No. 57

Japan International Cooperation Agency

The Democratic Socialist Republic of Sri Lanka
Ministry of Plan Implementation, Ethnic Affairs and National Integration

The Master Plan Study For Southern Area Development In The Democratic Socialist Republic of Sri Lanka

GIS Map Book

February 1997

Nippon Koei Co., Ltd.
International Development Center of Japan
System Science Consultants Inc.

Japan International Cooperation Agency

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GIS Map Book

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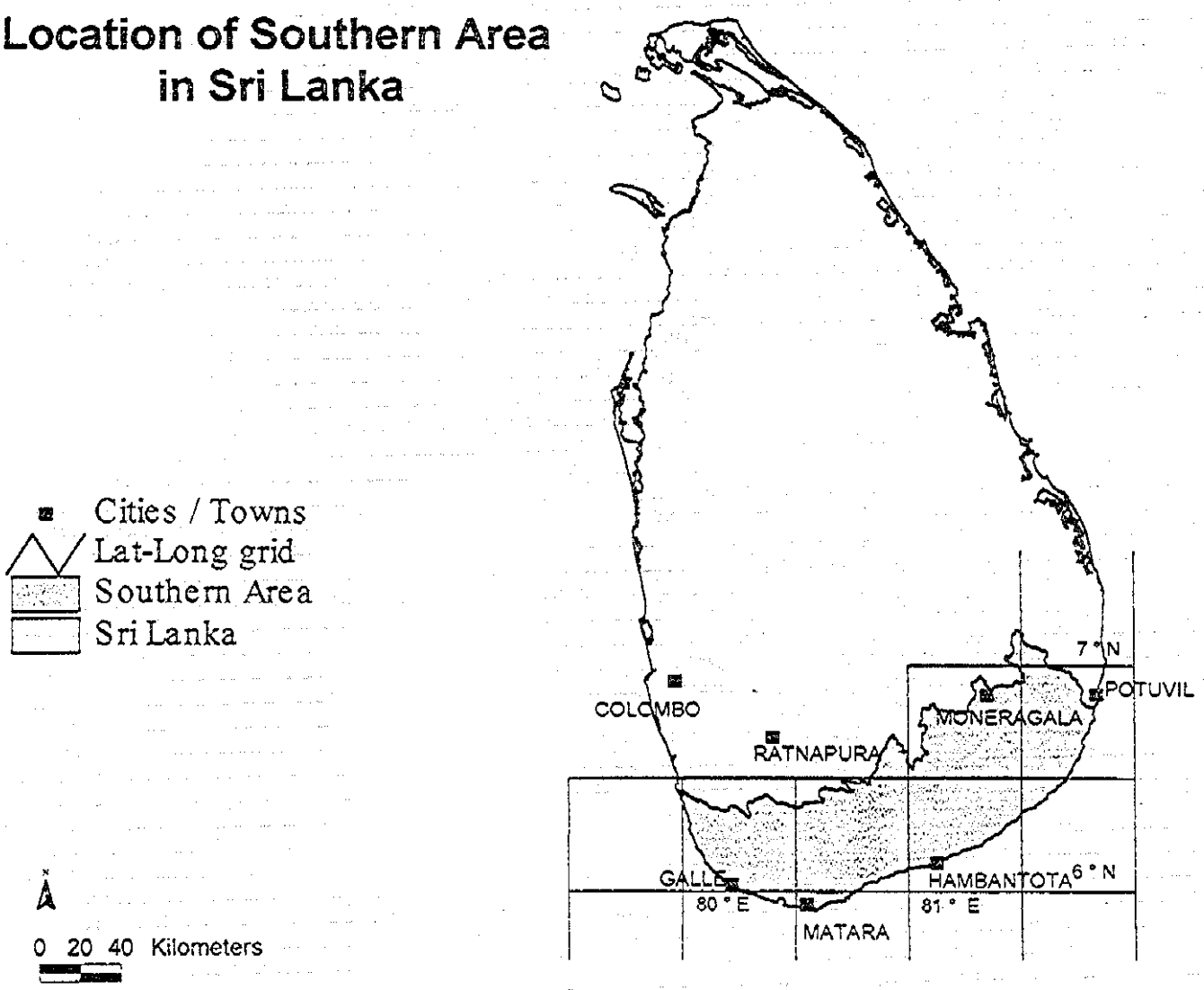
GIS MAP BOOK

The Master Plan Study for Southern Area Development in the Democratic Socialist Republic of Sri Lanka has been prepared by using a geographic information system (GIS) extensively as a tool for planning and analytical purposes. GIS has been applied not only to more conventional application fields of land capability analysis and land use planning but also to water supply-demand balance analysis, urban/industrial potential land evaluation, some social analysis and others.

The GIS Map Book has been prepared as supplemental output of the Master Plan Study. It contains most maps prepared and used for the Study, based on various input materials provided by related government agencies, socio-economic data collected and compiled by the JICA Study Team, and satellite imagery.

Associated with the GIS Map Book, a prototype of GIS-based Regional Information System (RIS) has been developed to facilitate the use of various maps prepared by a GIS. Description of the RIS is contained in Appendix.

Location of Southern Area in Sri Lanka



Source : JICA Study

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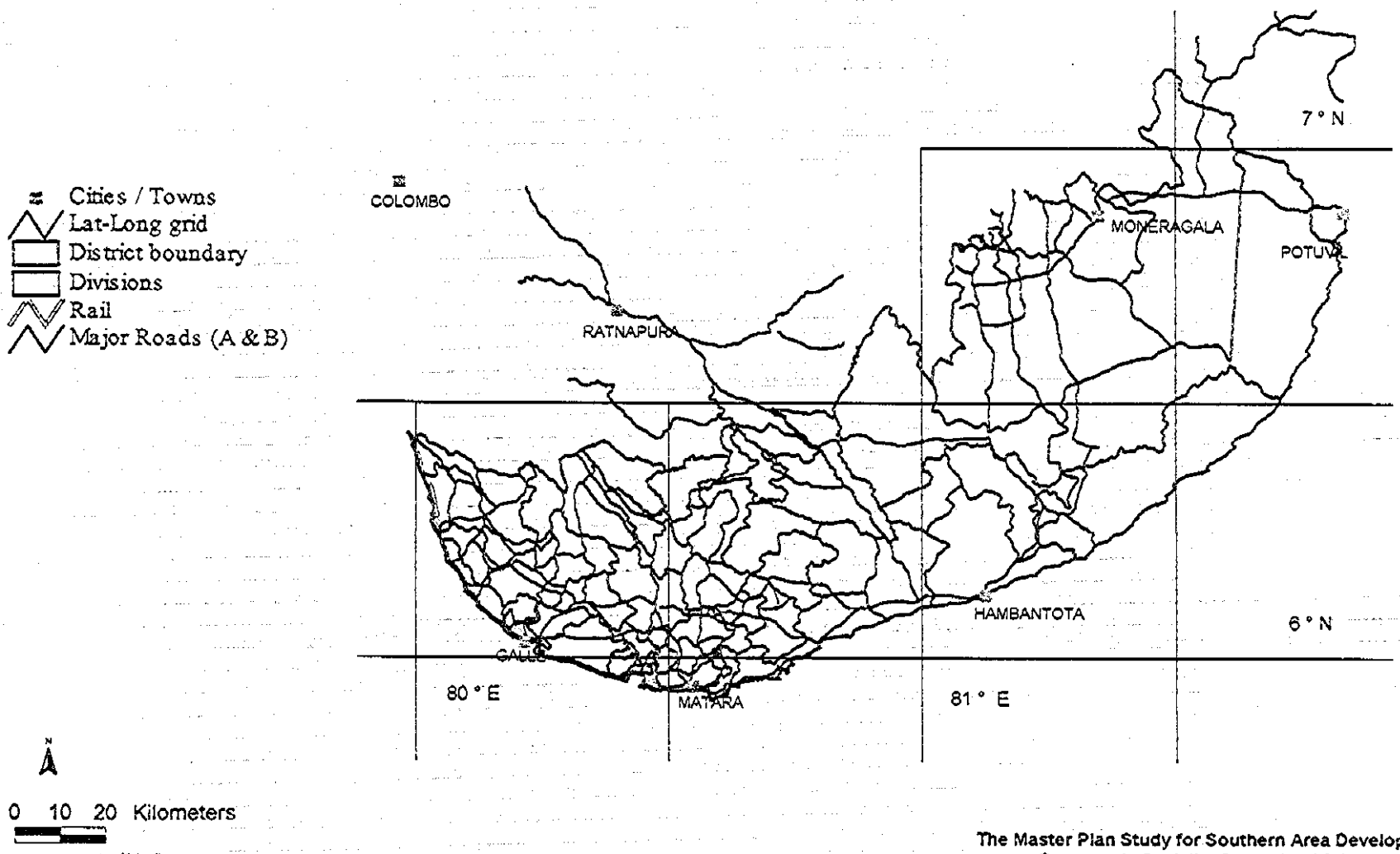
Figure :

Division boundaries map



Source : JICA Study

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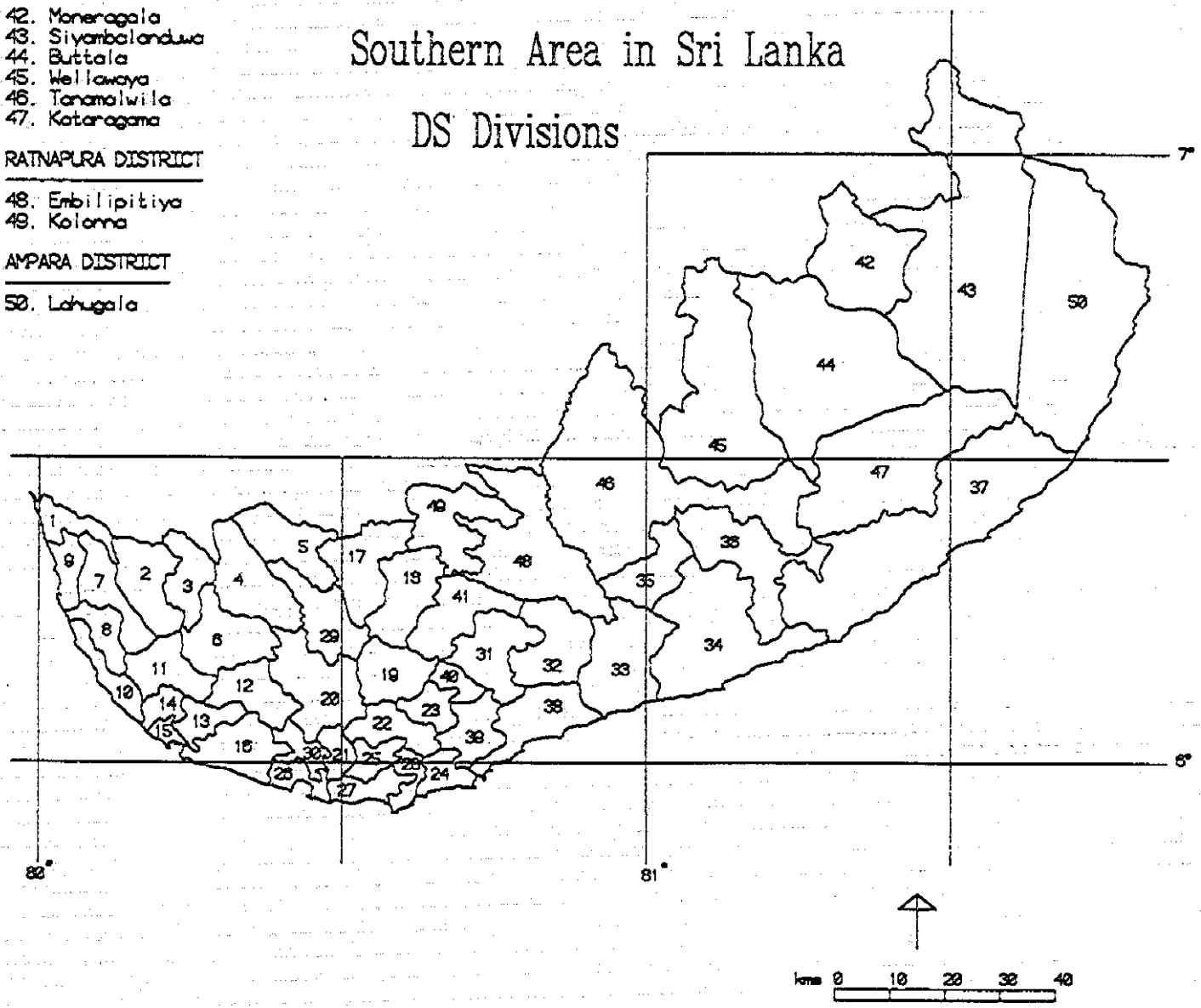
Figure :

Southern Area in Sri Lanka

DS Divisions



GALLE DISTRICT

1. Bentota
2. Elpitiya
3. Niyagama
4. Tawalama
5. Neluwa
6. Nagoda
7. Karandeniya
8. Ambalangoda
9. Balapitiya
10. Hikkaduwa
11. Baddegama
12. Yakkalamulla
13. Akmimana
14. Bope-Poddala
15. Galle
16. Habaraduwa

MATARA DISTRICT

17. Kotapola
18. Pasgoda
19. Mulatiyana
20. Akuressa
21. Malimboda
22. Kamburupitiya
23. Hakmana
24. Dikwella
25. Thihagoda
26. Weligama
27. Matara
28. Devinuwara
29. Pitabeddara
30. Weligama

HAMBANTOTA DISTRICT

31. Weerakatiya
32. Angunakolapelessa
33. Ambalangoda
34. Hambantota
35. Sooriyawewa
36. Lunugamwehera
37. Tissamharama
38. Tangalla
39. Beliatta
40. Okewela
41. Katuwana

MONERAGALA DISTRICT

42. Moneragala
43. Siyambalanduwa
44. Buttala
45. Wellawaya
46. Tanamalwila
47. Kataragama

RATNAPURA DISTRICT

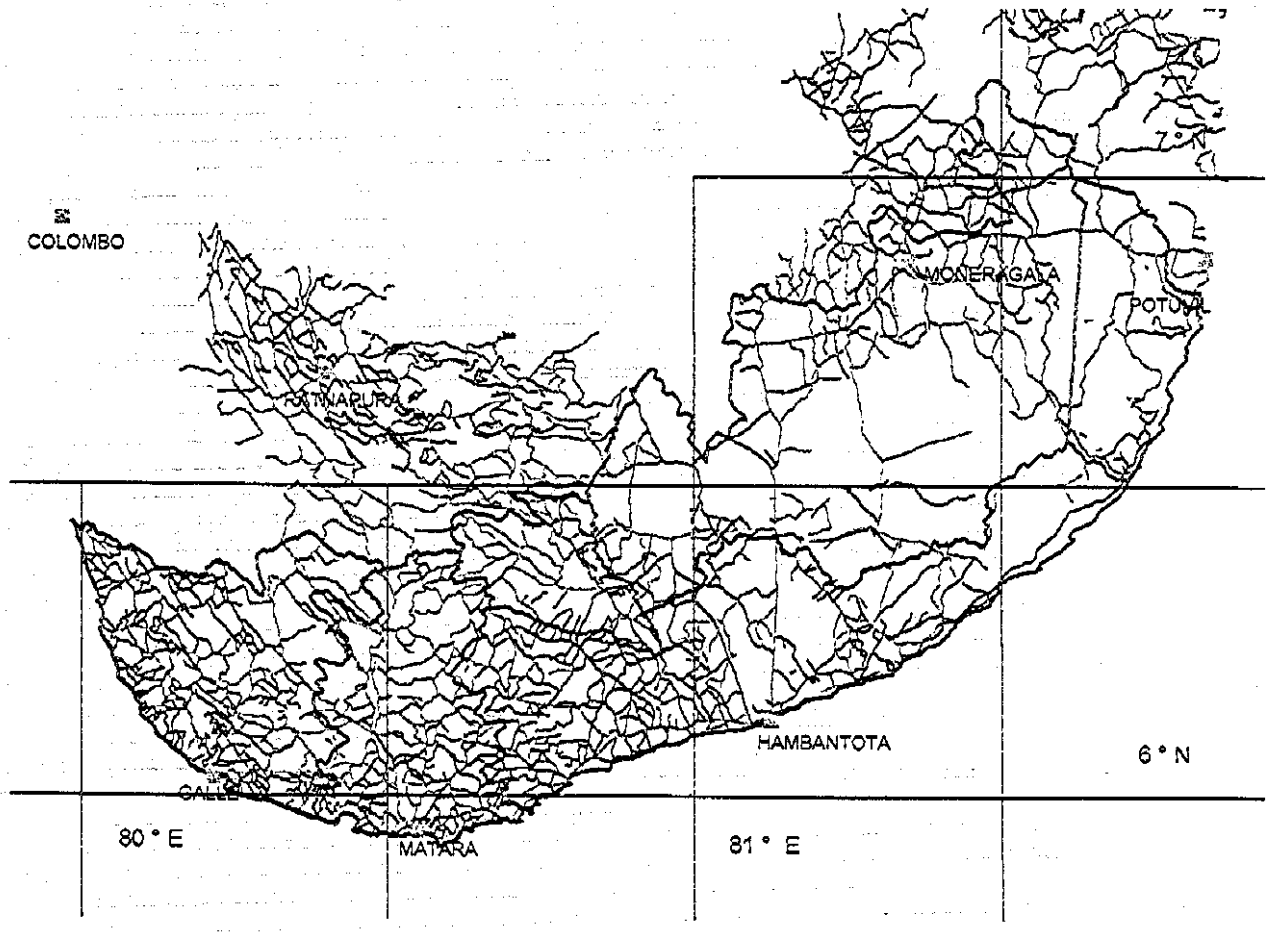
48. Embilipitiya
49. Kolonna

AMPARA DISTRICT

50. Lahugala

Roads

Cities / Towns
Lat-Long grid
District boundary
Road categories
1
2
3
4
6



0 10 20 Kilometers

Source : Survey Dept.

