT AREA	1-1
1.1 Delimitation of Project Area	1-1
1.2 Current Situation of National and Regional Geography and Economy	1-3
1.2.1 General Description	1-3
1.2.2 Natural Conditions	1-5
1.2.3 Population	1-6
1.2.4 Gross Domestic Products (GDP)	1-8
1.2.5 General Description of Industries	1-12
(1) Primary Sector of Industries	
(2) Secondary Sector of Industries	
(3) Tertiary Sector of Industries	
1.3 National and Regional Transportation System ...	1-18
1.3.1 Outline of Transportation Networks	1-18
1.3.2 Waterways	1-20
1.3.3 Railroads	1-23
1.3.4 Aviation	1-27
1.3.5 Roads	1-27
(1) General	
(2) The Change of Road Network	
(3) Number of Registered Vehicles	
(4) Road Transportation	
1.4 Current Economic Activities in Project Area ...	1-39
1.4.1 Population	1-39

1.4.2	Agriculture	1-43
	(1) Agriculture in Haut Zaire	
	(2) Food Products	
	(3) Non-Food Products	
1.4.3	Forestry	1-63
	(1) General	
	(2) Current Situation of Forestry in Project Area	
1.4.4	Other Industries	1-66
	(1) General	
	(2) Mining Industries	
	(3) Manufacturing Industries	
1.4.5	Medical and Educational Facilities	1-68
	(1) Medical Facilities	
	(2) Educational Facilities	

1. ECONOMIC ANALYSIS OF PROJECT AREA

The objective of this chapter is to analyze the present situation of geography, economy, and transportation not only of the project area but also of such wide territories as the whole country of Zaire and Region of Haut Zaire which involves the project area for the purpose of estimating the economic influence to be expected from the improvement of the project road.

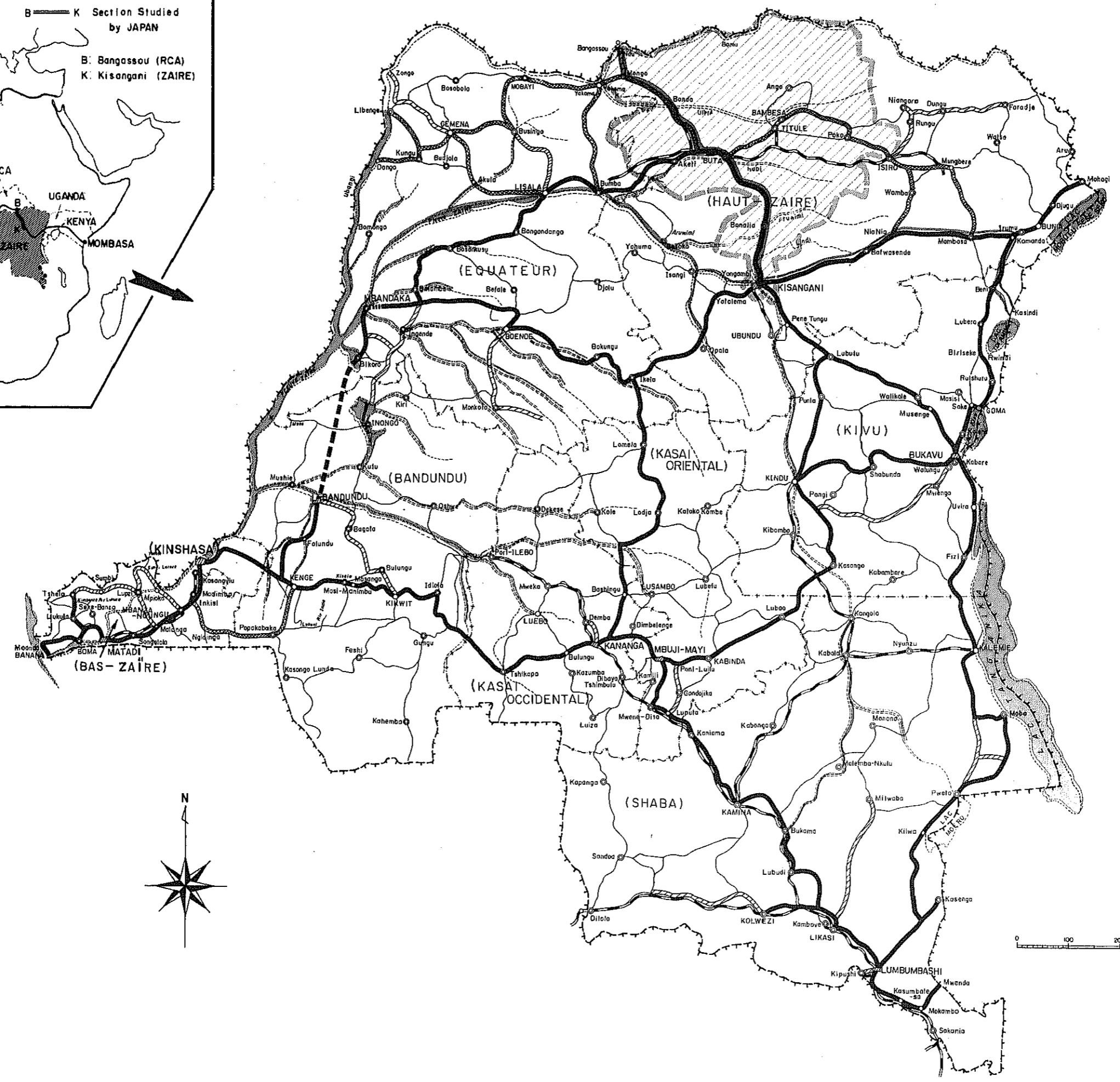
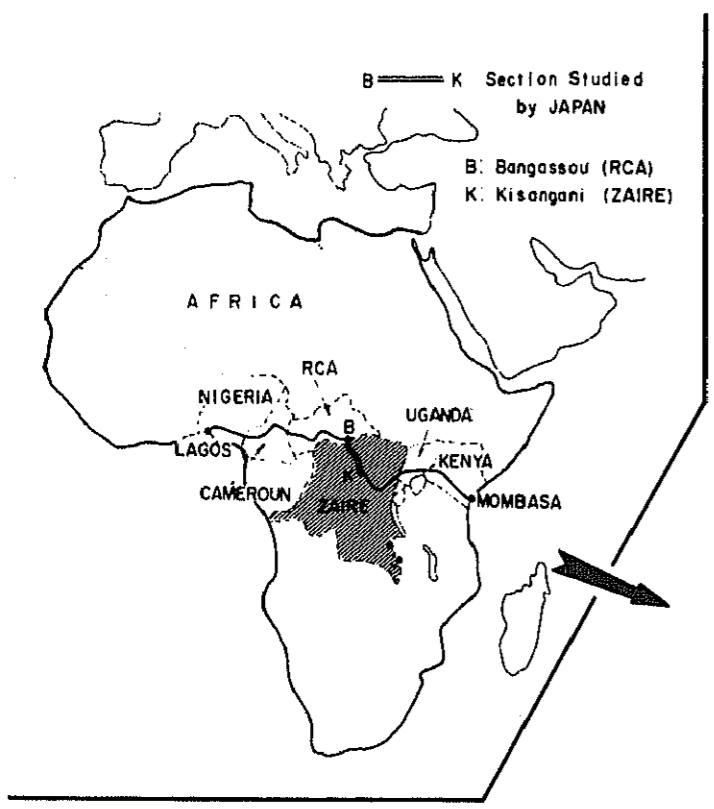
1.1 Delimitation of Project Area

The project area is considered to consist of the area where the local economy will receive the economic impact and the area which will generate the traffic that will use the project road by the improvement of the project road. The scope of the project area is delimited by the nature of the local economic activities, the existing local transportation network, and the extent of the influence to be considered. In this study the project area as shown in Plate 1.1.1 is defined as the most reasonable area to be directly influenced by the project road.

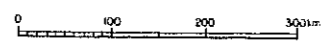
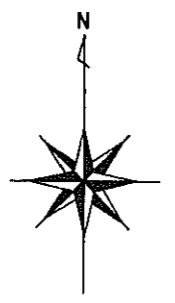
The administrative zoning of the Republic of Zaire is in the order of Region, Sub-Region, Zone, Collectivite, and Localite. The appropriate project area is determined to consist of the administrative areas of Kisangani Sub-Region and seven Zones: Banalia, Buta, Aketi, Bondo, Bambesa, Ango and Poko.

