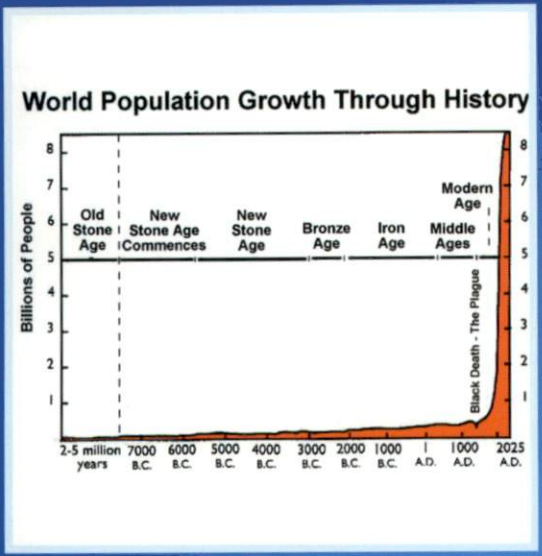
Karnataka State Open University

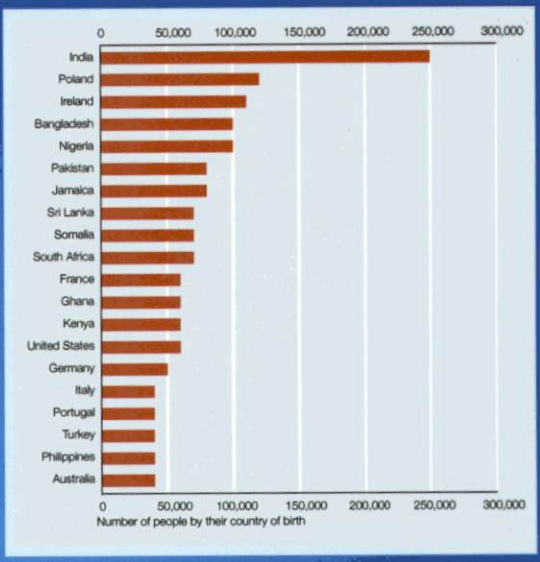
Department Of Studies In Geography

Manasagangotri, Mysore - 570 006

M.Sc. GEOGRAPHY

Second Semester





POPULATION GEOGRAPHY

COURSE - 203 **BLOCK - 1,2,3 and 4**

ಕರಾಮುವಿ

ರಾಷ್ಟ್ರೀಯ ಅಂತಾರಾಷ್ಟ್ರೀಯ ಮಾನ್ಯತೆ

- ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮುಕ್ತ ವಿಶ್ವವಿದ್ಯಾನಿಲಯವು ಜೂನ್ ೧, ೧೯೯೬ ರಂದು ಸರ್ಕಾರಿ ಅದೇಶ ಸಂಖ್ಯೆ : ED1/UOV/dated 12- February 1996 (Karnataka State Open University Act - 1992) ರ ಪ್ರಕಾರ ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಅನುಮೋದನೆಯೊಂದಿಗೆ ಪೂರ್ಣಪ್ರಮಾಣದ ವಿಶ್ವವಿದ್ಯಾನಿಲಯವಾಗಿ ಸ್ಥಾಪನೆಗೊಂಡಿತು. ರಾಜ್ಯದ ಶೈಕ್ಷಣಿಕ ಪದ್ಧತಿಯಲ್ಲಿ 'ದೂರ ಶಿಕ್ಷಣ ಪದ್ಧತಿ'ಯನ್ನು ಆರಂಭಿಸುವ ಮತ್ತು ಉತ್ತೇಜಿಸುವ ದೃಷ್ಟಿಯಿಂದ ಈ ಮುಕ್ತ ವಿಶ್ವವಿದ್ಯಾನಿಲಯವನ್ನು ಅಧಿನಿಯಮದ ಮೂಲಕ ಸ್ಥಾಪಿಸಲಾಯಿತು.
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- ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮುಕ್ತ ವಿಶ್ವವಿದ್ಯಾನಿಲಯವು ೧೯೯೯ ರಿಂದ 'ಏಷಿಯಾದ ಮುಕ್ತ ವಿಶ್ವವಿದ್ಯಾನಿಲಯಗಳ ಸಂಘ' (AAOU), ಬೀಜಿಂಗ್, ಚೀನಾ – ಇದರ ಶಾಶ್ವತ ಸದಸ್ಯ ಸಂಸ್ಥೆಯಾಗಿದೆ.
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ಉನ್ನತ ಶಿಕ್ಷಣ ಎಲ್ಲರಿಗೂ ಎಲ್ಲೆಡೆ

Karnataka State Open University
Manasa Gangotri Mysore - 570 006

M.Sc
SECOND SEMESTER
GEOGRAPHY
COURSE - 203

POPULATION GEOGRAPHY 203

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UNIT : 1 NATURE AND EVOLUTION OF POPULATION GEOGRAPHY

Structure

1.0 OBJECTIVES

After studying this unit you will be able to

- Define population geography
- Distinguish between population studies and population geography
- Understand the nature of population geography
- Understand the content of population geography
- Explain evolution of population geography
- Identify the recent trends in population geography
- Find out the contemporary issues in population geography

1.1 INTRODUCTION

Population geography is a recent sprout from the venerable trunk of Geography. But it has emerged as one of the major branches of human geography. It is one among the branches of systematic geography. Hence it is necessary to understand the meaning, nature and subject matter of this sub discipline of geography. Hence let us try to understand all these aspects in this unit and try to explain how population Geography is different from the discipline of population studies. We also focus on the growth of population geography as a separate branch and the scholars who have contributed for the development of this branch.

