CHAPTER - II

MATERIAL AND METHODOLOGY
2.1. FIELD AREA:
2.1.1. RAIPUR DISTRICT:

2.1.1.1. PHYSICAL FEATURES:

i) Area : 13445 sq.km

ii) Location : Latitudes 19°46’ and 21°50’ N
Longitudes 81°25’ to 83°16’ E

iii) Geological Features:

a) Central High Upland
b) Peripheral Low Upland
c) Low Uplands adjoining the Tanks and Nalas.

iiii) (b) Rocks : The region is constituted of Purana (Cuddapah System), Dharwar and Archean rocks.

iiii) (c) Drainage System: The region is drained by river Mahanadi and its tributaries. Important tributaries are Shivnath, Jonk, Pairi, Shkha.

iiii) (d) Minerals: Important deposits of the district include lime stone and dolomite. Minor occurrence of other minerals such as fluorite, garnet irons ore indicated encouraging indication of gold mine realization. Lime stone is chief minerals of the Raipur district.

iiii) (e) Soils
a. Kanhar : Blue- black or brown-black in colour. It is fertile soil.
b. Matasi: Yellow or white in colour. Suitable for paddy crop.
c. Bhata: Reddish and yellow.

2.1.1.2. CLIMATE:

i) Seasons
a) Winter Season : November to February
b) Summer Season : March to June
c) Rainy Season : June to September

ii) Annual Rainfall : 1292.1 mm

iii) Temperature Fluctuations : Maximum :27(January)-44(May)
Minimum: 08(January)-32(May)
2.1.1.3. FOREST:
i. Area: 7013 Sq. km, Constituting 39% of the total land.
   i (a) Reserved Forest: 3248 Sq km
   i (b) Protected Forest: 3265 Sq km

ii. Forest Types:
   ii (a) Tropical Moist Deciduous Forest
   ii (b) Tropical Dry Deciduous Forest

iii. Flora: Flora of the district is constituted of Sal (Shorea Robusta), Teak, Bija (Diptocarpus Marsupium), Shisham, Arjun (Terminella Arjuna), Tinsa, Haldu (Dina Cardifolia), Bahera(Terminella Bellirica), Dhaman, Dhaopa, Mauha (Madhuea Indica), Palas are important plant species in district.


2.1.1.4. POPULATION CHARACTERISTICS (Census: 2001):
i) Total Population: 3009042

ii) Urban Population: Urban Population (30.42%) of the district to that of 20.09% of the State

iii) Scheduled Caste Population: Schedule caste population is 16.16% as compared to 1.6% of the state.

iv) Density: The density is 230/ sq.km as compared to 154 / sq km of the state.

v) Gender Ratio: It is 980 as compared to 989 of the state. It is even higher 996 for scheduled caste population.

2.1.1.5. Developmental Indicators:

i. Households:
   a) Pucca Houses: 40.60%
   b) Houses Having Electricity: 65.70%
   c) Safe Drinking Water: 67.00%
   d) Toilet Facilities: 18.91%

ii. Educational Status:
   a) Literacy Rate (T): 68.50% (Male: 82.00%; Female: 54.80%)
   b) Literacy Rate (SC): 62.50% (Male: 78.40%; Female: 46.60%)
iii. Health Status:

iii. (a) Health Indicators:

a) IMR: 53.01 (State: 77.6 National (2005-2006): 57)
b) Crude Birth Rate: 16 (State: 26.7)
c) Fertility Rate: 1.9 (State: 2.79)

iii (b) Health Services:

i. Hospitals
ii. Public Health Centers (PHSC)
iii. Community Health Centers (CHC)
iv. Sub Health Centers (SHC)
v. Number of Beds

2.2. RAIPUR CITY

2.2.1. HISTORICAL PHASES:

i. The Haihaivansi Period (14 century – 1741 A.D.).
ii. The Maratha Age (1741 A.D. - 1854 A.D.)
iii. British Period (1854A.D. - 1947A.D.)

