# GEO-INFORMATION STRATEGY FOR RURAL DEVELOPMENT:

## A case study of Aurangabad District, Bihar.

## INTRODUCTION

*Geo-information provides a scientific base as an active database for the planning in general and rural development in particular as there is lack of rural resource database in general and the study area in particular.*

***In the present paper an attempt has been made to synchronize the future development & planning with geo-information and central places existing in the District of Aurangabad (Bihar) for decision making and planning for rural development through service centres***

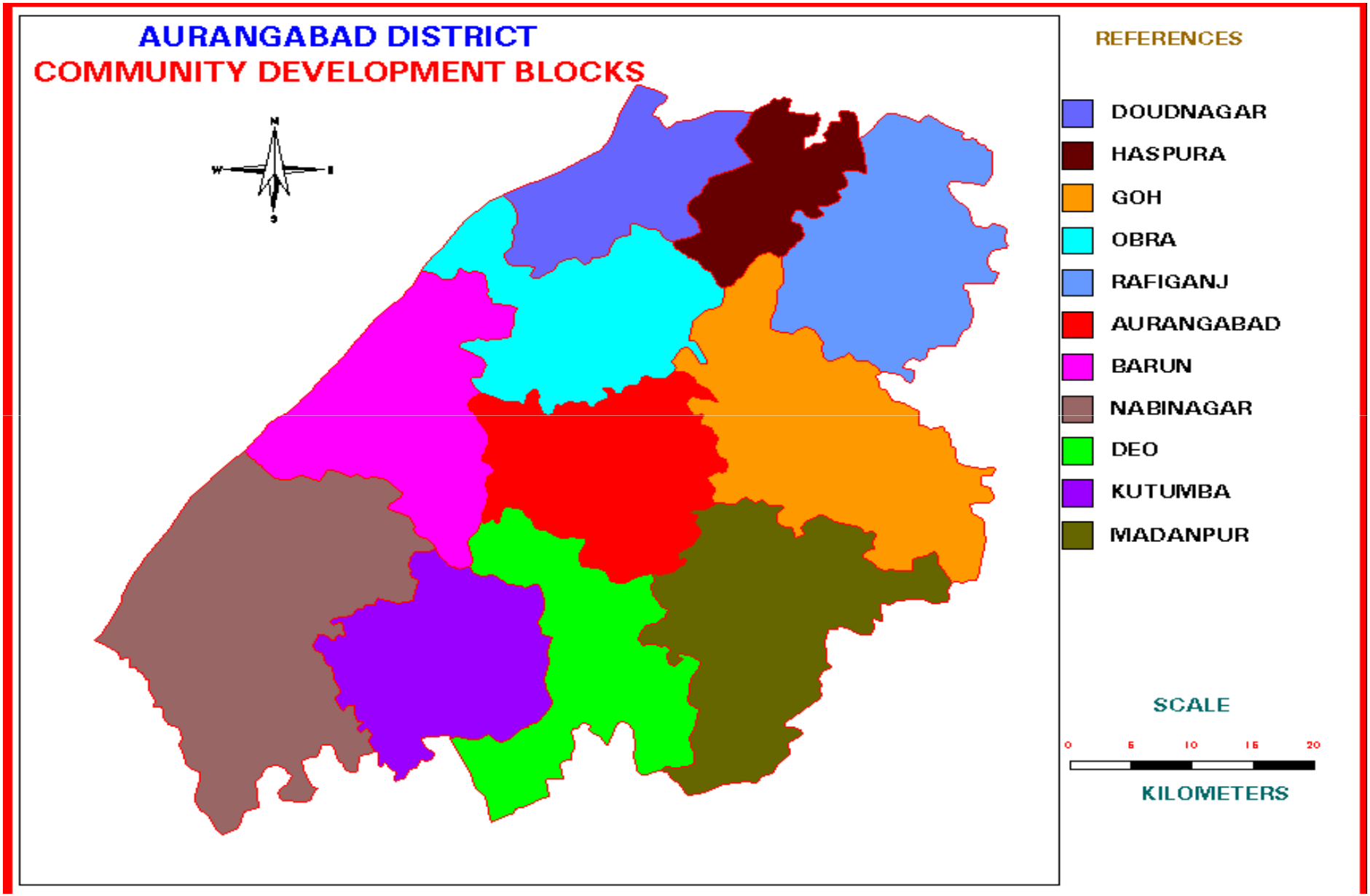
# INTRODUCTION

*Micro-level planning and integrated development strategies have attracted attention of the authorities and planners, as this is also a technological solution to develop any region at the grass root level and provide benefit to the poorest of the poor. All planners across the world has realized that there is no planning without giving due importance to central places in hierarchical perspective. The pioneering work that needs our attention is Growth Pole Model.*

## INTRODUCTION

*A micro-level study of Aurangabad district(Bihar) India, has been taken as the study area. The author has taken up the analysis work, both at district and at the block level so that the spatial pattern of the central places, it's natural and socio-economic phenomenon can emerge in a more effective and sustainable manner.*

# *The study Area*



# INTRODUCTION

*In the present study author has identified central places of the different orders, on the basis of 39 variables of socio-economic importance, as the vehicle of development. Some more rural service centres have been proposed with the help of Remote sensing and GIS based on geo-information related with the study area.*

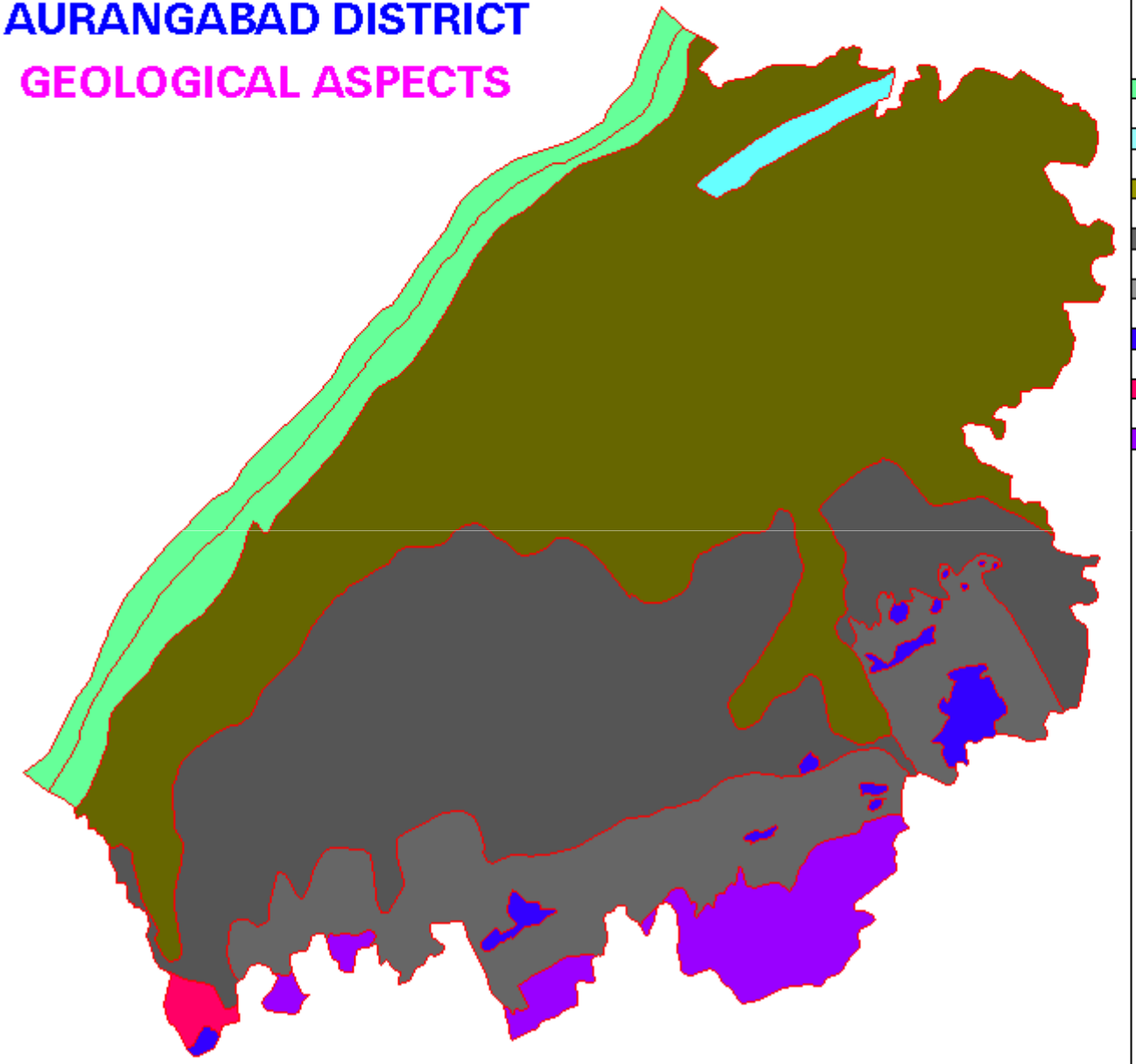
*Based on physical-socio-economic resources an attempt has been made to highlight the basic strategy for Area based planning. Alternative plans have been provided in certain proposed service centres to develop the study area as a whole, with the help of geo-information.*

## *METHODOLOGY*

- Physical–Geo-information like geology, relief, groundwater potentiality, drainage, soil, land use /cover etc.layers have been prepared with the help of remote sensing technique in which digital analysis have been done using LISS- III , 104 – 54 PATH & ROW scene of two seasons digital data with the help of GEOMATICA software of image processing.

