

Figure 2.4.23 Groundwater-Drinking Water Risk (Iron)

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Figure 3.5.1 National Power Grid Map

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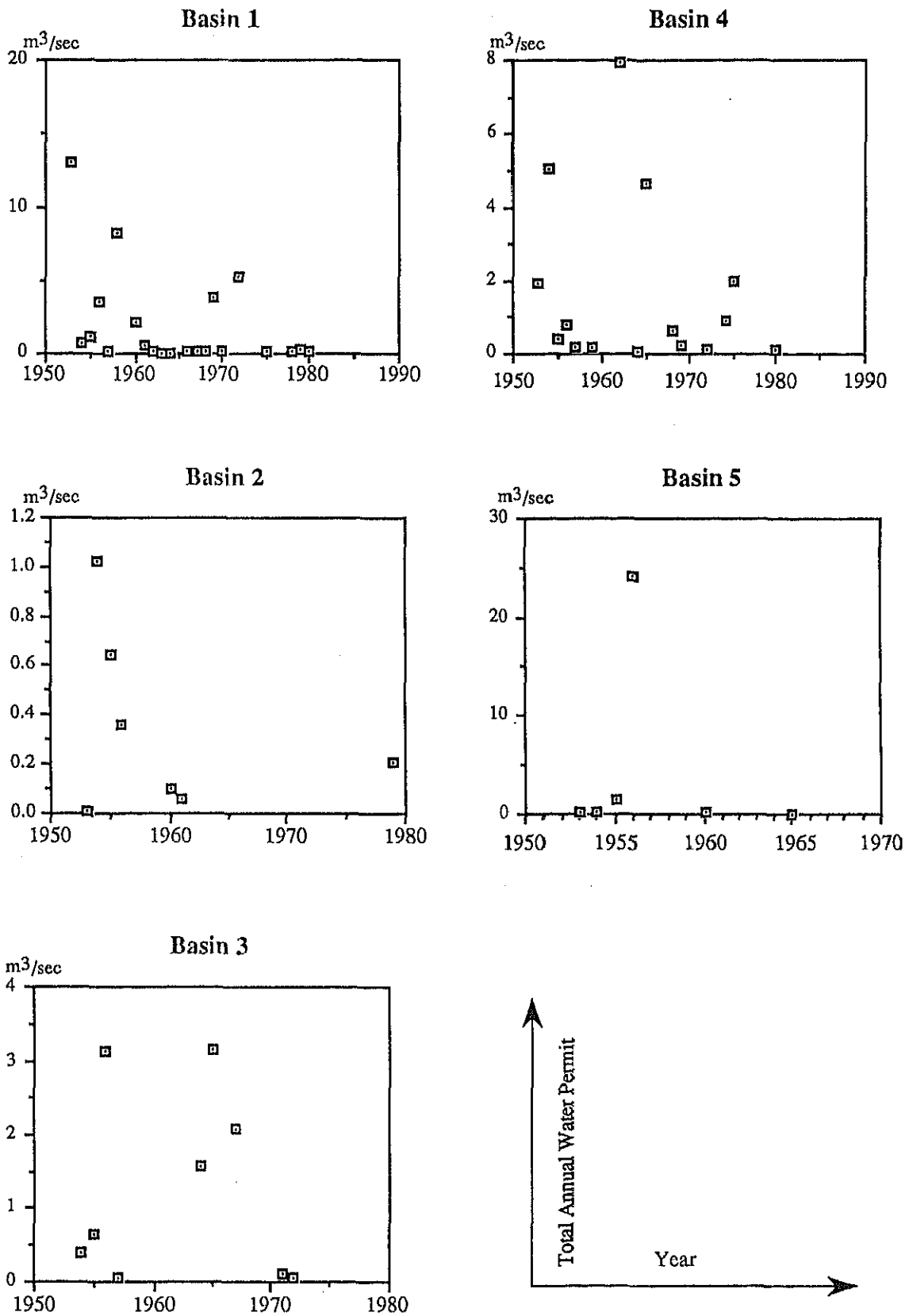


Figure 4.3.1 Trend of Water Permit

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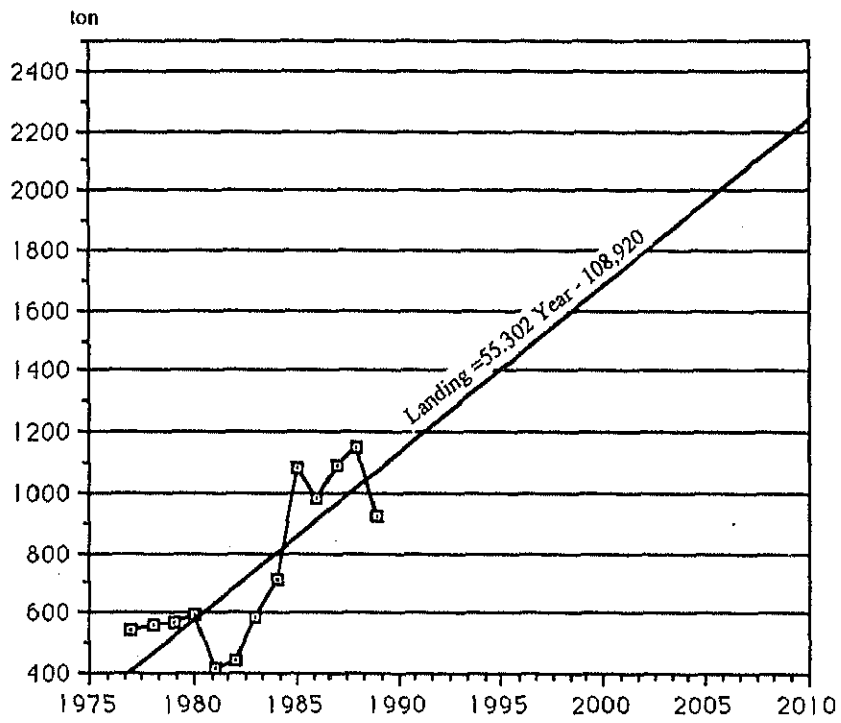


Figure 4.5.1 Trend of Fish Farming

Source : Ref. F.18

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Fig. 4.7.1

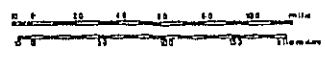
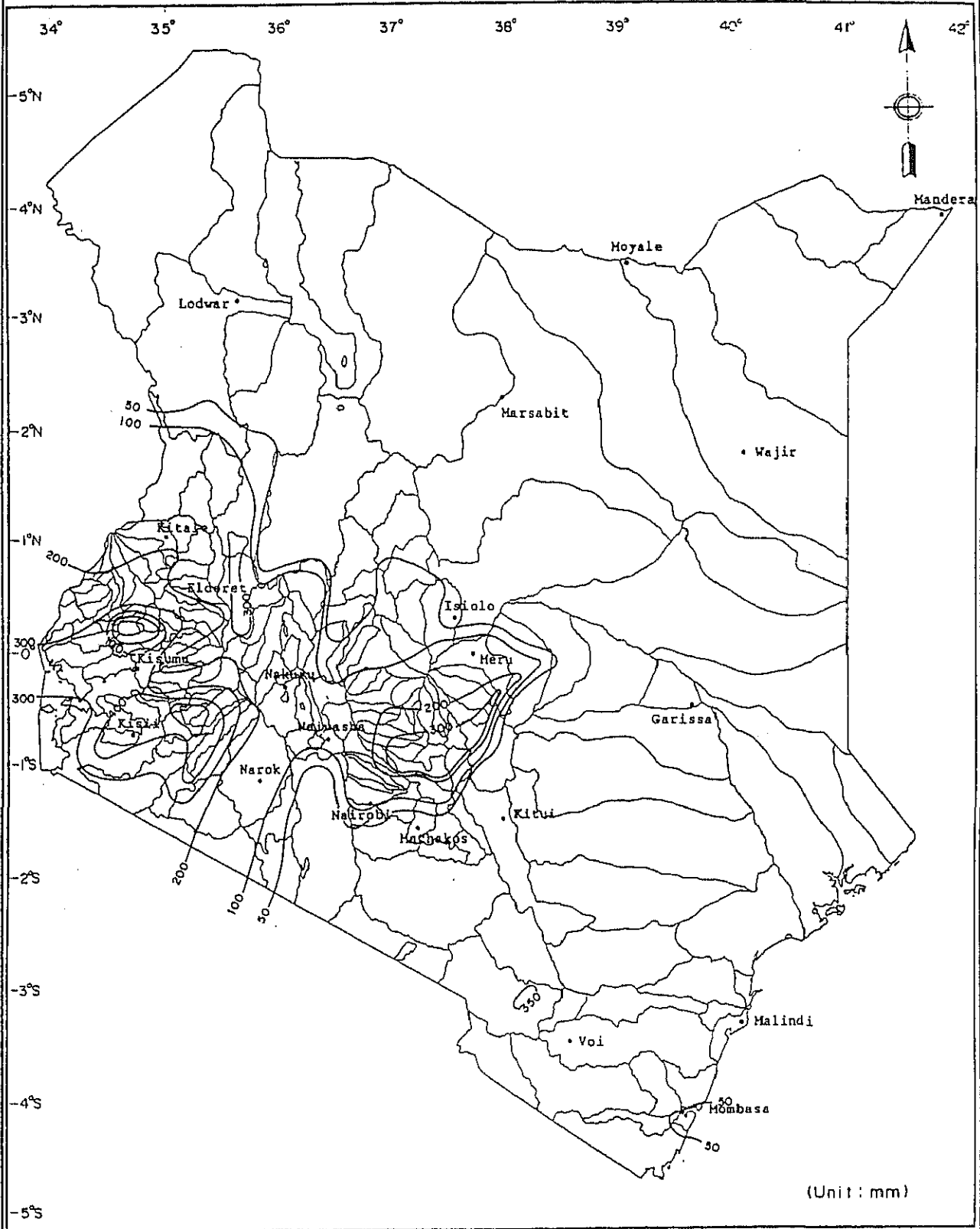


Figure 4.7.1 Annual Mean Runoff Depth

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Fig. 4.7.2

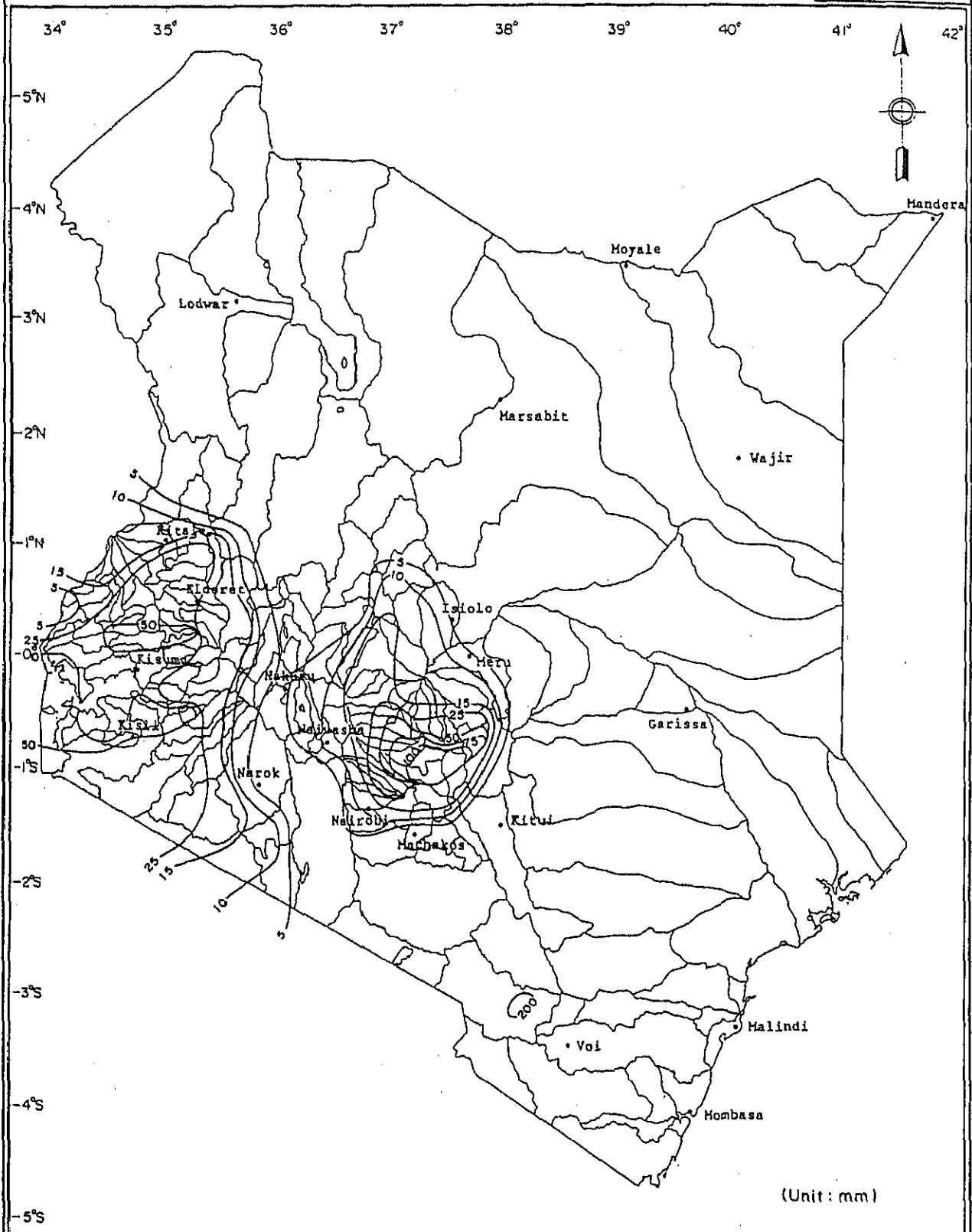


Figure 4.7.2 Minimum Monthly Runoff Depth

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34°E 35°E 36°E 37°E 38°E 39°E 40°E 41°E

