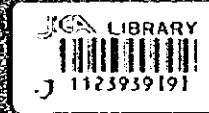


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
FEDERAL MINISTRY OF WATER RESOURCES
AND RURAL DEVELOPMENT
FEDERAL REPUBLIC OF NIGERIA

THE STUDY ON THE NATIONAL WATER
RESOURCES MASTER PLAN (NWRMP)

WATER RESOURCES DATABASE MAPS

VOLUME FOUR



MARCH 1995

SANYU CONSULTANTS INC.
SUMIKO CONSULTANTS CO. LTD.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

FEDERAL MINISTRY OF WATER RESOURCES
AND RURAL DEVELOPMENT
FEDERAL REPUBLIC OF NIGERIA

**THE STUDY ON THE NATIONAL WATER
RESOURCES MASTER PLAN (NWRMP)**

WATER RESOURCES DATABASE MAPS

VOLUME FOUR

MARCH 1995

SANYU CONSULTANTS INC.
SUMIKO CONSULTANTS CO., LTD.

COMPOSITION OF THE REPORT

The Final Report on the Study on the National Water Resources Master Plan (NWRMP) for the Federal Ministry of Water Resources and Rural Development in the Federal Republic of Nigeria comprises the following volumes:

- Volume One : SUMMARY AND MAIN TEXT
- Volume Two : SECTOR REPORT

This contains 12 Chapters, each of which has been presented in an independent manner for the sub-sector designated compiling all the requirements concerned, while major findings and recommendation of each sub-sector along with inter-sub-sectoral relations and basin-wide considerations are summarized in Volume 1:

CHAPTER 1. NWRIS and SIA	Part 1
CHAPTER 2. Socio-Economy and Land Use	
CHAPTER 3. Water Resources and Management	
CHAPTER 4. Water Source Works	
CHAPTER 5. Irrigation and Drainage	
CHAPTER 6. Water Supply and Sanitation	
CHAPTER 7. Gully Erosion and Flood Control	Part 2
CHAPTER 8. Hydropower Generation	
CHAPTER 9. Inland Navigation	
CHAPTER 10. Inland Fisheries	
CHAPTER 11. Environmental Management	
CHAPTER 12. Institution and Legislation	

- Volume Three : WATER RESOURCES INVENTORY SURVEY
- Volume Four : WATER RESOURCES DATABASE MAPS
- Volume Five : SATELLITE IMAGE ANALYSIS

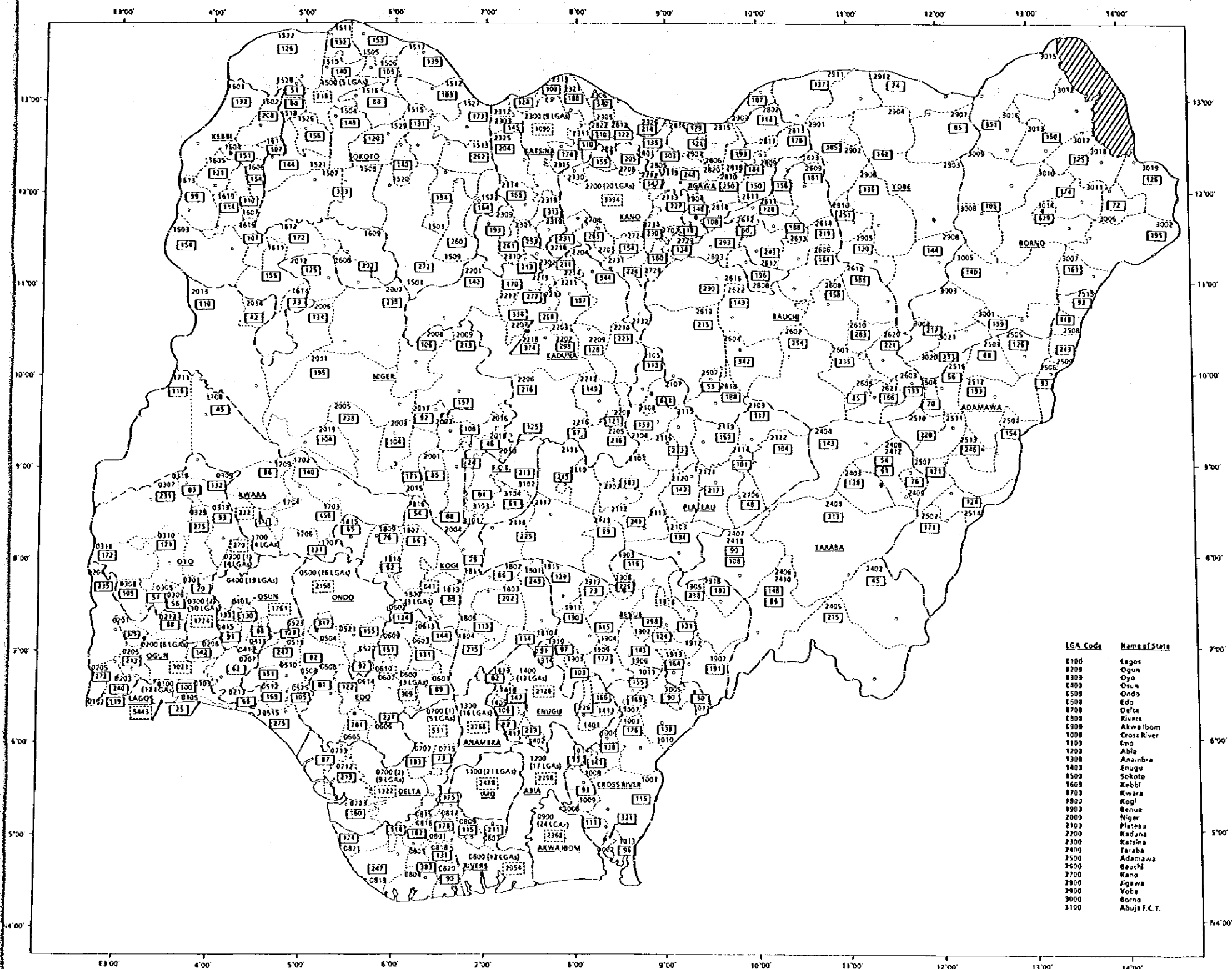
This is Volume Four: WATER RESOURCES DATABASE MAPS

It may be noted that all the findings and recommendation contained in this Report are those made by the Study Team with the members of Sanyu Consultants Inc. and Sumiko Consultants Co., Ltd. and do not imply any authorization by the Japan International Cooperation Agency or the Government of Japan.



CONTENTS OF WATER RESOURCES DATABASE MAPS

MAP 1	Administrative Boundary and 1991 LGA Population	1
MAP 2	State Demography	5
MAP 3	Present Land Use	6
MAP 4	Index of FSN Maps Available for NWRMP Study	7
MAP 5	Major Rainfall Stations	8
MAP 6	Isohytal Map (1980-1989)	9
MAP 7	Hydrological Area Sub-Divisions	10
MAP 8	Density of River Courses	14
DWG 9	Profile of Main River Systems	15
MAP 10	Major Runoff Stations	26
DWG 11	River Systems and Potential Surface Water Resources	27
MAP 12	Hydrogeological Map	33
MAP 13	Groundwater Potential Map	37
MAP 14	Existing Dams	38
DWG 15	Water Operations for Existing 11 Reservoirs	42
MAP 16	Existing Public Irrigation Projects	47
MAP 17	Existing Urban Water Supply: Service Level on LGA Basis	51
MAP 18	Existing Rural Water Supply: Service Level on LGA Basis	55
MAP 19	Well Density on LGA Basis	59
MAP 20	Well Depth and Water Level on LGA Basis	63
MAP 21	Proposed Water Supply: Water Demand on HA Basis	67
MAP 22	NEPA Power Grid System	69
MAP 23	NWRMP Priority Basins	70
	Hadejia-Jama'are (HA-VIII)	71
	Aboine & Mamu (HA-VII & V)	72
	Gbako (HA-II)	73
	Upper Ogun (HA-VI)	74
	Kilange (HA-III)	75
	Awun (HA-II)	76
DWG 24	Standard Design of Proposed Dams	76
MAP 25	Present Distribution of Gully Erosion	77
MAP 26	Gully Erosion Hazard	78



LEGEND

- +— International Boundary
- State Boundary
- - - LGA Boundary
- ⊙ State Capital
- LGA Center
- 0101 LGA Number
- 128 1991 Population In thousand

LGA Code	Name of State
0100	Lagos
0200	Ogun
0300	Oyo
0400	Osun
0500	Ondo
0600	Edo
0700	O'la
0800	Rivers
0900	Akwa Ibom
1000	Cross River
1100	Imo
1200	Abia
1300	Anambra
1400	Enugu
1500	Sokoto
1600	Zebbi
1700	Kwara
1800	Kogi
1900	Benue
2000	Niger
2100	Plateau
2200	Kaduna
2300	Katsina
2400	Taraba
2500	Adamawa
2600	Bauchi
2700	Kano
2800	Jigawa
2900	Yobe
3000	Borno
3100	Abuja F.C.T.



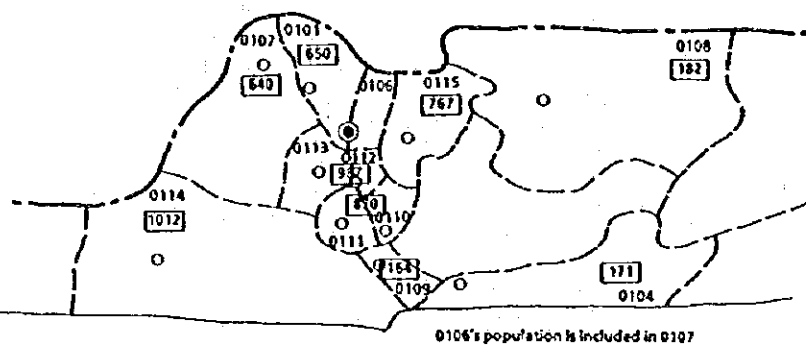
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN
 (NWRMP)

**ADMINISTRATIVE BOUNDARY
 AND 1991 LGA POPULATION**

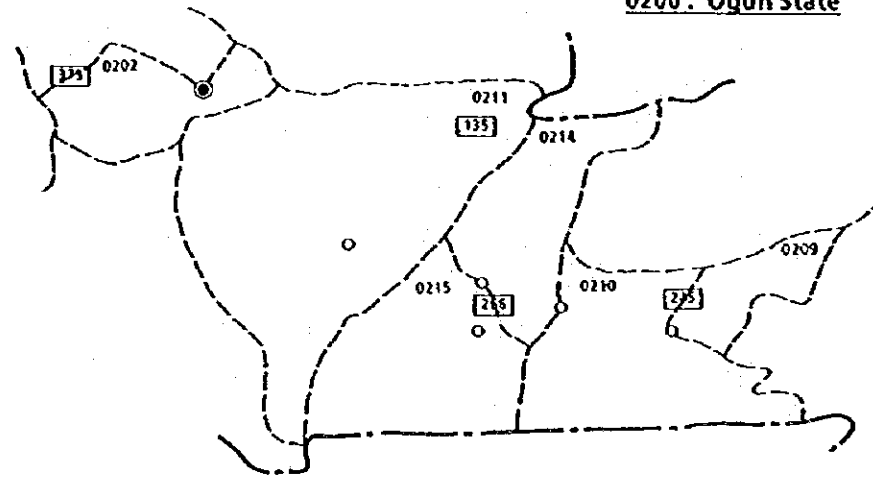
JAPAN INTERNATIONAL COOPERATION AGENCY MAP No
 SANYU & SUMIKO 1-1/4

0100 : Lagos State

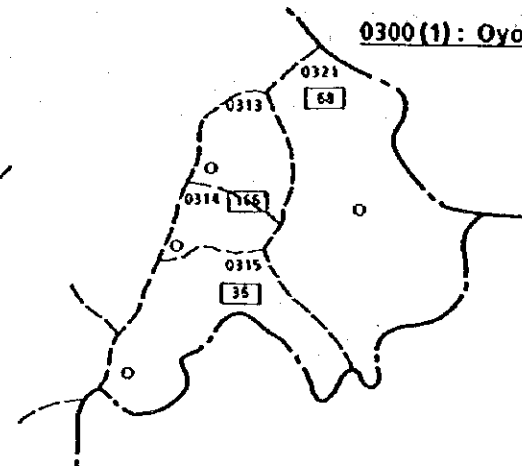


0106's population is included in 0107

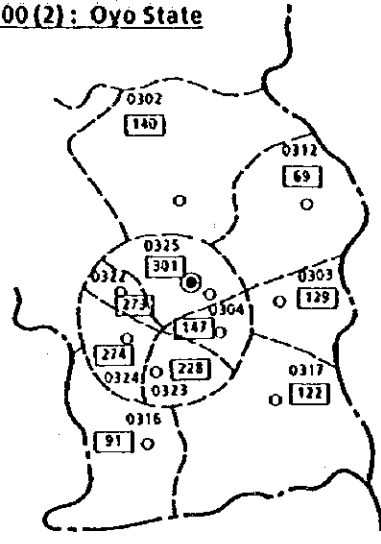
0200 : Ogun State



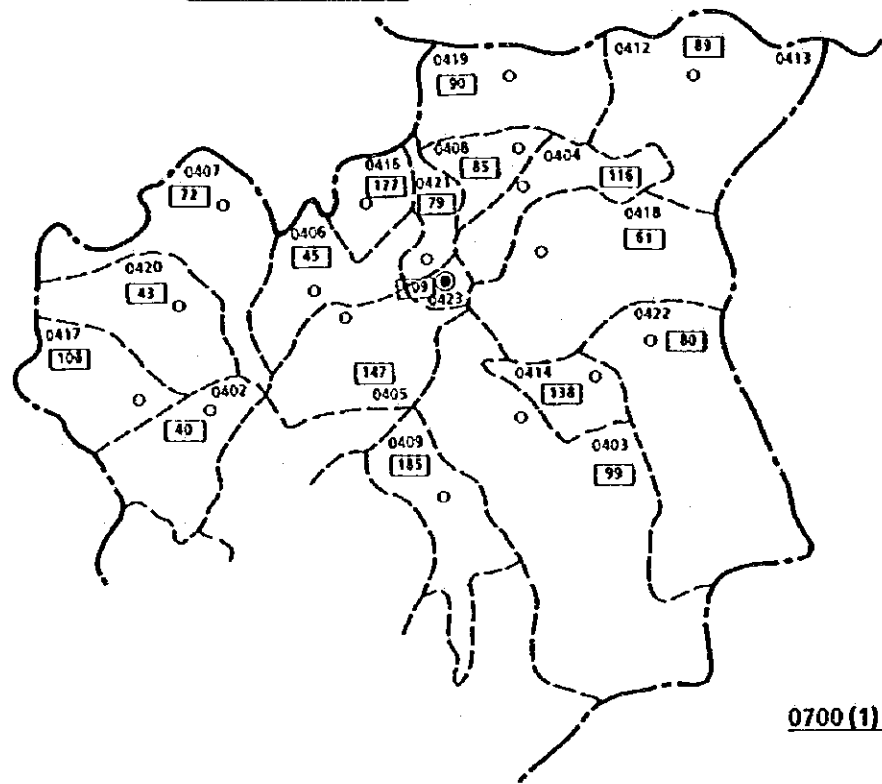
0300 (1) : Oyo State



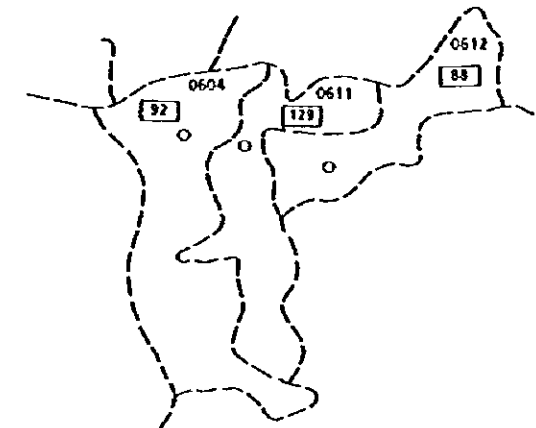
0300 (2) : Oyo State



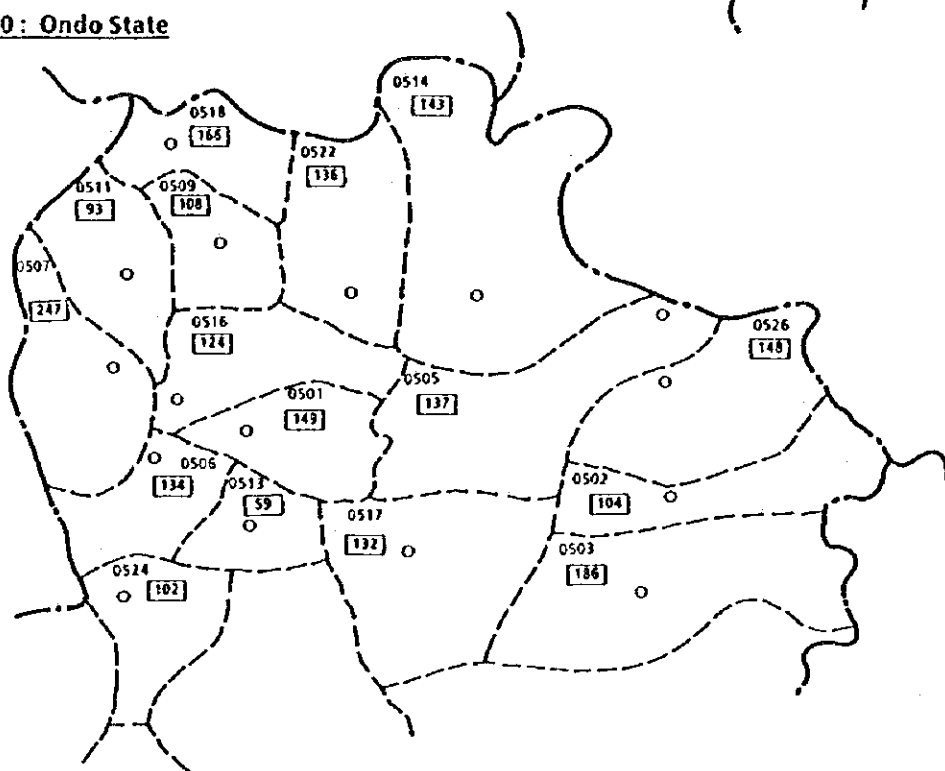
0400 : Oshun State



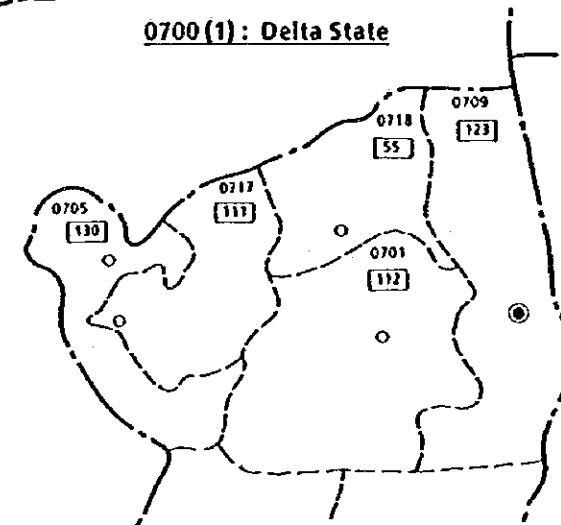
0600 : Edo State



0500 : Ondo State



0700 (1) : Delta State



LEGEND

- International Boundary
- - - State Boundary
- - - LGA Boundary
- ⊙ State Capital
- LGA Center
- 0101 LGA Number
- [124] 1991 Population in thousand

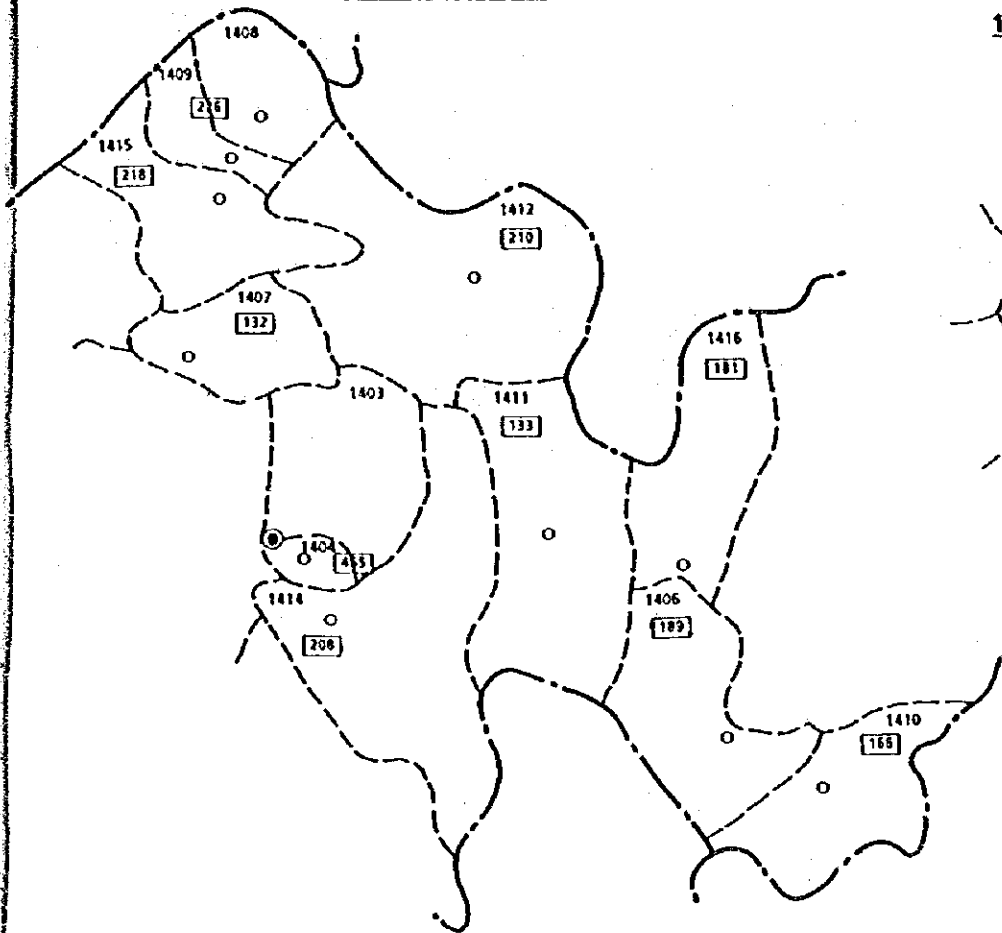
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN
 (NWRMP)