# AURANGABAD DISTRICT

## GEOLOGICAL ASPECTS



REFERENCES

- SON GRABEN
- SON PALEO-CHANNEL
- ALLUVIAL PLAIN
- MARGINAL ALLUVIAL PLAIN
- ARCHEAN BASEMENT
- DENUDATIONAL HILL
- SHALLOW BURIED PENIPLAI
- STRUCTURAL RIDGE

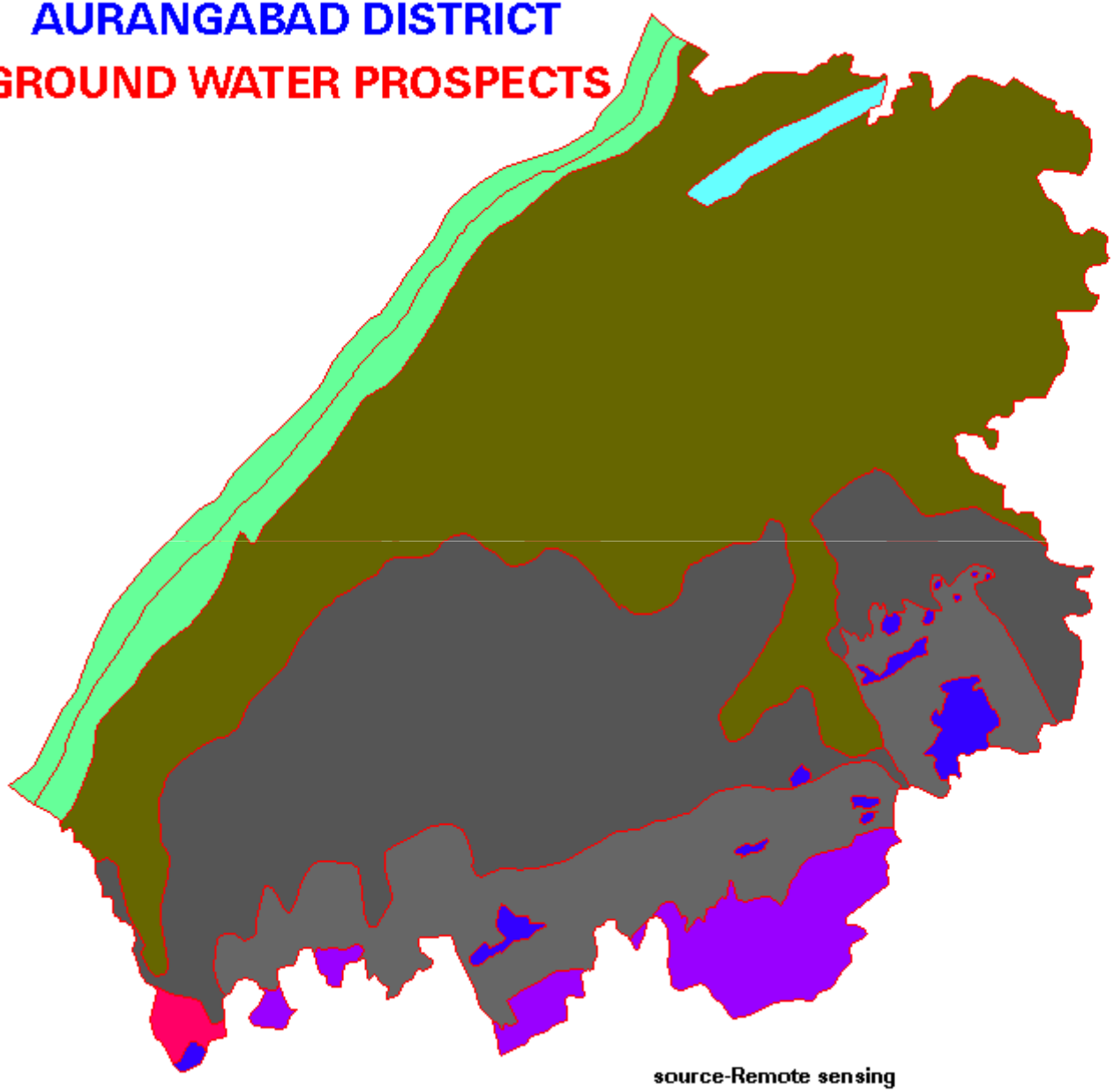
SCALE

0 5 10 15 20

KILOMETERS

# AURANGABAD DISTRICT

## GROUND WATER PROSPECTS



source-Remote sensing

REFERENCES

- EXCELLENT TO VERY GOOD
- EXCELLENT TO VERY GOOD
- VERY GOOD TO GOOD
- GENERALLY GOOD
- GOOD TO POOR
- GENERALLY POOR
- POOR
- POOR

