1.0 INTRODUCTION 01 - 15

1.1 GENERAL

1.2 SCOPE OF THE RESEARCH WORK

1.3 URBANIZATION
   1.3.1 International Scenario
   1.3.2 Indian scenario
   1.3.3 Degree of Urbanization in India
   1.3.4 Urban Morphology - India
   1.3.5 Urban Scenario of Andhra Pradesh:
   1.3.6 Urbanization of Hyderabad:

1.4 BASIC FEATURE AND PATTERN OF INDIA’S URBANIZATION

1.5 PROBLEMS OF URBANIZATION

1.6 STUDY OBJECTIVES

2.0 LITERATURE REVIEW 16 - 25

2.1 GENERAL

2.2 REMOTE SENSING AND GIS FOR EFFICIENT URBAN PLANNING

2.3 GIS IN MUNICIPALITIES
2.4 URBAN GIS
2.5 URBAN SPRAWL
2.6 MIRZAPUR MUNICIPAL GIS
2.7 LAND USE / LAND COVER MAPPING AND CHANGE DETECTION
2.8 NATIONAL URBAN INFORMATION SYSTEM (NUIS) SCHEME

3.0 HYDERABAD AND ITS ENVIRONS 26 - 45

3.1 ORIGIN OF HYDERABAD

3.2 STAGES IN THE GROWTH OF HYDERABAD AND SECUNDERABAD

3.2.1 THE QUTB SHAHI STAGE (OR) THE FIRST TWIN CITY STAGE (1591-1687)

3.2.2 THE TRANSITIONAL PHASE (1687-1725)

3.2.3 THE EARLY ASAF JAHI PERIOD (1725-1798)

3.2.4 THE SECOND TWIN CITY STAGE (1798-1874)

3.2.5 THE RAILWAY PERIOD (1874-1908):

3.2.6 THE MODERN (OR) METROPOLITAN STAGE (1908-1956):

3.2.7 THE DEVELOPING STAGE (1956-1985)

3.2.8 THE PRE-IT REVOLUTION STAGE (1986-2000)

3.2.9 THE TRI-CITY STAGE (2001 ONWARDS)

3.3 LOCATION & IMPORTANCE

3.4 AREA & DEMOGRAPHY

3.5 FUTURE GROWTH

3.6 CLIMATE
3.7 WIND DIRECTION
3.8 GEOLOGY
3.9 VEGETATION
3.10 FAUNA
3.11 URBAN ENVIRONMENT
  3.11.1 Air Pollution
  3.11.2 Water Pollution
  3.11.3 Musi River
3.12 URBAN LAKES
3.13 URBAN GREENERY
3.14 HERITAGE BUILDINGS

**4.0 METHODOLOGY**

4.1 GENERAL
4.2 DATA PRODUCTS USED
4.3 GIS DATA TYPES
4.4 SPATIAL DATA
  4.4.1 Satellite Data Processing
  4.4.2 Geo-coding and Geo-referencing
  4.4.3 Digital Image Enhancement of LISS III data
  4.4.4 Merging of LISS-III and PAN data of IRS-ID
  4.4.5 Generation of Thematic Maps
  4.4.6 Generation of Topographic Maps
  4.4.7 Derived Thematic Maps
4.5 ATTRIBUTE DATA

4.6 REQUIREMENTS STUDY PHASE
   4.6.1 Designing Phase

4.7 WORK STAGES

4.8 DATA PROCESSING

5.0 URBAN PLANNING, DEVELOPMENT AND MANAGEMENT

5.1 INTRODUCTION

5.2 URBAN PLANNING & DEVELOPMENT

5.3 PREPARATION OF THEMATIC MAPS
   5.3.1 BASE MAP GENERATION
   5.3.2 DRAINAGE NETWORK MAP
   5.3.3 WATERSHED MAP
   5.3.4 LAND USE/LAND COVER MAP

5.4 DATA COLLECTION AND FIELD SURVEYS
   5.4.1 Preparation of Final Base Map

5.5 DEVELOPING STANDARD SET OF THEMATIC MAP LAYERS AND COLLECTION AND INTEGRATION OF ATTRIBUTE DATA

5.6 PREPARATION OF MASTER PLAN (GENERAL TOWN PLAN)
   5.6.1 Future scenarios for growth over a 15 to 20 year period
       comprising
   5.6.2 Components of Draft General Town Planning Scheme / Master Plan
   5.6.3 Final Notification and Implementation of the Master Plan

5.7 DEVELOPMENT/MASTER PLAN INITIATIVES FOR HYDERABAD
   5.7.1 The 1975 Master Plan
5.7.2 Revision of Master Plan - 2020
5.7.3 Master Plan for Hyderabad Airport Development Authority:
5.7.4 Master Plan for the Core Area of Hyderabad:
5.7.5 Water supply
5.7.6 Sewerage system
5.7.7 Solid waste management
5.7.8 Traffic and transportation
5.7.9 Metro Rail Project