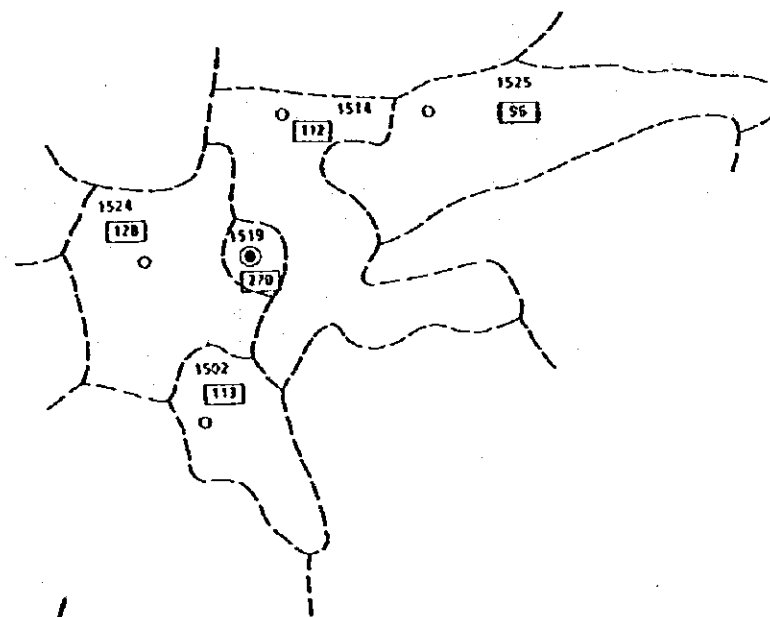
**ADMINISTRATIVE BOUNDARY
 AND 1991 LGA POPULATION**

JAPAN INTERNATIONAL COOPERATION AGENCY MAP No.
 SANYU & SUMIKO 1-2/4

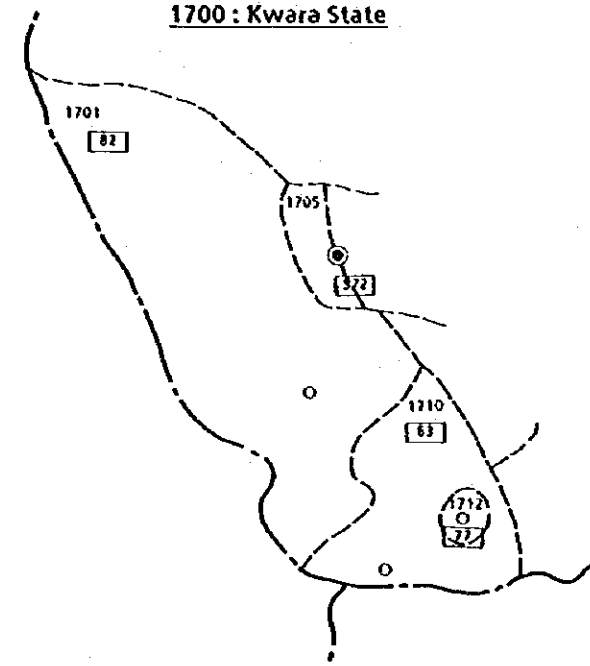
1400 : Enugu State



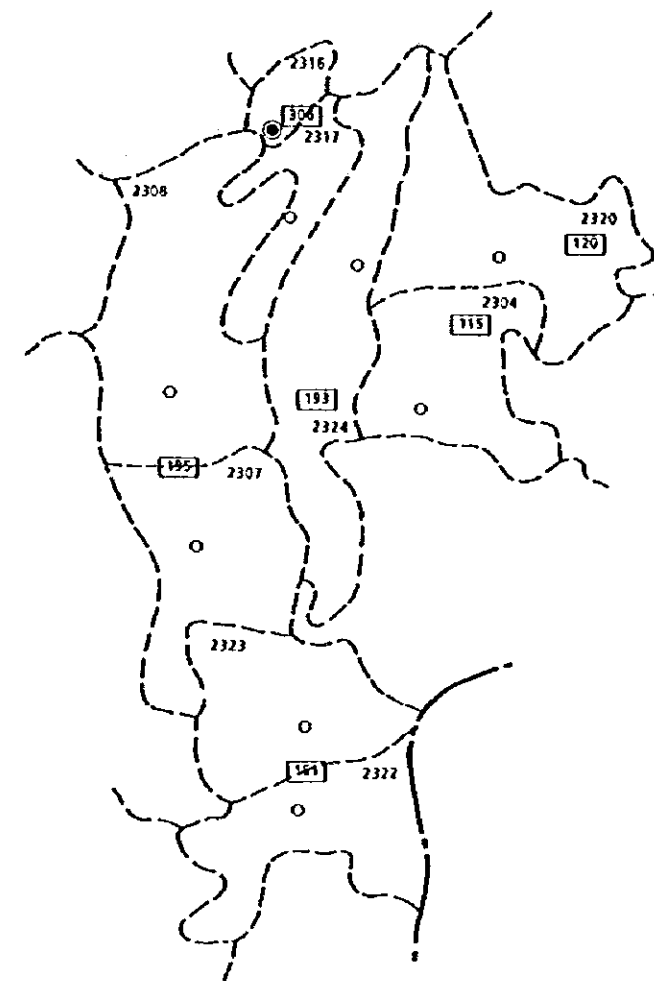
1500 : Sokoto State



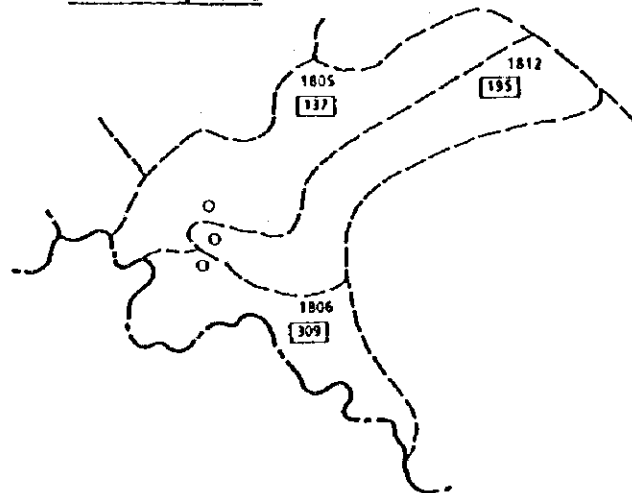
1700 : Kwara State



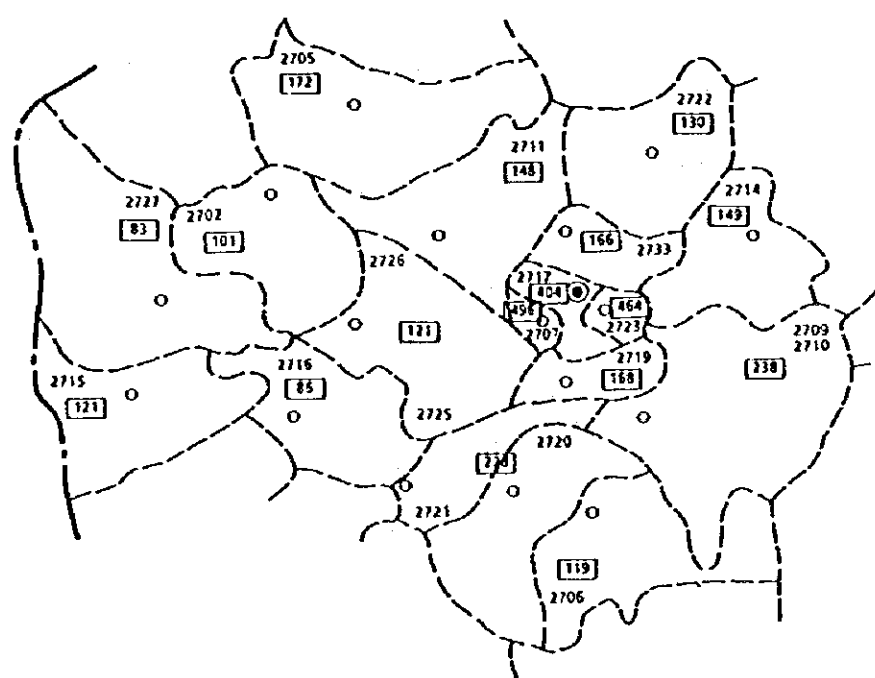
2300 : Katsina State



1800 : Kogi State



2700 : Kano State



LEGEND

- |—| International Boundary
- - - State Boundary
- - - LGA Boundary
- ⊙ State Capital
- LGA Center
- 0101 LGA Number
- 128 1991 Population in thousand

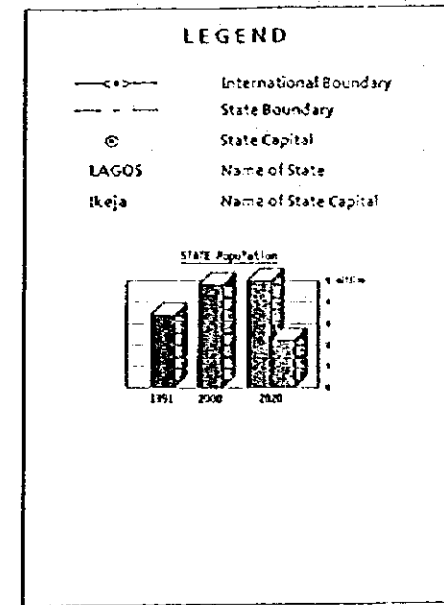
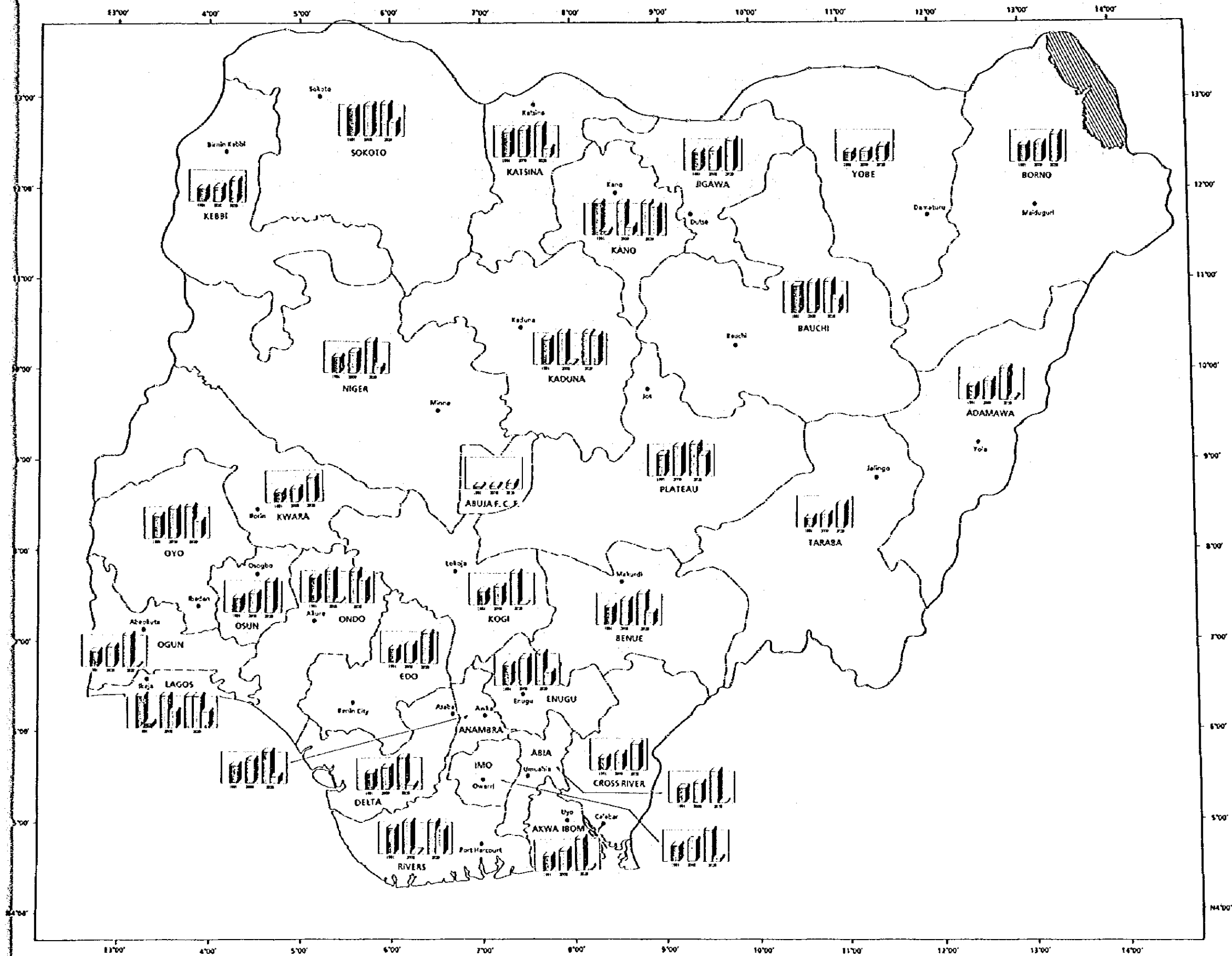
THE FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF WATER RESOURCES
AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
THE NATIONAL WATER RESOURCES MASTER PLAN
(NWRMP)

**ADMINISTRATIVE BOUNDARY
AND 1991 LGA POPULATION**

JAPAN INTERNATIONAL COOPERATION AGENCY
SANYU & SUJIKO

MAP No.
1-4/4

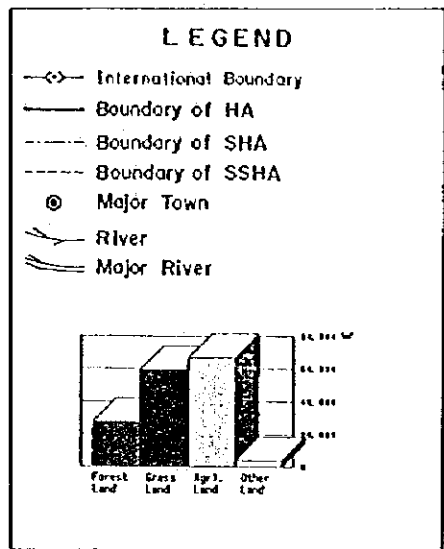
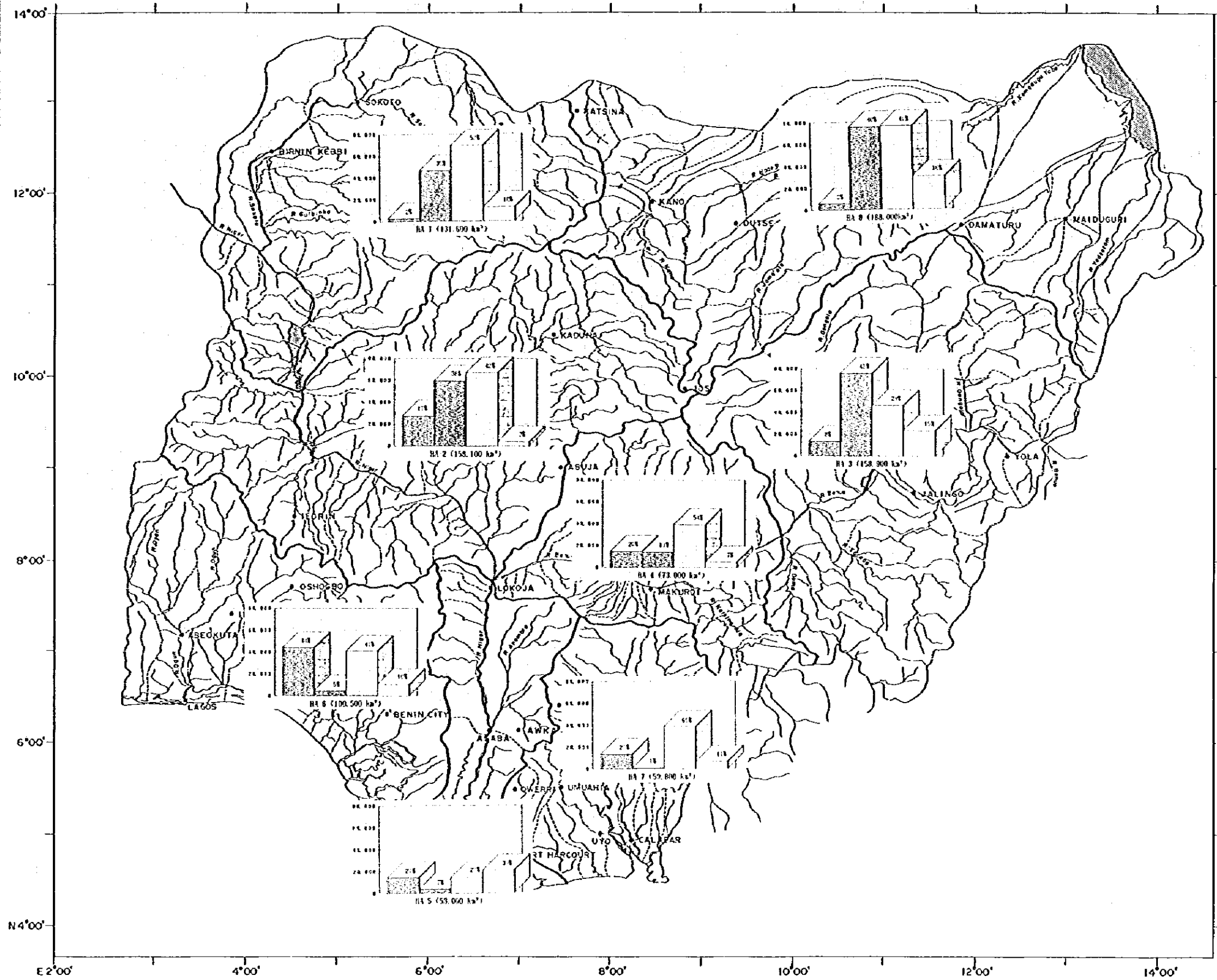


THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN
 (NWRMP)

STATE DEMOGRAPHY

JAPAN INTERNATIONAL COOPERATION AGENCY MAP No. 2
 SANJYU & SUMIKO

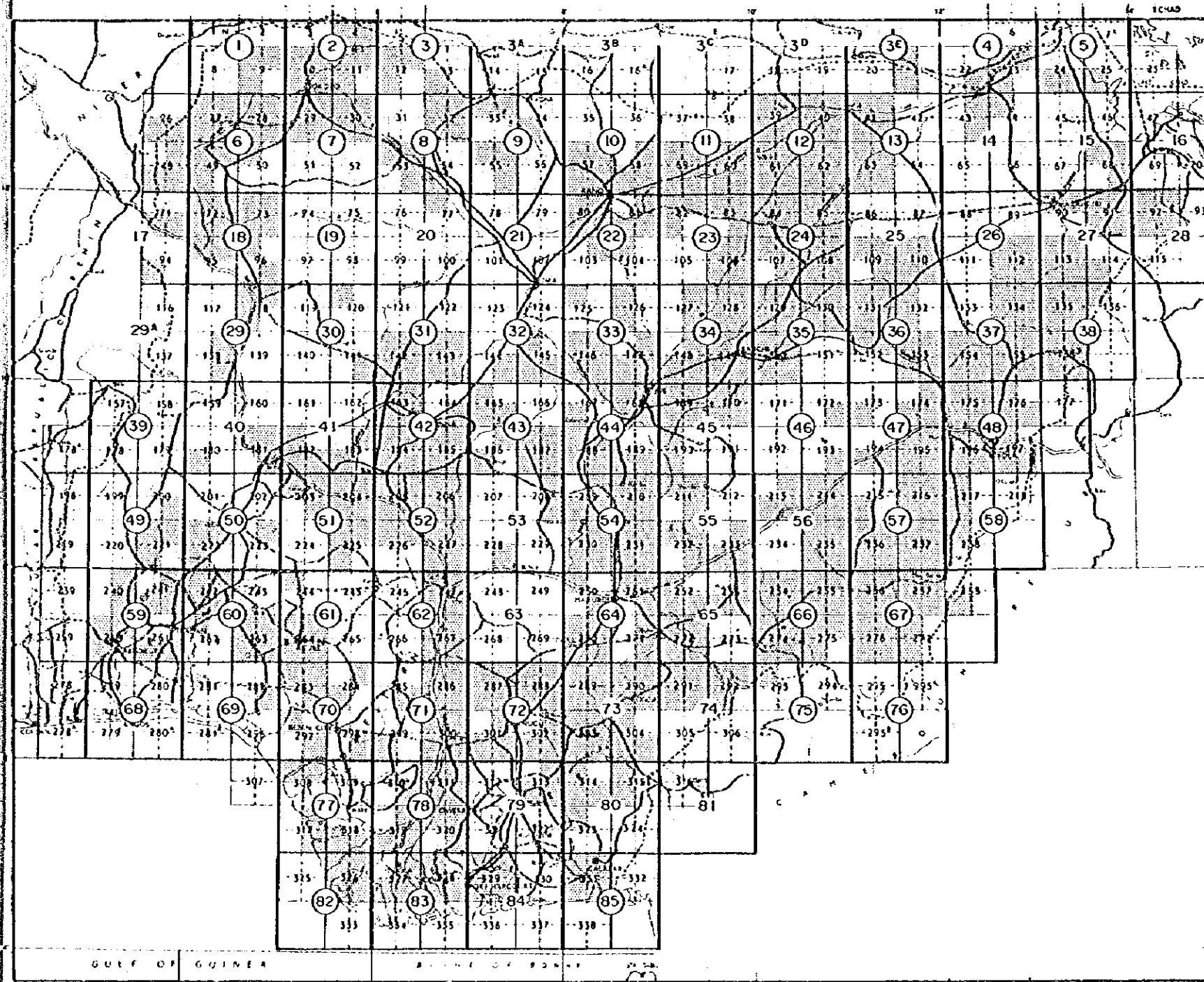


THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN
 (NWRMP)

PRESENT LAND USE

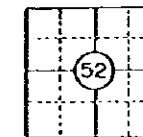
JAPAN INTERNATIONAL COOPERATION AGENCY MAP No. 3
 SANYU & SUMIKO



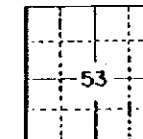
GENERAL LEGEND

- International Boundary
- Trunk Road
- Major River
- Major Town

SPECIFIC LEGEND



The 1:250,000 map with the Index number circled which was available for the JICA Study



The 1:250,000 map with the Index number not circled which was not available for the JICA Study

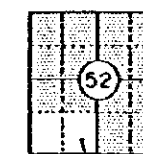


The 1:50,000 map which was available for the JICA Study



The 1:50,000 map which was not available for the JICA Study

Note: Since this would be rather complicated for understanding, an illustrative example of the 1:250,000 map numbered at 52 which was available for the JICA Study is shown below;



available

not available

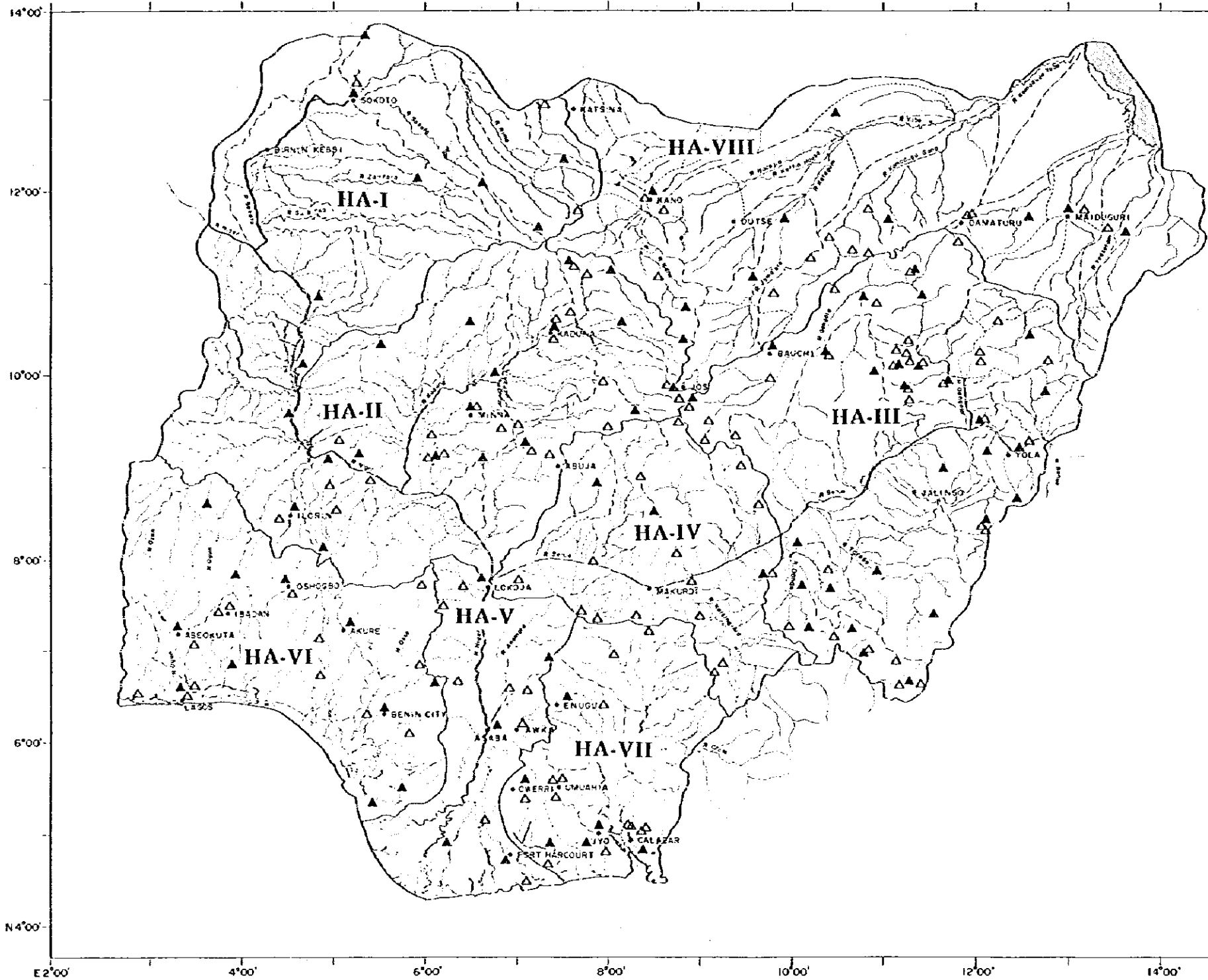
THE FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
AND RURAL DEVELOPMENT (FARAD)