The Master Plan Study for Southern Area Development of Democratic Socialist Republic of Sri Lanka

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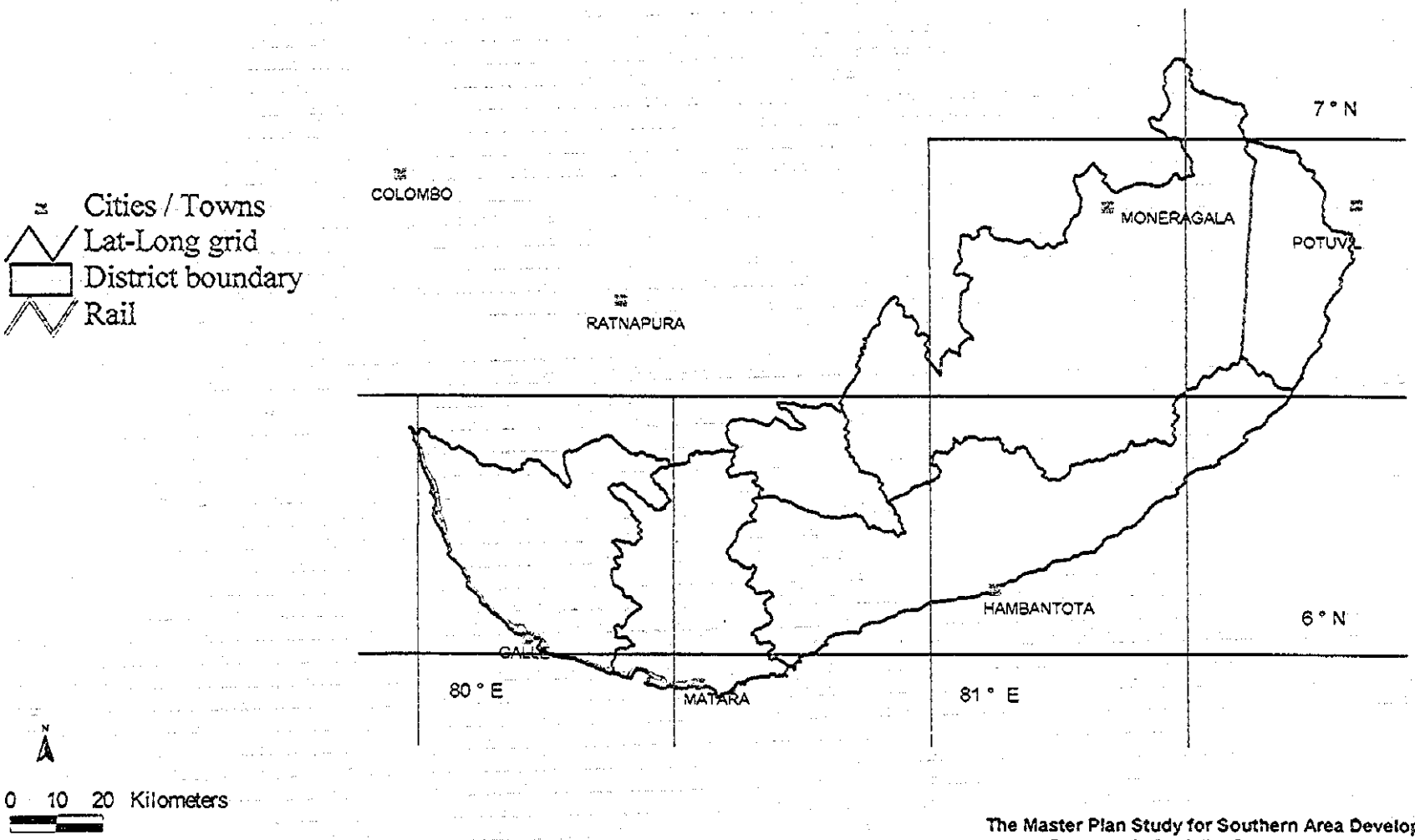
Figure :

Map showing Railway line



Source : Survey Dept.

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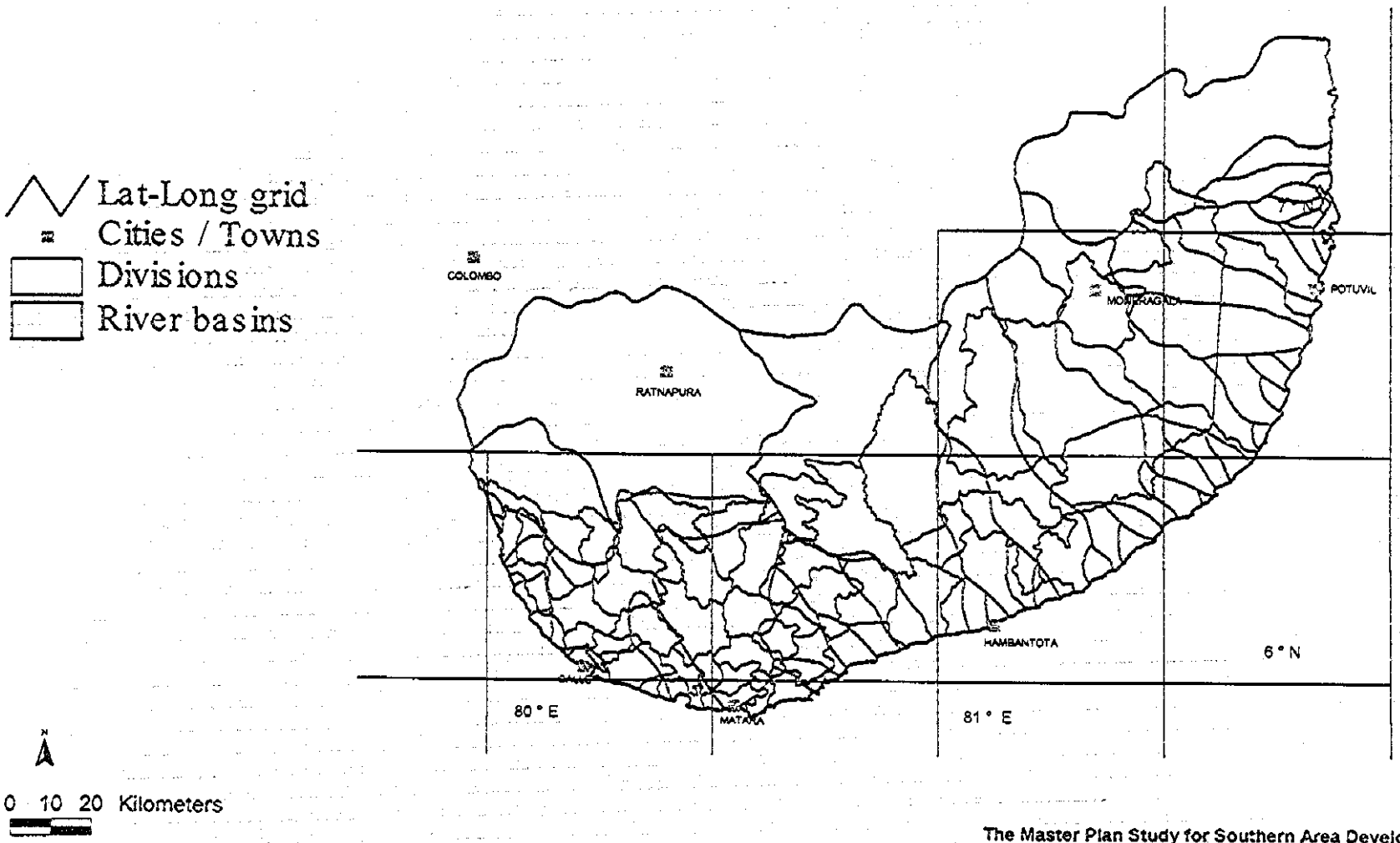
Figure :

River Basins



Source : Atlas by Survey Dept.

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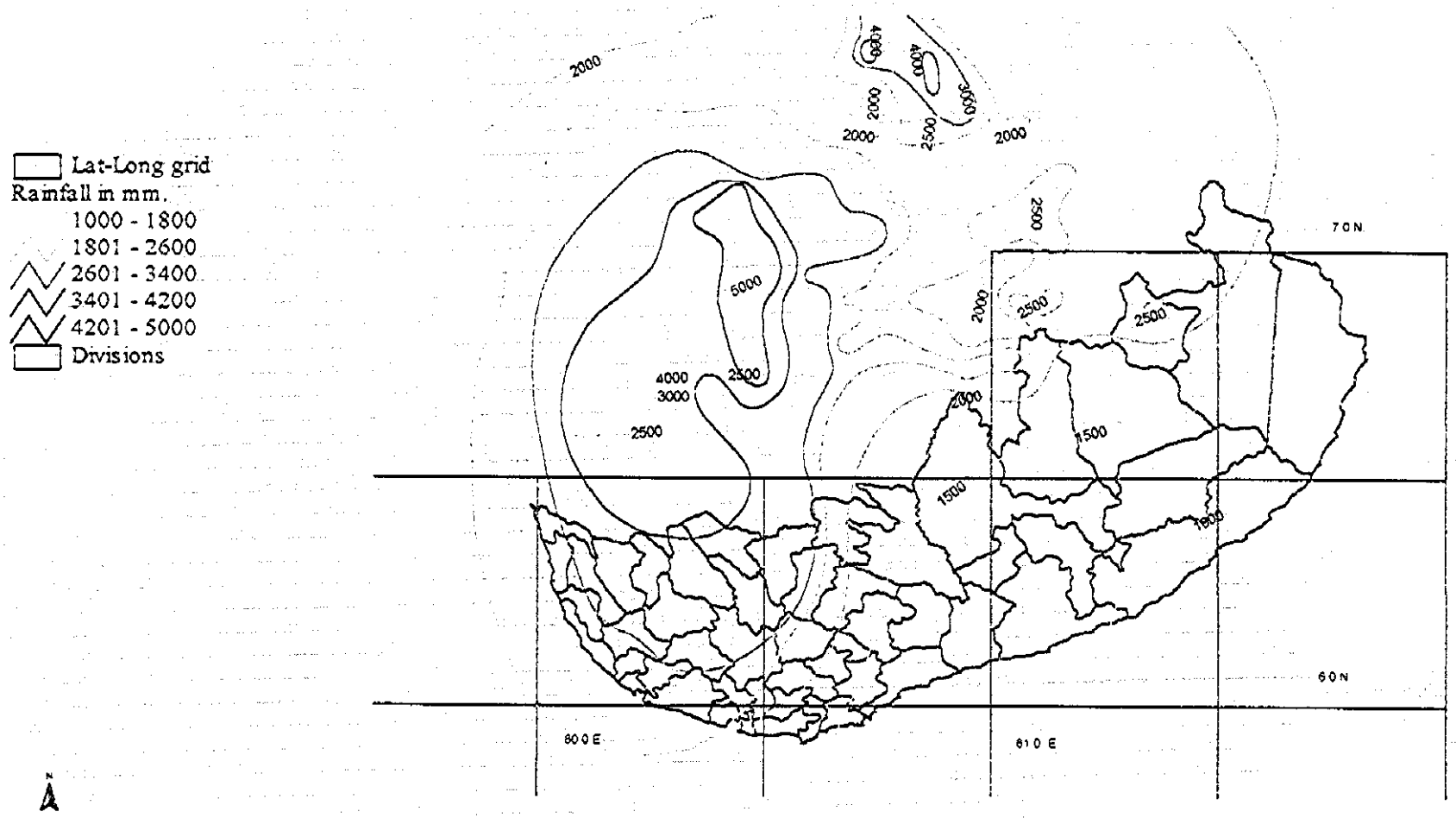
Figure :

Rainfall



Source : Atlas by Survey Dept.

