CHAPTER II
RESEARCH METHODOLOGY
The present chapter contains research methodology in detail which includes objectives, hypothesis, importance of the study, variables studied, index development, research design, sample selection procedure, methods of data collection, anthropometry measurement, hemoglobin test, morbidity profile, menstrual hygiene, nutritional awareness, importance of nutritional assessment, data compilation, statistical methods used for analysis, methodological issues and limitations of the study. According to Goddard and Melville (2004), answering unanswered questions or exploring which currently not exist is a research. The Advanced Learner’s Dictionary of current English lays down the meaning of research as a careful investigation or inquiry especially through search for new facts in any branch of knowledge. Redmen and Mory (2009), defines research as “a systematized effort to gain new knowledge”. Methodology refers to the process, principles, and procedures by which researcher tries to approach the current research problems and seeks answers through the application to how to carry out the social research. It can be considered to include multiple methods, each as applied to various faces of the whole scope of the methodology.

OBJECTIVES OF THE STUDY

1. To Study the Awareness of Nutrition among Parents and Adolescents
2. To Study the Determinants of Malnutrition among Adolescents
3. To Study the Menstrual Hygiene and Practices among Adolescent girls
4. To Study the Morbidity Pattern among Adolescents
5. To Suggest Policy Implications

HYPOTHESIS

In pursuance of the objectives stated above, few hypotheses have been framed.

1. Majority of the parents and Adolescents are not aware of Nutrition.
2. Most of the adolescents are malnourished or anaemic.
3. Most of the adolescent girls are underweight and anaemic than boys.
4. Socially backward communities are more likely to be vulnerable to malnutrition.
IMPORTANCE OF THE STUDY

Health has been recognized as a fundamental right to all human beings, which implies a right to good physical and mental health. Nutrition is one of the essential factors that determine health. Nutritional adequacy is one of the key determinants of the quality of human resources everywhere. Kar et al (2008) compared the performance of adequately nourished children to malnourished children and also compared age related differences in cognitive function and found that the malnourished children differ from the adequately nourished children on tests of phonemic fluency, design fluency, selective attention, visuospatial working memory, visuospatial functions, verbal comprehension and verbal learning, and memory.

The International Conference on Population and Development (ICPD) held in 1994 in Cairo put adolescents into focus as a vulnerable group. It was only after the Conference the subject gained gradual but dramatic transition to investigate adolescents’ problems and to address their concerns - social, physical as well as psychological. But still studies on the health and nutritional status of adolescents are a few and many more studies in different sections of the societies are required. Specifically, there is a need to discuss adolescents’ nutritional status within the social and economic context of different societies.

The sheer number and demographic weight of youth gives them importance, even more so in developing countries, with a typically younger population, and as a result of the drop in under-five mortality. The future economic development of poorer countries rests in large part on the prospect of having increasing proportions of the future adults who are educated, healthy and economically productive. There is an important interaction between economic opportunity and attitudes of the youth as pertinently noted by Burt (1996). If there is little realistic hope of getting ahead economically, adolescents may have little incentive to invest in education and to stay away from health-threatening activities or behaviours. Conversely, without the prospect of a qualified, healthy and productive workforce, potential investors may be reluctant to commit to economic
development. There are substantial costs to governments, societies and individuals for every failure of youth to reach adulthood alive, healthy, well-educated and without dependents for whom they cannot care. When advocating investment in adolescents, it is important to consider specific cultural values, and to identify the most valued as well as the least wanted personal and societal outcomes (Burt, 1996).

Adolescents are the best human resources. But for many years, their health has been neglected because they were considered to be less vulnerable to disease than the young children or the very old. Their health attracted global attention in the last decade only (Kalhan M et al., 2010).

**The Nutrition Scenario in India**

Malnutrition is more common in India than in Sub-Saharan Africa. One in every three malnourished children in the world lives in India. About 50 percent of all childhood deaths are attributed to malnutrition. In India, around 46 percent of all children below the age of three are too small for their age, 47 percent are underweight and at least 16 percent are wasted. Many of these children are severely malnourished. The prevalence of malnutrition varies across states, with Madhya Pradesh recording the highest rate (55%) and Kerala among the lowest (27%) (UNICEF, 2012).

According to Sample Registration System (SRS, 2010-11) Maternal Mortality Rate (MMR) of the State is 178, which is again higher than Andhra Pradesh (134), Tamil Nadu (97) and Kerala (81). Similarly infant mortality of Karnataka state (35) is lower than Andhra Pradesh (43) but higher than Tamil Nadu (22) and Kerala (12). The prevalence of under nutrition tended to increase from about 63 percent among children in 6-9 year age group to 78 percent in 10-13 years and then declined to 66 percent in 14-17 year age group.

In 2011, UNICEF-WHO-The World Bank joint estimates child malnutrition shows 165 million children under five years of age worldwide were stunted (i.e., low height-for-
age), a decrease from an estimated 253 million similar children in 1990. High prevalence levels of stunting among children in Africa (36% in 2011) and Asia (27% in 2011) remain a public health problem (UNICEF-WHO, 2011). According the U.S global health policy data the prevalence of child malnutrition is about 16.2 percent and India is ranked 2nd in the world of the number of children suffering from malnutrition about 43.7 percent (U.S Global Health Policy, 2012).

India is home to 243 million adolescent children aged 10 to 19 years. Sadly, a large proportion of India’s adolescents are anaemic: 56 percent of girls and 30 percent of boys were anaemic. Anaemia among adolescents adversely affects these young people’s growth, resistance to infections, cognitive development and work productivity (UNICEF, 2012).

Anaemia is a severe public health problem in 16 countries; the largest number of cases being found in India, where more than half of girls aged 15-19 is anaemic. Nearly 50 percent of adolescent girls aged 15-19 in India are underweight, with a body mass index of less than 18.5, and more than one quarter are underweight in 10 other countries. Such undernutrition renders adolescents vulnerable to disease and early death and has lifelong health consequences. In adolescent mothers, undernutrition is related to slow fetal growth and low birth weight (UNICEF-A Report Card on Adolescents, 2012).

The Nutrition Scenario in Karnataka State

The Nutrition Scenario in Karnataka compared to other Southern States is also a cause for concern. For example, the IMR in Karnataka according to NFHS-III is 43 as compared to 30.4 and 15.3 in Tamil Nadu and Kerala respectively. The under 5 mortality rate in Karnataka (54.7) is also much higher than Tamil Nadu (35.5) and Kerala (16.3). The percentage of under-three age stunted children in the State (42.4) according to NFHS-III is not only higher than the national percentage (38.4) but also much higher than the other three Southern States the percentages there being Andhra Pradesh (36.4), Kerala (26.5) and Tamil Nadu (31.1). The percentage with regard to under-three underweight children
in Karnataka in comparison to other three Southern States is also the highest (33.3) according to NFHS-III. Similarly 70.4 percent of the State’s Children fewer than six years are anaemic which a matter of great concern demanding urgent action. As per NFHS-III data, about 56 percent of girls and 30 percent of boys in 15-19 age group were anaemic in India (MoHFW, 2013). In India, 47 percent of adolescent girls age 15-19 years were underweight an 56 percent were anaemic (UNICEF global databases, 2011, based on DHS 2005–2010; data were reanalysed by UNICEF).

The Nutrition Scenario of Raichur District

The recent DLHS-IV (2012-13) Karnataka state report revealed that the percent of under-five age stunted children was (30%). The prevalence of stunting is not uniform across the different districts in Karnataka, stunting is lowest in Shimoga (19%) highest in Gadag (45%). In Northern Karnataka region the prevalence of stunting is high in Koppal (34%) followed by Raichur (33%). The prevalence of wasting in Karnataka state is 26 percent. In Northern Karnataka region wasting is highest in Raichur district (35%) followed by Yadgir (28%) and Bidar, Gulbarga & Koppal (27% each). Underweight among year 15-49 age of Karnataka is 28 percent. In Northern Karnataka region Yadgir district has more underweight persons (42%) followed by Raichur (38%) Bidar (37%) Gulbarga and Bellary (34% each).Similarly 56 percent of the adolescent in Karnataka found to be anaemia. The prevalence of anaemia in Yadgir is highest in the state (70%) followed by Bellary (58%) and Raichur district (53%). Overall in Karnataka the BMI <18.5 of the adolescent girls age group 15-19 was 49.2 percent, similarly mild and sever thinness was 21.2 percent and 27 percent respectively.

As per data provided by Women and Child Welfare Department Karnataka (2011), Over 2,600 children below the age of 6 years have died due to malnutrition in Raichur district of Karnataka of which 811 died in 2009 while the number went up to 1,233 in 2010. As many as 645 such deaths have been recorded till August 2011. "As many as 4,531 malnourished children are on their deathbed. Malnutrition has hit epidemic proportions in villages of Deodurga and Manvi taluks in the Raichur district. Malnourishment among
kids is so acute in Raichur which is at the bottom of the 30 districts of the state in terms of human development index that such deaths have become common to every household in the district. The Data also shows that 78,366 children are malnourished in the district, of which 639 are severely malnourished (IndiaToday, 2011; Justice N K Patil report, 2012; TV9 Program on “Anna Anna Anna”, 2012).

After reviewing the various literatures from International to district level, Studies in malnutrition related to adolescence has not been conducted. Most of the programs/researches focused on RMNCH concepts ‘Reproductive Maternal Newborn and Child Health. However, not much attention has been paid to adolescents’ age group 13-19 years by nutrition related programmes in developing countries, particularly in India.

The data from rural area is especially lacking as the areas are not easy to reach. We need to relook at the prevalence of malnutrition among adolescents and identify the causative factors. Year back UNICEF was dealing with four approaches such as ‘Reproductive Maternal Newborn and Child Health’ now the they added 5th one that is “Adolescents” it means ‘RMNCH+A’ approach. It is a positive sign or development in study of adolescent health in context of malnutrition. There are so many studies focusing on malnutrition among adolescent school going girls but there is no such studies dealing with boys or both sexes. So, present study will work on both boys and girls in school or out of school. There is a lack of studies or programs focusing adolescent’s health mainly on malnutrition in Raichur district. This study will try to fill the gap and suggest the policy makers in this area. In addition, there are adolescent specific issues that call for specific strategies and interventions. If adolescents are well nourished, they can make optimal use of their skills, talents and energies today and be healthy and responsible citizens and parents of healthy babies tomorrow. To accomplish such a task and in order to break the intergenerational cycle of malnutrition, a special focus for overcoming adolescent malnutrition is needed. This task can be accomplished if a special focus is given to overcome malnutrition in adolescents and break the intergenerational cycle of malnutrition. In this context we undertook a study of adolescent both boys and girls in
rural areas of Raichur district in Northern Karnataka (Hyderabad Karnataka), India, with focus on their nutritional status.