THE STUDY OF
THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

INDEX OF FSN MAPS AVAILABLE
FOR NWRMP STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY
SAHYO 8 SERIES

MAP No.
4



LEGEND

- International Boundary
- Boundary of HA
- Boundary of SHA
- Boundary of SSHA
- Major Town
- ~ River
- ~ Major River
- △ Major Rainfall Station
- ▲ Selected Major Rainfall Station



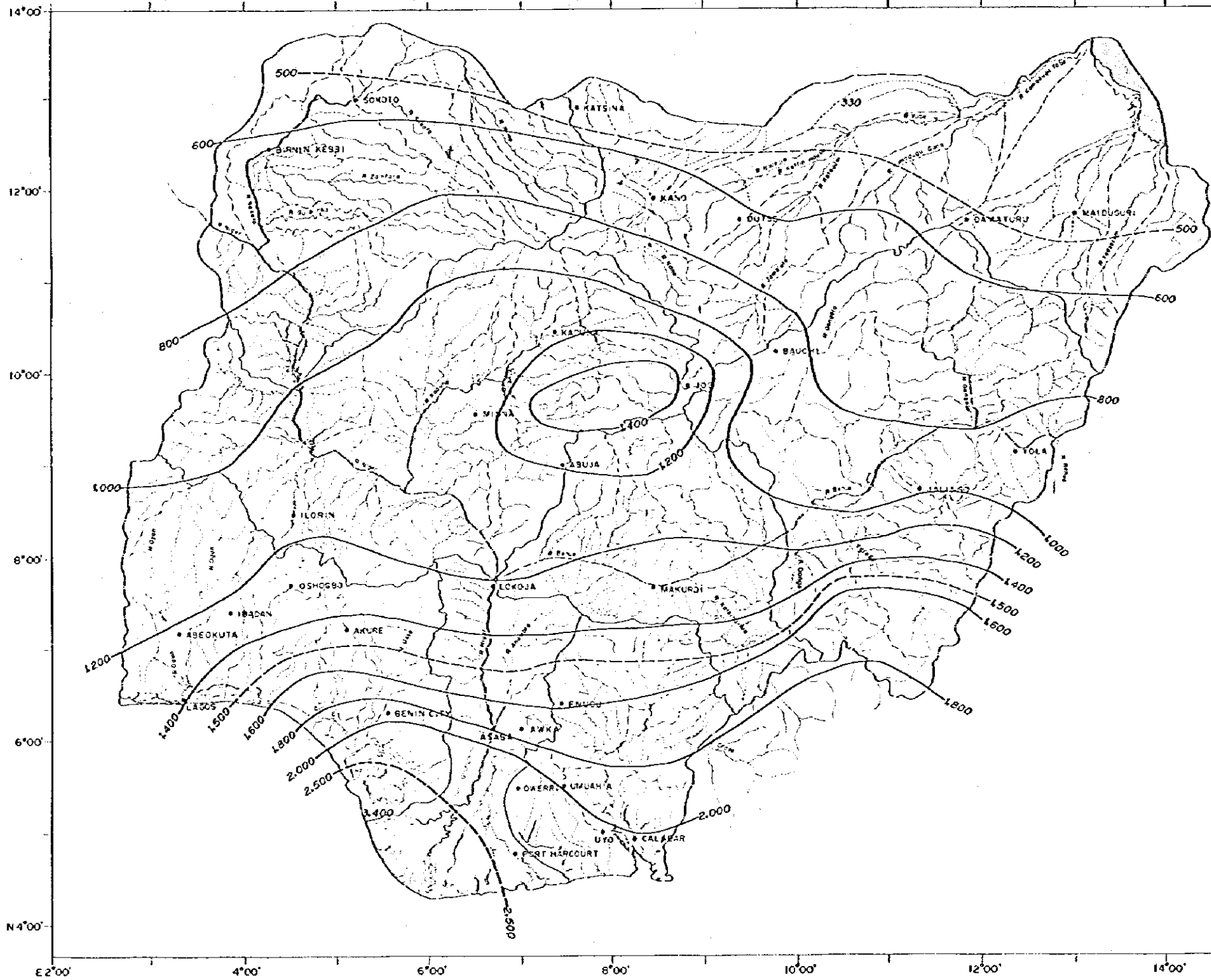
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
 AND RURAL DEVELOPMENT (FARMRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

MAJOR RAINFALL STATIONS

JAPAN INTERNATIONAL COOPERATION AGENCY
 SANYO & SERIES

RAP No.
 5



LEGEND

- International Boundary
- Boundary of HA
- - - Boundary of SHA
- - - Boundary of SSHA
- ⊙ Major Town
- ~ River
- == Major River

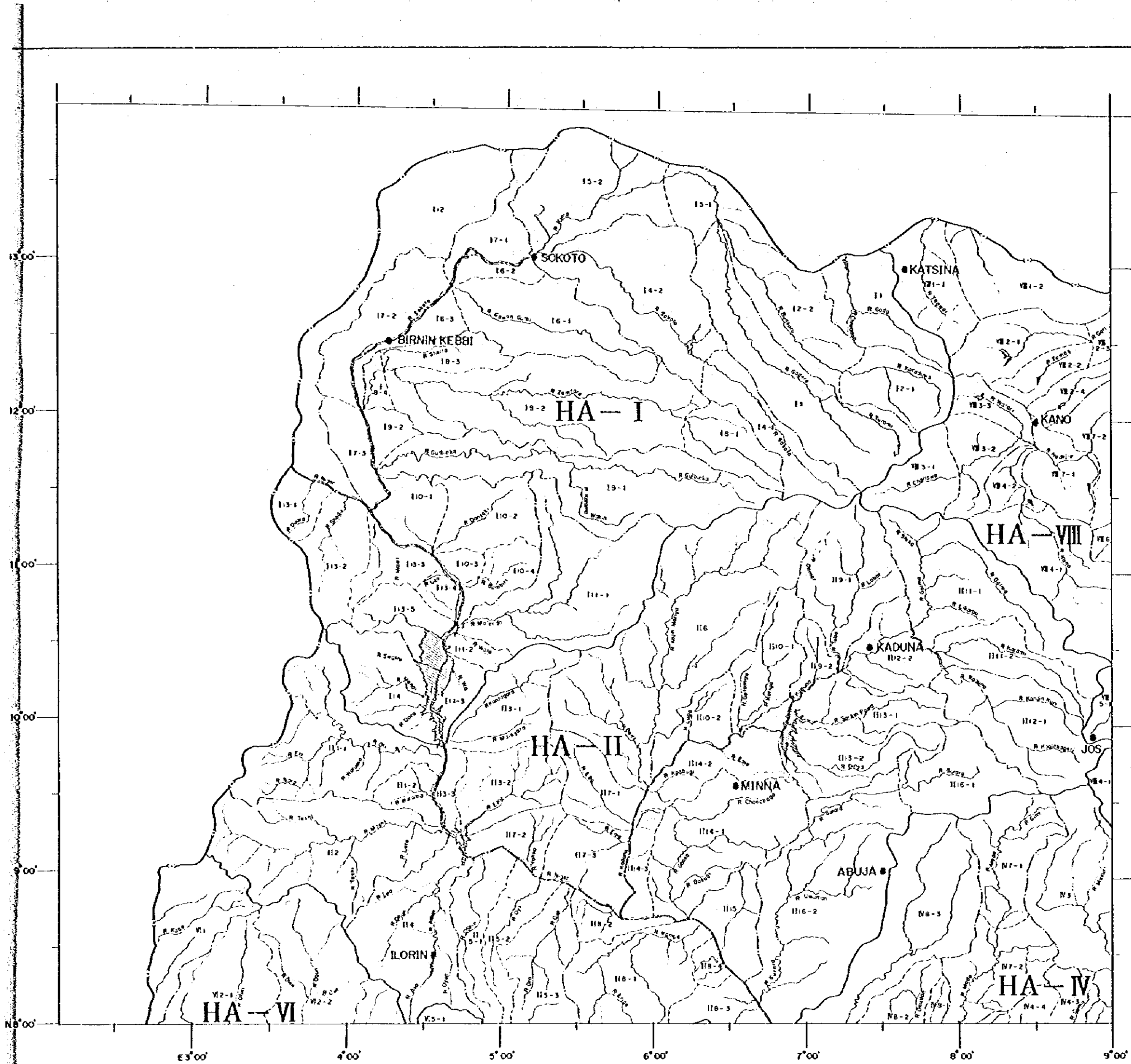


THE FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
AND RURAL DEVELOPMENT (FARWARD)

THE STUDY ON
THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

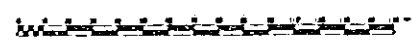
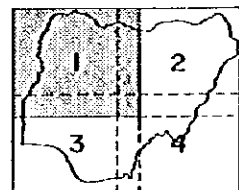
ISOHYTAL MAP (1980-1985)

JAPAN INTERNATIONAL COOPERATION AGENCY SAKYO K. SCH. 13	MAP No. 6
--	--------------

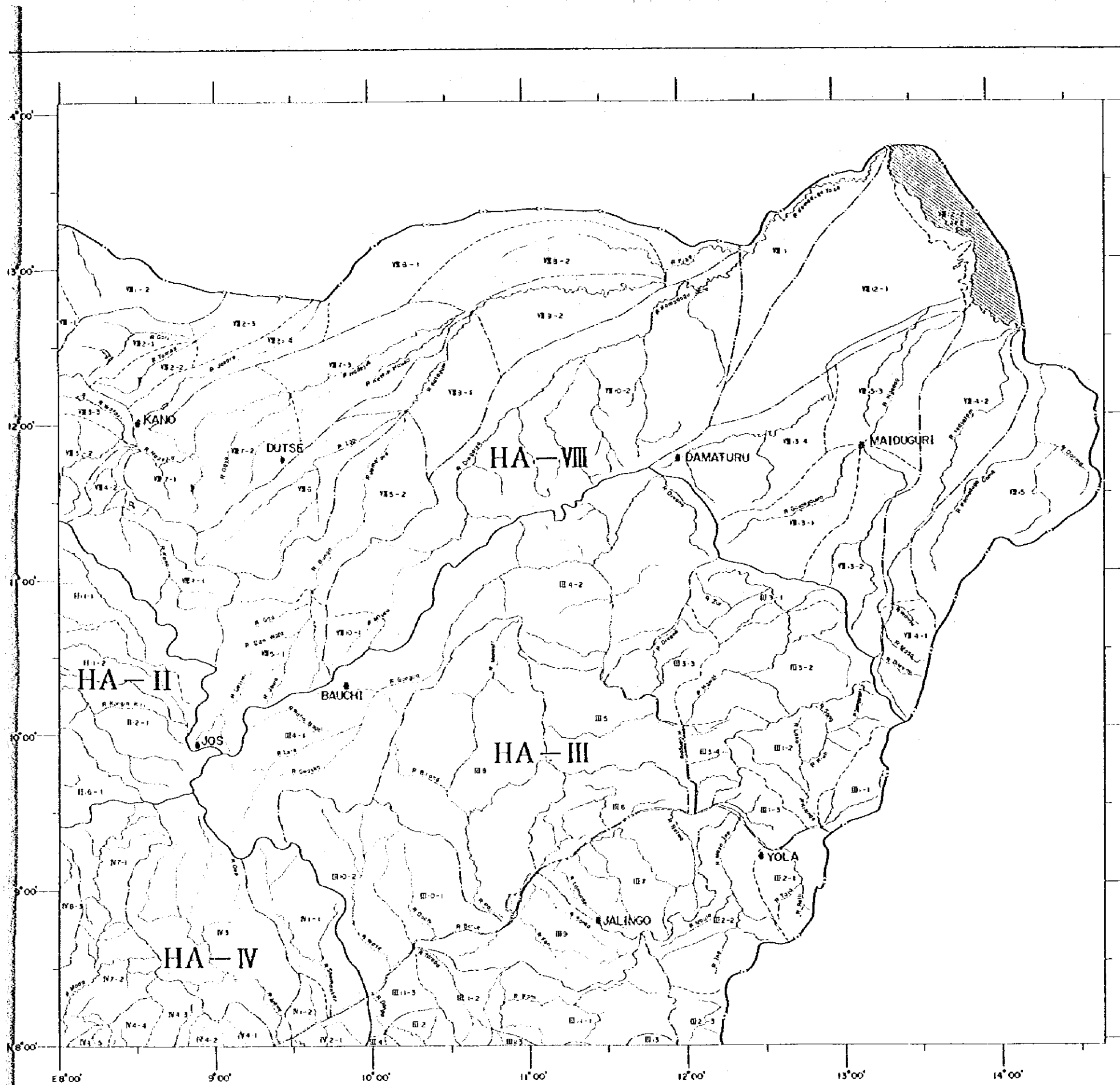


LEGEND

- <—> International Boundary
- Boundary of HA
- - - - - Boundary of SHA
- - - - - Boundary of SSHA
- Major Town
- River
- Major River
- v0-2 SSHA Code No.

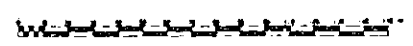
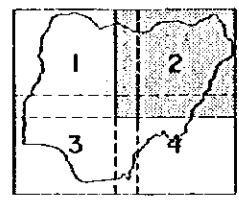


THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES AND RURAL DEVELOPMENT (FAR/RD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
HYDROLOGICAL AREA SUB-DIVISIONS	
JAPAN INTERNATIONAL COOPERATION AGENCY SANYO & SUNIED	MAP No. 1-1/4



LEGEND

- <—> International Boundary
- Boundary of HA
- - - - - Boundary of SHA
- - - - - Boundary of SSHA
- Major Town
- River
- Major River
- VI0-2 SSHA Code No.



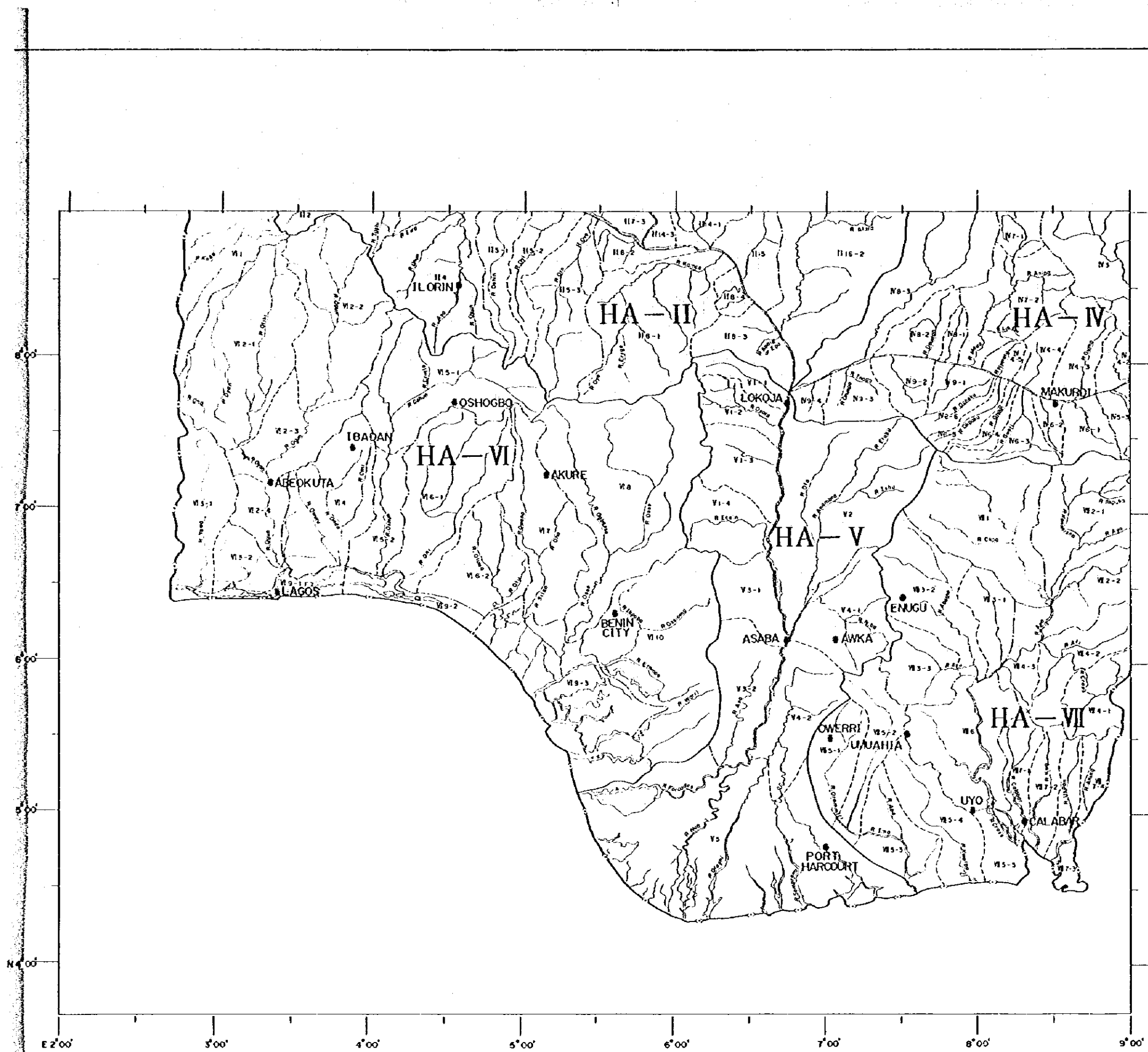
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
 AND RURAL DEVELOPMENT (EMRWD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

HYDROLOGICAL AREA
 SUB-DIVISIONS

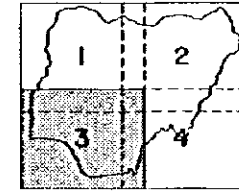
JAPAN INTERNATIONAL COOPERATION AGENCY
 SANGU & SCHIED

RMP No.
 7-2/4

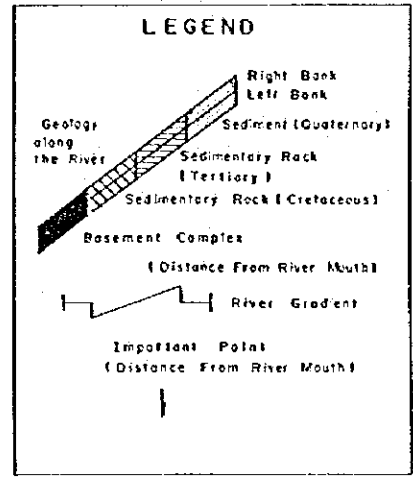
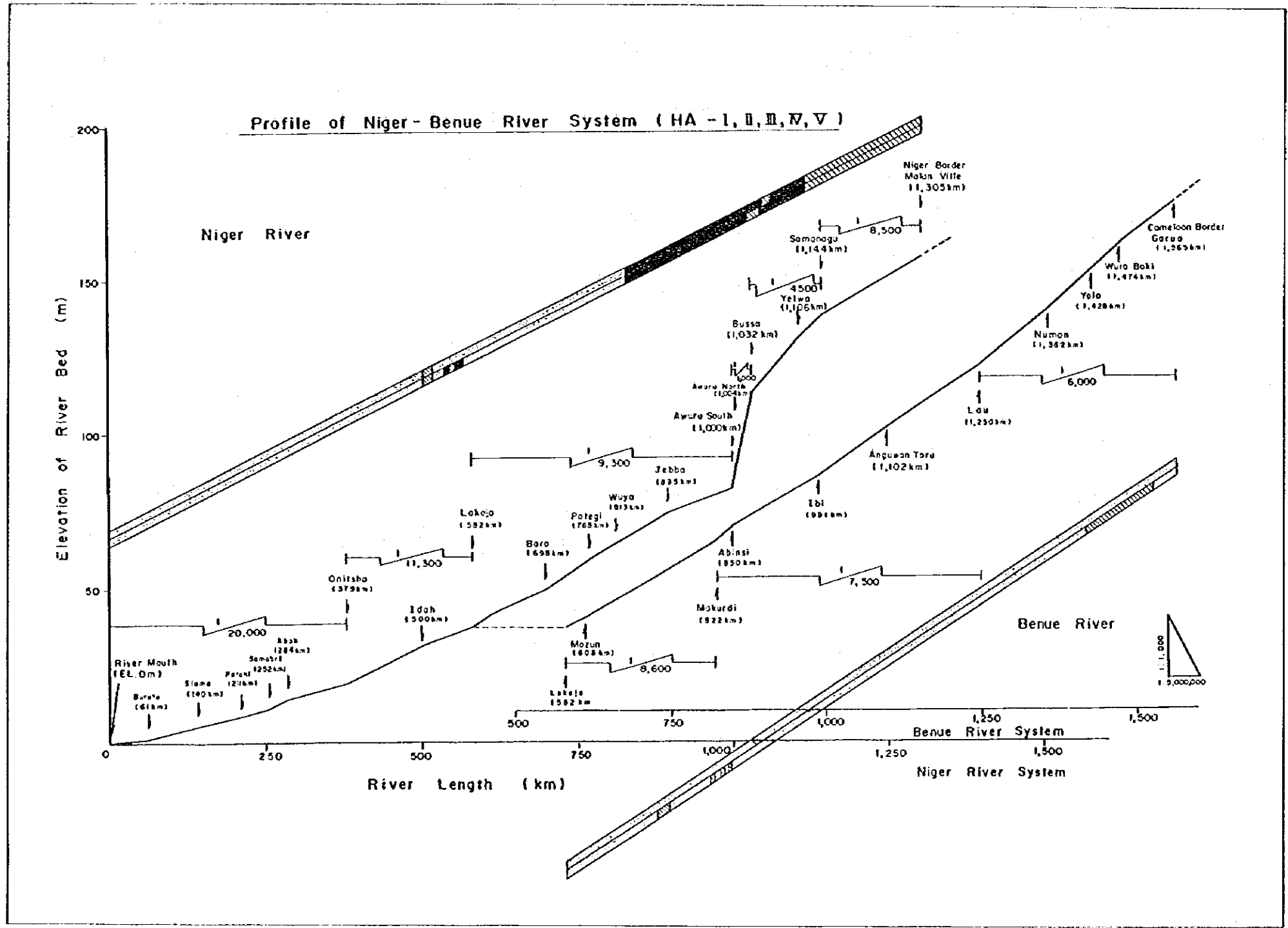


LEGEND

- <—> International Boundary
- Boundary of HA
- - - - - Boundary of SHA
- - - - - Boundary of SSHA
- Major Town
- River
- Major River
- VI-2 SSHA Code No.



THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES AND RURAL DEVELOPMENT (FAWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
HYDROLOGICAL AREA SUB-DIVISIONS	
JAPAN INTERNATIONAL COOPERATION AGENCY SARUB & SAKIHO	MAP No. 7-5/4

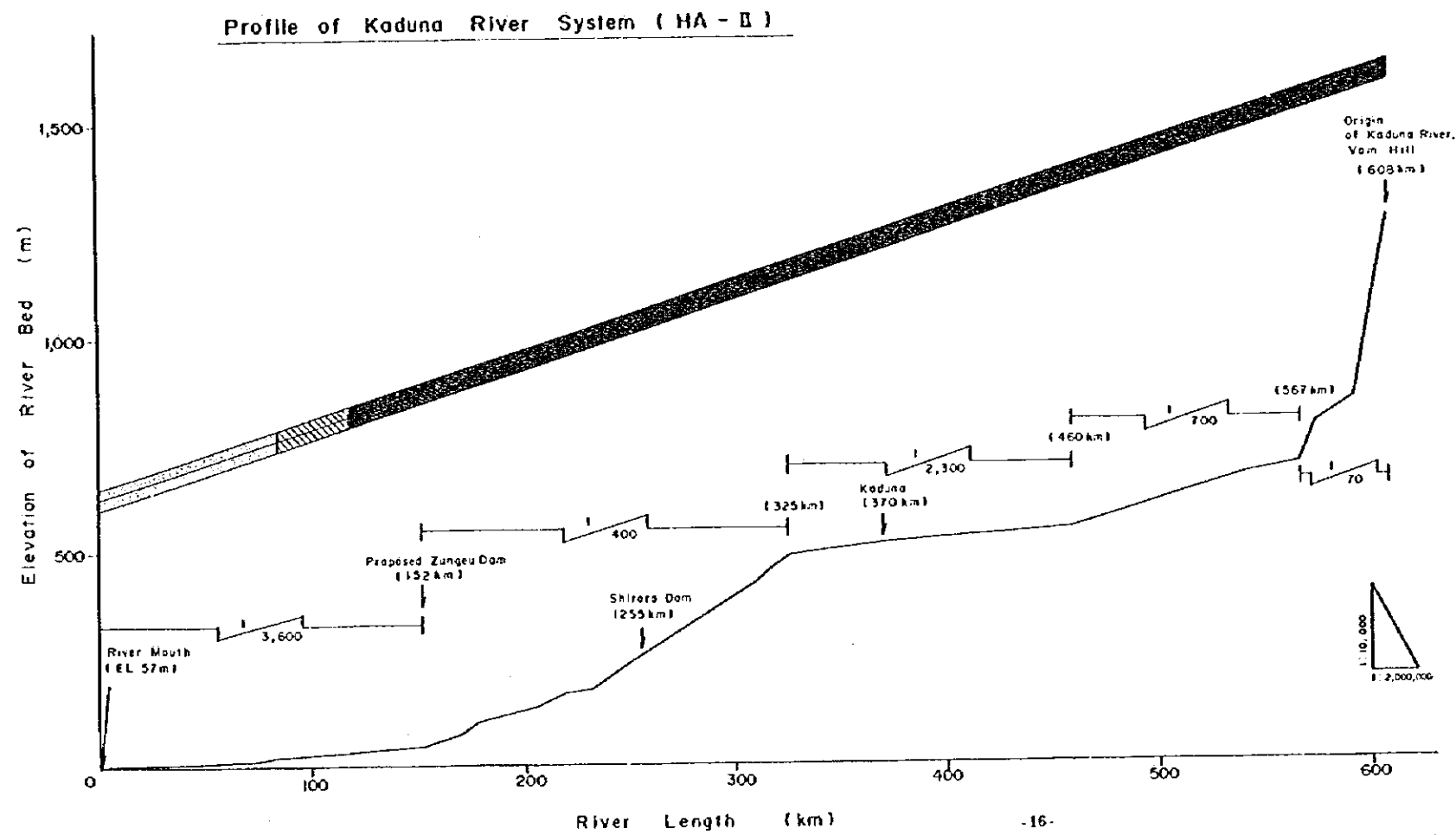
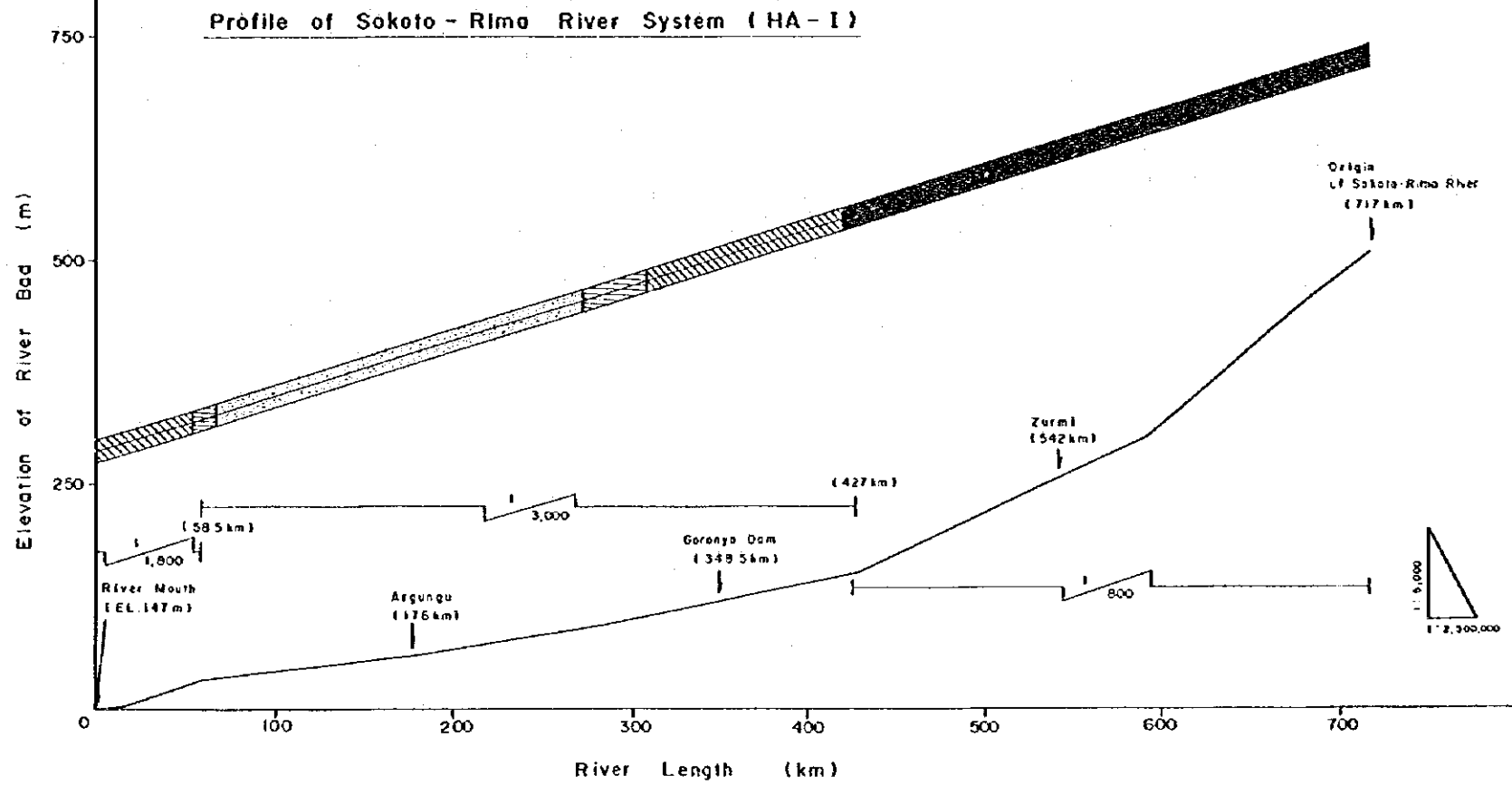


THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND POWER DEVELOPMENT (FWRPD)

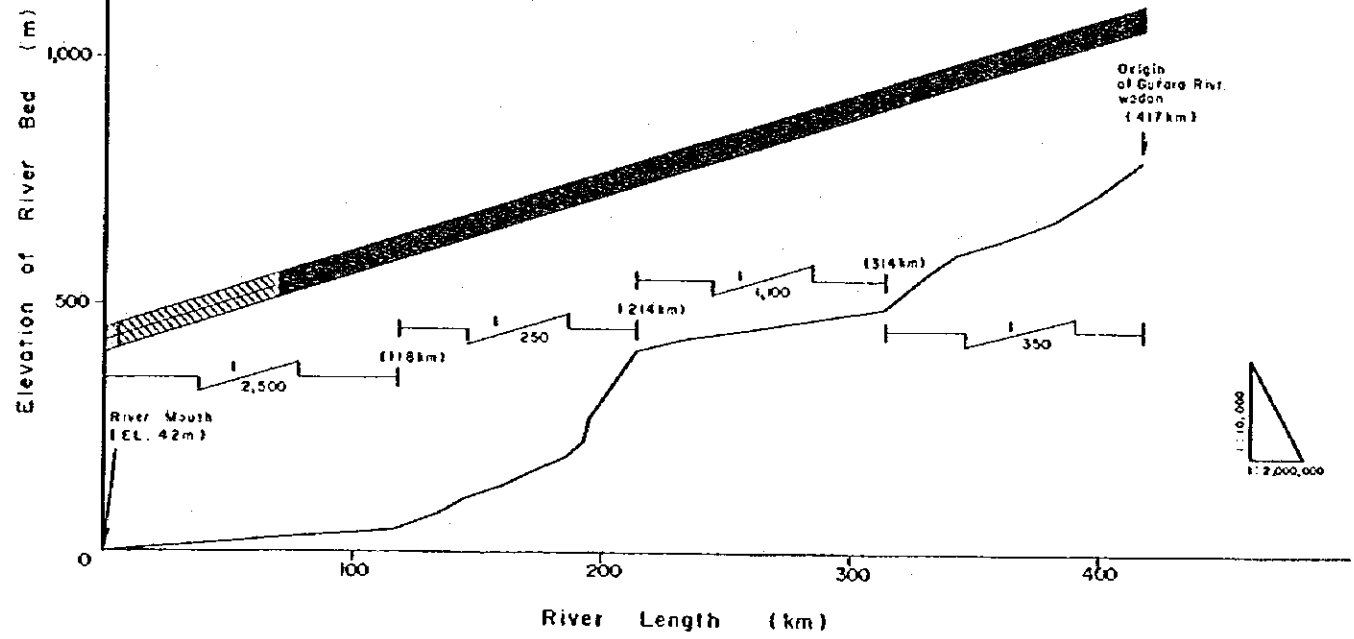
THE STUDY ON
 THE NIGERIAN WATER RESOURCES MASTER PLAN (AWRMP)

PROFILE OF MAIN RIVER SYSTEMS

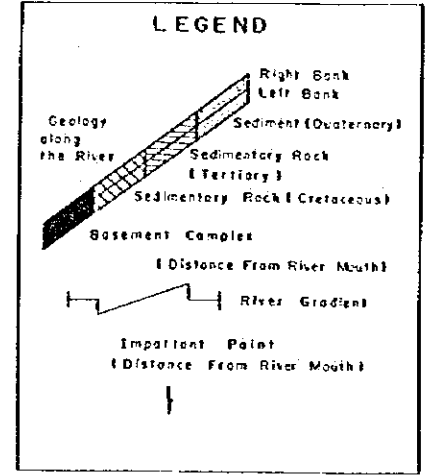
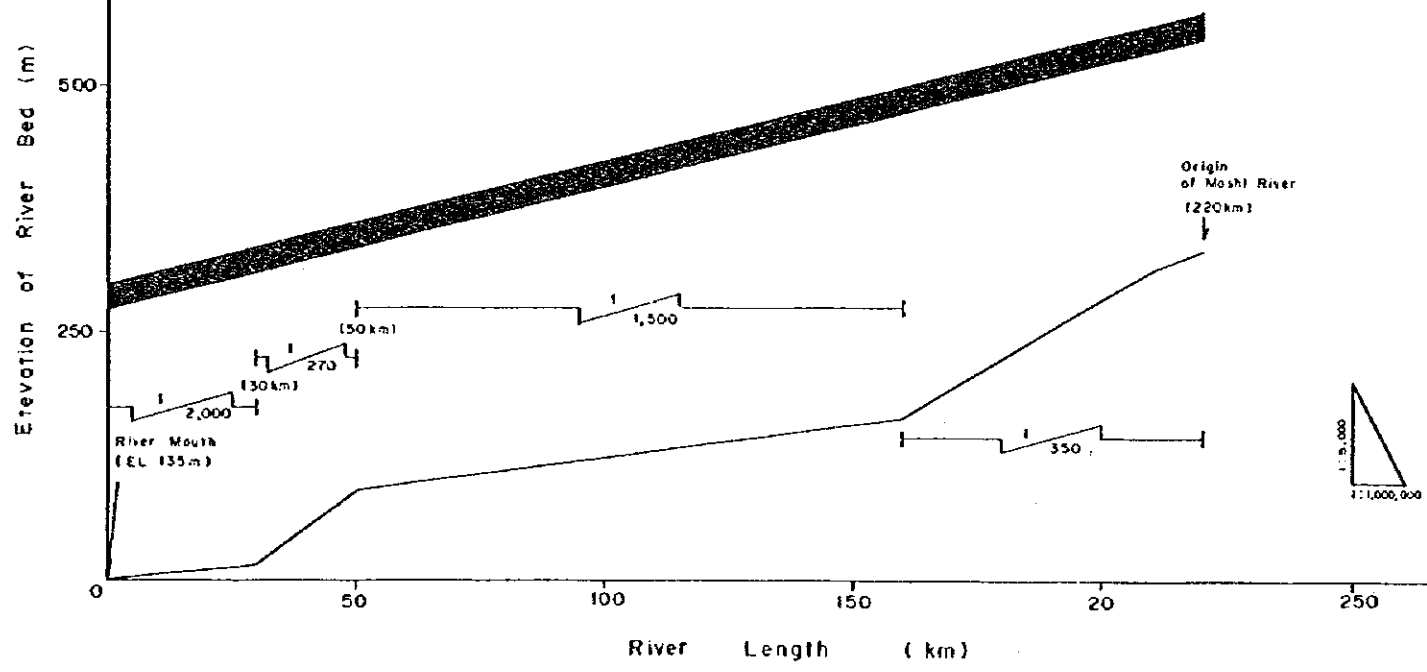
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) No. B-1/11
 SANYU & SUNIED



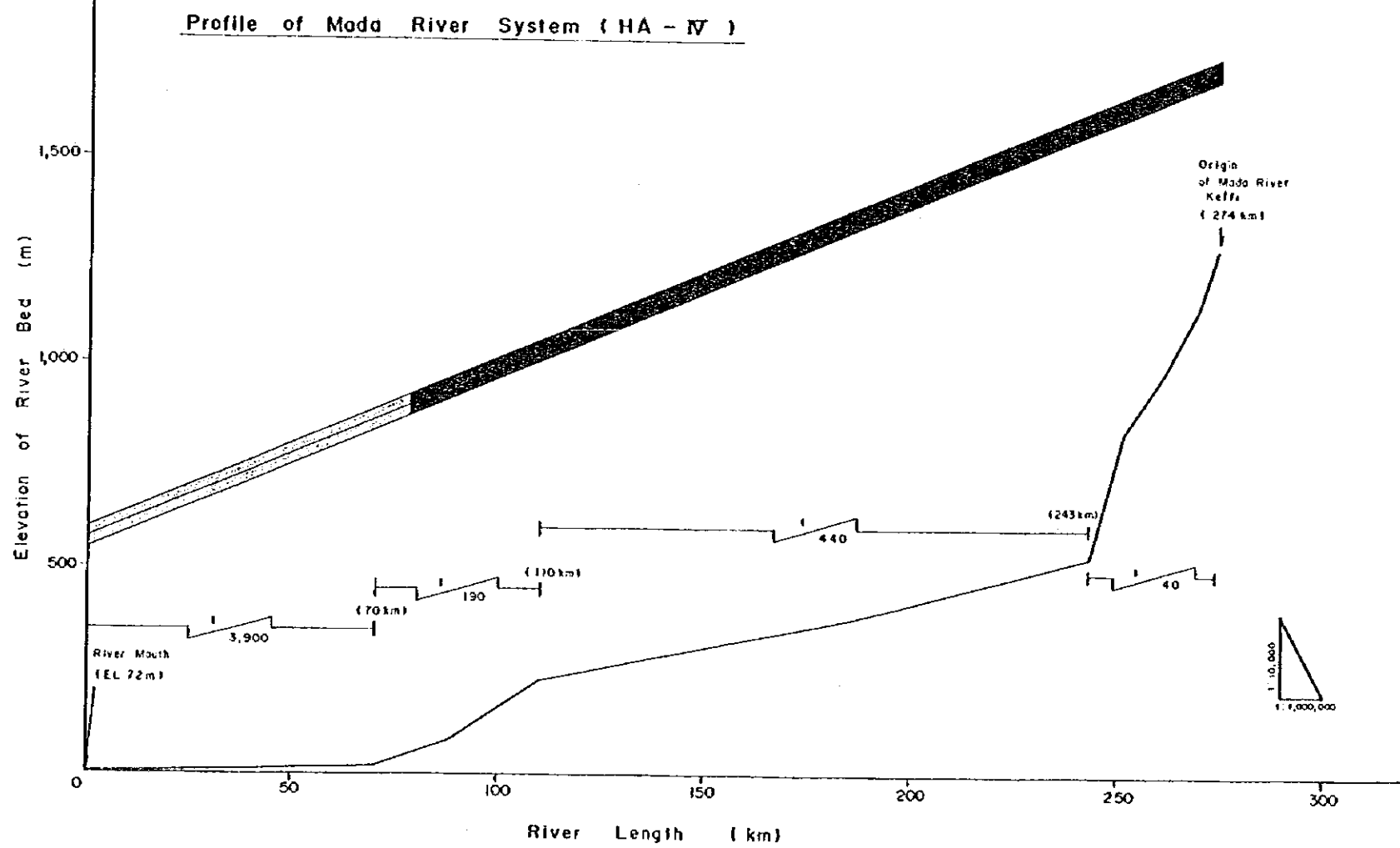
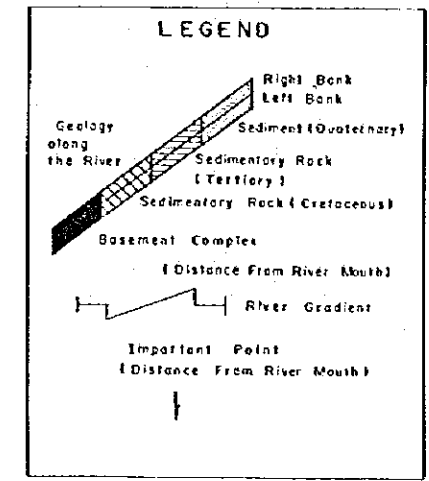
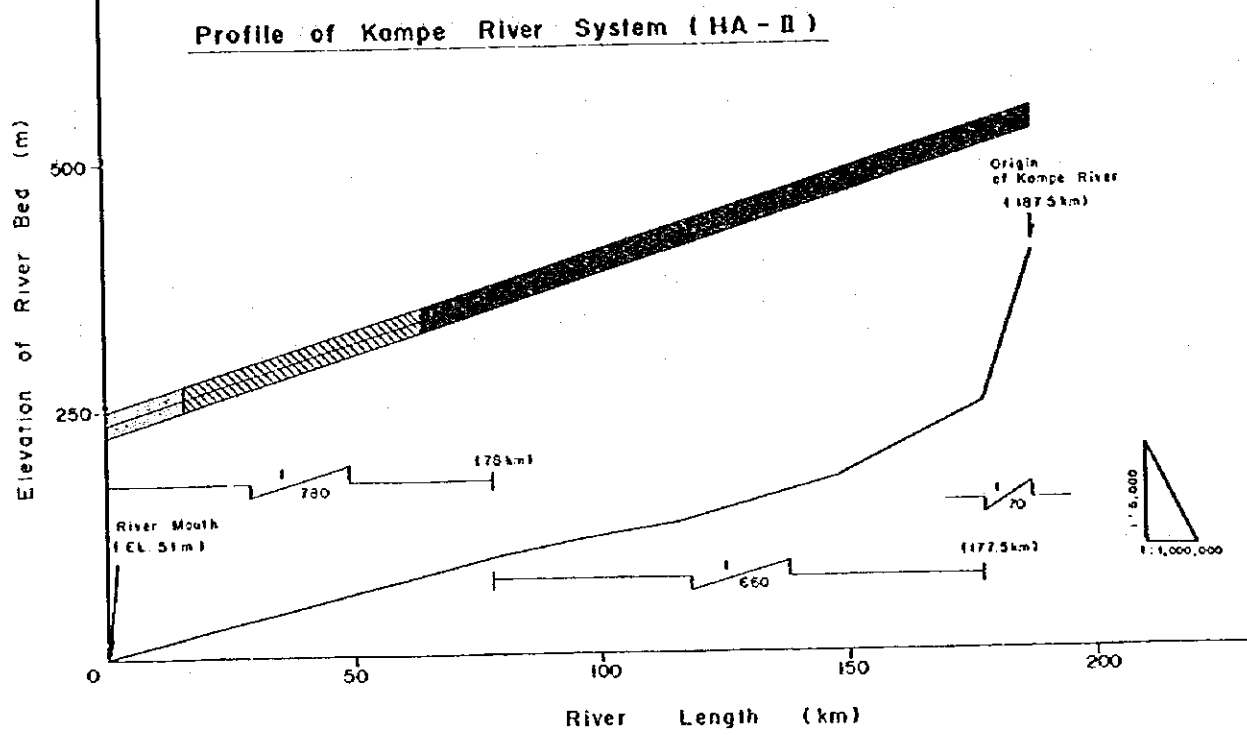
Profile of Gurara River System (HA - II)



Profile of Moshi River System (HA - II)

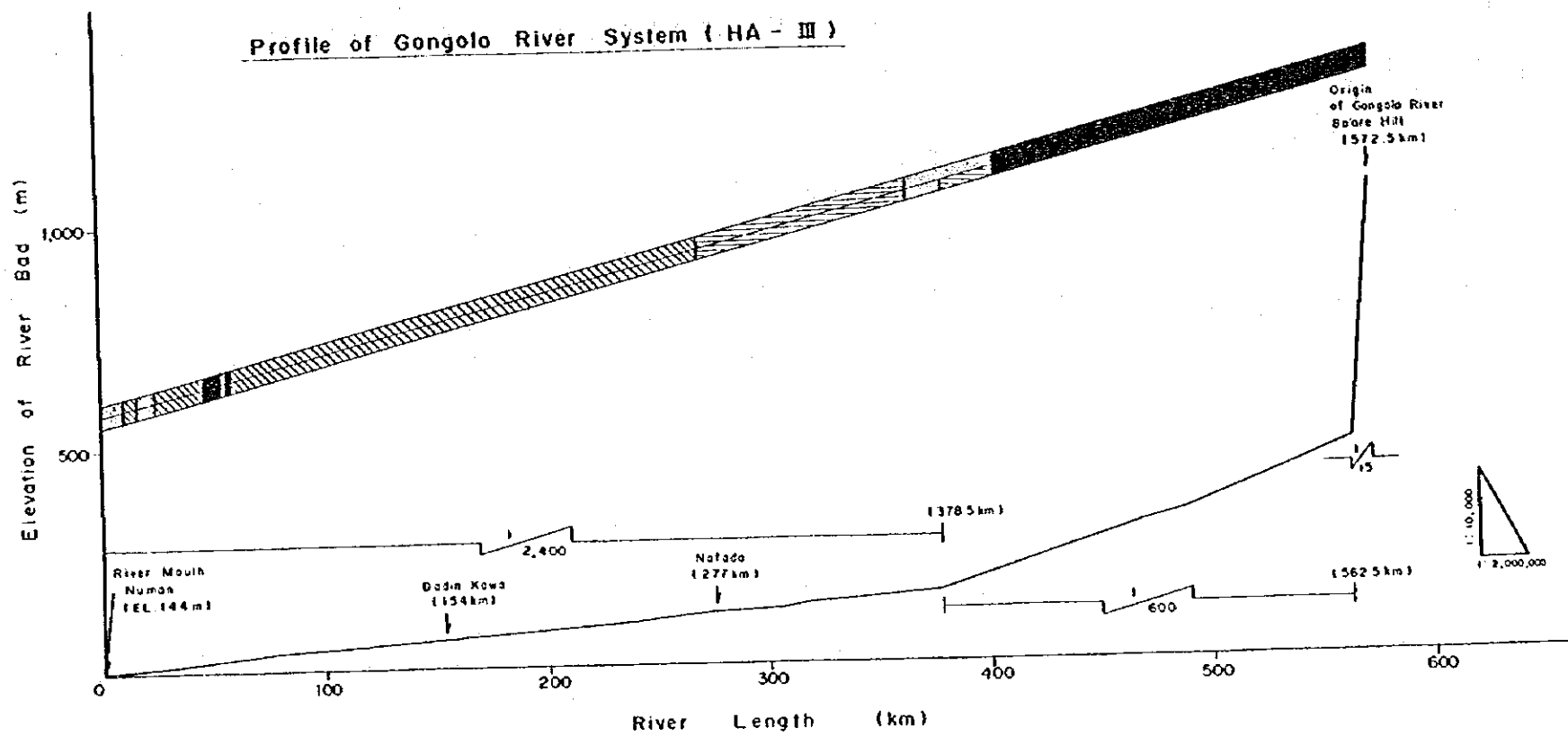


THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FRWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	FIG No.
SANYU & LIMITED	9-3/11