N

W E

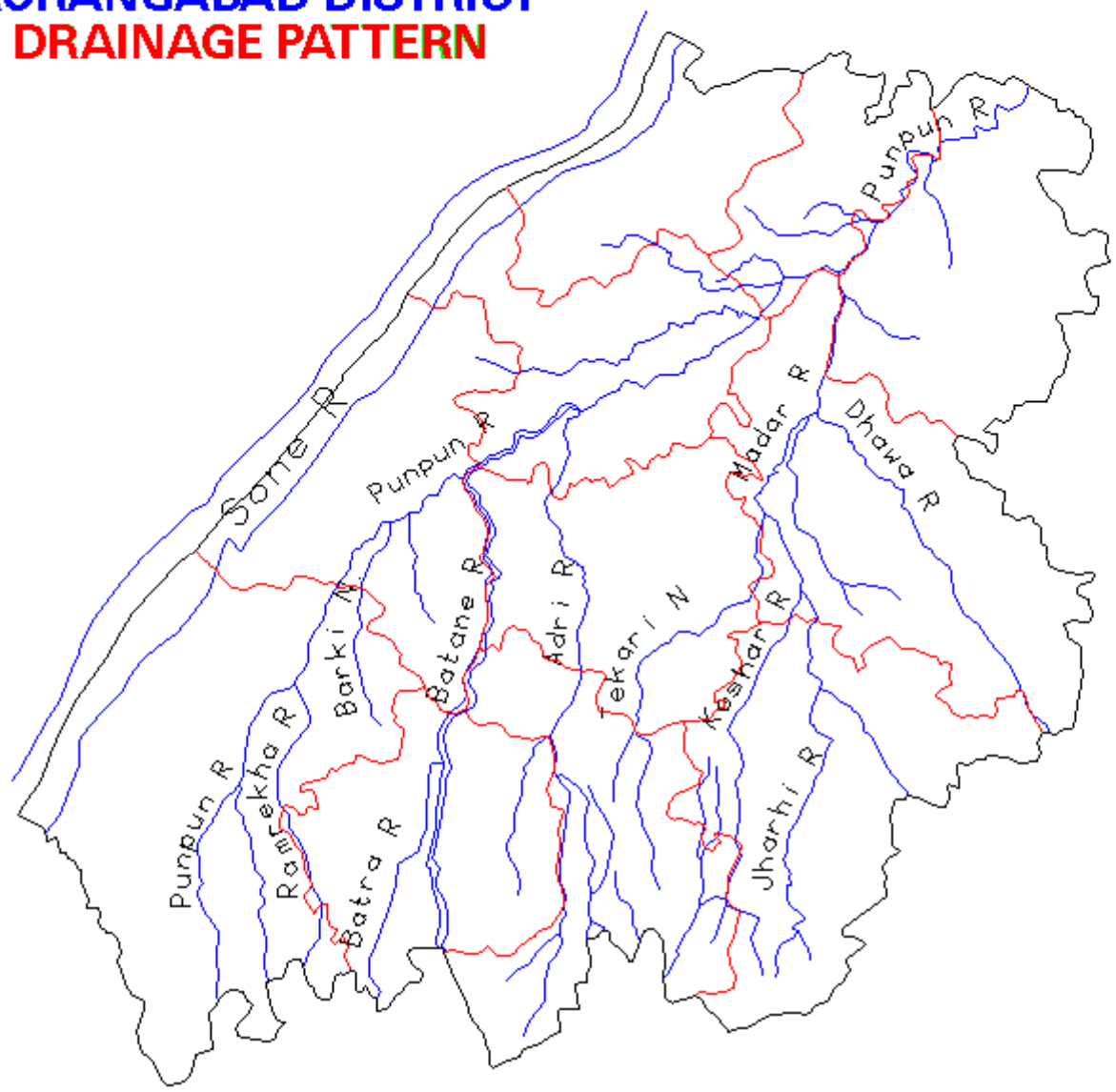
S

SCALE

5 0 5 10 15

KILOMETERS

# AURANGABAD DISTRICT
## DRAINAGE PATTERN




REFERENCES

RIVERS

BLOCK BOUNDARY

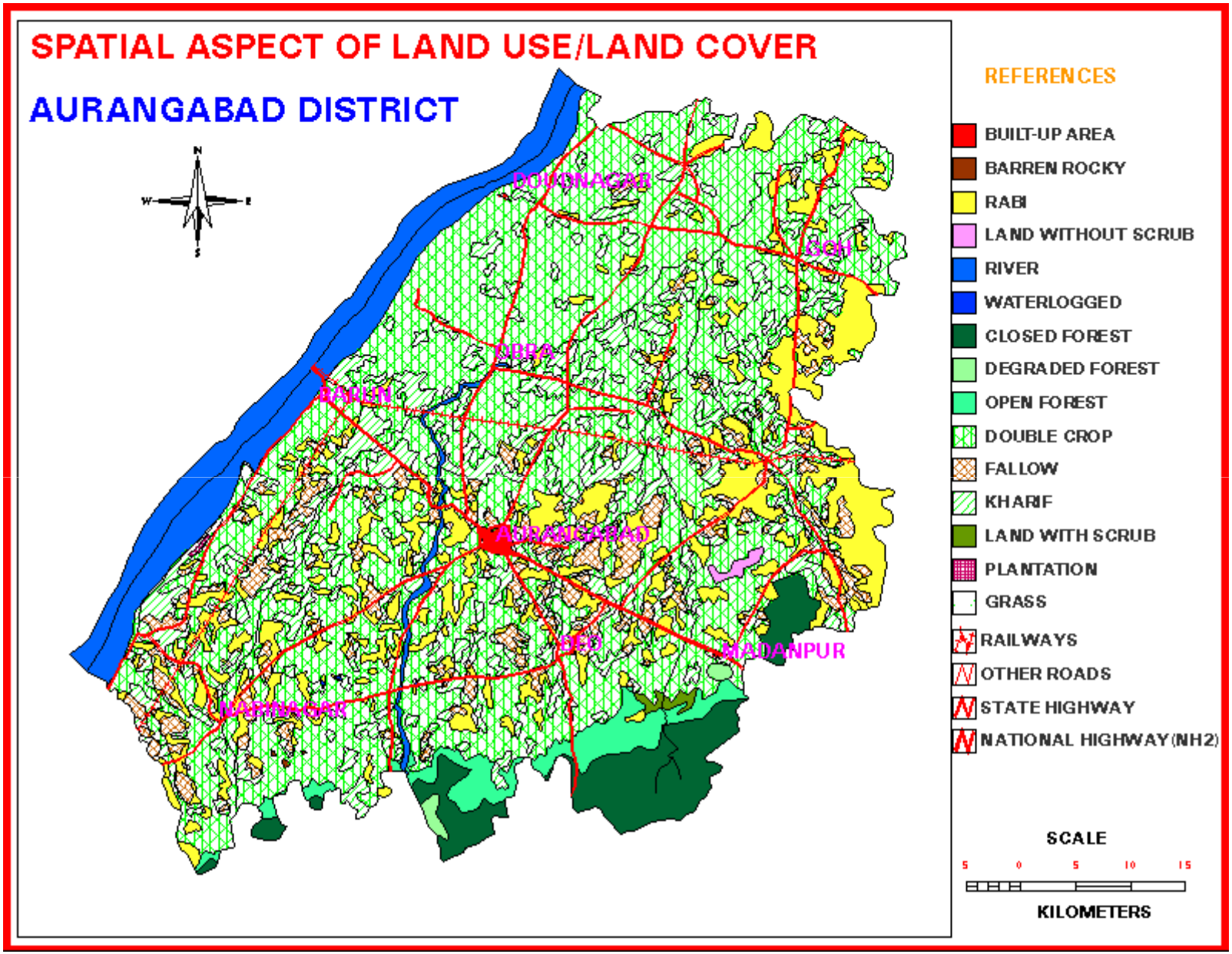
DISTRICT BOUNDARY

N
W
E
S

SCALE

5 0 5 10 15

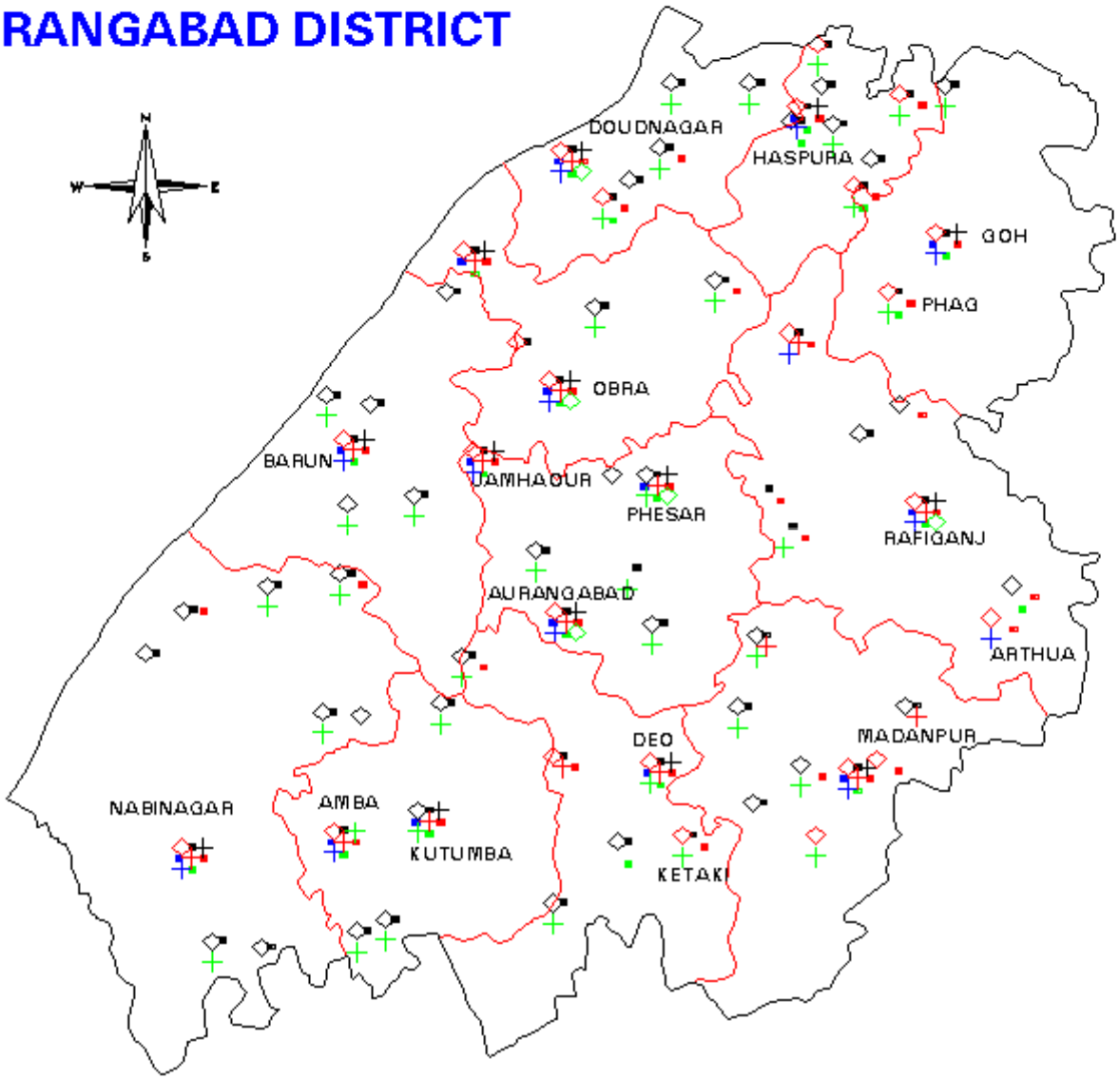
KILOMETERS


SPATIAL ASPECT OF LAND USE/LAND COVER
AURANGABAD DISTRICT
N
W
E
S
DOUGNAGAR
GOL
DIBRA
BARUN
AURANGABAD
MAJANPUR
MAHIMAGAR
REFERENCES
BUILT-UP AREA
BARREN ROCKY
RABI
LAND WITHOUT SCRUB
RIVER
WATERLOGGED
CLOSED FOREST
DEGRADED FOREST
OPEN FOREST
DOUBLE CROP
FALLOW
KHARIF
LAND WITH SCRUB
PLANTATION
GRASS
RAILWAYS
OTHER ROADS
STATE HIGHWAY
NATIONAL HIGHWAY (NH2)
SCALE
5 0 5 10 15
KILOMETERS

## METHODOLOGY

Information of social provisions like, hospital, primary health centres, dispensary, maternity child welfare centres, post offices, post and telegraph offices, high schools, colleges, training & technical institute their location have been digitized as information received by district centres. SOI- toposheets and District Census handbook have also been used to incorporate information in different layers.

# SOCIAL PROVISION
# AURANGABAD DISTRICT




## REFERENCES

- HOSPITAL
- PHS
- DISPENSARY
- MCW
- PHS & MCW
- DISPENSARY & MCW
- POST OFFICE
- POST & TELEGRAPH
- HIGH SCHOOL
- COLLEGE
- Tr.TECH.INSTITUTE

**SCALE**

0 5 10 15 20

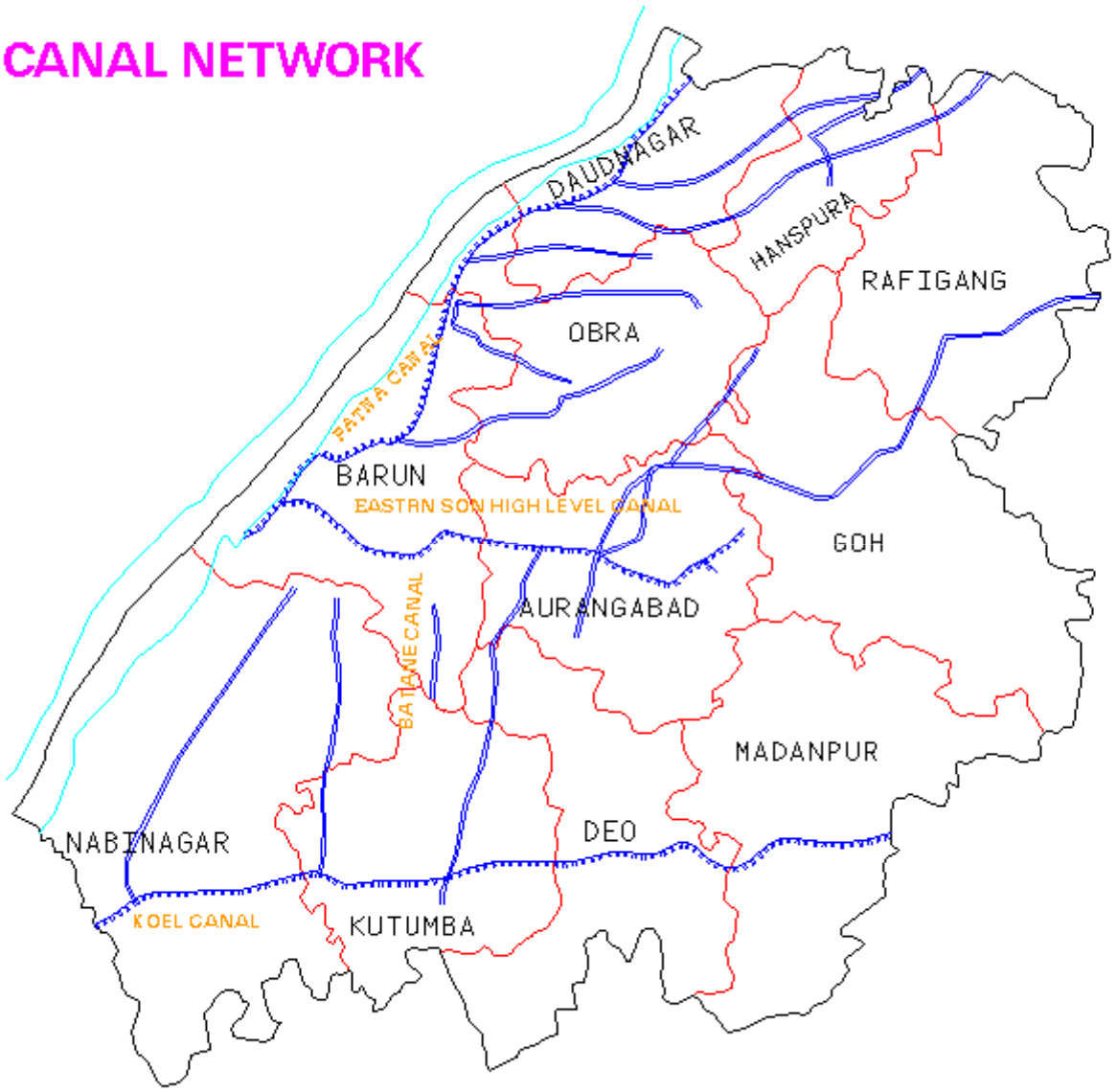
KILOMETERS

# METHODOLOGY

Economic provisions like canal networks, transport networks, etc. have also been digitized and were placed in GIS environment