5°N

3°N

2°N

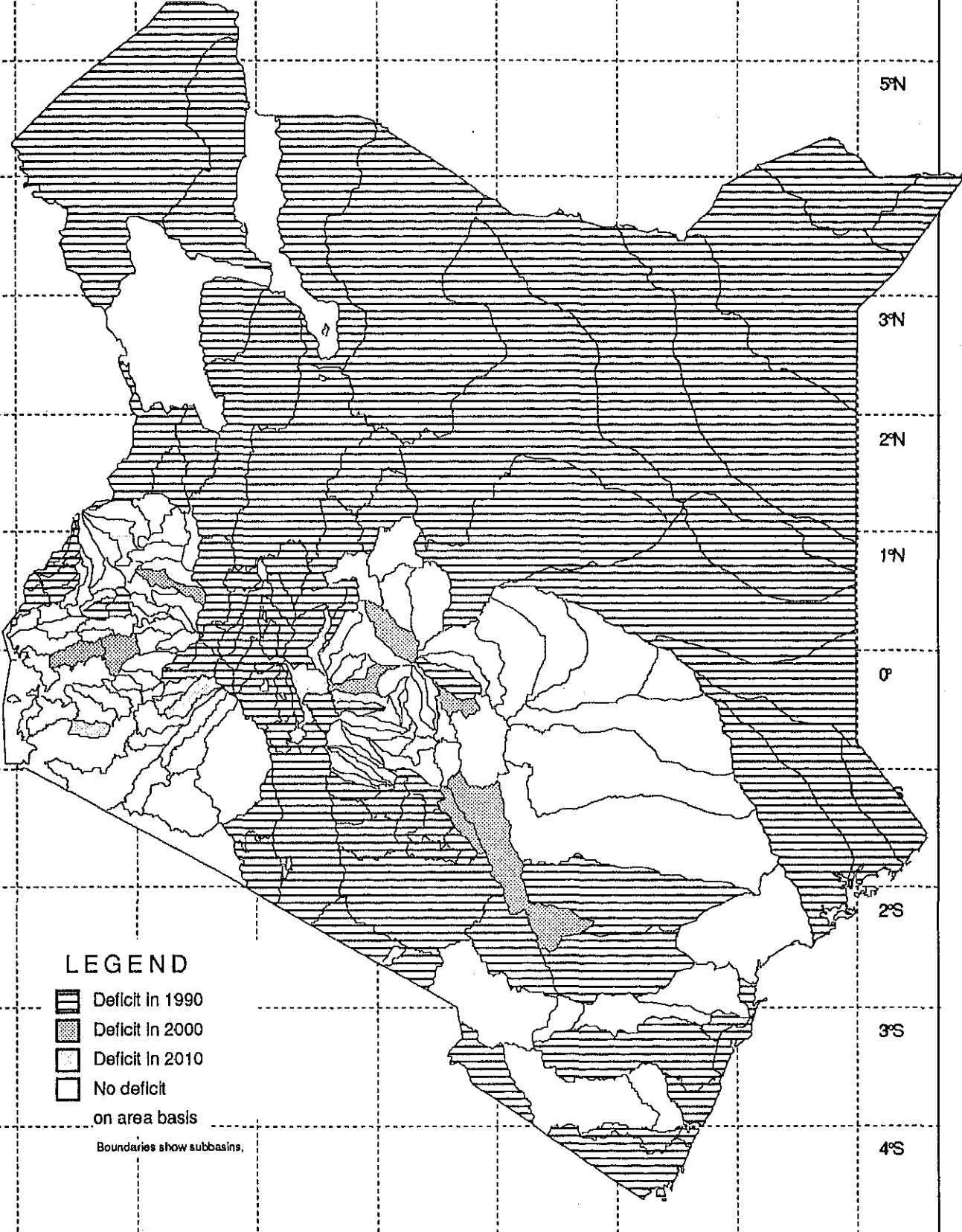
1°N

0°





2°S

3°S

4°S



LEGEND

-  Deficit in 1990
-  Deficit in 2000
-  Deficit in 2010
-  No deficit

on area basis

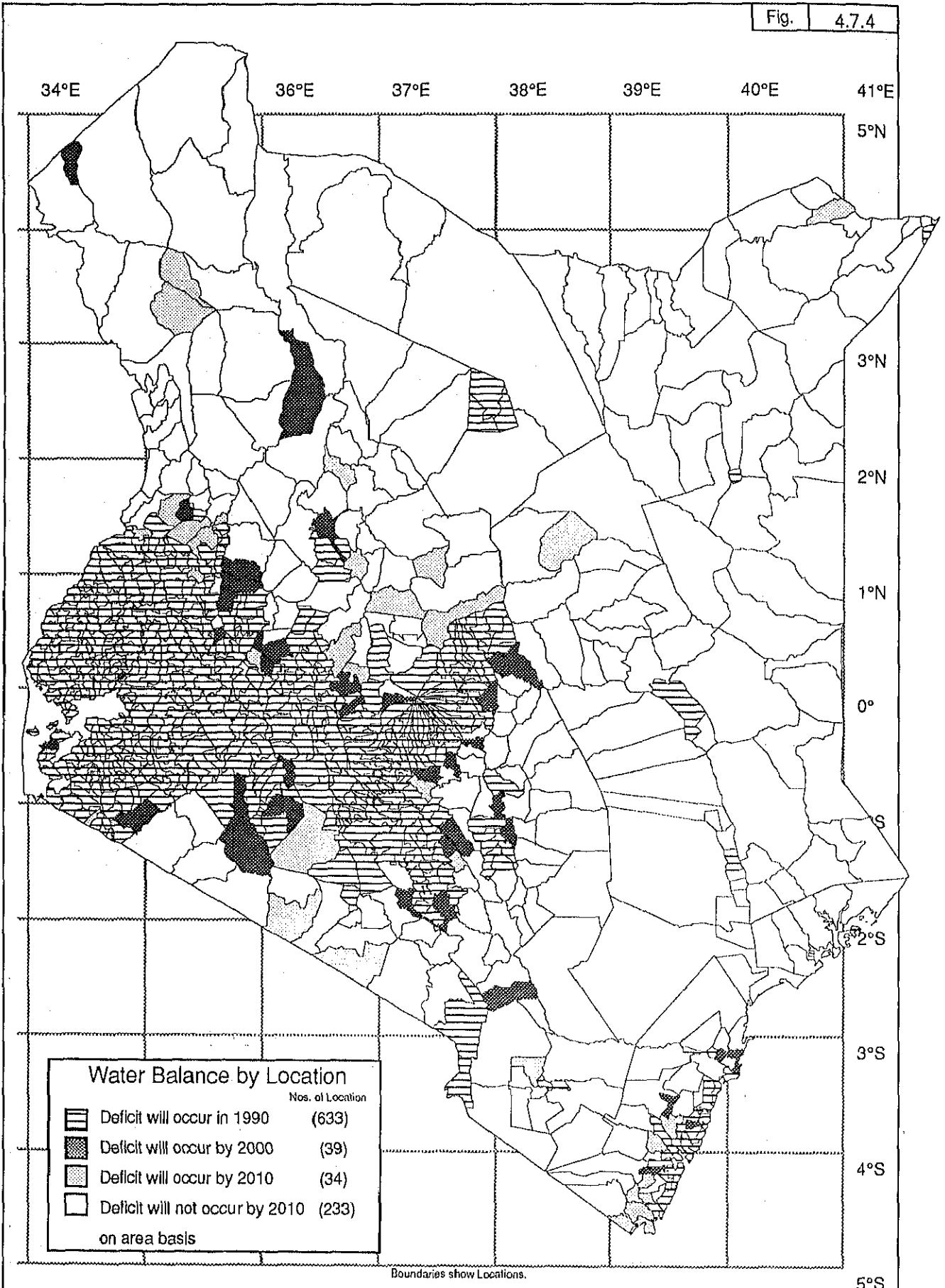
Boundaries show subbasins.

Note: This figure shows the balance between projected water demand and potential available surface water "on area basis". Even in the areas classified above as "no deficit", there may still be water shortage on local area basis.

Figure 4.7.3 Balance between Demand and Available Surface Water

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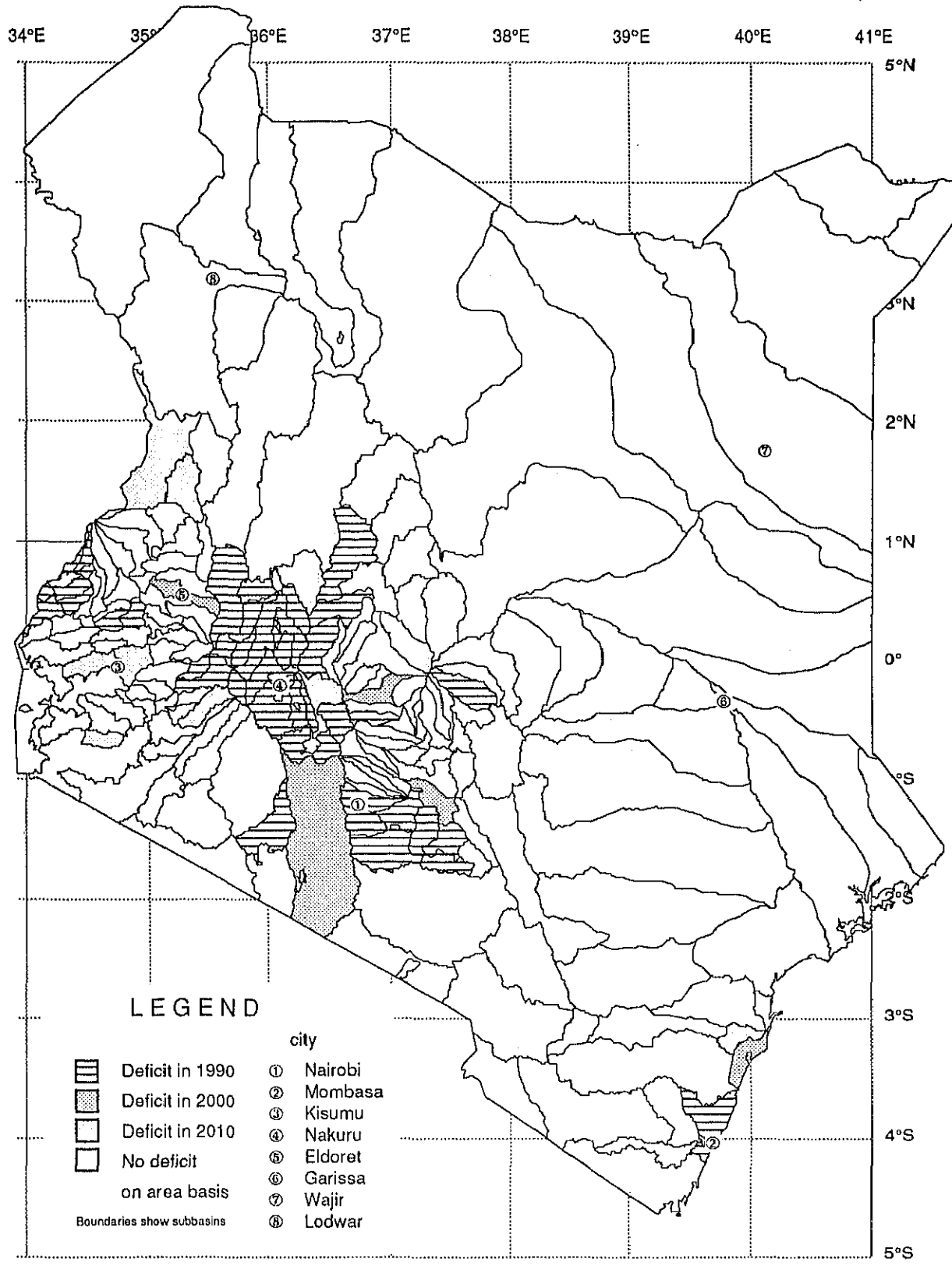
Fig. 4.7.4



Note; This figure shows the balance between projected water demand and maximum exploitable groundwater "on area basis". Even in the areas classified above as "no deficit", there may still be water shortage on local area basis.

Figure 4.7.4 Balance between Demand and Maximum Exploitable Groundwater

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Note : This figure shows the balance between projected water demand and potential available water "on area basis". Even in the areas classified above as "no deficit", there may still be water shortage on local area basis.

Figure 4.7.5 Balance between Demand and Potential Available Water (Groundwater + Surface Water)

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Concept of Minimum Flow

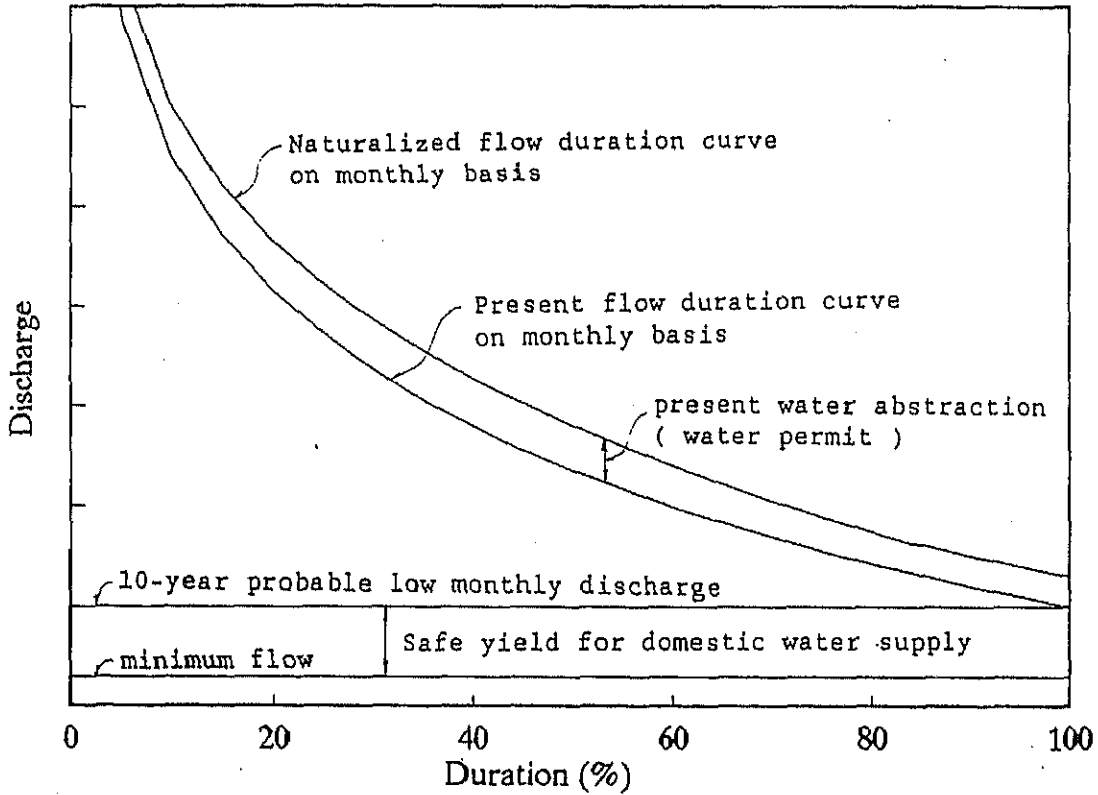


Figure 5.2.1 Concept of Minimum Flow

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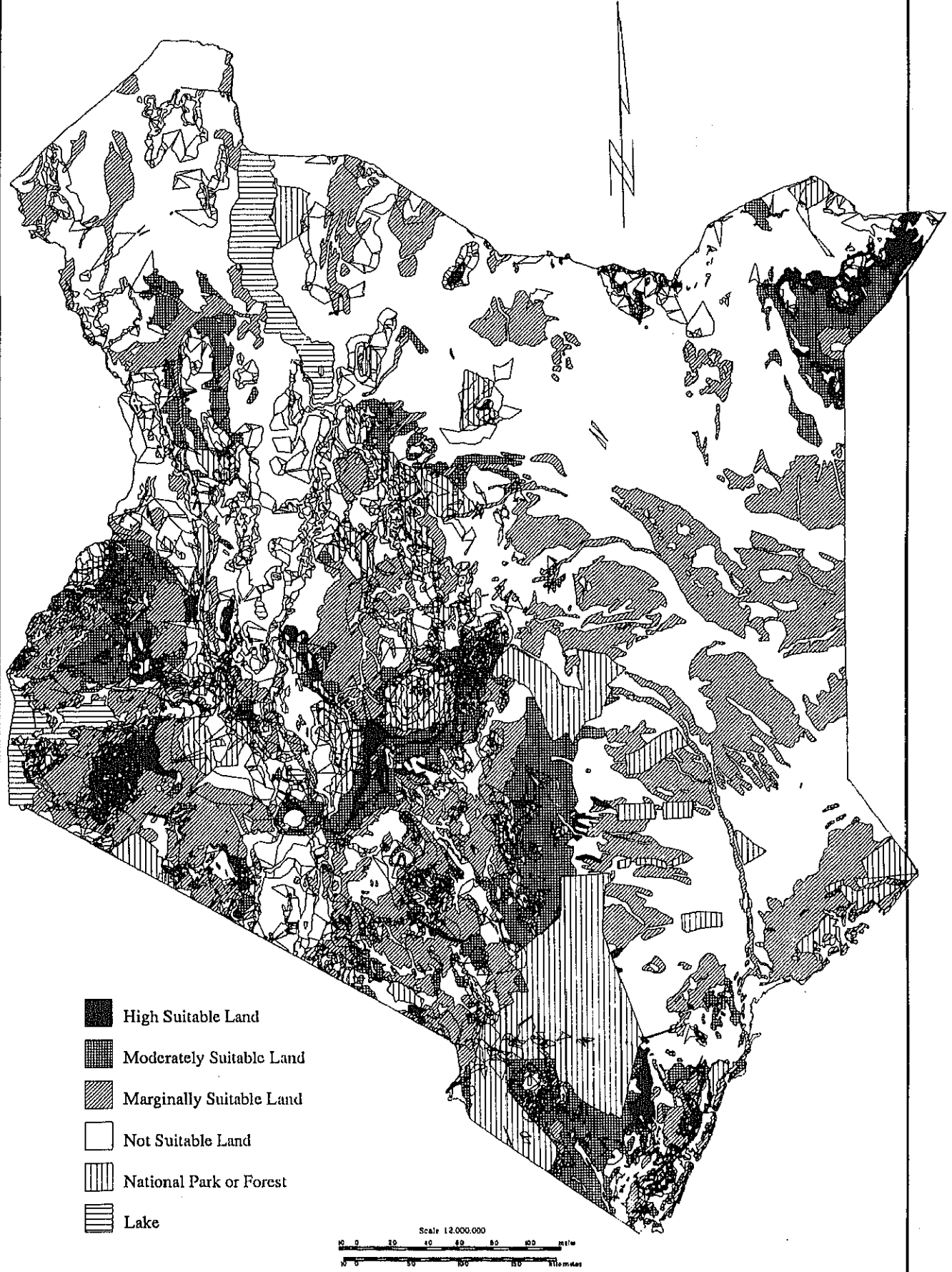