**VARIABLES STUDIED**

“Variable” is a term frequently used in research. It is pertinent to define and identify the variables while designing quantitative research. A variable incites excitement in any research than constants. The central purpose of research is to solve problems and improve the welfare of the society. Research cannot be possible without taking into consideration measurable factors that are subject to change due to circumstances. Anything that can vary in research due to circumstances is called a variable. There are so many variables in research that, it could be impossible or extremely difficult to account for all of them due to the fact that what can be considered a variable in one study may not necessarily be a variable in another study.

Variable is a measurable characteristic that varies, it may change from group to group, person to person, or even within one person over time. Further, keeping in mind the objectives of this study, it was decided to have vast information on various background characteristics like, (social, economic, demographic, hemoglobin level and anthropometry of the respondents). However, the variables which have been taken into account in this study were based on relevant theoretical (logical) grounds. Moreover, for a clear understanding of the nature of these variables, classification was done into different groups. Further the justification for the selection of the determinants (variables) and their hypothesized relationship is well presented.

**Independent Variables**

The independent variable is the antecedent while the dependent variable is the consequent. If the independent variable is an active variable then we manipulate the values of the variable to study its effect on another variable.
Demographic Characteristics

Variables which cannot be manipulated are attribute variables and the variables that the researcher creates are the active two qualitative aspects of the course.

Economic Characteristics

The significant economic characteristics of the respondents were taken for the study purpose, i.e. occupation of the parents, income of the family per month, and other related information.

Social Characteristics

The major social characteristics of the respondents are; social status of respondent, religion, caste, type of family, education of the respondent and the other relevant information.

Dependent Variables

Characteristics of the respondents considered for the present study was; awareness about nutrition, nutritional deficiencies, more importantly to assess the malnutrition height and weight were measured and Hemoglobin level was tested. Similarly we have studied menstrual hygiene, practices and menstrual disorders among adolescent girls and also morbidity profile of the adolescents. These characteristics were important from the point of understanding the prevalence of Malnutrition in Raichur district of Karnataka State, India.
INDEX DEVELOPMENT

Standard of Living Index (SLI)

Standard of living index (SLI) was computed using information on type of house, whether house is electrified or not, availability of wall clock, TV, Fridge, Fan, Inverter, Mixer grinder and availability of two wheeler or three wheeler, Tractor and availability of agriculture land and information of 21 durable goods. The principal component analysis (PCA) was used to generate the weights for each indicator while computing the index. Before applying PCA all the category variables were converted into binary form. After the preliminary works PCA has been applied to the selected variables, derived from component matrix has been used as weights. These raw values were further divided into three equal parts with an equal number of individuals in each group. We did not divide values into five divisions only due to small sample size as such; division might lead to lower cell frequencies in further analysis. Thus, at the aggregate level almost 33 percent household population was in each of three categories. 47 percent of household belongs to low SLI followed by medium SLI 33.7 percent and high SLI 19.1 percent.

DATA COLLECTION

In order to understand the malnutrition systematically, two separate well-structured interview schedules were prepared; one for parents and another for adolescents. The interview schedule was prepared in. Kannada, keeping in view that the spoken language of the study population (respondents) was Kannada.

Standardized Parents Questionnaires Consists of three Sections

1. Personal information.
2. Household information.
3. Information on awareness about nutrition.
Standardized Adolescent Questionnaires Consists of Seven Sections

1. Basic information of the Adolescents.
2. Information on awareness about nutrition and its deficiency.
3. Information on meal skipping patterns.
4. Information on hemoglobin.
5. Information on anthropometric status.
7. Morbidity pattern among adolescents.

The above mentioned were major sections in interview schedule, apart from that the schedule was printed with cover page and identification section. To meet the study objectives and to collect the quality of information, the researcher kept some open ended and close ended questions in interview schedule.

VALIDITY AND RELIABILITY OF INTERVIEW SCHEDULE

Kirk and Miller (1986) amongst others claim that reliability as well as validity shall be separated into internal and external concepts. The amount of internal reliability can be considered to be high when two or more researcher have agreed on in what way to interpret their empirical findings (Bryman and Bell, 2005; Kirk and Miller, 1986).

As mentioned earlier, this research has been performed in Raichur district of Karnataka, India with several participants whose performance, affect or is affected by Malnutrition in India. Achieving different views upon Malnutrition increased the authors understanding for the concept and decreased the possibilities of using their own interpretations. Even though keeping in mind the cause and consequences the researcher gone for a pilot study in a form of pre-testing the prepared interview schedule and incorporated the necessary modifications before starting the final field survey.
PILOT STUDY

Many authors pointed the importance of the pilot study in social science research. A pilot study is a mini-version of a full-scale study or a trial run done in preparation of the complete study. The latter is also called a ‘feasibility’ study. It can also be a specific pre-testing of research instruments, including questionnaires or interview schedules. (Compare Polit, et al., 2002; Van Teijlingen and Hundley, 2001). The pilot study will thus follow after the researcher has a clear vision of the research topic and questions, the techniques and methods, which will be applied, and what the research schedule will look like. It is “reassessment without tears”, trying out all research techniques and methods, which the researcher have in mind to see how well they will work in practice. If necessary it can then still be adapted and modified accordingly (Blaxter, Hughes and Tight, 1996).

A pilot study is a primary work to gain clear cut and specific research perspective in the subject of investigation to be undertaken. Moreover, for any research a pilot study is not only essential but also pre-requisite in order to simplify the task of designing interview schedule, in a compact and scientific way. Hence, in the present study the rough draft interview schedule was administered to one village and 50 adolescents and same was discussed with research experts and incorporated those necessary changes to standardize the interview schedule with the intention that the researcher, respondents view point should not face any problem in understanding and filling up the questionnaire themselves. The pilot study was carried out in Kudalagi village of Kalghatgi taluka Dharwad district with 15 samples were covered.

FIELD EXPERIENCE

After taking permission letter from the guide, the researcher visited the Raichur to obtain permission from Deputy Commissioner and District Health and Family Welfare officer, Raichur. To complete the process of obtaining the permission, it took two to four days’ time. Finally the data collection was started from 18th June 2015 and completed on 15th
September 2015. The researcher used to stay nearby places of study areas in order to reach the site in time, according to the convenient time of the respondents. In certain cases researcher used to stay back in the field area till late night but also used to revisit the sample houses two to three times in order to complete the interview.

**RESEARCH DESIGN**

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the “research design”. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.” In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. Designing is an important part of every research activity which determines the format of the research proposal and its outcome. As the purpose of the research was descriptive, the unit of analysis was adolescents’ age group 13-19 years and parents.

**Descriptive and Analytical-Diagnostic Research design** was regarded as the most appropriate research design to carry out this study. Hence the study is designed to examine present trends in malnutrition among adolescents both boys and girls, for which researcher studied socio-economic and demographic background conditions of the adolescents.

**Universe and Sample**

All the items under consideration in the research constitute the population or universe of the research. Practically it is not possible to include all the items in the investigation due to various reasons, mainly due to cost implications. Therefore, it is a prevalent practice in research process to take a representative sample of the entire universe and put it to test. In
this case adolescents’ age group 13-19 years of Raichur district of Karnataka State, India has been considered as universe.

The elementary units or the group or cluster of such units may form the basis of sampling process in which case they are called as sampling units. A list containing all such sampling units is known as sampling frame. Thus sampling frame consists of a list of items from which the sample is to be drawn. If the population is finite and the time frame is in the present or past, then it is possible for the frame to be identical with the population. In most cases they are not identical because it is often impossible to draw a sample directly from population. As such, this frame is either constructed by a researcher for the purpose of his study or may consist of some existing list of the population. For instance, one can use telephone directory as a frame for conducting opinion survey in a city. Whatever the frame may be, it should be a good representative of the population.

SAMPLE SELECTION PROCEDURE

Sample Size

The sample size i.e. number of adolescents were determined by using the formula below. This method requires a target precision for the estimates and a given design effect (with the adjustment for expected non-response) (Lwanga and Lemeshow, 1991).

\[ n = \frac{Z_{\alpha}^2 \times p \times q \times (1 + R) \times (\text{deff})}{d^2} \]

Where,
- \( n \) = the estimated sample size;
- \( \alpha \) = the level of statistical significance that was set at 0.05;
- \( Z_{\alpha} \) = the z value at 95% confidence level, (Here, \( z_{0.05} = 1.96 \), with 95% confidence level);
- \( d \) = the margin of error, (Here, \( d = 0.05 \));
- \( p \) = the proportion of adolescents who rate their health as poor, in Raichur district (as per DLHS-4th round) (Here, \( p = 0.58 \));
- \( q = 1 - p \) (\( q = 0.42 \));
- \( R \) = non-response rate (Here, \( R = 0.1 \));
- \( \text{deff} \) = the design effect (Here, \( \text{deff} = 1.5 \)).

The number of respondents after solving the above equation is 618.
The present study follows cross sectional design. A multi stage stratified sampling procedure was employed for the selection of the respondents.

**The Selection of the Respondents was Done in Three Stages.**

1. In the first stage taluks were selected,
2. In the second stage villages were selected, and
3. In the third stage based on house listing the households were selected using systematic random sampling.

In the Raichur district the study sample was selected as follows, the district having five taluks namely, Devadurga, Lingasugur, Manvi, Raichur and Sindhanur, for representing all the taluks the multi stage stratified sample procedure was adopted. As per this procedure; in each taluka 10 villages were selected using systematic random sample method, i.e. for selecting the 10 villages, all the villages in each taluks were chronologically arranged (ascending order) by number of households having more than 300 households (*Census of India, 2011*). In addition to 10 villages, seven more villages have been taken in Devadurga Taluka because it was one of the most backward taluks with lowest HDI ranking (*IndiaToday, 2012; TV9 program on “Anna Anna Anna”, 2011, N K, Patil report, 2014*). Finally research study was carried out in 57 villages in Raichur district.

**House Listing**

For household selection, the separate house listing was carried out in the selected 57 villages. House listing format containing, name of the head of the household, number of adolescents in the households, gender, age, religion and caste were included. The total 15 households were selected from each village. Example; in the village, if there are 300 households, all of them were listed, and since the researchers target is 15 households. The selection interval would be 300/15=20. Then, a random number between 1 and 20 should be selected which will be taken as a random start or first selection unit. In this case, we
selected random number as 10. Then the households to be selected are the once with the following numbers: 10, 20, 30…and so on. In 57 villages total 2000 households were listed, in which finally 830 households were visited. 283 parents and 728 adolescent were interviewed and the response rate was 87.7 percent (see table 2.1).