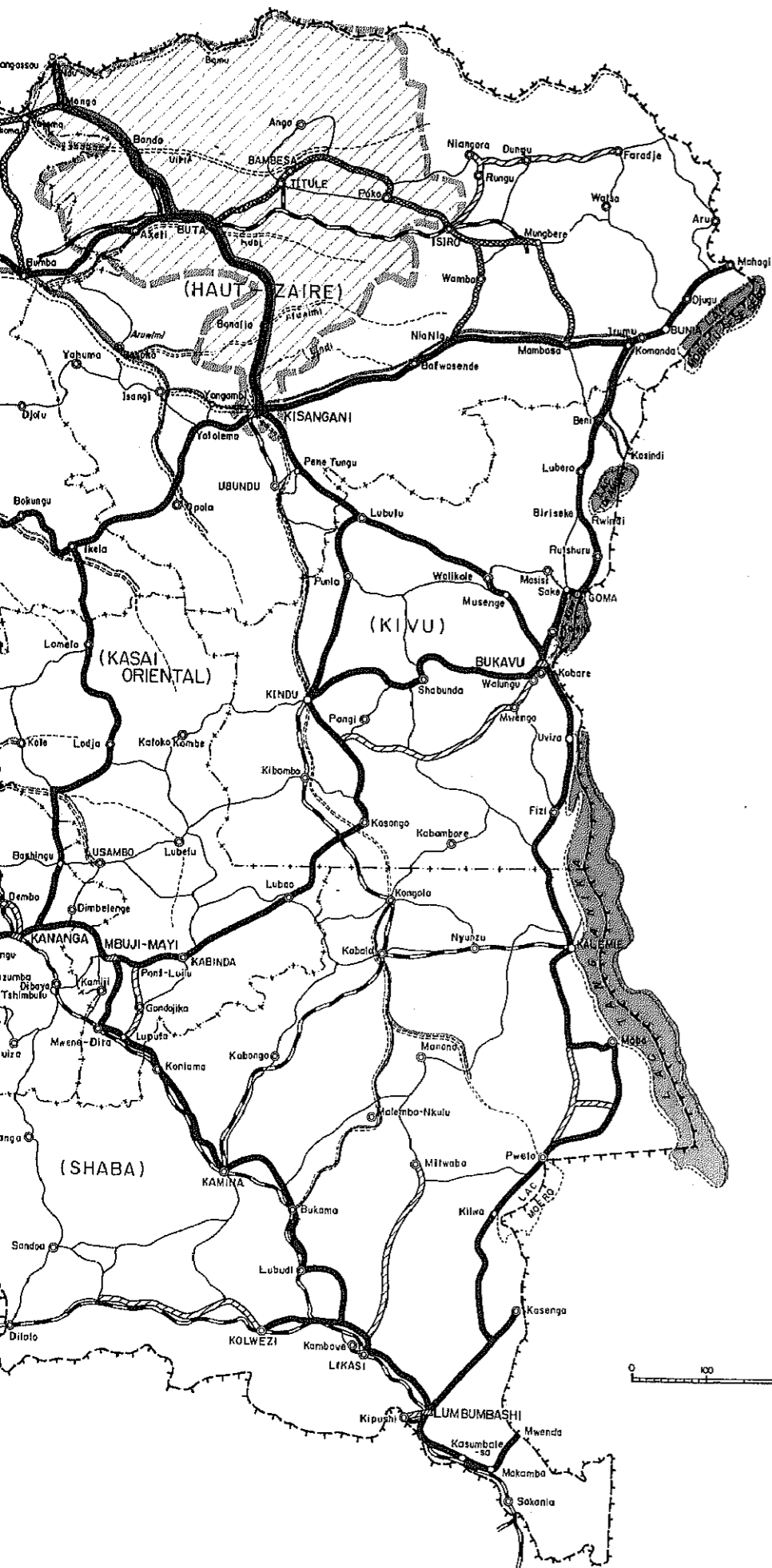
Because the economic activities of the project area are closely related not only with Haut Zaire Region but also with the whole country, those wide territories are also considered to be the objectives of the analysis.

B — K Section Studied
by JAPAN
B: Bangassou (RCA)
K: Kisangani (ZAIRE)



- Proj
- Tran
- Proj
- Prim
- Prim (unc)
- Othe
- Othe
- Rail
- Nav
- Unn
- Regi
- Nat


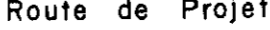
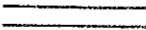
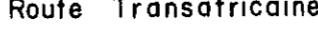
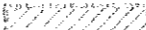
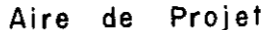

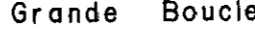

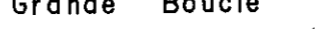




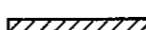









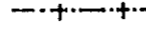
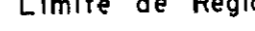




LOCATION MAP
CARTE DE SITUATION

Legend

Legende

	Project Road		Route de Projet
	Transafrican Highway		Route Transafricaine
	Project Area		Aire de Projet
	Primary Trunk Road		Grande Boucle
	Primary Trunk Road (under study)		Grande Boucle (Etudes en Cours)
	Other Trunk Road		Autre Boucle
	Other Road of Less Priority		Autre Route Prioritaire
			
	Railway		Chemin de Fer
	Navigable Waterway		Cours d'Eau Navigable
	Unnavigable Waterway		Cours d'Eau Non-navigable
	Regional Border		Limite de Region
	National Border		Limite National

1.2 Current Situation of National and Regional Geography and Economy

1.2.1 General Description

The Republic of Zaire is located on the Atlantic side of the central part of the African Continent, extending over both sides of the equator from 5°-20" north to 13°-27" south in latitude and covering an area of 2,346,201 km². The land has no desert but is covered with tropical forests over the vast area on both sides of the equator, which changes gradually into savannah terrain as it proceeds north. Most of the territory is a vast fertile basin of the Zaire River where the climate and soils are suitable for agriculture as well as forestry, but is still undeveloped although the land possesses tremendous potentiality for agriculture and forestry and is also full of other natural resources. Abundant water resources, mainly the Zaire River, are valuable not only for utilization in agriculture but also as the energy resources to be utilized in industries, and the convenient deep river system is available as the natural transportation waterway. Mineral resources, among which copper is the major item to earn foreign currencies, are not fully developed yet; but anyway the mining industry is the most important to Zaire not only presently but also in the future.

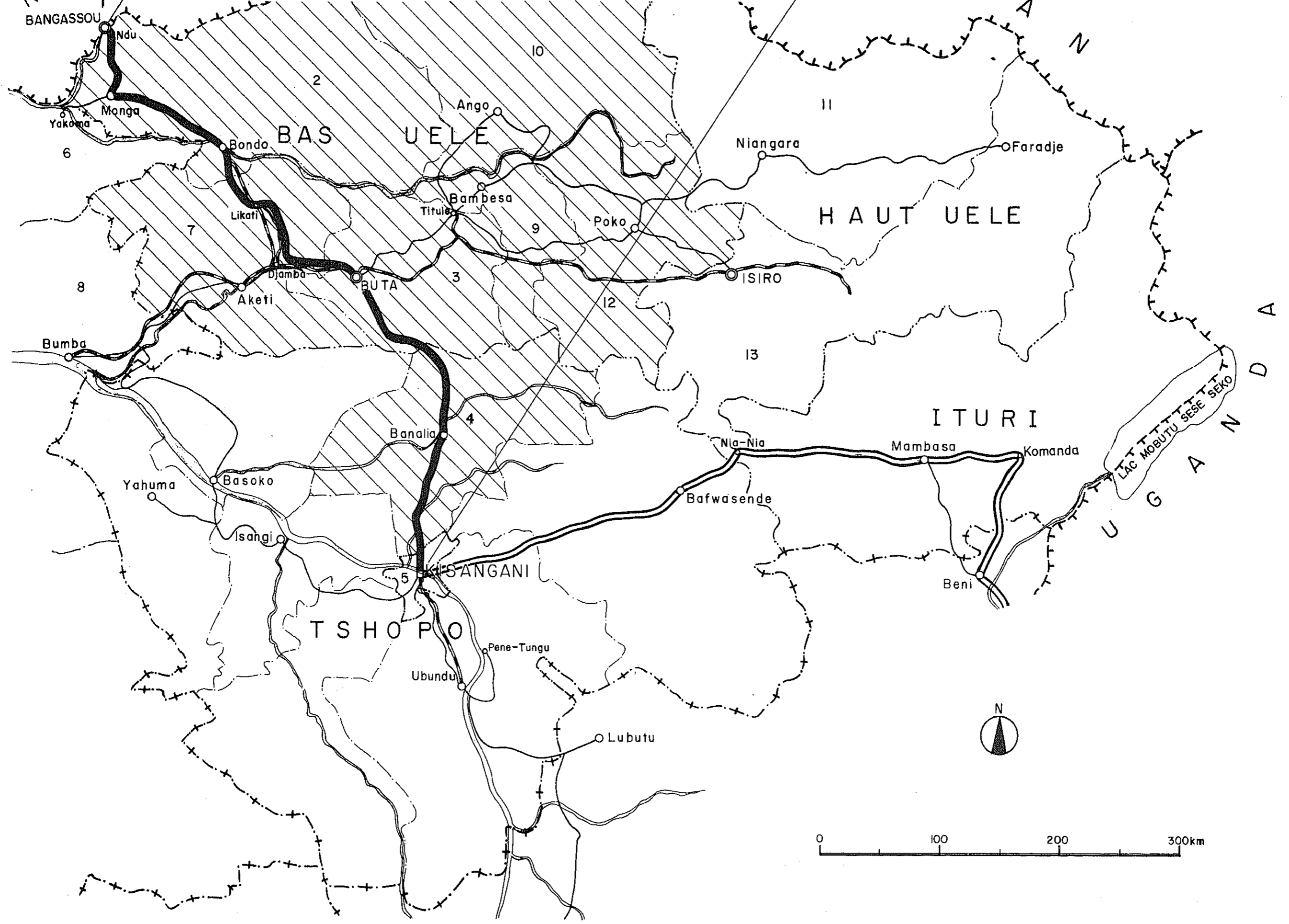
Haut Zaire Region involving the project route within is located in the north-eastern territory of the country that is bordered by Equateur Region on the west side, by Kivu Region on the south side, by Republic of Uganda on the east side and by the Central African Republic and Republic of Sudan on the north side. It covers a total area of 503,239 km². The Region is divided into 5 Sub-Regions administratively; namely, Kisangani, Tshopo, Bas-Uélé, Haut-Uélé and Ituri; most of Kisangani and Tshopo where the Zaire River traverses are covered with thick forests, while the northern part of Bas-Uélé and the mountainous side of Haut-Uélé and Ituri belong to savannah terrain.