Figure 5.5.1 Irrigation Potential for Upland Crops

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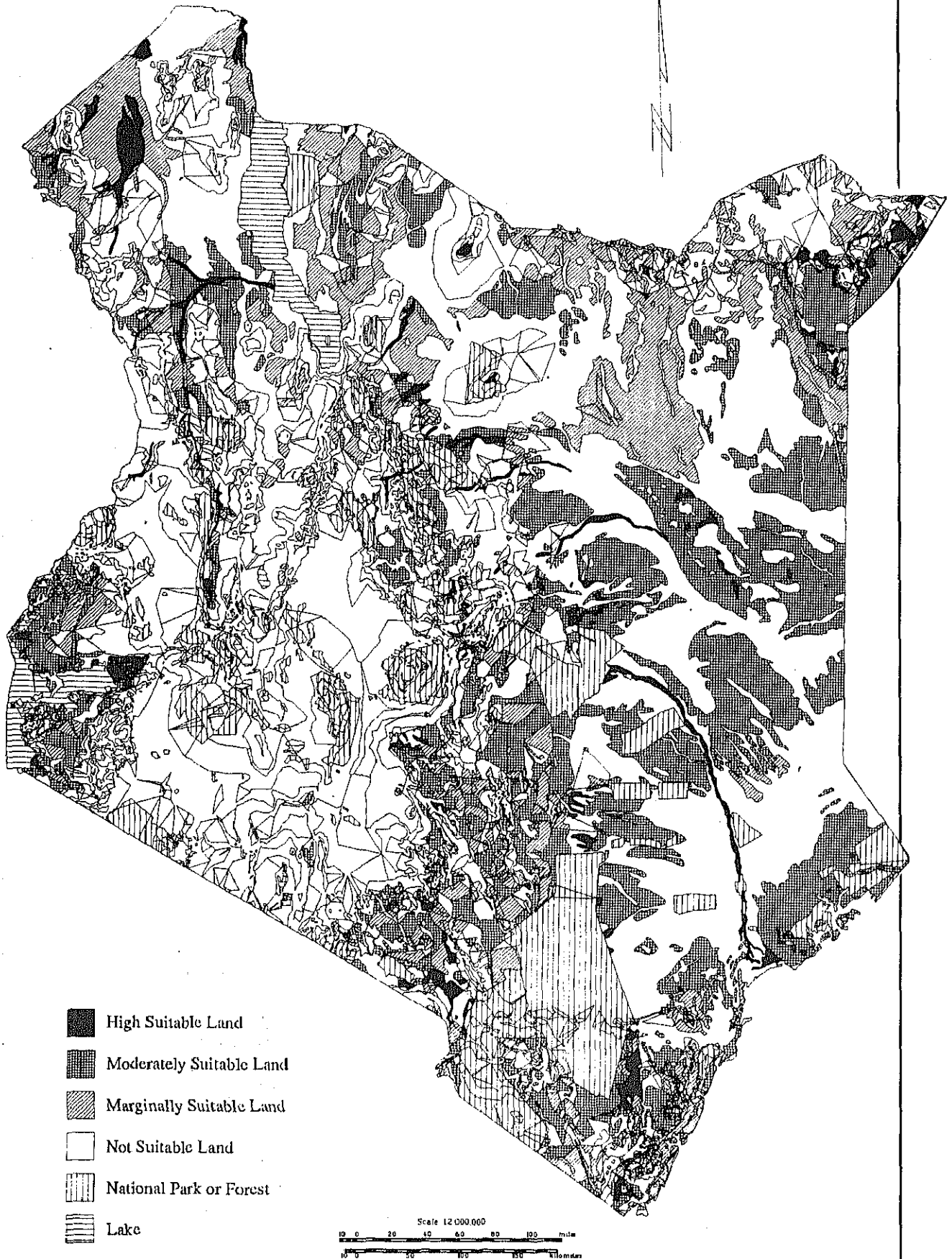


Figure 5.5.2 Irrigation Potential for Lowland Crops

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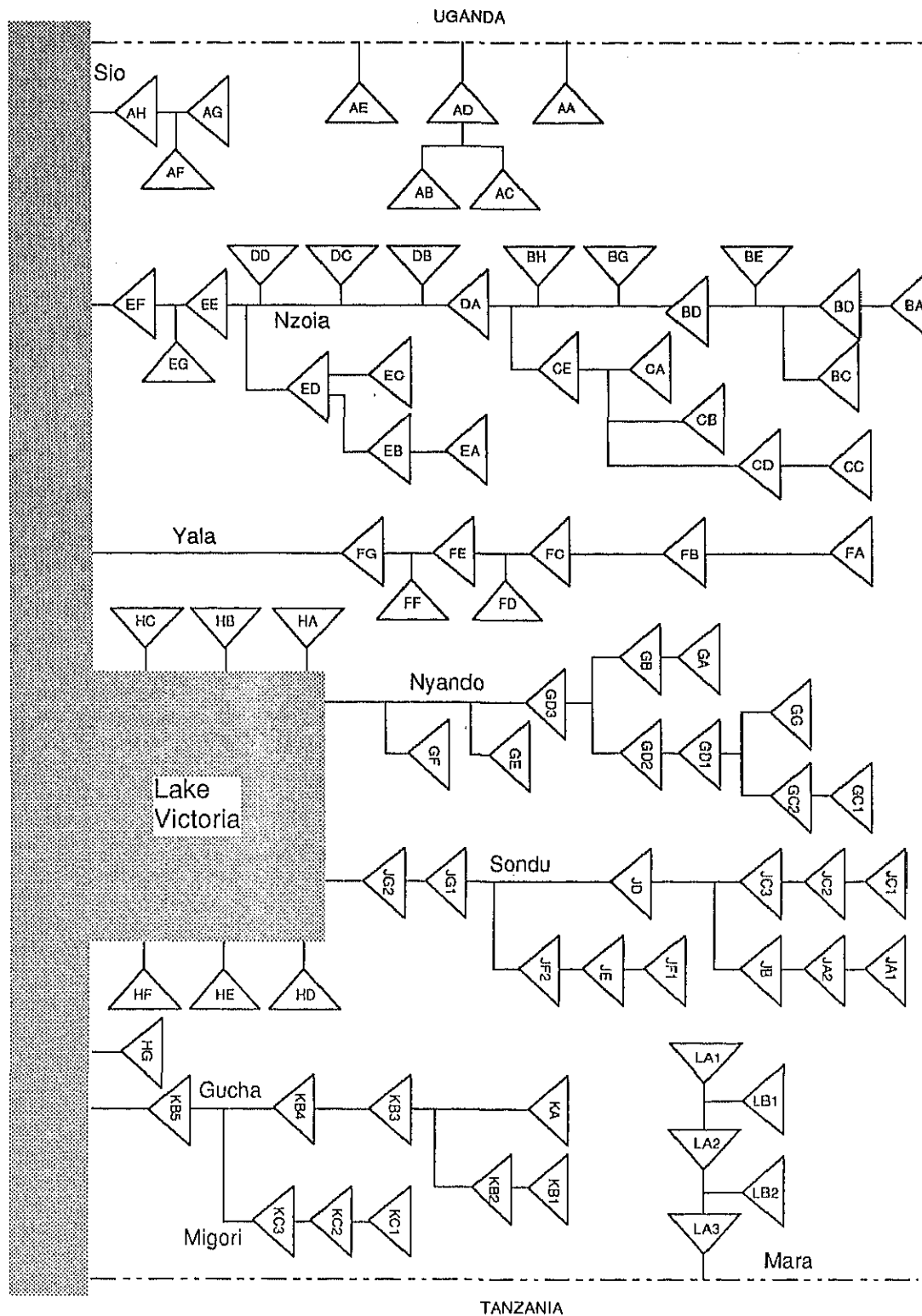


Figure 5.5.3 River System (1/5) (Base 1)

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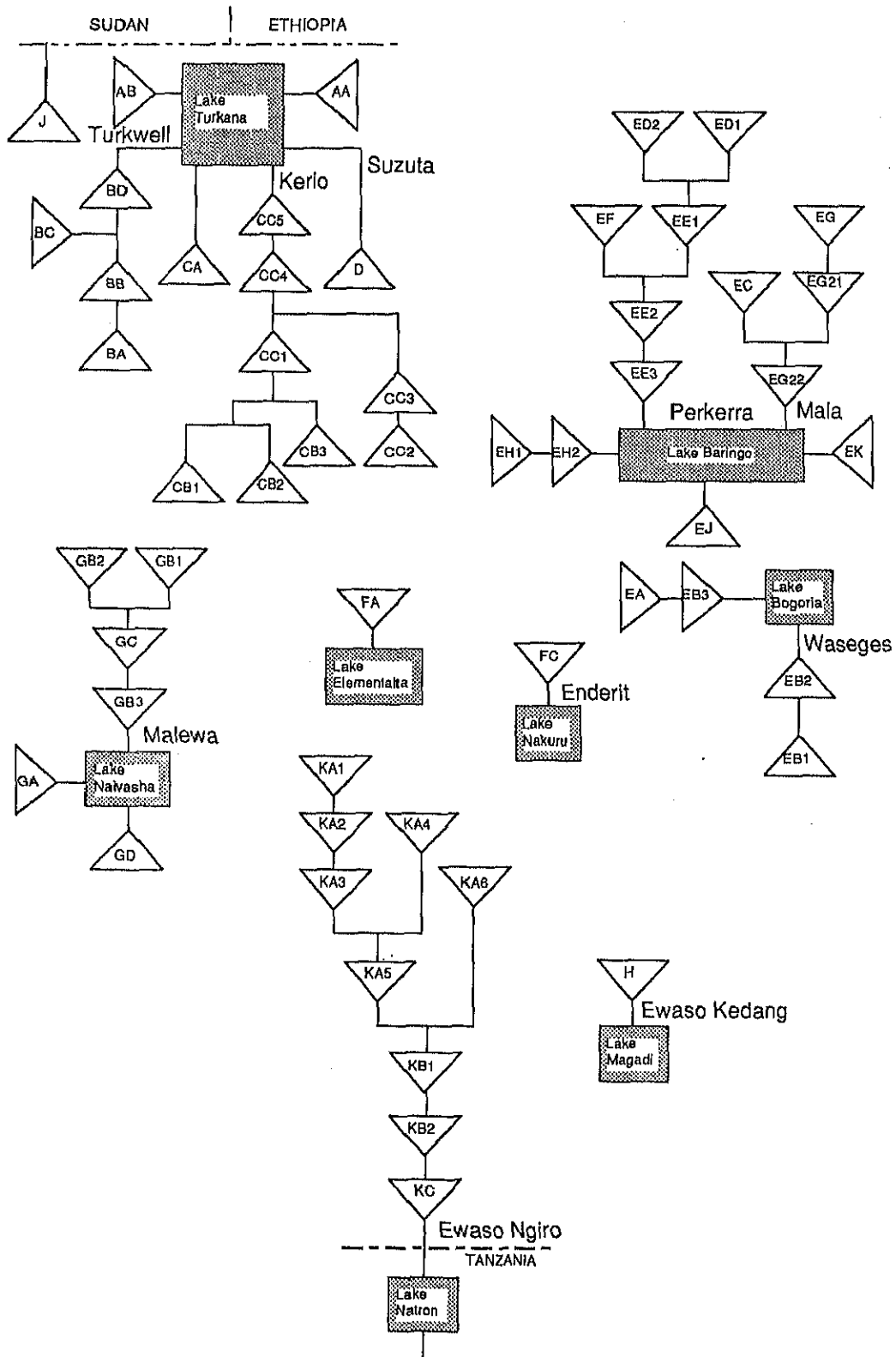


Figure 5.5.3 River System (2/5)
(Base 2)

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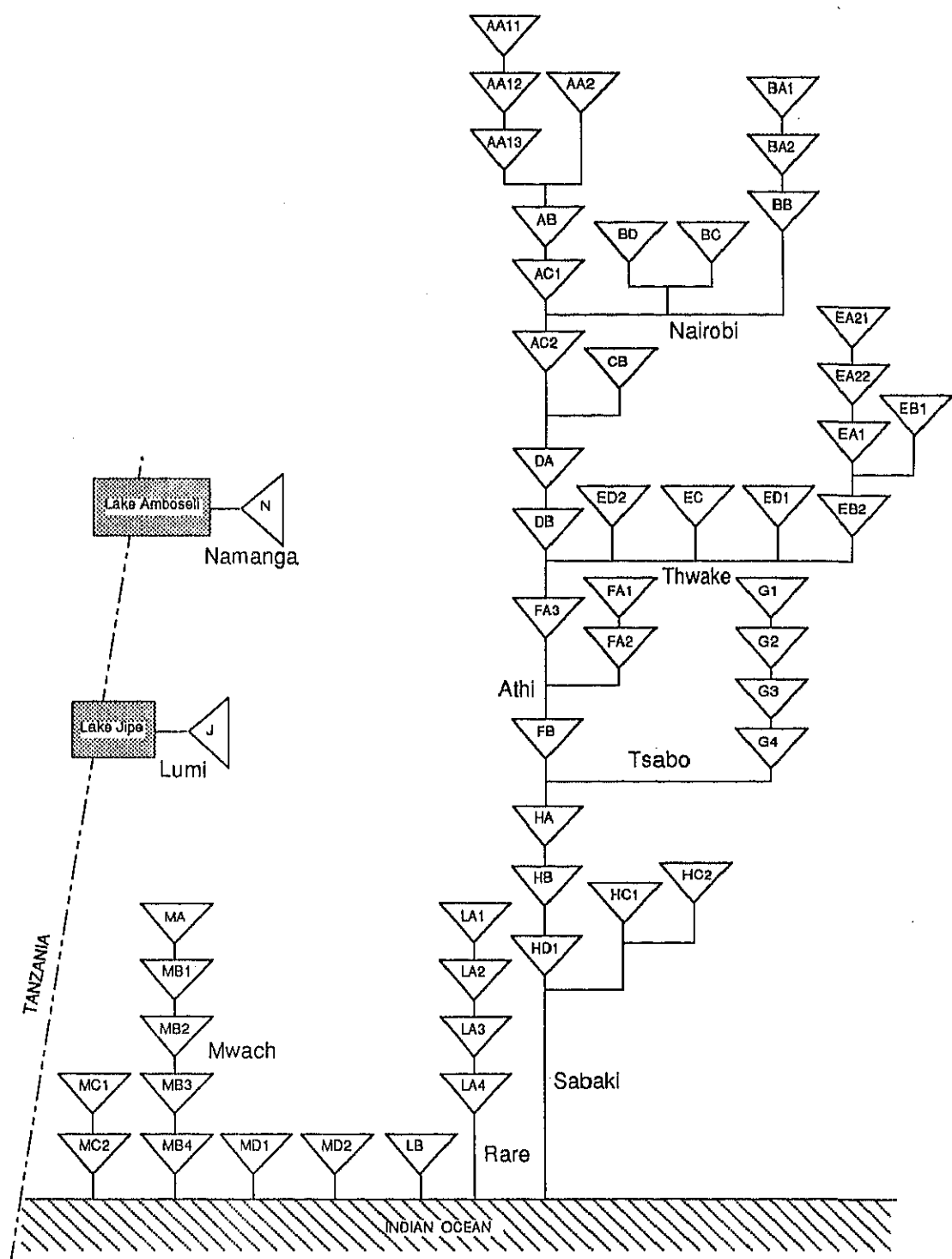