Table 2.1: Number of Households Covered and Number of Interviews Completed by Taluka

<table>
<thead>
<tr>
<th>Taluka</th>
<th>Population*</th>
<th>No. of Villages Selected*</th>
<th>Total No. of Villages with &gt; 300 HHs*</th>
<th>No. of HHs Listed</th>
<th>Household Visited</th>
<th>No. of Interviews Done</th>
<th>Not Eligible/Refused/Not at Home</th>
<th>No of Adolescent Interviews Completed</th>
<th>No of Parent Interviews Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deodurga</td>
<td>251677</td>
<td>17</td>
<td>35</td>
<td>596</td>
<td>272</td>
<td>265</td>
<td>33</td>
<td>232</td>
<td>87</td>
</tr>
<tr>
<td>Lingasugur</td>
<td>297743</td>
<td>10</td>
<td>44</td>
<td>351</td>
<td>148</td>
<td>144</td>
<td>21</td>
<td>123</td>
<td>49</td>
</tr>
<tr>
<td>Manvi</td>
<td>323539</td>
<td>10</td>
<td>62</td>
<td>351</td>
<td>146</td>
<td>142</td>
<td>22</td>
<td>120</td>
<td>51</td>
</tr>
<tr>
<td>Raichur</td>
<td>247476</td>
<td>10</td>
<td>61</td>
<td>351</td>
<td>150</td>
<td>148</td>
<td>16</td>
<td>132</td>
<td>52</td>
</tr>
<tr>
<td>Sindhanur</td>
<td>302457</td>
<td>10</td>
<td>68</td>
<td>351</td>
<td>139</td>
<td>136</td>
<td>15</td>
<td>121</td>
<td>44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1422892</strong></td>
<td><strong>57</strong></td>
<td><strong>270</strong></td>
<td><strong>2000</strong></td>
<td><strong>855</strong></td>
<td><strong>835</strong></td>
<td><strong>107</strong></td>
<td><strong>728</strong></td>
<td><strong>283</strong></td>
</tr>
</tbody>
</table>

*Sources: Census of India, 2011

**METHODS OF DATA COLLECTION**

In order to find sufficient and relevant information, both primary and secondary sources of data have been used in the present study.

**Primary Source of Data**

The primary sources of data have been obtained from interviews that included both open and closed-ended questions. Sumner and Tribe (2008) argue that primary data can be intensive way in order to find available research resources, which has been gained from the field survey interviews.
Interview

The interview has a strong claim to be the most widely used method of research (Gilbert 1993). It is probably the most widely employed method in qualitative research (Bryman and Bell, 2003). The aim of the interview is to gain in-depth information that could be difficult to acquire via other methods (Zhang, 2006). Given that the sample of this research is considered to be low, it is thus more likely that other types of data collection, such as interview schedule, would not be suitable in this study. In addition, researchers argue that interviews provide an opportunity to understand meaning held in unarticulated way by the subjects interviewed, which in turn requires more in-depth interviews to be achieved (Maali, 2005). According to Gilbert (1993), the interview is a conversation, usually between two people. But it is a conversation where one person, the interviewer is seeking responses for a particular purpose from the other person. The interview provides the descriptive data necessary for any qualitative investigation.

Map 2.1: Selected Villages for the Survey by Taluka Raichur District
All interviews of respondents were conducted in the villages. Prior to the interview, the participants were assured that the whole process is confidential and their names and personal details would not be disclosed. At the beginning of each interview, the researcher explained to the participants the aim of the interview, and asked if there were any questions or if any further explanation was required. It was explained to the respondent that the researcher is not looking for right and wrong answers, but is rather seeking their opinion and perceptions on the matters of discussion. Interviews were carried out in both languages: Kannada and Telugu. This is because some of the respondents bordering to Andhra Pradesh preferred to conduct the interview in Telugu. However, most of the respondents knew Kannada they preferred to conduct the interviews in Kannada. All interviews on an average last for approximately 30 to 45 minutes.

**ANTHROPOMETRY MEASUREMENT**

Anthropometry data was also collected for the purpose of the study, height and weight of the adolescents was taken.

**Height**

Height in centimeters was marked on a wall with help of the measuring tape. All Adolescents were measured against the wall. Adolescents were asked to remove their footwear, and stand with heels together and head positioned, so that the line of vision was perpendicular to the body for this process researcher took help of field investigators.

**Weight**

A digital weighing machine was used to measure the weight. The scale was adjusted to zero before each measurement. The respondents were asked to stand on the platform of the scale without touching anything and looking straight ahead.
HEMOGLOBIN TEST

Anaemia is characterized by low level of haemoglobin in the blood. Haemoglobin is necessary for transporting oxygen from the lungs to other tissues and organs of the body. Because anaemia is such a serious health problem in India, the present study undertook direct measurement of the haemoglobin levels of all adolescents both boys and girls. Measurements were taken in the field using the HemoCue Hb 201+ analyzer. This system uses a single drop of blood from a finger prick, which is drawn into a cuvette and then inserted into a portable, battery-operated instrument. In less than one minute, the haemoglobin concentration is indicated on a digital read-out. The consent of respondents and parents was taken before drawing the blood for HB test.

Before testing hemoglobin, the lab-technician read a detailed informed consent statement to the parent informing about anaemia, describing the procedure to be followed for the test, and emphasizing the voluntary nature of the test. In addition, the lab technician described the meaning of the results for each adolescent and advised the parents if medical treatment was necessary. In cases of severe anaemia, an additional statement was read to the parent to determine whether or not he/she would give permission for the research organization conducting the survey to inform a local health official about the problem. Out of 728 adolescents 682 respondents were agreed to undergo the test.

Classification of Anthropometry

1. **Stunting (Height-for-age-2SD):** is an indicator of linear growth retardation and cumulative growth deficits. Children or adolescent (13-19 years) whose height-for-age Z-score is below minus two standard deviations (-2SD) from the median of the reference population are considered short for their age (stunted) and are chronically malnourished (WHO, 2007).

2. **Severely Stunted (Height-for-age-3SD):** Children or Adolescent below minus three standard deviations (-3SD) from the median of the reference population are considered to be severely stunted. Stunting reflects failure to receive adequate
nutrition over a long period of time and is also affected by recurrent and chronic illness (WHO, 2007). Height-for-age, therefore, represents the long-term effects of malnutrition in a population.

3. **Underweight (BMI-for-Age-2SD):** Body mass index (BMI) is calculated from a person’s weight and height and is obtained as the individual’s body weight (in Kgs) divided by the square of his or her height (in meters). **It is the only indicator that includes all the three measurements of weight, height and age.** In recent years, it has become the most widely used diagnostic tool for screening and identifying underweight, overweight and obesity in population for both adults and children. The adolescent age whose BMI for age (13-19 years) Z-score is below minus two standard deviations (-2SD) from the median of the reference population are considered short for their age (Thin or underweight) and are chronically underweight (WHO, 2007).

4. **Severe Underweight (BMI-for-Age-3SD):** Adolescent below minus three standard deviations (-3SD) from the median of the reference population are considered to be severely underweight.

**Classification of Anaemia**

Anaemia is characterized by a low level of haemoglobin in the blood. Haemoglobin is necessary for transporting oxygen from the lungs to other tissues and organs of the body. Anaemia in young children is a serious concern because it can result in impaired cognitive performance, behavioural and motor development, coordination, language development, and scholastic achievement, as well as increased morbidity from infectious diseases. One of the most vulnerable groups is adolescent age 13-19 years. According to NFHS-III (2005-06) the severity of Anaemia was classified into four levels. The same classification has been followed in the present study. (Haemoglobin in g/dl = grams per deciliter).
1. **Mild/Moderate Anaemia**: The range between 7.1 to 12 g/dl for adolescent girls, and 9.1 to 13 g/dl for adolescent boys,

2. **Severe Anaemia**: The range less than 7.0 g/dl for adolescent girls and less than 9.0 g/dl for adolescent boys,

3. **Any Anaemia**: less than 12 g/dl for adolescent girls and less than 13 g/dl for adolescent boys,

4. **No Anaemia**: above the 12.1 g/dl for adolescent girls and above the 13.1 g/dl for adolescent boys

**MORBIDITY PROFILE**

Socio-economic status influences the morbidity as well as the different health problems in the adolescents. In the present study morbidity profile among adolescents both male and female was recorded. A checklist was used for recording general morbidity symptoms that respondents had experienced in the preceding three months prior to survey conducted. The checklist included fever, cough/cold, diarrhea/dysentery, stomachache, ear and eye problems, skin problems and others.

**MENSTRUAL HYGIENE**

In the present study we have collected the information pertaining to menstrual hygiene among adolescent girls. Menstruation and menstrual practices are still clouded by taboos and socio-cultural restrictions resulting in adolescent girls remaining ignorant of the scientific facts and hygienic health practices, which sometimes result into adverse health outcomes. Present study focused on hygienic practices, menstrual disorders and taboos related menstruation among girl respondents. The information was collected based on the usage of sanitary pads, its awareness, menstrual disorders and related taboos during menstruation.
NUTRITIONAL AWARENESS

The ‘nutritional awareness’ was collected among the parents based on their views and opinions (qualitative responses). The same had been applied for the collection of ‘good health’. The opinion was further interpreted to the needed information as ‘yes’ or ‘no’ on nutrition awareness and interpretation of views for defining good health according to the view of the respondents. Majority of the response towards good health and nutrition awareness was given as ‘don’t know’.

In the study, information about nutritional awareness and nutritional deficiency was collected from the adolescents. In order to get the information on nutritional awareness, the adolescent were asked questions on vegetables, green vegetables, fruits, season wise fruits and dairy products. And to get the information on nutritional deficiency qualitative questions such as on what is nutrition deficiency? And the response was as absence of fewer, cough, thyroid, bone problem etc. This was further interpreted by the researcher according to the need information.

IMPORTANCE OF NUTRITIONAL ASSESSMENT

The best global indicator of children’s well-being is growth. The assessment of growth not only serves as a means of evaluating the health and nutritional status of children but also provide an excellent measure to decide future action. Growth is the fundamental physiological process that characterizes childhood. Secular trends in growth show the level of health of the population group. Growth monitoring is a screening tool to diagnose nutritional chronic systemic and endocrine diseases at an early stage.

Growth monitoring has the potential for significant impact on mortality even in absence of nutrition supplementation or education. Growth trends are an essential tool in paediatric practice. Their value resides in helping to determine the degree to which physiological needs for growth and development are being met during important childhood period (De Onis, 2009) to adolescents.
Nutrition monitoring helps to assess nutritional problems prevalent in the community, in terms of their nature, magnitude and distribution among the population groups as well as geographical areas. Such monitoring over a period of time gives us an opportunity to study the changes occurring over a period of time. This information is necessary to evolve policies, to formulate appropriate programs and implement the same for the prevention and effective control of nutritional deficiency disorders. It highlights the need to evaluate the on-going nutrition programs, identify bottlenecks if any and to initiate corrective steps, wherever necessary (Brahman, 2005). Secular changes in growth and development can be considered as the changing pattern of nutritional status of adolescents. Anthropometric measurement is the best way to measure the nutritional status of adolescents.

