

INTRODUCTION

School age is the period when children start their formal learning and teaching and in this period they acquire certain belief, value of social skills that become a permanent part of their personality. Adequate nutrition, proper education and congenial environment are very essential for over all development of the children. Health and Nutritional status of school age children are very vital because they are the nation's biggest assets for development and harmony. The physical and mental development of school age children determines the prosperity and peace of tomorrow. Therefore, it is an index of what the nation is investing in the development of its future manpower potentials. An individual health status directly depends upon the nutritional intake.

School going children normally consists of the group of children of class 1st to 5th, and their age normally falls between 6 to 12 years. This segment of population is very prime group as far as nutritional status is concern because this is the period of their learning and maturation and all other development such as physical, mental, social, emotional and language are taken place. Schools are their first place after home where they learn the basic knowledge so that school environment and teachers are the most important constituent for their future development.

Nutrition is a basic human need and a prerequisite for healthy life. It can be defined as the process of assimilating food and the science of nutrition involves the study of all functions of growth, maintenance and repair

of the living body, which depends upon the intake of daily food. The inadequate nutritional supply may cause many serious health disorders. To supply sufficient energy to the body and other material for growth, a food must have basic ingredients such as protein, carbohydrates, fats, minerals and vitamins. Due to lack of nutrients, two possible conditions of deficiency could exist in the body. One is malnutrition means: a state in which the amounts of various ingredients are not enough; particularly minerals and vitamins or it can be said when diet is qualitative deficient. The other condition is under-nutrition in which the amount of food is inadequate. Deficiency of various nutrients could particularly affect the health status of the growing children. Deficiencies of minerals and vitamins constitute diseases, but under-nutrition also make body more susceptible to diseases due to weak resistance power.

Malnutrition is the main cause of various ill health conditions in the school children. This is born out from the fact that children always consume foodstuffs, which they get from in family. So it can be said that local food production is the mirror of the health of the people of the region. Therefore, the studies of health, nutrition and children have become very important because the health of children basically depend upon the body resistance, which directly related with nutrients.

Coming specifically to the interaction of nutrition and health, there is a general consensus that these two are complementary both conceptually and operationally. Nutritional status of an individual or a community, which is not too distant, regarded as nothing special to the nutrients and related food intake is now regarded as an indicator of national health and the quality of life. Health hazards among school children, due to nutritional deficiency, have

not received proper attention and, therefore, the present study has been proposed to wipe out this lacuna. Children of tribal community, who are inhabited in remote areas, have their own style of living. These children are mostly engaged in agriculture and allied activities. It is well known fact that the balanced diet is very essential to sustain good health.

Basically the study of health and nutrition is concerned with the scholar of medicine and home science, but various geographical components are also play vital role in the field of health and nutrition. So this type of inter-disciplinary study is very useful to detect the basic lacuna in health and nutritional status of the people particularly of children. Physical and cultural environment in which people live, their dietary habits and nutritional status are the main determinants of the health and diseases, which they suffer from. Normally medical profession though deeply involve with the remedy of health problems but they have not paid proper attention to the important geographical aspect such as the study of diseases which occur due to maladjustment with environment and improper dietary habits of the people. This way environmental and nutritional aspect always considered as secondary aspect in these studies.

The micro study of various health disorders in the light of environmental pollution and nutritional deficiency factors is one of the recent additions in the field of systematic geographical research, which is known as medical geography. This type of study represents a combination of two or more sciences such as medicine and home science and of course such types of cross fertilization of knowledge is unique for the well being of human race. The present study also related with this new scientific approach.

The International Geographical Union (IGU) constituted a commission on Medical Geography and in its first report discussed at Washington in 1952, defined medical geography as - the study of geographical factors concerned with cause and effect of health and diseases. Since then the analysis of health and disease through man-environment relationship has engaged the attention of geographers, and medical geography has emerged as a specific branch of subject.

The various views regarding medical geography are as follows:

1. Medical Geography deals with the distribution of disease and conditions under which it develops.
2. It deals with the effects of natural conditions on the health of the man.
3. The object of medical geography is the study of geographical environment of human societies and its influences on the health of the man.

MEDICAL GEOGRAPHY: DEVELOPMENT

In western countries the earliest literature in this field goes back to the Hippocratic accumulation of Greek philosophers. During the seventeenth and eighteenth centuries further progress was made when a number of books on medical geography and related topics were written. Among these, Finke, a German clinician, accumulated a large collection of data of his travels and published three volumes and named them as medical geography.¹ In the recent past considerable work has been done in the U.K. the U.S.A. the U.S.S.R. and in the Germany.