Figure 5.5.3 River System (3/5)
(Base 3)

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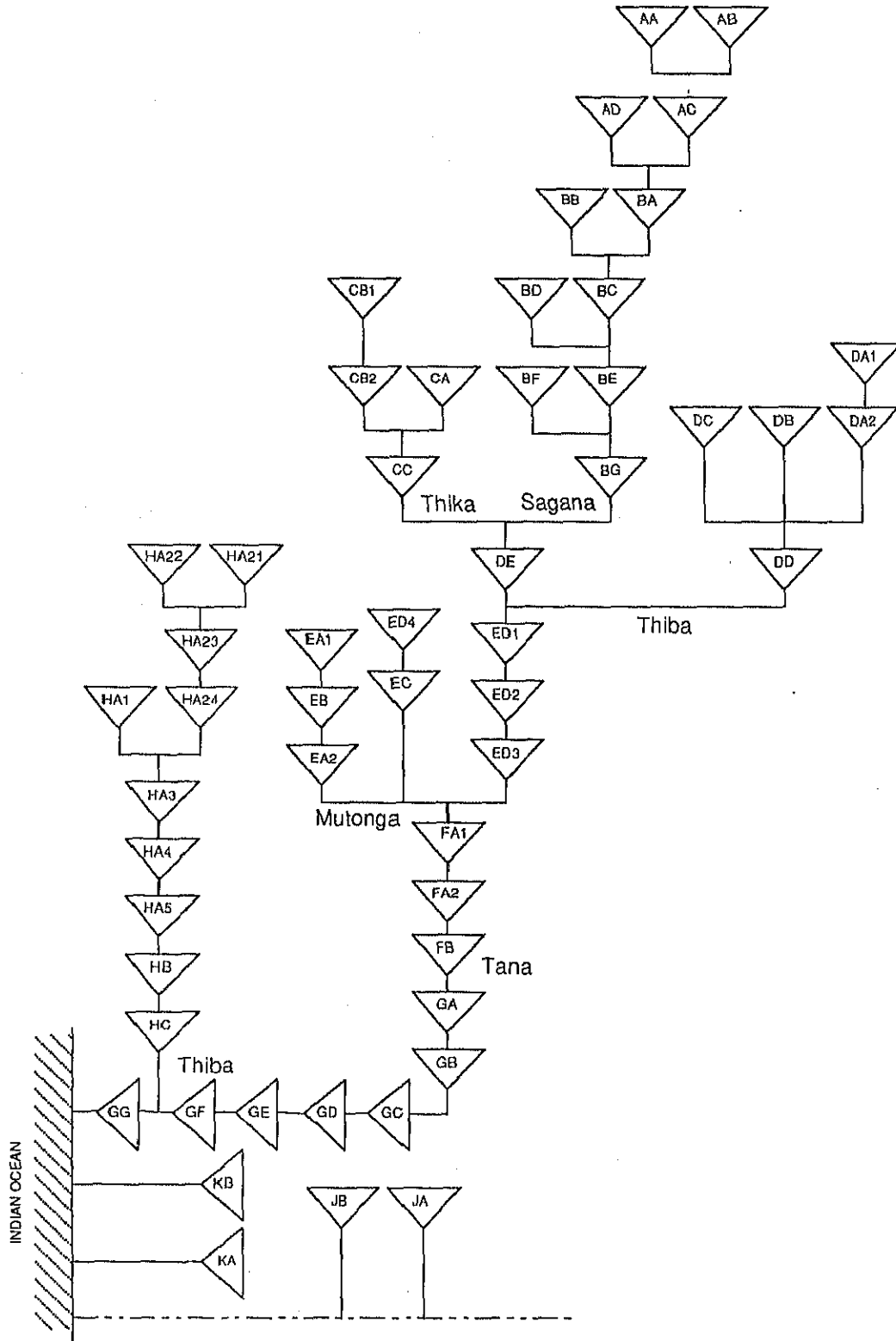


Figure 5.5.3 River System (4/5)
(Base 4)

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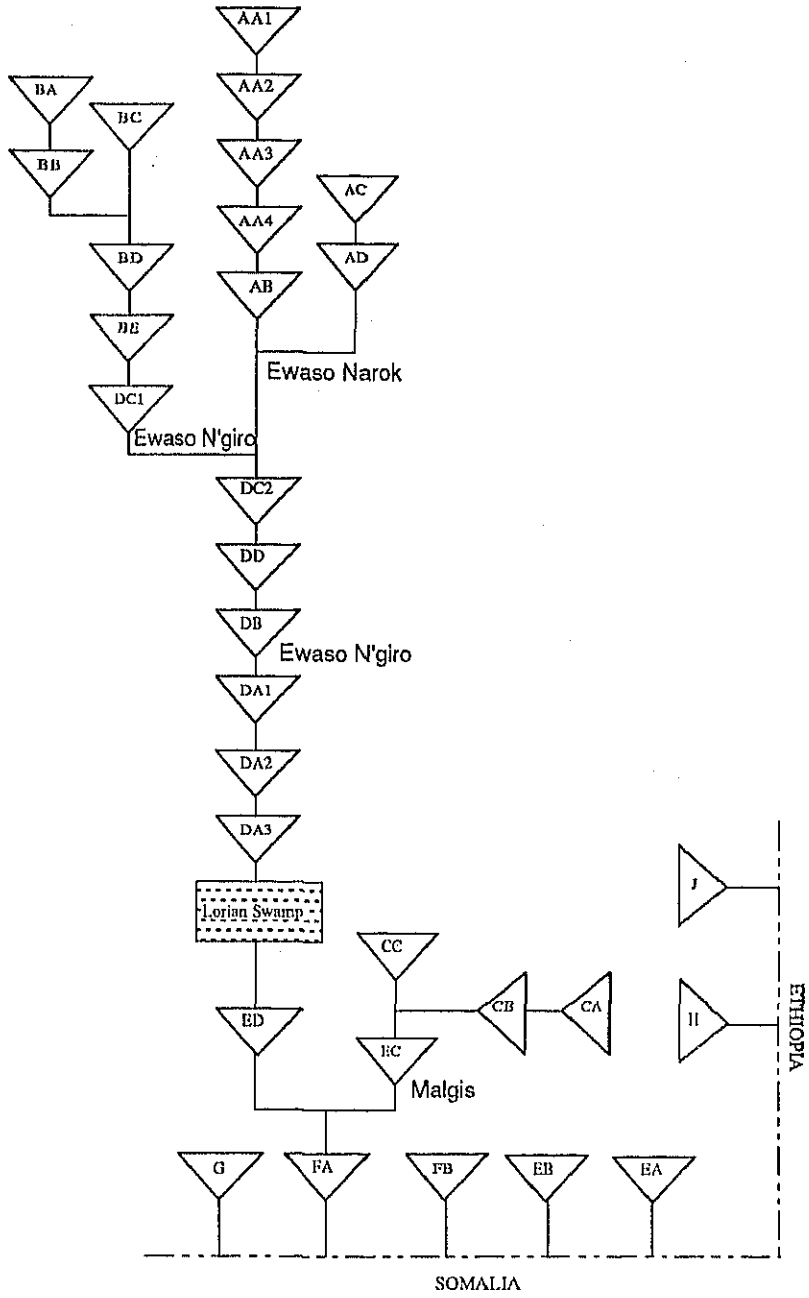
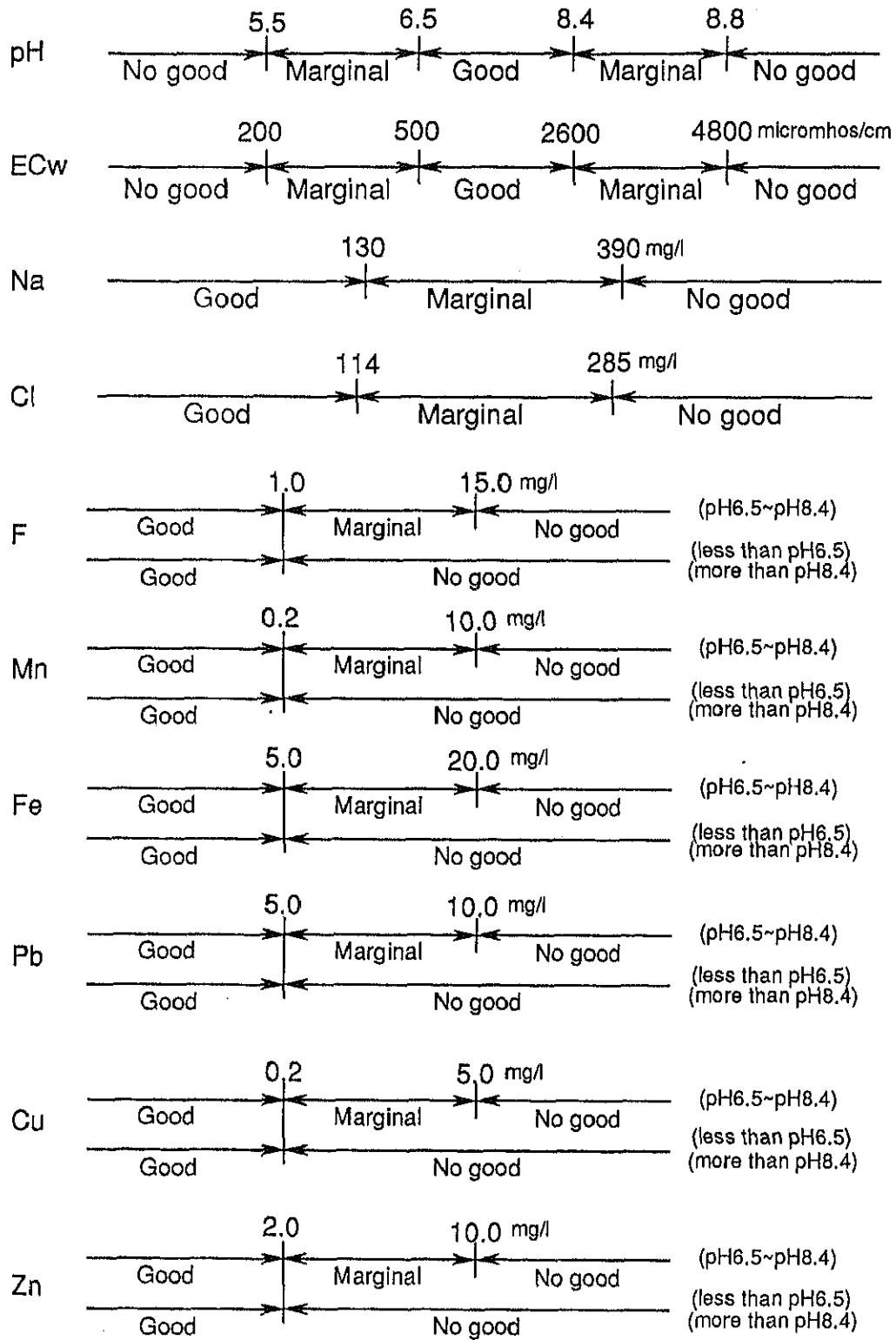


Figure 5.5.3 River System (5/5)
(Base 5)

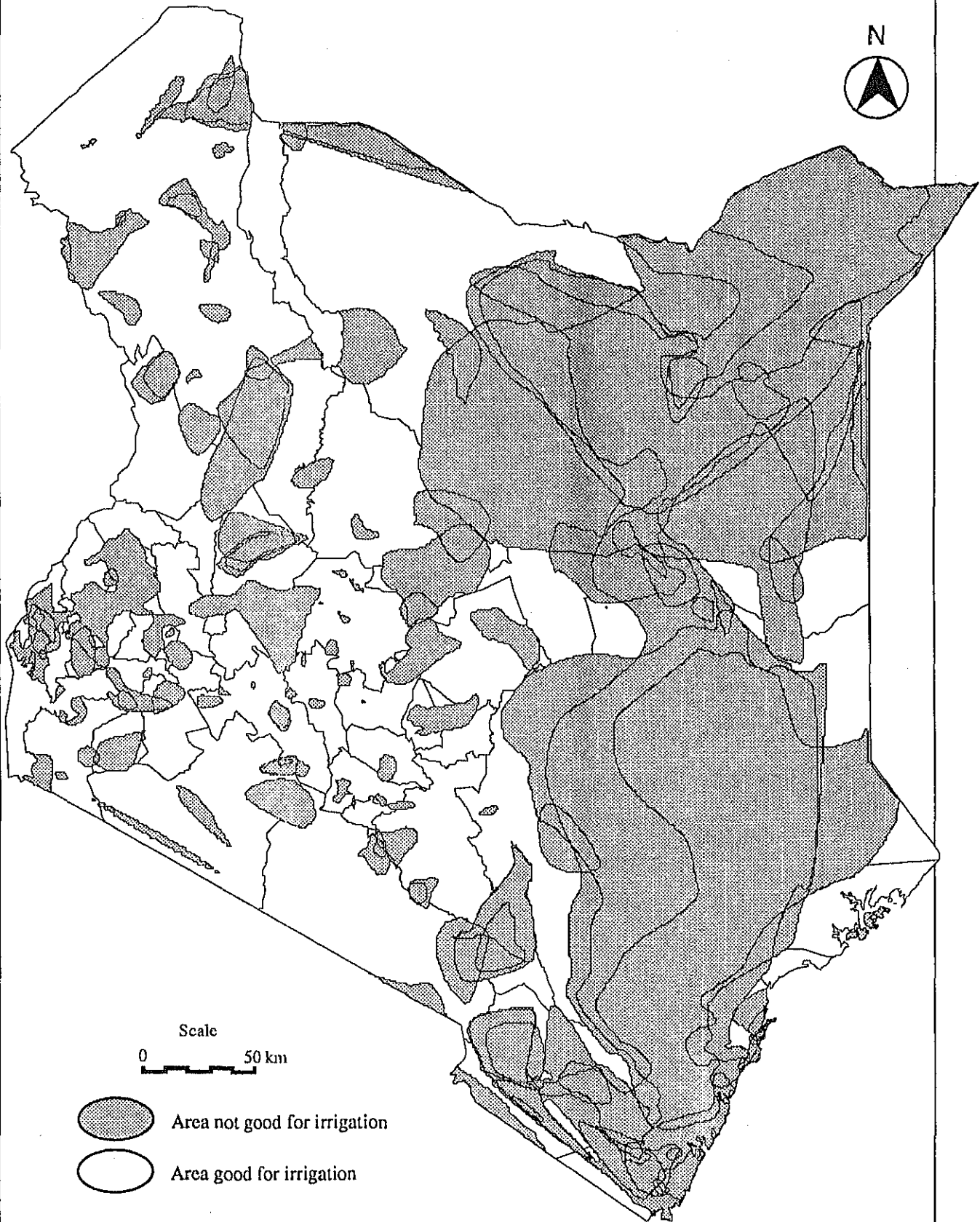
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Source : Ref. E.46