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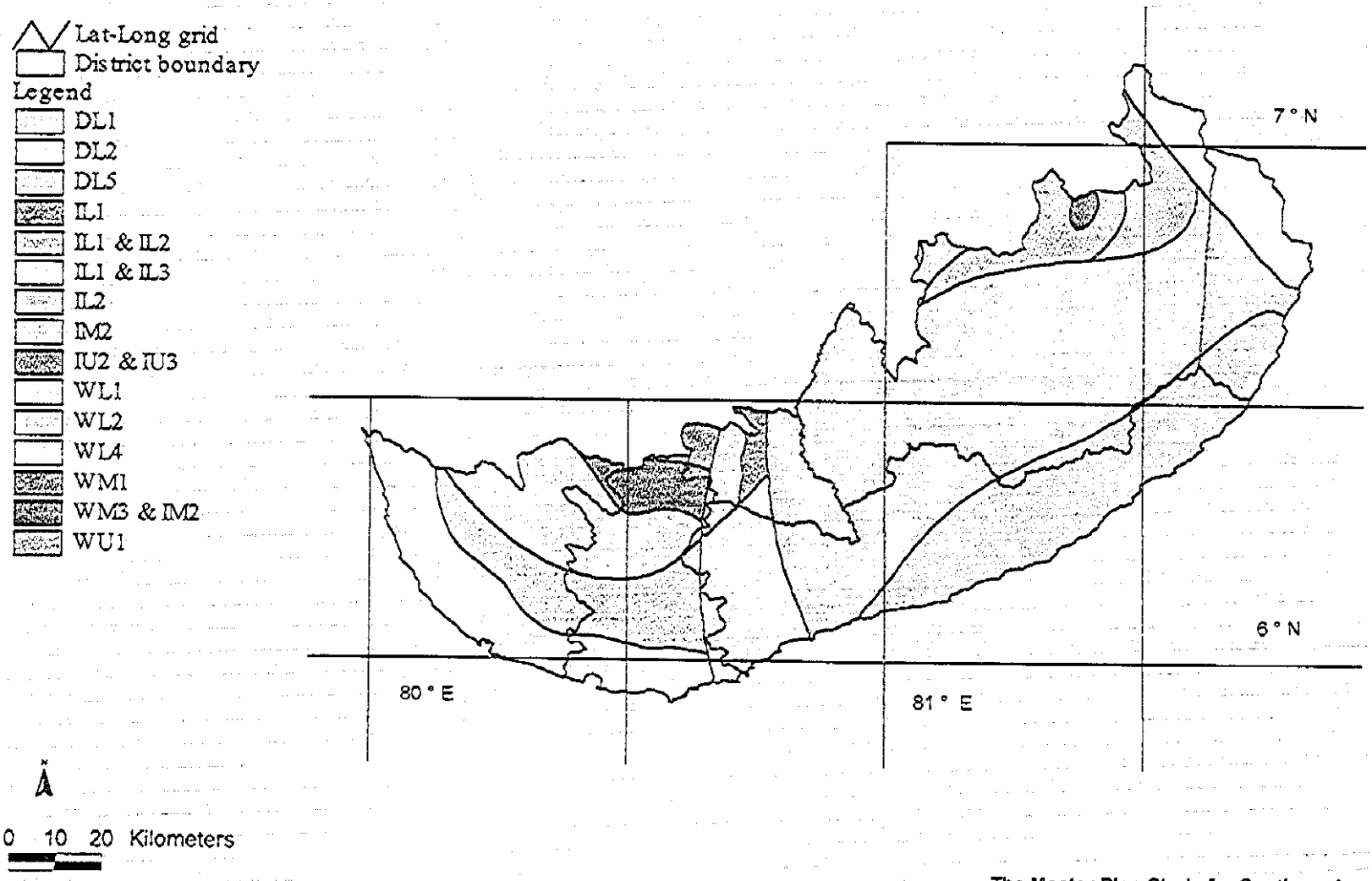
Figure :

Agro Ecological Regions



Source : Atlas by Survey Dept.

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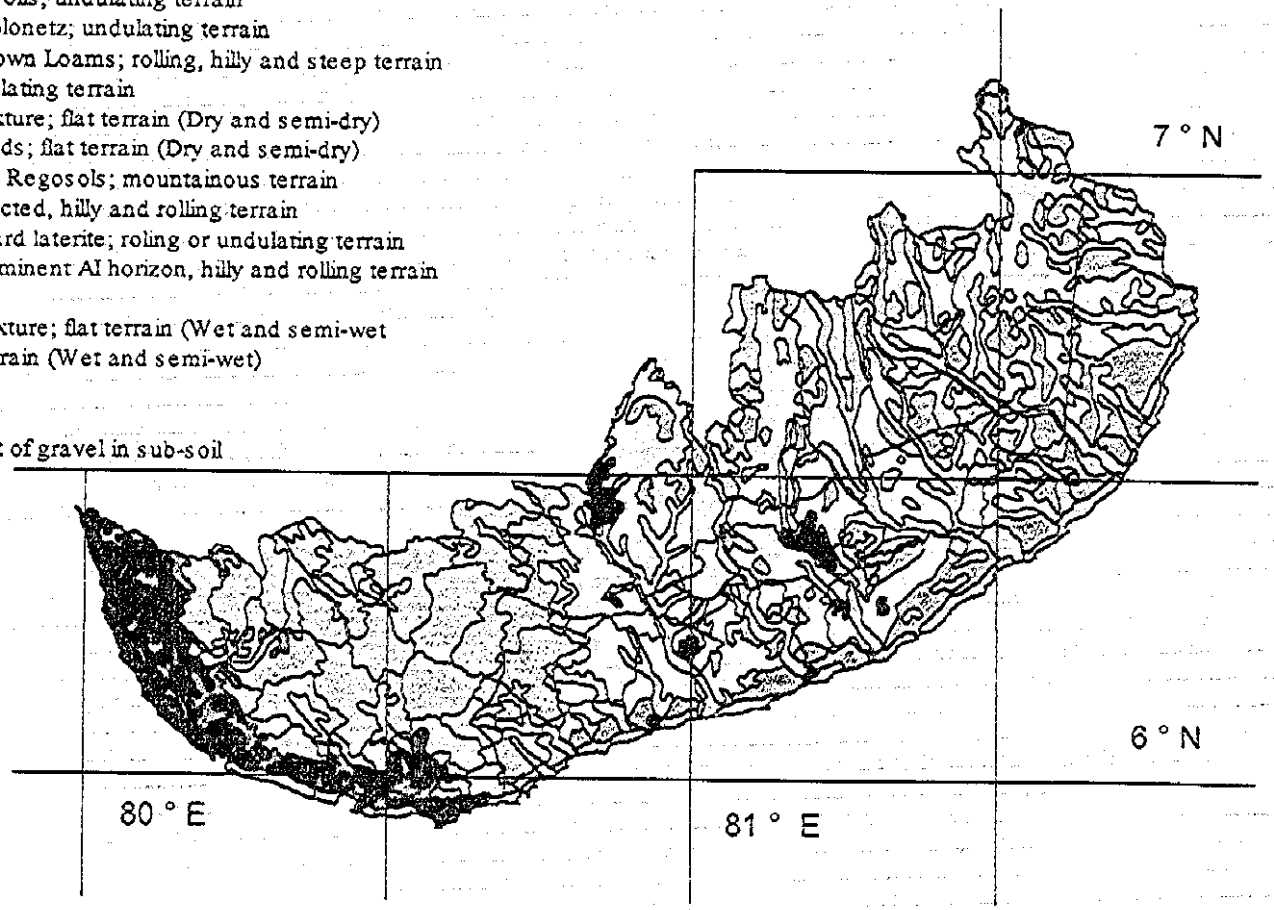
Figure -

Soil Map

Lat-Long grid
Divisions
District boundary

Legend

- Reddish Brown Earths and Low Humic Soils; undulating terrain
- Reddish Brown Earths and Solodized Solonetz; undulating terrain
- Reddish Brown Earths and immature Brown Loams; rolling, hilly and steep terrain
- Red-Yellow Latosols; flat to slightly undulating terrain
- Alluvial soils of variable drainage and texture; flat terrain (Dry and semi-dry)
- Regosols on recent beach and dune sands; flat terrain (Dry and semi-dry)
- Red-Yellow Podzolic Soils and Mountain Regosols; mountainous terrain
- Red-Yellow Podzolic Soils; steeply dissected, hilly and rolling terrain
- Red-Yellow Podzolic Soils with soft or hard laterite; roling or undulating terrain
- Red-Yellow Podzolic Soils with semi-prominent AI horizon, hilly and rolling terrain
- Bog and Half-bog soils; flat terrain
- Alluvial Soils of variable drainage and texture; flat terrain (Wet and semi-wet
- Regosols on recent beach sands; flat terrain (Wet and semi-wet)
- Rock knob plains and eroded lands
- Erosional remnants
- Reddish Brown Earths with large amount of gravel in sub-soil
- Water bodies



0 10 20 Kilometers

Source : Atlas by Survey Dept.

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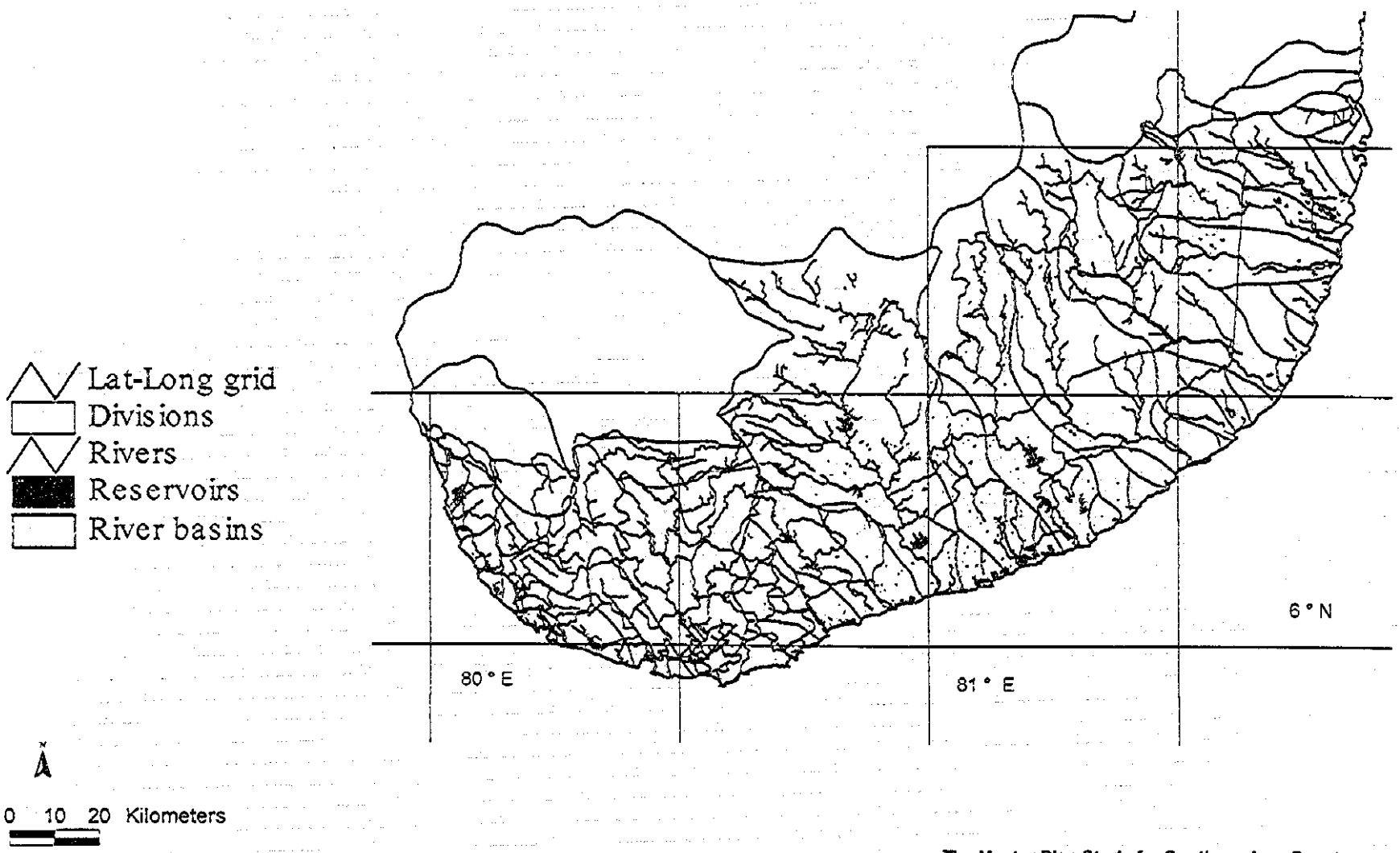
Figure :

Surface Water



Source : Atlas by Survey Dept.

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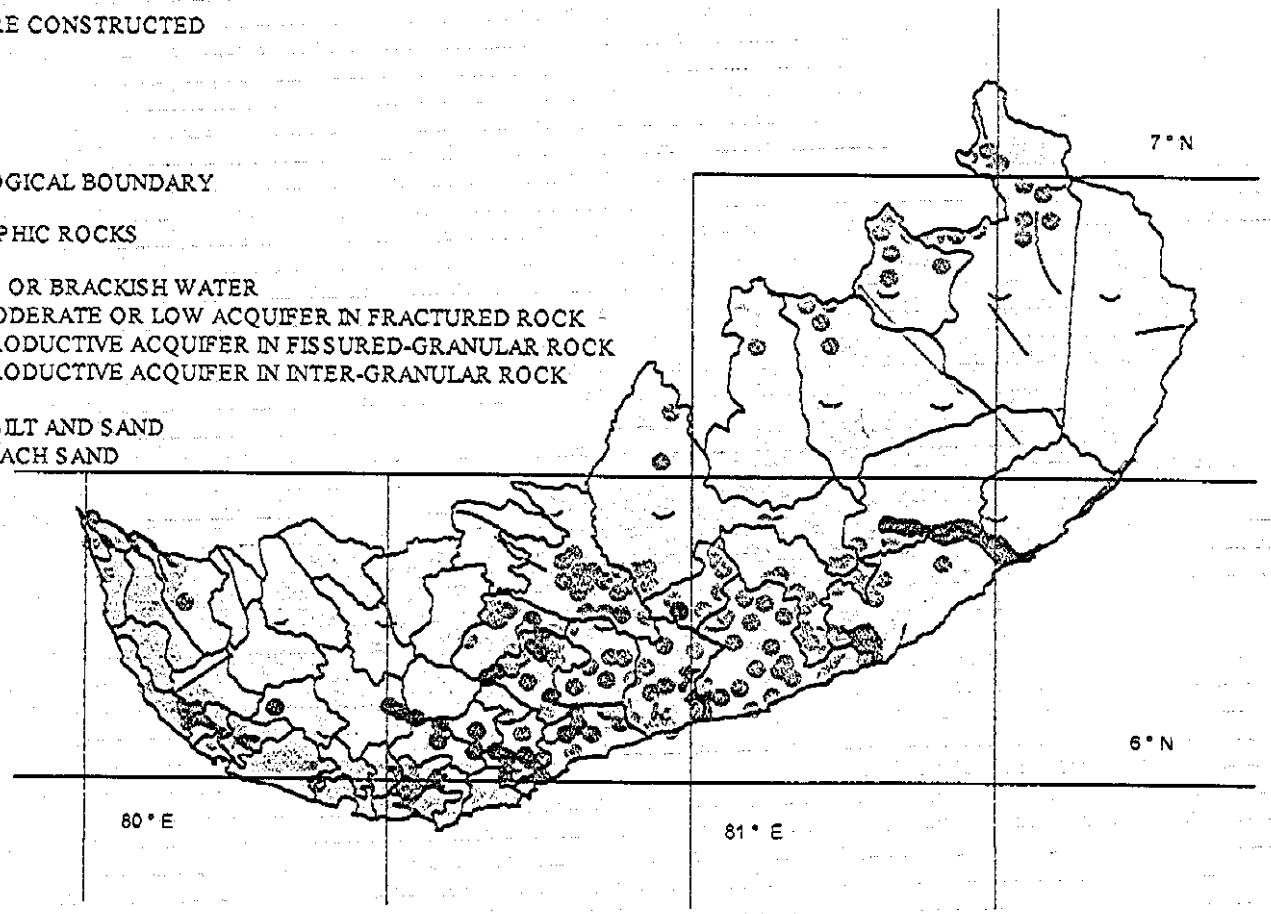
Figure :

Ground Water

Lat-Long grid
Divisions
Tube wells and Springs
AREAS WHERE TUBE WELLS ARE CONSTRUCTED
SPRING
THERMAL SPRING
Lineaments
ANTICLINE PLUNGING
FAULT
GEOLOGICAL OR HYDROGEOLOGICAL BOUNDARY
SYNCLINE PLUNGING
UNDIFFERENTIATED METAMORPHIC ROCKS
Other Hydrological Features
LAGOON OR LAKE WITH SALINE OR BRACKISH WATER
LOCAL OR DIS-CONTINUOUS MODERATE OR LOW ACQUIFER IN FRACTURED ROCK
LOCAL OR DIS-CONTINUOUS PRODUCTIVE ACQUIFER IN FISSURED-GRANULAR ROCK
LOCAL OR DIS-CONTINUOUS PRODUCTIVE ACQUIFER IN INTER-GRANULAR ROCK
Other Geoological Features
ALLUIVIAL DEPOSITS OF CLAY SILT AND SAND
COASTAL SAND-DUNES AND BEACH SAND



N

0 10 20 Kilometers

Source : Atlas by Survey Dept.