1. Razia Khan: Purpose, Scope and Progress of Medical Geography, Ind. Geog. Jour., XLVI, 1971, P-1 cf.

The most important work in this field is done by Jacques M. May, who has published several papers. In particular, his paper "Medical Geography, its method and objectives" has become a starting point for researchers.¹ His studies in Medical Geography have been published in three volumes, viz.:

1. The ecology of human diseases, 1958
2. Studies in disease ecology, 1961
3. The ecology of malnutrition in the Far and Near East, 1961.

In the United Kingdom the Royal Geographical Society, published "The National Atlas of Disease Mortality" edited by G. Melvyn Howe in 1963, LD. Stamp wrote a book "Geography of Life and Death" in 1965.

The year 1972 is a turning point for medical geography because that was the year in which Mc. Glashan's edited volume of professional geographers appeared under the title of 'Medical Geography': Techniques and Field Studies. In Mc. Glashan volume, there is an introductory section on the approach and techniques used by medical geographers and an essay on medicine and Medical Geography. During eighties (1970-1980) health care geography stream had become strong in North America and it was also in developing state those days in Britain. But at that time the health care scheme was rather separate from what might be called the ecological stream, though Prof. Pyle's (1971) useful work combined these aspects to some extent. But the development was slow, even by 1976. In 1978, Learmonth's introductory book on medical geography emerged as a milestone for the further study in medical geography.

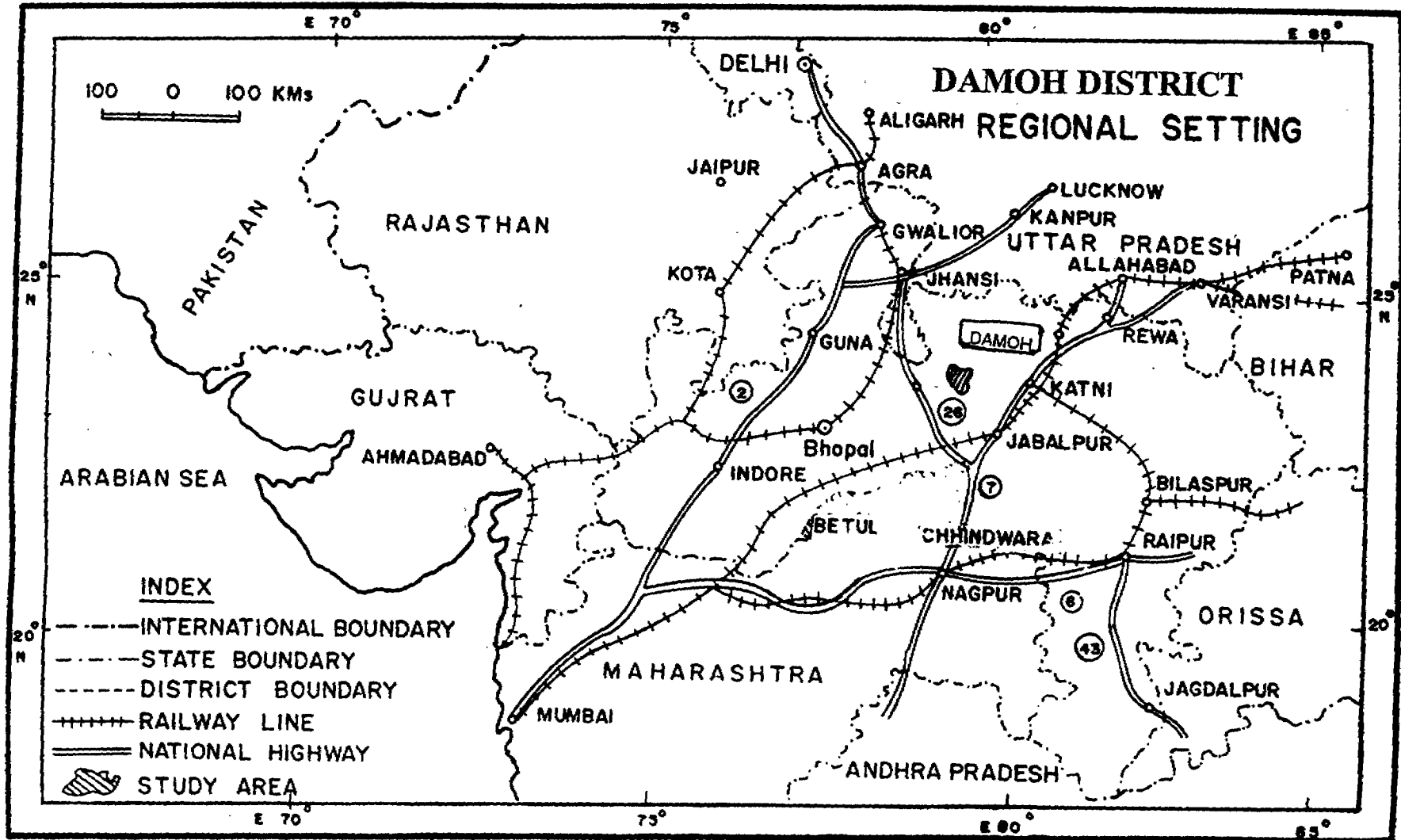
1. Jacques M. May: Medical Geography its Methods and Objectives, Geog. Rev. XL, 1950, pp-9-41.