Figure 5.5.4 Water Quality Evaluation Criteria for Irrigation

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Scale
0 50 km



-  Area not good for irrigation
-  Area good for irrigation

Figure 5.5.5 Area of Groundwater Unsuitable for Irrigation

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Fig. 5.5.6

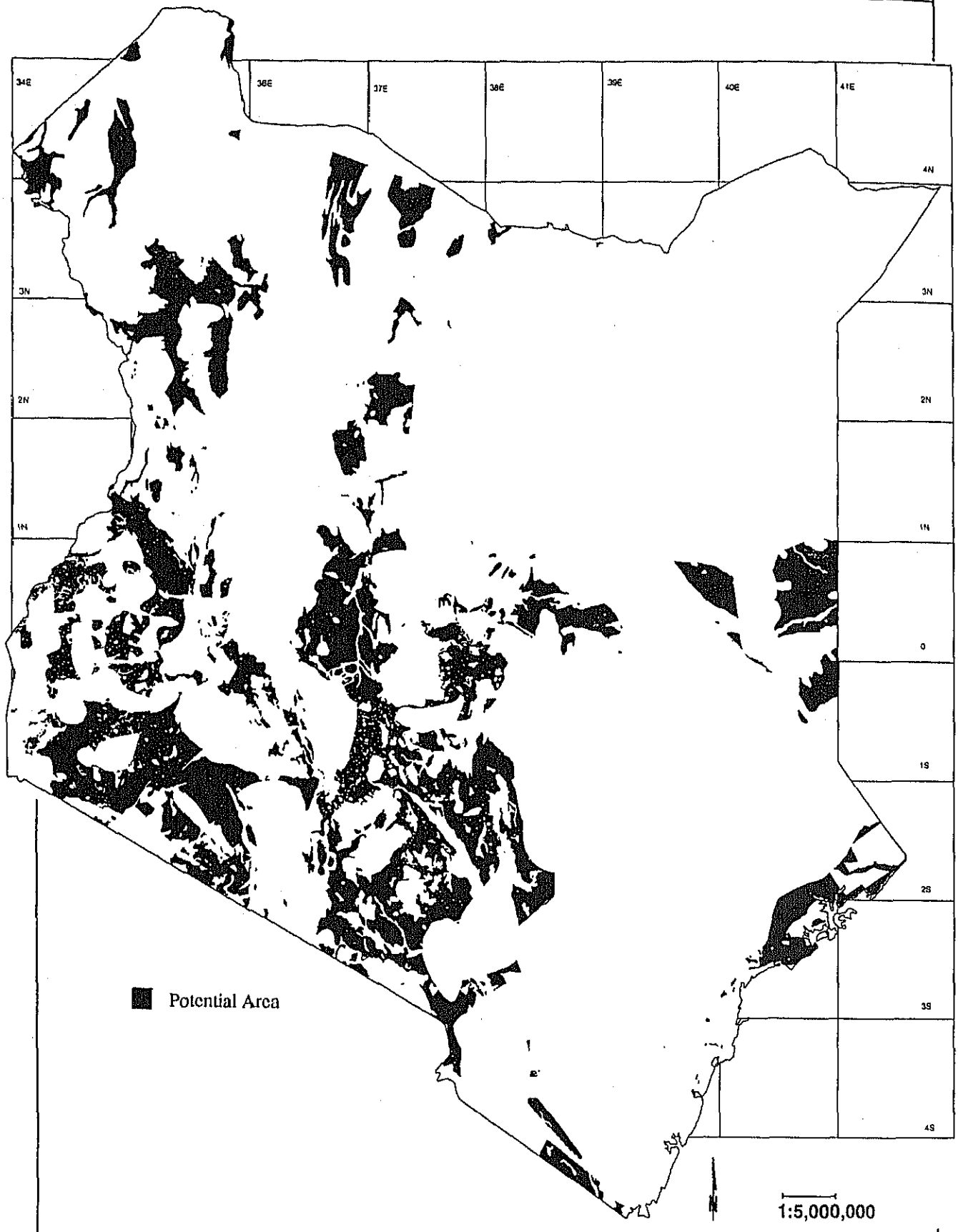


Figure 5.5.6 Irrigation Potential Area by Groundwater for Upland Crops

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Fig. 5.5.7

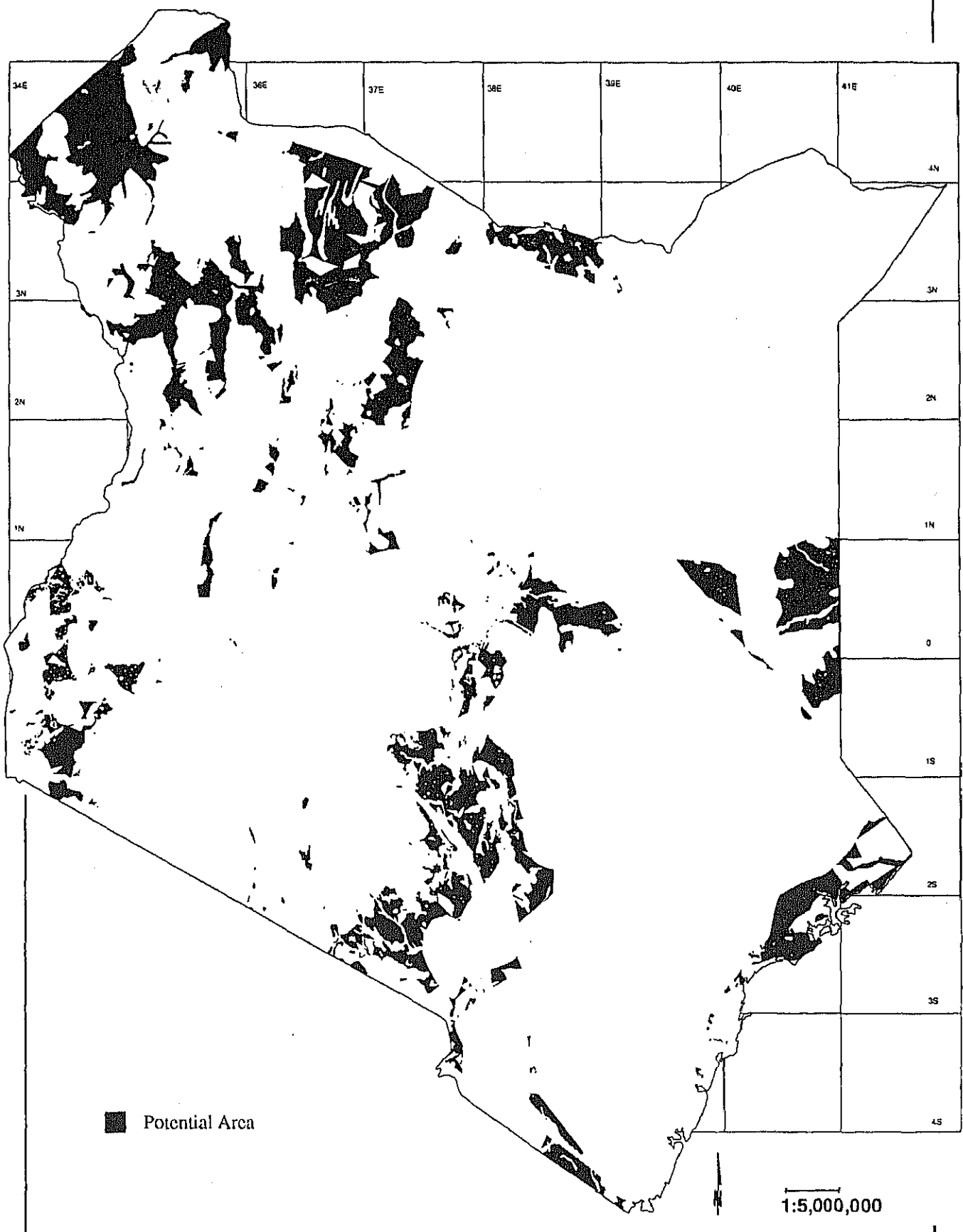
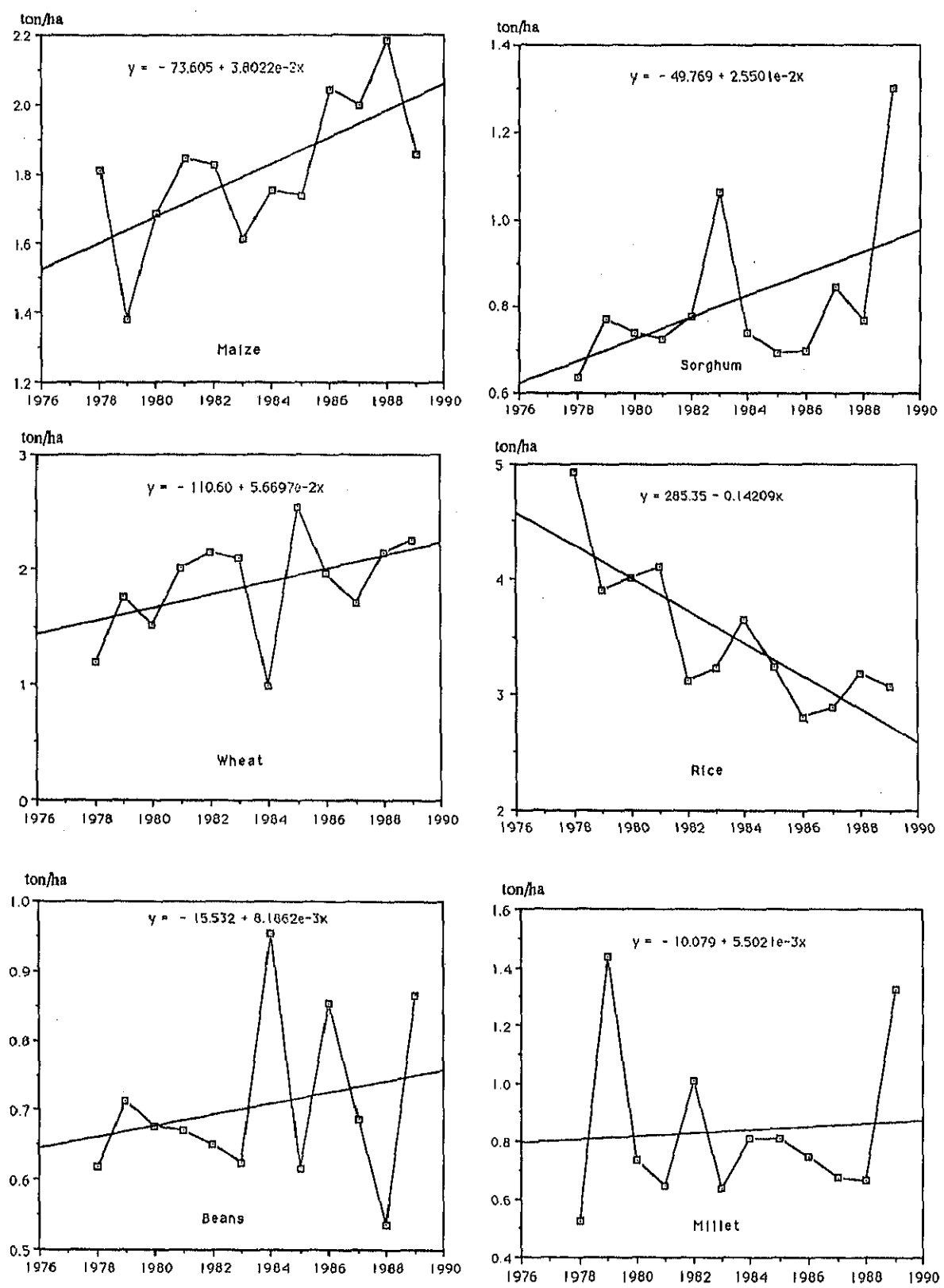


Figure 5.5.7 Irrigation Potential Area by Groundwater for Lowland Crops

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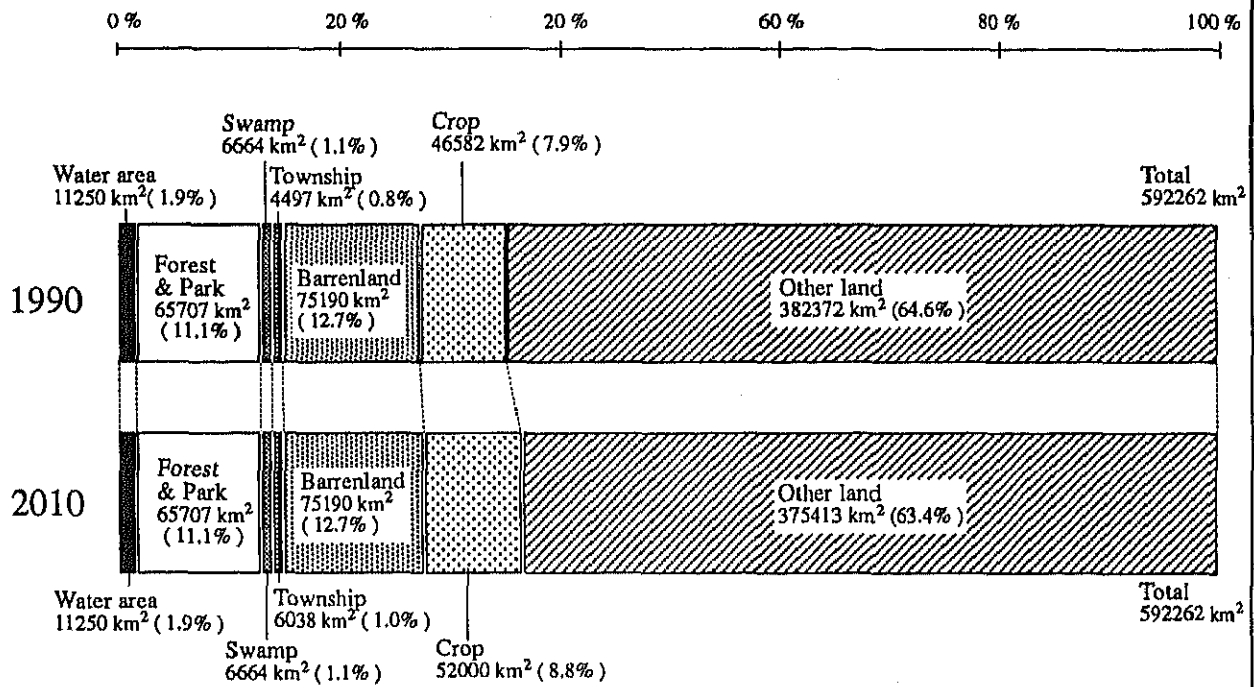


Source : Ref. 45

Figure 6.3.1 Trend of Unit Yield for Major Crops

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Overall Land Use



Breakdown of Crop Land

[Unit : 1000 ha]