# AURANGABAD DISTRICT

## CANAL NETWORK




REFERENCES

- BRANCH CANAL
- MAIN CANAL
- DIST.BOUNDARY
- BLOCK BOUNDARY

N
W
E
S

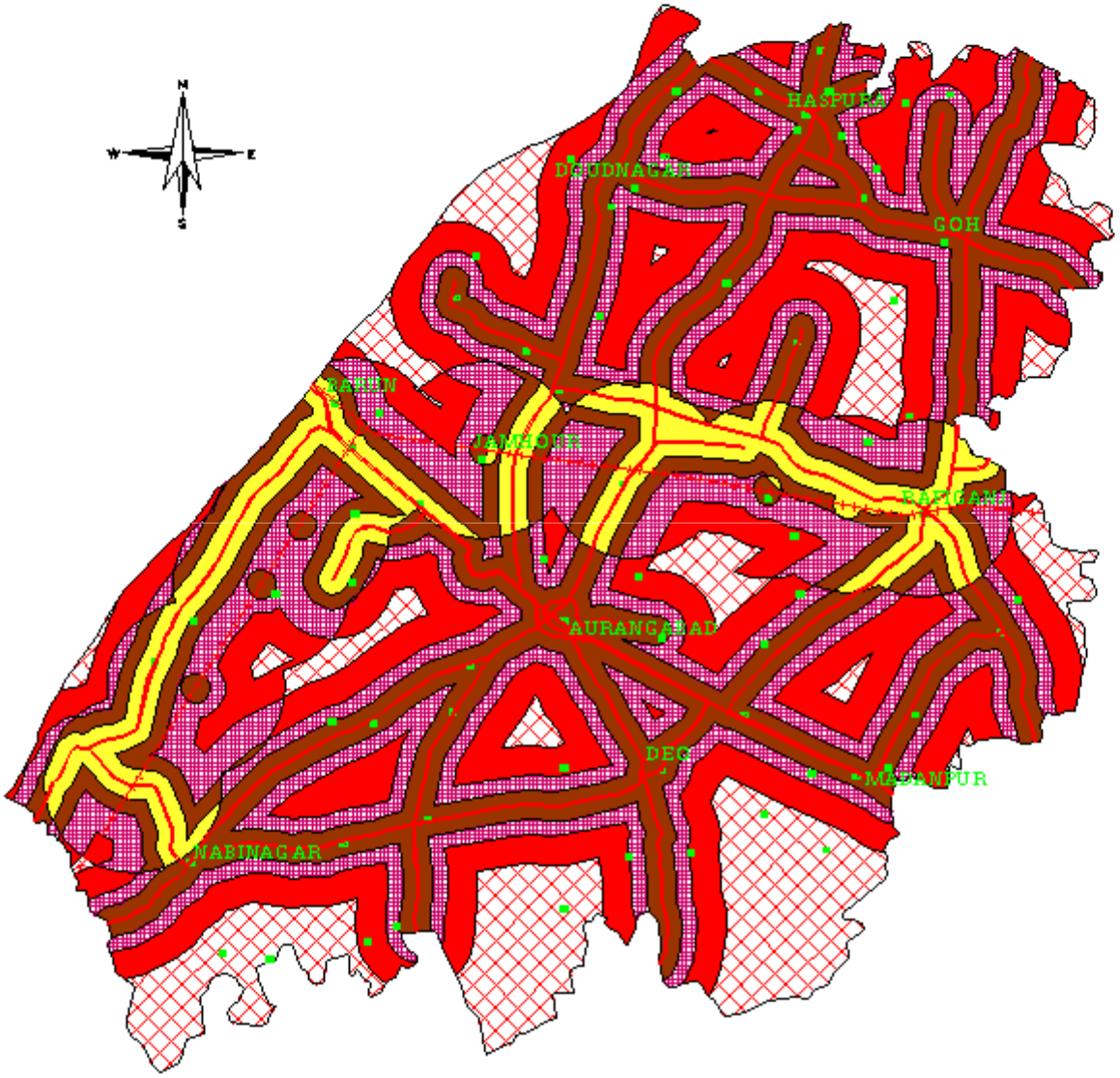
SCALE

0 5 10 15 20

KILOMETERS

# AURANGABAD DISTRICT

## SPATIAL ASPECTS OF RAIL-ROAD ACCESSIBILITY




## REFERENCES

### ACCESSIBILITY

- EXCELLENT APPROACH
- GOOD APPROACH
- POOR APPROACH
- MEDIUM APPROACH
- NO APPROACH
- CENTRAL PLACES
- ROADWAYS
- RAILWAYS

SCALE

5 0 5 10 15

KILOMETRES

# AURANGABAD DISTRICT

## SPATIAL ASPECTS OF RAIL-ROAD ACCESSIBILITY

REFERENCES

APPROACH

- EXCELLENT APPROACH
- GOOD APPROACH
- MEDIUM APPROACH
- POOR APPROACH
- NO APPROACH
- SETTLEMENTS
- ROAD
- RAIL

N

W E

S

SCALE

5 0 5 10 15

KILOMETERS

**Identification of central places.-** Those settlements which are predominately concerned with serving the needs of their surrounding areas are called **Central Places.**

Central places play a very crucial role in the regional development. Their role in the regional development is not only because central places function as economic service centres to it's surrounding region , they also spread ideas of modern technology and modern values towards their hinterland, which also helps in better development and prosperity.

## Importance of Central places in Decentralized Planning processes of India

The planning processes for decentralized planning has also identified the role of central places. After IV five years plan it was felt that sectoral priorities and planning from top level is little helpful in providing better result as far as socio-economic development to the people is concerned. Since then the sectoral approach has been changed into integrated area development in which central places either urban or rural service centres are being considered as focal point for the decentralized planning. This is really a basic approach towards assessing the regional or local resources and evaluating their role in the regional development.

# Table no-1

| Sr.No | Population size | No of settlements |
|---|---|---|
| 1 | 1001-1500 | 138 |
| 2 | 1501- 2000 | 70 |
| 3 | 2001- 2500 | 33 |
| 4 | 2500-3000 | 15 |
| 5 | 3001- 3500 | 8 |
| 6 | > 3500 | 23 |

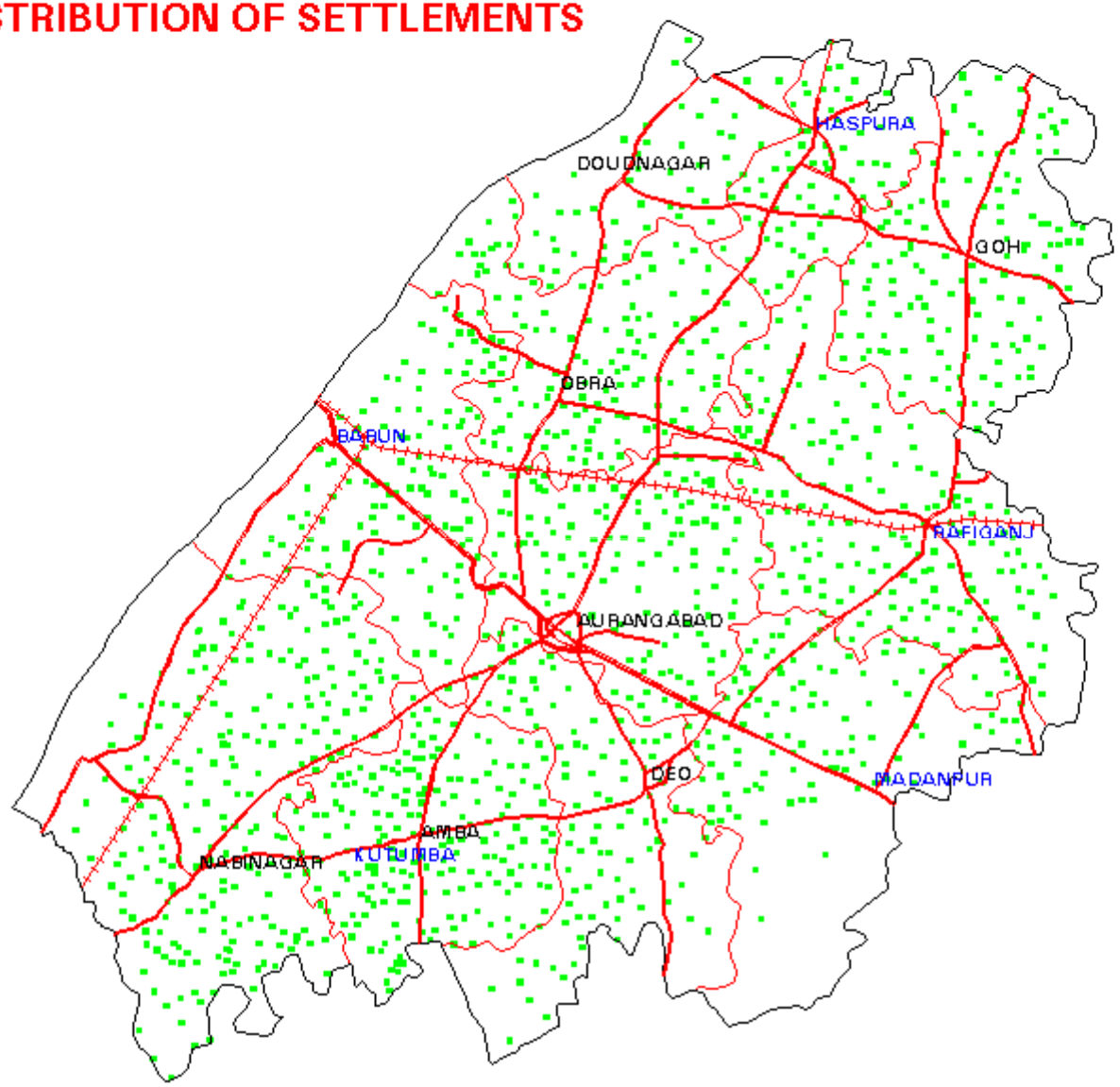
- All 287 settlement were digitized and were kept in GIS environment.