The foundation of modern medical geography in India was laid down in 1930. Capt. A.M.V. Hesterlow, who worked on diseases of South India in 1929, introduced medical geography in India. Mc. Clelland (1859) and Macnomoia also studied few aspects in medical geography in India. But it was Andrews Learmonth who provided the scientific background to researches in medical geography. The 21st International Geographical Congress (New Delhi, 1968) provided an encouraging opportunity to Indian Geographers to contribute their research papers in this branch of the subject. After International Geography Union (Delhi), Dr. R.P.Mishra (1970) wrote a good reference book entitled Medical Geography of India. In India some of the important worker in the field of Medical Geography are Prof. M. Shafi, Prof. Rais Akhter, Prof. Indrapal, Prof. Ramesh, Prof. Kailash Choubey, Prof. Jayanti Hazara and Prof. Jaishree De.

Recently Rais Akhter and A.T.A. Learmonth (1985) edited a good reference book "Geographical Aspects of Health and Diseases in India". Besides this several research projects and doctoral work are also completed as well as in progress in various Indian Universities, particularly, Chennai, Kolkata, Agra, Madurai, Mumbai, Aligarh etc., including Sagar University where students are engaged in doctoral work. Various research projects has been completed and also are in progress in this university. Beside research work this newly emerged branch has been also introduced for teaching in postgraduate level, in various universities including Sagar University.

PROFILE OF THE STUDY UNIT

The study unit lies between 23^o9' and 24^o27' North Latitude and between 79^o3' and 79^o57' East Longitude on Sagar- Jabalpur road. The shape of the region is irregular and elongated from north and south with projections



in the east and west. The district of Chhatarpur and Panna bound the region in the north and northeast, Sagar in the west, Narsinghpur in the south, Jabalpur in the southeast and Katni is in the east. The whole of study unit lies on the Malwa-Bundelkhand plateau. The area of the study unit is 7306 sq. km. and the length of region from north to south is nearly 144.8 km. and width about 80.46 k.m.

The population of the study unit is 10,81,909 (2001) out of which 5,68,704 are male and 5,13,205 are female. The population density of the region is 148 persons per sq. k.m. and sex ratio is 902 female per 1000 male. Urban population of the study region is 2,04,315 out of which 1,07,480 are male and 96,835 are female. Rural population is 8,77,594 out of which 4,61,224 are male and 4,16,370 are female.

The literacy rate of the region is 51.07 per cent, in urban area it is 69.32 per cent while in rural areas literacy rate is 46.82 per cent. The region has 1188 primary schools and 1,43,881 children are enrolled in these schools out of which 76,683 are boys and 67,198 are girls.

STATEMENT OF THE PROBLEM

The children are the group of population segment on which future of any nation depends, so that their nutritional status as well as health should be sound because they become future active generation of the country. Basic education is the next important necessity of the child, after health. Among various multidimensional and interdisciplinary problems, which includes social, cultural and economical problems, nutrition and health related problems are the main. The problems like malnutrition and poor health in the area may be due to poverty, superstition, ignorance of parents and other

environmental factors. There are many basic factors, which are responsible for health problems among school age children:

1. There is lack of awareness about personal hygiene among the people of the study region;
2. Children do not get required food and nutrition due to low social-economic conditions. (purchasing power).
3. Children are engaged in some earning activities, and they also care their younger, to support their parents who work outside.
4. Children suffer from various health disorders due to unhealthy surrounding environment.
5. They often use contaminated drinking water and thus suffer various water born diseases.
6. Due to large size of family, parents are unable to provide/arrange sufficient diet to their children.
7. Cereals are the main foodstuffs available for them, which supply lack of mineral and vitamin to their body.