DATA COMPILATION

The data entry was done using CSPro software. The use of Census and Survey Processing System (CSPro) is a software package for entering, editing, tabulating, and disseminating data from census and surveys. CSPro combines the features of the Integrated Microcomputer Processing System (IMPS) and the Integrated System for Survey Analysis (ISSA).

Process Census or Survey Data

Given an existing data file, a user developed CSPro applications that examine the file for inconsistencies, structural defects, or other errors. CSPro permits the user to generate detailed reports on all errors found; the user may also create sub files from the original data, and may use multiple look-up files during the validation and/or report-generation process.
Enter, Modify, and Verify Data

The researcher used CSPro software for entering the quantitative data. CSPro users can create data entry forms (screens) for data capture. The application designer has full control over form layout. CSPro supports rosters, consistency checks and skip patterns of unlimited complexity, user-defined messages and menus, multiple lookup files, and produces operator statistics.

Qualitative Method: The analysis was systematically done by using the STATA version 12, to maximize consistency and objectivity of the study with the help of coding key. Quantum GIS software used to plot the GIS maps wherever required.

WHO Anthroplus: Height and weight data was collected for 728 adolescents, Z-score has been computed using WHO Anthroplus; it uses the WHO 2006 standard. Using Z-scores given by WHO Anthroplus, standard indices of physical growth have been computed: Height-for-age (Stunting) and BMI-for-age (underweight). For all indices of physical growth, minus 2 standard deviation (-2SD) and minus 3 standard deviation (-3SD) below Z score was computed and used in the study.

STATISTICAL METHODS USED FOR ANALYSIS

To fulfill the objectives of the study, appropriate uni-variate, bi-variate techniques were used. Apart from that following statistical technics were used:

Central Tendency: The mean (also known as average), is obtained by dividing the sum of observed values by the number of observations, n. Although data points fall above, below, or on the mean, it can be considered a good estimate for predicting subsequent data points.

Standard Deviation: The standard deviation gives an idea of how close the entire set of data is to the average value. Data sets with a small standard deviation have tightly grouped, precise data. Data sets with large standard deviations have data spread out over a wide range of values.
The Use of Z-Scores: The number of standard deviation (SD) away from the mean, when the distribution is normal. The use of Z-scores is recommended for several reasons. First, Z-scores are calculated based on the distribution of the reference population (both the mean and the standard deviation (SD); thus, they reflect the reference distribution. Second, as standardized measures, Z-scores are comparable across age, sex and measure (as a measure of “dimensionless quantity”). In statistical terms, Z-scores are a special application of transformation rules. The Z-score for a measure (e.g., height or BMI), indicates how far and in what direction (positive vs. negative) a measured value deviates from the population mean, expressed in units of the population SD. It is a dimensionless quantity derived from dividing the difference between individual value (x) and the population mean (μ) by the population SD (σ). The transformed Z-scores’ distribution will have a mean of zero and a SD of one (i.e., mean = 0, SD = 1). This conversion process is called standardizing or normalizing.

Z-scores are sometimes called “standard scores”. The Z-score transformation is especially useful when seeking to compare the relative standings of different measures (e.g., height vs. BMI, or the measures of boys’ vs. girls’) from distributions with different means and/or different SDs. Z-scores are especially informative when the distribution to which they refer is normal. In every normal distribution, the area under the curve between the mean and a given Z-score value corresponds to a fixed proportion of the total area. Based on this characteristic, statisticians have created tables indicating the value of these proportions for various Z-scores.

Pearson's Chi-squared Test ($\chi^2$) is a statistical test applied to sets of categorical data to evaluate how likely it is that any observed difference between the sets arose by chance. It is the most widely used of many chi-squared tests statistical procedures whose results are evaluated by reference to the chi-squared distribution. Its properties were first investigated by Karl Pearson in 1900. In contexts where it is important to improve a distinction between the test statistic and its distribution, names similar to Pearson $\chi$-squared test or statistic are used.
METHODOLOGICAL ISSUES

There are mainly three approaches to measure the incidence of malnutrition among vulnerable groups of the society. (i) Calorie/nutrition intake approach (Sukhatme, 1977, 1982; Gopalan, 1992; Seckler, 1982, 1984), (ii) Anthropometric approach (Strauss and Thomas, 1995; Kakawani, 1997; Svedberg, 2001; Pal, 1999; Osmani, 1992). And (iii) Haemoglobin test. Dietary approach is taken in to consider only one nutritional element only, viz the energy (calorie) content in the food. But over the years it has been agreed upon that anthropometric and test of haemoglobin (Hb) approach is a better measurement than calorie approach. The present study focuses on anthropometric and Haemoglobin test approach which are considered as more reliable measurement over calorie intake approach due to the following grounds.

1. Calorie intake approach is based on data collected from households, on their consumption of major food items in last 7 days or 30 days. This is called reference period. In India, NSSO and NNMB collects data on calorie consumption of the people. This approach ignores the requirement of calorie of a person in terms of age and sex. It does not take in to account the variation due to the factors like body weight, nature of work, state of current health of the person concerned.

2. In Calorie intake approach, anybody consuming below the required norm is considered undernourished. It ignores the effects of inter-personal and intrapersonal variations in calorie requirement. One individual’s calorie requirement might vary from time to time in given period due to change in climatic condition, changing work pattern, and state of the health of the individual. Calorie requirement among individuals from similar age, sex, work pattern, and health status also likely to vary due to difference in their genetics.

3. Calorie-adequate diet is not necessarily a balanced diet containing adequate amount of protein, fat and other micro-nutrients like vitamins, minerals etc.

4. Also, certain months particularly in rural areas some people will not eat certain foods (i.e., in Shravana month most of the Hindus won’t consume non-veg similarly, during Ramzan months most of the Muslims consume food only after sunset.
Nutritionists argue that, the energy intake is a poor measure of nutritional status, which depends not only on the nutrient intake but also on non-nutrient food attributes, privately, and publicly provided inputs and health status (Martorell and Ho, 1984). The non-food factors which influence biological absorption are also considered as important for food security as food factors. It is suggested that the assessment of malnutrition should be based on outcome measures rather than input measures. The suggested outcome measures include anthropometric measures, clinical signs of malnutrition and biochemical indicators. Outcome indicators are more closely related to health and functional capacity. Among the outcome measures, anthropometric measures are considered to have an advantage over other indicators since body measurements are sensitive to even minor levels of malnutrition whereas biochemical and clinical indicators, on the other hand, are useful only when the level of malnutrition is extreme.

Anthropometric observations as measurements and indicators of undernutrition have come to dominate increasingly since early 1980s. Information about nutrition is often collected with the explicit aim of selecting people for targeted intervention. Then it need to know who is undernourished and who is not, and standardized dietary intake norms cannot be used to detect undernutrition in individuals. For this purpose, anthropometric and related methods have to be applied. Nevertheless, most development social scientists and contemporary nutritionists seem to believe that anthropometric measures provide more reliable and useful indications of nutritional status than do dietary intake measurements. The basic advantages of the anthropometric approach are simplicity and accuracy. Until recently, the anthropometric approach was used almost exclusively to estimate undernutrition among children under the age of five but now every age group persons were measuring through anthropometric. Based on the above arguments the anthropometric approach is preferred to calorie-intake approach because it reflects the past nutritional status in terms of stunting, wasting, underweight and body mass index.
LIMITATIONS OF THE STUDY

1. Married adolescents were not included in the survey.
2. Parent’s interviews were reduced by 300 samples, because of the time and money constrains.
3. This survey is based on rural areas of Raichur district and it cannot be generalized to entire state or country.
THEORIES RELATED TO ADOLESCENTS AND MALNUTRITION

ADOLESCENCE

Adolescence is a developmental transition between childhood and adulthood. It is the period from puberty until full adult status has been attained. In the developmental period of adolescence was to delay young people from going into the workforce, due to the scarcity of jobs. There are also varying views on the actual time line of adolescence—especially about when it ends. Typically, we view adolescence beginning at puberty and ending at 18 or 21 years. Others suggest that there is a period of late adolescence that extends well into what is now known as the period of young adulthood. World Health Organisation had given universal accepting definition for adolescents that, those adolescent ages between 10-19 years is considered to be adolescents.

G. STANLEY HALL'S BIOGENETIC PSYCHOLOGY OF ADOLESCENCE

G. Stanley Hall (1844-1924), was the first psychologist to advance a psychology of adolescence in its own right and to use scientific methods to study them. He defined this period to begin at puberty at about 12 or 13 years, and end late, between 22 years to 25 years of age. Hall also described adolescence as a period of Sturm und Drang," -- storm and stress." In German literature, the period of Sturm und Drang includes the works of Schiller and the early writings of Goethe. It is a literary movement full of idealism, commitment to a goal, revolution against the old, expression of personal feelings, passion and suffering. Hall saw an analogy between the objectives of this group of young writers at the turn of the eighteenth century and the psychological characteristics of adolescence.

According to Hall's analogy and expansion of Darwin's concept of biological "evolution." into a psychological theory of recapitulation, adolescence corresponds to a time when the human race was in a turbulent transitional stage. In this theory, Hall stated that the experiential history of the human species had become part of the genetic structure of each
individual. The law of recapitulation claimed that the individual organism, during its
development passes through stages that correspond to those that occurred during the
history of mankind. To sum up, the individual relives the development of the human race
from early animal like primitivism, through a period of savagery, to the more recent
civilized ways of life that characterize maturity. Therefore, Hall described adolescence
as a new birth, "for the higher and more completely human traits are now born" (Hall,
1916).

Hall describes this particular aspect of adolescent development (storm and stress) in
detail in a chapter of his book on adolescence "Feelings and Psychic Evolution." He saw
the emotional life of the adolescent as an oscillation between contradictory
tendencies. Energy, exaltation, and supernatural activity are followed by indifference,
lethargy, and loathing. Exuberant gaiety, laughter, and euphoria make place for
dysphoria, depressive gloom, and melancholy. Egoism, vanity, and conceit are just as
characteristic of this period of life as are abasement, humiliation, and bashfulness. Hall
believed that adolescent characteristics contained both the remnants of an uninhibited
childish selfishness and an increasing idealistic altruism. The qualities of goodness and
virtue are never so pure, but never again does temptation preoccupy the adolescent's
thinking. Hall described the adolescent as wanting solitude and seclusion, while he finds
himself entangled in crushes and friendships. Never again does the peer group have such
a strong influence over the person. The adolescent also moves between the exhibition of
several personality traits including exquisite sensitivity and tenderness at some points in
time to callousness and cruelty at other times. The display of apathy and inertia also
vacillate with enthusiastic curiosity, along with the urge to discover and explore.
According to Hall, during this stage of development, there also is a yearning for idols and
authority that does not exclude a revolutionary radicalism directed against any kind of
authority. In late adolescence, according to Hall, the individual recapitulates the state of
the beginning of modern civilization. This stage corresponds to the end of the
developmental process: maturity. Hall's genetic psychology did not see the human being
as the final and finished product of the developmental process; it allowed for indefinite
further development (Muuss, 1975).
SIGMUND FREUD AND THE PSYCHOANALYTIC THEORY OF ADOLESCENT DEVELOPMENT

Freud paid relatively little attention to adolescent development only to discuss it in terms of psychosexual development. He shared a common idea with that of Hall's evolutionary theory: that the period of adolescence could be seen as phylogenetic. Freud did maintain that the individual goes through the earlier experiences of mankind in his psychosexual development. According to Freud and psychoanalytic theory, the stages of psychosexual development are genetically determined and are relatively independent of environmental factors. Freud believed that adolescence was a universal phenomenon and included behavioral, social and emotional changes; not to mention the relationships between the physiological and psychological changes, and the influences on the self-image. He also stated that the physiological changes are related to emotional changes, especially an increase in negative emotions, such as moodiness, anxiety, loathing, tension and other forms of adolescent behavior.