5.8 URBAN ADMINISTRATION
5.8.1 State Government Agencies
5.8.2 Parastatals
5.8.3 Urban Local Bodies

5.9 FUNCTIONS OF URBAN LOCAL BODIES
5.9.1 Functions of an Urban Local Body (MCH):
5.9.2 Major Processes

5.10 URBAN MANAGEMENT
5.10.1 Measures of performance

5.11 CRITICAL SUCCESS FACTORS FOR BETTER & EFFICIENT PERFORMANCE

6.0 INTEGRATED MUNICIPAL INFORMATION 120 - 207

6.1 GENERAL

6.2 UNIQUE IDENTIFICATION NUMBER IN A LOCAL BODY –
INTELLIGENT HOUSE NUMBERING SYSTEM OF HYDERABAD
6.2.1 Need for House Numbering System:
6.2.2 Types of House Numbering System in Andhra Pradesh:

6.2.3 New House Numbering System in MCH

6.2.4 Procedure adopted in the New System of House Numbering:

6.2.5 Delineation of Localities

6.2.6 Delineation of Main Roads:

6.2.7 Assignment of House Numbers & Preparation Locality Maps:

6.2.8 Preparation of Correlation Statements

6.2.9 Installation of Signboards And Number Plates:

6.2.10 Uniqueness of the New House Numbering System of MCH:

6.2.11 Unique code

6.3 UNIQUE PREMISES NUMBERING SYSTEM

6.4 GIS APPLICATION

6.4.1 Finance Resource Management

6.4.2 Property Tax GIS

6.4.3 Objectives of Property Tax GIS:

6.4.4 Benefits of GIS Applications for Property Tax

6.4.5 Methodology for Property Tax GIS

6.5 STATUS OF PROPERTY TAX SYSTEM IN MCH

6.5.1 Overview of MCH Finances

6.5.2 Property Tax System of MCH

6.5.3 PT Administration- The Organizational Structure

6.5.4 New Reforms in MCH
6.5.5 Methodology of Arriving at the MRV (Monthly Rental Value)

6.5.6 Rate

6.5.7 PT Computation

6.5.8 Verification of Self Assessment Forms:

6.5.9 Development of a Property Tax Database

6.5.10 Property Identification and Record Keeping

6.5.11 Assigning new property Tax Identification Number IN MCH

6.5.12 The Collection Process, Monitoring and Control

6.6 PROPERTY TAX GIS APPLICATION DEVELOPMENT

6.7 GIS APPLICATION FOR PROTECTION OF GREEN ENVIRONMENT AND PUBLIC OPEN SPACES

6.8 GIS APPLICATION FOR OTHER INFRASTRUCTURE

6.8.1 DETAILS AND ILLUSTRATIONS OF INFRASTRUCTURE APPLICATION

6.8.2 HOW TO RUN THE APPLICATION?

6.8.3 BROWSING (ACCESS) INFORMATION:

6.8.4 QUERY BUILDER

6.8.5 PROJECTS

6.8.6 VIEWS

6.8.7 TABLES

6.8.8 CHARTS

6.8.9 LAYOUTS

6.8.10 SCRIPTS

6.9 DEVELOPMENT AND IMPLEMENTATION OF GIS FOR
LIST OF TABLES

Table 1.1: Degree of urbanization in world, regions, continents & selected countries – 2001
Table 1.2: Trend of urbanization in India 1901 - 2001
Table 1.3: Degree / index of urbanization
Table 1.4: Number of towns and percentage of urban population by size class
Table 1.5: Urbanization trends in India and Andhra Pradesh: 1901-2001
Table 1.6: Population growth in Hyderabad 1901- 2001
Table 1.7: Demographic characteristics: Hyderabad and Andhra Pradesh
Table 3.1: Population Trends - Hyderabad Urban Agglomeration (HUA)
Table 3.2: Population Projections
Table 3.3: Air Quality Statuses at Selected Locations
Table 4.1: Data Products Used
Table 4.2: Data Type, Important Features and Sources of Acquisition
Table 4.3: Sensor Characteristics of IRS ID (LISS III and PAN)
Table 5.1: Urban Local Bodies
Table 5.2: Critical Success Factors
Table 6.1: Showing Street wise and main road wise premises.
Table 6.2: Showing the usage of buildings.
Table 6.3: Showing the Floor wise data of circle 6
Table 6.4: Benefits of GIS Applications
Table 6.5: Benchmark MRV for Non residential properties (Rs. per sq.ft.)
Table 6.6: PT Rates - MCH
Table 6.7: Residential Properties
Table 6.8: Non Residential Properties
Table 6.9: Provisions in HMC Act
Table 6.10: Abstract Statement showing the details of Layout Open Spaces in erstwhile MCH area [ex-Circle Nos: I to VII]
Table 6.11: Comprehensive Statement of Layout Open spaces falling in Circle No. I to VII
Table 6.12: Layout Open Spaces Developed with Compound wall in Circle No.VI in ex-MCH area