School going children in their growing stage require much more nutrients for body building and further growth. Thus the children of 6-12 years age group are selected for present study. The present study is related with health and nutritional status of school age children, which is one of the burning problems in our country. Basically the present work is an attempt to study the prevalent nutritional practices and their components in the study region, in details. The various aspects of the health, health care facilities, dietary habits, foodstuffs, nutritional deficiency, and related diseases are studied and analyzed in present study.

As far as study region is concerned, no such type of research work has ever been initiated by government agencies or any research center. Since the area under study is scholar's native place, so it was author's first and foremost priority to study and evaluate the health and nutritional status among school children in Damoh region. Since study region represents a backward area of Bundelkhand and northern Madhya Pradesh, conclusive studies achieved through this research work may prove as a guideline for policy makers.

A REVIEW OF THE PREVIOUS WORK

Despite the fact that health and nutritional status of school age children have been studied by the people of medical science, particularly by the scholar of the subject of preventive and social medicine and the people of home science faculty. There are very few scholars who have taken up this types of studies in geography.

A good deal of work has been done in the field of "nutrition" by the physicians, scientists of medicine, biochemistry, geography as well as by the scholars of home science. As far as nutritional studies of school going children are concerned, no systematic effort has been made to define the health and nutritional status of the school going children. A community-based study is needed in this regard, which will go a long way in identifying their major health problems. It also seeks to find out whether the food consumed by the children is commensurate with its nutritional value. The present research work aims to focus on diet, nutrition and health condition of school going children in distinct ecological conditions.

The large numbers of diet and nutritional survey have also been carried out by different workers on the nutritional status of school children in the developing countries. The results have shown that majority of the school

children consume inadequate diet and hence are malnourished. Shafi (1961) an attempt to make a comparative study of the food production efficiency and the availability of nutrition in term of calories in India.

Rathore B.S., Mathur H.C., Saxena did the survey of nutritional anthropometrics of 100 children in slum areas of the Jaipur compared to that of 500 children of the elite (1975). This cross sectional study made in 1973 was of 1000 children of 492 families in three slum districts without public amenities of any kind apart from limited provision of drinking water. Comparison was made with 500 children of upper class families. Measurements of slum children were significantly less than those of the elite.

Nutritional levels of different socio-economic groups at community, local, regional and national level have been assessed through food consumption surveys and food balanced sheets. The most important study at the national level was conducted by ICMR for period covering 1960, 1969 and 1982. Young children below five year of age from low socio economic groups and from rural and urban areas are noted to be suffering from some degree of PCM (Banik, 1971; Peely, 1971; Mathur, 1974; Rathore, Mathur and Saxena, 1977). Chatterjee (1976) estimates that the prevalence of PCM in children 1-5 year of age is around 70-90 per cent of the standard weight. Several other studies have also identified a relationship between PCM and the incidence of several infectious and non-infectious diseases.

Regional variation in several anthropometrics measures on young children is clearly discernible in the nutritional atlas of India (Gopalan and Raghvan, 1971). Agrawal (1986) has found out the determinates of malnutrition among children in ten selected villages of Haryana. Tiwari (1989)

has also attempted to identify the nutritional problem and made some suggestion for its improvement in Sagar - Damoh plateau.

Ayyer and Shrivastava (1968) have made an elementary attempt to work out an indirect relationship between land use and nutritional status in selected village of Bebus basin. They have pointed out the difficulty in collecting dietary data and have recommended conduct of such surveys on family basis. Pingle V. studied two tribal groups of Central India in 1973. She observed the eating habits of Kaya tribes of Andhra Pradesh and Maria Gonds of Maharashtra state. Food of Kayas is millets with some rice and pulses while that of Marias Gond is rice with little pulses. Bhattacharya (1968) analysed the agriculture land use and crop production in West Bengal and concluded that it was possible to eliminate the deficiency in cereals if a more intensive and co-ordinate drive is made by the state as well as by individual farmer. He also suggested change in the dietary habit of the people.