- Based on their central functions later on 71 settlements selected through GIS query system based on the reasoning "that those centres which are performing more than 7 service ranging from VII group of services".

❖ Services considered have been listed

# AURANGABAD DISTRICT

## DISTRIBUTION OF SETTLEMENTS




REFERENCES

- SETTLEMENT
- DIST.BOUNDARY
- BLOCK BOUNDARY
- RAILWAYS
- ROADWAYS

N
W
E
S

0 5 10 15 20

# List of Service group and central services

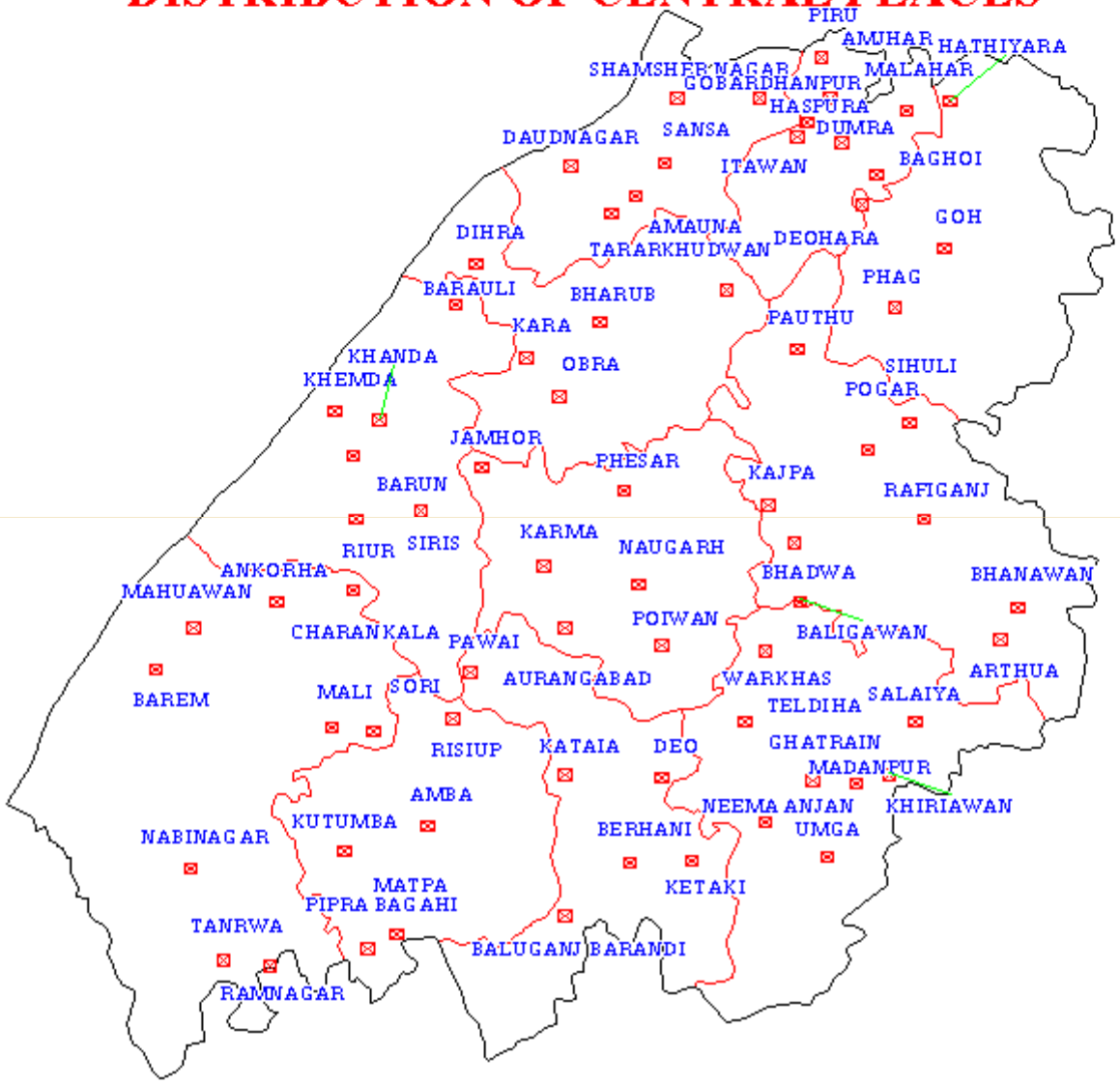
| Service Groups | Services |
|---|---|
| (1(1)_Administrative Provisions | 1. District headquarter |
| | 2. Sub division office |
| | 3. Police stations |
| | 4. C.D. Block |
| | 5. Gram Panchayat office |
| | 6. Municipal office |
| (ii) Educational provision:- | 7. primary School |
| | 8. Middle School |
| | 9. High School |
| | 10. Intermediate School |
| | 11.Degree College |
| | 12.Traning&Technical Institute |

| | |
|---|---|
| (iii) Medical Provision :- | 13. Hospital |
| | 14. Health centre |
| | 15. State dispensary |
| | 16. Nursing home |
| | 17. Veterinary centres |
| | 18. Veterinary sub centres |
| ((iv) Communication :- | 19. Post office |
| | 20. Post & telegraph office |
| | 21. Telephone services |
| | 22. Bus Stand |
| | 23. Railway stations |
| (v) Commercial provisions | 24. Permanent market |
| | 25. periodical hats |
| | 26. Commercial Bank |
| | 27. Electrification |
| | 28. Large Industrial Unit |
| | 29. Small Industrial Unit |
| | 30. Tiny Industrial Unit |

(vi)Agricultural Provisions :- 31. Biscouman Depot.
32. Co-oprative Bank
33. Land development Bank
34. Fertilizer Depot
35. H.Y.V. seed depot
36. Vaypar mandal
37. Agricultural implements

(vii) Other Services :- 38. Tap water
39. Urban centres (NAC)