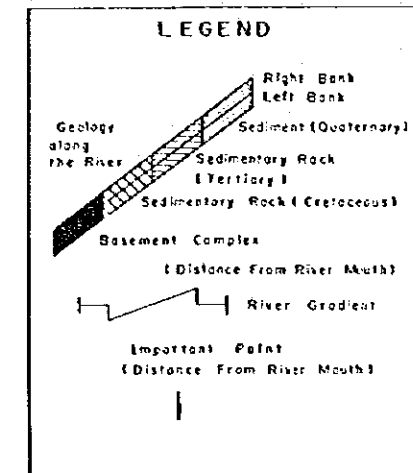
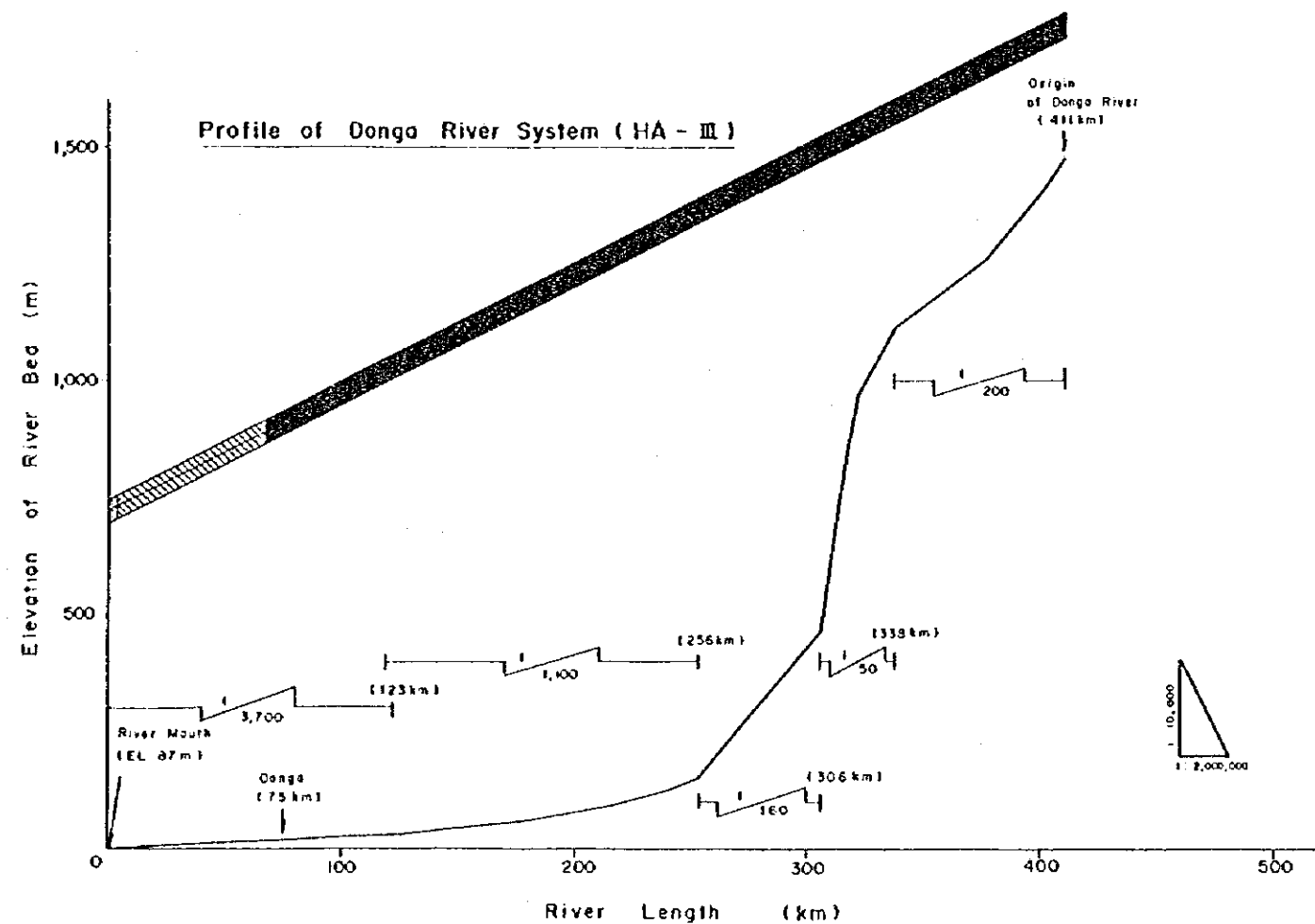


THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	DWG No.
SANYU & SUNTOS	0-4/11

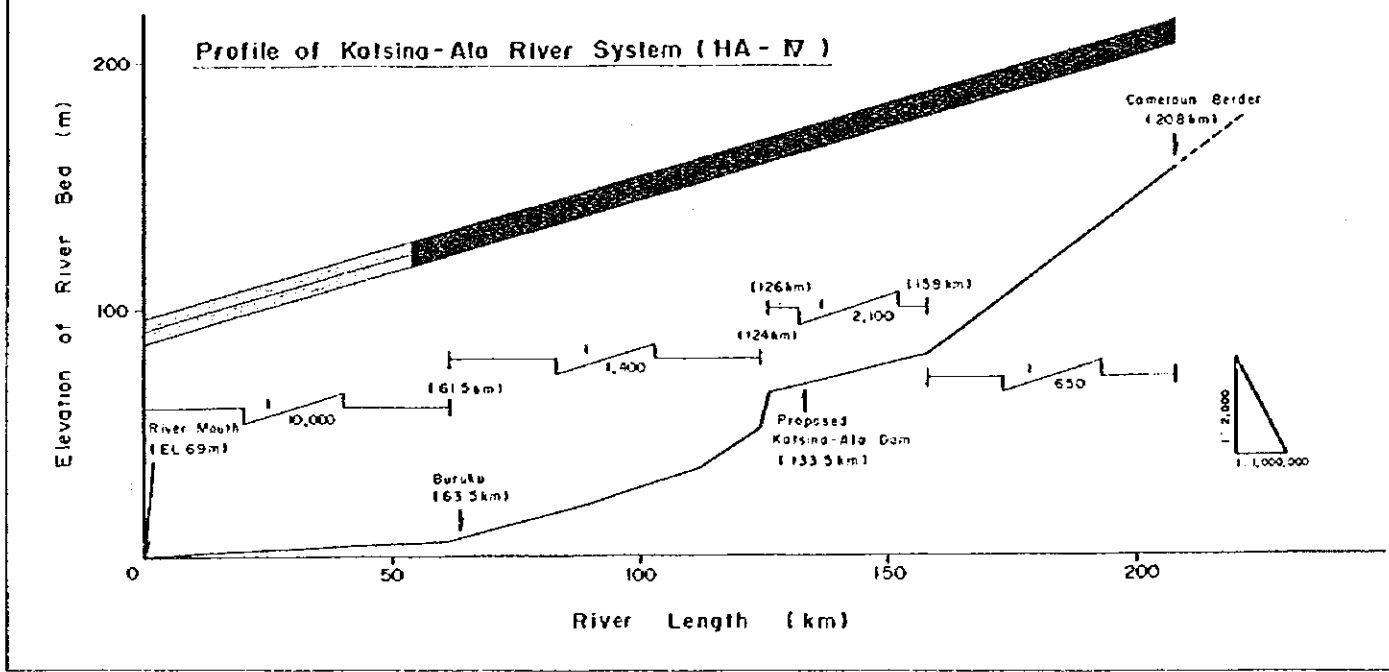
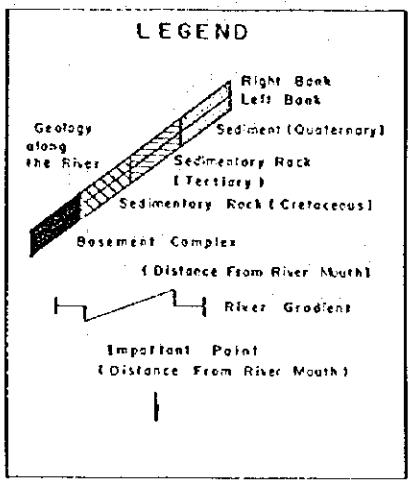
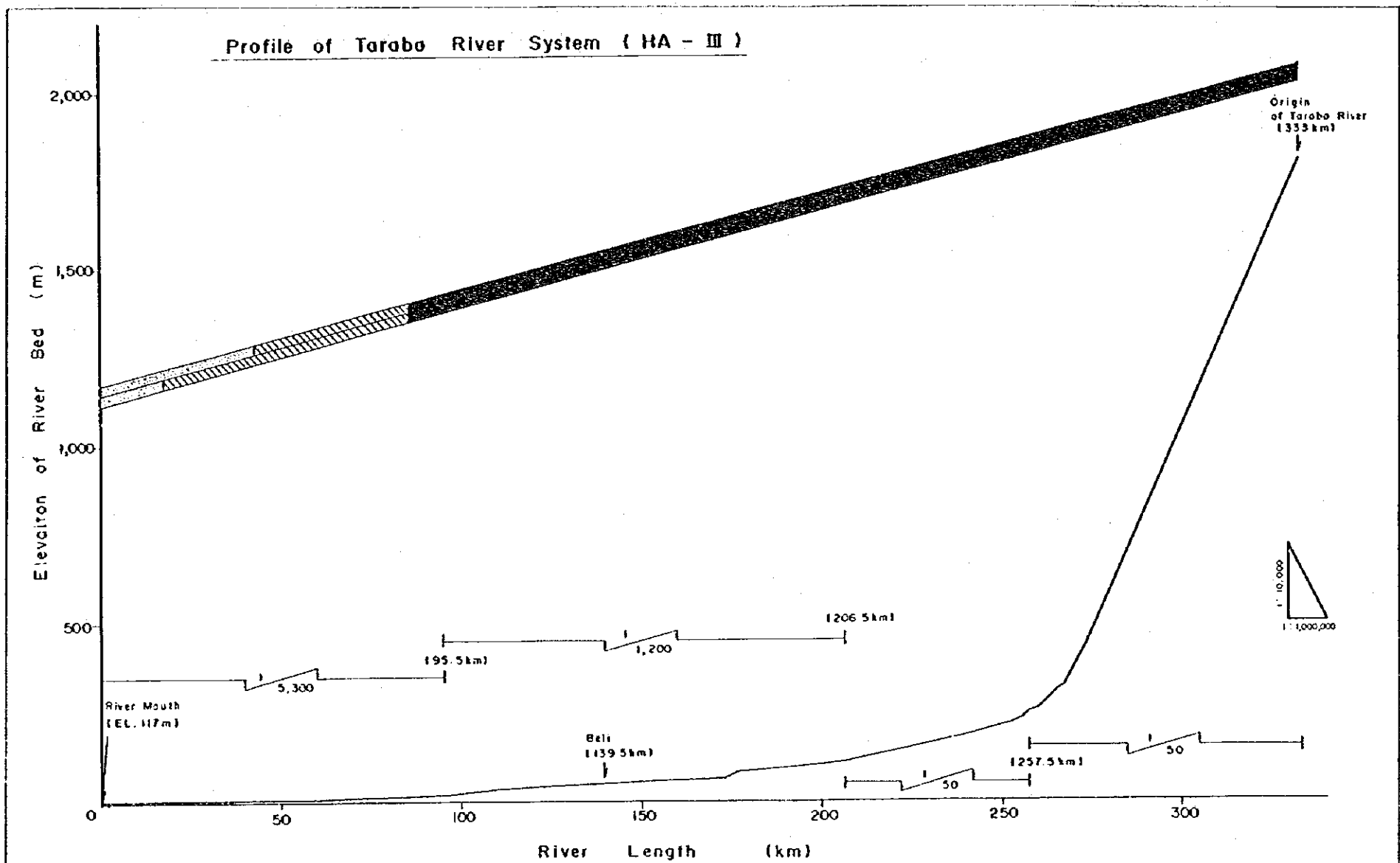
Profile of Gongolo River System (HA - III)



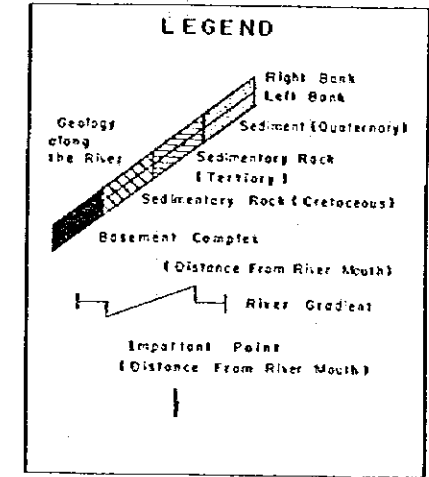
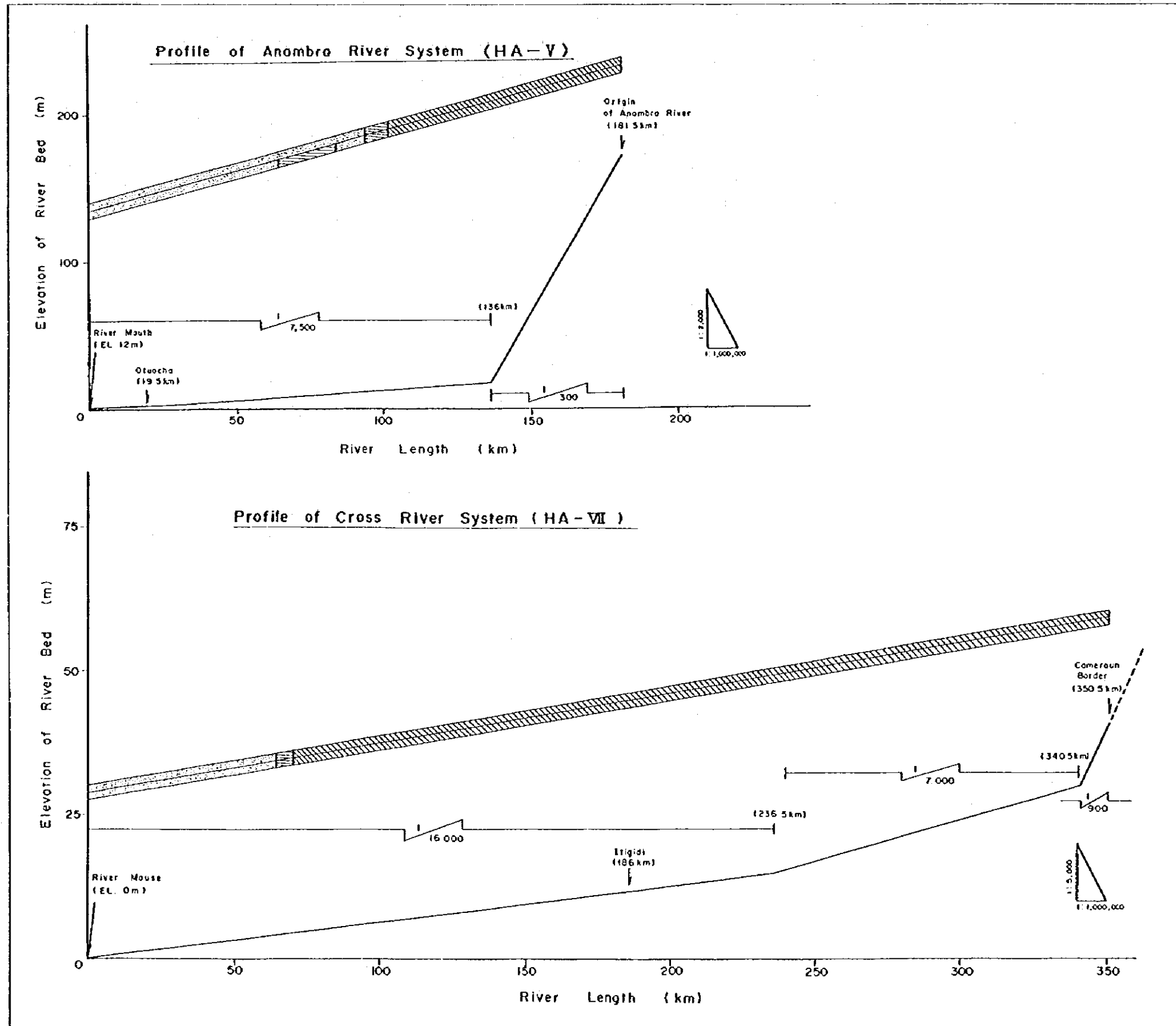
Profile of Donga River System (HA - III)



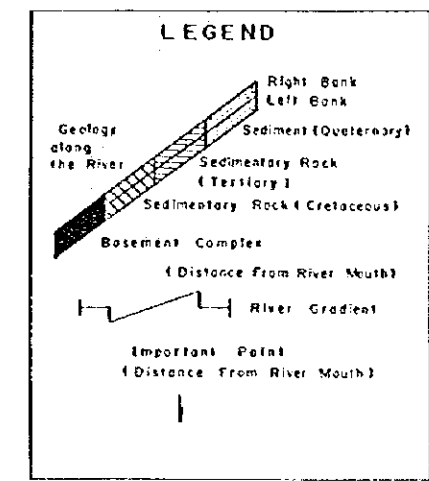
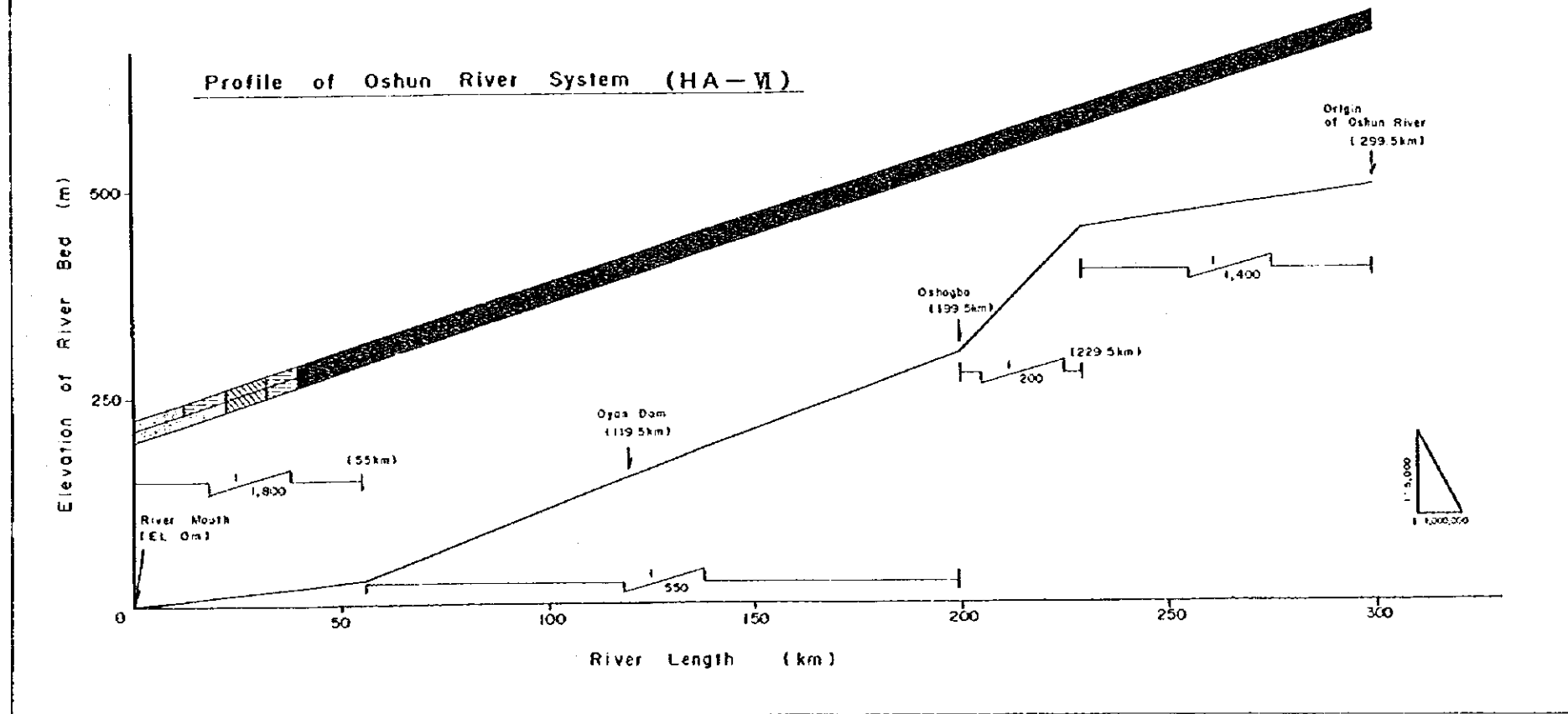
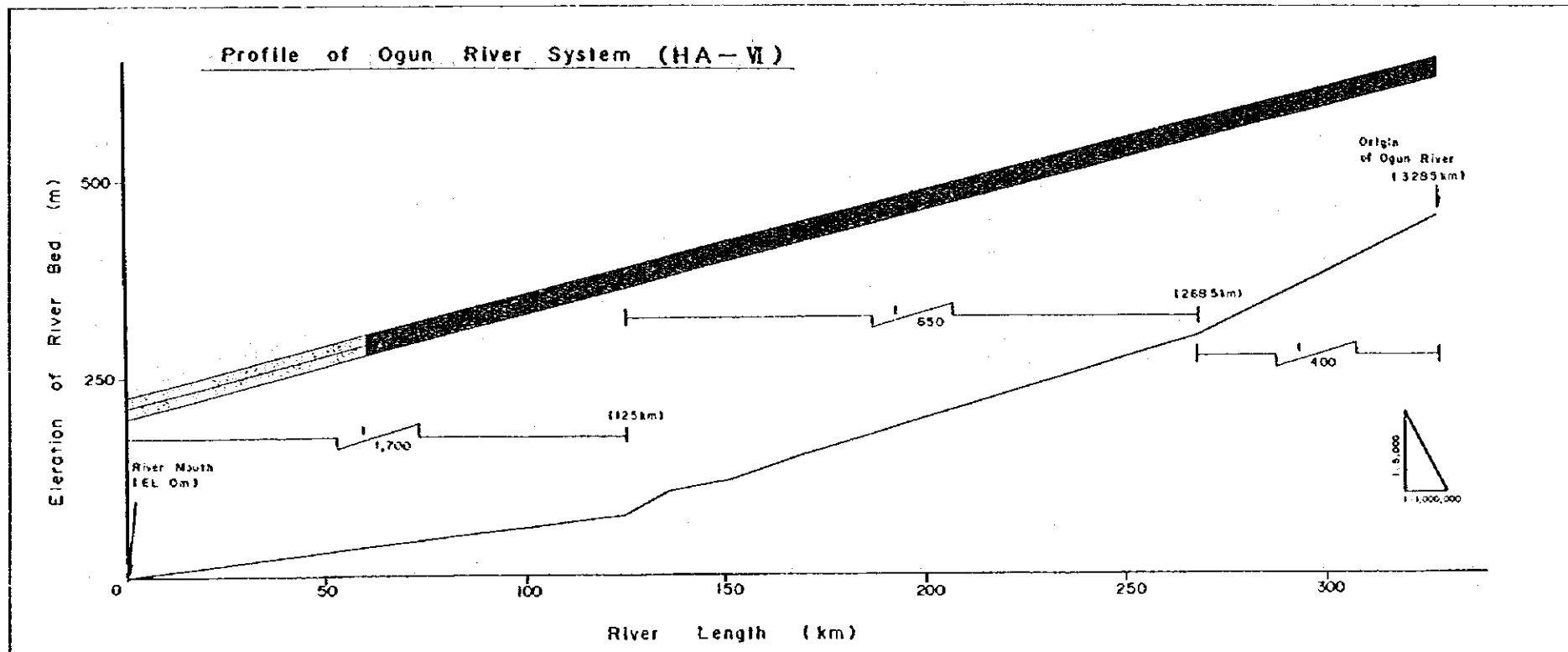
THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	ENG. No.
SUNYU & SUNIBO	D-5/11