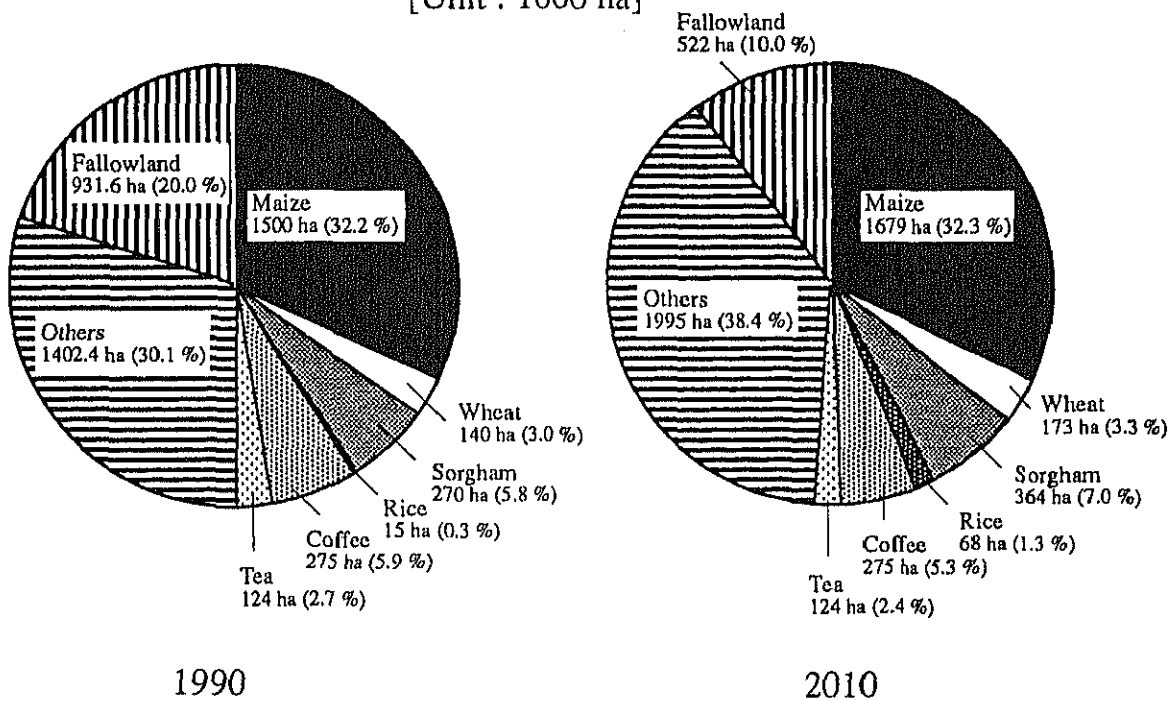


Figure 6.3.2 Preliminary Assessment of Future Land Use Plan

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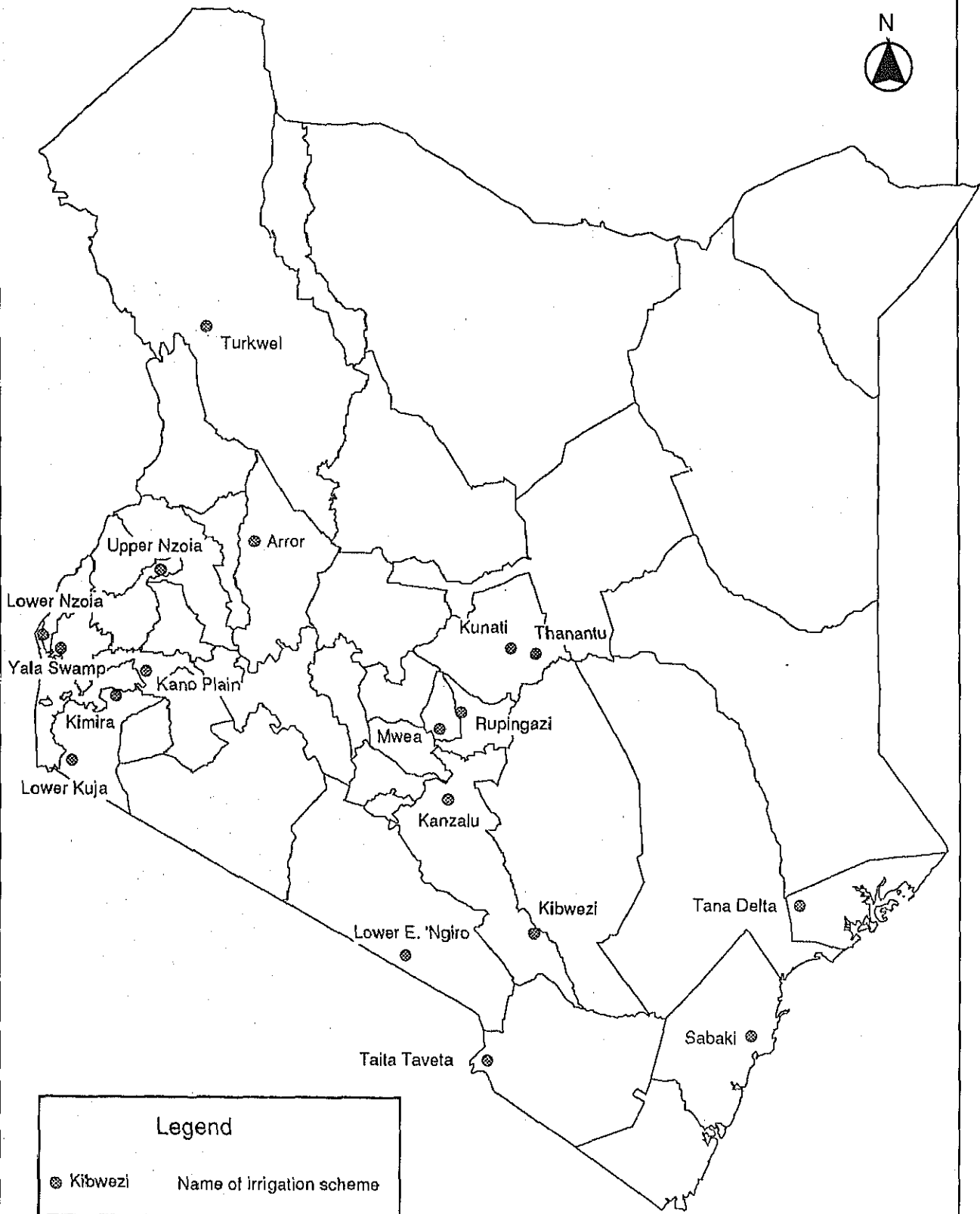
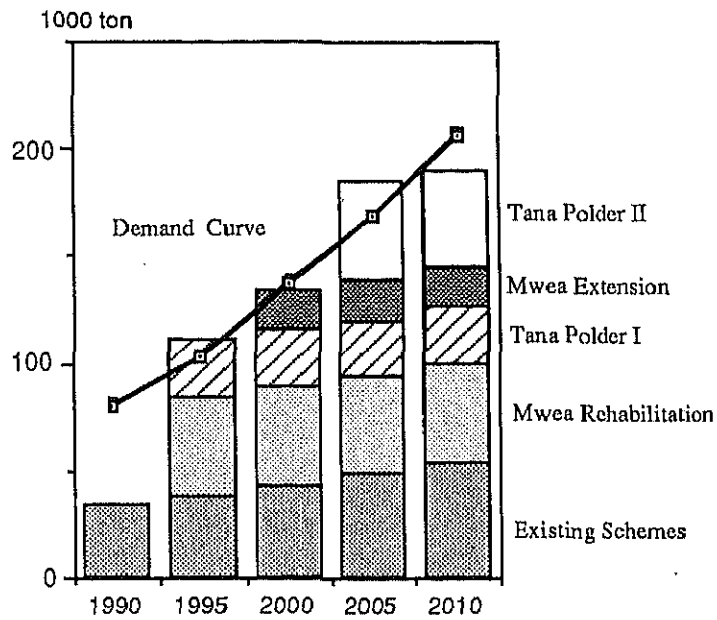


Figure 6.3.3 Location of Selected Large Scale Irrigation Schemes

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Rice Production Projection

Unit : 1000 ton

Year	Demand *1	Existing Scheme *2	Mwea Rehabili *3	Tana Polder I *3	Mwea Extension *3	Tana Polder II *3	Total Production *4	Balance
1990	78.2	52					33.8	-44.4
1995	101.4	58	70.4	26.5			109.96	8.56
2000	135.8	66	70.4	26.5	28.6		133.75	-2.05
2005	167.2	74	70.4	26.5	28.6	45.1	184.05	16.85
2010	204.9	82	70.4	26.5	28.6	45.1	189.25	-15.65

*1 see Table E.1.20

*2 projected from past production trend as shown in Figure below

*3 milled rice

*4 applying 65% of milling rate from paddy to milled rice

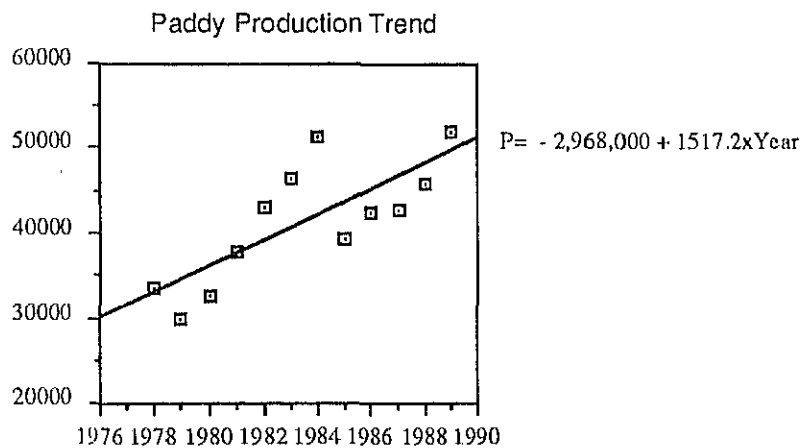


Figure 6.3.4 Rice Production Projection

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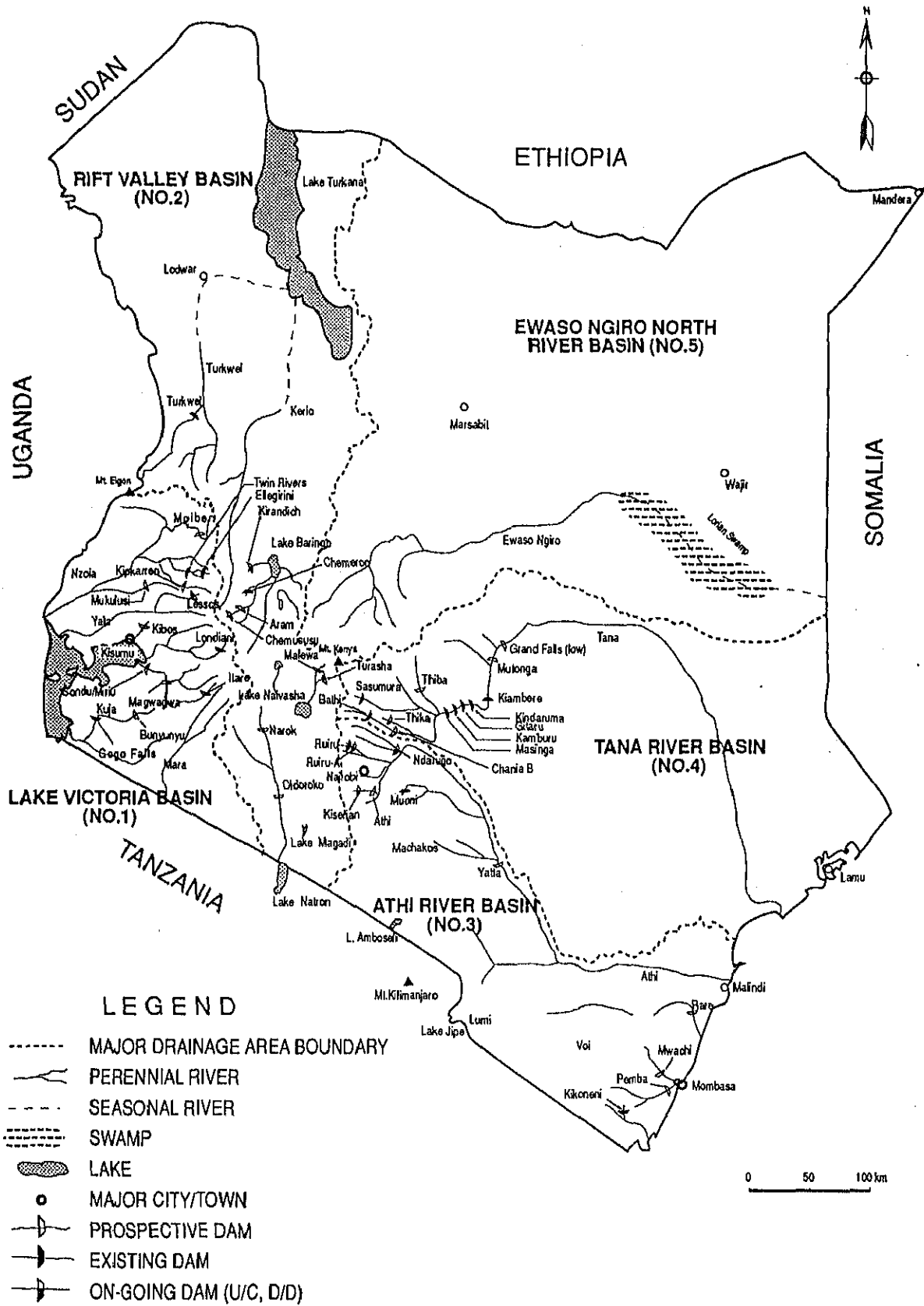
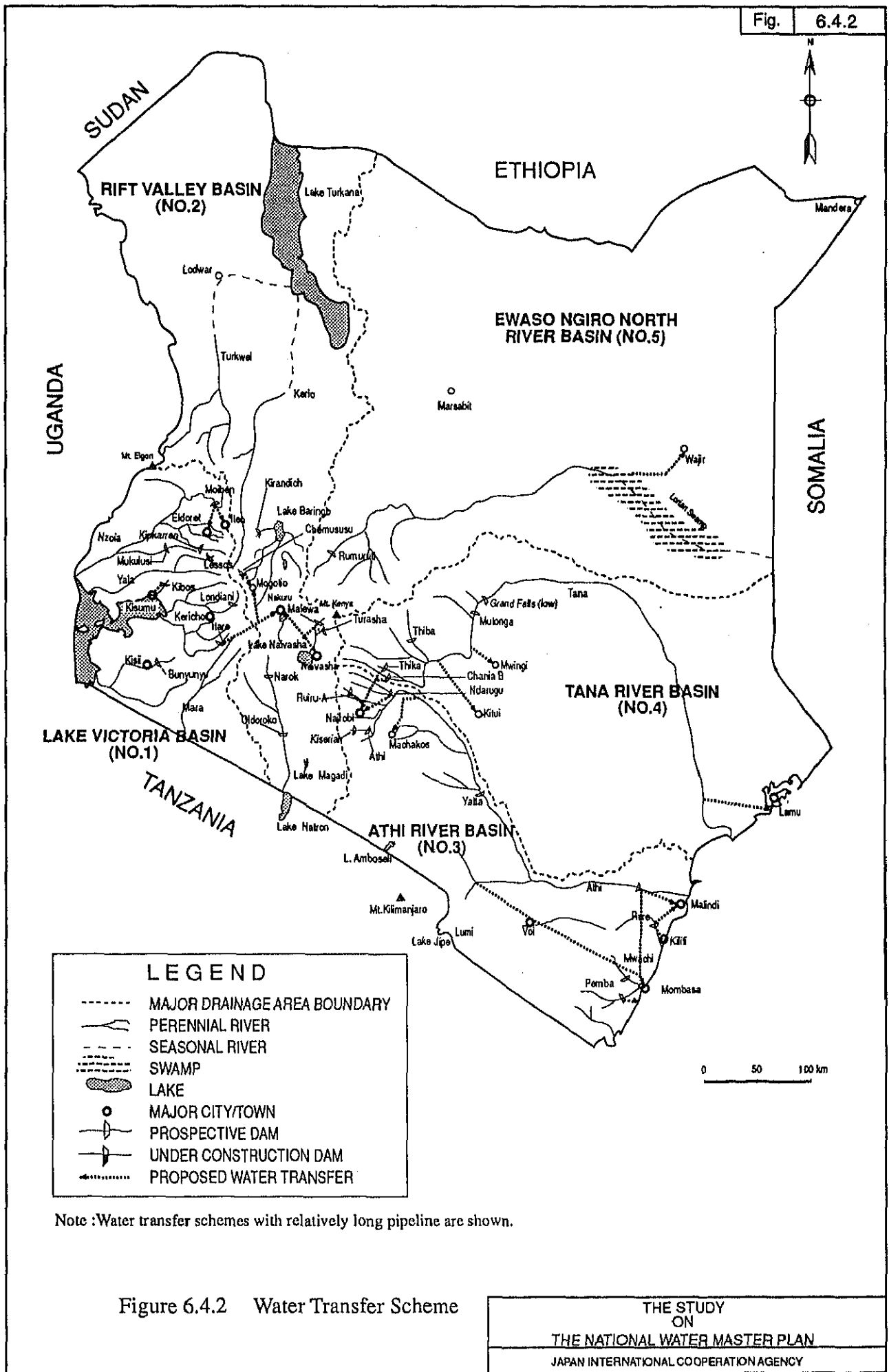