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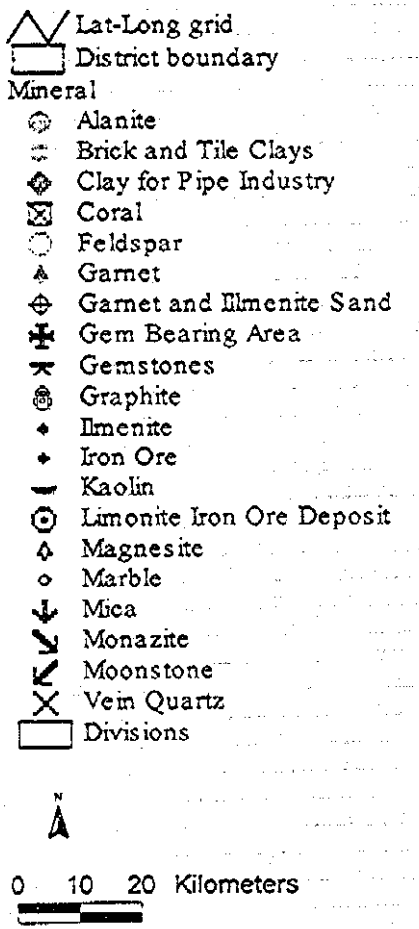
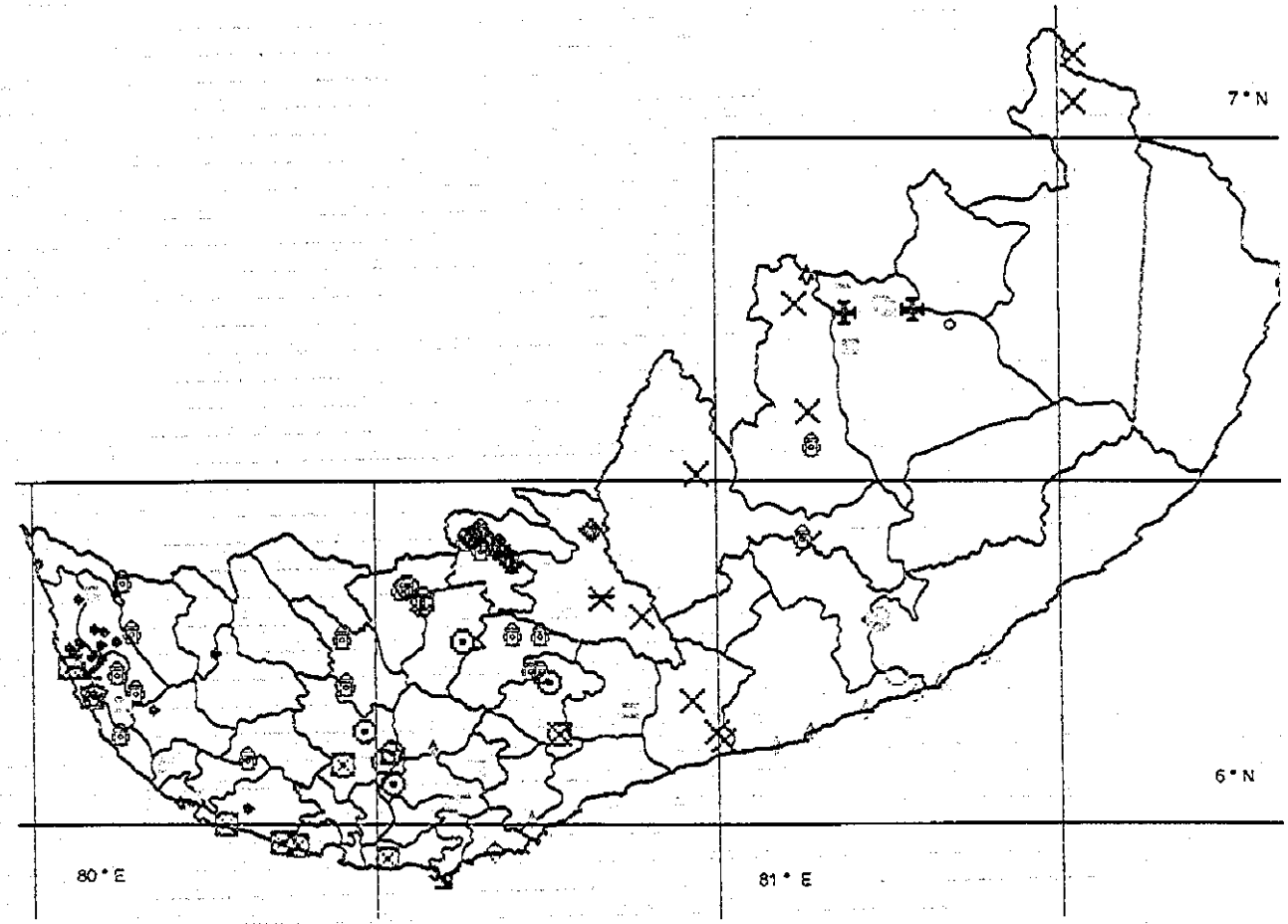
Figure :

Minerals





Source : JICA Study

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Figure :

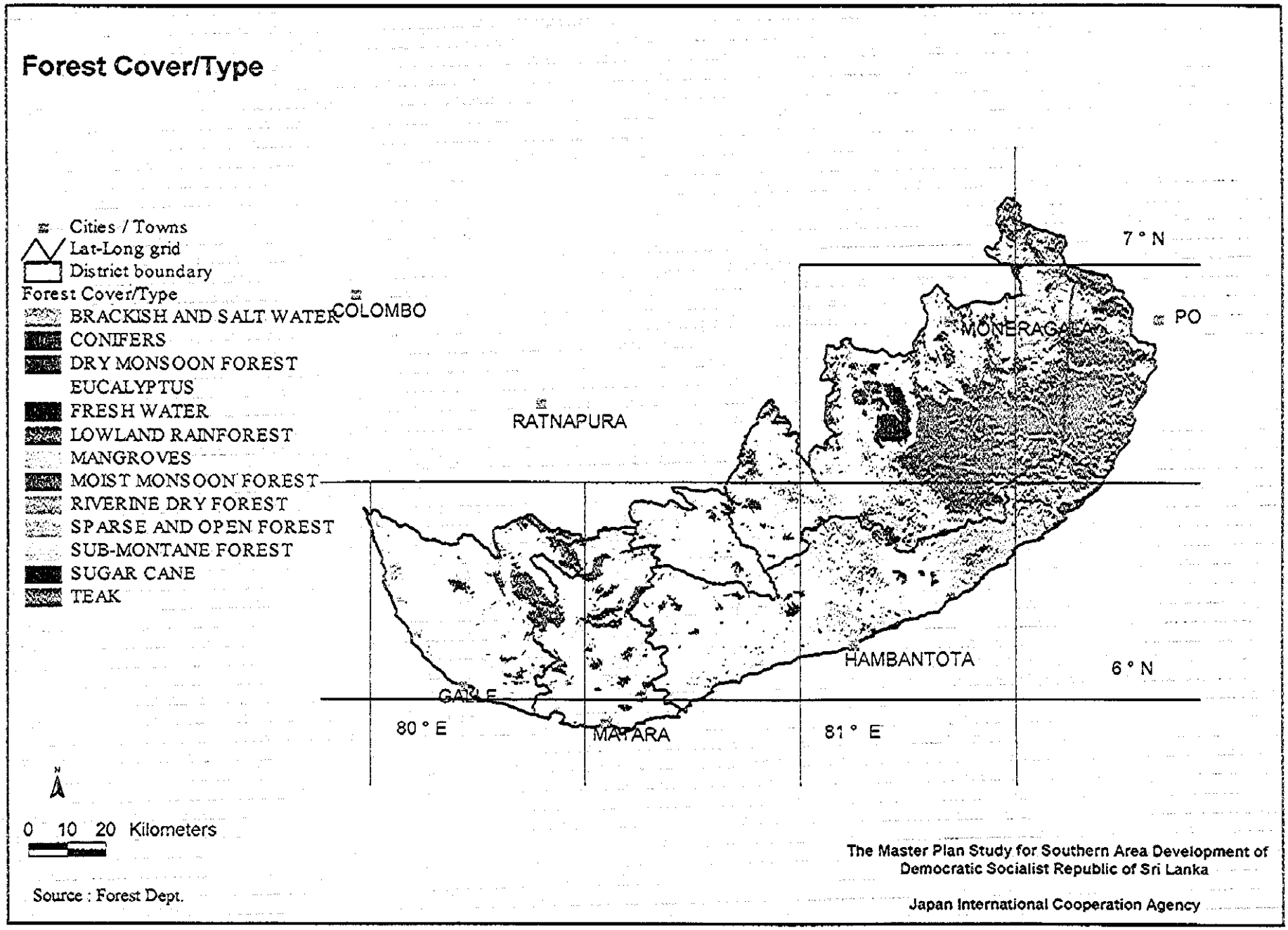
Forest Cover/Type
Cities / Towns
Lat-Long grid
District boundary
Forest Cover/Type
BRACKISH AND SALT WATER
CONIFERS
DRY MONSOON FOREST
EUCALYPTUS
FRESH WATER
LOWLAND RAINFOREST
MANGROVES
MOIST MONSOON FOREST
RIVERINE DRY FOREST
SPARSE AND OPEN FOREST
SUB-MONTANE FOREST
SUGAR CANE
TEAK
COLOMBO
RATNAPURA
MONERAGALA
PO
HAMBANTOTA
GALLE
MATARA
7 ° N
6 ° N
80 ° E
81 ° E
N
0 10 20 Kilometers
Source : Forest Dept.
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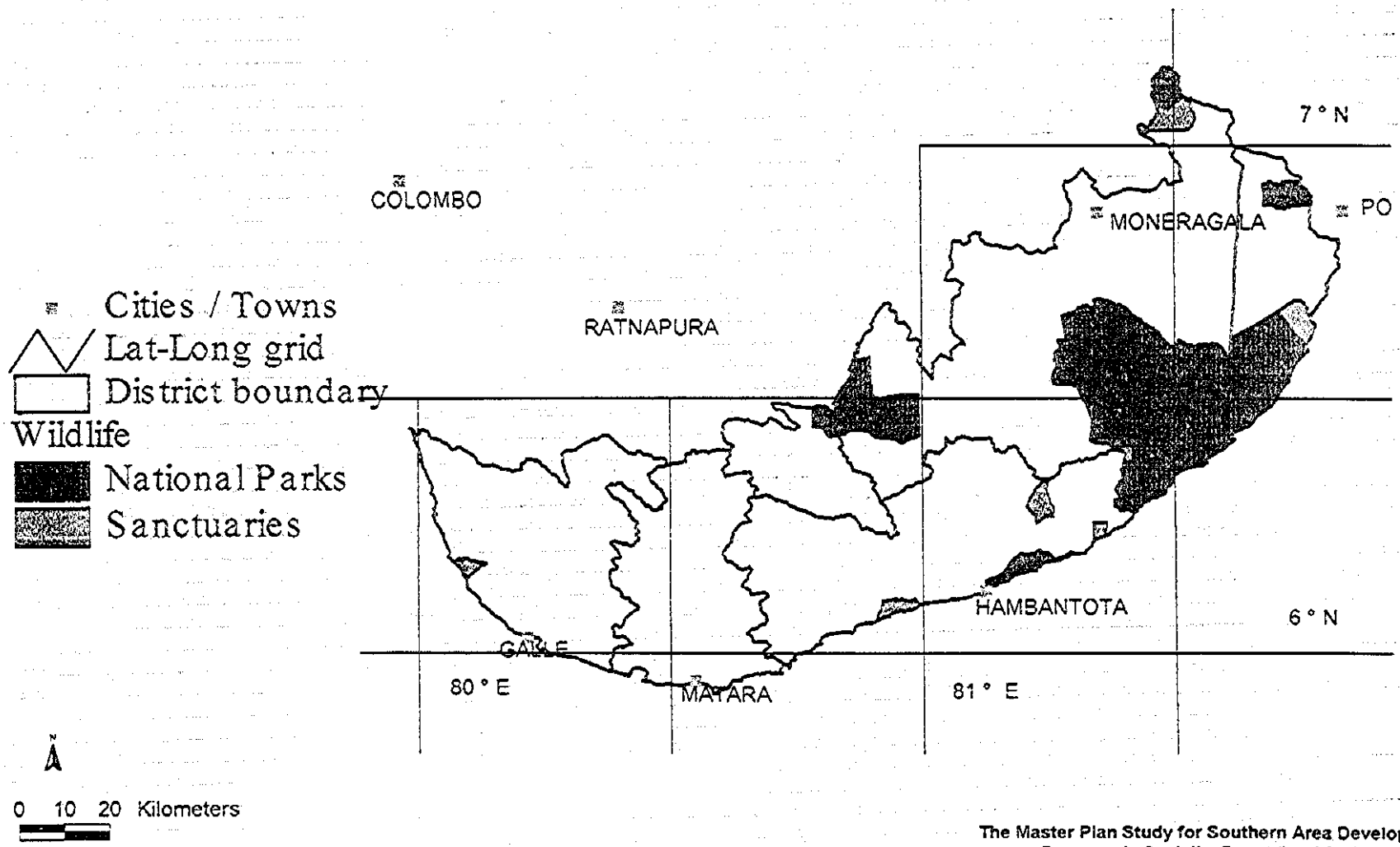
Figure :

National Parks and Sanctuaries



Source : Forest Dept.

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Figure :

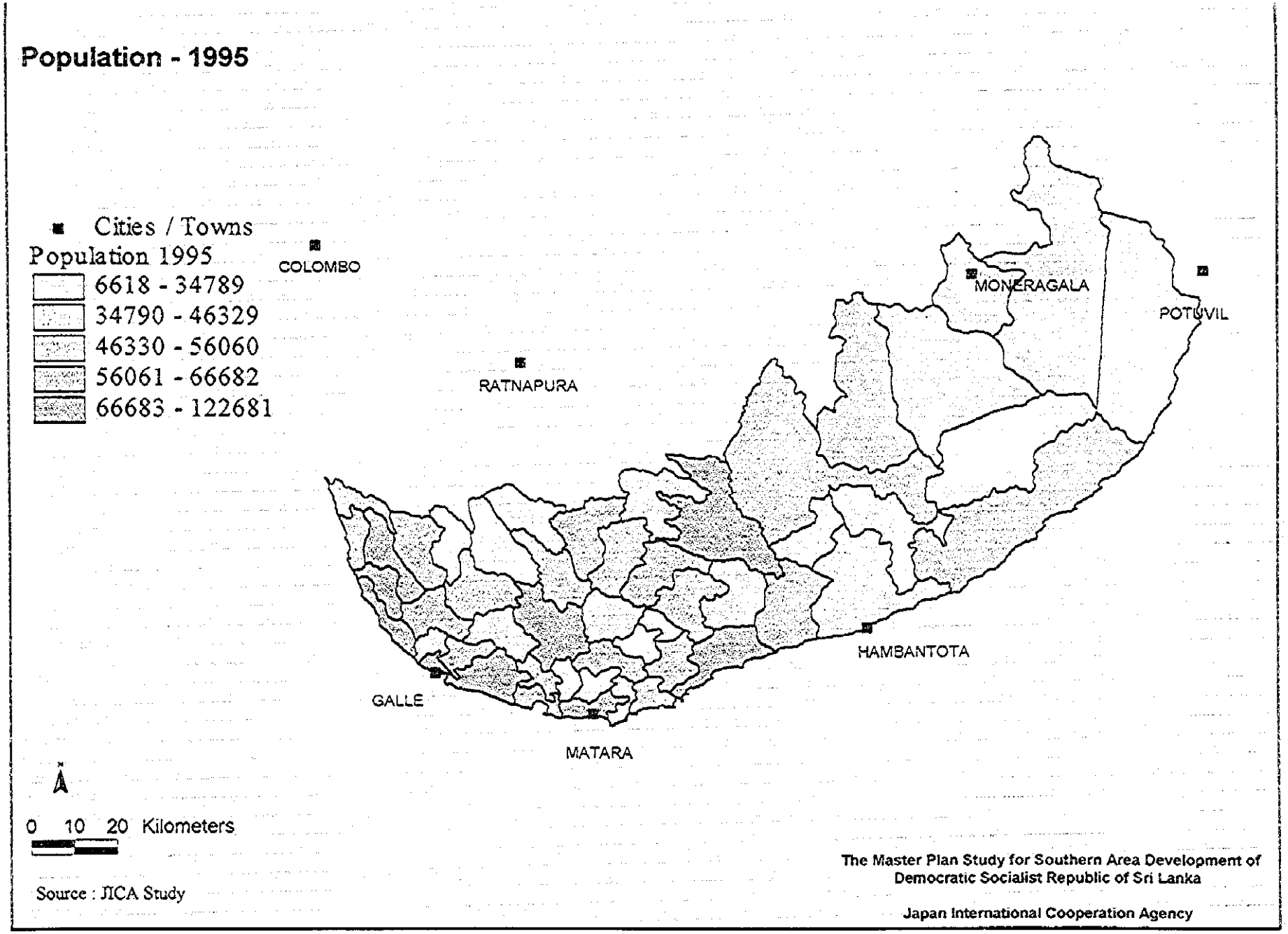
Population - 1995
Cities / Towns
Population 1995
6618 - 34789
34790 - 46329
46330 - 56060
56061 - 66682
66683 - 122681
COLOMBO
RATNAPURA
MONERAGALA
POTUVIL
HAMBANTOTA
GALLE
MATARA
N
0 10 20 Kilometers
Source : JICA Study
The Master Plan Study for Southern Area Development of
Democratic Socialist Republic of Sri Lanka
Japan International Cooperation Agency