2.2.2. PHYSICAL FEATURES:

i) Area: 55.05 Sq km
ii) Location: Latitudes 19°45’ to 21°14’ N
     Longitudes 81°38’ to -----------E
iii) Site: The Raipur is situated on the low ridge, north west of the Kharun River. The ridge is distinctly flat and open. It is situated on the main rail route between Bombay and Kolkota.

iv) Altitude: 298 mts above mean sea level

2.2.3. POPULATION CHARACTERISTICS:

i. Total Population (2001) : 6,51,191 Male: 336607; Female: 314584
ii. Density (2001) : 8392.11 per sq. km
iii. Gender Ratio (2001) : 1069
2.3. RAIPUR SLUMS: (Municipality Corporation Report, 2001; Directorate of Economic and Statistics, Chhattisgarh)

i. Location:

Through concentration of slums is in centre of the city, they are scattered all over. Most of them are located at bank of canal of Naguls land, ponds, railways tracks, road margins, river beds etc.

ii. Land Status:

According to City development Report (2001), 65.5% slums are regularized. Two-fifth (40%) of houses are un-authorized structures.

iii. Size

Raipur city has 154 Slum Settlements spread over 54 wards. Number of slum settlements has undergone rapid increase from 12 (1961) to 154 (2001).

<table>
<thead>
<tr>
<th>Years</th>
<th>No. of Slums</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>12</td>
</tr>
<tr>
<td>1971</td>
<td>29</td>
</tr>
<tr>
<td>1981</td>
<td>58</td>
</tr>
<tr>
<td>1991</td>
<td>135</td>
</tr>
<tr>
<td>2001</td>
<td>154</td>
</tr>
</tbody>
</table>

![Image: Figure 2.2. INCREASES PATTERN OF SLUMS POPULATION]

![Image: Table 2.2. SLUMS POPULATION INCREASE PATTERN]

<table>
<thead>
<tr>
<th>Years</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>97264</td>
</tr>
<tr>
<td>2001</td>
<td>159120</td>
</tr>
<tr>
<td>2005</td>
<td>369929</td>
</tr>
</tbody>
</table>

iv (b) Population Groups

Slums population in Raipur urban agglomeration is heterogeneous. In character with Hindu, Muslims and Christian. Majority of the residents have migrated from neighboring states (A.P., Orissa), adjacent districts, and nearby villages in search of jobs in business, industries and other informal sectors activities. They are mostly self-employed as rickshaw pullers. Quite number of them also work as industrial labourers. Their proportions in Government jobs is very low and almost confirmed to class IV posts.
iv. (c) Composition of Population

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>08.33%</td>
</tr>
<tr>
<td>SC</td>
<td>22.90%</td>
</tr>
<tr>
<td>OBC</td>
<td>48.02%</td>
</tr>
<tr>
<td>Others</td>
<td>20.75%</td>
</tr>
</tbody>
</table>

iv (d) Distribution Pattern of Households Belonging to SC:

Majority (57.40%) of Wards have less than 25 households belonging to SC. On the other hand, there are 9.25% Wards which has SC households in the range of 51 to 75. Remaining 33.33% Wards have SC households in the range of 26 to 50.

<table>
<thead>
<tr>
<th>SC Households : Range</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-25</td>
<td>57.40</td>
<td>31</td>
</tr>
<tr>
<td>26-50</td>
<td>33.33</td>
<td>18</td>
</tr>
<tr>
<td>51-75</td>
<td>09.25</td>
<td>05</td>
</tr>
<tr>
<td>Total</td>
<td>99.98</td>
<td>54</td>
</tr>
</tbody>
</table>

v. Households

There are 26,899 household (Census, 2001). Houses are over crowded. They are sub-standard structures with most of them are Kutchha and Semi-Pucca ones. They are small sized with most of them lacking separate kitchens, bathrooms and toilets. Most of houses do not have proper cross-ventilation and adequate light due to inadequate window and ventilators.

vii. Literacy Level:

Literacy rate of slum population in Raipur urban agglomeration is 71% among males and 63% among females. Inspite of higher literacy rate, drop rate is very high. Most of them are being drawn into labour market.

vii. Civil Amenities:

Roads, at times, cemented are extremely narrow. Almost half (52%) of slums population has assess to drainage but it is invariably opened one. Through, one-third of slums households have individual water connections, majority water is
supplied at fixed hours. Slums residents have to spend sizeable time daily in fetching water. Community toilets are both inadequate and ill maintained. In absence of any waters collection services, kitchen refuse is thrown in open.

vii. Education Facilities:

Primary and middle school are present in most of slums. They are neither adequately staffed or well equipped. Eight out of 14 government schools are running in private buildings.