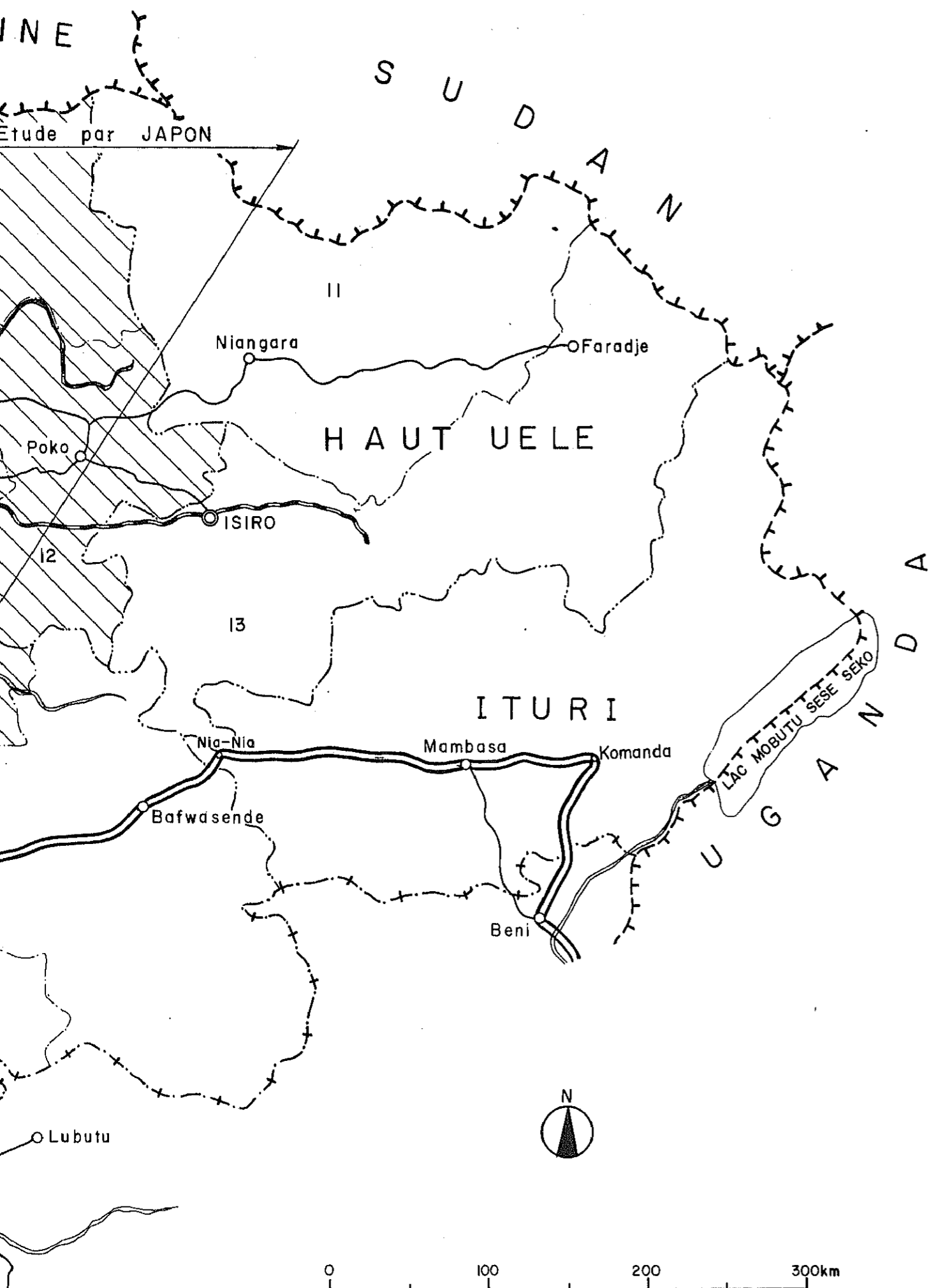
CENTRAFRICAINE

REPUBLIQUE

SUDAN

Section Studied by JAPAN / Tronçon d'Etude par JAPON





PROJECT ROAD AND PROJECT AREA
ROUTE DE PROJET ET AIRE DE PROJET

<u>Legend</u>		<u>Legende</u>	
	Project Road		Route de Projet
	Transafrican Highway		Route Transafricaine
	Project Area		Aire de Projet
	Zonal Border		Limite de Zone
	Sub-Zonal Border		Limite de Sous-Region
	Regional Border		Limite de Région
	National Border		Limite Nationale
7	Zonal Number		Numero Zonal

Zonal Number / Numero Zonal	
1 Bangassou	8 Bumba
2 Bondo	9 Bambesa
3 Buta	10 Ango
4 Banalia	11 East beyond Ango
5 Kisangani	12 Poko
6 West of Monga	13 East beyond Poko
7 Aketi	

1.2.2 Natural Conditions

(1) Climate

The annual average temperature of the project area is about 25 degrees centigrade and the range of variation of the monthly average temperature is 2 degrees.

The annual total rainfall is in the range of 1,500 mm to 1,800 mm; and the wet season lasts from March to November and the dry season from December to February.

The monthly average humidity is about 80 - 90% in wet season and 75 - 80% in dry season.

Such climatic conditions are favorable for agriculture. The details on the local climate are described in A.3.1.1 (1) - (5).

(2) Topography

Among Sub-Regions in Haut Zaire, Haut-Uélé Sub-Region is in the high plateau of 600 m to 1,000 m in altitude except for the area along the eastern border which is of mountainous topography. The Sub-Regions of Tshopo and Bas-Uélé are in a gently rolling topography which does not hinder any agricultural activities from the point of view of topography. The details of the local topography are described in A.3.1.1 (6).

(3) Vegetation

Most of the Haut Zaire Region is covered with thick tropical rain forests of 20 m to 30 m tall trees with 40 m tall trees scattered among them and 5 m to 10 m tall trees growing underneath. The ground surface is covered with weeds. The area along the project road is

also in the same condition and the tree height gradually decreases and forests get sparse as the road proceeds northward from 4 degrees in latitude where savannah gradually appears in the area near the northern border. The details of the local vegetation are described in A.3.1.1 (6).

1.2.3 Population

The national population of Zaire was about 22.3 million in 1972. As shown in Table 1.2.1, the national population had been 13.5 million in 1958; as far as this table is concerned, the population has expanded about 4% annually during the period of 1958 - 1972, which is extremely high in comparison with the average population growth trend of African countries. According to the opinion of UN-ECA, the national population of Zaire of 1958 was overstated; the real growth rate is said to be about 3.0 to 3.5% per annum.

The population of Haut-Zaire Region in 1973 was 3.46 million that accounted for 15% of the national population; the Region was ranked as the second largest in the country next to the Kivu Region. In 1958, the Region had been ranked as the largest population in the country; but owing to political difficulties of the early 1960's the movement and the decrease of population had continued in the Region and the annual growth rate was 2.0 to 2.3% during the period of 1958 - 1973 which was lower than the national average growth rate of the same period. (See Table 1.2.1.)

Table 1.2.1 Regional Population Distribution and Density in Zaire
 Tableau 1.2.1 Distribution et densité de population régionale au Zaïre

Region Région	Area (%) Zone (%)	Population Distribution (%) Distribution de population (%)		Density (persons/km ²) Densité (personnes/km ²)	
		1958 year année	1972 year année	1958 year année	1972 year année
Kinshasa	0.4	2.7	5.8	36.9	129.1
Bas-Zaire	2.3	6.7	6.3	16.7	26.2
Bandundu	12.6	14.3	13.2	6.5	9.9
Equateur	17.2	13.4	11.6	4.5	6.4
Haut-Zaire	21.5	18.2	14.9	4.9	6.6
Kivu	11.0	16.4	15.9	8.6	13.7
Shaba	21.2	12.3	12.7	3.3	5.7
Kasai Occidental	6.7	9.2	10.8	7.9	15.4
Kasai Oriental	7.2	6.2	8.8	5.4	11.6
Total	100.0%	100.0%	100.0%	5.8	9.5
	2,344 thousand km ² mille km ²	13.5 million persons million personnes	22.3 million persons million personnes		

Source: Département des Affaires Politiques : Tableau Synthétique de Recensement 1972

1.2.4 Gross Domestic Products (GDP)

Table 1.2.2 indicates the trend of GDP between 1966 and 1972, from which it is found that the average growth rate was 5.3% per annum until 1970 and declined to 4.0% after then. This decline resulted mainly from the stagnation of production in agriculture and the mining industry due to the decline of the copper price in the international market after 1970. Accordingly, the growth rate of GDP per capita has slowed down since 1970. Between 1966 and 1971, the yearly average growth rate of GDP was 5.0 % and that per capita was about 1.4%.

The GDP by region and by sector of industries in 1972 are shown in Table 1.2.3. According to this table, the percentage of total GDP is 24.5% for the mining industry including metallurgy, 21.9% for commerce, and 18.9% for commercial agriculture including forestry and fishery. However, if it is reviewed by region, 53.4% of the total GDP is concentrated in Kinshasa and Shaba and noticeable differences are found in those two regions when they are compared to the rest of the regions. In the GDP/capita by region, it is overwhelmingly as high as 140 zaires in Kinshasa and Shaba; but most of the other regions remain in turn as low as 20 to 30 zaires.

The Haut-Zaire Region accounts for 8.2% of the total GDP, of which the GDP/capita is no more than 25 zaires and is ranked as one of the lowest among regions. But in commercial agriculture, Haut-Zaire accounts for 19.0% of the total GDP, which is the highest in the country. Therefore, it is clear that Haut-Zaire plays an important role in the tertiary sector of industries of the nation but not in the secondary sector that is extremely undeveloped.

