INTRODUCTION
Rural health is directly influenced by the living environment and agriculture because in rural areas most of the people are engaged in agriculture and its related activities.

Malnutrition is the main cause of various ill health conditions of the rural people. This is borne out from the fact that the rural people always consume the food-stuffs which they get from their land. So it can be said that agricultural production is the mirror of the rural health. In our country more than three-fourth population directly depends on agriculture for their food. Therefore, the study of agriculture, nutrition supply and rural health has become very important. This is because the health of the people basically depends on body resistance and the resistance is made by good food supply while food supply depending on agricultural products.
This type of study relating to rural health and nutritional status in the light of agricultural production has been recently taken up by the geographers. Present problem is a combination of agriculture, nutrition and medical geography. This type of hybrid study is very useful for future planning of the region. Study of agricultural geography and study of agriculture with special reference to nutrition has been already done by many geographers during the last few years. But study relating to health, that is the study in geography of health, has recently become a field in systematic geographical research.

Due to rapid growth of population, land-man relationship has reached a critical situation. This relationship between agriculture and nutrition, which forces the geographers to undertake nutritional studies and suggest measures for improvement in nutritional level, is needed to improve the health conditions, particularly in rural areas. This is stated to be the applied aspect of the geographical research and such studies would be helpful in future planning of the area.

The main source of nourishment for the human body is food, defined as the subsistence, while yields heat or energy to build up tissues and to repair worn out tissues simultaneously to regulate body processes. Nutrition supply is very much related with prevailing land-use and cropping pattern. Therefore, suitable measures for improvement in agricultural pattern are necessary as far as improvement in nutritional
standard is concerned.

The rural areas of the country are facing very serious problem of nutritional deficiency which hampers both physical and mental development. In our country majority of population of various communities lives in rural areas and every community form homogeneous group is of mostly uniform dietary habits. Agriculture is the main source of food and majority of rural people are engaged in agriculture and its related activities.

It is a well known fact today that the diet of the rural people of a particular area is greatly influenced by local conditions of soil and climate, the density of rural population, extent of urban contacts, local religious beliefs and traditions etc. And these are the factors which determine the agricultural production of the area.

The rural population, like urban, has definite health problems. Conditions have been more favourable for the rural population in some respects as far as the healthy environment is concern. It has been customary to refer to the obvious advantages of outdoor work, fresh air, and lack of crowded conditions in rural areas as health advantages.

A food is a substance which, when taken into the body, may be digested and gives heat and energy, to build body tissues and to regulate body processes. To provide energy and material for growth and repairs to the body, food must contain certain basic ingredients. These are proteins, vitamins,
minerals, fats and carbohydrates. Nutrition is perhaps the most important single factor for the maintenance of the health and resistance to diseases. There is a direct relation between the nutrition and the working capacity of an individual, and nutrition is also directly related with the health of the people. Therefore agriculture, nutrition and rural health are inter-related.

Health hazards among rural people, due to nutritional deficiency and drawbacks in agricultural activities, have not received proper care and, therefore, the present study has been proposed to wipe out this lacuna. Tribals and other people who are inhabited in far off areas, have their own pattern of living. These people are mostly engaged in agriculture and allied activities.

It is not easy to define exactly the connotation of the term 'agriculture' derived from the two words: 'ager' which means field or soil and 'culture' which denotes the 'care of' or 'the tilling of'. Thus agriculture would mean the cultivation of the land. But agriculture includes far more than this. It also includes animal husbandry, forestry and various other activities. However, food production is by far the largest and the most essential function of agriculture.

In the present study those agricultural aspects are

studied deeply which are directly related with nutritional level of the area, i.e. main agricultural production of the area. In this way various food-stuffs which are cultivated in the area are taken for consideration. Other aspects of agricultural geography are not included.

In agricultural geography many researches have been done so far. But research in Agriculture Geography with reference to nutrition has been started by Prof. M. Shafi. Now it is realized to know the indirect effects of local agricultural production on the health of people of the area. This type of study may be very useful for improving health conditions of the rural people through modified agricultural production of the respective area.