2.3.2. SURVEYED AREA:

2.3.2.1. Surveyed Slums: (Municipal Corporation, 2000)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Slums</th>
<th>Wards</th>
<th>Households</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Krishna Nagar</td>
<td>Sheed Manmohan Singh</td>
<td>189</td>
<td>2798</td>
</tr>
<tr>
<td>2.</td>
<td>Jyoti Nagar</td>
<td>Sheed Manmohan Singh</td>
<td>322</td>
<td>3756</td>
</tr>
<tr>
<td>3.</td>
<td>Behra Colony</td>
<td>Guru Govind Singh</td>
<td>158</td>
<td>792</td>
</tr>
<tr>
<td>4.</td>
<td>Jangannath Nagar</td>
<td>Guru Govind Singh</td>
<td>289</td>
<td>1449</td>
</tr>
<tr>
<td>5.</td>
<td>Dewar Para</td>
<td>Ishwari Charan Shukla</td>
<td>215</td>
<td>2022</td>
</tr>
<tr>
<td>6.</td>
<td>Poddar Talab</td>
<td>Sardar Chunamani</td>
<td>116</td>
<td>1318</td>
</tr>
</tbody>
</table>

2.3.2.1.1. Selection Criteria:

i) Slums were identified on basis of distribution of target community.

ii) There-after, six slums were short-listed on the basis of concentration (≥/≤25) of households belonging to Ganda community.

2.3.2.2. AVAILABLE FACILITIES:

2.3.2.2.1. Health Facilities:

<table>
<thead>
<tr>
<th>Slum Colonies</th>
<th>Anganbadi</th>
<th>Private Clinics</th>
<th>Pathological Lab.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Allopathic</td>
<td>Ayurvedic</td>
</tr>
<tr>
<td>Krishna Nagar</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Jyoti Nagar</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Devar Para</td>
<td>Y (2)</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Behra Colony</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Jangannath Nagar</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Poddar Talab</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>
2.3.2.2.2. Health Practitioners:

<table>
<thead>
<tr>
<th>Slum Colonies</th>
<th>Midwives Trained</th>
<th>Midwives Un-Trained</th>
<th>Nurse</th>
<th>Health Worker</th>
<th>Private Doctors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krishna Nagar</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Jyoti Nagar</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Devar Para</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Behra Colony</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Jagannath Nagar</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Poddar Talab</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

2.3.2.2.3. Educational Facilities:

<table>
<thead>
<tr>
<th>Slum Colonies</th>
<th>Primary School</th>
<th>Middle School</th>
<th>High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krishna Nagar</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Jyoti Nagar</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Devar Para</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Behra Colony</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Jagannath Nagar</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Poddar Talab</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

2.3.2.2.4. Other Facilities:

<table>
<thead>
<tr>
<th>Slums Colonies</th>
<th>Drinking Water</th>
<th>Public Hand Pump</th>
<th>Electriciy</th>
<th>Drainage</th>
<th>Tar Road</th>
<th>Community Toilet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Street Tap</td>
<td>Public Hand Pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krishna Nagar</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Jyoti Nagar</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y (SLB)</td>
</tr>
<tr>
<td>Devar Para</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y (SLB)</td>
</tr>
<tr>
<td>Behra Colony</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Jagannath Nagar</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Poddar Talab</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

2.3.2.3. Target Community: Ganda (Scheduled Caste)

2.3.2.3.1. Criteria used in Selection of Community:
i) Ganda community was selected because of its being the single largest one among various Schedule Caste groups inhabiting Raipur slums.

ii) Mother Child Health Care investigations from bio-cultural perspective of the Ganda community were not attempted by earlier scholars.