Table 1.2.2
Tableau 1.2.2

Gross Domestic Products and Per-capita GDP
in Zaire

Produit intérieur brut et P.I.B. per capita
au Zaïre

Year Année	GDP (in Million Zaire) P.I.B. (au Million Zaïre)			Per-capita GDP P.I.B. per-capita		Population (in million)
	Current Market Prices	Market Prices in 1966	Growth Rate to Preceding Year (%)	Price in 1971 Year (Zaire)	Growth Rate to Preceding Year (%)	Population (en million)
	Prix courant	Prix courant en 1966	Taux de crois- sance à l'année d'auaravant(%)	Prix en 1971 année (Zaïre)	Taux de crois- sance à l'année d'auaravant(%)	
1966	305	305	-	47.6	-	17.9
1967	460	301	-1.1	45.2	-5.0	18.6
1968	728	326	8.2	47.2	4.5	19.3
1969	902	353	8.2	49.3	4.5	20.0
1970	1,026	374	5.9	50.4	2.2	20.7
1971	1,089	390	4.3	50.7	0.6	21.5
1972	1,191	-	-	-	-	27.3

Note: Population in each year was estimated with the assumption that average annual growth rate was 3.6% during 1958-1972 year according to Table 1.2.1.

Population dans chaque année a été estimé avec l'assomption que le taux moyen de croissance annuelle était 3.6% pendant 1958-1972 année suivant Tableau 1.2.1.

Source: UN Economic Commission for Africa,
"Summaries of Economic Data, Zaire, Dec. 1973"

Table 1.2.3 Distribution of Sectoral GDP by Region in 1972 Year
 Tableau 1.2.3 Distribution de P.I.B. par région en 1972 année

Region/Région Sector/Secteur	Distribution (%)					Total (million Zaires)	Total (%)				
	Kinshasa	Bas- Zaire	Bandundu	Equateur	Haut- Zaire			Kivu	Shaba	Kasai Occidental	Kasai Oriental
Primary Sector Secteur primaire											
Agriculture, Forestry, Fishing Agriculture, Sylviculture, pêche	1.0%	28.7%	46.5%	47.8%	42.5%	37.1%	5.3%	25.4%	19.4%	193.7	18.9
Mining Mine	-	-	-	-	2.4	9.6	17.1	7.3	30.7	92.5	9.0
Sub -total Sous	1.0%	28.7%	46.5%	47.8%	44.9%	46.7%	22.4%	32.7%	50.1%	286.2	27.9
Secondary Sector Secteur secondaire											
Metallurgy Métallurgie	-	-	-	-	0.1	1.2	42.5	-	-	158.5	15.5
Manufacturing Industrie	14.3	8.1	0.5	1.3	2.1	1.5	3.5	1.8	1.5	51.0	5.0
Construction Construction	13.4	15.8	4.6	2.8	1.3	0.3	2.8	2.6	3.2	56.6	5.5
Energy Énergie	0.1	4.4	0	-	0.1	0.3	1.3	-	0.2	9.4	0.9
Sub - total Sous	27.8%	28.3%	5.1%	4.1%	3.6%	3.3%	50.1%	4.4%	4.9%	275.5	26.9

Table 1.2.3 (continued)
Tableau 1.2.3 (continué)

Region/Région Sector/Secteur	Total										
	Kinshasa	Bas- Zaire	Bandundu	Equateur	Haut- Zaire	Kivu	Shaba	Kasai Occidental	Kasai Oriental	(Million) Zaires	(%)
Tertiary Sector Secteur tertiaire											
Transportation Transportation	7.5%	5.3%	4.9%	4.1%	5.0%	3.8%	4.7%	5.5%	1.9%	51.7	5.0
Commerce Commerce	35.3	17.5	20.7	26.2	26.7	25.0	13.1	30.7	19.8	224.2	21.9
Public Services Services publics	13.0	13.8	16.7	12.4	12.3	13.3	4.4	18.5	18.3	109.0	10.6
Indirect Taxes Contributions indirectes	15.4	6.4	6.1	5.4	7.5	7.9	5.3	8.1	5.0	78.9	7.7
Sub Sous- total	71.2%	43.0%	48.4%	48.1%	51.5%	50.0%	27.5%	62.8%	45.0%	463.8	45.2
Total GDP Mill: Zaire	178.0	85.5	59.2	70.7	84.7	73.6	370.6	49.2	54.0	1,025.5	
P.I.B. Total %	(17.3) 100.0	(8.3) 100.0	(5.8) 100.0	(6.7) 100.0	(8.2) 100.0	(7.2) 100.0	(36.1) 100.0	(5.2) 100.0	(5.2) 100.0	(100.0) 100.0	
per-capita GDP P.I.B. per-capita	140 z	57 z	23 z	29z	25 z	22 z	140 z	27 z	39 z	50 z	

Source: Professor Saint Moulin's Article "Zaire-Afrique", March 1973

1.2.5 General Description of Industries

(1) Primary Sector of Industries

The primary sector of industries of Zaire consists of commercial agriculture including forestry and fishery which accounts for 18.9% of the total GDP and mining which accounts for 9.0% of the total GDP. Table 1.2.4 shows agricultural production by type of product and by region. The three regions of Haut-Zaire, Equateur, and Kivu account for 50.2% of the total agricultural products. These three regions, which are called the north-east territory of the country, play an important role as the main agricultural zone of Zaire, producing 52% of the total production of oil palm and its products, 81% of coffee, 86% of rubber, 55% of cocoa, 56% of cotton and 100% of tea. Equateur and Haut-Zaire account for 55% of the lumber production, but their potentiality of lumber production is so great that these two regions are said to be the prospective center of lumber industry of this country in the future.

Agriculture of Zaire had developed noticeably in the period of 1966 - 1968 but its growth rate has slowed down since then owing to the stagnation of the growth of food products for domestic consumption, the stagnation of agricultural export and the increase of import of agricultural food products. Such phenomena became an important factor to make the international trade of Zaire unbalanced. For that reason, the Government proclaimed such economic policy to stabilize the national economy by promoting domestic agriculture and decreasing the dependence on imported agricultural food products. As a part of this policy, the government has planned a development program of self-sufficiency of subsist agricultural products and promotion of export agricultural products of the main categories, but its detailed implementation is not made clear yet although various kinds of basic survey for the program are underway. It must be noted that the reasons for giving priority to the agricultural development are not only to save and earn foreign currency by promoting agricultural production that accounts for 18% of total import which aims at attaining the self-sufficiency of

staple foods and livestock products till 1980, but also has the intention of realizing the social development of the country. In spite of the fact that three-fourths of the total population inhabit the rural area, their income level is extremely low and its growth rate is also quite low when it is compared with that of urban inhabitants. Accordingly, the promotion of agriculture will result not only directly in the rise of income level of rural inhabitants who are the majority of the national population, but also will bring much effect to reduce the difference of income levels between urban and rural inhabitants. (See Table 1.2.4.)

Table 1.2.4 Agricultural Production by Region of Zaïre
 Tableau 1.2.4 Produit agricole par région du Zaïre

(Unit : % & Million Zaires
 Unité : % et Million Zaires)

Region Région	Commercialized Production % / Production Alimentaire %											Total Million		
	Oil Palm Products Huile de palme	Coffee Café	Rubber Caout- chouc	Cotton Coton	Cacao Cacao	Tea Thé	Other Industri- arized Crops Denrées autres Industries	Timber Bois de Charpente	Live- stock Ele- vage	Fish Pêche	Non Commerci- alized Production de Zaïre	%	Million	%
Kinshasa	-	-	-	-	-	-	-	0.1	-	1.5	1.7	0.9		
Haut-Zaïre	12.6	6.2	5.9	-	45.5	-	34.4	15.4	16.4	11.9	24.4	12.6		
Bandundu	32.6	8.6	7.8	-	-	-	18.0	2.7	12.7	13.6	27.5	14.2		
Equateur	40.9	16.7	70.6	21.8	54.5	-	14.8	1.8	19.9	11.9	33.9	17.5		
Haut-Zaïre	11.7	45.5	15.7	17.0	-	-	13.1	18.2	7.3	16.7	36.0	18.6		
Kivu	-	19.1	-	17.0	-	100.0	14.8	6.4	5.4	17.2	27.3	14.1		
Shaba	-	-	-	19.4	-	-	1.6	43.6	38.1	10.5	19.8	10.2		
Kasai Occidental	-	2.9	-	24.3	-	-	-	8.2	-	7.2	10.7	5.5		
Kasai Oriental	2.2	1.0	-	0.5	-	-	3.3	3.6	0.2	9.5	12.4	6.4		
Total Millions of Zaire	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Millions de Zaire	23.0	20.9	5.1	4.1	3.1	1.1	1.1	11.0	5.5	112.7	193.7			
%	11.9	10.8	2.6	2.1	1.6	0.6	0.6	5.7	2.8	58.2				100%

Source: Professor Moulin's Article, "Zaire-Afrique", March 1973

(2) Secondary Sector of Industries

The secondary sector of industries of Zaire accounts for 26% of the total GDP, among which mining and metallurgy account for 15.5%, construction 5.5%, and manufacturing industries 5%. As it is understood distinctly from Table 1.2.3, that the distribution of secondary industries is so much localized that Shaba, Bas-Zaire, Kinshasa, which account for almost 100% of the metallurgy industry, account for 94% of the total production of secondary industries.