Geographers have very recently shown interest in this specific subject. Interest by geographers in this field dates back to the past twenty-five years or so with the pioneer work of Prof. M. Shafi. He studied Eastern Uttar Pradesh and prepared 'Food Balance Sheets' to assess the caloric availability per head per day. This kind of work has since been actively pursued by many other universities of the country including Sagar University. Some other researchers who have worked on the problem related to nutritional aspects are Prof. N.P. Ayyar and Shanker Roy. And a number of researches have been also done in Sagar University in this new field.

Another important work in the field of geography of health has been done by Jacques M. May who has published
several papers, some of which can be regarded as the basics in this field. In India the pioneer work has been done by Prof. R.P. Misra, who has written a good reference book on Medical Geography of India. Faiz Akhtar has also done reference work in various aspects in this branch. Research in this new field is also in progress in Jaipur, Poona, Aligarh, Banaras and Sagar Universities.

AREA OF STUDY

The area under study 'Upper Narmada Basin' lies between $22^\circ 12'$ to $24^\circ 18'$ North latitude and from $79^\circ 21'$ to $81^\circ 56'$ East longitude. It is primarily confined to the districts of Mandla and Jabalpur of Madhya Pradesh. From administrative point of view the area is surrounded by the districts of Panna, Satna, Shahdol, Bilaspur, Durg, Balaghat, Seoni, Narsinghpur and Damoh. It comprises an area of 23,429 Sq Km and a population of 32,36,137 persons (1981). For the sake of convenience in collecting and mapping of data, the districts of Jabalpur and Mandla have been chosen for study although the area exceeds the catchment area of the Upper Narmada river.

AIM OF THE STUDY

Aim of the present study is to find out the relation between agricultural production, nutritional level and the health of the people of the region particularly in rural areas. So only specific aspect of agriculture, nutrition and medical geography has been studied to achieve the goal.
Plate No. 1

Upper Narmada Basin Location Map

International Boundary ---
State Boundary -
District Boundary ---
Railway
National Highway
River
Study Area

Source: Survey of India Atlas
The food production of a certain area plays a very important role in deciding the consumption pattern of the inhabitants. Hence it is not possible to determine the real measurement of nutrition level from nutritional availability. The author has, therefore, made efforts in this respect to calculate the actual intake of nutrients on the basis of diet survey of the study region so that a clear picture of nutrition level may appear. These studies are very necessary particularly to increase the production and reducing the problem of under-nutrition and mal-nutrition.

Man's social and cultural conditions are very much influenced by the process of learning. Such conditions are responsible for individual health character and their progress is directly related to the social and cultural structure of the area. Generally, cultural and social activities are closely bounded with the old faiths and traditions. These never provide a conductive environment for living, but they play a vital role in determining the disease pattern. (The main objectives of the study are as follows:)

(i) to assess the actual agricultural production of the area;
(ii) to determine the nutritional level of the people of the study area;
(iii) to detect the main factors responsible for poor diet of the people;
(iv) to assess the role of customs and conditions responsible for determining the diet;
(v) to account for the other geographical factors which influence the various activities in the area;
(vi) to assess the disease pattern of the study area;
(vii) to assess the role of social and environmental factors in the incidence of diseases;
(viii) to assess the health care facility of the study area.

SOURCE OF DATA

The proposed study basically depends on the field work. The scholar has used only standard methods and techniques for field investigation and suitable cartographic methods for statistical representation.

AGRICULTURE

The block-wise land use data has been collected from various Agriculture Extension Officers (A.E.Os) where all the information regarding agriculture and its related aspects are compiled blockwise. For the present study, data for the years 1982-83 to 1984-85 were collected from all the centres of the area. Other information and data about climate, forest, soil and so on have been collected from published and unpublished reports of the respective departments. Information also has been collected from District Statistical Hand Book, Census Hand Book, Gazetteer and Settlement Reports etc. Other related information has been collected from various Government offices of the districts. Information regarding various agricultural activities has also been collected directly through farmers in
the form of agricultural survey. Survey shall cover different aspects of agriculture.

POPULATION

The recent data about population has been taken from the B.O.S of different blocks for the year 1983-84, and that of food production has been compiled through the per hectare production of crops and 'anawari' method for the year 1983-84 block-wise.

NUTRITIONAL LEVEL

To know the nutritional level of the people of the Upper Gomada Basin two standard methods are used.