2.3.2.4. Ganda : Socio-Cultural Profile

i. Origin:

Sir S. Risley suggested that the name of Ganda might have derived from Gond and the sub-group pans may originally have been an offshoot of the Gond. It, is however, not established in the central provinces.

ii. Distribution:

Migrated from Orissa, they are concentrated in Raipur and Raigarh districts of the Chhattisgarh state.

iii. Sub-Division:

They are divided into 5 sub-groups, namely Chatrapal Ganda, Jharia Ganda, Panka Ganda, Bhowhedia Ganda and Dom Ganda. In Social hierarchy, Panka Ganda occupies the highest status and the Dom Ganda the lowest one. Chhattrapal Ganda and Jharia Ganda inter-marry. The division is made on occupation ground. The Bajna / Bajgari are those who act as musician at feasts and marriages, Mang or Mangia make screens and mats while their women serve as midwives, Dholias make baskets, Doms skin cattle and Nagarchis play drums.

iv. Clan:

The Sub-groups are further divided into exogamous clan namely, Sonohani, Kuldeep, Tandi, Surobanshi, Nagnetrum and Mooney.

v. Population:

Out of 43 scheduled castes population groups in the state, Ganda with a population of 303292 (Census, 2001) is the second largest one.

vi. Language:

Chhattisgarhi (Indo-Aryan language ) is their spoken language. They are conversant with Hindi. Devanagari script is used for writing.
vii. Literacy Rate:

It is 62.5% as compared to 64% at the State level and to 54.7% at the National level aggregated for combined scheduled castes. Female literacy rate is 48.5% as compared to 49.2% and 41.9% for all scheduled castes combined at the state and national levels, respectively.

Among literates, 7.8% are without any education. Majority of literates (68.2%) are educated just upto primary level. Relative proportion of matriculate and gradates among Ganda is 9.2% and 1.6%, respectively.

viii. Food:

They are non-vegetarians who eat fish, eggs, mutton, pork and beef. Rice is their staple food. It is supplemented with pulses, vegetables, roots and tubers. They are fond of liquor.

ix. Occupation:

i) Traditional Occupations: They are traditionally musicians who play drums and other musical instruments at the time of Holi and Dussehra. Village watchmanship and weaving coarse cloth are their traditional occupations.

ii) Present Occupations: Presently, they are engaged as cultivators and daily waged labourers. Some of them are involved in vegetable selling and making idols. According to 1981 census, 42.02% of them were occupied as workers (Male:60.33%; Female:34.09%). Among them, 31.78% are returned as cultivators, 48.53% as agricultural labourers, 1.43% livestock, forestry etc., 1.48% in household industry and 2.53% in making Idol and so on.

x. Life Ceremonies:

i) Chhatti: It is name giving ceremony observed on the sixth day of birth.

ii) Marriage:

Main rituals are Sagai, Haldi, Tika, Phere and Bida. Marriage is prohibited within a clan. They practice adult marriage, through child marriage is still prevalent. Cross-cousin marriage, Junior Sororate and Junior levirate are prevalent among them. They are normally monogamous and married women put vermilion on their forehead as a symbol of marriage. Residence after marriage is patrilocal.
If a girl arrives at maturity without a husband having been formed for her, she is wedded to a spear struck up in the courtyard of the house and then given to any who wished to take her. Marriage post is made of Mahua tree and beneath it are placed 7 cowries and seven pieces of turmeric. As elder male member of the caste know as Sethia conducts the marriage and couple go 5 time around the sacred pole in the marriage and trice in the evening. Remarriage of widows is permitted and younger brother of deceased husband takes his widow if he wishes to do so. A husband may divorce his wife for adultery before the caste committee and if she marriage her lover, he has to repay to the expenses incurred by the later on his marriage.

**Death Ceremonies:**

Corpses are either buried or cremated depending upon the economic status of the family involved. A man is laid on his face in grave and women on her back. Morning is observed for 3 days, except in case of children under 3 years of age, whose death entail no special observances. On the 4th day, a feast is given and when all have been served, the chief mourner takes a little food from the plate of each guest an put it in a leaf cup. He takes others cup full of water and places the two outside the house saying ; here is “good for you” to the spirit of the departed.

**xii. Religion :**

They are predominantly Hindu. Though some have adopted Christianity, as well. In the Chhattisgarh, however, 100% Ganda are Hindu. God Shiv, Kali, Santosi Mata are main deities worshipped by them.

**xiii. Festivals :**

They celebtrare Nuakhai, Kaampuji, Bhajjayantia, Rathdutiya.