The current production of secondary industries in Haut-Zaire is slight in quantity which accounts for not more than 1% of the total production of that sector. But the industrial development program centered in and around Kisangani, as described in the aforementioned industrialization of the North-East Territory of the country, was adopted as an important strategy of the national economic development policy. For this purpose, l'Association Internationale d'Industrialization du Nord-Est de la Republique du Zaire, which is abbreviated as ASSINEZ, was organized in May 1974 jointly by the governments of the Republic of Zaire and the Federal Republic of Germany. Although the detailed implementation plan was not made clear, the investment is said to amount approximately to 800 to 950 million marks, which corresponds to 154 to 183 million zaires, for the development of iron ore including the construction of an iron mill, production of cement, fertilizer, chemicals and lumber, etc. Kisangani is, of course, the center of this developing investment in Haut-Zaire and the development of the local economy of the region depends much on this plan.

(3) Tertiary Sector of Industries

The tertiary sector of industries accounts for 45% of the total GDP, and, like the secondary sector, is concentrated in Kinshasa and Shaba which account for 50% of the tertiary sector's GDP.

The tertiary sector of industries of Haut-Zaire accounts for 9.4% of the total GDP, which is the largest next to those regions above-mentioned. The urbanization in and around Kisangani is considered to be the main reason of this large share. (See Table 1.2.5.)

Table 1.2.5
Tableau 1.2.5

Regional Distribution Pattern of Tertiary
Sectoral GDP in 1972 year

Modèle de distribution Régionale de troisième
partie PIB en 1972 année

(Unit
Unité : %)

Region	Commerce & Services	Education	Other Public Services	Indirect Taxes	Total
Région	Commerce & Services	Education	Autre Services Publics	Taxes Indirects	Total
Kinshasa	27.6	25.4	19.5	34.6	27.3
Bas-Zaire	7.1	9.3	11.5	6.9	8.0
Bandundu	5.5	9.5	8.9	4.6	6.2
Equateur	7.7	5.5	9.2	4.8	7.3
Haut-Zaire	9.7	9.7	9.5	8.1	9.4
Kivu	7.6	8.5	9.2	7.5	7.9
Shaba	24.0	13.9	15.2	25.1	22.0
Kasai Oriental	4.3	10.3	8.5	3.4	5.2
Kasai Occidental	6.5	7.9	8.5	5.0	6.7
Total	100.0%	100.0%	100.0%	100.0%	100.0%
(in million Zaires)	275.9	32.0	125.4	78.9	463.8
(en million Zaïres)					

Source: "Professor Moulin's Article", Zaire-Afrique, March 1973

1.3 National and Regional Transportation System

1.3.1 Outline of Transportation Networks

The transportation facilities of Zaire are formed into a single network by interdependence of various modes of transportation (See Plate 1.1.1.). Namely, the water-way network, consisting of the Zaire River and its tributaries (the Kasai River and Ubangi River etc.) extends for 13,000 km and is ranked as one of a few grand river transport networks in the world. Meanwhile, railroads have their historical value in having developed as carriers supplemental to water-ways; and accordingly railways and waterways are closely dependent to each others from organizational as well as operational viewpoints.

The railroad network with a total length of 5,500 km is operated by four companies, namely, ONATRA (Office National des Transport au Zaire), CFL (Office des chemins de Fer des Grands Lacs), KDL (Chemins de Fer Kinshasa - Dilolo - Lubumbashi) and CVZ (Chemins de Fer Vicinaux du Zaire), each of which is responsible for one of four transportation districts of the country.

Meanwhile, the road network has a total length of 141,560 km, of which 68,560 km or approximately 48% is comprised of trunk roads such as national and regional roads. Viewing things from the transportation networks of the entire country the road network plays the role of feeder to the waterways. However, the road network serves as a main transport system in the area east of Kisangani, where navigable waterways and railroads are almost non-existent.

On the other hand, because of the dispersion of principal cities over a vast territory and a steady growth in traffic demand, road traveling being the only reliable means of long-haul domestic passenger transport, the aviation network of Zaire is expected to gain a more important position in the national transportation system.

At present, the international airports are important bases for the economic growth of Zaire. There is one each at Kinshasa and Lubumbashi and an additional new international airport is under construction at Kisangani. Domestic airports are scattered over the entire country at 34 local towns.

The features of the transportation network in the Haut-Zaire Region, where the project road is to be located, are the facts that the Zaire River flows through the southwestern part of this region and that the area is divided into the northern district which is centered around Buta and the southern district with Kisangani as its center where one can see the characteristics of the local commodity flows particularly in the agricultural products of the region.

In the northern district, the CVZ Railroad, traversing the district from east to west, is comprised of 868 km of main line starting from Bumba, a junction with the Zaire River, and ending at Mungbere through Aketi, Buta and Isiro and two branch lines, one 121 km long reaching to Bondo and 32 km long reaching to Titule. These railroad lines serve as transportation arteries together with roads which are utilized as feeders to railroads.

As for trunk roads in the northern district, Route # 445, connecting the areas of Isiro and Poko with Aketi and Bumba through Buta, runs almost parallel to the CVZ Railroad. However, because of poor road conditions particularly in the area west of Dulia, this road is little used, at present, for long-haul transport.

Meanwhile, in the southern district, the waterway utilizing the Zaire River, plays a central role in transportation for reaching the Kinshasa area; however, for the area east of Kisangani, roads serve as arteries of the regional transportation network.

For the area south of Kisangani, the CFL Railroad is provided, which extends from the river bank on the opposite side of Kisangani to Ubundu bypassing the rapids on the Zaire River. However, because of poor maintenance of railroad track and rolling stock, existing roads are predominantly used for transportation. The trunk roads in this region are Route # 425 from Kisangani to Bafwasende, Mambasa and Bunia which are located east of Kisangani, Route # 418 which links Kisangani with Goma and Bukavu in the Kivu Region, Route # 403 and # 412 heading for the Kasai Region from Kisangani and Route # 421 from Kisangani to Buta which will be a part of the project road. (See Plate 1.3.1)

1.3.2 Waterways

The main stream, the Zaire River from which the Kasai River branched off approximately at 200 km upstream of Kinshasa, traverses Equateur Region, and enters into the Haut Zaire Region from its west side, passing through Basoko and Isangi and reaching the port of Kisangani.

A 1,740 km section of this river between Kinshasa and Kisangani is said to be the most navigable waterway in the world. From the vicinity of Bumba Port in the Equateur Region, the Itimbiri River branches off and reaches Aketi Port.

The Zaire River extends southward from Kisangani and goes upstream into the Kindu Region, however, a section of this river between Kisangani and Ubundu of approximately 120 km is not navigable because of falls and rapids.

The principal ports in the project area Kisangani, Bumba and Aketi. At present, because of the layout and the function of the regional transportation network, the Port of Kisangani has the central and southern parts of the Haut Zaire Region as its hinterland, while the ports of Aketi and Bumba, led by the CVZ Railroad and trunk road # 445, have the northeastern part of the region as their hinterland.

The freights to be handled at the port of Kinshasa are brought in through the Zaire and Kasai Rivers, and the port is strongly characteristic of being a transferring point of freight to be collected from various localities of the country.

By comparison of the volume of freights handled at Kinshasa with that at the three ports in the project area, the current volume of transportation in the project area against that of the entire country may be grasped. The ratio of the volume of freight handled at the above three ports against that at Kinshasa was 35.2% in 1959; however, this figure declined to 12.8% in 1973. This represents that the volume of transportation decreased under the strong influence of civil war in these areas during the period. The volume of freight handled by three ports in the project area was 559,000 tons in 1959, while this declined to 259,000 tons in 1973 and at present the rate of tonnage is only 46% of that of the freight handled in 1959.

Comparing the volume of freight handled at the Port of Kisangani with that at Aketi and Bumba Ports, (Table 1.3.1.) it is seen that the decrease in the volume at Kisangani was greater than those at Aketi and Bumba during the same period.

The following facts may be considered as the reason of such a decrease: First, the growth of integrated agricultural production in Isiro, Wamba, Wasta and Bunia areas was greater than that in the Kisangani, Opala, Banilia and Bafwasende areas. This is considered to be attributable to the fact that the CVZ Railroad and truck transportation services had functioned better than the transportation network around Kisangani despite the fact that the damages due to the civil war were worse in the former areas.

Secondary, conditions of trunk roads in the project area are poor. Kisangani Port did not always function as the center of the river transportation of the project area and in fact, it may be said that

Table 1.3.1
Tableau

Freight Tonnage Loaded and Unloaded
at River Ports

Tonnage de fret chargé et déchargé
aux ports fluviaux

(Unit: 1,000 ton
(Unité: 1.000 tonnes)

Name of Port Nom de port	1959 ¹⁾			1973 ³⁾			1973/1959 (%)
	Loaded Chargé	Unloaded Décharge	Total	Loaded Chargé	Unloaded Décharge	Total	
(1) Project Area Région sous projet							
Kisangani							
Right bank (OTRACO) Bord droit	50	127	177	29	83	122	63.2
Left bank (CFL) Bord gauche	70	91	161	11	9	20	12.4
Sum Montant	120	218	338	40	92	132	39.1
Aketi	75	60	135	52	23	75	55.6
Bumba	-	-	86 ²⁾	48	4	52	60.5
Sum Montant	-	-	221	100	27	127	57.5
Total in Project Area Total dans la région sous projet			559			259	46.3
(2) Kinshasa	708	879	1,587	367 ⁴⁾	666 ⁴⁾	1,033 ⁴⁾	65.1
(1)/(2) %			35.2			12.8	

Source: 1) Statistiques Officielles, Province Orientale 1959.

2) Berensho-Bosboon Conseil en gestion de OTRACO, 1970 & 1975.

3) ONATRA (Traffic Department) - The Tonnage at Kinshasa is the total of the tonnage transported through Zaire River and Kasai River.
ONATRA (Département de la Circulation) - Le tonnage à Kinshasa est le tonnage total transporté par le Fleuve Zaïre et la Rivière Kasai.