# AURANGABAD DISTRICT
## DISTRIBUTION OF CENTRAL PLACES




**REFERENCES**

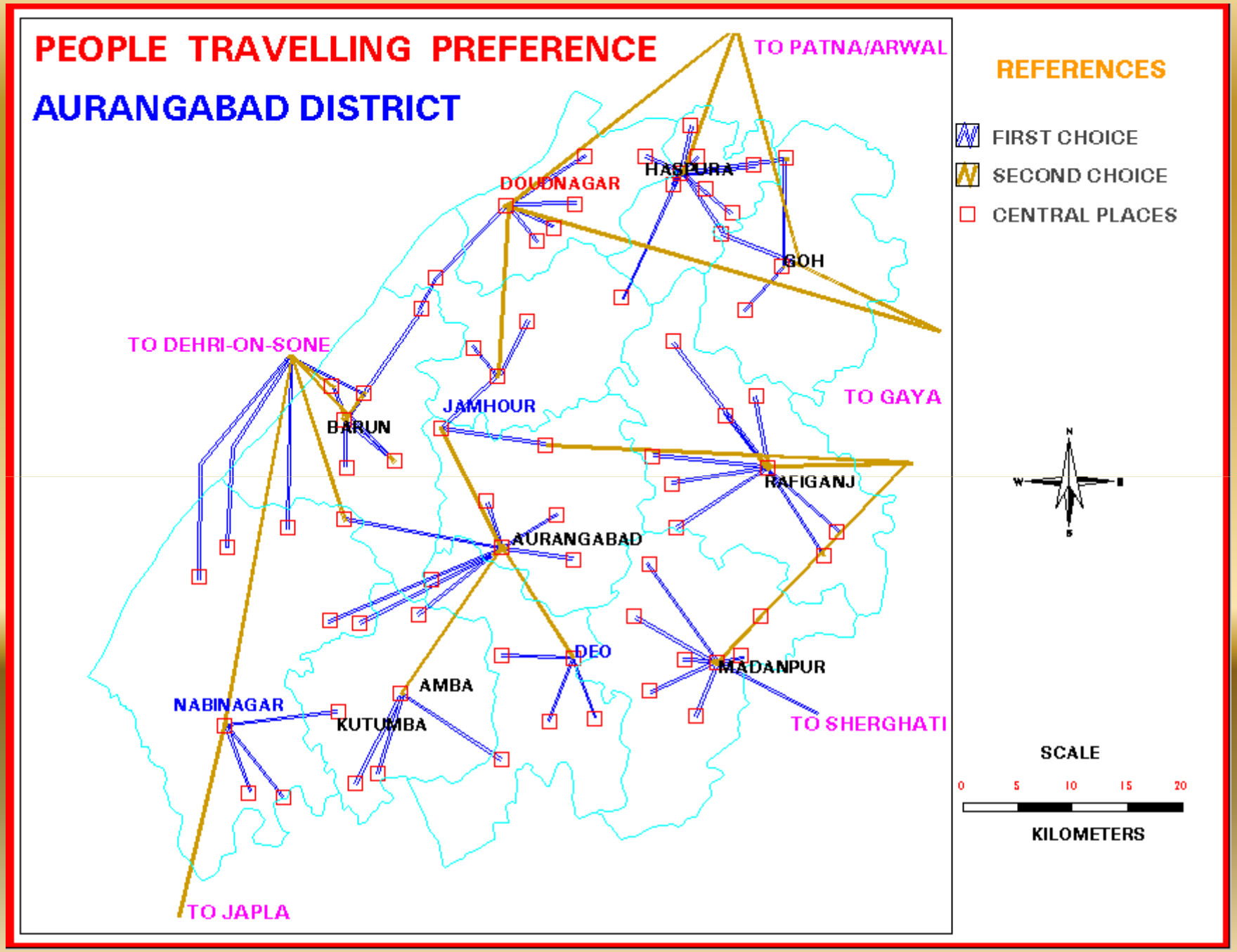
- CENTRAL PLACES
- DIST.BOUNDARY
- BLOCK BOUNDARY

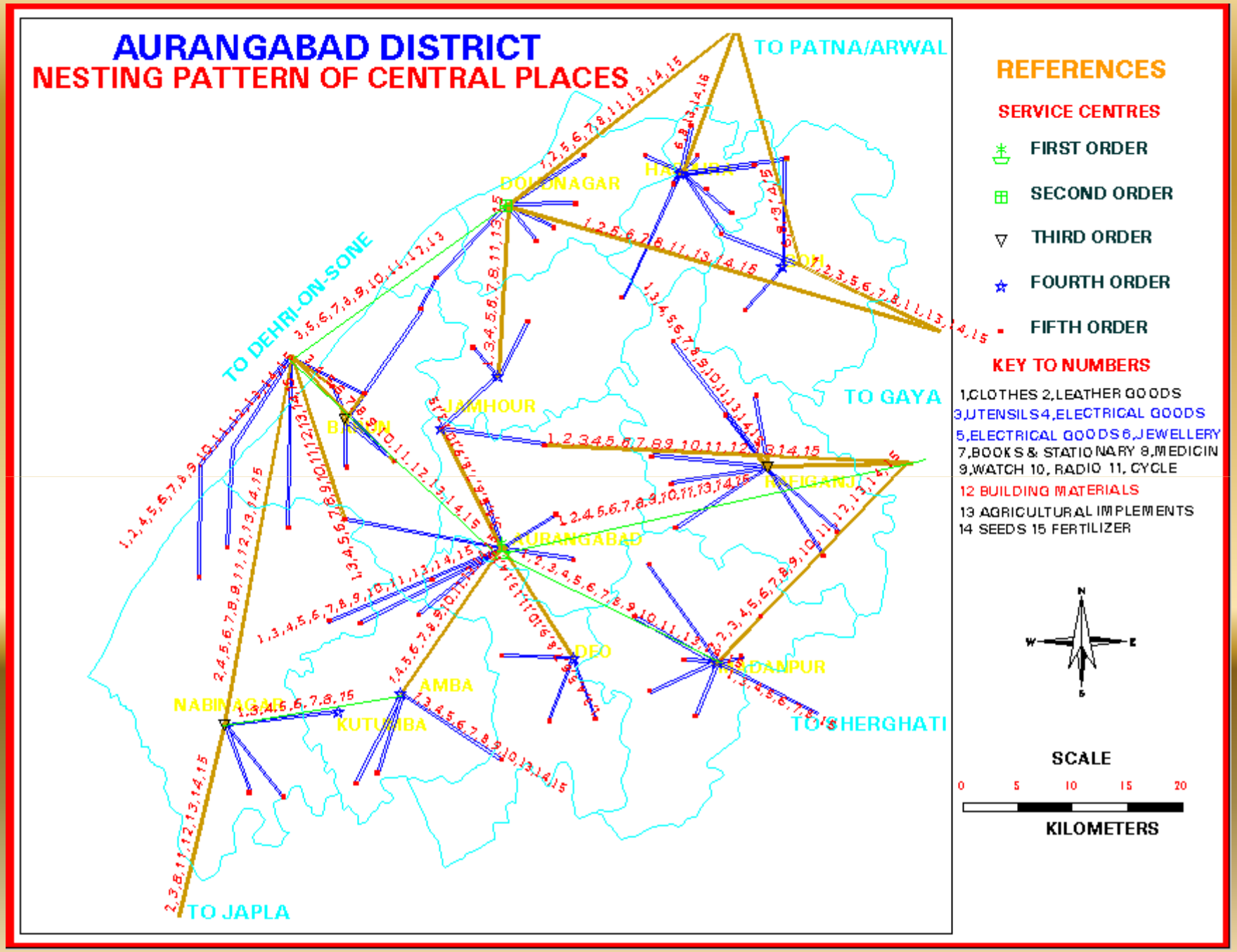
N
W
E
S

**SCALE**

5 0 5 10 15

**KILOMETERS**


PEOPLE TRAVELLING PREFERENCE
AURANGABAD DISTRICT
TO PATNA/ARWAL
DOUDNAGAR
HASPURA
GOH
TO DEHRI-ON-SONE
TO GAYA
JAMHOUR
BARUN
RAFIGANJ
AURANGABAD
DEO
MADANPUR
AMBA
NABINAGAR
KUTUMBA
TO SHERGHATI
TO JAPLA
REFERENCES
FIRST CHOICE
SECOND CHOICE
CENTRAL PLACES
N
W
E
S
SCALE
0 5 10 15 20
KILOMETERS

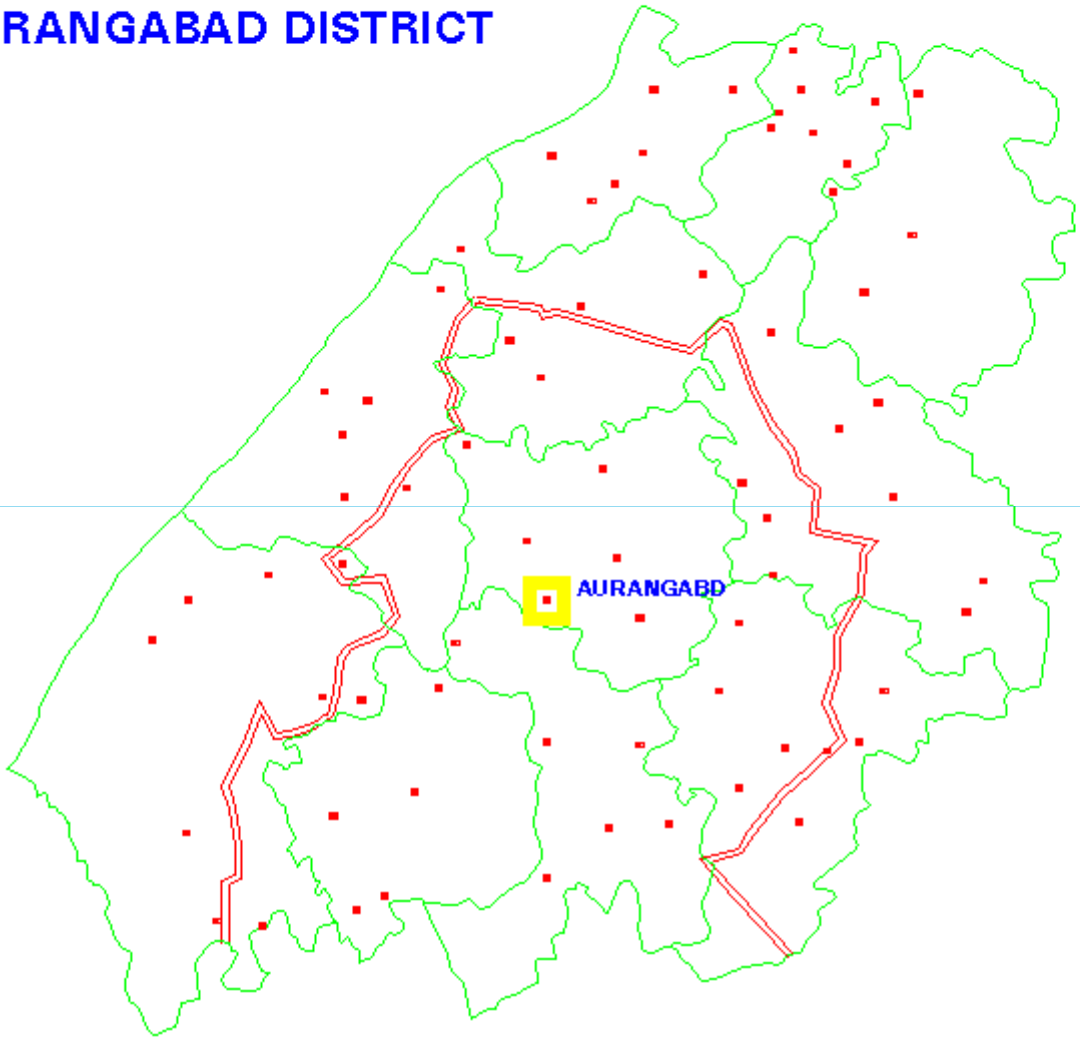

AURANGABAD DISTRICT
NESTING PATTERN OF CENTRAL PLACES
TO PATNA/ARWAL
TO DEHRI-ON-SONE
TO GAYA
TO JAPLA
TO SHERGHATI
DOBHUNAGAR
JAMHOUR
AURANGABAD
DEO
AMBA
KUTUMBA
REFERENCES
SERVICE CENTRES
FIRST ORDER
SECOND ORDER
THIRD ORDER
FOURTH ORDER
FIFTH ORDER
KEY TO NUMBERS
1,CLOTHES 2,LEATHER GOODS
3,UTENSILS 4,ELECTRICAL GOODS
5,ELECTRICAL GOODS 6,JEWELLERY
7,BOOKS & STATIONARY 8,MEDICIN
9,WATCH 10, RADIO 11, CYCLE
12 BUILDING MATERIALS
13 AGRICULTURAL IMPLEMENTS
14 SEEDS 15 FERTILIZER
N
W
E
S
SCALE
0 5 10 15 20
KILOMETERS

| Table no-4. | | | | |
|---|---|---|---|---|
| | | Hierarchy Level | | |
| Order of hierarchy | Name of hierarchy | Centrality index value | Number of centre places | Name of central places |
| 1st order | Growth centre | >7 | 1 | Aurangabad |
| 2nd order | Growth point | ,5-7 | 1 | Daudnagar |
| 3rd order | Service centre | ,3-5 | 3 | Barun, Nabinagar,Rafiganj |
| | | | | |
| 4th order | Rural service centre | ,3-1 | 8 | Madanpur, Goh, Haspura, Obra, Jamhaur, Kutumba, Amba |

| | | | | |
|---|---|---|---|---|
| 5th order | Village service centre | < 1 | 58 | Ketaki, Pauthu, Pawai, Khemda, Siris, Risiap, Tamrwa, Kataia,Dihra,Tarar, Ankora, Kara,Baghoi, Kiriawan, Kajpa, Khudwan, Deohara, Baligaon, Phag,Charankala, Bhadwa, Poiwan, Riur, Salayia, Ghatrain, Mahuwan, Matpa, Phesar, Samser nagar, Mali, Naugarh, Malhara, Pipra, Bghoi, Sansa, Bharuli, Piru,Sihuli, Gobardhanpur, Kamnpi, Baluganjbrandi, Khanda, Arathua, Amjhar, Warkhas, Dhanwan, Karma, Barem, Sori, Umga, Nimaajan, Dumra, Teldiha, Baruli, Itwan, Hathiyara, Beshani, Amauna, Ramngar and Pogar. |

