1. MAJOR FACTORS

(a) Drinking water
   (i) Source of water in urban environment
   (ii) Availability of water
   (iii) Source of contamination

(b) Environmental Factor
   (i) Cleanliness of the outer environment
   (ii) Housing: The basic requirement
   (iii) Type of house
   (iv) Infrastructural facilities

(c) Behavioural Factor
   (i) Eating habits
   (ii) Habit of throwing garbage

(d) Socio-Economic Factor
   (i) Income
   (ii) Literacy

(e) Demographic Factor
   (i) Population density
   (ii) Age-group
   (iii) Sex-ratio

(f) Ecological Factor
2. OBJECTIVE OF THE STUDY

3. RELEVANCE OF THE STUDY

4. STUDY AREA: AHMEDABAD URBAN AGGLOMERATION

(a) Core Region or walled city region
   (Residential and commercial area)
(b) Eastern Region
   (Industrial and commercial area)
(c) Western Region
   (Mainly new residential-cum-commercial area)
(d) Eastern Suburb
   (Residential and Industrial Suburbs)
(e) Western Suburb
   (Mainly Residential)

5. LITERATURE SURVEY

(a) Medical Geography
(b) Cartographic and Statistical Study
(c) Ecology of diseases and malnutrition
(d) Epidemics
(e) Indian Scenario
(f) Spatial distribution of disease
(g) Different factors and disease.
   (i) Regional Factor
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(a) Gujarat State
   (i) Gastro-enteritis
   (ii) Viral Hepatitis
   (iii) Typhoid
   (iv) Cholera

(b) Distribution of diseases by district, (1995)

(c) Distribution of water-borne diseases in main cities of the state

4. OCCURRENCE OF WATER-BORNE DISEASES IN AHMEDABAD
   (AS GIVEN IN NEWS-PAPER)

(a) Contamination of water
(b) Food habit and unhygienic food
(c) Water logging
(d) Socio-economic background
(e) Behavioural factor
CHAPTER - IV

NON-SPATIAL FACTORS AFFECTED WATER BORNE DISEASES

1. ECOLOGICAL FACTOR

(a) Rainfall

(b) Flood and drought conditions and water-borne diseases

(c) Effect of ground water

(d) Seasonal variation in water-borne diseases

2. DEMOGRAPHIC FACTOR

(a) Growth of population

(b) Sex-ratio

(c) Age-group

3. SOCIO-ECONOMIC FACTOR

(a) Income and water-borne diseases

(b) Literacy and water-borne diseases

(c) Religion and diseases

(d) Occupation and diseases

(e) Other variables

4. SUMMARY OF THE CHAPTER
CHAPTER - V

INFLUENCE OF DIFFERENT SPATIAL FACTORS ON THE SELECTED WATER-BORNE DISEASES

1. DRINKING WATER FACTOR

(a) Sources of water
(b) Quality of water and water-borne diseases
(c) Availability of quantity of water
(d) Amount of water needed (per person per day)

2. ENVIRONMENTAL FACTOR

(a) Inner environmental factor
   (i) Housing amenities (separate bath-room, separate toilet, separate kitchen)
   (ii) Number of rooms per house
   (iii) Cleanliness of house
   (iv) Types of houses

(b) Outer-Environment
   (i) Water-logged areas by sewerage water
   (ii) Water-logged areas by rain water
   (iii) Outfall points of sewerage
   (iv) Damaged water-pipes
   (v) Garbage accumulation and diseases
   (vi) Overall cleanliness of area
   (vii) Problem of mosquito/fly in rainy season
3. **BEHAVIOURAL FACTOR**

(a) Purification of drinking water

(b) Low standard of personal hygiene

(c) Cleaning of water tank

(d) Throwing of daily garbage around the house

(e) Habit of eating out cut fruits and food which are not covered and drinking of iced water on road

(f) Low standard of cleanliness in food and kitchen hygiene

(g) Awareness

(i) Taking bath

(ii) Precaution and use of medicine

(iii) Awareness about clean clothes, vessels of patients separately

4. **SUMMARY OF THE CHAPTER**

**CHAPTER - VI**

**URBAN ENVIRONMENTAL QUALITY THROUGH GIS**

1. **DRINKING WATER FACTOR**

(a) City wise (macro level - eastern and western side of the city)
2. ENVIRONMENTAL FACTOR

(a) City wise (Macro level, Eastern and Western side of the city)

(b) Region wise and ward wise distribution of environmental quality (meso and micro level)

3. BEHAVIOURAL FACTOR

(a) City wise (Macro level - Eastern and Western side of the city)

(b) Region wise and ward wise distribution of behavioural factor (meso and micro level)

4. TOTAL ENVIRONMENTAL QUALITY

(GIS OVERLAY OF THREE MAIN FACTORS)

(a) City wise (Macro level - Eastern and western side of the city)

(b) Region wise and ward wise distribution of total environmental quality (Meso and micro level)

5. SUMMARY OF THE CHAPTER
CHAPTER VII

SPATIO-TEMPORAL DISTRIBUTION OF WATER-BORNE DISEASES IN AHMEDABAD AGGLOMERATION

1. CHANGING PATTERN OF MORBIDITY OVER TIME

(a) Gastro-enterities
(b) Viral Hepatitis
(c) Typhoid
(d) Cholera

2. SPATIAL PATTERN OF DISTRIBUTION OF WATER-BORNE DISEASES

(a) Disease wise spatial pattern of distribution
   (i) Gastro-enterities
      - City wise distribution
         (macro level - Eastern and western side)
         (meso-level)
         (micro-level)
   (ii) Viral Hepatitis
      - City wise distribution
         (macro-level Eastern and western side)
         (meso-level)
         (micro-level)
   (iii) Typhoid
      - City wise distribution
         (macro level - Eastern and western side)
### Region wise distribution (meso level)  
- Ward wise distribution (micro level)  

- **Cholera**  
  - City wise distribution  
    - (macro level Eastern and western side)  
  - Region wise distribution (meso level)  
  - Ward wise distribution (micro level)  

### Level of Intensity of diseases  

- **Very high level of intensity**  
- **High level of intensity**  
- **Moderate level of intensity**  
- **Low level of intensity**  
- **Very low level of intensity**  

### Overlay of Five Years' Distribution of Water-Borne Diseases of Ahmedabad (1989 to 1993) with GIS:  

- City wise distribution  
  - (macro level - eastern and western side)  
- Region wise distribution (meso level)  
- Ward wise distribution (micro level)  

### Centre of Gravity for the Spatial Distribution  
*(with GIS)*  

### Degree of Concentration for Spatial Distribution  

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**XIII**
6. THE ENVIRONMENTAL BEHAVIOURAL MODEL SHOWING THE IMPACT OF VARIOUS FACTORS ON THE SPATIAL DISTRIBUTION OF DISEASES BY DIFFERENT REGIONS IN AHMEDABAD

7. SUMMARY OF THE CHAPTER

CHAPTER - VIII
CONCLUSION

1. MAJOR FINDINGS

(a) Type of diseases
(b) Seasonal pattern
(c) Demographic parameters
(d) Socio-economic parameters
(e) Problems of drinking water
(f) Spatial pattern

2. PLANNING STRATEGY

(a) Environmental perception of residents of Ahmedabad.
(b) Macro level planning
(c) Micro-level planning (by ward)
   Overall Strategy