4) The tonnage is based on the data of ONATRA, 1972.
Le tonnage est basé sur les données de l'ONATRA, 1972.

the rate of decrease in freight handled was smaller at Aketi and Bumba than in Kisangani during that period.

1.3.3 Railroads

The total length of railroad in Zaire reaches 5,508 km, of which two stretches 524 km and 1,163 km are operated by the public corporations of ONATRA and CFL respectively, while the remaining 1,021 km and 2,800 km stretches are operated by the private railroad companies of CVZ and KDL respectively.

Approximately 900 km of the CVZ railraod and the 125 km CFL Kisangani - Ubundu section runs through the Haut Zaire Region. Railroad is usually organized together with the river transportation agency into a single transport network and the volume of transport handled by the above four organizations including that of river transportation is shown on Table 1.3.2.

There has been little change in the share of freight transportation expressed in ton-kilometer among the four organizations since 1967. In 1971, two organizations, namely KDL and ONATRA occupied 51% and 44.8% shares respectively which were predominantly greater than those of the other two organizations, namely CFL with 3.2% and CVZ with merely 1.0%.

The passenger transportation expressed in passenger-kilometer by KDL and CVZ tends to increase and the shares of the four organizations in 1971 were 56.2% for KDL, 32.8% for ONATRA, 7.6% for CFL and 3.3% for CVZ.

Thus, from a viewpoint of sharing rate in transportation, the volume handled by CVZ which traverses the northern part of Haut Zaire Region is very small when it is compared with the rest of the country. However, this railroad and the connecting river boat service carry

such agricultural products as coffee, cotton, palm oil etc. from the north and northeastern parts of Haut Zaire to the Kinshasa area and carry fuel and daily commodities back from Kinshasa back to these areas, playing an arterial role in the transportation network of the northern area.

However, the railroad in the project area was most severely effected by the civil war, which caused the loss of equipment and the shortage in the supply of materials and spare parts required for maintenance of rolling stock and the train operation was almost suspended during the period between 1965 and 1967. As of 1971 the volume of freight transportation was 40 million-ton-kilometers which is approximately 50% of the 1959 level.

Meanwhile, the volume of passenger transportation reached the 1959's level again in 1969, but in 1971 it increased to 1.9 times as much as that in 1969, which amounted to 35,000,000 passenger-kilometers. (See Table 1.3.2 and 1.3.3)

Table 1.3.2
Tableau 1.3.2

Volume of Traffic Carried by
Main Transport Agencies

Volume du trafic par les agences de
transports principales

	<u>1967</u>	<u>1969</u>	<u>1971¹⁾</u>
<u>Freight Traffic</u> <u>Trafic de fret</u>			(Million ton - km) (Million tonne - km)
KDL	1,625 (52.7)	1,796 (50.8)	2,112 (51.0)
ONATRA	1,326 (43.1)	1,577 (44.6)	1,856 (44.8)
CFL	98 (3.2)	116 (3.3)	133 (3.2)
CVZ	30 (1.0)	45 (1.3)	40 (1.0)
Total	3,079 (100.0%)	3,534 (100.0%)	4,141 (100.0%)
<u>Passenger Traffic</u> <u>Trafic de passager</u>			(Million passenger - km) (Million passager - km)
KDL	376 (52.7)	468 (54.7)	593 (56.3)
ONATRA	288 (40.4)	284 (33.2)	346 (32.8)
CFL	41 (5.8)	85 (9.9)	80 (7.6)
CVZ	8 (1.1)	18 (2.1)	35 (3.3)
Total	713 (100.0%)	855 (100.0%)	1,054 (100.0%)

Source: 1) UNECA: M73-68 'Summaries of Economic Data, Zaire, 1972'

Table 1.3.3 Yearly Fluctuation of Volume of Traffic Carried by CVZ Railway
Tableau 1.3.3 Flux annuel du volume de trafic transporté par le chemin de fer CVZ

Year	Freight Traffic (million ton - km)	Passenger Traffic (million passenger - km)
<u>Année</u>	<u>Trafic de fret (million tonne - km)</u>	<u>Trafic de passagers (million passager - km)</u>
1959	81.5	18.8
1966	10.0	2.2
1967	27.8	7.9
1968	30.6	14.7
1969	44.5	18.2
1970	40	23
1971	40	35

Source: CVZ

UNECA: Fourth Year/Number 43, Summaries of Economic Data,
Zaire, 1972

1.3.4 Aviation

The airports of Zaire consist of 2 international airports located at Kinshasa and Lubumbashi and 34 local domestic airports, which are connected by Air Zaire, a government-owned air-carrier. Because of the vast area of territory, scattered principal cities over the entire country, and poor conditions of roads, long-haul passenger transportation is highly dependent on aviation.

Direct flights from abroad mainly arrive at and leave from Kinshasa, while domestic flight are made to and from Lubumbashi. Connections between Kisangani and foreign countries are made only by Air Zaire which serves these two cities as domestic flight.

At Kisangani, a total of 41 flights per week connect Kisangani with Kinshasa and the principal cities such as Isiro, and Bunia in the Haut Zaire Region and Bukavu, Bumba, Goma, Kindu, Lisala, Lodja, Mbandaka and Bunia in the surrounding regions, of which 13 non-stop flights are between Kisangani and Kinshasa.

At present, Kisangani Airport is used basically for domestic services for it is not suitable to accommodate large aircrafts. Therefore a new international airport is being built 14 km east of Kisangani by clearing jungle in order to accommodate jumbo aircrafts.

1.3.5 Roads

(1) General

The trunk roads in Zaire which reach about 68,000 km in total length are composed of approximately 1,900 km of national paved roads, 17,800 km of national gravel roads, 17,400 km of regional gravel roads and 31,500 km of other gravel roads. Adding up to approximately 73,000 km

of roads of local interest, the national road network comes to a total of approximately 141,600 km. Since the Zaire River and its tributaries flow in a pattern covering the entire territory of Zaire, ferries serve instead of bridges where the trunk roads cross rivers and the traffic is scarce.

The entire length of trunk roads in the Haut Zaire Region is 13,562 km which is approximately 20% of the total length of roads in the entire country. The roads are classified into 4,215 km of national roads which occupy 31% and 3,207 km of regional roads which correspond to 24%.

Paved roads consist of several sections of roads from Kisangani to Lubutu and from Kisangani to Bafwasende for a total of 178 km and the rests of the sections are all dirt roads.

The number of ferry service locations in the Haut Zaire Region occupying approximately 25% of the national total, is 56, of which 13 locations are serviced by diesel-engined type, 37 by rowing type, and the remaining 6 by rope-guided type.

(2) The Change of Road Network

The traffic facilities in this area such as railroads and roads were constructed between the years of 1900 and 1960, and the roads connecting Kisangani with the Buta and Bongo areas will become the TAH route. It was rather early that the existing routes # 421, # 445 and # 471 etc. were built. By around 1924 Kisangani-Buta section had already been constructed and it is said that the sections of the roads north of Buta were built thereafter. The state of transport facilities in this area around 1960 was such as to have functions suitable for the traffic situations then and scrapers and small bulldozers were allocated for road maintenance activities. Even then CVZ was operating vehicles especially for transporting passengers and mails.

However, as these transportation networks were not maintained nor repaired for more than a decade because of the national independence and the succeeding social disorder, the function of the entire transportation network lowered and the traffic volume on the roads showed a sharp decline.

Above all, the roads are physically in critical conditions when seen from the functional viewpoint. Large gullies and pots are seen everywhere on the road surface and during the wet season, worsened by poor drainage, the roads are turned into muddy pools. Even the trunk roads, except for paved sections, make the passage of passenger cars impossible.

Plate 1.3.2 shows the results of investigations conducted by Regional Office des Routes on the trunk roads in September, 1974. It is noted in Plate that the trunk roads are severed into pieces everywhere. On the project road, the road conditions are extremely poor in the section between Dulia and Bondo and even four-wheel drive vehicles such as TOYOTA-Land Cruisers are not adequate unless they are equipped with long wooden boards and shovels for emergency to get rid of muddy spots. The survey team, during their field surveys, frequently came across large trucks trapped in mud and unable to get out for several days.

The roads in this area serve not only as the feeders to waterways and railroads but as the sole available means of transportation between the places of agricultural production and the market. This is especially true of Route # 425 which connects Kisangani with the eastern part of the Region. Therefore, the influence of the deteriorated roads on the regional economic activities is noticeable. To improve these situations, assistance has been offered mainly by international financing institutions and UNDP for the rehabilitation of road facilities.

On the project road, a rehabilitation has been on the way since mid-1974 on the Kisangani-Buta section with the IBRD loan.

(3) Number of Registered Vehicles

The number of national registered vehicles in 1972 was 143,400 and this represents one vehicle for every 159 inhabitants. Passenger cars occupy 56.7% of the entire vehicle fleet while trucks occupy 37.9%, buses 1.7% and others 3.6%.

Against these figures, the number of regional registered vehicles in Haut Zaire in the same year was 12,163 with a ratio of one vehicle for every 284 inhabitants. From the national viewpoint, the number of vehicles in Kinshasa, the capital, is the largest with one vehicles for every 22 inhabitants.

The national average, except for Kinshasa, is one for 299 inhabitants. Therefore, it may be said that the rate of the number of registered vehicles per population in the Haut Zaire Region is roughly the same as the national average, however by the types of vehicle, the share of trucks is 49.3%, higher than the national average. The passenger cars 42.9%, buses 1.2% and others 6.5%. When seen from its yearly fluxation, the average annual growth between the years 1966 and 1972 was 11.3% for the entire nation and 6.3% for the Haut Zaire Region. (See Tables 1.3.4 and 1.3.5.)