ERIK ERIKSON'S THEORY OF IDENTITY DEVELOPMENT

The core concept of Erikson's theory is the acquisition of an ego-identity, and the identity crisis is the most essential characteristic of adolescence. Although a person's identity is established in ways that differ from culture to culture, the accomplishment of this developmental task has a common element in all cultures. In order to acquire a strong and healthy ego-identity the child must receive consistent and meaningful recognition of his achievements and accomplishments (Muuss, 1975).

Adolescence is described by Erikson as the period during which the individual must establish a sense of personal identity and avoid the dangers of role diffusion and identity confusion (Erikson, 1950). The implication is that the individual has to make an assessment of his or her assets and liabilities and how they want to use them. Adolescents must answer questions for themselves about where they came from, who they are, and what they will become. Identity, or a sense of sameness and continuity, must be searched
for. Identity is not given to the individual by society, nor does it appear as a maturational phenomenon; it must be acquired through sustained individual efforts. Unwillingness to work on one's own identity formation carries with it the danger of role diffusion, which may result in alienation and a lasting sense of isolation and confusion. The virtue to be developed is fidelity. Adhering to one's values contributes to a stable identity.

The search for an identity involves the production of a meaningful self-concept in which past, present, and future are linked together. Consequently, the task is more difficult in a historical period in which the past has lost the anchorage of family and community tradition, the present is characterized by social change, and the future has become less predictable. According to Erikson, in a period of rapid social change, the older generation is no longer able to provide adequate role models for the younger generation. Even if the older generation can provide adequate role models, adolescents may reject them as inappropriate for their situation. Therefore, Erikson believes that the importance of the peer group cannot be overemphasized. Peers help adolescents find answers to the question "Who Am I?" as they depend on social feedback as to what others feel and how they react to the individual. Therefore, adolescents "are sometimes morbidly, often curiously, preoccupied with what they appear to be in the eyes of others as compared with what they feel they are and with the question of how to connect to earlier cultivated roles and skills with the ideal prototypes of the day" (Erikson, 1959).

Pubescence, according to Erikson, is characterized by rapidity of body growth, genital maturity, and sexual awareness. Because the latter two aspects are qualitatively quite different from those experienced in earlier years, an element of discontinuity with previous development occurs during early adolescence. Youth is confronted with a "physiological revolution" within himself that threatens his body image and interferes with the formation of an identity. Erikson maintains that the study of identity has become more important than the study of sexuality was in Freud's time. Of great concern for many adolescents is the need to settle the question of vocational identity. During the initial attempts to establish a vocational identity some role diffusion frequently exists. Adolescents at this stage hold glamorized and idealized conceptions of their
vocational goals, and it is not uncommon that goal aspirations are higher than the individual's ability warrants. Frequently, vocational goal models are chosen that are attainable for only a few: movie heroes, rock musicians, athletic champions, car racers, astronauts, and other glamorized "heroes." In the process, the adolescent identifies with and idolizes his heroes to the extent that he yields his own identity and presumes himself as others. At this point, according to Erikson, a youth rarely identifies with his own parents; they often rebel against their dominance, their value system, and their intrusion into their private life, since they must separate their identity from that of their family. The adolescent must assert their autonomy in order to reach maturity.

The search for a personal identity also includes the formation of a personal ideology or a philosophy of life that can serve to orient the individual. Such a perspective aids in making choices and guiding behavior. A personal identity influences the adolescent for the rest of their life. If the adolescent bows out and adopts someone else's identity or ideology, it is often less satisfactory than developing their own. The adopted ideology rarely becomes personal and can lead to foreclosure in adolescent development. The positive outcome of the identity crisis is dependent on the young person's willingness to accept his past and establish continuity with their previous experiences. The adolescent must find an answer to the question: "Who Am I?" Other questions that must be answered include: "Where am I going?" "Who am I to become?" There must be a commitment to a system of values - religious beliefs, vocational goals, a philosophy of life, and an acceptance of one's sexuality. Only through the achievement of these aspects of ego-identity can it be possible for the adolescent to move into "adult maturity," achieve intimacy of sexual and affection love, establish deep friendships, and achieve personal self-abandon without fear of loss of ego-identity.

If the adolescent fails in his search for an identity, he will experience self-doubt, role diffusion, and role confusion; and the adolescent may indulge in self-destructive one-sided preoccupation or activity. Such an adolescent may continue to be morbidly preoccupied with what others think of them, or may withdraw and no longer care about themselves and others. This leads to ego diffusion, personality confusion and can be
found in the delinquent and in psychotic personality disorganization. In its most severe cases, according to Erikson, identity diffusion can lead to suicide or suicide attempts. Once the personal identity is established, then the adolescent can move on to find intimacy or isolation in interpersonal relationships.

**CULTURAL ANTHROPOLOGY AND ADOLESCENCE: MARGARET MEAD**

There are several studies by cultural anthropologists that shed light on adolescent development. The contributions of one great anthropologist, Margaret Mead, gave us much insight into perspectives on adolescent development in a cultural context. Mead wrote two books that relevant to a discussion of adolescence: *Coming of Age in Samoa* (1950) and *Growing Up in New Guinea* (1953). The first book is devoted entirely to the adolescent period.

*Coming of Age in Samoa* is an empirical field study; it uses anthropological methodology, but does not contain an explicitly stated theory of adolescent development. But, Ruth Benedict in "Continuities and Discontinuities in Cultural Conditioning" (1954), provides an explicit theory of development from a cultural anthropological point of view which she relates directly to Mead's study of adolescence in Samoa. It is from these theoretical writings that a systematic statement about the importance of cultural factors in the developmental process was summated. "Cultural relativism" - a term more appropriate to the earlier than later writings of Mead - contributes new and important ideas to the understanding of the phenomenon of adolescence. It emphasizes the importance of social institutions and cultural factors in human development and describes the rituals of pubescence as well as adolescent experiences in primitive societies.

Mead maintains that the major task facing adolescents today is the search for a meaningful identity. This task is immeasurably more difficult in a modern democratic society than in a primitive society. The behavior and values of parents no longer constitute models, since they are out modeled as compared with the models provided by
the mass media. Furthermore, the adolescent in the process of freeing the self from dependency on parents is not only unresponsive, but frequently antagonistic to their value system. Since the adolescent has been taught to evaluate his behavior against that of his age-mates, he now discards his parents' value system and exchanges it for the standard of his peers. Rapidity of social change, exposure to various secular and religious value systems, and modern technology make the world appear to the adolescent too complex, too relativistic, too unpredictable, and too ambiguous to provide him with a stable frame of reference.

In the past, there was a period which both Erikson and Mead called a "psychological moratorium," an "as if" period during which youth could tentatively experiment without being asked to show "success" and without final emotional, economic, or social consequences. The loss of such a period of uncommitted experimentation, during which youth can find itself makes it difficult to establish ego-identity. As a substitute, for psychological identity, youth utilizes peer group symbols to establish a semi-identity of deprived and/or semi criminal groups. According to Mead, even education has become functional and "success" oriented. Consequently, the goals and values of adolescents are directed toward success, security, immediate gratification of desires, conformity, and social acceptance with little room for experimentation, idealism, utopianism, and personal martyrdom. Mead states that "failure to adopt our educational and social system...may be held responsible for some of the sense of self-alienation, search for negative identities, and so forth, characteristic of this present group of young people" (Mead, 1961). Mead does advocate greater freedom for the adolescent and less conformity to family, peer and community expectations to allow the adolescent to realize his creative potential. She states, "we can attempt to alter out whole culture, and especially our child-rearing patterns, so as to incorporate within them a greater freedom for and expectation of variations" (Mead, 1951).

Mead also criticizes the American family for its too intimate organization and its crippling effect on the emotional life of the growing youth. She believes that too strong family ties handicap the individual in his ability to live his own life and make his own
choices. She suggests that "it would be desirable to mitigate, at least in some slight measure, the strong role which parents play in children's lives, and so eliminate one of the most powerful accidental factors in the choices of any individual life". Muuss (1975) points out that even though Mead objects to the pattern of the American family that produces conformity and dependency in its children, she considers the family a tough institution and demonstrates that it is nearly universal. Mead knows of no better way to produce wholesome individuals than through a tolerant family system in which "father says 'yes' and mother says 'no' about the same thing", and in which the adolescent can disagree with his parents without a resulting loss of love, self-respect, or increase of emotional tensions.

Ruth Benedict's theory of continuities and discontinuities in cultural conditioning has important educational implications. According to Muuss (1975). Our educational practices at home as well as in school should emphasize continuity in the learning process so that the child becomes conditioned to the same set of values and behavior in childhood that will be expected from him in adulthood. The child should be taught nothing that he will have to unlearn in order to become a mature adult. Changes in behavior, often constituting a discontinuity, are expected as the individual moves from elementary to high school, from college into the labor market, and from denial of sexuality before to sexual responsiveness following the wedding.

LETA HOLLINGSWORTH'S EMPHASIS ON THE CONTINUITY OF DEVELOPMENT

An influential theory of development has been espoused by Leta Hollingsworth (1886-1939) in her book, The Psychology of the Adolescent (1928). It is reported that she was even more pronounced than were Mead and Benedict in her attack on Hall's idea of adolescence as a period of "storm and stress." She dismissed his works as of little scientific or practical value. Her views were influenced by the work of cultural anthropologists. Hollingsworth emphasized the idea of continuity of development and the gradualness of change during the adolescent period. She indicates that "the child grows by imperceptible degrees into the adolescent, and the adolescent turns by gradual degrees
into the adult” (Hollingworth, 1928). She challenged the idea that there were distinct stages and sharp dividing lines among the different "epochs," "stages", and "phases of development."

She also asserted that the sudden change in social status that results from puberty initiation rites and ceremonies of primitive people has become confused with the biological changes of organic development. She believed that there is no connection between the biological changes and the changes in social status. She attributes these changes to social institutions and ceremonies only.