(i) through food balance sheet - on the basis of food production.

(ii) through diet/nutrition survey - personal interview.

For the present study the scholar has calculated the nutritional level through food balance sheet. But it is not a very correct method to know nutritional level of any area because it is solely based on secondary data. For the real picture of the nutritional level the scholar has conducted a diet survey in various rural and urban places of the study area through oral questionnaire method to avoid various lacuna found in food balance sheet method. Diet survey was conducted in the villages selected through systematic stratified sampling method.
As far as study of rural health is concerned, it is proposed to collect the diseases incidence data of different ill health conditions from the medical officers of different primary health centres of the area. For the purpose, information regarding health care services in the area was collected from all the Government hospitals (GHs) of the study area, since about 50 per cent patients are usually treated by private doctors. Normally people have more faith in private doctors. So that 32 private doctors of the region have been personally interviewed on prescribed pro forma and required information and data has been collected to know the real picture of the rural health. Besides this, during diet survey, steps were taken to collect data for general health conditions by consulting the villagers, such as living conditions, drinking water, house conditions, religious beliefs etc.

The informative data on the above aspects have been collected through extensive field work. Information on this aspect has been collected from the villages as well as from families selected for diet survey. Village report as a whole is also prepared which includes general environmental conditions, drainage system, settlements, way of living source of drinking water, roads, civic-sense, way of medical treatment etc. This is done on the basis of personal observations and with the help of interviews with the villagers.
Apart from the above literature had been gone through, as could be available from World Health Organization, National Institute of Nutrition, Medical College Jabalpur, and Agriculture University Jabalpur in addition to consulting work. Besides above several books and journals of geography, agriculture, health and general science were also consulted.

PLAN OF THE WORK

The first Chapter titled as the 'Physical Environment' deals with the Location of area, Physiography, Geology, Drainage, Climate, Natural vegetation and soils of the region under study. In the second Chapter various cultural aspects of the environment in which people live and their direct and indirect effects on the agriculture, nutrition and health such as density of population, growth of population, occupational structure of population, educational standard, facilities of transportation, industries, religions, drinking water facility and living environment have been discussed.

The third Chapter has been divided into two parts, viz. Pattern of Land Utilization and Agricultural Methods and Techniques. This deals with such topics as different land uses, Characteristics of agriculture, Agricultural seasons, Cropping techniques, Irrigation facilities and Fertilizers, which have been thoroughly discussed in this chapter.

The fourth Chapter relates to the most important part of the study as far as agriculture is concerned, study has been
made regarding detailed distribution of cereals, pulses and oilseeds crops. Further discussion in this chapter is crop combination regions.

Chapter fifth is titled as 'Production of food-stuffs and nutritional availability'. This has been divided into four parts, viz. nutritive value of food-stuffs, diet and nutrition, production of food-stuffs and level of nutritional availability through food balance sheet methods. Chapter Sixth is titled as Analysis of nutritional structure of the area. It has been divided into three parts - Diet survey method and techniques, Nutritional structure - Urban and Rural, and Level of nutrition of the area.

Chapter Seventh is titled as the Rural Health Hazards. This has been discussed with reference to general consideration of rural environment and health, and distribution of diseases in the area. Chapter Eighth deals with Rural Health Care Systems and detailed study of health facilities of the area.

In the end, which is the concluding part of the thesis, author has briefly summarised the main factors of the environment, agricultural situation, level of nutrition, incidence of diseases, health care services and suggestions for better nutrition and health care facilities of the study area. In addition, further scope for research has also been discussed.
DEGREE OF ORIGINALITY OF WORK

(i) The data collected from agricultural point of view and obtained from the Agriculture Extension Officers of different blocks of the study area are very reliable and dependable.

(ii) A diet survey was conducted for arriving at an accurate picture with reference to intake of different food-stuffs and nutrients among different communities and places in the area to assess the nutritional level of the people of the area instead of resorting to food balance sheet method.

(iii) Most of the patients go to private doctors while some go to the Government hospital for their treatment. That is why a private doctors survey was conducted in the area. In addition, different diseases incidence data has been collected from the Medical Officers of the different primary health centres (PHC), which is a very reliable source for this purpose, and they are classified according to international classification of diseases, in each primary health centres (PHC).