Khan (1969) studies nutritional deficiency diseases and environmental factor in the Central Ganga-Yamuna doab. Mishra (1970) tried to analyse the available data on morbidity and mortality by disease and has given a general account of distribution of various diseases with environmental condition in India. The work on the nutrition and deficiency disease in relation to environment in Uttar Pradesh has been done by Siddiqui (1971). Many other Universities of the country including Sagar University have since actively pursued this kind of work. Choubey (1977) studied environmental and nutritional deficiency diseases in the eastern Malwa plateau on the basis of field survey. Ali identified the situation of food and nutrition in India. Akhtar (1980) conducted field survey on the impact of environment on the level of nutrition in the Kumoun region. Some other researchers who have worked on

the problem of food with nutritional and health aspect are Ayyar, Chandrakar (1981), Tiwari (1982), Dubey (1984), Singhai (1988), Rai (1988), Patel (1989), Tigga (1989), Jain (1992), Mishra (1992), Sahu (1992), Tiwari (1992), Vishwakarma (1996) and so on.

The National School Lunch Act was passed in 1946 to provide nutritionally adequate milk and nutrition education. The programmes of collaborative effects of Federal and State Government Local Communities, School Children and their parents.

OBJECTIVES OF THE STUDY

The main aim of the present work is to study different aspects of health and nutrition, of the school children of the study unit. On the above refereed problem, we have the following objectives of the present study.

- (1) To Study the general composition and structure of schools in Damoh region.
- (2) To assess the general health and nutritional status of school going children.
- (3) To find out the main causative agents of the environment and socio-cultural environment responsible for ill health conditions of the region.
- (4) To formulate suitable interventions, strategies, to meet the specific health and nutritional needs.
- (5) To find out the magnitude and characteristics of malnutrition among the school going children of Damoh.
- (6) To highlight the socio-economic factors associated with malnutrition among the school age children.

- (7) To find out institutional facilities available in Damoh region which are primarily responsible for nutrition and health care of school children.

METHODOLOGY

The main object of the proposed survey was to work out the magnitude of malnutrition, undernutrition of the main nutrients which are deficient in their diet in various community's children of the region. The school were selected through systematic stratified random sampling method. Beside this the student / families which were interviewed were so selected that as far as possible they were equally distributed among the different communities as well as various income groups. The diet survey was conducted in study area through the oral questionnaire method. Selected children of different communities were interviewed personally.

To collect the required information a detail schedule was prepared regarding dietary habits containing various aspects i.e., their habits, parents occupation, housing condition, source of drinking water, dietary pattern, consumption of various food stuffs, special food prepared on festivals and general health troubles of the family etc. Besides this information on surrounding environment, tradition and method of cooking have also been collected during diet survey. Total 660 children of various communities has been interviewed for statistical analysis.

Information on raw food consumption of all the food stuffs taken by the family, previous day were collected with the help of mother of the children or female member who are responsible for the food preparation. Besides this, other required information has been also noted.

To find out the daily intake of various nutrients first of all children of 6-12 years were studied for age wise on the basis of four age groups. The

food consumption by a child was converted into nutritive values, so the total amount of nutrients including total calories, protein, iron, etc. was calculated.

The average intake of different nutrients taken by the children of the study unit has been calculated from diet schedule. It is a fact the dietary habits including consumption of various food stuffs was quite different in different communities of the study unit and food consumption is also influenced by various respective local factors.

The children have been divided into 13 groups according to communities on the basis of their different dietary habits, beliefs and traditions. Then on the basis of nutritive value of the food stuffs eaten by communities per child per day intake, children chart was prepared and analysed. The Bengali, Maharashtrian, Sindhi, Sikh, Christian and Gujarati children were reside only in Damoh block.

DATA BASE

The present study is basically based on:

- (i) Secondary data and information collected from the respective offices.
- (ii) Primary data has been collected through various field survey conducted personally by author herself. The under mentioned 4 schedules were prepared for the field survey:
 - (1) School schedule / survey (Appendix – A)
 - (2) Student schedule / survey (Appendix – B)
 - (3) Mother schedule / survey (Appendix – C)
 - (4) Doctors questionnaire / disease survey. (Appendix – D)

School schedule includes various aspects of schools condition, surrounding environmental condition, drinking water supply, staff members of the school, ventilation sanitation etc. Student schedule includes name, parents name, date of birth and many of student related aspects. Anthropometrics investigation have been made by standard procedure height and weight, general physical appearance, eye, skin, teeth, hair, to find out the nutritional status and food habits of the school children.