**KURT LEWIN: FIELD THEORY AND ADOLESCENCE**

Kurt Lewin (1890-1947) was a pupil of the early Gestalt school of psychologists at the University of Berlin. He was influenced by Freud's psychoanalytic theory, specifically as it relates to motivation. But Lewin's theory on adolescence is conceptually different from other theories. His theory on adolescent development is explicitly stated in "Field Theory and Experiment in Social Psychology" (1939). His field theory explains and describes the dynamics of behavior of the individual adolescent without generalizing about adolescents as a group. His constructs help to describe and explain, and predict the behavior of a given individual in a specific situation. In a sense, the field theory of adolescence is expressed explicitly and stated more formally than other theories of adolescent development.

Field theory has successfully integrated the biological and sociological factors, which are frequently considered contradictory (for example, the nature vs. nurture issue). Lewin makes explicit his position: "the psychological influence of environment on the behavior and development of the child is extremely important"; "psychology in general as a field of biology" (Lewin, 1935).

Fundamental to Lewin's theory of development is the view that adolescence is a period of transition in which the adolescent must change his group membership. While both the
child and the adult have a fairly clear concept of how they fit into the group, the adolescent belongs partly to the child group, partly to the adult group, without belonging completely to either group. Parents, teachers, and society reflect this lack of clearly defined group status; and their ambiguous feelings toward the adolescent become obvious when they treat him at one time like a child and at another time like an adult. Difficulties arise because certain childish forms of behavior are no longer acceptable. At the same time some of the adult forms of behavior are not yet permitted either, or if they are permitted, they are new and strange to the adolescent.

The adolescent is in a state of "social locomotion," since he is moving into an unstructured social and psychological field. Goals are no longer clear, and the paths to them are ambiguous and full of uncertainties-the adolescent may no longer be certain that they even lead to his goals. Such ambiguities and uncertainties are illustrated will by the boy asking or hesitating to ask for his first date. Since the adolescent does not yet have a clear understanding of his social status, expectations, and obligations, his behavior reflects this uncertainty. For example, the adolescent is confronted with several attractive choices that at the same time have relatively impervious boundaries. Driving a car, smoking pot, dropping acid, having sexual relations are all possible goals with positive valence, influence of junk food and thus they become a part of the adolescent's life space. However, they are also inaccessible because of parental restrictions, legal limitations, or the individual's own internalized moral code. Since the adolescent is moving through a rapidly changing field, he does not know the directions to specific goals and is open to constructive guidance, but he is also vulnerable to persuasion and pressure.

The self-image of an individual depends upon his body. During the normal developmental process, body changes are so slow that the self-image remains relatively stable. The body image has time to adjust to these developmental changes so that the individual knows his own body. During adolescence changes in body structure, body experience, and new body sensations and urges are more drastic so that even the well-known life space of the body image becomes less familiar, unreliable, and unpredictable. The adolescent is preoccupied with the normality of his body and how his
body is perceived by others; he is concerned about and may actually be disturbed by his body image. He spends considerable time studying his own image in the mirror and is concerned about the development of primary and secondary sex characteristics in relationship to age-mates. This is understandable; obviously, the body is especially close to and vital to one's feelings of attractiveness, stability, security, and one's sex role. Negative feelings about one's own body are related to a negative self-concept (Rosen and Ross, 1968) and may lead to emotional instability that can change one's orientation toward life. Because of these various uncertainties adolescent behavior is characterized by an increased plasticity of personality that can lead to personality changes and even religious conversions.

Field theory defines adolescence as a period of transition from childhood to adulthood. This transition is characterized by deeper and far-reaching changes, a faster rate of growth, and differentiation of the life space as compared with the preceding stage of late childhood. The transition is also characterized by the fact that the individual enters a cognitively unstructured region that results in uncertainty of behavior. Transition from childhood to adulthood is obviously a universal phenomenon, since children become mature adults in all societies. However, the shift from childhood to adulthood can occur in different patterns. It can take the form of a sudden shift, such as has been observed in primitive societies in which the puberty rites end childhood and signify the beginning of adulthood (Muuss, 1975).

According to Lewin, there are also cultural differences in adolescent behavior. He attributes these differences to several factors: the ideologies, attitudes, and values that are recognized and emphasized; the way in which different activities are seen as related or unrelated (for example, religion and work are more closely related in Mennonite society than in American society as a whole); and, the varying length of the adolescent period from culture to culture and from social class to social class within a culture. Moreover, the degree to which the child group and the adult group are differentiated in a given culture has far-reaching consequences for adolescent behavior. The more clearly they are separated, the more difficult the transition (Lewin, 1942).
THEORETICAL PERSPECTIVE OF MALNUTRITION

The sociology of adolescence focuses on biological, social, economic, and psychological development of youth during the period between childhood and adulthood. In this period, typical youth undergo puberty, consolidate cognitive reasoning abilities, and attain majority status and social privileges. Most youths complete their education, undergo cultural rites of passage, develop economic and emotional independence from parents, and develop the capacity for intimacy with peers. Developmental sociologists examine these changes in the contexts of home, family, peer group, school, neighborhood, work, houses of worship, and extracurricular activities.

Although the field has much in common with the psychological study of adolescence, developmental sociology focuses more on the institutions in which adolescents develop: from whole societies to ethnic groups, from schools to homeless shelters, and from baseball fields to gang turf. Although Erik Erikson was a clinical psychologist, sociologists consider (Erikson, 1959; Erikson, 1968) to be important introductory works on adolescence, along with Hall (1904). The first sociologist to give great attention to adolescents was James Coleman, who broadened the focus from individuals to social groups in schools (Coleman, 1961). Coleman’s later work on educational inequality, and public policy recommendations for reducing it, were also significant (Coleman 1966). Bronfenbrenner (2005) is based in psychology, but the theory is appealing to scholars of all disciplines, including ecology, sociology, and human development.

Pertinently the World Health Organization views health as a state of complete physical, mental and social well-being and not merely as the absence of disease or infirmity. Thus Health is not merely a biological phenomenon; it is equally related to the social phenomena (Malathi S, 1990). Health, or lack of health, was once merely attributed to biological or natural conditions. Sociologists have demonstrated that the spread of diseases is heavily influenced by the socioeconomic status of individuals, ethnic traditions or beliefs, and other cultural factors. Where medical research might gather statistics on a disease, a sociological perspective on an illness would provide insight on
what external factors caused the demographics who contracted the disease to become ill (White, 2002). The social determinants of health model is supported by a substantial body of empirical evidence which reveals a strong social slope for most diseases, with the poorer classes experiencing higher rates of disease than their more affluent peers (Marmot, M et al. 1999).

HEALTH ISSUES IN SOCIAL SCIENCE

Social science oriented studies in the field of nutrition indicate that Sociologists have shown lukewarm interest and others have evinced more interest. Most of these studies are generally brought by methodological difficulties in establishing cause and effect relationship and hence ensured continued debates, Nevertheless these studies do stress that:

- Health and Nutritional status of a population is an indicator of development!
- Health and Nutritional inputs must take precedence in socio-economic environment which determine the growth and development of human organism, opportunities for acquisition of skills, social placement in life and the quality of life enjoyed as an individual or community member;
- Malnutrition is in and of itself a major deterrent to economic development;
- Labor (social) productivity and social contribution have been limited in malnourished groups due to a limitation of growth and development, physiological capabilities and acquisition of skills;
- Growth retardation or shortness measured in terms of deviation of height indicates social deprivation.

David and Richard (1972) in their evaluation of the economic consequences of malnutrition hypothesized that malnutrition in a society results in a degradation of the human being which in and of itself is a social problem that cries for solution.

In the sociological studies on Health, the relationship between unequal stratification system and Health status gained considerable importance. Good health is an obviously
important human condition, but unfortunately for those toward the bottom of the stratification system good health is to some degree unequally distributed through the stratification system. There are two basic reasons for this, first adequate health care is unequally distributed and second conditions promoting better health are unequally distributed. A second reason good health is unequally distributed is that a low income often means poor nutrition, less sanitary living conditions and less knowledge about how to maintain better health. A lower position in the stratification system means a more unhealthy work environment or better household living conditions.

The relationship between unequal distribution of income and health shows that chronic diseases are more prevalent among those with lower incomes. Further that the numbers of days per year people are disabled due to illness is strongly related to income. In short, along with an unequal distribution of income the stratification system also operates to distribute good health unequally. An unequal distribution of good health can be found in a number of statistics. For example, infant mortality is an often used indicator because it is a condition that can be reduced with better medical care. The data shows that, lower the income, higher the infant mortality rate in the United States. Furthermore, it is important note that with the best medical technology and knowledge in the world, the United States has a relatively high infant mortality rate among industrialized nations. A prime reason for this poor standing by the United States may be that its distribution of medical care is based more on the ability to pay than on need (Herbo, 1983).

Sociologists study all things of human, from the interactions between two people to the complex relationships between nations or multinational corporations. Franklin Henry Giddings defines sociology as “The Science of social phenomena”. By this definition we make out that sociology is the accumulated concept which includes fundamental laws of social behavior, relations between others, institutions, social problem, social development, organization and functioning of human society. It is clear to us sociology discuss about social problem. Social problem is a condition that at least some people in a community view as being undesirable. Everyone would agree about some social problems, such as health problems may be viewed as such by certain groups of people.
Sociology takes a different approach, as it stresses that individual problems are often rooted in problems stemming from aspects of society itself (Wright Mills, 1959). Personal troubles refer to a problem affecting individuals that affect individual, as well as other members of society, typically blame on the individual’s own personal and moral failings. Examples include such different problems as poverty, eating disorders and unemployment. Public issues, whose source lies in the social structure and culture of a society, refer to social problems affecting many individuals. Problems in society thus help account for problems that individuals experience. Mills felt that many problems ordinarily considered private troubles are best understood as public issues, and he coined the term sociological imagination to refer to the ability to appreciate the structural basis for individual problems. Social problem is an issue within the society that makes it difficult for people to achieve their full potential. Poverty, unemployment, unequal opportunity, racism, and malnutrition are examples of social problems.

Theories in sociology provide us with different perspectives to view our social world. A perspective is simply a way of looking at the world. A theory is a set of interrelated propositions or principles designed to answer a question or explain a particular phenomenon; it provides us with a perspective. Sociological theories help us to explain and predict the social world in which we live. Sociology includes three major theoretical perspectives: the structural-functionalist perspective, the conflict perspective, and the Malthusian Population perspective theory. Each perspective offers a variety of explanations about the causes of and possible solutions for social problems of Malnutrition (Rubington & Weinberg, 1995).