Figure :

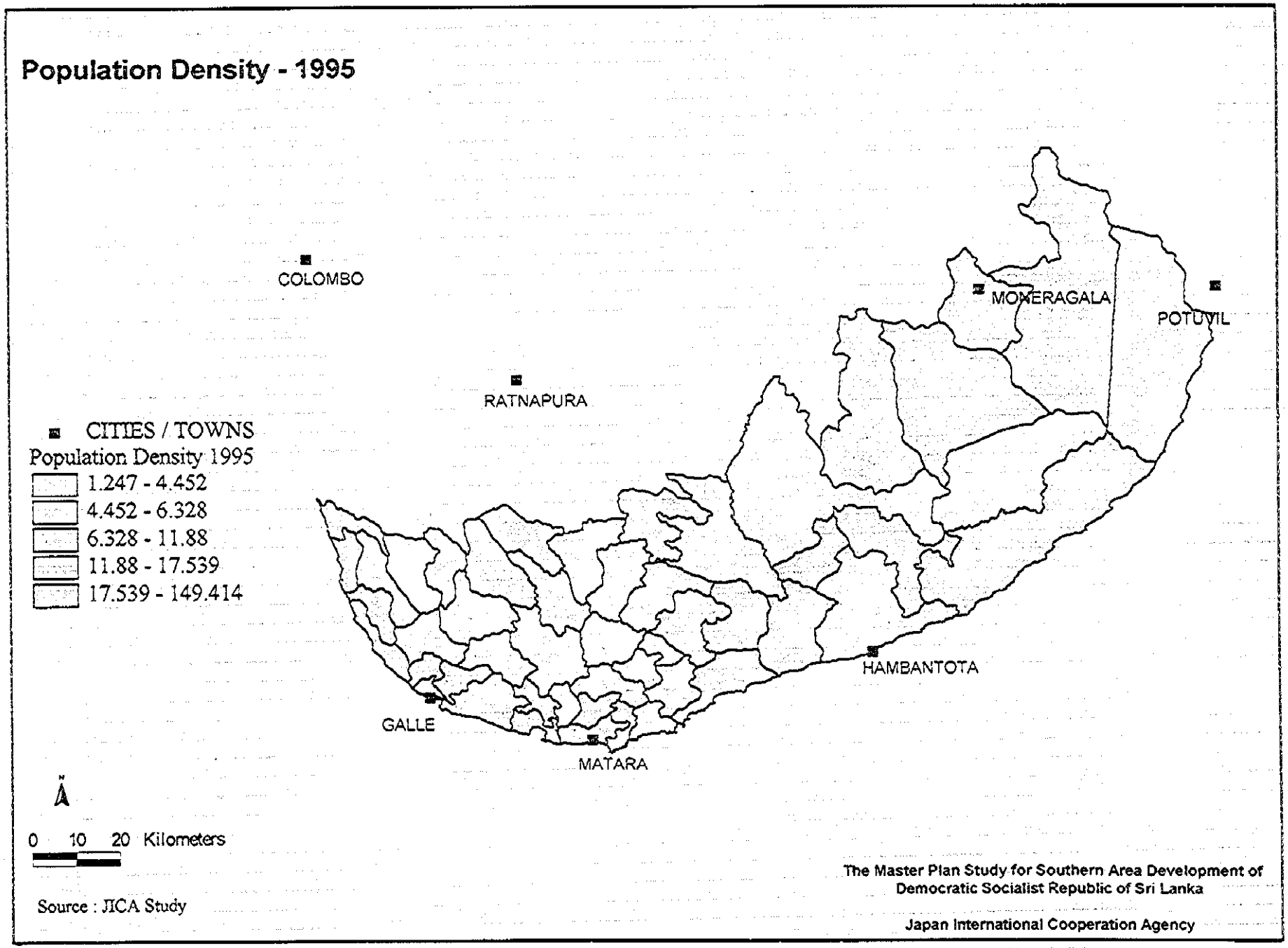
Population Density - 1995
COLOMBO
RATNAPURA
MONERAGALA
POTUVIL
HAMBANTOTA
GALLE
MATARA
CITIES / TOWNS
Population Density 1995
1.247 - 4.452
4.452 - 6.328
6.328 - 11.88
11.88 - 17.539
17.539 - 149.414
0 10 20 Kilometers
Source : JICA Study
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Figure :

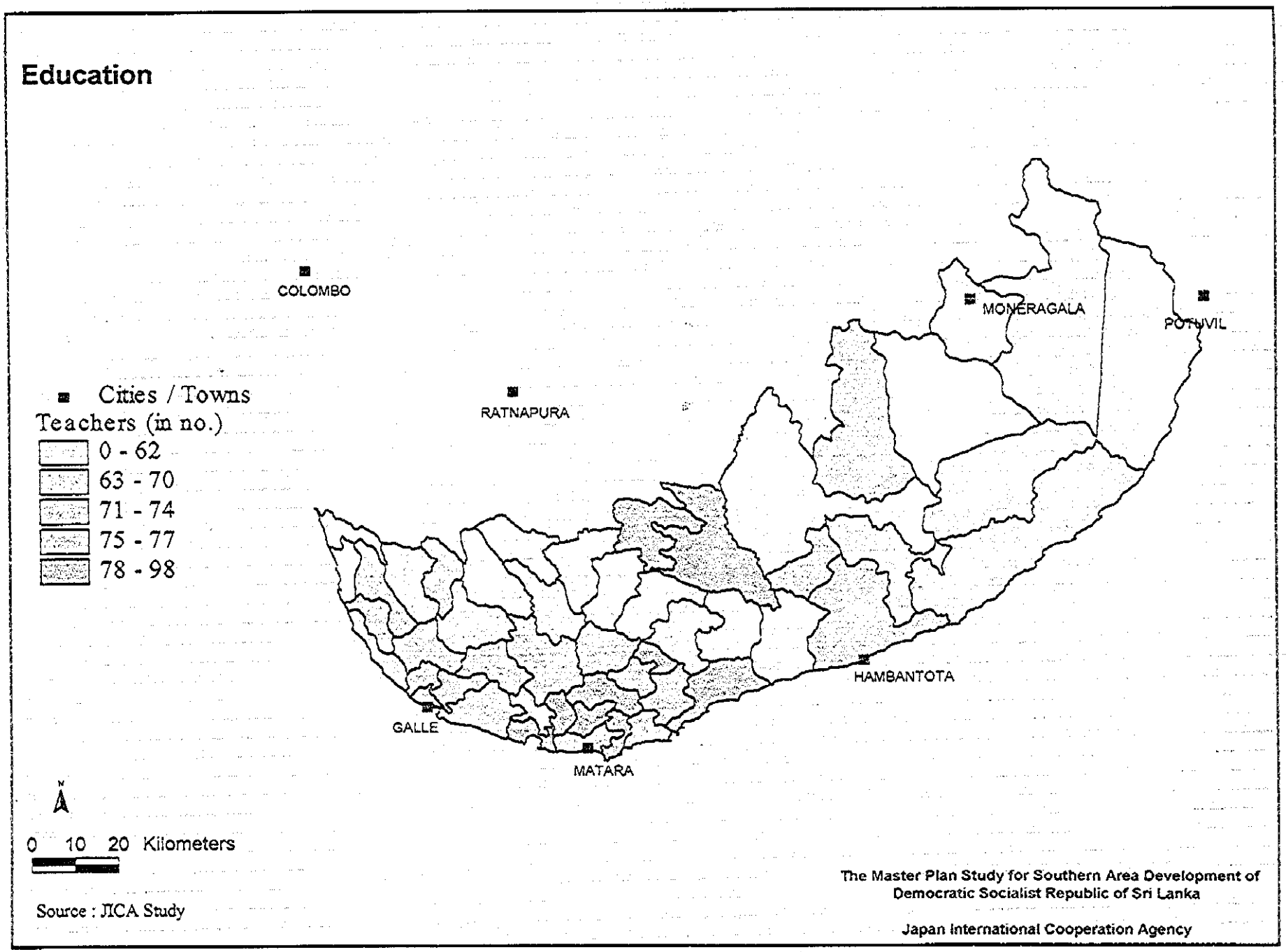
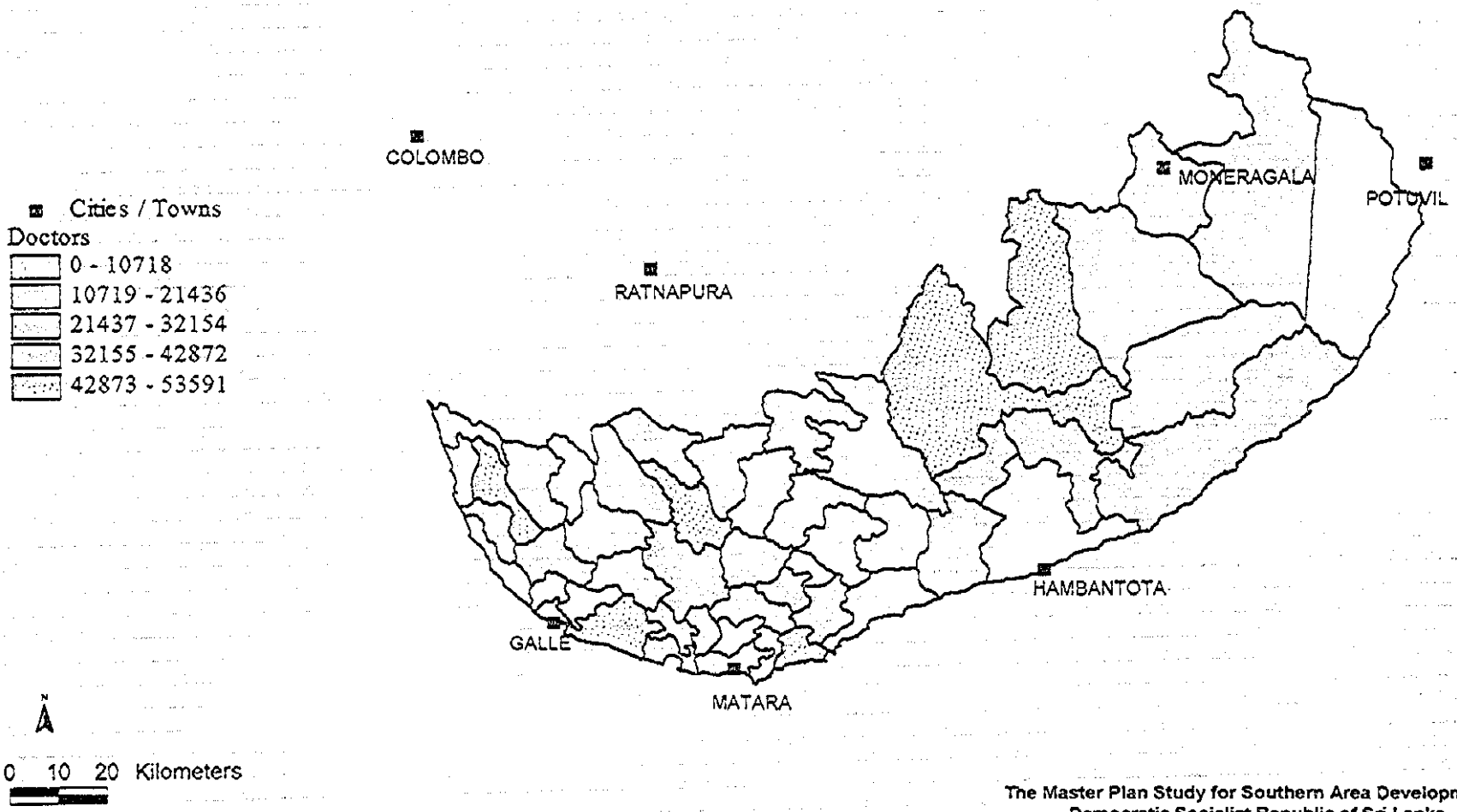

Education
COLOMBO
RATNAPURA
MONERAGALA
POTUVIL
HAMBANTOTA
GALLE
MATARA
Cities / Towns
Teachers (in no.)
0 - 62
63 - 70
71 - 74
75 - 77
78 - 98
N
0 10 20 Kilometers
Source : JICA Study
The Master Plan Study for Southern Area Development of
Democratic Socialist Republic of Sri Lanka
Japan International Cooperation Agency

Figure :