**LIST OF FIGURES**

Fig 1.1: Process of Urbanization in India
Fig 1.2: Degree of Urbanization in India 1901-2001
Fig 1.3: Growth of Urban area by size class from 1901-2001
Fig 1.4: Population Growth in Hyderabad 1901- 2001
Fig 3.1: Showing Location & Base Map of MCH
Fig 4.1: Flow chart showing the methods of collecting data in GIS

Fig 4.2: Flow chart showing the methodology for urban GIS data processing

Fig 5.1: Showing Base Map of Hyderabad City

Fig 5.2: Showing Drainage Map of Hyderabad City

Fig 5.3: Showing Watershed Map of Hyderabad City

Fig 5.4: Showing Land Use Land Cover Map of Hyderabad City

Fig 5.5: Showing 1975 Master Plan of Hyderabad City

Fig 5.6: Showing 2020 MASTER PLAN OF HUDA (excluding) MCH area

Fig 5.7: Showing Master Plan for HADA MCH area

Fig 5.8: Master Plan for the Core Area of Hyderabad

Fig 5.9: Metropolitan Water Supply and Sewerage Board Map of Hyderabad city

Fig 5.10: Sewerage Distribution Network of MCH area of Hyderabad City

Fig 5.11: Traffic and Transportation Map of Hyderabad City

Fig 5.12: Map showing the alignments of the three corridors of Hyderabad City

Fig 5.13: Map showing the Andhra Pradesh – Urban Local Bodies

Fig 6.1: MCH map showing Circles

Fig 6.2: MCH map showing the Wards.

Fig 6.3: MCH map with (254) Localities and (133) Main roads.
Fig 6.4 Locality Map showing Streets & Main Roads with Premises numbers.

Fig 6.5: Showing the Correlation of Old and New House Numbers
Fig 6.6: Showing how to identifying a premises (house) / unit in the city
Fig 6.7: Showing Circle 6 map of MCH showing Localities
Fig 6.8: Showing the Abids circle & Jambagh in ArcGIS Software
Fig 6.9: Showing the Existing land use categories in ArcGIS Software
Fig 6.10: Showing the Number of Floors in ArcGIS Software
Fig 6.11: Showing the Existing Slums in ArcGIS Software
Fig 6.12: Showing the Vacant land in ArcGIS Software
Fig 6.13: Showing the Assessments or Door Numbers in ArcGIS Software
Fig 6.14: Showing the Tax Ranges in ArcGIS Software
Fig 6.15: Showing the Tax to be collected in ArcGIS Software
Fig 6.16: Showing the Status of Area Demand in ArcGIS Software
Fig 6.17: Showing the Tax Demand Vs Collection in ArcGIS Software
Fig 6.18: Hyderabad Municipal Corporation – Map showing Open Spaces
Fig 6.19: Hyderabad Municipal Corporation – Map showing Open Spaces in Circle 6
Fig 6.20: Hyderabad Municipal Corporation – Map showing photographs of the Open Spaces in Circle 6
Fig 6.21: Map Showing the Open Spaces in study area
Fig 6.22: Showing the Road Network in ArcGIS Software
Fig 6.23: Showing the Street Lights in ArcGIS Software
Fig 6.24: Showing the Dustbins in ArcGIS Software

Fig 6.25: Showing the Land Marks in ArcGIS Software

Fig 6.26: Showing the Browsing Information in ArcGIS Software

Fig 6.27: Showing the Query Builder in ArcGIS Software

Fig 6.28: Showing the Projects in ArcGIS Software

Fig 6.29: Showing the Viewer in ArcGIS Software

Fig 6.30: Showing the Road Network in ArcGIS Software

Fig 6.31: Showing the Charts in ArcGIS Software

Fig 6.32: Showing the Layouts in ArcGIS Software

Fig 6.33: Showing the Scripts in ArcGIS Software

Fig 6.34: Showing Usage of building: This application is showing the Usage categories.

Fig 6.35: Showing No. of Floors: This application is showing the Building height information based on floors

Fig 6.36: Showing Demand Vs Collection: This application is showing the Correlation between Issued Demand notices Vs Collection of Tax.

Fig 6.37: Showing Tax Ranges: This application is showing the properties based on the tax amount ranges

Fig 6.38: Showing Street Lights: a) This application is showing the location of the electrical pole and street light.

Fig 6.39: Showing this application is showing the type of lights used.

Fig 6.40: Showing Solid Waste: This application is showing the location of dustbins, manholes and dumping places.

Fig 6.41: Showing Trees, This application is showing Existing Plantation along the major roads.
Fig 6.42: Showing Road Network: This application is showing Type and Condition of the Road Network

Fig 6.43: Showing Administrative Boundaries: This application is showing the Locality Boundaries of Circle - 6

Fig 6.44: Showing this application is showing the major road network, Water course and MCH Limits Boundary.