# HINTERLAND OF FIRST ORDER SERVICE CENTRE

## AURANGABAD DISTRICT




BASED ON SERVICE CENTRE SCHEDULE

REFERENCES

FIRST ORDER SERVICE
SERVICE CENTRE
SERVICE CENTRES

HINTERLAND

N
W
E
S

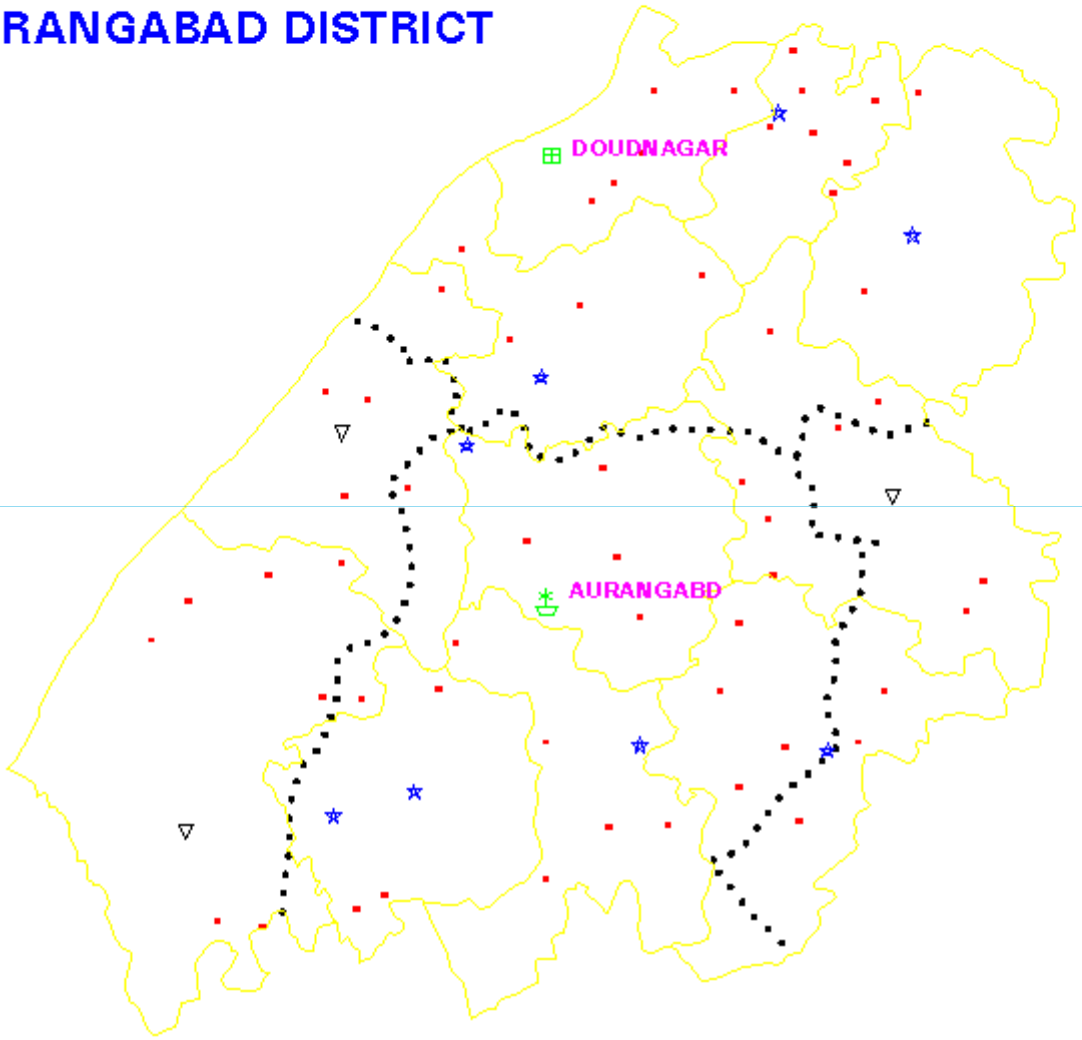
SCALE

0 5 10 15 20

KILOMETERS

# HINTERLAND OF SECOND ORDER SERVICE CENTRE

## AURANGABAD DISTRICT




REFERENCES

SERVICE CENTRES

FIRST ORDER

SECOND ORDER

HINTERLAND

N

W

E

S

SCALE

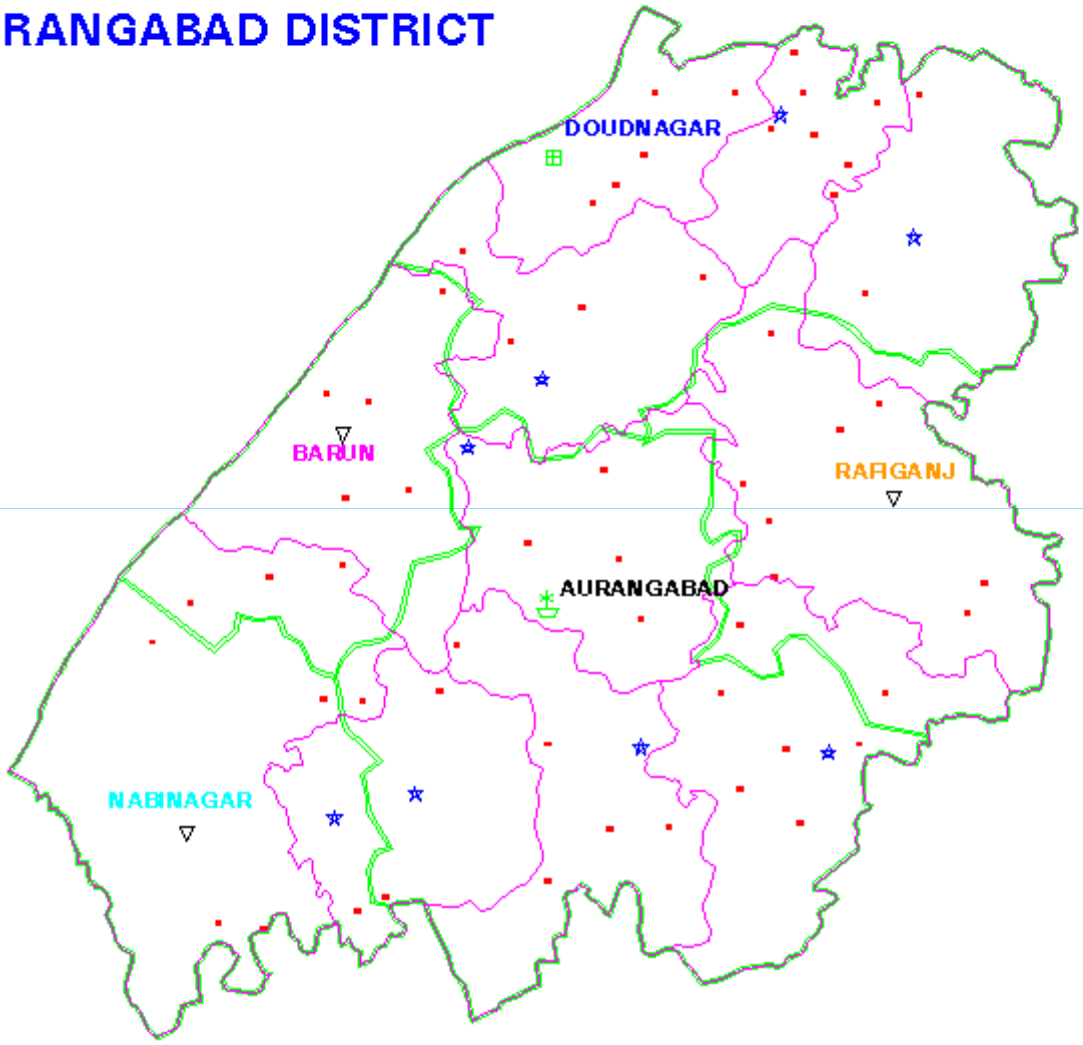
0 5 10 15 20

KILOMETERS

BASED ON SERVICE CENTRE SCHEDULES

# HINTERLAND OF THIRD ORDER SERVICE CENTRE

## AURANGABAD DISTRICT




BASED ON SERVICE CENTRE SCHEDULE

REFERENCES

SERVICE CENTRE

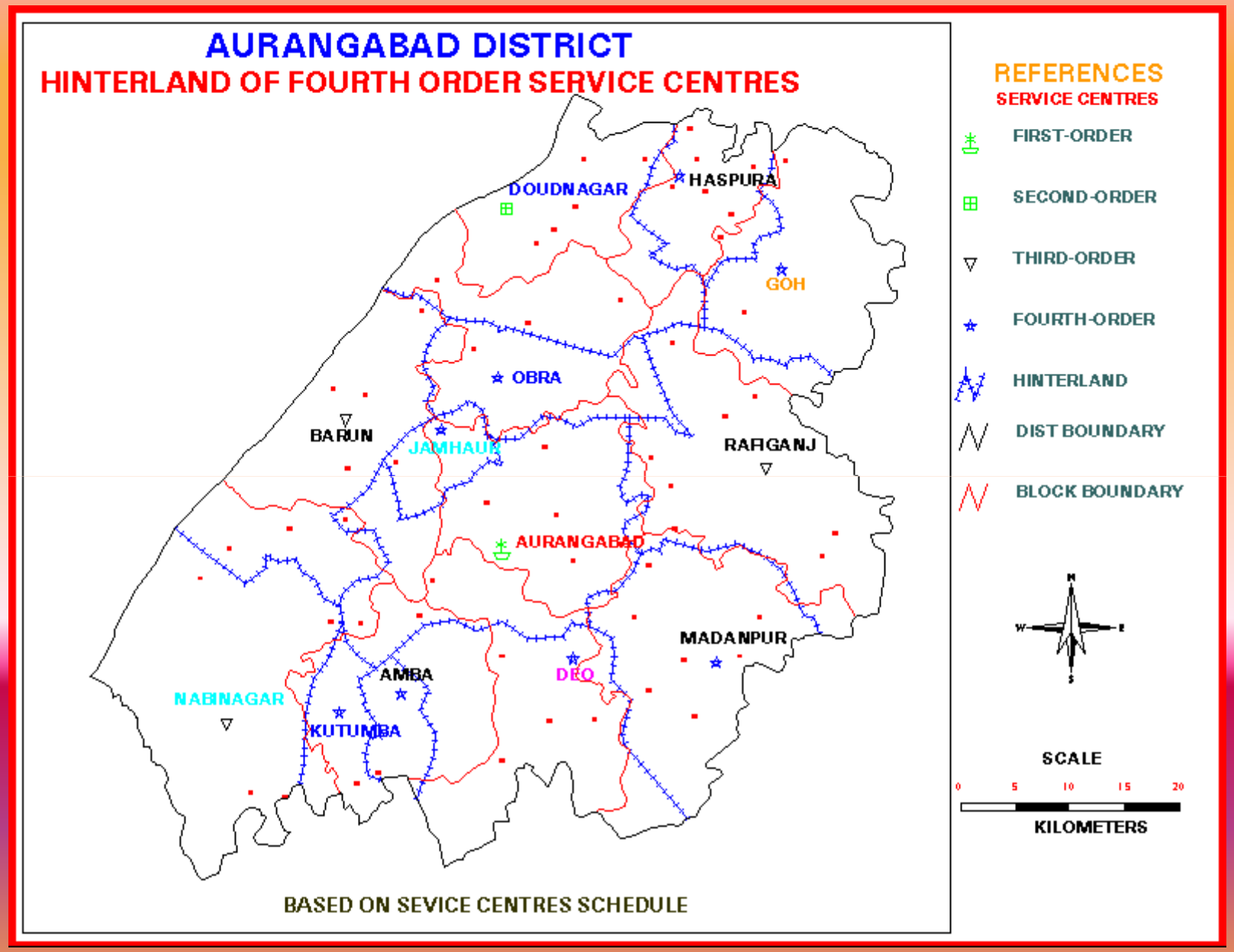
- FIRST-ORDER
- SECOND-ORDER
- THIRD-ORDER
- HINTERLAND BOUNDARY
- BLOCK BOUNDARY