**2.4. SAMPLE SIZE:**

**2.4.1. Sample Size for Various MCH Investigations:**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Slum Colonies</th>
<th>Lactating Women (N)</th>
<th>Pregnant Women (N)</th>
<th>Children(0-2yrs) (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Krishna Nagar</td>
<td>45</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>2.</td>
<td>Jyoti Nagar</td>
<td>12</td>
<td>06</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>Devar Para</td>
<td>50</td>
<td>11</td>
<td>50</td>
</tr>
</tbody>
</table>
2.4.1.1. Sampling Techniques Used:

i) Pregnant Women (Target: 50): All available pregnant women belonging to Ganda community in the selected slum colonies constitute the subjects of the present study. Field-work was carried out till the target was achieved.

ii) Lactating Women (Target: 100): All available lactating women in the selected slum colonies are included in the study. Number is increased to 160 in an effort to make the sample representative.

iii) Children (Target: 100): Sample size was increased to 167 to have adequate numbers in each age groups for statistical analysis. Efforts work made to draw subjects from each surveyed settlements to make the sample representative of the whole area.

2.4.2. PHYSICAL PARAMETERS:

2.4.2.1. ANTHROPOMETRIC MEASUREMENTS: (Singh and Bhasin, 1971; Weiner and Lourie (1981)

Two anthropometric measurements on mothers and six measurements on infant were taken. Standard definitions, landmarks and instruments were used. Standard instrument used are namely Anthropometer Rod, Weighing Machin, Infantometer, Skinfold Caliper and Measuring Tape.

2.4.2.1.1. On Mothers:

i. WEIGHT (kg):

a. Procedure:

The machine was kept on the horizontal surface. The subject was made to stand barefooted on it. The figure corresponding to needle was recorde to nearest 0.5 kg.
b. Precautions:

The subject was instructed to remove extra clothes and shoes before taking measurement.

ii. HEIGHT (cm):

a. Measurement:

It measures the vertical distance from vertex to floor.

b. Landmark:

b.1 Vertex:

It is the highest point on the head when the head is placed in eye-ear plane.

c. Procedure:

The subject was made to stand on horizontal platform with heels together, stretching upward to the fullest extent. The subject’s back was kept straight with relaxed shoulders. After making sure that marked FH plain was horizontal, the horizontal arm of the anthropometer was brought to the subject’s head. Keeping the instrument vertical, reading was recorded to the nearest 0.1 c.m.

d. Precautions:

It was made sure that the subject’s heels did not leave ground. The horizontal bar of anthropometer was brought down gently till it touched head.

2.4.2.1.2. On Infants:

i. WEIGHT (kg):

a. Procedure:

The infants (upto1 yr) were measured by Infantometer. The subject was placed on pan in lying position. The reading was recorded to the nearest 0.5kg.

b. Precautions:

Excess cloths were removed before taking measurement. Subject was held in stationary position at the time of recording reading.

ii. HEIGHT (cm):

a. Measurement: It measures the vertical distance from vertex to floor

b. Landmark:

b.1. Vertex:
It is the highest point on the head when the head is placed in eye-ear plane.

c. Procedure :

Subject (up to 1 yr) was made to lie on pan. His head was held in the Vertical Frankfort plane. The top of the head was brought gently into contact with the fixed head board. Thereafter, subject’s feet were held with toes pointing directly upwards. Finally, after bringing sliding movable footboard upto the subject heels, reading was recorded to the nearest 0.1 kg. Anthropometer Rod was used to measure height of infants beyond 1 year.

d. Precautions Observed :

iii. HEAD CIRCUMFERENCE (cm) :

a. Measurement :

b. Landmarks:

b.1. Opisthocranion (op)

b.2. Glabella (g)

c. Procedure :

The tape was held with left hand on Gabella & was taken with right hand over the left side to Opisthocranion than over the right side back to Glabella. Finally, the reading was noted on tape to the nearest 0.1 cm.

iv. CHEST CIRCUMFERENCE (cm) :

a. Measurement :

It is the maximum circumference of the chest taken at the marked union of 3rd & 4th sternum, at the right angle to the axis of body. It is taken at the end of expiration.

b. Landmarks:

b.1. Mesosternale (mst) :

It is the point on the anterior border of the sternum where mid-sagittal plane cuts the line joining the articular surface of the fourth ribs.
c. Procedure:

One end of the measuring tape was held at the level of the nipple of the subject and other end was taken around the chest passing over the lower scapular angle back to the nipple. Finally, reading was noted to nearest to 0.1 cm.

d. Precautions Observed:

The arms of the subject were raised before fixing the tape around the chest. The measurement was taken with minimum cloths.

v. UPPER MID-ARM CIRCUMFERENCE (cm)

Measurement:

It is the maximum circumference of upper arm taken at the point where Biceps muscles are most developed, midway between Acromiale and Olecranon process.

b. Landmarks:

b.1. Acromiale (a): It is the most lateral point on the lateral margin of the acromial process when the subject stands in normal position with his arms hanging by his side.

b.2. Olecranon (o1): It is the most proximal point of olecranon process and thus the highest point of ulna.

c. Procedure:

The mid-point between Acromiale and Olecranon was first marked on upper arm. One end of the measuring tape was kept at the marked point. Other end of the measuring tape was taken around the upper arm back to marked point. The reading was recorded nearest to 0.1 cm.

d. Precautions:

It was taken on left arm, which was kept in relaxed hanging position away from body.

vi. TRICEP SKINFOLD THICKNESS (mm):

Measurement:

It is the thickness of triceps muscles in the middle of the arm at the level of upper arm circumference in line with the Olecranon process.

b. Landmarks:

c. Procedure:
Mid point of the upper arm was marked first of all. Triceps skinfold was picked up between the thumb and forefinger about 1 cm above the marked point. After bringing the jaws of the caliper to the skinfold at the marked level, the reading was noted nearest to 0.1 mm.

d. Precautions

2.4.2.2. CLINICAL SYMPTOMS (Jelliffe, 1966; Park, 2005):

<table>
<thead>
<tr>
<th>a) General Appearances</th>
<th>b) Face</th>
<th>c) Hair</th>
<th>d) Eyes</th>
<th>e) Lips</th>
<th>f) Tongue</th>
<th>g) Gums</th>
<th>h) Skin</th>
<th>i) Nails</th>
<th>j) Thyroid</th>
<th>k) Skeleton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ii) Conjunctival Xerosis</td>
<td>ii) Cheilosis</td>
<td>ii) Bright Red</td>
<td>ii) Odema</td>
<td>ii) Dry Cracks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>iii) Bitot’s Spots</td>
<td></td>
<td>iii) Fissured</td>
<td></td>
<td>iii) Swollen.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.4.2.2.1. On Infants

2.4.2.2.2. Pregnant and Lactating Women :-

a) Pallor of the Conjunctiva of the lower eye lid (Inside)

b) Pale Nails
2.4.2.3. BIO-CHEMICAL TEST [CHOUHAN 2003, MUKHERJEE 1997]

Only carries on Pregnant and Lactating women are subjected for biochemical tests.

i. Haemoglobin Test [Acid Haematin Method]
   a) Unit : Gram/per deciliter.
   b) Instrument : 
      1. Haemoglobin meter
      2. Haemoglobin tube
      3. Haemoglobin pipette
      4. N/10 HCL
      5. Distill water
      6) Cotton

c) Procedure:

The apparatus was cleaned and dried first of all. In the Haemometer tube N/10 HCL is taken up to 20 marks on the percentage side. It is then allowed to stand in the comparator in the space provided for it. In the left ring finger is pricked & the blood is sucked in the haemometer pipette exactly upto 20 cm mark. The pipette is then dipped into N/10 HCL contained in the haemometer tube & it is rinsed several times with acid solution. The tube is then allowed to stand in the comparator, for 30 minute for the maximum development of colour. Distilled water is mixed with the mixture with the help of a stirrer & the colour of the mixture matched against that of the standard. During matching the stirrer should be kept above the level of the mixture. After the colour of the mixture ha matched with that of the standard, the tube is taken out of the comparator. The stirrer is removed from the top & the level of mixture both in percentage as well as in grams per 100ml is noted.

ii. Sugar Test:
   a) Unit : mg/dl.
   b) Instrument: 
      1) Ascensia Entrust Blood Glucose Meter
      2) CR2032 Lithium Coin Cell Battery
      3) Check Strip
      4) Code Card

c) Procedure: 
   i) Remove a test Strip from the test bottle and immidialty use.
ii) Be sure the meter is off before inserting the strip. Holding the strip by the test strip handle with the contact point up, insert the test strip into the test strip holder.

iii) The meter display will show the current test strip code. The meter will monitor the environment temperature. If the temperature is within the testing range of 18° C to 38° C (64° F to 100° F), the display will show a flashing blood symbol indicating it is ready to test a blood sample.

iv) Stick your finger with the MICROLET Adjustable lancing device and form a small drop of blood. Apply the blood to the absorbent area at the curved edge of the reaction zone or gently touch the blood drop to the top of the reaction zone. When the reaction zone has filled completely the meter will beep and the display will show timing bars "---". When the timing bars have completely (approximately after 30 seconds) disappeared the meter will display the result.