Three theoretical perspectives guide sociological thinking on Malnutrition: functionalist theory, conflict theory, and Malthusian Population theory. These perspectives look at the same social problems of Malnutrition, but they do so in different ways. Their views taken together offer a fuller understanding of social problems than any of the views can offer alone.
STRUCTURAL-FUNCTIONALIST PERSPECTIVE

The structural-functionalist perspective is largely based on the works of Herbert Spencer, Emile Durkheim, Talcott Parsons, and Robert Merton. According to structural-functionalist, society is a system of interconnected parts that work together in harmony to maintain a state of balance and social equilibrium for the whole. Today’s functionalist perspective arises out of Durkheim’s work and that of other conservative intellectuals of the nineteenth century. It uses the human body as a model for understanding society. In the human body, our various organs and other body parts serve important functions for the ongoing health and stability of our body. Our eyes help us see, our ears help us hear, our heart circulates our blood, hormones helps to grow and so forth. Just as we can understand the body by describing and understanding the functions that its parts serve for its health and stability, so can we understand society by describing and understanding the functions that its parts or, more accurately, its social institutions serve for the ongoing health and stability of society. Thus functionalism emphasizes the importance of social institutions such as the family, religion, caste and education for producing a stable society.

Similarly to the view of the conservative intellectuals from which it grew, functionalism is skeptical of rapid social change and other major social upheaval. The analogy to the human body helps us understand this skepticism. In our bodies, any sudden, rapid change is a sign of danger to our health. If we break a bone in one of our legs, we have trouble walking; if we lose sight in both our eyes, we can no longer see. Slow changes, such as the growth failure, are fine and even normal, but sudden changes like those just described are obviously troublesome. By analogy, sudden and rapid changes in society and its social institutions are troublesome according to the functionalist perspective. If the human body evolved to its present form and functions because these made sense from an evolutionary perspective, so did society evolve to its present form and functions it is because these made sense. Any sudden change in society thus threatens its stability and future.
As these comments might suggest that, functionalism views social problems of Malnutrition as arising from society’s natural evolution. When a social problem of Malnutrition does occur, it might threaten a society’s stability, but it does not mean that fundamental laws in the society exist. Accordingly, gradual social reform should be all that is needed to address the social problem of Malnutrition. Functionalism even suggests that social problems or malnutrition must be functional in some ways for society, because otherwise these problems would not continue. This is certainly a controversial suggestion, but it is true that many social problems do serve important functions for our society. For example, health problem is a major social problem, but it is also good for the economy because it creates hundreds of thousands of jobs in health department. If there is no health problems, many people would be out of work! Similarly, poverty is also a major social problem, but one of the functions that poverty serves is that poor people do jobs that otherwise might not be done because other people would not want to do them. Two dominant theories of social problems grew out of the structural-functionalist perspective: social pathology and social disorganization.

**Social Pathology**
According to the social pathology model, social problems of malnutrition result from some "sickness" in society. Just as the human body becomes ill when our systems, organs, and cells do not function normally, society becomes "ill" when its parts (i.e., elements of the structure and culture) no longer perform properly. For example, problems such as, violence, poverty, and juvenile delinquency are often attributed to the breakdown of the family institution, the decline of the religious institution, and inadequacies in our socio, economic, health outcomes, educational, and political institutions.

**Social Disorganization**
According to the social disorganization view of social problems of malnutrition, rapid social change disrupts the norms in a society. When norms become weak or are in conflict with each other, society is in a state of anomie or normlessness. According to this view, the solution to social problem lies in slowing the pace of social change and strengthening social norms *(Elster, 1990).*
CONFLICT THEORY

In many ways, conflict theory is the opposite of functionalism but ironically also grew out of the Industrial Revolution, thanks largely to Karl Marx (1818-1883) and his collaborator, Friedrich Engels (1820-1895). Marx suggested that all societies go through stages of economic development. As societies evolve from agricultural to industrial, concern over meeting survival needs is replaced by concern over making profit, the hallmark of a capitalist system. Industrialization leads to the development of two classes of people: the bourgeoisie, or the owners of the means of production (e.g., factories, farms, businesses), and the proletariat, or the worker who earn wages.

The division of society into two broad classes of people--the "haves" and the "have-nots" is beneficial to the owners of the means of production. The workers, who may earn only subsistence wages, are denied access to the many resources available to the wealthy owners. According to Marx, the bourgeoisie use their power to control the institutions of society to their advantage. For example, Marx suggested that religion serves as an "opiate of the masses" in that it soothes the distress and suffering associated with the working-class lifestyle and focuses workers' attention on spirituality, God, and the afterlife rather than on such worldly concerns as living conditions. In essence, religion diverts the workers so that they concentrate on being rewarded in heaven for living a moral life rather than on questioning exploitation.

There are two general types of conflict theories of social problems: Marxist and Neo-Marxist. Marxist theories focus on social conflict that results from economic inequalities; Neo-Marxist theories focus on social conflict that result from competing values and interests among social groups.
MARXIST CONFLICT THEORY

According to contemporary Marxist theorists, social problems particularly malnutrition results from class inequality inherent in a capitalistic system. A system of "haves" and "have-nots" may be beneficial to the "haves" but often translate into poverty for the "have-nots." Many social problems, including physical growth and mental illness and low educational achievement are linked to poverty. In addition to creating an impoverished class of people, capitalism also encourages "corporate violence." Corporate violence may be defined as actual harm and/or risk of harm inflicted on consumers, workers, and the general public as a result of decisions by corporate executives or managers. Corporate violence may also result from corporate negligence, the quest for profits at any cost, and willful violation of health, safety, and environmental laws (Hills, 1987).

Marxist conflict theories also focus on the problem of alienation, or powerlessness and meaninglessness in people's lives. In industrialized societies, workers often have little power or control over their jobs, which fosters a sense of powerlessness in their lives. The specialized nature of work requires workers to perform limited and repetitive tasks; as a result, the workers may come to feel that their lives are meaningless. Alienation is bred not only in the workplace, but also in the classroom. Students have little power over their education and often find the curriculum is not meaningful to their lives. Like poverty, alienation is linked to other social problems, such as low educational achievement, low health status, malnutrition, violence, and suicide. Marxist explanations of social problems imply that the solution lies in eliminating inequality among classes of people by creating a classless society. The nature of work must also change to avoid alienation. Finally, stronger controls must be applied to corporations to ensure that corporate decisions and practices are based on safety rather than profit considerations.

NEO-MARXIST CONFLICT THEORY

Neo-Marxist conflict theorists such as Ralf Dahrendorf are concerned with conflict that arises when groups have opposing values and interests. Value conflicts may occur
between diverse categories of people, including nonwhites versus whites, heterosexuals versus homosexuals, young versus old, Democrats versus Republicans, and environmentalists versus industrialists. Solutions to the problems that are generated by competing values may involve ensuring that conflicting groups understand each other's views, resolving differences through negotiation or mediation, or agreeing to disagree. Ideally, solutions should be win-win; both conflicting groups are satisfied with the solution. However, outcomes of value conflicts are often influenced by power; the group with the most power may use its position to influence the outcome of value conflicts.

**THOMAS MALTHUS AND HIS THEORY**

Thomas Malthus (1766-1834), a clergy man and a mathematician, was the first to give serious thought to exponential growth in population and its consequences on humanity. People, according to him, unless checked in some way doubled their numbers in every quarter of a century.

The theoretical underpinning of this work lies in Malthusian theory of population. Reverend Thomas Malthus observed two things that necessitated his work: the rapid increase in population of Great Britain as at the time of his first publication and the law of diminishing return experienced in the area of agricultural output. Thus, he declared: “The best lands are taken up first, then the next best, then the inferior, at last the worst; at each stage the amount of food produced is less than before. If existing cultivated land were farmed intensively the same inexorable law will operate and again there will be diminishing return. Consequently, it would be impossible to maintain expansion of food production to keep pace with increasing population”.

The fundamental assumption of Malthus based on his experience of time, is that human beings are like plant and non-rational animals have the instinct and urge to reproduce. Therefore, without a check, human beings would grow to an incalculable number to fill the world in few thousand years (Weeks, 2002). In summary, the theory postulates that, population increases at geometric ratio while food production increases at arithmetic
ratio. It goes further that if the situation is left unchecked, at a time, population will grow beyond food supply. He therefore, envisaged or predicted two checks to be in control. Of course, Malthus was aware that starvation rarely operates directly to kill people; something else intervenes to kill before starvation, this he referred to as “positive” checks. They include death via war, malnutrition and pestilence. There are also “preventive” checks limit” to birth via infanticide, abortion, contraception etc which he referred to as “improper means” and not economically productive a position borne out of morality as a clergy man. He further pointed out that positive checks and other forms of preventive checks are “misery” or “vice” that would markedly lower the dignity of human nature (Weeks, 2002).

Malthus argued that, the best form of population control is the moral restraint which meant late marriage, remaining chaste for the meantime the only option to save people and their communities from “rags and squalid poverty”. In other words, poverty was an inevitable result of rapid population growth.
THE SETTING

PROFILE OF THE STUDY AREA

Profile of the Karnataka State

Karnataka is a state in south western region of India. It was formed on 1 November 1956, with the passage of the States Reorganization Act. Originally known as the State of Mysore, it was renamed Karnataka in 1973. The capital and largest city is Bangalore (Bengaluru). Karnataka is bordered by the Arabian to the west, Goa to the north west, Maharashtra to the north, Telangana to the North east, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west. The state covers an area of 191,976 square kilometres (74,122 sq. mi), or 5.83 percent of the total geographical area of India.

The two main river systems of the state are the Krishna and its tributaries, the Bhima, Ghataprabha, Vedavathi, Malaprabha, and Tungabhadra, in the north, and the Kaveri and its tributaries, the Hemavati, Shimsha, Arkavati, Lakshmana Thirtha and Kabini, in the south. Most of these rivers flow out of Karnataka eastward into the Bay of Bengal. The Raichur district is stays Krishna and its tributaries.

Demography

According to the Census of India (2011), the total population of Karnataka is about 61 million, the decadal growth is 15.67. Bangalore Urban is the largest district, comprising 12% of the state population, followed by district Belgaum (8 %) and Gulbarga (6%), each having a population of more than three million. Gadag, Chamarajanagar and Kodagu districts have a population of less than one million. The state had a sex ratio of 968 females per 1,000 males in 2011. The sex ratio was the lowest in Bangalore Urban district at 908, indicating relatively higher male in-migrants into the district. On the other hand, the sex ratio is more than 1,000 in Udupi (1093), Kodagu (1019) and Dakshina
Kannada (1018), probably indicating a relatively higher male out-migrants from these districts.

**Regional Variations**

There are large inter-district variations, particularly between northern and southern districts, in all aspects of development, including health. All but one of the six districts in the state with the lowest human development index (HDI) in 2015 were in northern Karnataka. For instance the infant and maternal mortality is 31 per 1000 live births and 144 per 100,000 live births (SRS-2010-12) and birth rate recorded around 18.3 (SRS,2013) at average in all the northern districts. The estimated life expectancy at birth in 2011 was 65.3 and lowest among northern district of Bagalkot, at 60.8 years. Not only are health outcomes poorer in northern Karnataka districts, the health infrastructure in these districts are also poorer than in more affluent southern districts.