Figure 6.4.1 Location of Prospective Dams

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LEGEND

- MAJOR DRAINAGE AREA BOUNDARY
- PERENNIAL RIVER
- - - - SEASONAL RIVER
- ~~~~~ SWAMP
- ▨ LAKE
- MAJOR CITY/TOWN
- ⊥ PROSPECTIVE DAM
- ⊥ UNDER CONSTRUCTION DAM
- ⋯ PROPOSED WATER TRANSFER

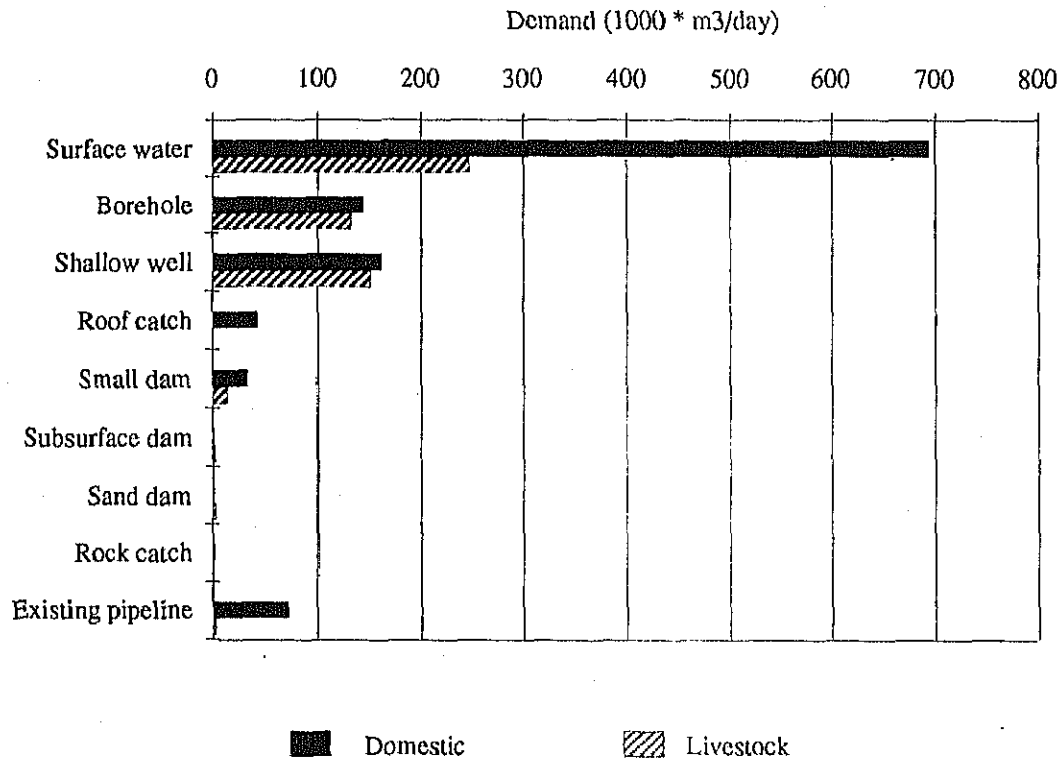
Note :Water transfer schemes with relatively long pipeline are shown.

0 50 100 km

Figure 6.4.2 Water Transfer Scheme

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Rural Water Supply



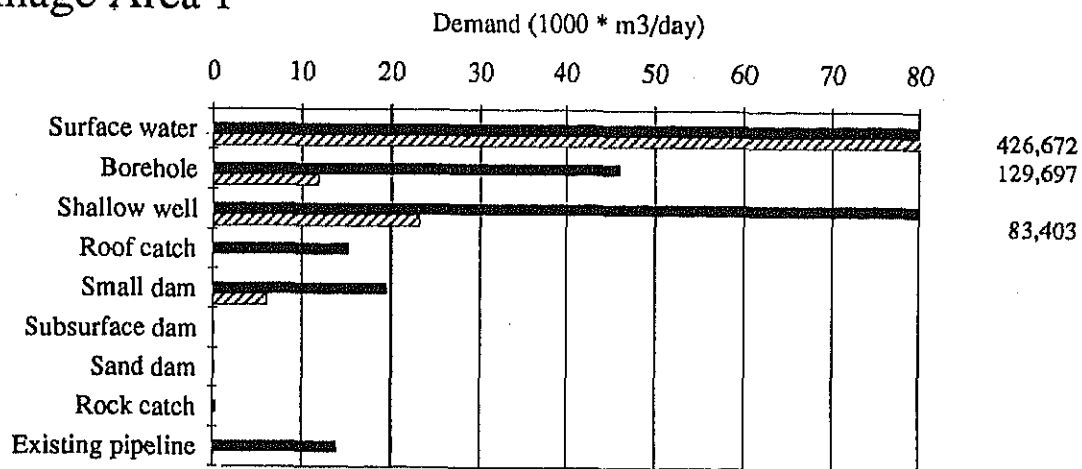
Water Source Allocation for Rural Water Supply

(Unit : m³/day)

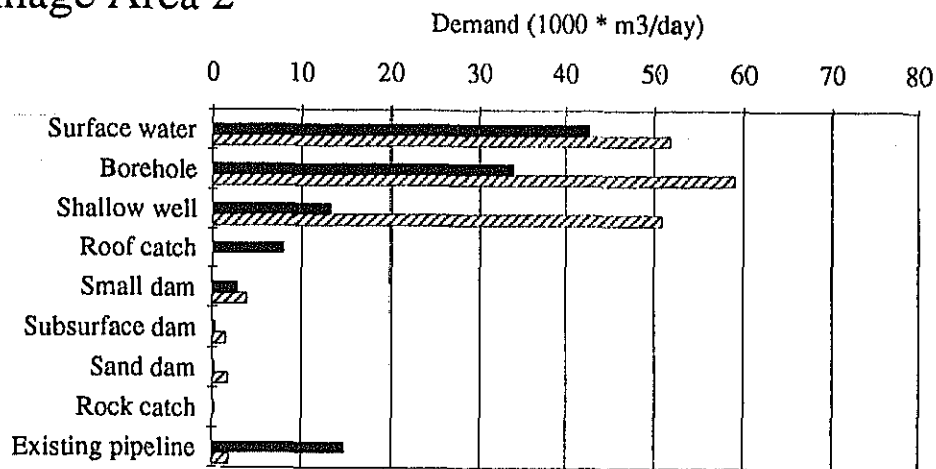
Water Source	Domestic	Livestock	Total
Surface water	695,627	248,489	944,116
Borehole	144,530	133,675	278,205
Shallow well	162,142	151,320	313,462
Roof catch	43,876	0	43,876
Small dam	34,977	14,404	49,381
Subsurface dam	2,171	3,473	5,644
Sand dam	1,917	4,256	6,173
Rock catch	2,147	0	2,147
Existing pipeline	72,333	3,114	75,447
Total	1,159,720	558,731	1,718,451

Figure 6.4.3 Water Source Allocation for Rural Water Supply

Drainage Area 1



Drainage Area 2



Drainage Area 3

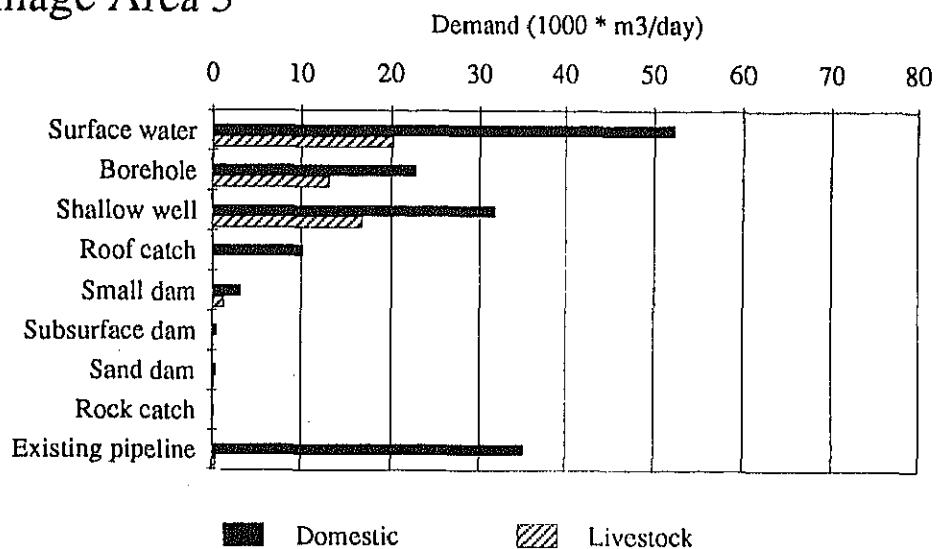
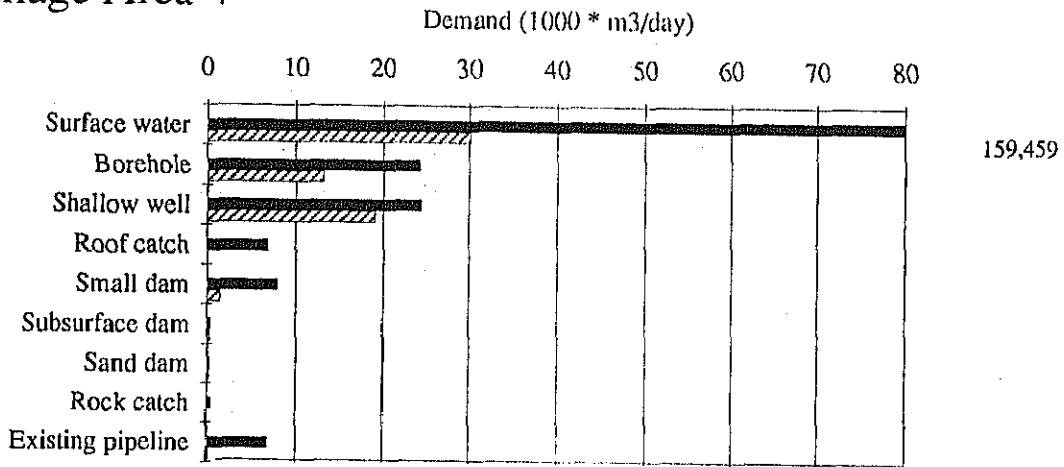


Figure 6.4.4 Water Source Allocation by Drainage Area (1/2)
(Rural and Livestock Water Supply)

Drainage Area 4



Drainage Area 5

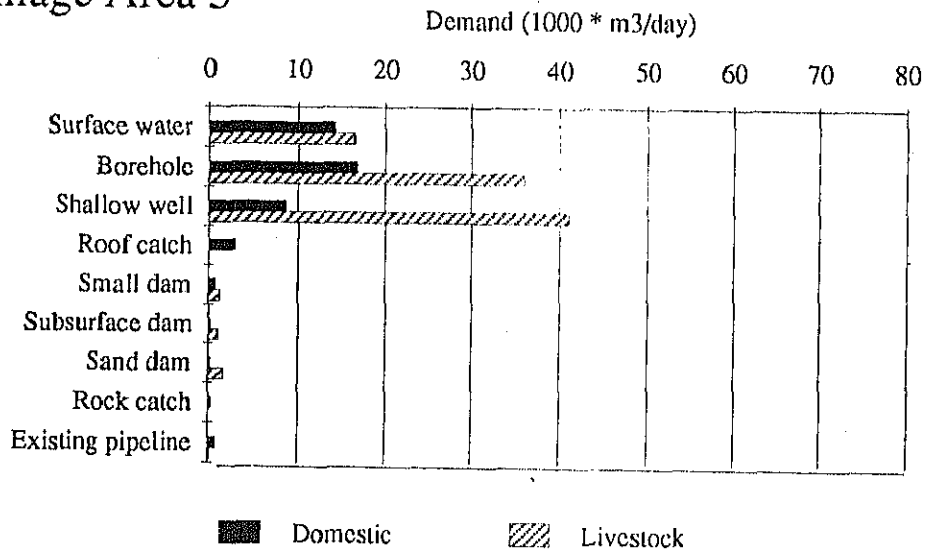


Figure 6.4.4 Water Source Allocation by Drainage Area (2/2)
(Rural and Livestock Water Supply)

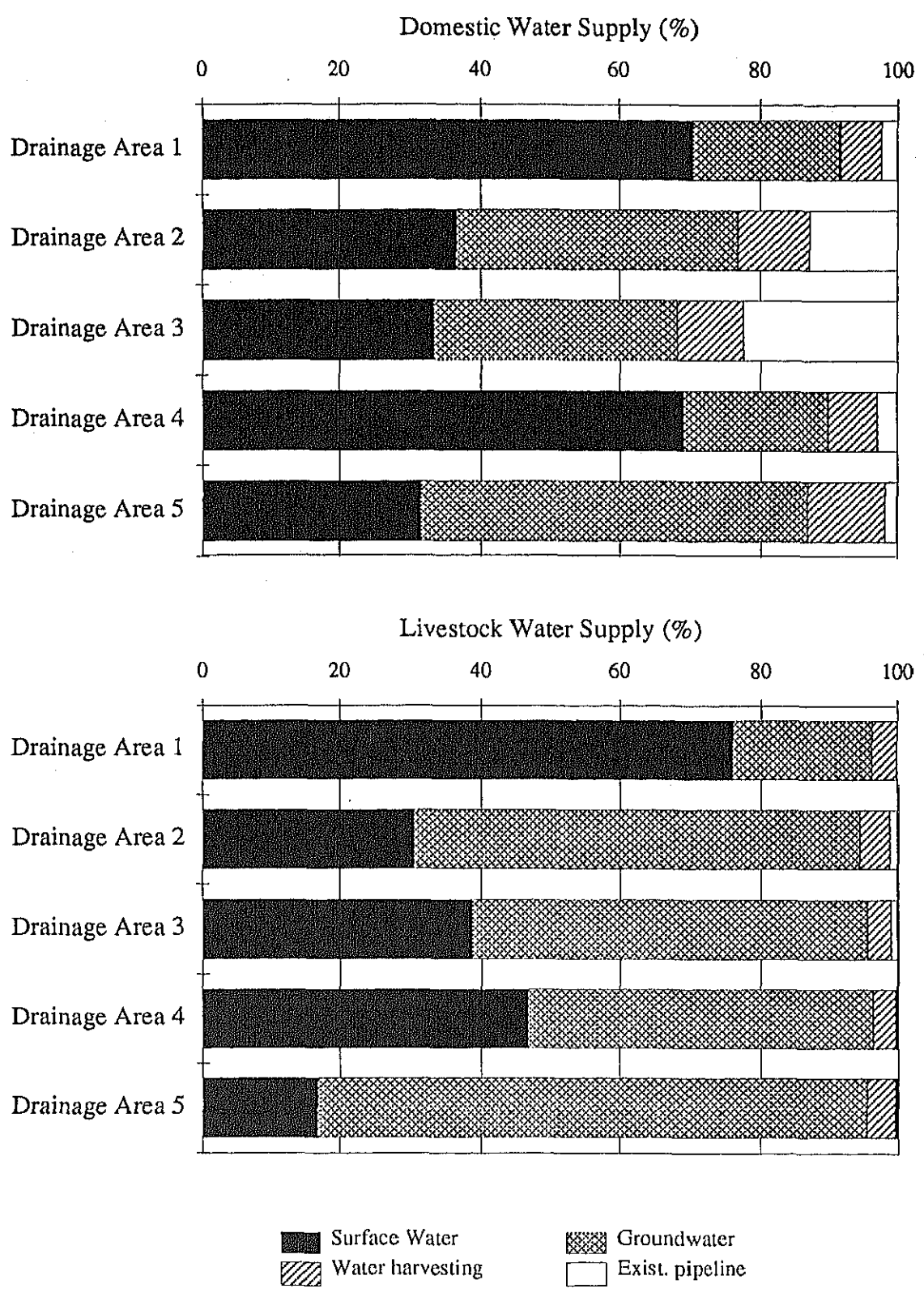


Figure 6.4.5 Allocation Ratio of Water Source (Rural and Livestock Water Supply)