2.4.3. SOCIO – ECONOMIC DATA:

Detail information have been collected on socio-economic variable having bearing on health status such as economic status, Dietary practices, hygienic standards, educational status, family size, marriage pattern and so on.

2.4.3.1 Sample Size for Socio- Economic Investigations:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Slum Colonies</th>
<th>Households (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Krishna Nagar</td>
<td>57</td>
</tr>
<tr>
<td>2.</td>
<td>Jyoti Nagar</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Devar Para</td>
<td>56</td>
</tr>
<tr>
<td>4.</td>
<td>Behra Colony</td>
<td>23</td>
</tr>
<tr>
<td>5.</td>
<td>Jagannath Nagar</td>
<td>21</td>
</tr>
<tr>
<td>6.</td>
<td>Poddar Talab</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>200</td>
</tr>
</tbody>
</table>
2.4.4. Primary Data:

Data collected directly from target group primary one. It is collected through following research tools

i. Schedule:
The schedule is used to collect information on family composition, economic strategies, dietary pattern, hygienic standard, child rearing practices, awareness and acceptance of modern MCH care programmes etc.

ii. Interview:
Health practitioners namely nurse, health workers, midwives, aganwadi workers were interviewed. Interviews conducted were both opened and closed types. Group interviews were conducted as well to seek information on conventional mother child health care practices, related beliefs and attitudes towards modern MCH concepts.

iii. Observations:
Information settlement pattern, house types, hygienic conditions, routine activities etc. was collected directly through observations.

iv. Documentation:
Photos graph of studied slum settlements, life ways, subjects health practitioners, health facilities etc. were taken to substantiate findings of the present studies.

2.4.3. SECONDARY DATA:

Secondary data, namely prevailing govt. health schemes, beneficiaries, laccolution records, birth and death records, population, IMR, MMR etc. was collected from Census report, Chhattisgarh Development Report, Anganwadi Registers, Municipal records etc.

2.5. ANALYSES OF DATA:

Data obtained during survey is first tabulated & classified & then analysed by means of statistical methods.

2.5.1 CLASSIFICATION OF DATA:

2.5.2 Statistical Analyses (Prakash, 2000)
The following statistical formula are used for the analyses of obtained data.
i. **Arithmetic Mean (X):**

The mean of a set of finite observation is the sum of all the observations divided by all the total number of observations.

\[ \bar{X} = \frac{\sum X}{N} \]

Where,

- \( \bar{X} \) = Arithmetic Mean
- \( N \) = The total number of variables
- \( X \) = Sum of all the recorded variables

ii. **Standard Deviation (S.D.):**

It is the positive square root of the average of the squared deviations of all the scores from their mean.

\[ S.D. = \sqrt{\frac{1}{N} \sum x_i^2 - \bar{X}^2} \]

iii. **Co-efficient of Variation**

\[ C.V. = \frac{S.D. \times 100}{\bar{X}} \]

Where  
- **C.V.** = Coefficient of variation
- **S.D.** = Standard Deviation
- **\( \bar{X} \)** = Arithmetic Mean

iv. **Standard Error (S.E.M.):**

It enables the measurement of the magnitude of sampling error.

\[ S.E.M. = \frac{S.D.}{\sqrt{N-1}} \]

Where,  
- **S.E.M.** = Standard Error of mean
- **S.D.** = Standard Deviation
- \( N \) = Size of Sample
v. t-test:

It is used for comparing the means of two groups for independent and dependent samples.

\[ t = \frac{x - y}{\sqrt{\frac{s^2}{n1 + n2}}} \]

\( x \) = Mean of first sample
\( y \) = Mean of second sample
\( s \) = Standard Deviating
\( n1 \) = Second sample size
\( n2 \) = First sample size

vi. \( x^2 \):

Chi-square test is used for testing the independence of attributes where attributed are divided into two or more classes.