Health



Source : JICA Study

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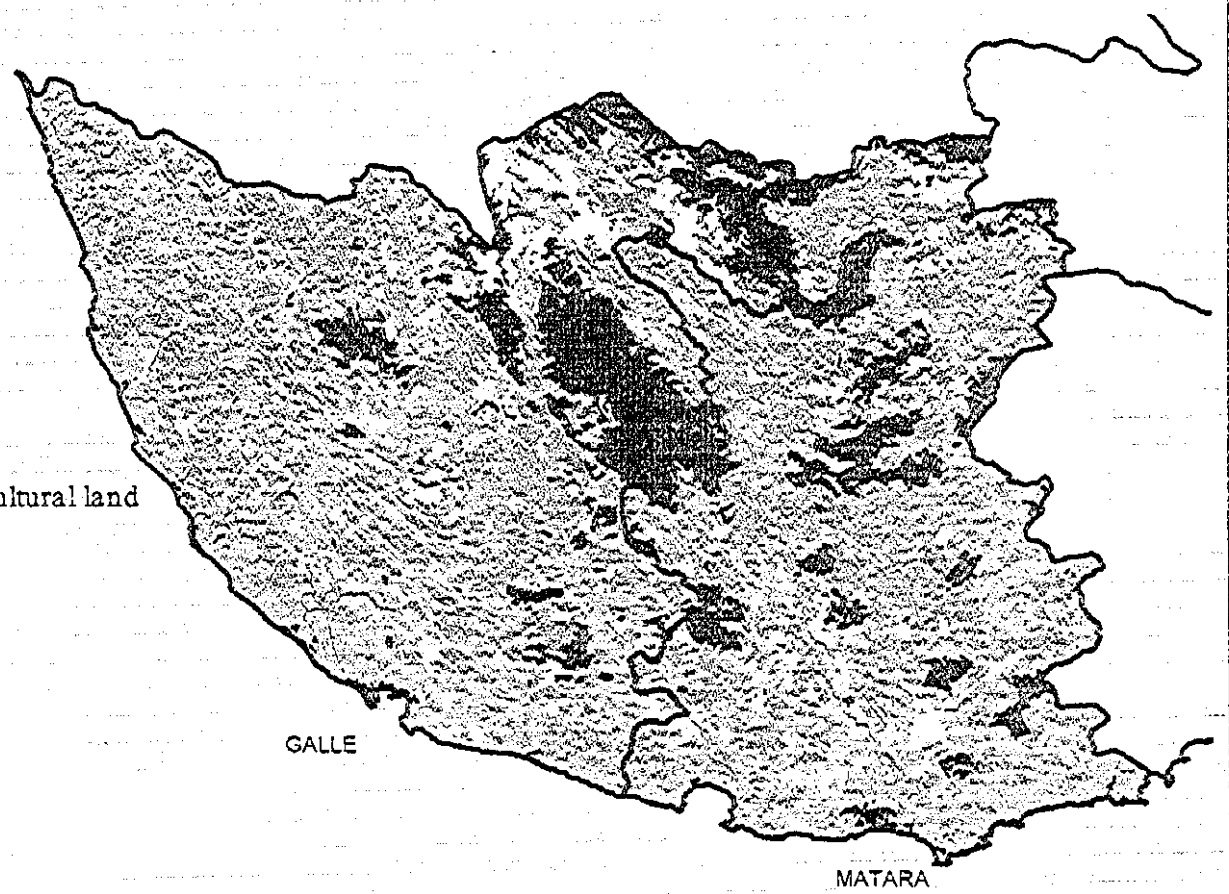
Figure :

Existing Land Use (1995)

Galle & Matara



Cities / Towns
District boundary

Legend (Galle & Matara)

- Built-up land, Associated non-agricultural land
- Homesteads
- Trees and other perennial crops
- Paddy cropland
- Sparsely used and other cropland
- Desnse forests
- Open forests and plantations
- Scrubland and grassland
- Water bodies and wetlands
- Barren land

N

0 5 10 Kilometers

Source : Survey Dept. and Satellite data

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Figure :

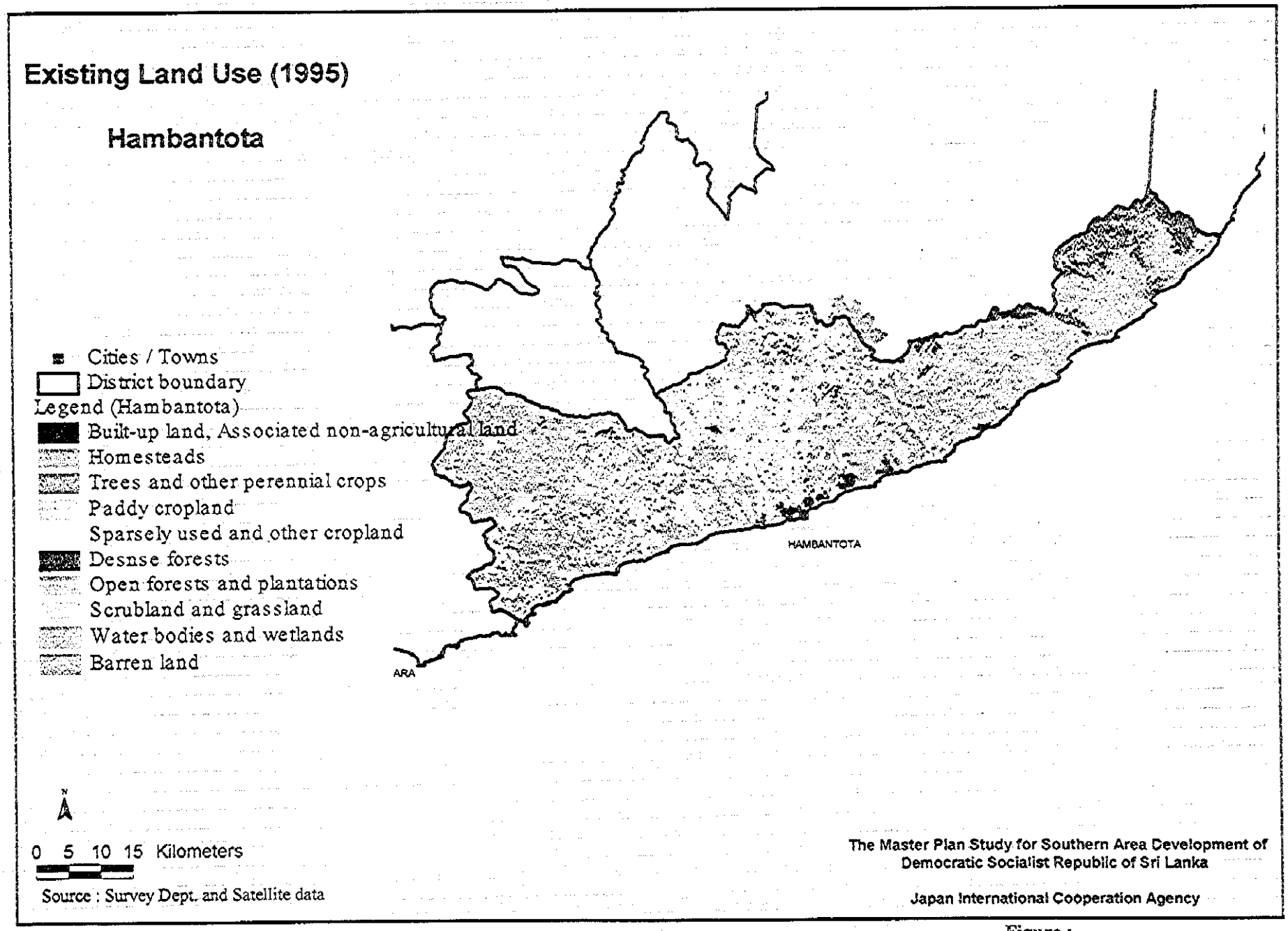

Existing Land Use (1995)
Hambantota
Cities / Towns
District boundary
Legend (Hambantota)
Built-up land, Associated non-agricultural land
Homesteads
Trees and other perennial crops
Paddy cropland
Sparsely used and other cropland
Desnse forests
Open forests and plantations
Scrubland and grassland
Water bodies and wetlands
Barren land
HAMBANTOTA
ARA
N
0 5 10 15 Kilometers
Source : Survey Dept. and Satellite data
The Master Plan Study for Southern Area Development of
Democratic Socialist Republic of Sri Lanka
Japan International Cooperation Agency

Figure :

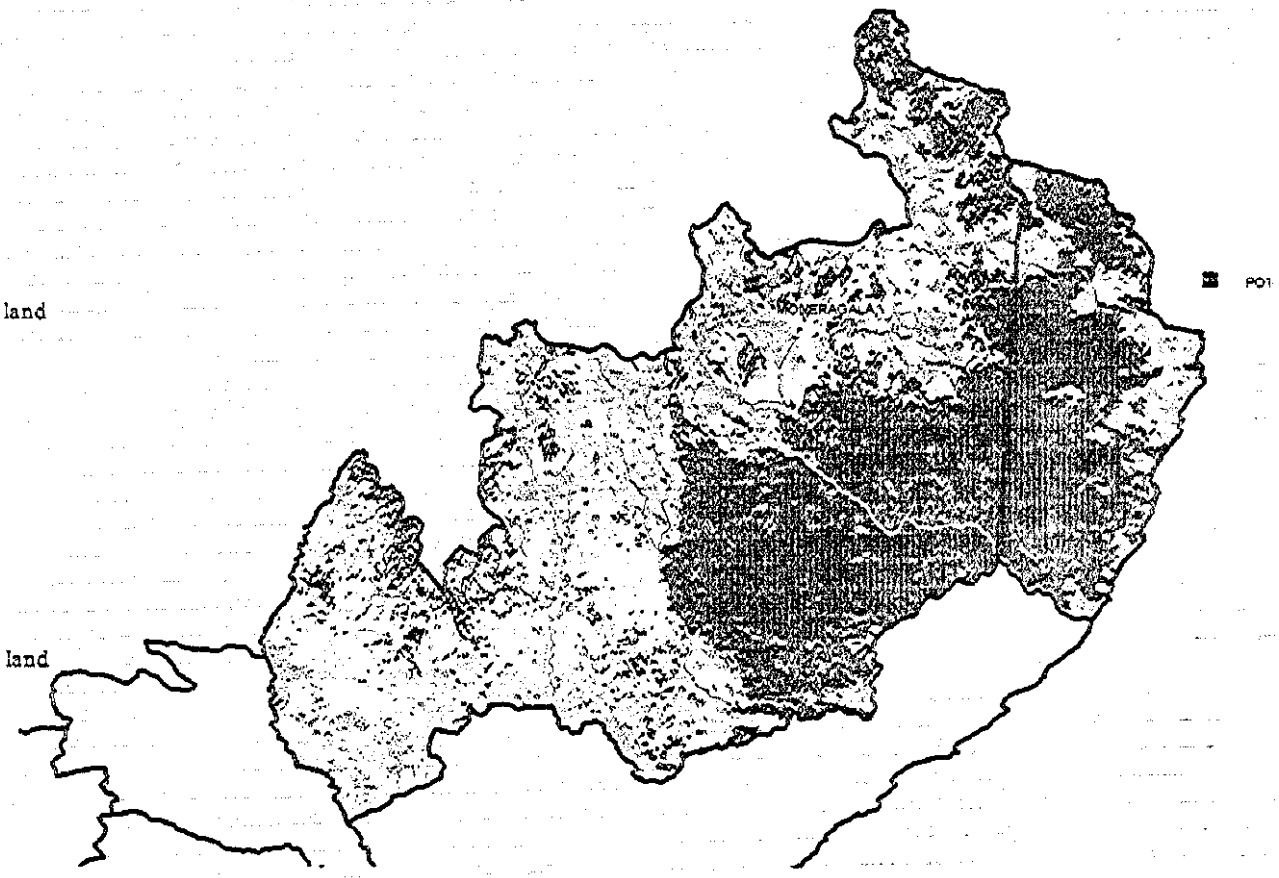
Existing Land Use (1995)

Moneragala and Ampara

Cities / Towns
District boundary

Legend (Moneragala)
- Built-up land, Associated non-agricultural land
- Homesteads
- Trees and other perennial crops
- Paddy cropland
- Sparsely used and other cropland
- Desnse forests
- Open forests and plantations
- Scrubland and grassland
- Water bodies and wetlands
- Barren land

Legend (Ampara)
- Built-up land, Associated non-agricultural land
- Homesteads
- Trees and other perennial crops
- Paddy cropland
- Sparsely used and other cropland
- Desnse forests
- Open forests and plantations
- Scrubland and grassland
- Water bodies and wetlands
- Barren land



N

0 5 10 15 Kilometers

Source : Survey Dept. and Satellite data

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Figure :

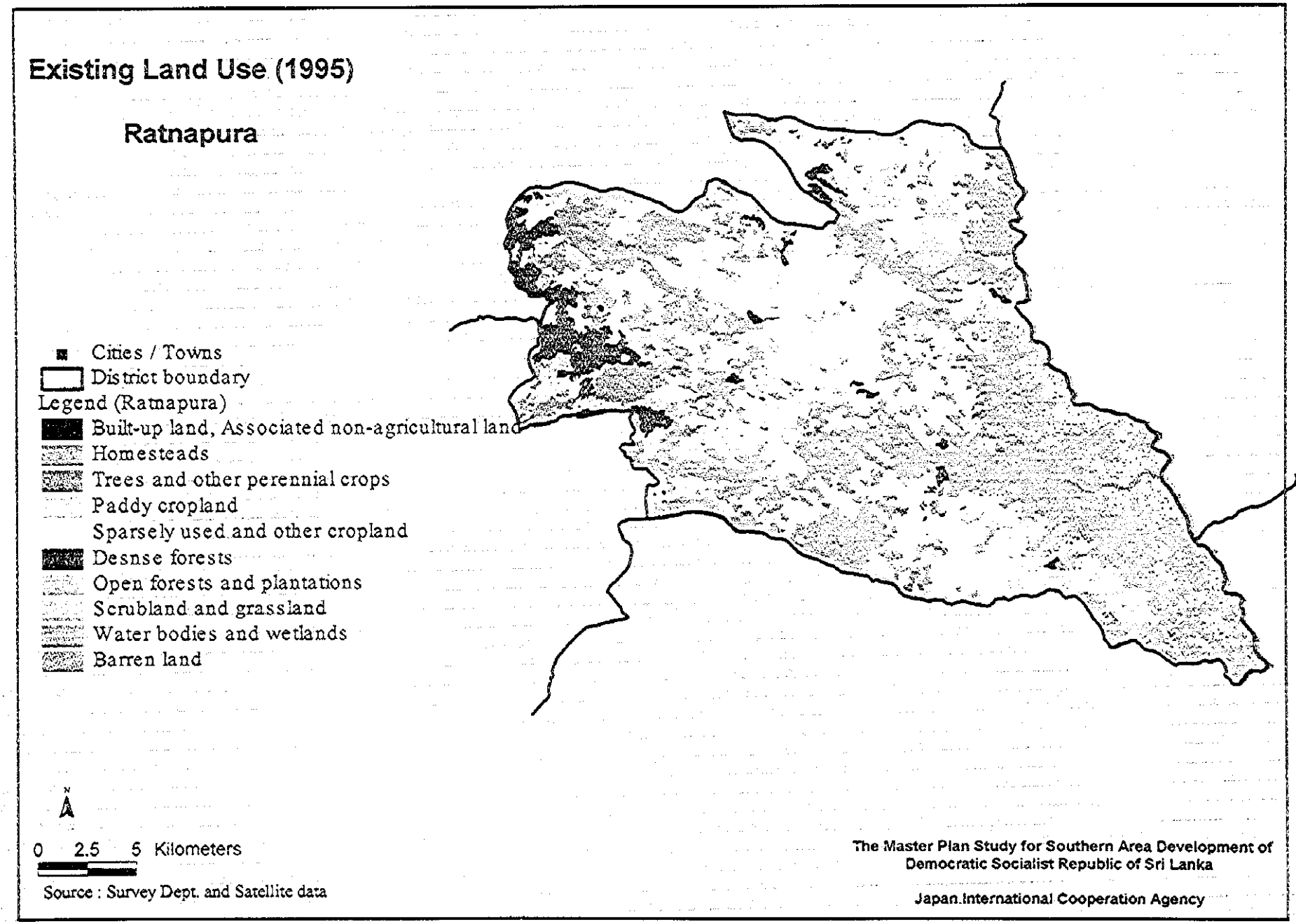
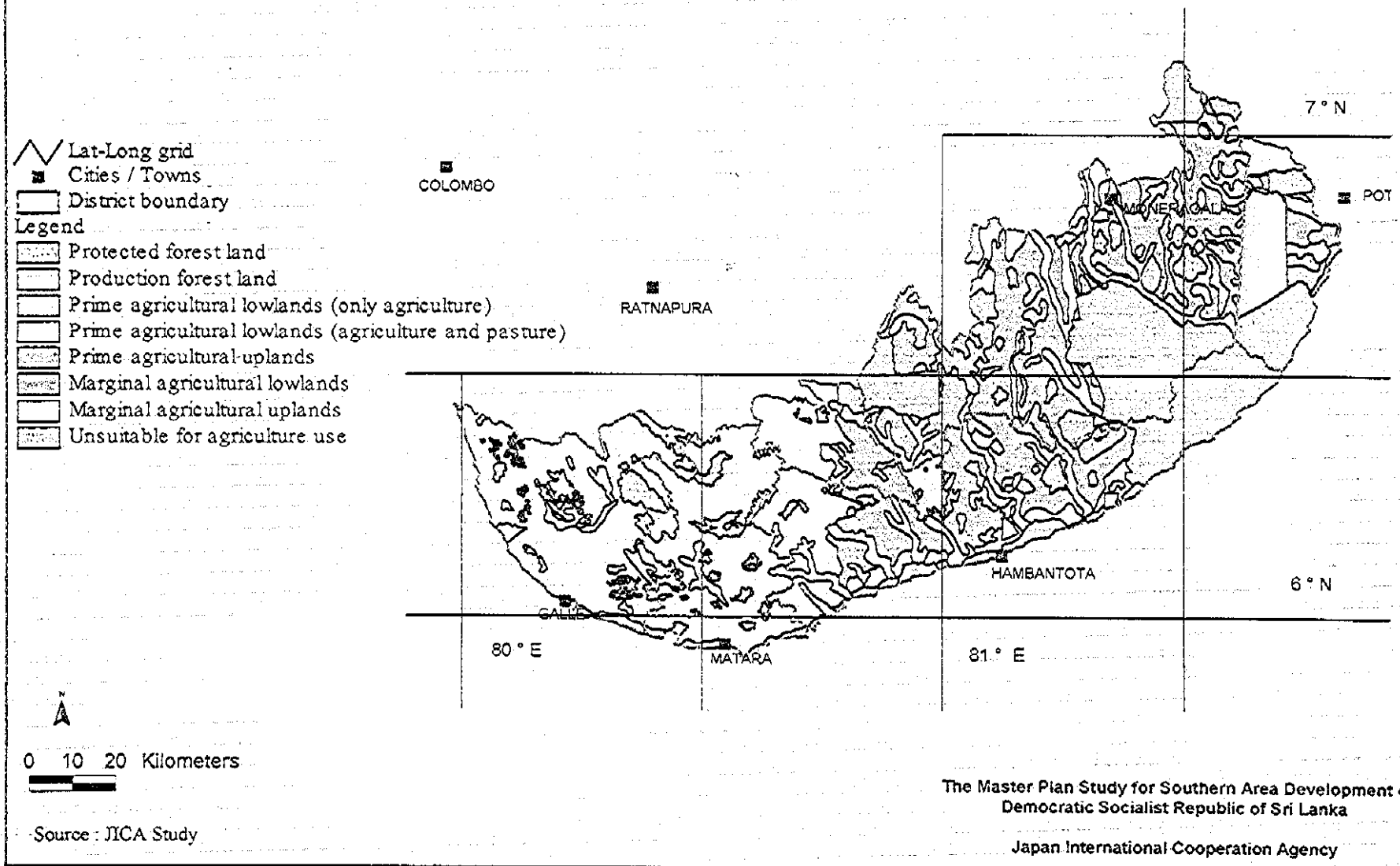