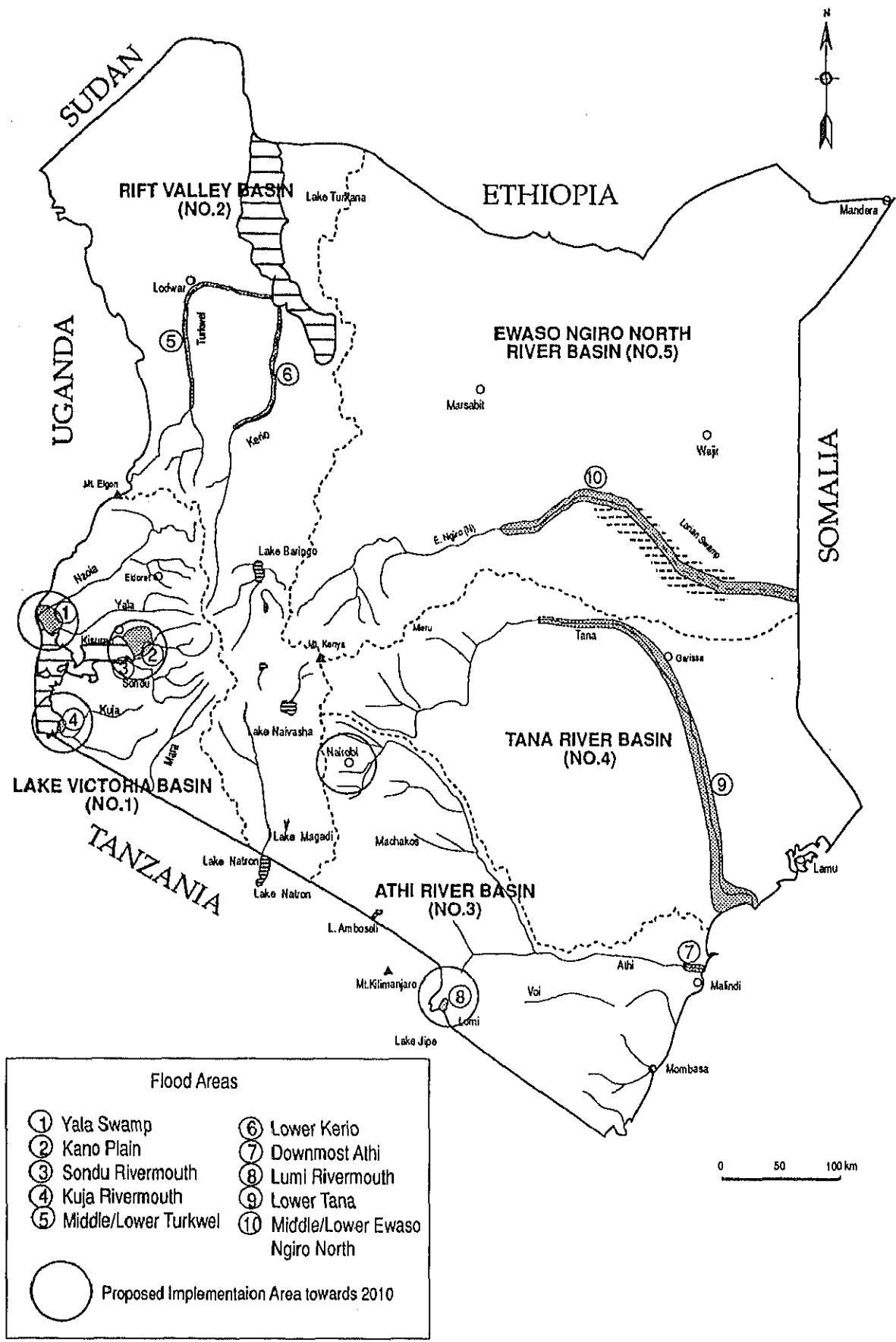
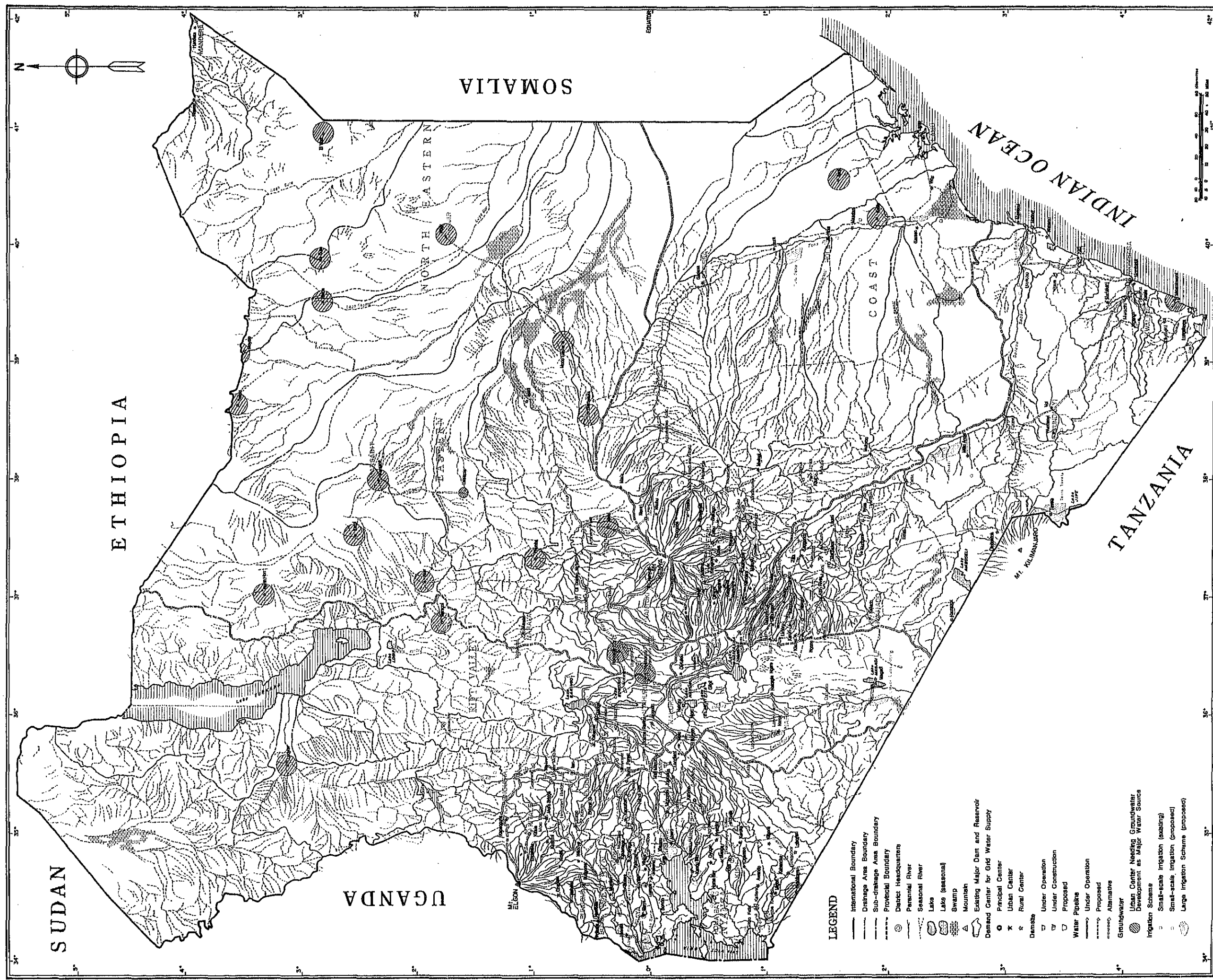


Figure 6.6.1 Flood Areas in the Country

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ATTACHED DRAWINGS

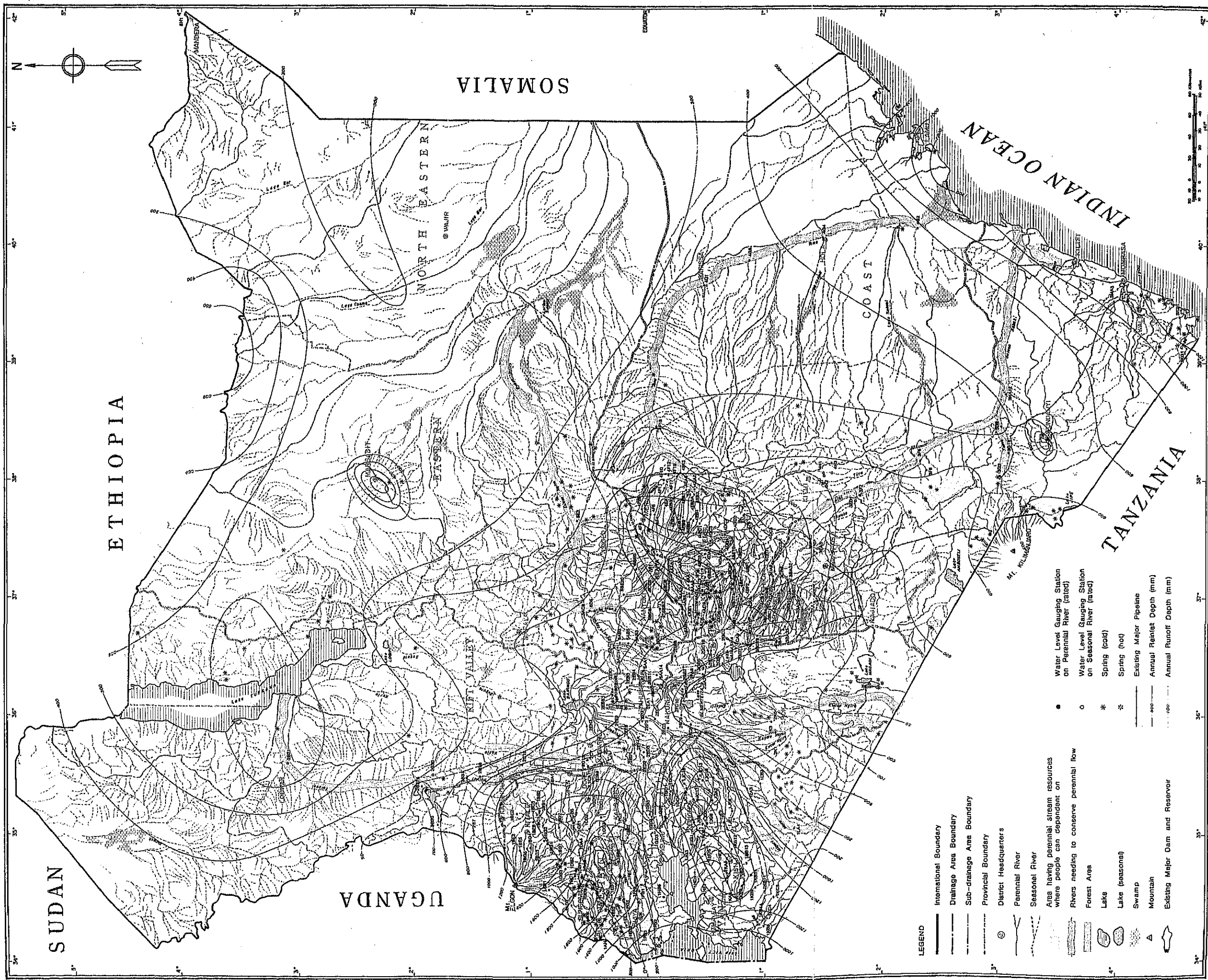
WATER RESOURCES DEVELOPMENT PLAN



LEGEND

- International Boundary
- - - Drainage Area Boundary
- - - Sub-Drainage Area Boundary
- - - Provincial Boundary
- ⊙ District Headquarters
- ⊙ Perennial River
- ⊙ Seasonal River
- ⊙ Lake
- ⊙ Lake (seasonal)
- ⊙ Swamp
- ⊙ Mountain
- ⊙ Existing Major Dam and Reservoir
- ⊙ Demand Center for Grid Water Supply
- ⊙ Principal Center
- ⊙ Urban Center
- ⊙ Rural Center
- ⊙ Dam
- ⊙ Under Operation
- ⊙ Under Construction
- ⊙ Proposed
- ⊙ Water Pipeline
- ⊙ Under Operation
- ⊙ Proposed
- ⊙ Alternative
- ⊙ Groundwater
- ⊙ Urban Center Needing Groundwater Development as Major Water Source
- ⊙ Irrigation Scheme
- ⊙ Small-scale Irrigation (existing)
- ⊙ Small-scale Irrigation (proposed)
- ⊙ Large Irrigation Scheme (proposed)

SURFACE WATER INFORMATION MAP



- LEGEND**
- International Boundary
 - Drainage Area Boundary
 - Sub-drainage Area Boundary
 - Provincial Boundary
 - ⊙ District Headquarters
 - Perennial River
 - Seasonal River
 - Area having perennial stream resources where people can dependant on
 - Rivers needing to conserve perennial flow
 - ▨ Forest Area
 - Lake
 - Lake (seasonal)
 - ▨ Swamp
 - △ Mountain
 - Existing Major Dam and Reservoir
 - Water Level Gauging Station on Perennial River (rated)
 - Water Level Gauging Station on Seasonal River (rated)
 - * Spring (cold)
 - * Spring (hot)
 - Existing Major Pipeline
 - Annual Rainfall Depth (mm)
 - Annual Runoff Depth (mm)