Table 1.3.4		Number of Vehicles Registered in 1972 year					Unit : vehicle (Unité : véhicule)	Population /vehicle Population /véhicule
Tableau 1.3.4		Nombre de véhicules enregistrés en 1972 année						
		Cars	Trucks	Buses	Others			
		<u>Voitures</u>	<u>Camions</u>	<u>Autobus</u>	<u>Autres</u>	<u>Total</u>		
National Total	Number	81,384	54,350	2,491	5,184	143,409		
Total national	%	56.7	37.9	1.7	3.6	100.0	159.4	
Region of Haut-Zaire	Number	5,223	6,000	143	793	12,163		
Région du Haut-Zaïre	%	42.9	49.3	1.2	6.5	100.0	283.7	

Source: Office des Routes "Programme Court et Moyen Terme" Mai 1974

Table 1.3.5		Yearly Variation of Number of Vehicles Registered in 1966-1972 year							Average Annual Growth Rate (%) Taux moyens de croissance(%)
Tableau 1.3.5		Variation annuelle du nombre de véhicules enregistrés en 1966-1972 année							
		(Unit : 1,000 vehicles) (Unité : 1,000 véhicules)							
		<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	
National Total		85.4	93.0	103.5	111.1	120.5	135.9	143.4	
Total national		(100)	(108.9)	(121.2)	(130.1)	(141.1)	(159.1)	(167.9)	11.3
Region of Haut Zaire		9.3	9.8	10.7	11.5	11.9	12.4	12.8	
Région de Haut Zaïre		(100)	(105.4)	(115.1)	(123.7)	(128.0)	(133.3)	(137.6)	6.3

Source: INSTITUT NATIONAL DE LA STATISTIQUE "PARC AUTOMOBILE 1972"
UN-ECA Fifth Year/Number 43 "SUMMARIES OF ECONOMIC DATA, ZAIRE"
Number of vehicles in the Region of Haut-Zaire includes motor-cycles.
Nombre de véhicules dans la Région du Haut-Zaïre y compris les motocyclettes.

(4) Road Transportation

(i) Freight Transportation

There are several trucking companies in Kisangani and Buta; most of them have exclusive contracts with such public corporations as ONAFITEX and ONC etc. and almost no trucking company exists for personal freight.

The current main routes of trucking along and around the proposed project route are shown in Plate 1.3.1. In the northern part of the project area, agricultural products chiefly coffee and raw cotton are taken to Bondo, Likati and Buta, the centers of the area, and are transported to Kinshasa via the ports of Aketi and Bumba.

Meanwhile, cotton seed produced in the vicinity of Banalia is transported to Kisangani. Conversely, daily commodities and miscellaneous goods are transported back from Kisangani to these rural areas.

Due to the deterioration of roads, shortage of technical labor and spare parts, freight fare per ton-kilometer is generally high and runs 5 to 6 Makuta and for the areas where road conditions are poor it is as high as 16 Makuta to allow for the delay in delivery and accidents.

Poor road conditions and driving ability and insufficient maintenance of trucks caused by difficulty in obtaining spare parts have shortened the life of trucks to an average of 3 years.

From the results of O-D survey, the following facts are noted regarding trucking on the project road.

Of the vehicular traffic which passed the survey stations large trucks occupied an average of approximately 26%, however, tonnage of the freight carried is shared 81.5% by large trucks and 18.5% by small vehicles.

The average tonnage carried is 2.74 tons/truck for large trucks and 0.93 ton/truck for small trucks.

33.5% of the total tonnage of freight is agricultural products, lumber and cement etc. and the rest 66.5% is daily commodities and miscellaneous goods. Except for cotton, lumber and coffee, most of the freights are mix-loaded. (See Table 1.3.6.)

(ii) Passenger Transportation

Before 1960, CVZ was the largest trucking company in this Region, and the company was offering mail and passenger transport services by using trucks especially equipped for the purposes. This was the only official transport agency and services were offered once or twice a week.

For example, the service route was to take such a course as Isiro→Poko→Buta→Kisangani→Nia Nia→Isiro and billeting accommodation was provided at the principal stops.

At present only within the boundary of the cities of Kisangani and Buta buses are operated and no long-haul bus service between cities is existent. In Kisangani, 15 buses are being operated on 11 routes by two companies and in Buta, just a single bus is being operated on one route by one company. The bus fare is 3 to 4 makuta per ride.

Although there is no road transportation organization to meet the demand for long-distance passengers, the results of the survey show that an average of 9 passengers travel on each large truck and thus trucks share of the passenger transport service in a large degree.

Table 1.3.6
Tableau 1.3.6

Average Tonnage carried per-vehicle by Type
by Commodity

Moyenne de tonnage transporté par véhicule
en type d'article

(unit : ton)
(Unité : tonne)

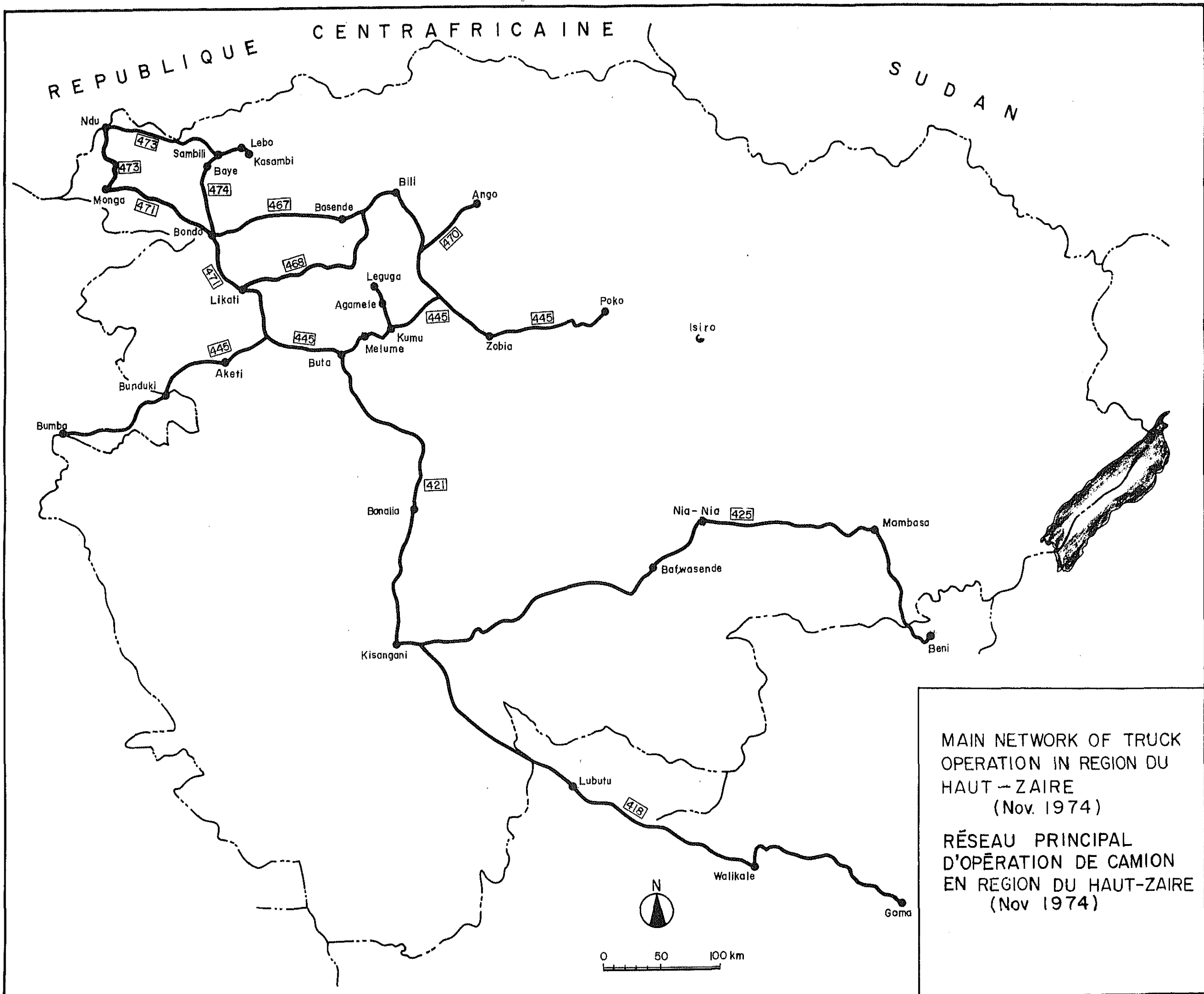
			Cotton & Coffee	Lumber & Cement	Others Agricultural Products	Others	Average
			Coton & Café	Bois de Charpente & Ciment	Autres Produits agricoles	Autres	Moyen
	<u>Arachides</u>	<u>Banane</u>					
Light Vehicle Véhicule léger	1) -	0.63	-	0.55	1.60	0.95	0.93
Heavy Vehicle Véhicule lourd	2) 3.50	1.14	4.57	3.37	-	2.69	2.74

Note: 1) Vehicle under 2 tons in capacity
Véhicule au-dessous de 2 tonnes dans capacité

2) Vehicle over 2 tons in capacity
Véhicule au-dessus de 2 tonnes dans capacité

Source: O-D survey data corrected in October, 1974 at Kisangani.
Banalia, Buta and Bondo.

Données d'Etude O-D par-dessous en Octobre, 1974 à Kisangani,
Banalia, Buta et Bondo.