Existing Land Use (1995)
Ratnapura
Cities / Towns
District boundary
Legend (Ratnapura)
Built-up land, Associated non-agricultural land
Homesteads
Trees and other perennial crops
Paddy cropland
Sparsely used and other cropland
Desnse forests
Open forests and plantations
Scrubland and grassland
Water bodies and wetlands
Barren land
N
0 2.5 5 Kilometers
Source : Survey Dept. and Satellite data
The Master Plan Study for Southern Area Development of
Democratic Socialist Republic of Sri Lanka
Japan International Cooperation Agency

Figure :

Potential Land Use



Source : JICA Study

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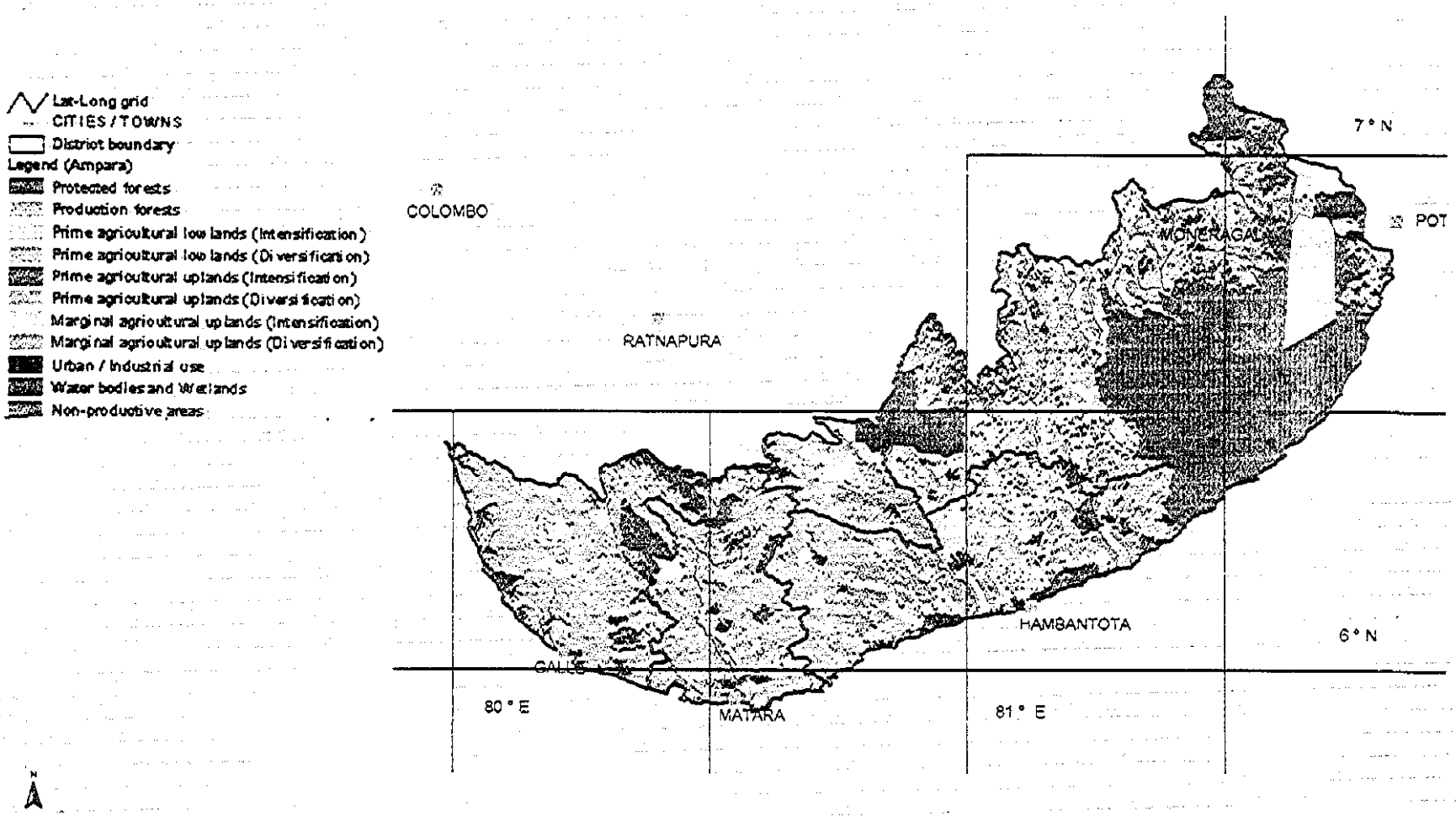
Figure :

Proposed Land Use



Source : JICA Study

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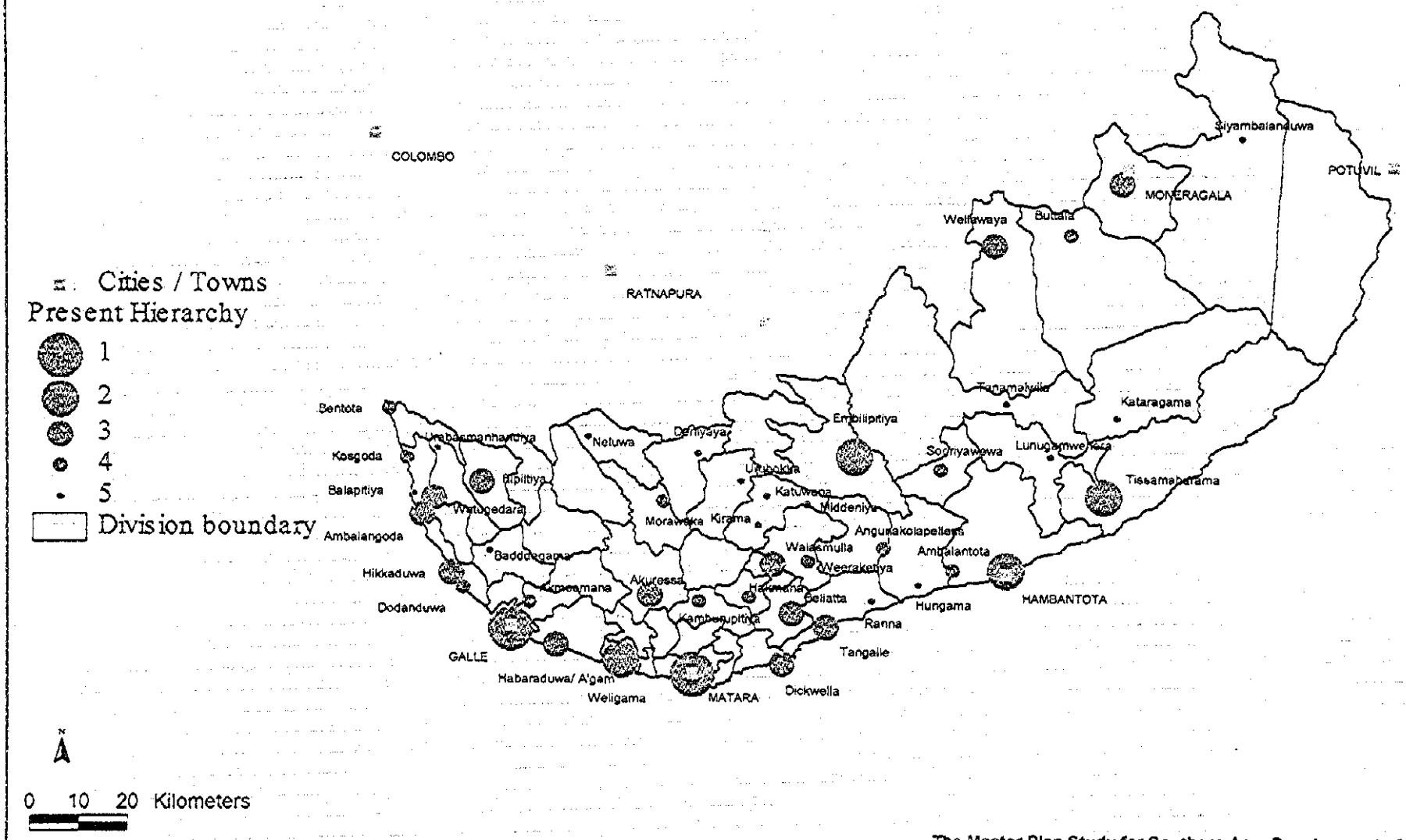
Figure :

Present Urban Hierarchy



0 10 20 Kilometers

Source : JICA Study

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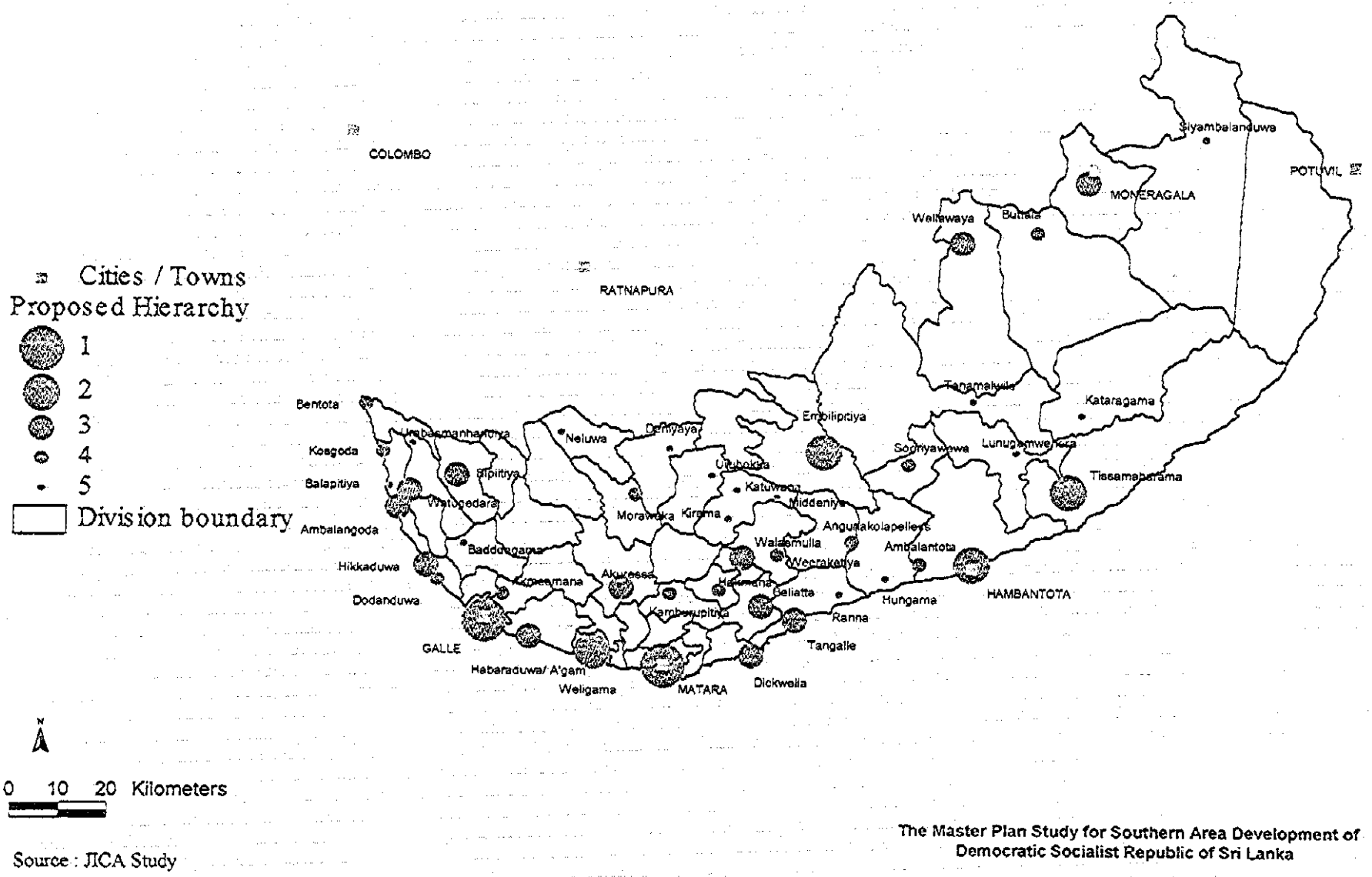
Figure :