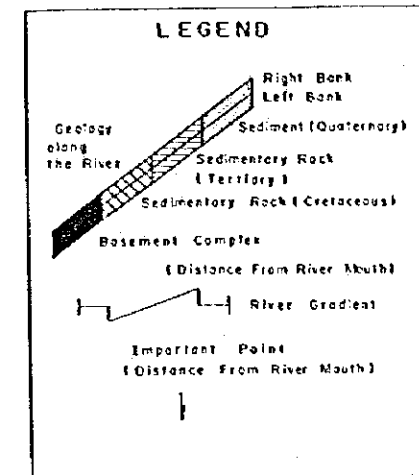
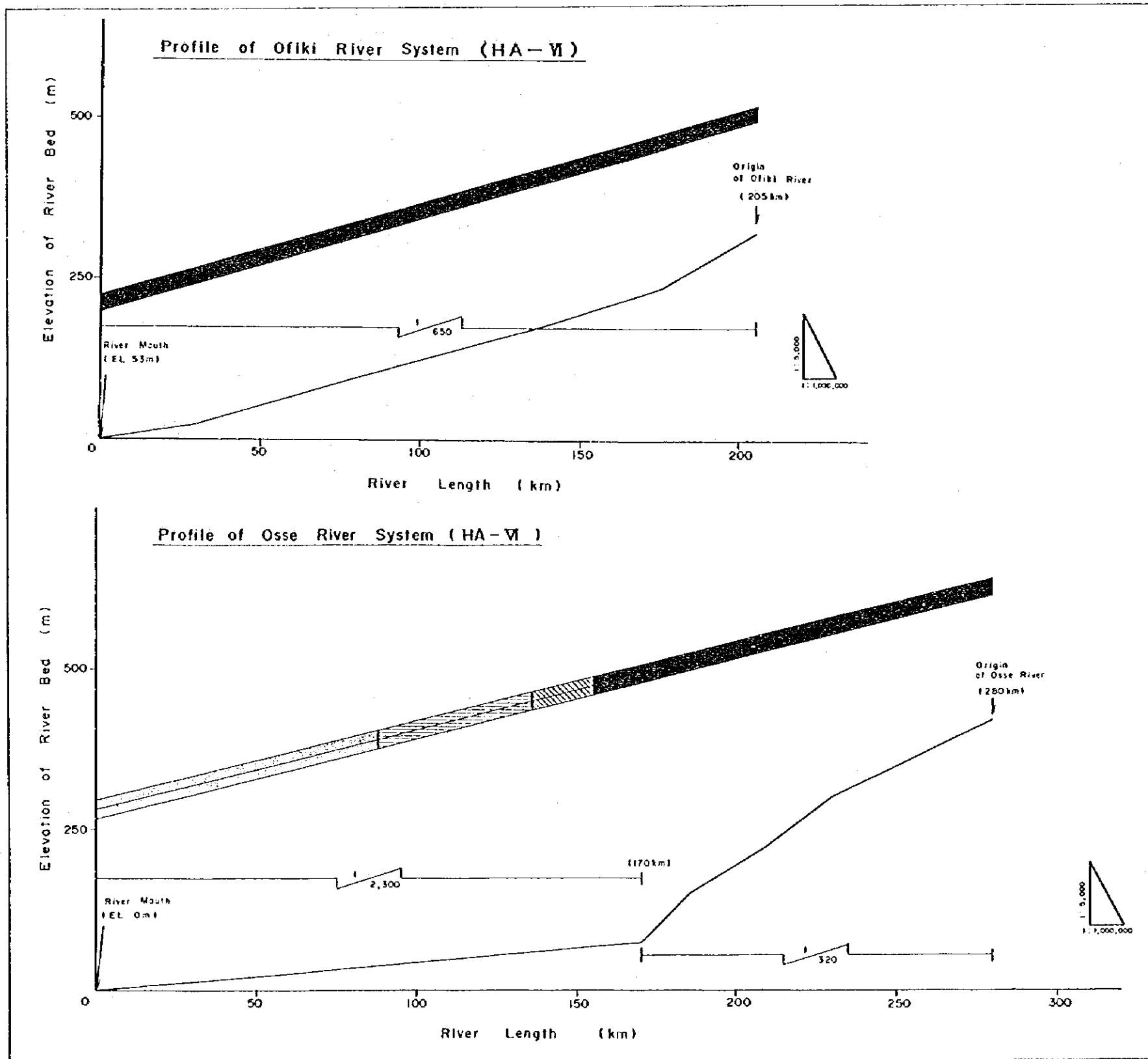
THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FORWARD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (RURAD)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	DRG No.
SANYU & SURIED	9-8/11



THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	DAI NIPPON KAIEN KAISHA
SAKUYA & SAKUYA	8-7/11

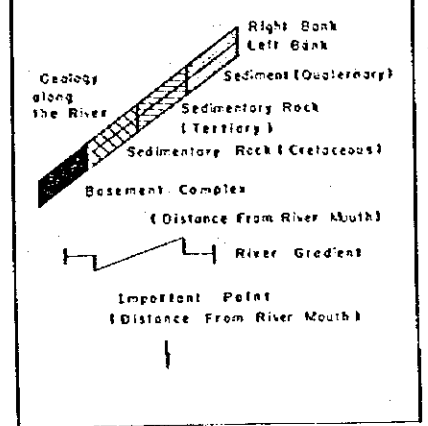


THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	DRG No.
SANJU & SUMIDA	0/8/11

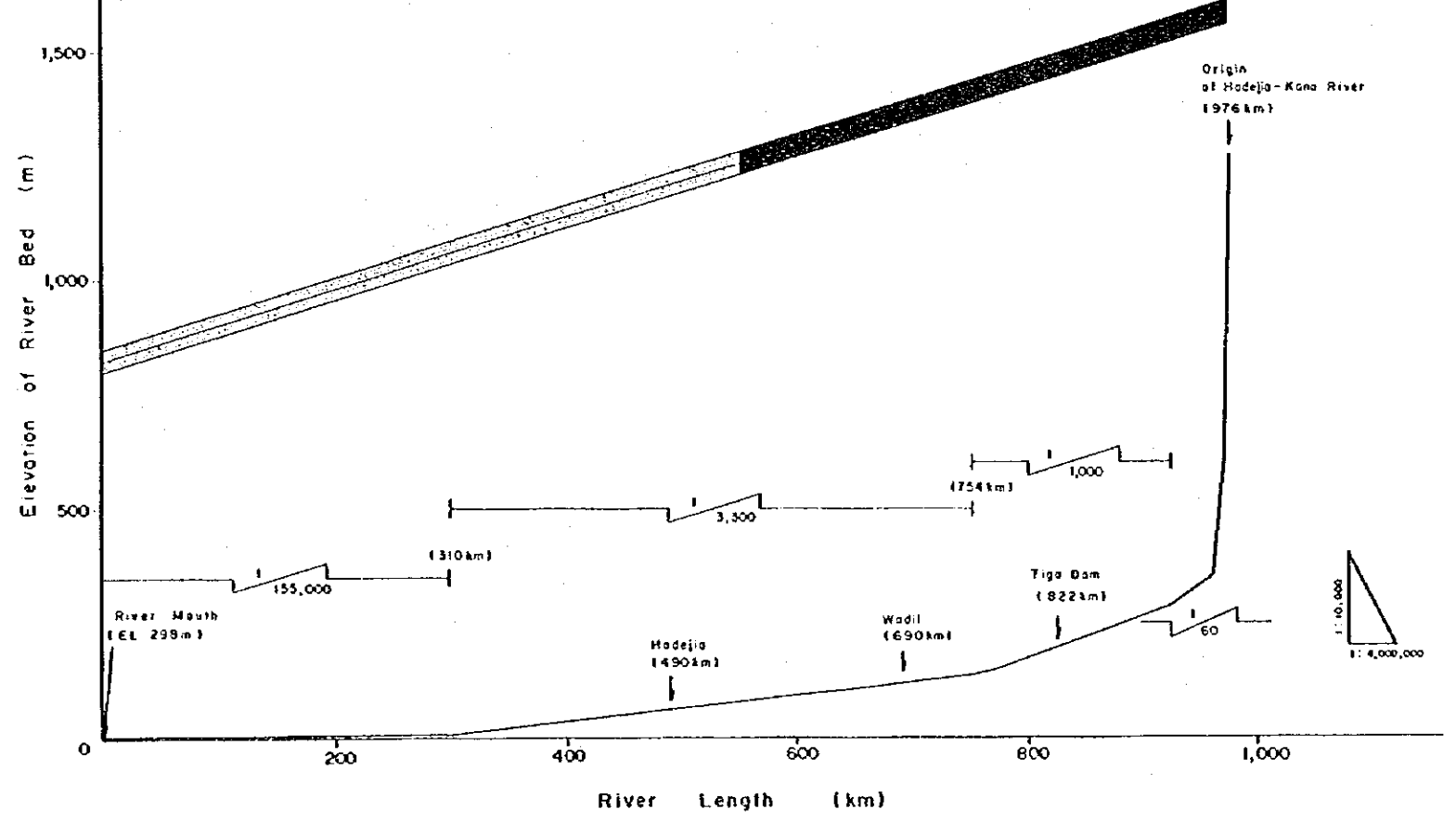


THE FEDERAL REPUBLIC OF NIGERIA	
FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAJOR RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	WRS No.
SASUYU & SUMINO	0-9/11

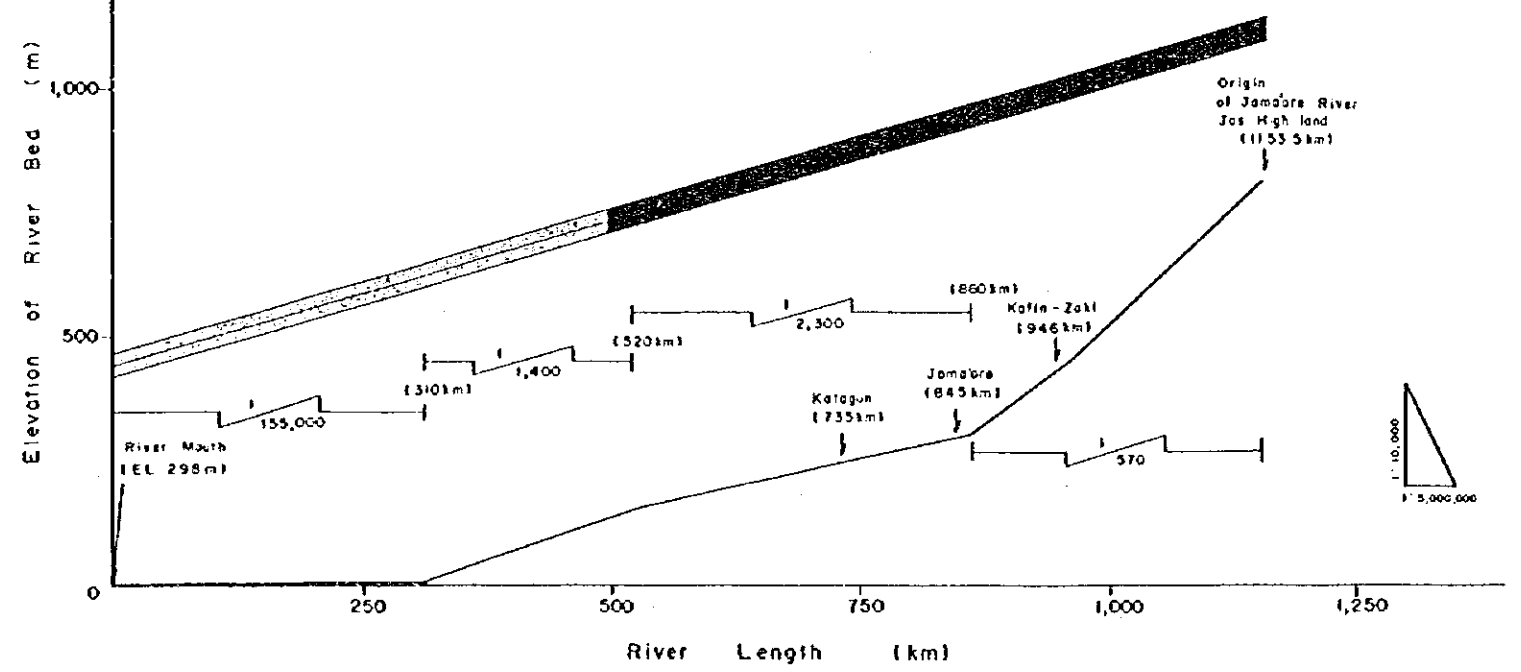
LEGEND



Profile of Hadejia - Kano River System (HA - VII)

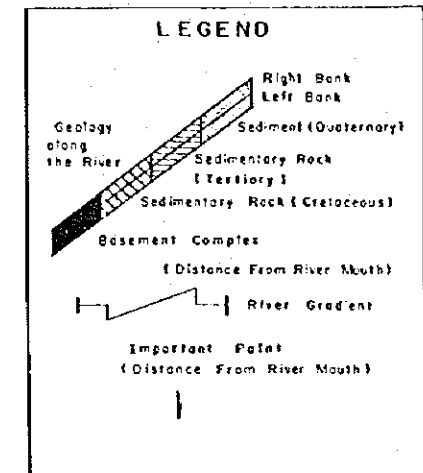
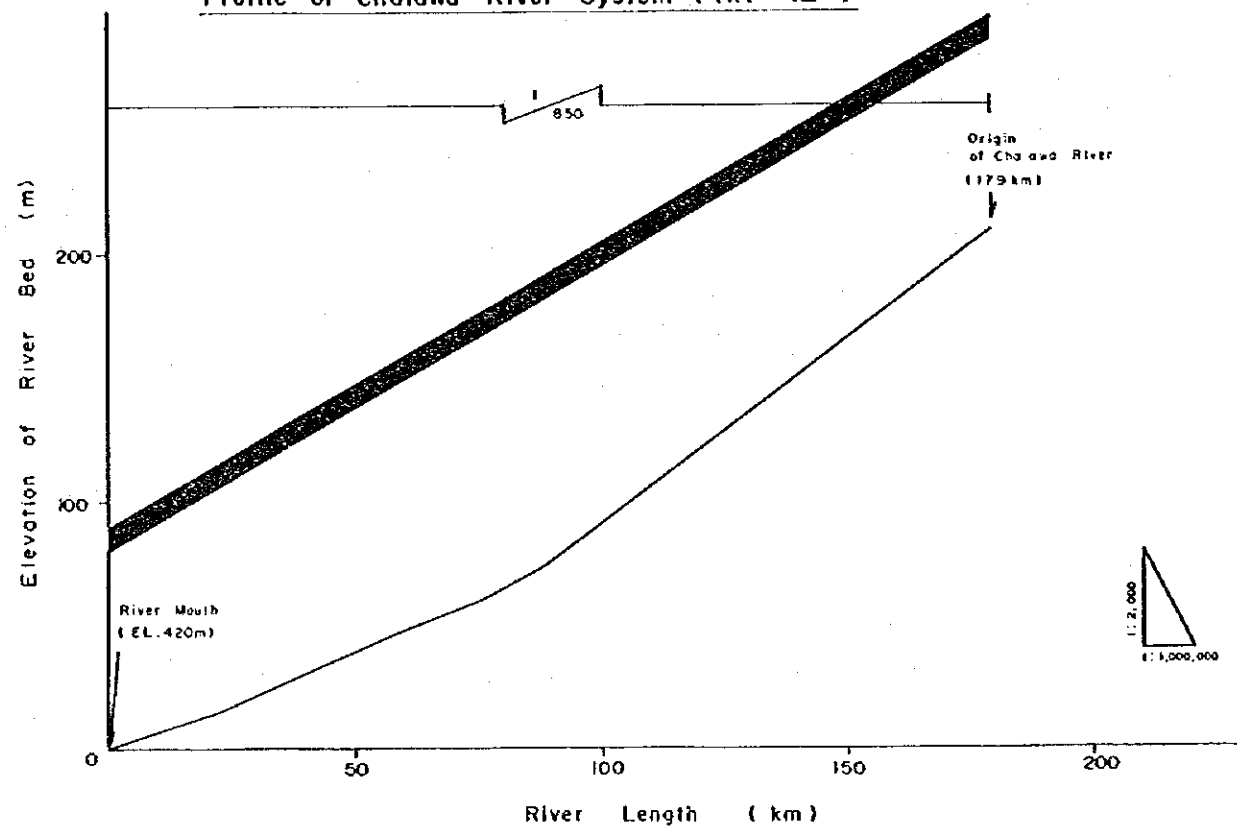


Profile of Jama'are River System (HA - VIII)

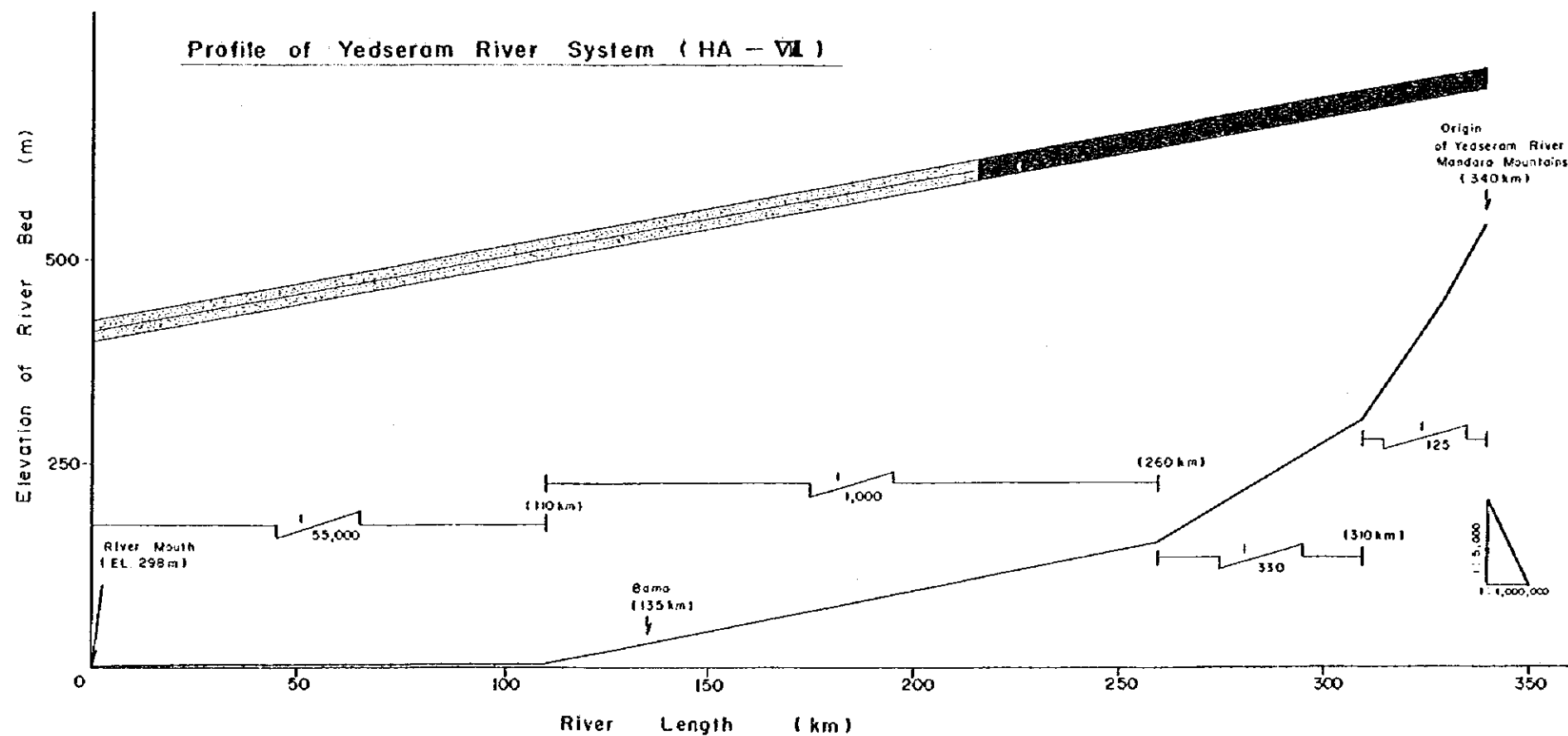


THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY IS THE NATIONAL WATER RESOURCES MASTER PLAN (WRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	DRP No.
SANJU & SUNIBO	6-10/11

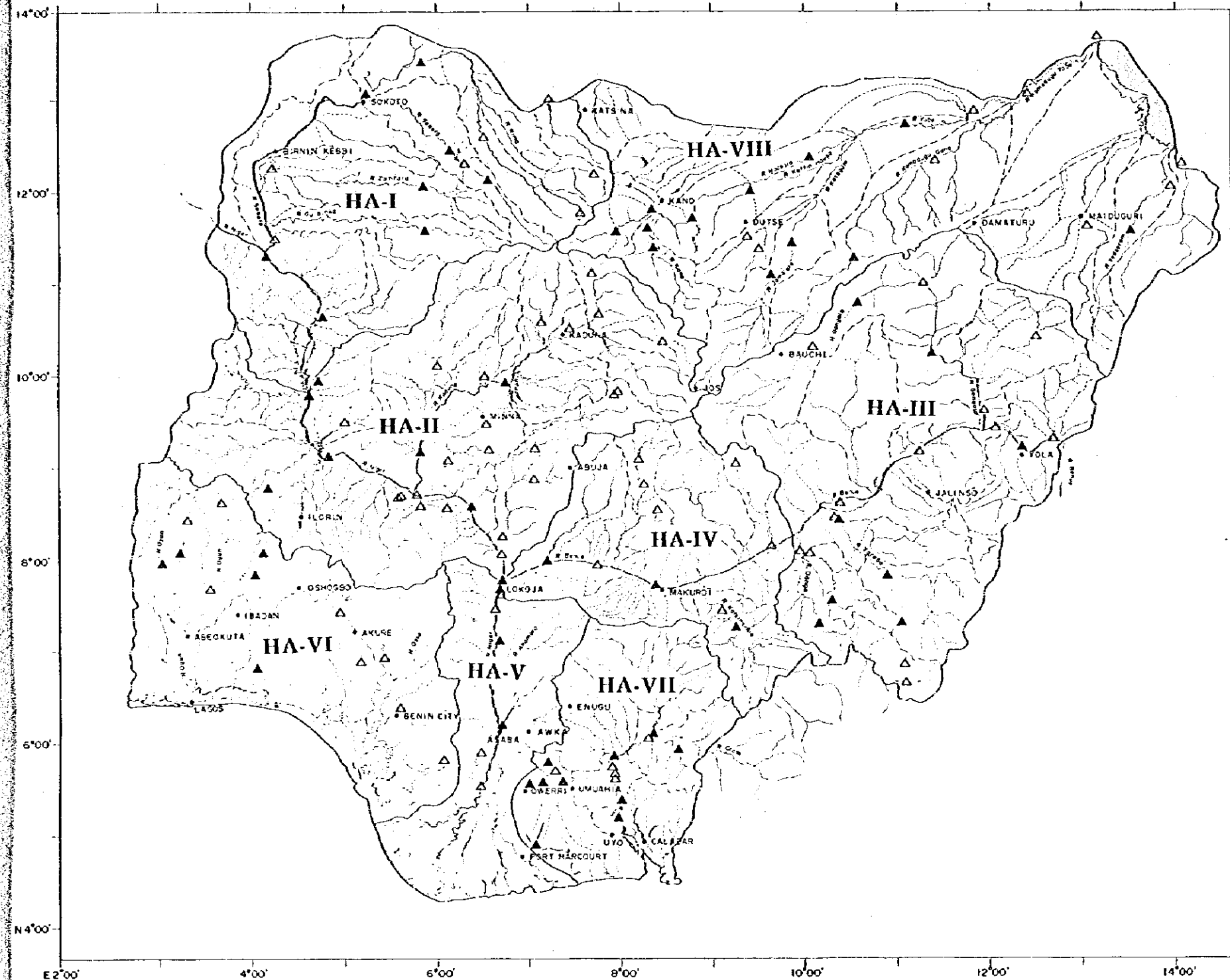
Profile of Chalawa River System (HA - VII)