\[ x^2 = \frac{(f_0 - f_e)^2}{f_e} \]

\( f_0 \) = Observed Frequency
\( f_e \) = Expected Frequency

2.5.3. INDICES USED

i. Body Mass Index (BMI):

It is an index used to ascertain weight deficit. It is the ratio of weight in kg and height in meter.

\[ BMI = \frac{Wt \, (kg)}{Ht \, (mt)^2} \]

WHO (1995) has categorized BMI values into following categories.
### BMI Values

<table>
<thead>
<tr>
<th>BMI Values</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5-24.9</td>
<td>Normal</td>
</tr>
<tr>
<td>17.0-18.4</td>
<td>Grade -I Malnutrition</td>
</tr>
<tr>
<td>17.0-18.4</td>
<td>Grade -II Malnutrition</td>
</tr>
<tr>
<td>16.0-16.99</td>
<td>Grade -III Malnutrition</td>
</tr>
<tr>
<td>&lt;16.0</td>
<td>Grade -IV Malnutrition</td>
</tr>
</tbody>
</table>

#### ii. Height for Age (Ht/Age):

An index which reflects achieved linear growth and its deficits indicate long cumulative inadequacies of health or nutrition. It is referred to as 'shunting' when it is due to pathological causes and is a result of sub optimal health and nutritional conditions.

\[
\text{Height for Age} = \frac{\text{Observed Height} - \text{Median of Reference Height}}{\text{S.D. of Reference Height}}
\]

#### iii. Weight for Age (Wt/Age)

An index which reflects body mass relative to chronological age. It is a measure for being under weight.

\[
\text{Weight for Age} = \frac{\text{Observed Weight} - \text{Median of Reference Weight}}{\text{S. D. of Reference Weight}}
\]

#### vi. Weight for Height (Wt/Ht)

An index reflects body weight relative to height. It advantage is that if does not require knowledge of age. How weight for height weight \(<-2\text{SD}\) of sex specific reference data relative to height. It is referred to as 'Wasting' when it is due to recent and severe pathological process such as acute starvation and / or severe diseases and results in significant weight loss.

#### v. Z-Score

\[
\text{Z-Score} = \frac{\text{Observed value} - \text{Median of the reference population}}{\text{Two SD of the reference population}}
\]

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$Z$-Score values are categorized (NC/HS/WHO) into following categories

i. Below Normal $(Z: -2)$  
ii. Normal $(Z: -2 \rightarrow 2)$  
iii. Above Average $(Z: +2)$

vi. Kanawati & McLaren's Index:

It is the ratio of Mid Upper Arm Circumference over Head Circumference

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.31 &amp; above</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>0.31 – 2.80</td>
<td>Grade-I</td>
<td>Mild PCM</td>
</tr>
<tr>
<td>0.279 – 0.250</td>
<td>Grade-II</td>
<td>Moderate PCM</td>
</tr>
<tr>
<td>Below 0.250</td>
<td>Grade-III</td>
<td>Severe PCM</td>
</tr>
</tbody>
</table>

vii. Ghosh and Tejaswini’s index:

Mid Upper Arm Circumference (MUAC) has been suggested as a useful public health index of PCM (Jelliffe, 1959, 1960, 1966, Rao et al., 1978) 12.6 cm above is taken as normal and below this is considered as malnourished.

<table>
<thead>
<tr>
<th>Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;12.6</td>
<td>Normal</td>
</tr>
<tr>
<td>&lt;=12.6</td>
<td>PCM</td>
</tr>
</tbody>
</table>

viii. TRICEPS SKINFOLD ASSEMENT (Jelliffe, 1969)

<table>
<thead>
<tr>
<th>Range(%)</th>
<th>Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;90</td>
<td>Normal I</td>
<td>Normal</td>
</tr>
<tr>
<td>90%</td>
<td>Grade-I Malnutrition</td>
<td>Mild</td>
</tr>
<tr>
<td>80%</td>
<td>Grade-II Malnutrition</td>
<td>Moderate</td>
</tr>
<tr>
<td>70%</td>
<td>Grade-III Malnutrition</td>
<td>Moderate</td>
</tr>
<tr>
<td>60%</td>
<td>Grade-IV Malnutrition</td>
<td>Severe</td>
</tr>
</tbody>
</table>