Proposed Urban Hierarchy



0 10 20 Kilometers

Source : JICA Study

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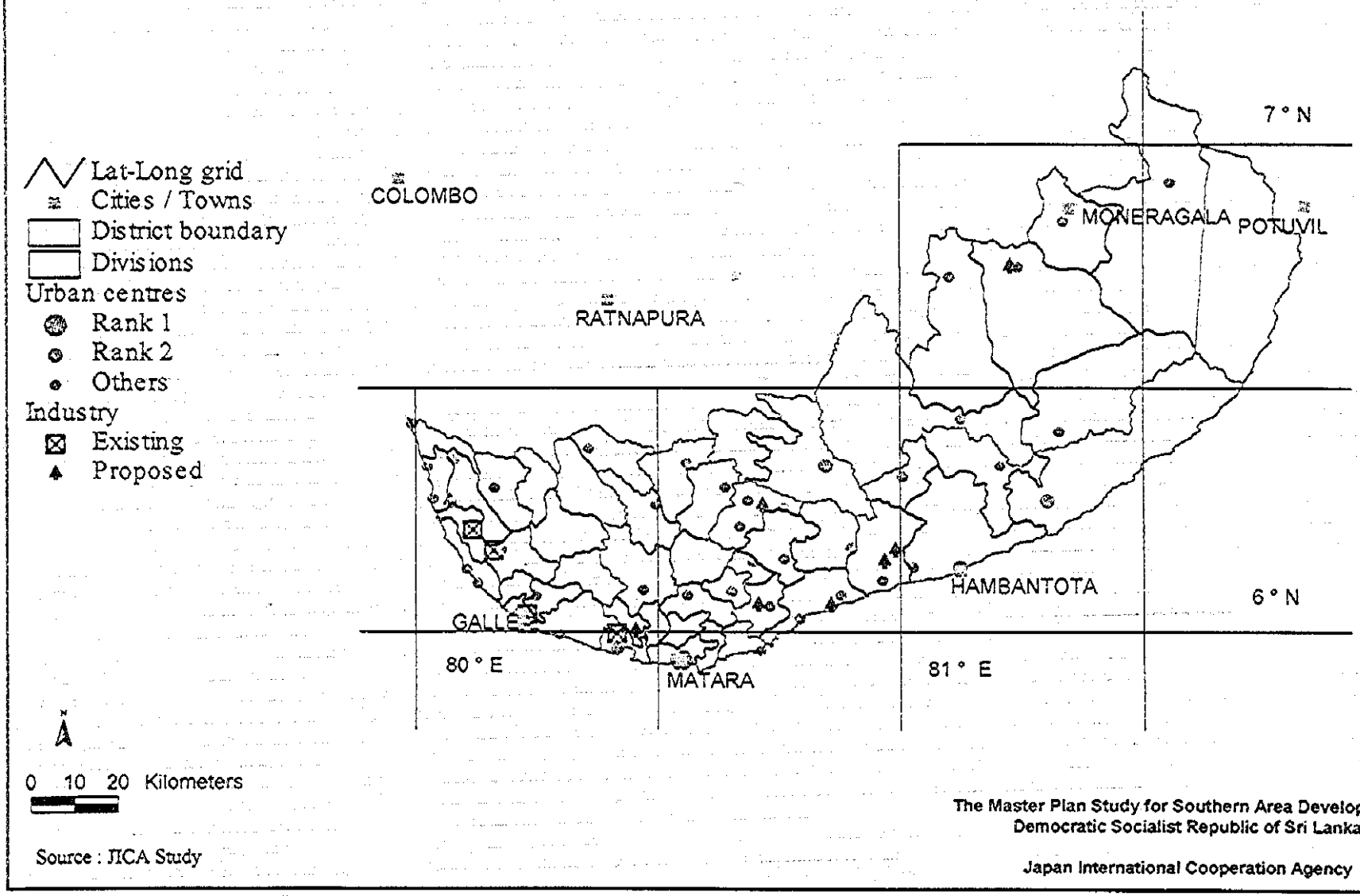
Figure :

Industrial sites



Source : JICA Study

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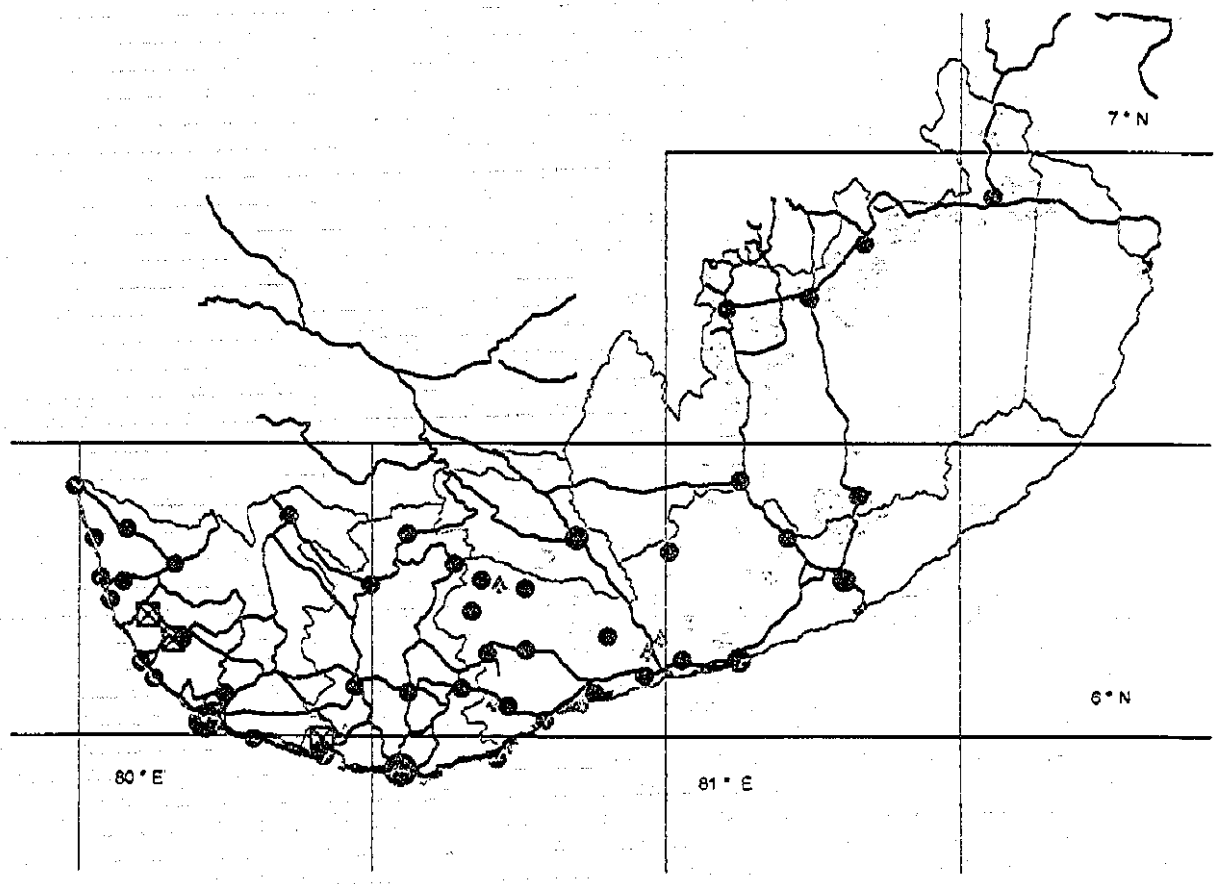
Figure :

Urban/Industrial Land Potential of Southern Area

District boundary
Lat-Long grid
Major Roads (A & B)
Urban centres
Rank 1
Rank 2
Others
Industry
Existing
Proposed
Legend
Marginal agricultural uplands
Marginal agricultural lowlands
Unsuitable for agricultural use



N

0 10 20 Kilometers

Source : JICA Study

The Master Plan Study for Southern Area Development of
Democratic Socialist Republic of Sri Lanka

Japan International Cooperation Agency

Figure :

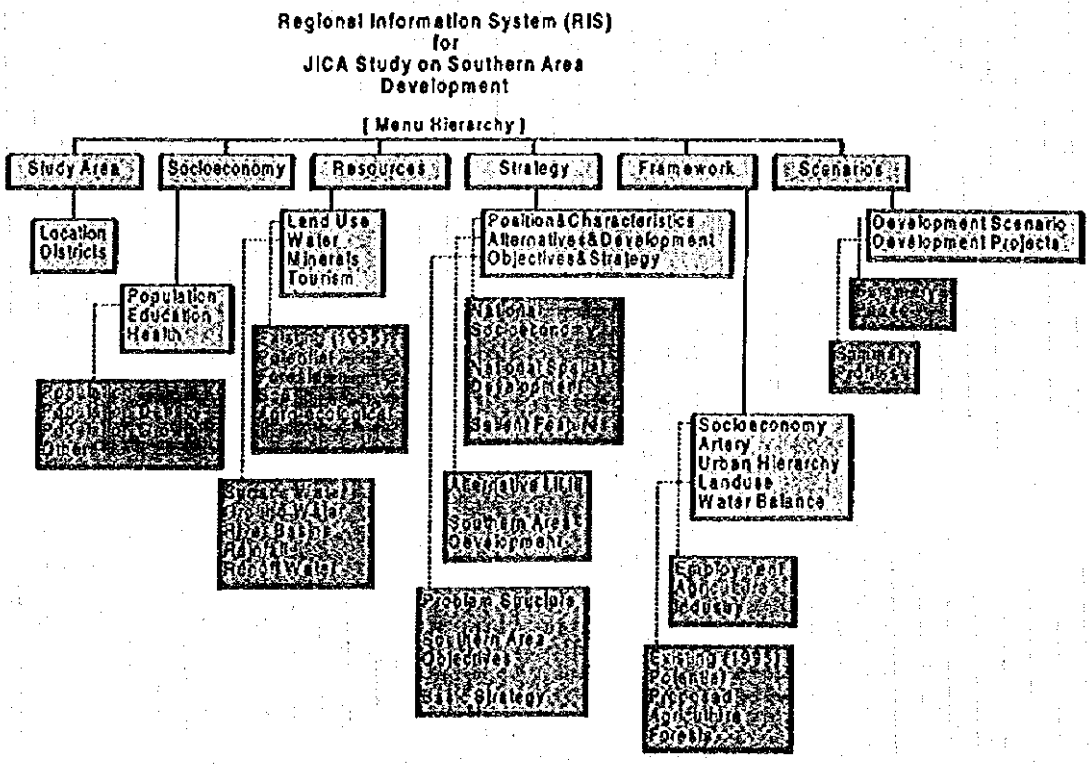
Appendix

1. Introduction

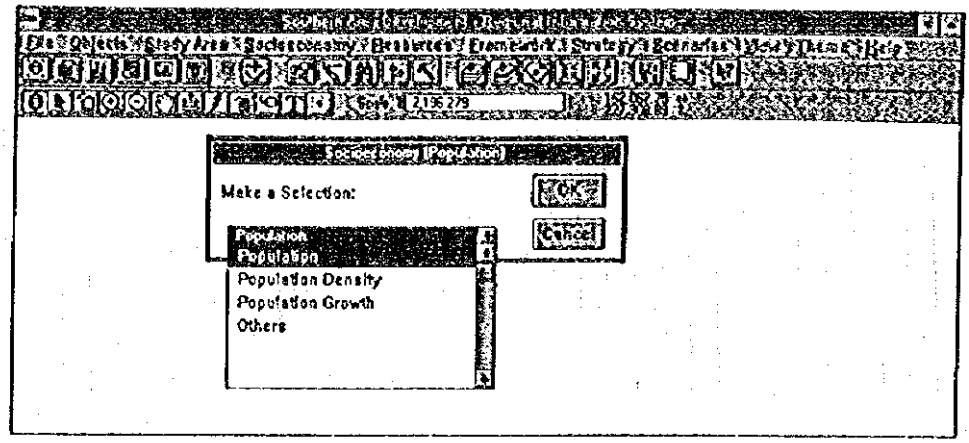
The Regional Information System (RIS) has been developed based on a GIS data base for the Master Plan Study for Southern Area Development in the Democratic Socialist Republic of Sri Lanka. This is a prototype application to enable the users to view, query and print a variety of information about Southern Area in the form of maps, tables, layout etc. The system aims to help regional planners for improved decision making.

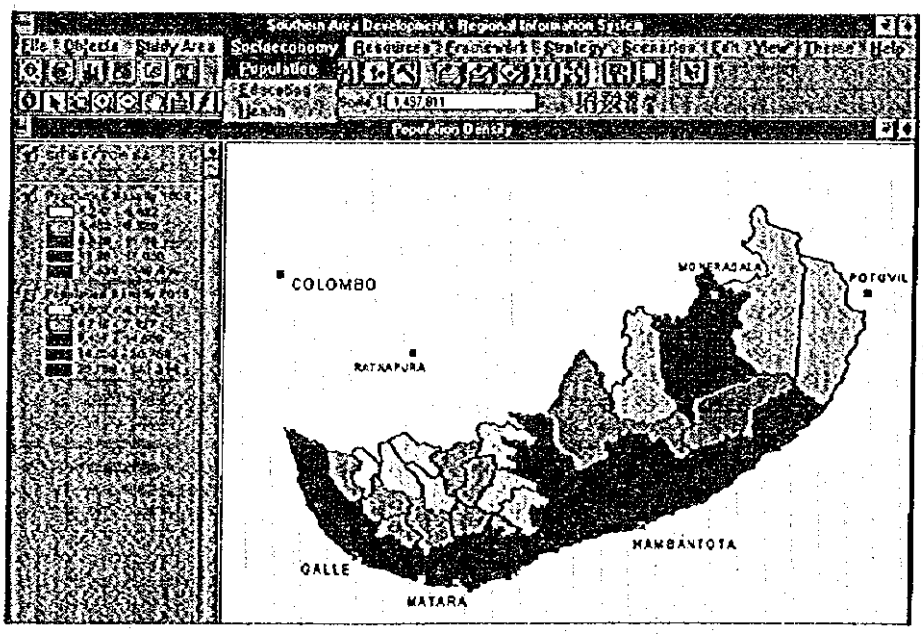
2. Deliverable Features

RIS is a menu based application developed in Arc View 2.1 using Avenue scripts in Windows environment. The menu hierarchy is as below.



Sample screens are as follows:





The following five objects are possible for a menu item.

1. View
2. Layout
3. Description
4. Chart
5. Picture

Of these five, only relevant objects are related to a menu item. If an object is related to menu item, the menu item appears, if not a beep occurs. Under every View are placed one or more themes. User can set these themes on/off, change colors, text size for graphics etc. User can also add/delete themes using Arc View's features.

Zoom, query and pan buttons/icons allow for the named operations. The status line contains a brief message for buttons/icons.

3. Hardware and Software Requirements

Hardware:

Pentium PC with minimum 16 MB RAM
(Recommended 32 MB RAM)
110 MB free disk space
CD-ROM drive
Color SVGA monitor
Mouse
Color printer

Software:

Windows 3.1 or higher
ArcView 2.1 or higher

Environment Variable:

An environment variable RISPATH should be set before running RIS application under ArcView.
For example: If the application is in C:\RIS, the Autoexec.bat should have the following statement:
SET RISPATH=C:\RIS

4. Package Information

The RIS application and data occupying about 540 MB, are packaged in one CD. The following table describes the directories and files in the CD.

Directory/File	Content/Description
GDB (directory)	This contains all the data created/generated during entire project period. The map data is under Maps sub-directory.
RIS (directory)	This contains RIS10.APR application and the data/pictures/tables required by the application.
RIS10.EXE (file)	This is a self extract utility to install the application and data into hard disk.
README.TXT (file)	This provides important information for installing and executing the application.
RELRIS.DOC (file)	MS Word 6.0 file containing Release Notes
DD20.DOC (file)	MS Word 6.0 file containing Design Document (Version 2.0). This has RIS design details for the developer/modifier

5. Installation Procedure

RIS10.EXE is a self-extract program, executable under Windows. It gives the user a window with options for installing the RIS application on the hard disk. Choose the drive and path for installing the application.

The application runs under ArcView 2.1/3.0 in Windows 3.1 or higher environment with 110 MB free disk space. The environment variable RISPATH should be set before running RIS with the following statement in your Autoexec.bat file:
SET RISPATH=C: \RIS - if the application and data are in the C:\RIS directory.

Note that the RIS10.APR can be run from the <CD-ROM drive>:\RIS directory. In this case, any modifications made to the APR file should be saved in the hard disk.

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