Profile of Yedseram River System (HA - VII)



THE FEDERAL REPUBLIC OF NIGERIA FEDERAL MINISTRY OF WATER RESOURCES AND RURAL DEVELOPMENT (FWRD)	
THE STUDY ON THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)	
PROFILE OF MAIN RIVER SYSTEMS	
JAPAN INTERNATIONAL COOPERATION AGENCY	ORG. No.
SANYU & SUIKOU	9-11/11



LEGEND

- International Boundary
- Boundary of HA
- - - Boundary of SHA
- - - Boundary of SSHA
- Major Town
- River
- Major River
- △ Major Runoff Station
- ▲ Selected Major Runoff Station



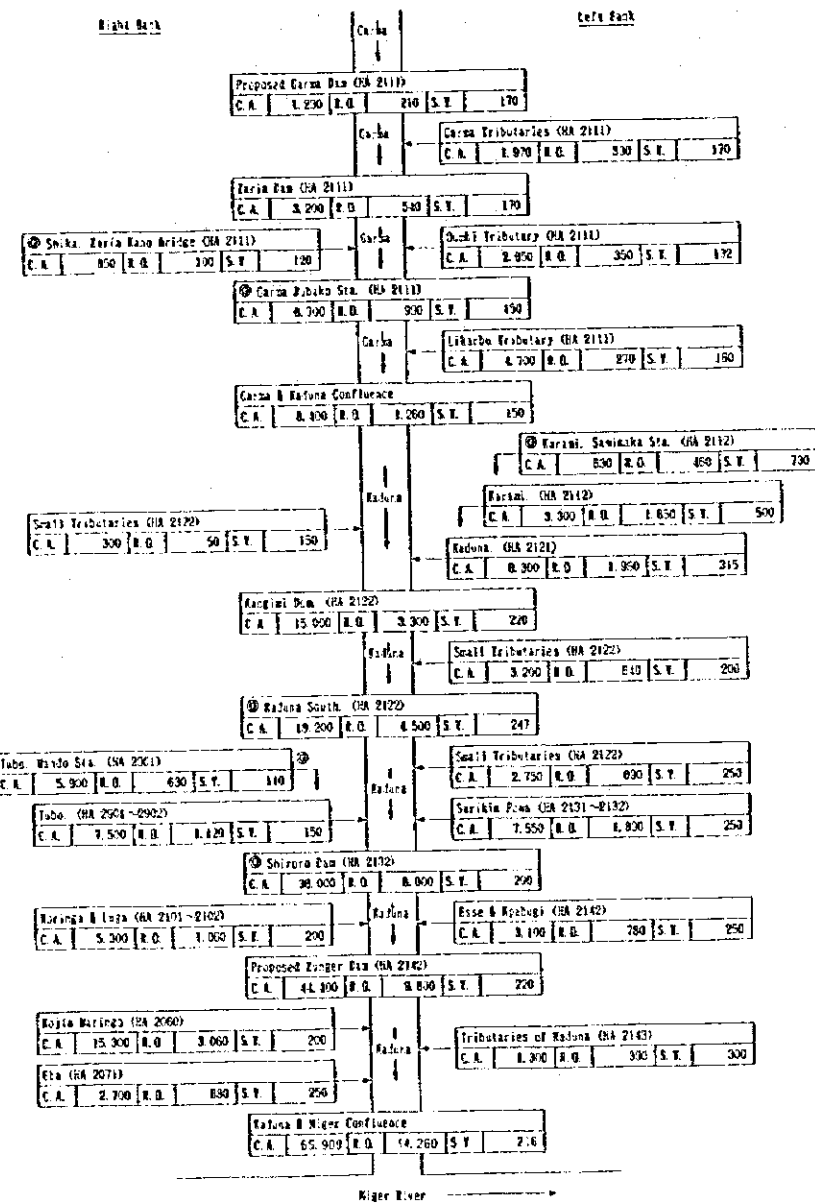
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
 AND RURAL DEVELOPMENT (FAMARAD)

THE STUDY OF
 THE NATIONAL WATER RESOURCES MASTER PLAN (ENWRMP)

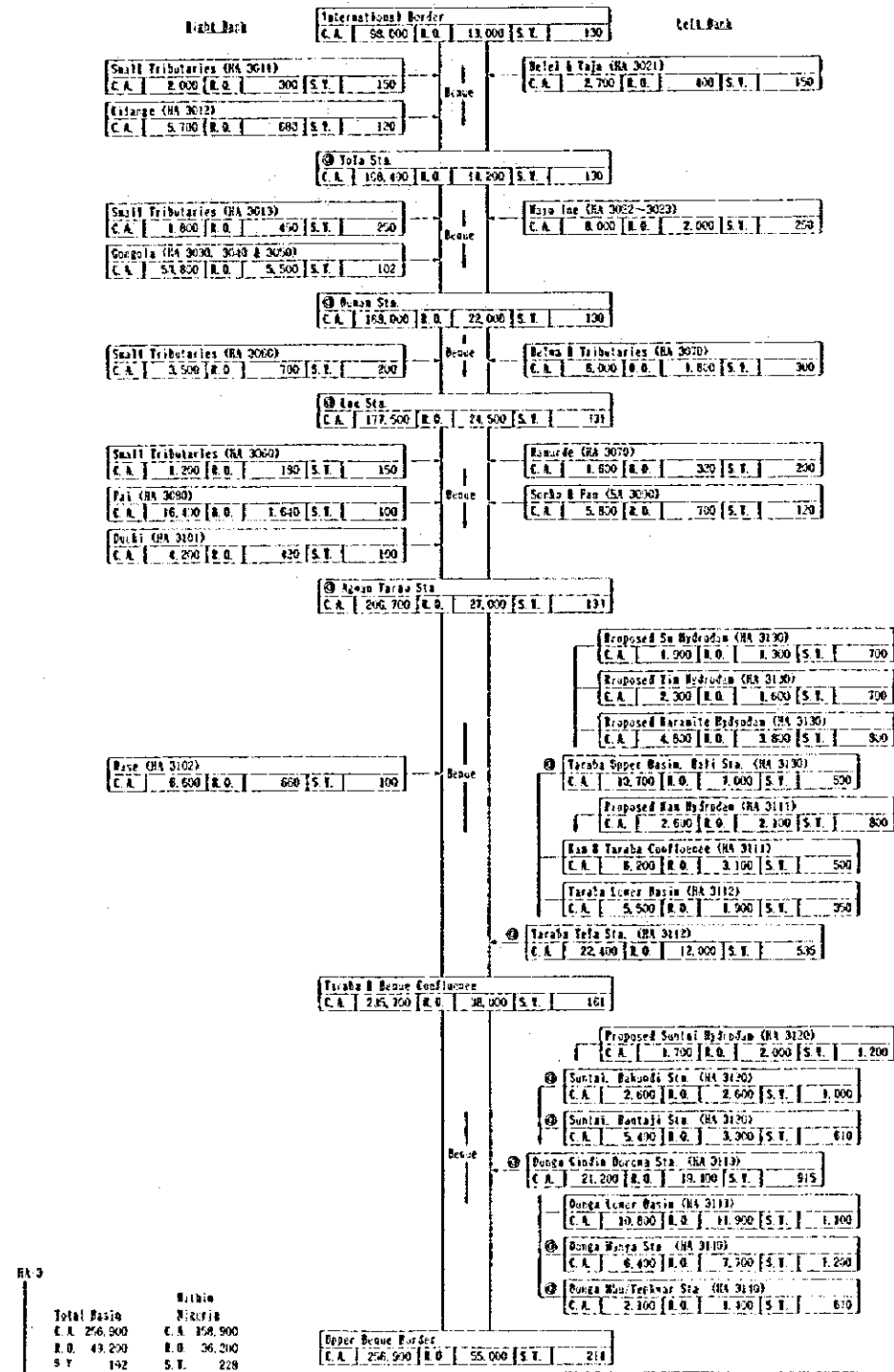
MAJOR RUNOFF STATIONS

JAPAN INTERNATIONAL COOPERATION AGENCY SAYU & SUNEKO	NAP No. 10
---	---------------

1-1-2 KADUNA RIVER SYSTEM (HA-2060-2140)



1-2 UPPER BENUE RIVER SYSTEM (HA-111)



LEGEND: C.A. Catchment Area (km²)
 R.O. Runoff (MCM)
 S.Y. Specific Runoff Yield (mm)

Total Basin		Within Basin	
C.A.	26,500	C.A.	158,900
R.O.	43,200	R.O.	56,200
S.Y.	192	S.Y.	228

Upper Benue Basin	
C.A.	26,500
R.O.	55,000
S.Y.	214

THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FWRD)

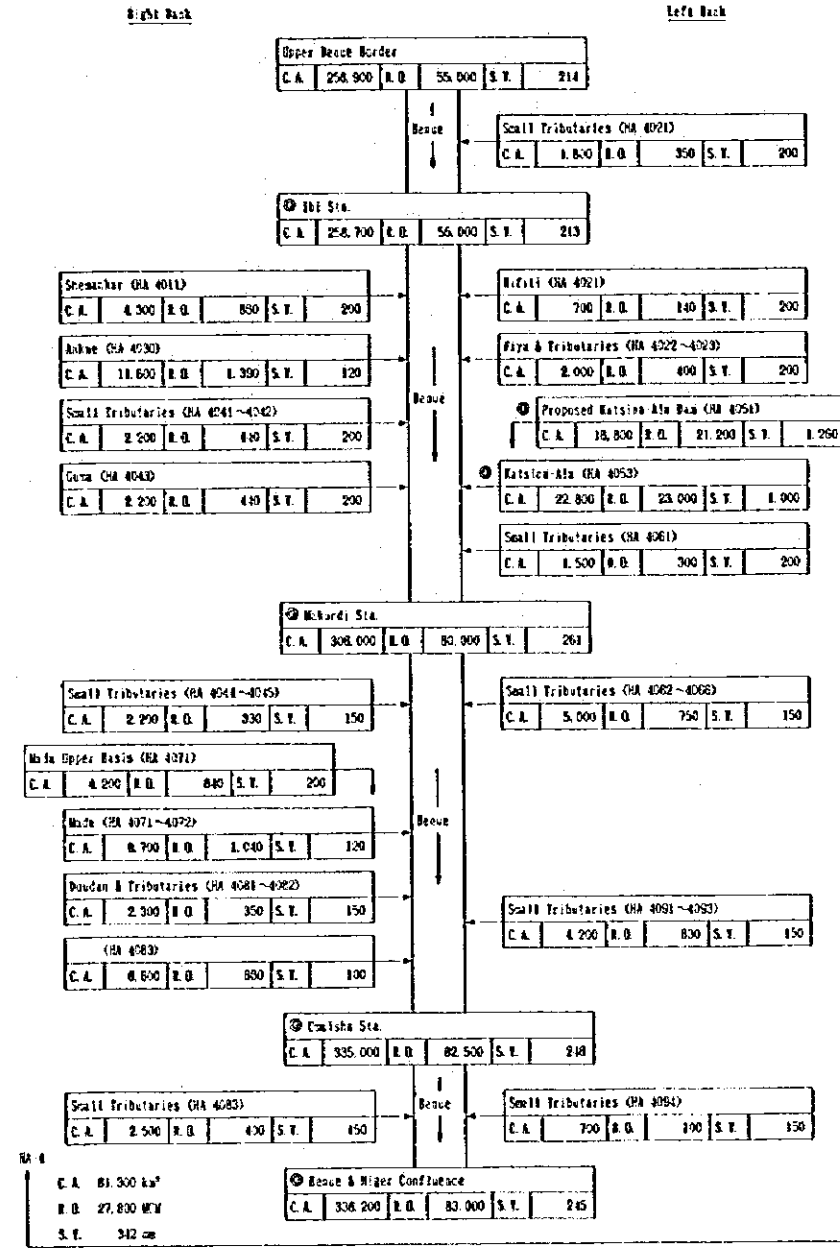
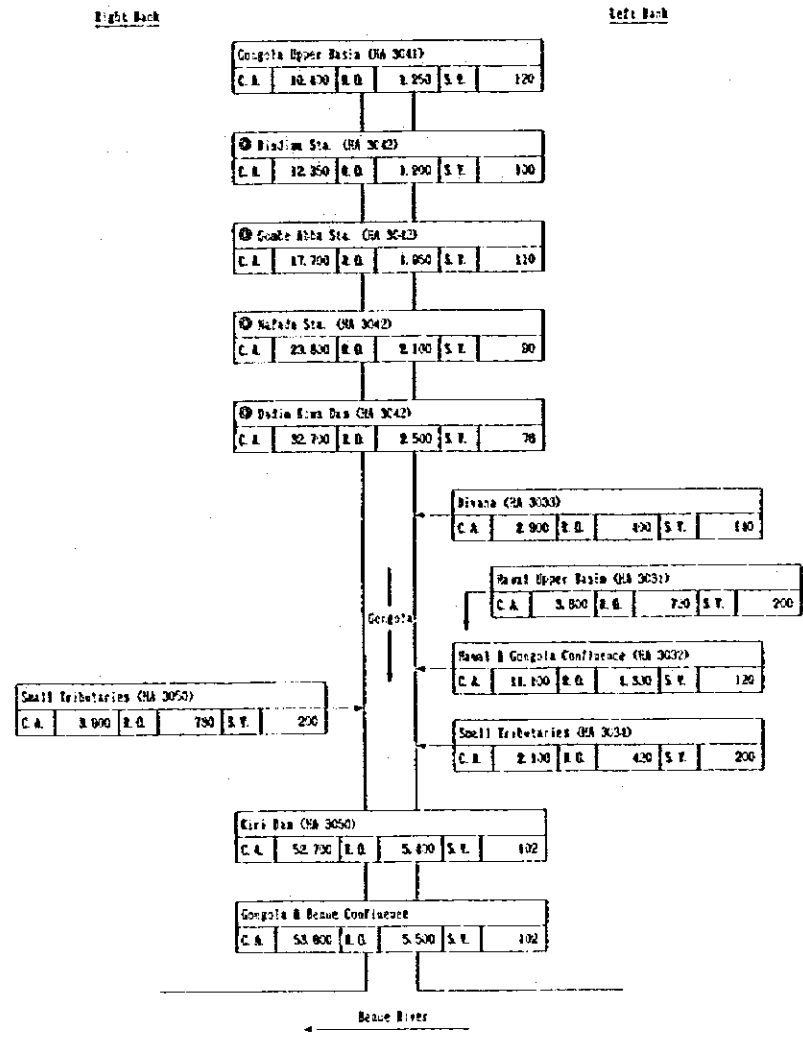
THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NRMP)
 RIVER SYSTEMS
 AND POTENTIAL SURFACE WATER RESOURCES

JAPAN INTERNATIONAL COOPERATION AGENCY DWG No.
 SAYO & SENEIO 11-2/8

1-2-1 CONGOA RIVER SYSTEM (HA3030~3050)

1-3 LOWER BENUE RIVER SYSTEM (HA-IV)

LEGEND: C.A. Catchment Area (km²)
 R.O. Runoff (MCM)
 S.Y. Specific Runoff Yield (mm)



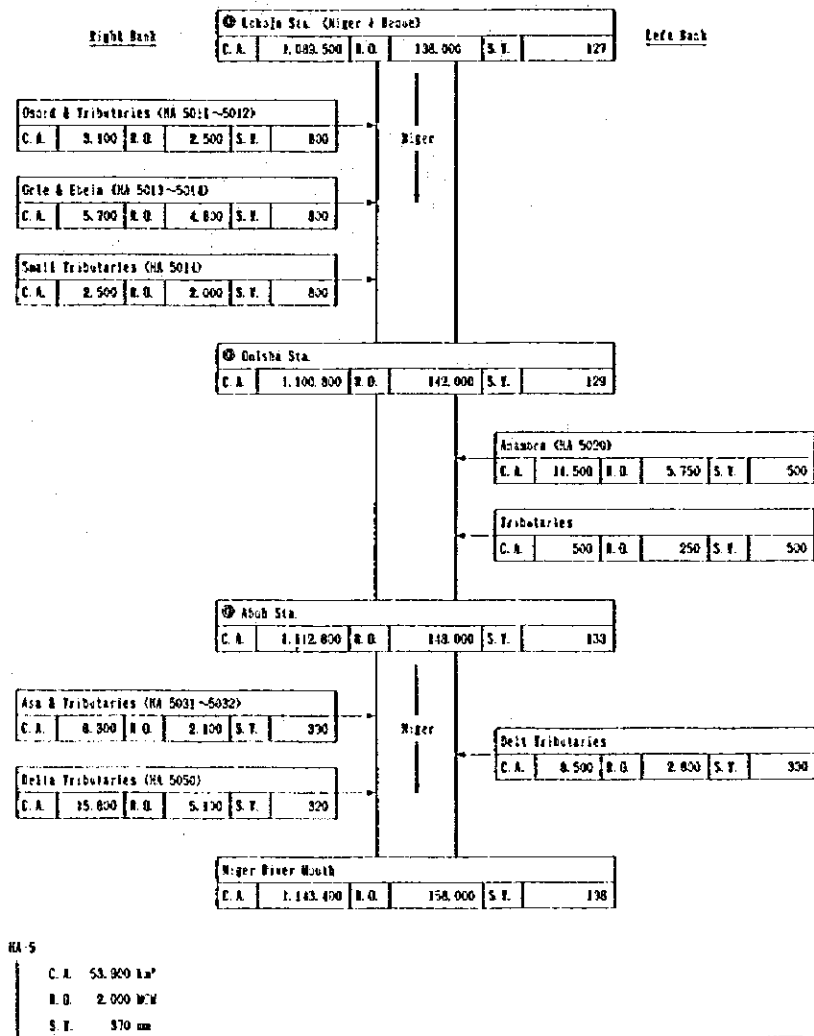
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

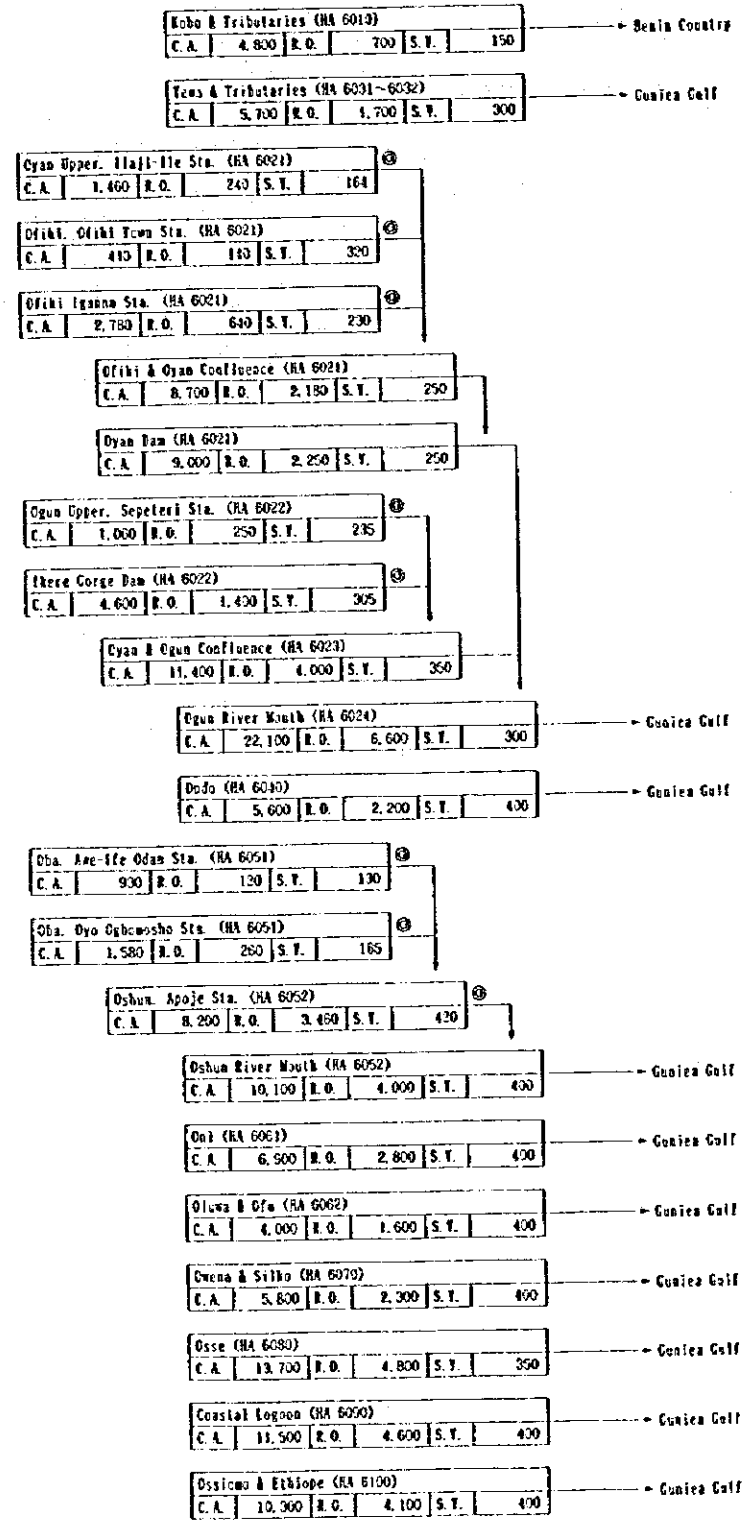
RIVER SYSTEMS
 AND POTENTIAL SURFACE WATER RESOURCES

JAPAN INTERNATIONAL COOPERATION AGENCY ICG No.
 SANYU & SUNIKO I 1-3/B

1-4 RIVER SYSTEM OF LOWER NIGER (HA-V)



2 RIVER SYSTEM IN SOUTH WEST REGION (HA-VI)



LEGEND : C.A. Catchment Area (km²)
R.O. Runoff (MCM)
S.Y. Specific Runoff Yield (mm)

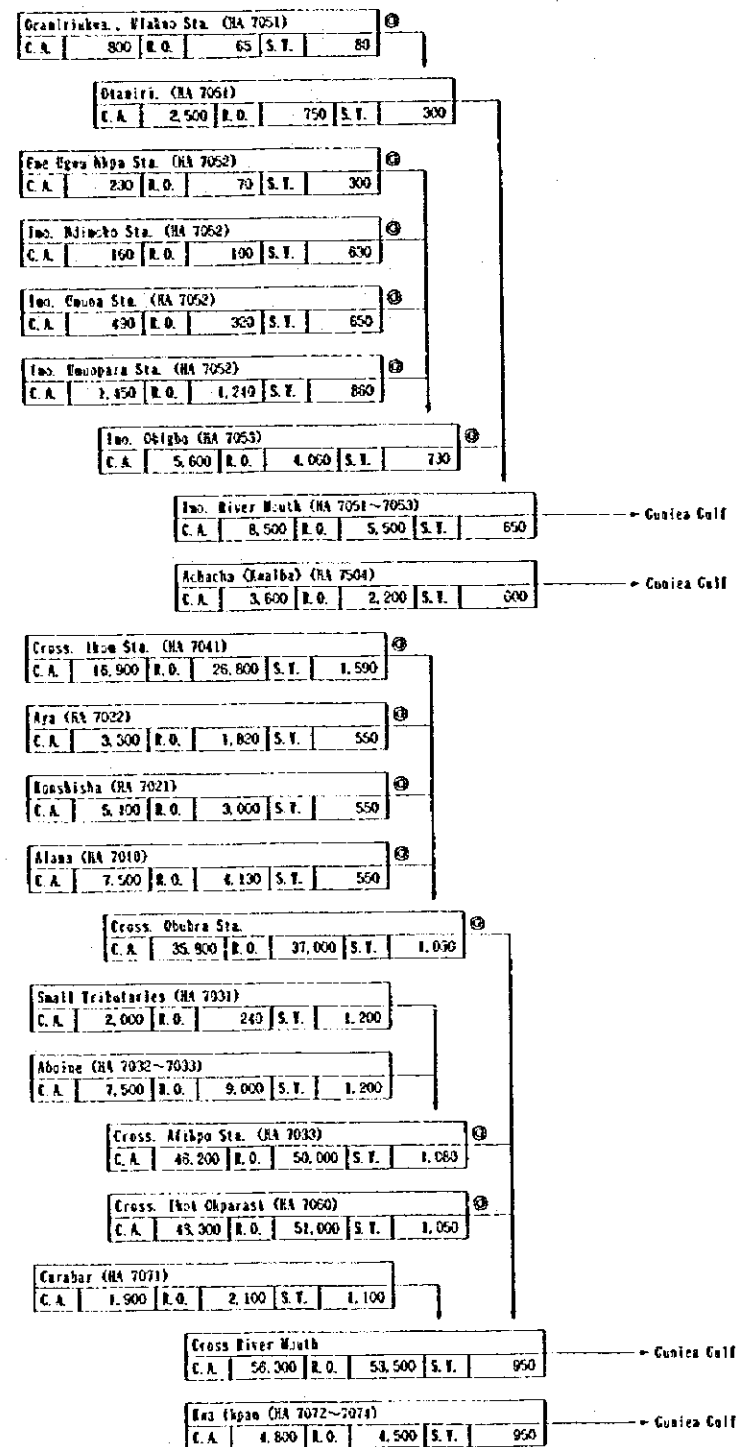
THE FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF WATER RESOURCES
AND RURAL DEVELOPMENT (FMWRD)