MAIN NETWORK OF TRUCK
OPERATION IN REGION DU
HAUT-ZAIRE
(Nov. 1974)

RÉSEAU PRINCIPAL
D'OPÉRATION DE CAMION
EN REGION DU HAUT-ZAIRE
(Nov 1974)

Source : ONAFITEX

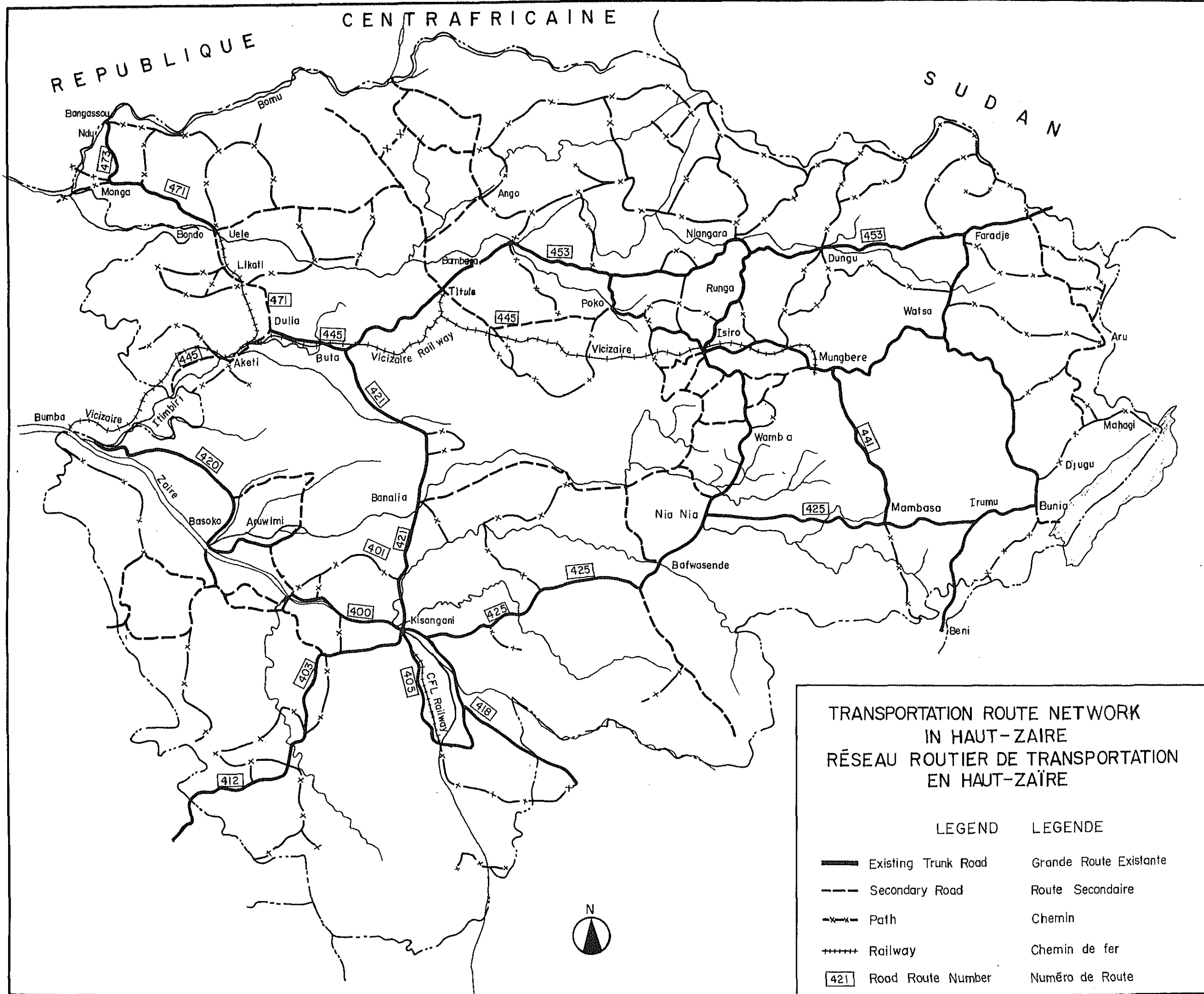
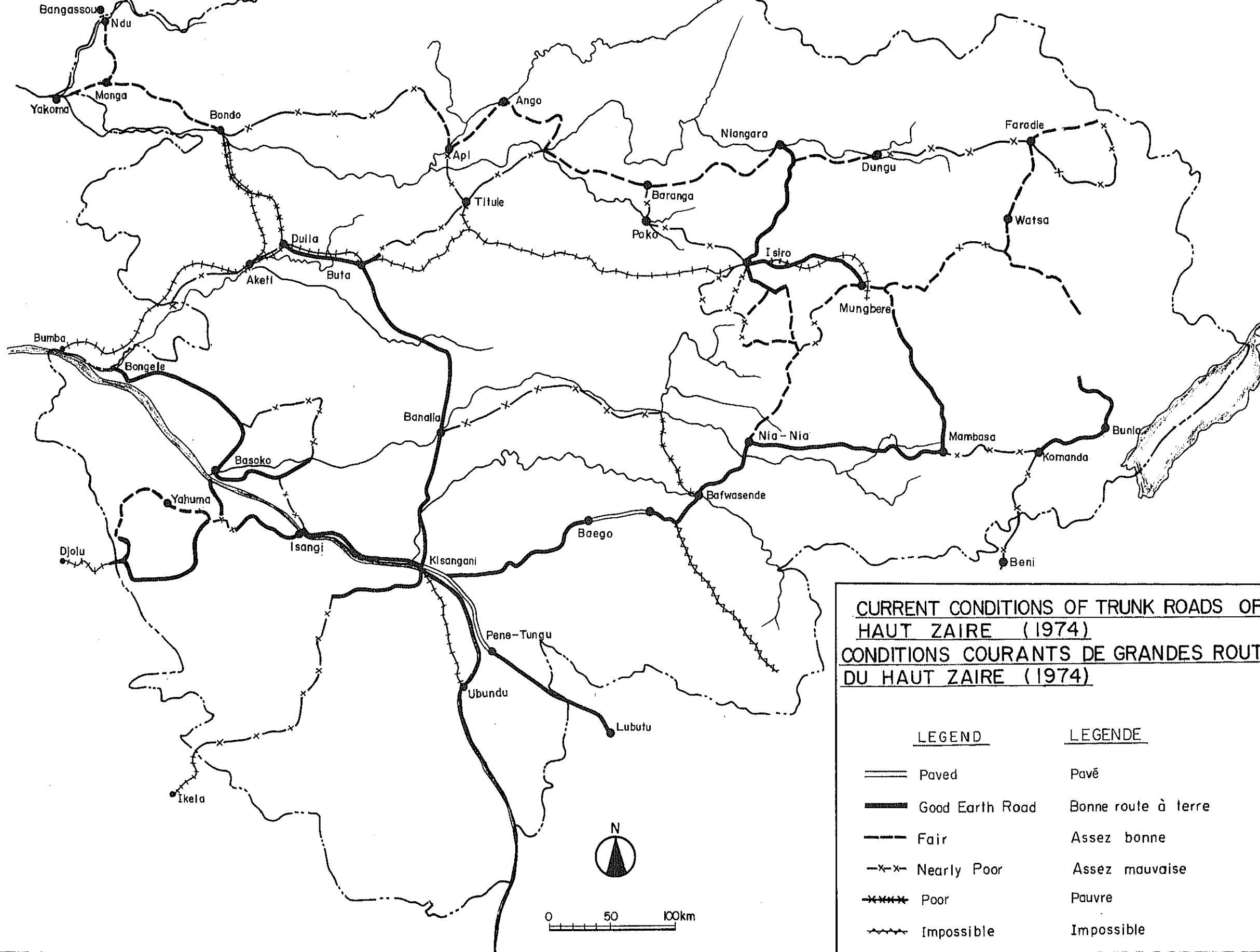


PLATE 1-3-2
PLANCHE 1-3-2

CENTRAFRICAINE

REPUBLIQUE

SUDAN



CURRENT CONDITIONS OF TRUNK ROADS OF HAUT ZAIRE (1974)
 CONDITIONS COURANTS DE GRANDES ROUTES DU HAUT ZAIRE (1974)

LEGEND	LEGENDE
==== Paved	Pavé
———— Good Earth Road	Bonne route à terre
- - - - Fair	Assez bonne
-x-x- Nearly Poor	Assez mauvaise
-x-x-x- Poor	Pauvre
-x-x-x-x- Impossible	Impossible

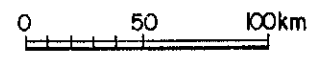
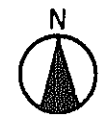


Table 1.3.7 Average Passenger Occupancy by Vehicle Type
 Tableau 1.3.7 Moyenne de voyageur concomitant en type de véhicule

(Unit : persons/vehicle
 Unité : personnes/véhicule)

Type of Vehicles <u>Type de véhicules</u>	Locations of Survey Station <u>Localité de point d'étude</u>			Average of Survey Stations <u>Moyenne par Point d'Etude</u>
	<u>Kisangani</u>	<u>Banalia</u>	<u>Buta</u>	
1. Car Voiture	3.7	-	2.8	3.4
2. Van & Pick up Wagon (Fourgon) & Pick up	4.7	3.0	4.1	4.3
3. Light Truck Véhicule léger	9.8	4.5	4.0	8.2
4. Heavy Truck Véhicule lourd	11.6	14.7	5.1	9.2

4.35*

Source: O-D survey in October, 1974

Etude O-D en Octobre, 1974

Note: Passengers shown here include drivers, and in case of heavy truck, passengers include assistants, too.

Voyageurs qui indiquent y compris d'ici chauffeurs, et dans le cas de véhicule lourd, voyageurs inclu assistants, aussi.