A report by the High Power Committee for the Redressal of Regional Imbalances (HPCFRRRI), constituted in 2000, further highlights the regional disparities in health infrastructure and service facilities, especially between southern and northern Karnataka. Northern Karnataka consists of districts from the former “Hyderabad Karnataka” (Bidar, Gulbarga, Raichur, Koppal and Bellary) and parts of the former “Bombay Karnataka” (Belgaum, Bijapur, Bagalkot, Gadag, Haveri, Dharwad, and Uttar Kannada).

**Area and Administrative Divisions**

The total land area in Karnataka is 191,791 square kilometers. The state contains five percent of the population and six percent of the land area of India. With the separation of Bangalore district into rural and urban, Karnataka has now 30 districts. For administrative purposes the state is divided into four revenue divisions: Bangalore, Belagavi, Gulbarga and Mysore divisions and Raichur came under Gulbarga Division. Bangalore, the capital city, is situated in the southeastern part of the state.
Economy and infrastructure
In Karnataka, 69 percent of the population live in rural areas, compared to 74 percent in the country as a whole. Among the main workers, 63 percent depend on agriculture (cultivation and agricultural labour) compared to 65 percent in the country. The share of agriculture in the state's income was 39 percent in 1988-89, compared to 35 percent in India.

HYDERABAD KARNATAKA

Hyderabad-Karnataka is a region located in north-east Karnataka, India. It is the Kannada speaking part of the Hyderabad Statethat was ruled by the Nizams of Hyderabad until 1948. After merging with the Indian union, the region was part of Hyderabad State until 1956. The Hyderabad-Karnataka region comprises Bidar, Yadgir, Raichur, Koppal, Bellary and Gulbarga that are in the present state of Karnataka. The Hyderabad-Karnataka region is the second largest arid region in India.

Profile of Study District

Raichur District Geography
Raichur District is an administrative district in the Indian state of Karnataka, in the southern region of India. It is located between 15° 09 min. and 16° 34 min. N latitude and 75°46 min. and 77°. 35 min E longitude and in between two major rivers, namely, the Krishna and the Tungabhadra. The general slope of the district is from the north-west towards the south-east, its average height above the Mean Sea-Level being just 1,311 feet.

General Boundaries
It is located in the northeast part of the state and is bounded by Yadgir district in the north, Bijapur and Bagalkot district in the northwest, Koppal district in the west, Bellary
district in the south, Mahbubnagar district of Telangana and Kurnool district of Andhra Pradesh in the east.

**Administration**
Administratively, the district is divided into five administrative blocks (taluks), viz., Deodurga, Lingsugur, Manvi, Raichur and Sindhanur.

**Map 2.2: Raichur district Taluka locations**

![Raichur District Taluka Locations](image)

**Climate and Rainfall**
Climate of Raichur is characterized by dryness for the major part of the year and a very hot summer. The year may be broadly divided into four seasons. The hot season begins by about mid-Feb and extends until the end of May; south west monsoon is from June to end of September. October and November are the post monsoon months; and the period from December to mid-February is the cold season. December is the coldest month and May is the hottest month with temperature reaching as high as 44 degree Celsius. The heat is oppressive till the onset of monsoons. During the south-west monsoon months,
viz., June to September, the district receives about 71% of the annual rainfall, September being the month with the highest rainfall. In the post-monsoon months of October and November also, the district receives some rain.

**History of Raichur District**

The recorded history of the district is traced to as far back as the third century B.C. The fact that three minor rock edicts of Ashoka are found in this district one at Maski in the Lingasugur taluk and the other two near Koppal, prove that this area was included in the dominions of the great Mauryan king Ashoka (273-236 B.C.). At that time, this region was under the governance of the Viceroy or Mahamatra of Ashoka. Early in the Christian era, the district appears to have been a part of the kingdom of the Satavahanas. The Vakatakas, who reigned during the 3rd and 4th centuries A.D., seem to have held sway over Raichur for some time, after which it appears to have been included in the Kadamba dominions. The next dynasty of importance, which ruled over this region, was that of the Chalukyas of Badami. Later the whole of the present Raichur district was included in the dominions of the Rashtrakutas, who rose to power in the eighth century, as could be gathered from the inscriptions of that period found in this district. Numerous inscriptions of the Western Chalukyas, found in the various parts of the district, testify to the fact that this region was under their sway for a considerable length of time between the 10th and 12th centuries A.D. Later, after the fall of the Chalukyas, Raichur passed into the hands of the Kalachuri and later Sevna Yadava kings. Then came the Kakatiyas in the 13th century. From an inscription on the fort-wall of Raichur, referred to earlier, it is learn that the original fort was built by one Gore Gangayya Reddy, a general of the Kakatiya queen Rudramma Devi of Warangal, in 1294 A.D., at the instance of the latter. Raichur was sacked by Malik Kafur, was commander of Sultanate of Delhi in 1312.

Raichur district was passed to Vijayanagara Empire in 1323 after demise of Kakatiyas due to invasions of Sultanate of Delhi. It was captured by Bahmani Sultanate in 1363. It was passed to Bijapur Sultanate in 1489 after fragmentation of Bahmanids. Vicayanagara recaptured it after Battle of Raichur in 1520 but Bijapur recaptured it in 1565 after
Vijayanagara's defeat at hands of Deccan Sultanates during Battle of Talikota. Finally 1724 Raichur became part of Nizam of Hyderabad between 1724 and 1948 except British Empire rule between 1853 and 1860 as part of Madras Presidency. During Nizam rule it was part of Gulbarga Division.

**Demography**
According to Census of India 2011, Raichur had population of 19, 28, 812 of which males and females were 9, 64,511 and 9, 64,301 respectively. The decadal growth rate of population was higher in the district at 15.27 percent during 2001-2011. While the sex ratio was higher and favorable at exactly 1000, the density was lower at 228 persons per sq. km. SC and ST sections each accounted for about 16 percent of population.

**Growth in Population**
The population of Raichur has increased by 2.59 lakhs during 2001-2011, i.e., by 15.5 percent. A lion’s share of the increase is in rural areas (73%) vis-a-vis that in the rural areas (31%). Taluk wise Raichur, Lingsugur and Deodurga have contributed to this increase significantly. The same is also reflected in the growth rates with the same three taluks reporting higher growth in population.

**Urbanization**
The district is one of the low urbanized districts with hardly one-fourth of the population living in urban areas and between 2001 and 2011, the percent urban population almost remained constant at 25.2 percent and 25.4 percent, respectively. Raichur taluk has the highest proportion of urban population and Deodurga the least. Further, while urbanization ratios have increased in Deodurga, Lingsugur, Manvi and Sindhanur, it has declined marginally in Raichur taluk.

**Density of Population**
Due to the continuous rise in the population, the density of the population has steadily increased throughout the district. Raichur, Sindhanur and Manvi have relatively higher densities compared to Deodurga and Lingsugur taluks.
Demography of SC and ST Sections

The SC population was about 21 percent and ST population was about 19 percent in Raichur district. Lingsugur taluk had the highest proportion of SC population and Deodurga taluk had the highest proportion of ST population. Both SC and ST populations have increased between 2001 and 2011. Further, the sex ratio among SC and ST population is more favorable and higher than for the general population.

Literacy

Literacy is a basic indicator of social advancement of a society. A literate population is expected to be more skilled and more concerned about the social evils of the community. Moreover, many intangible benefits follow from providing literacy to the people. In this context, there has been a substantial progress in extending literacy levels by creating infrastructure and enabling milieu for people to be educated and literate. The percent of people who can read and write are considered to be literate in any socio-economic surveys. Hence, the data generated in the censuses is a good source of information on literacy attainments. About 60 percent of the population was literate in Raichur district, with 70 percent of males and 49 percent of females being counted as literates. However, the differences in female-male and urban-rural literacy rates are quite stark even today, Rural females in Raichur district have a literacy rate of about 42 percent compared to 83 percent for urban males. While Raichur taluk has reported highest literacy rates, Deodurga has reported lowest rates. The disparity ranges from 36 percent literacy rates for rural females in Deodurga to 85 percent literacy in respect of urban males in Raichur taluk.

Industry

Raichur District is industrially one of the most backward districts in Karnataka. Sindhanur and Manvi Taluks of the Raichur District are considered as Rice Bowl of Karnataka as they are blessed with good paddy grown fields. However, the district has the potential to emerge as a strong industrial base as it possess abundant natural resources like minerals, water resources, power, land, human resources, railway and road
connectivity, and being the nearest town to Hyderabad. While Gold is a major mineral available in the district, Copper, Iron, Feldspar, Granite, Sandstone, Limestone and Quartz other minerals available in smaller quantities. The Hutti Gold Mines Company Ltd; Mysore Petrochemicals Ltd; Vishal Cotspin Ltd; Farroq Anwar Company; Surana Industries Ltd; Shilpa Medicare Ltd; Raichur Thermal Power Corporation Ltd; and Raichur Solvents.

**Irrigation**

The scanty and uncertain rainfall makes it inevitable to practice artificial irrigation. The district is drained by waters of Krishna in the northern parts and Tungabhadra in the southern parts. Hence, the district has one of the high irrigation percentages. The reported net irrigated area is 193 thousand hectares, which is about 43 percent of the net sown area. Source wise, canals are the major sources accounting for 87 and almost total in Manvi and more than 90 percent in Sindhanur and Manvi. Tube wells in Lingsugur, open wells in Raichur taluk, and to a certain extent lift irrigation account for major irrigation areas. The taluk with least rainfall is having the least irrigation.

**Regional Perspectives and Backwardness**

Raichur has been one of the most backward districts of Karnataka. This is because of historical reasons and the poor resource base. According to the Directorate of Economics and Statistics (DES), Government of Karnataka, the total district domestic product was estimated at Rs. 2, 99,634 lakhs in 2004-05, which increased to Rs. 4, 20,727 lakhs by 40.4 percent during 2004-2009, which was slower than that at the state level. As a result, the district’s share in state’s income decreased from 1.8 percent to 1.7 percent between 2004-05 and 2008-09. The income disparity is very high because Sindhanur, Lingsugur and Deodurga taluk have less than district average PCGTDP. This disparity in development was also brought out in the HPCFRRRI (2002). While Deodurga was the least developed taluk in the state, Lingsugur was one of the 10 least developed taluks in 2002. Position of Manvi and Sindhanur taluks is equally precarious. Except Raichur, which was classified as a more backward taluk, all others were in the most backward category. The district had the least value of HDI in both 2001 as well as 2011, but the
percent change in the value was little higher than at the state level. With respect to GDI, though the value has increased by more than the value of the state but that has not been able to improve the ranking of the district and it continues to be in the last place. Hence, the district is backward in terms of both income and human development.