THE STUDY ON
THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

RIVER SYSTEMS
AND POTENTIAL SURFACE WATER RESOURCES

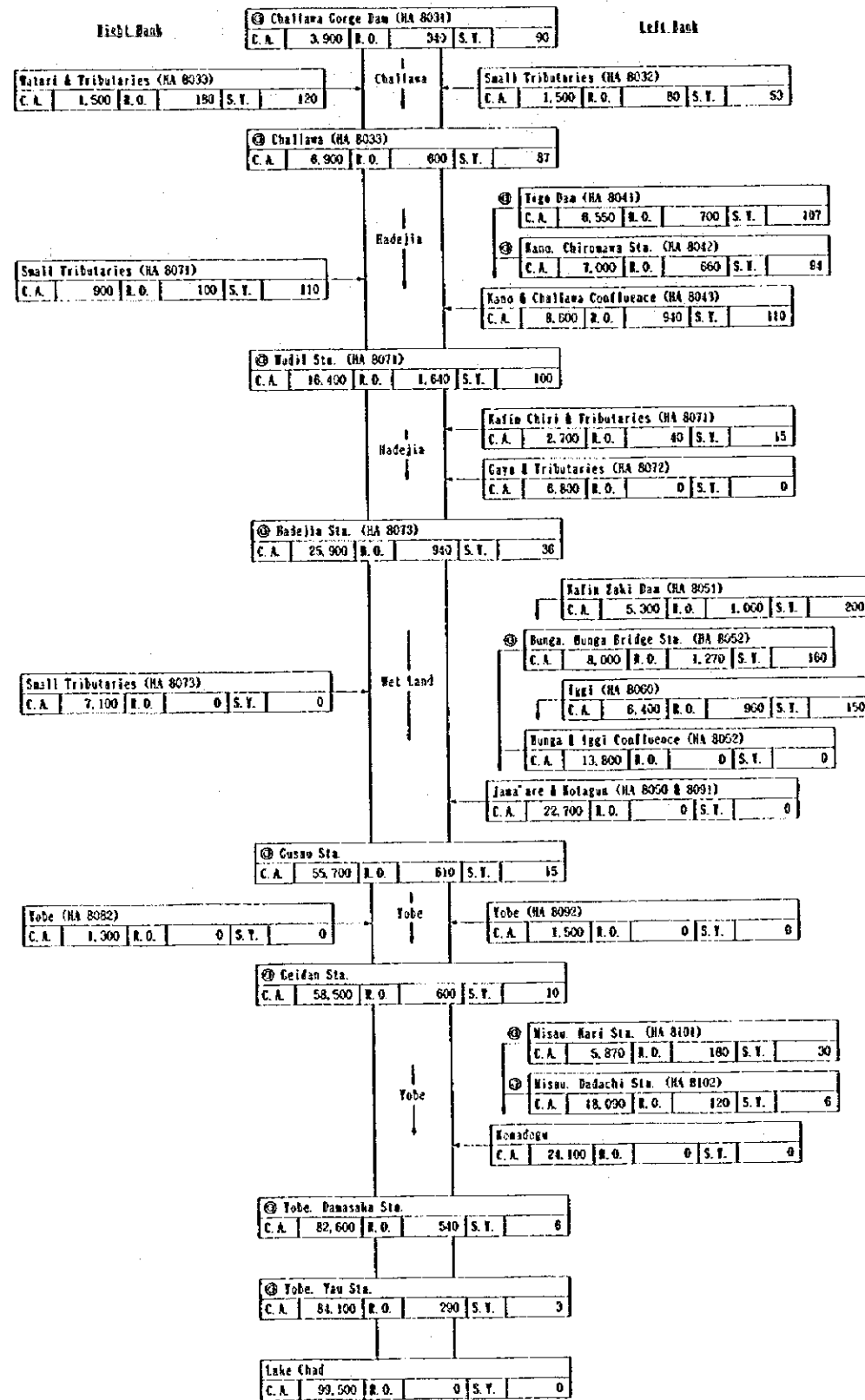
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) DRG No.
SAYU & SUMITO I 1-4/8

3. RIVER SYSTEM IN SOUTH EAST REGION (HA-VII)



RA-7
 Total Basin
 C.A. 73,200 km²
 R.O. 65,700 MCM
 S.Y. 900 mm

4. RIVER SYSTEM OF HADEJIA, JAMA' ARE & KOMADUGU YOBE (HA-8010~8110)



LEGEND: C.A. Catchment Area (km²)
 R.O. Runoff (MCM)
 S.Y. Specific Runoff Yield (mm)

THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FWRD)
 THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)
 RIVER SYSTEMS
 AND POTENTIAL SURFACE WATER RESOURCES
 JAPAN INTERNATIONAL COOPERATION AGENCY
 SANJU & SUNITO
 CPC No. 11-576

5. RIVER SYSTEM ALONG NIGER BORDER (HA-8010-8081)

Tegoni (CA 8011)					→ To Niger
C.A.	3,700	R.O.	370	S.Y.	
Small Tributaries					→ To Niger
C.A.	4,400	R.O.	230	S.Y.	
Cank & Fomas (CA 8021-8023)					→ To Niger
C.A.	7,000	R.O.	700	S.Y.	
Jikawa (CA 8024)					→ To Niger
C.A.	3,000	R.O.	300	S.Y.	
Tributaries Along Border (CA 8081)					→ To Niger
C.A.	0,000	R.O.	0	S.Y.	

LEGEND : C.A. Catchment Area (km²)
 R.O. Runoff (BCM)
 S.Y. Specific Runoff Yield (mm)

6. RIVER SYSTEM OF NGADDA, YEDESERAM & KOMADUGU GAMA (HA-8130-8150)

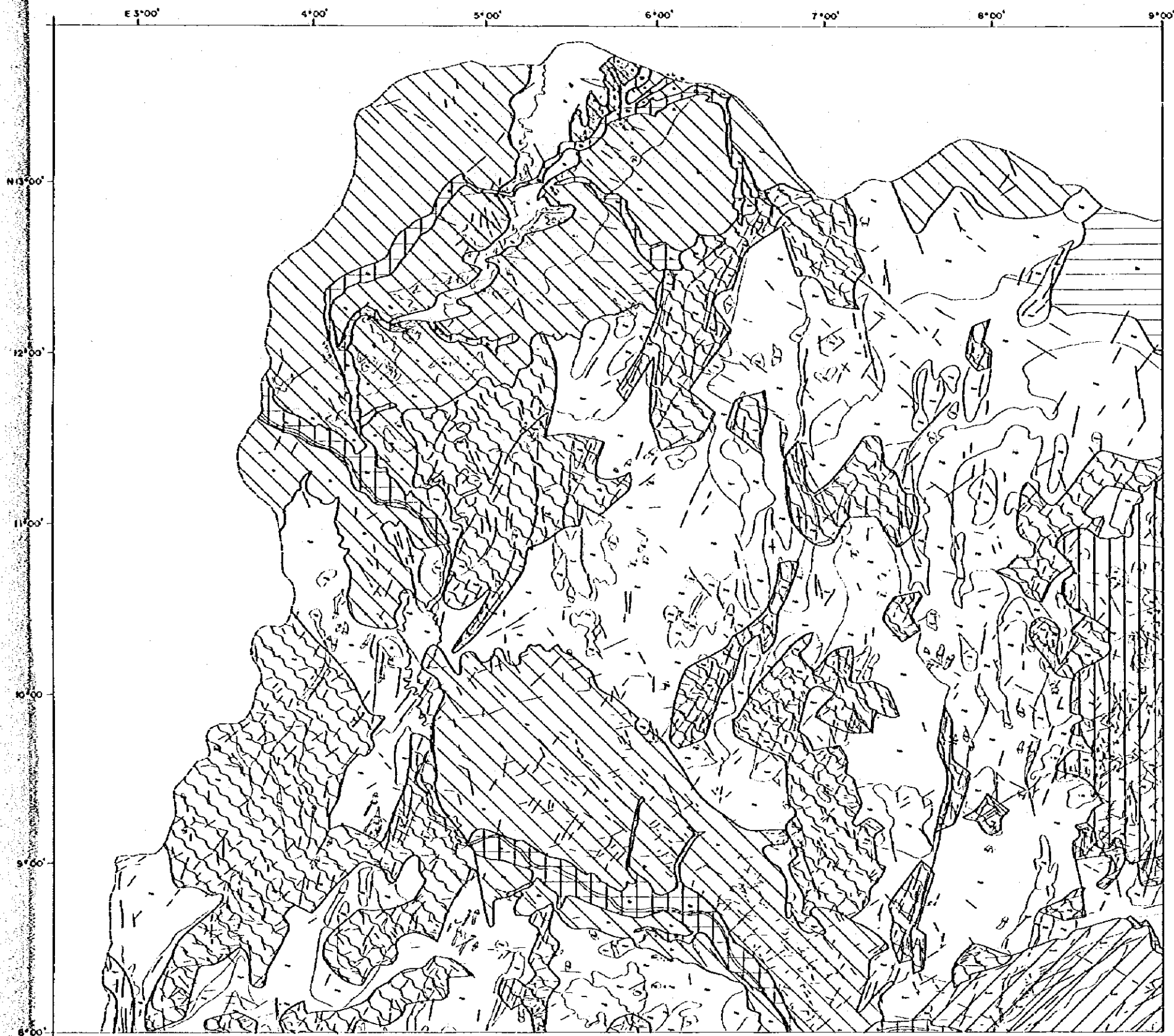
Desert Area (CA 8121)					→ To Lake Chad
C.A.	15,700	R.O.	0	S.Y.	
Dev.A. Foma (CA 8131)					→ To Lake Chad
C.A.	4,900	R.O.	0	S.Y.	
Jisu Dam (CA 8132)					→ To Lake Chad
C.A.	4,100	R.O.	270	S.Y.	
Desert Area (HA 8133-8134)					→ To Lake Chad
C.A.	14,500	R.O.	0	S.Y.	
Ngada (CA 8131-8134)					→ To Lake Chad
C.A.	21,500	R.O.	0	S.Y.	
Yedseram Upper Basin (CA 8141)					→ To Lake Chad
C.A.	1,700	R.O.	170	S.Y.	
Yedseram (CA 8141-8142)					→ To Lake Chad
C.A.	8,500	R.O.	0	S.Y.	
Komadugu Gama					→ To Lake Chad
C.A.	14,300	R.O.	430	S.Y.	

THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF WATER RESOURCES
 AND RURAL DEVELOPMENT (FWRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN(NWRMP)

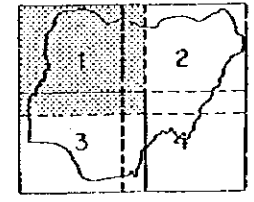
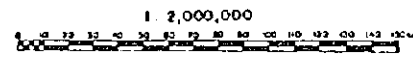
RIVER SYSTEMS
 AND POTENTIAL SURFACE WATER RESOURCES

JAPAN INTERNATIONAL COOPERATION AGENCY MAP No.
 SANYO & SUNYU 11-8/8



LEGEND

- International Boundary
- State Boundary
- State Capital
- LAGOS Name of State
- Reja Name of State Capital
- Cinder Cone
- Anticline
- Syncline
- Lithology
- Foliation
- Fault
- Lineament
- Oka
- International Boundary and Coastline
- Basement Complex Areas
- Basement Complex Areas Well-Developed Foliation, Satellite Image Lineations and Faults
- Basement Complex Areas with Steep Land and Thin Weathered Layer
- Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- Aquifers in Segments of Tertiary to Quaternary Period
- Water Bearing Sediments of Quaternary Period

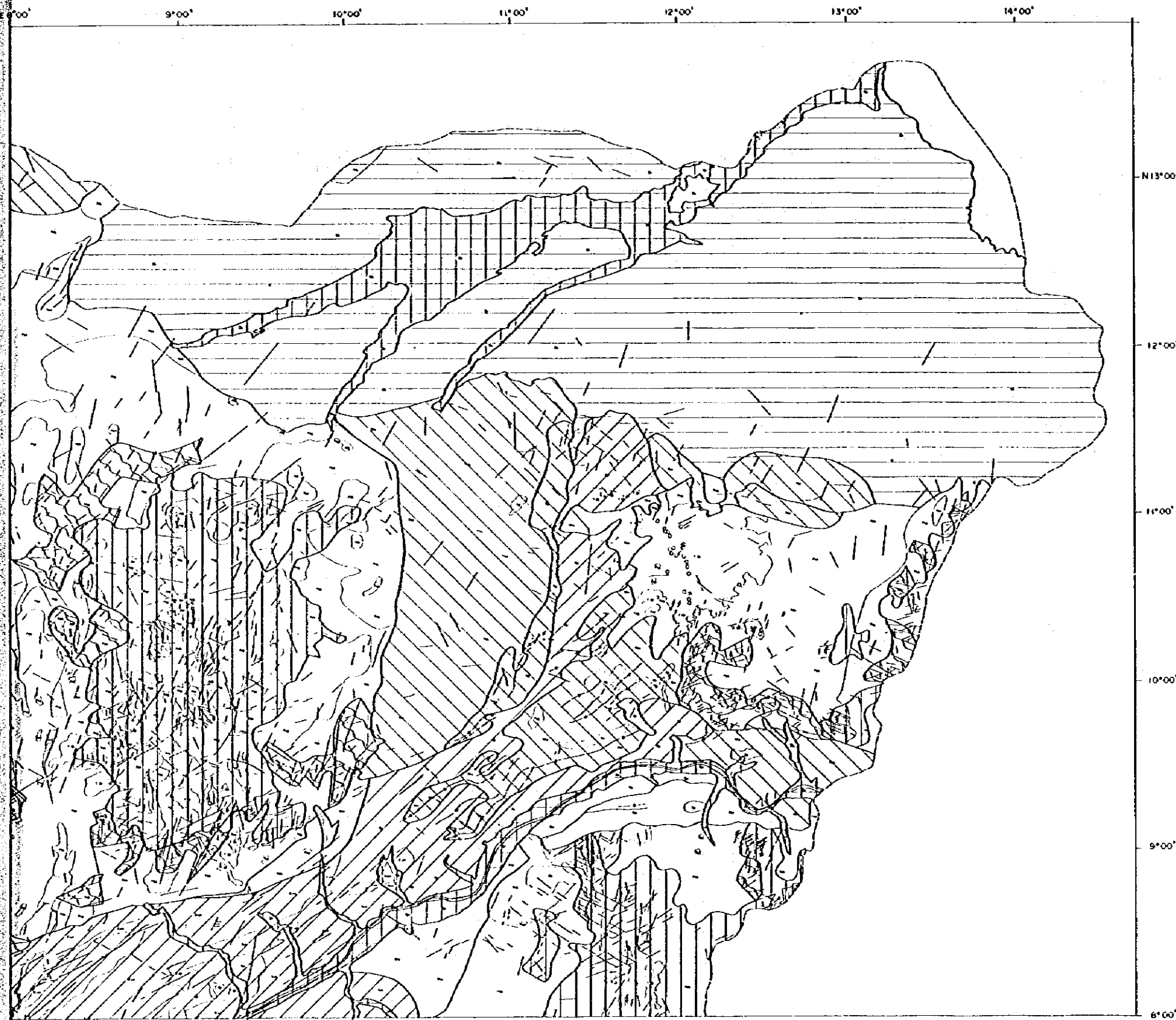


THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
 AND RURAL DEVELOPMENT (FARMRRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

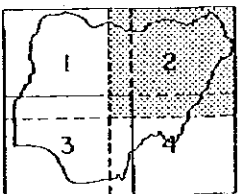
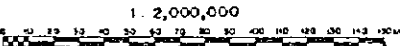
HYDROGEOLOGICAL MAP

SANYU & SUMIKO MAP. No 12-1/4



LEGEND

- +—+— International Boundary
- - - State Boundary
- ⊙ State Capital
- LAGOS Name of State
- Ikeja Name of State Capital
- ☼ Cinder Cone
- Anticline
- ⊖ Syncline
- N Lithology
- N Foliation
- N Fault
- N Lineament
- N Dike
- N International Boundary and Coastline
- Basement Complex Areas
- ▨ Basement Complex Areas Well-Developed Foliation, Satellite Image Lineations and Faults
- ▩ Basement Complex Areas with Steep Land and Thin Weathered Layer
- ▧ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▦ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▤ Aquifers in Sediments of Tertiary to Quaternary Period
- ▣ Water Bearing Sediments of Quaternary Period



THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE WATER RESOURCES
 AND RURAL DEVELOPMENT (FAR/RDD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NWRMP)

HYDROGEOLOGICAL MAP

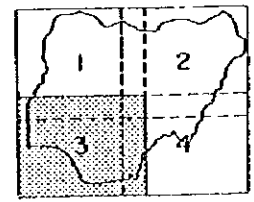
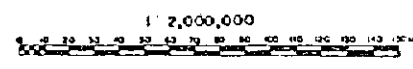
SANYU & SUMIKO

MAP No
 12-2/4



LEGEND

- >— International Boundary
- - - State Boundary
- ⊙ State Capital
- ⊙ LAGOS Name of State
- Ikeja Name of State Capital
- ☼ Cinder Cone
- Anticline
- Syncline
- N Lithology
- N Foliation
- N Fault
- N Lineament
- N Ore
- N International Boundary and Coastline
- Basement Complex Areas
- ▨ Basement Complex Areas Well-Developed Foliation, Satellite Image Lineations and Faults
- ▩ Basement Complex Areas with Steep Land and Thin Weathered Layer
- ▧ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▦ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▤ Aquifers in Sediments of Tertiary to Quaternary Period
- ▣ Water Bearing Sediments of Quaternary Period



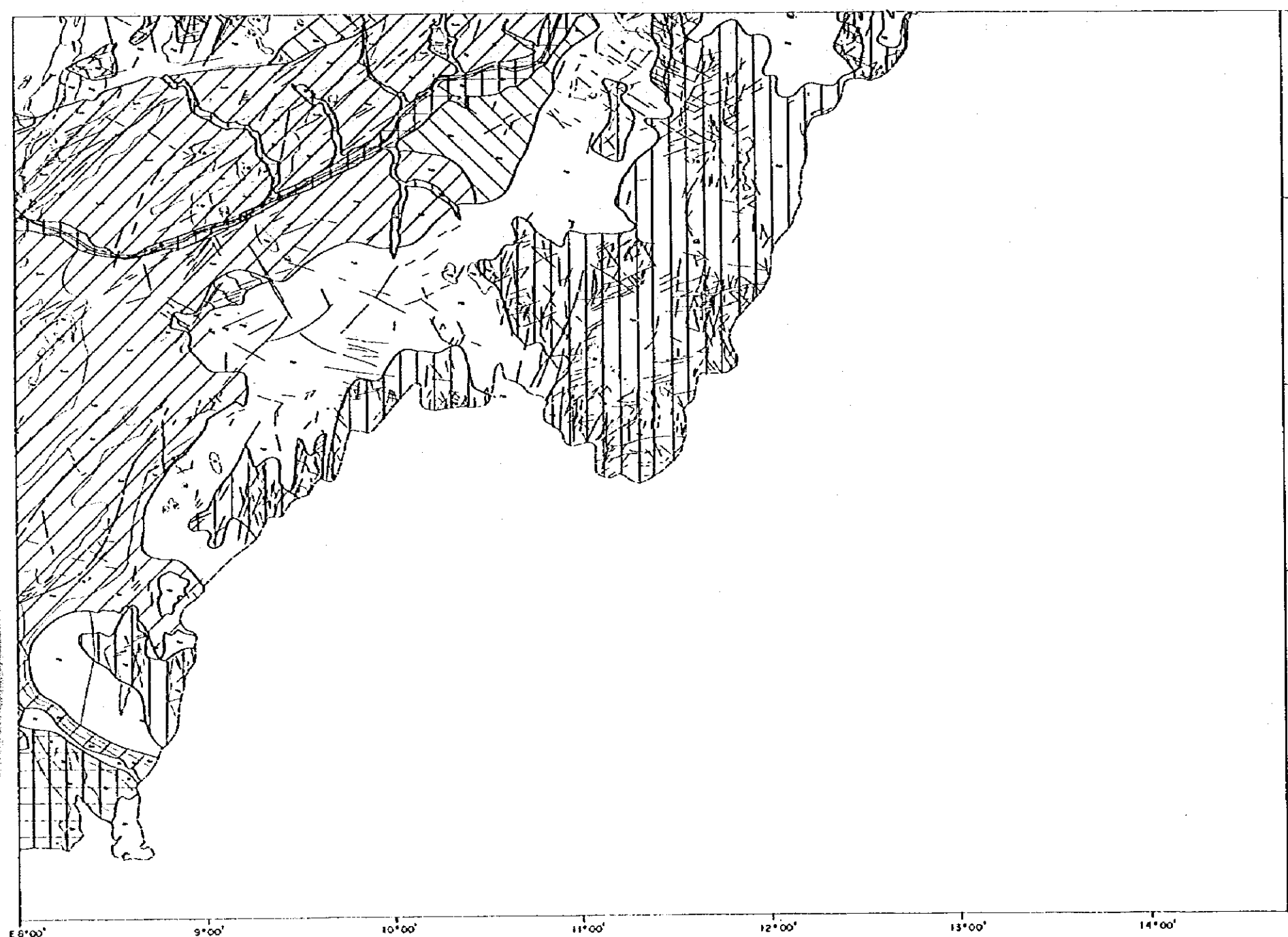
THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE, WATER RESOURCES
 AND RURAL DEVELOPMENT (FARMRRD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NRMP)

HYDROGEOLOGICAL MAP

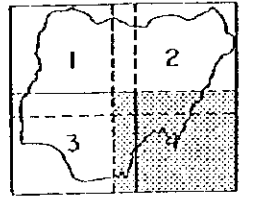
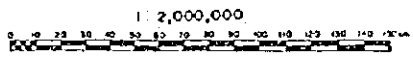
SANYU & SUMIKO

MAP No
12-3/4



LEGEND

- +--- International Boundary
- State Boundary
- ⊙ State Capital
- LAGOS Name of State
- Ikeja Name of State Capital
- ☼ Cinder Cone
- Anticline
- ⊖ Syncline
- N Lithology
- N Foliation
- N Fault
- N Lineament
- N Dike
- N International Boundary and Coastline
- Basement Complex Areas
- ▨ Basement Complex Areas Well-Developed Foliation, Satellite Image Lineations and Faults
- ▩ Basement Complex Areas with Steep Land and Thin Weathered Layer
- ▧ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▦ Aquifers in Sedimentary Formation Areas of Cretaceous and Tertiary Period
- ▤ Aquifers in Sediments of Tertiary to Quaternary Period
- ▣ Water Bearing Sediments of Quaternary Period



THE FEDERAL REPUBLIC OF NIGERIA
 FEDERAL MINISTRY OF AGRICULTURE WATER RESOURCES
 AND RURAL DEVELOPMENT (FARMARD)

THE STUDY ON
 THE NATIONAL WATER RESOURCES MASTER PLAN (NRMP)

HYDROGEOLOGICAL MAP

SANYU & SUNIKO

MAP. No
 12-4/4