N
W
E
S

SCALE

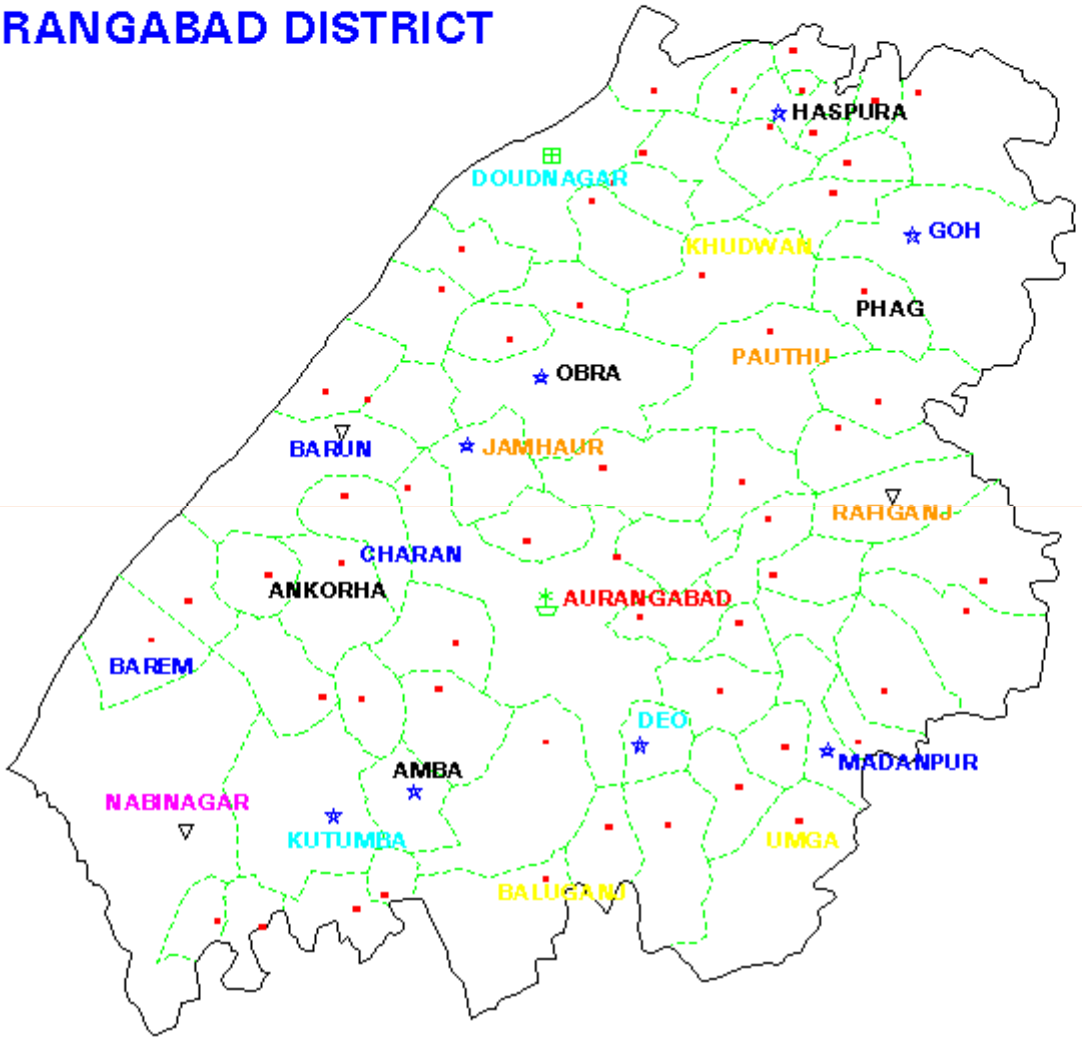
0 5 10 15 20

KILOMETERS


AURANGABAD DISTRICT
HINTERLAND OF FOURTH ORDER SERVICE CENTRES
DOUDNAGAR
HASPURA
GOH
OBRA
BARUN
JAMHAUR
RAFIGANJ
AURANGABAD
MADANPUR
AMBA
DEO
NABINAGAR
KUTUMBA
BASED ON SEVICE CENTRES SCHEDULE
REFERENCES
SERVICE CENTRES
FIRST-ORDER
SECOND-ORDER
THIRD-ORDER
FOURTH-ORDER
HINTERLAND
DIST BOUNDARY
BLOCK BOUNDARY
N
W
E
S
SCALE
0 5 10 15 20
KILOMETERS

# HINTERLAND OF FIFTH ORDER SERVICE CENTRES

## AURANGABAD DISTRICT




REFERENCES

SERVICE CENTRES

- FIRST-ORDER
- SECOND-ORDER
- THIRD-ORDER
- FOURTH-ORDER
- FIFTH-ORDER
- HINTERLAND

N W E S

SCALE

0 5 10 15 20

KILOMETERS

BASED ON SERVICE CENTRES SCHEDULE

## Table no-5

| Sr.no | Name of Growth Centres. | Percentage of working population in Secondary & tertiary activities. | Existing Important industrial works | Proposed industrial works. |
|---|---|---|---|---|
| 1. | Doudnagar | 64.67 | Brass & pottery works,carpet weaving,blanket weaving,lac works,brick klin,stone crushing,cloth weaving, handloom, oil and flour mills,rice mills. | Glass industry,sugar industry,food processing industry,dairy industry,woolen clothes industry e.t.c. |
| 2. | Barun | 21.14 | Vanaspati ghee ,glass,smokeless fuel,stone crushing,rice clin,oil & flour mills e.t.c. | Iron and steel works,food processing,hush based paper industry,sugar industry e.t.c. |
| 3. | Nabinagar | 48.75 | Cloth weaving,handloom works,biri making,stone crushing,rice mills,pottery making,basket making,lac works. | Agro-based industries like sugar.food processing,dairy e.t.c. Forest based industries like paper, brick klin,glass industry e.t.c. |
| 4. | Rafiganj | 79.33 | Cloth weaving,handloom,biri ,stone crushing,pottery making,basket making,lac works. | Food processing,stone chips,dairy industry,cloth industry,readymade garments industry e.t.c. |
| 5. | Madanpur | 55.03 | Rice & flour mills,brick clean,cloth weaving,blanket weaving,stone crushing,lac works e.t.c. | Food processing,paper industry,lac industry,ready made garments,mat weaving e.t.c. |

| | | | | |
|---|---|---|---|---|
| 6. | Goh | 41.53 | Rice,flour and oil mills,stone crushing,biri making,handloom & pottery works. | Food processing,packaging,sugar,glass industries e.t.c. |
| 7. | Haspura | 73.65 | Cloth weaving,handloom,pottery works,brick clin,rice & flour mills e.t.c. | Readymade garments,dairy,food processing,hush-based paper and power industries |
| 8. | Obra | 71.68 | Carpet weaving,dyeing,cloth making,blanket weaving,carpet weaving,handloom and powerloom industries e.t.c. | Carpet weaving ,readymade garments,blanket weaving,dairy & food processing,dyeing industries,sugar industry e.t.c. |

| | | | | |
|---|---|---|---|---|
| 9. | Deo | 54.01 | Blanket weaving,handloom & power loom,brass works,earthen tile,pottery making,rice & flour mills. | Food processing &dairy industries,cement,carpet weaving,textile,readymade garments,fertilizer,tourism industries e.t.c. |
| 10. | Jamhaur | 46.23 | Rice and flour mills, handloom & powerlooms,blanket industry,brick klin,pottery &earthenware. | Cement,dairy,carpet weaving,readymade garments,textile,fertilizer,cardboardindustries e.t.c. |
| 11 | Kutumba | 13.38 | Stone crushing,cloth,handloom blanket weaving,rice & flour mills. | Rice & flour mills,paper & hardboard industries,packing,cork,glass,cement,plywood & building industries,e.t.c. |
| 12. | Amba | 52.57 | Carpet & blanket weaving,rice,flour,lac works,wooden works,earthen pottery & tile industries e.t.c. | Furniture,sugar,food processing.dairy.glass,hardboard,paper,plywood,lac works,glass industries e.t.c. |
| 13. | Pauthu | 14.34 | Rice & flour mills,sugar,rope weaving,earthen tile & pottery making e.t.c. | Hush based paper.power,dairy,iron & steel works.food processing,ready made garments industries e.t.c. |

***The above study shows that Geoinformatic can play a decisive role in the rural development as it provide better visual shares and query system to reach on certain decision making for the decentralized planning.***

***THE END***