Mother schedule includes some important aspects such as housing condition, surrounding and environmental condition, drinking water supply, quality of life, sanitary habits, agriculture production, annual expenditure pattern, food habits, health care system, diseases and their treatment, nutrition programmes and health programmes, literacy of parents. Diet survey was carried out through oral questionnaire method and information regarding daily food consumption was gathered by putting questions to the mother of the child. The daily food consumption included breakfast, lunch and dinner for each child. Seasonal changes in diet are quite apparent among the people. Seasonal changes in diet among the people were noted down by putting questions to the mother of the child.

For the assessment of malnutrition among the selected children various anthropometrics measurement like weighing machine and measuring tap were used. In order to collect the relevant data for the study, the respective sources, as discussed below, have also been consulted.

- (i) Data and information about various schools and education system have been collected from District Education Officer, Damoh, as well as from office of the District Primary Education

Programme Damoh District. For the data and information about school students, building, teachers and other staff.

- (ii) Data and information about various health facilities, health statistics, have been collected from office of the District Health and Chief Medical officer, Damoh region.
- (iii) The general statistics and information have been taken from the office of District Statistical Officer of the district concerned.
- (iv) The climatic data have been obtained from Regional Metrological Department, Nagpur.
- (v) For the population data, census publications of the state have been consulted.
- (vi) Considerable literature has been received from different libraries i.e. library of NIPCCD – New Delhi and Library of Food and Nutrition Department, Nagpur University, Library of Food and Nutrition Department, M.H. College of Home Science, Jabalpur.
- (vii) Besides these, to get relevant information regarding the health and nutrition, extensive field work, have been conducted by scholar herself and various data have been collected through personal interview and well designed schedules. (Appendix)

DATA ANALYSIS

Secondary data are analysed and compared for various aspects of the student as well as for study region. Data, obtained on various aspects of environmental condition, economic and socio cultural aspects of families are analysed child wise and block wise.

Child wise food intake is carried out with the help of the table published by the NIN Hyderabad “Nutritive value of Indian Food” (1994). In

this way food stuff intake per child is considered thoroughly and the consolidated result is carefully taken consideration for the block as well as community wise.

The malnutrition survey has been carried out for children (6 to 12 years) on the basis of age, weight and height. The malnutrition status is divided into four categories (viz. Normal Grade-I, Grade-II and Grade-III) and these categories are further classified as per their percentage requirements. This classification scheme is adopted from the National Child Health Statistics, National Institute of Nutrition, ICMR, Hyderabad and Harvard Standards-Stuart and Stevenson.¹ The doctor questionnaire helped extensively to obtain the consequences of various diseases among the school age children of the study region.

PLAN OF WORK

The plan of the present work is divided into eight chapters, excluding introduction and conclusion, in which various aspect of the present work are discussed, extensively.

Chapter-I titled **PHYSICAL ENVIRONMENT** deals with physiography, location, drainage, climate, soil, and natural vegetation of the region under study. While various socio-cultural aspects such as population, density of population, educational standard, housing, food habits, drinking water etc. are discussed in Chapter-II entitled **SOCIO-CULTURAL ENVIRONMENT** Chapter-III deals with **STUDENT AND EDUCATIONAL ENVIRONMENT** in which child education, situation of school, teacher, student and student-teacher relation is discussed in detail.

1. Jelliffe, D. B., (1966), The Assessment of Nutritional Status of the Community, World Health Organization, Geneva, pp.234-235.

Chapter-IV deals with various aspects of food consumption and food intake pattern of school going children. Dietary habits of school children are also studied in this chapter named **DIET AND FOOD CONSUMPTION**.

Chapter-V entitled **DIET ANALYSIS** deals with the nutrients and their function, nutritional requirements of children, energy intake, and protein intake vitamin and minerals intake. While chapter-VI studied various aspects of **HEALTH AND NUTRITIONAL STATUS OF CHILDREN**. Anthropometrics aspects of the school going children such as age, height, weight are also studied in this chapter. Health problem related with diet and dietary habits of children are discussed in this chapter. Deficiency diseases, protein-energy malnutrition, minerals and vitamin deficiency diseases are also discussed extensively here.

Chapter-VII covers various aspects on **ENVIRONMENTAL HEALTH DISORDERS**. Determinants of health status, major health disorders and classification of diseases are discussed in this chapter. And at the last but not least Chapter-VIII entitled **HEALTH CARE DELIVERY SYSTEM** deals with concept of health, level of health care delivery system, organizational setup and health programmes prevalent, in the study area. Doctor-population ratio and Bed-population ratio are also discusses in this chapter.