1.2 MEANING OF POPULATION GEOGRAPHY

There are two terms viz., Population studies and Demography which are normally used inter-changeably. But there is difference between these two terms. Demography deals mainly with the components of population change i.e fertility, mortality and migration. Population studies on the other hand deals with not only the components of population change but also with the relationship between population change and many other variables such as Social, Economic, political, biological, geographical psychological etc. Thus population study is more comprehensive and broader than Demography. However, many scholars nowadays do not approve this kind of artificial distinction between population studies and Demography. The term population study has been more familiar in recent decades and received higher acceptance.

The discipline of population study is mainly concerned with size, structure, characteristics, distribution and the changes taking place in these over a period of time. It also deals with fertility, mortality and migration. The subject also examines the underlying causes of population phenomena.

Population is a multi-disciplinary subject as it encompasses much wider field including social, economic, political, geographical etc. It is therefore the subject of concern of many scientists' especially social scientists. Each social science has contributed towards the understanding of the subject properly and from different perspective.

Geography also deals with the subject of population from its own perspective. The perspective that is adopted by geographers in the study of population is spatial perspective. It means in population geography we study how various population variables vary from space to space in addition to variations from time to time. It is this aspect which distinguishes population geography from population studies. Thus the study of various aspects of population from the spatial perspective is population geography.

1.3 DEVELOPMENT OF POPULATION GEOGRAPHY AS A SEPARATE BRANCH : TREWARTH 'S CASE FOR POPULATION GEOGRAPHY

As we all know geography has been for a long time concerned with man – environment relationship with a greater emphasis on physical aspects. Hence human elements were missing almost up to the later half of the 19th century. Foundation for human geography was laid only towards the end of 19th century by Friedrich Ratzel who coined the term "anthropogeographie" and the term anthropo means man.

The works of Ratzel attracted the attention of many scholars in different parts of the world which led to emergence of human geography as a main branch of geography later. Scholars like Vidal de la blache, Jean brunes, M.Sorre, Hettner etc. were mainly responsible for this development.

However the during this time also population remained a neglected field in the overall scheme of human geography almost up to middle of the 20th century. Population was only a topic regional geography emphasizing on the size and distribution of population in a country or a region. But geographers like Arther Geddes (1941), Baker (1928), Mecarty (1942), Aurousseau (1923), Jefferson (1909) etc have emphasized the need for the greater attention to population aspects in geography. In spite of all the efforts by these scholars population geography did not emerge as a separate sub branch of geography.

It was in 1953 however a significant shift took place in the history of population geography when Glen T.Trewarth came out with most influential statement on this subject while delivering his presidential address before the association of American Geographers. He argued that the number, density, quality and other attributes of population provide essential background to all branches of geography since geography is basically anthropocentric in nature. Population is the pivotal element in geography and around population all other elements are oriented. According to him "population is the point of reference from which all other elements are observed and from which they all, singly or collectively, derive significance and meaning". Therefore Trewartha, said any neglect of population study will cause serious injury in general.

Geographers later realised importantance of this sub field which led to the emergence of population geography as an important sub-field in geographical science. Thus emergence of population geography as a separate branch owes much to the influential appeal by Trewarth to his fellow geographers.

1.4 FACTORS RESPONSIBLE FOR DEVELOPMENT OF POPULATION GEOGRAPHY : ROOTS OF POPULATION GEOGRAPHY;

In spite of the appeal made by Trewartha which is regarded as a turning point in the emergence of population geography as a separate branch, the development was neither sudden nor unexpected. There are sex interrelated factors which are identified as significant development both within geography and outside during earlier periods and in 19th century which helped a great deal in the emergence and expansion of this sub – field.

One of the important factors which favoured the development of population geography was the increasing availability of population statistics. The UN agencies, Census Organization of various countries of the world and several government and private agencies were involved in collection and compilation of population data. These sources of population data across different countries were used by geographers also successfully which led to development of population geography.

Advances made in population mapping was another impetus for population geography. The growing availability of data after the II world war facilitated the mapping of various demographic variables relating various regions and countries of the world.

Another important factor which induced the development of population geography is greater emphasis given in geography on man as opposed to determination. French scholars especially were responsible for this kind of development in geography. Growing recognition of human elements in geography thus helped the emergence of population geography.

Increasing use of computer aided quantification process also helped geographer handle large sets of data pertaining to population attributes. The new methods of data analyses developed especially in the fields such as population study also contributed for the development of population geography as an important branch of study.

Societal concern relating to population issues gained importance especially after the onset of demographic transition in many countries of the world by the turn of the 20th century. This has resulted in the unprecedented growth of human population which in the effected the process of economic development of many countries of the world. As a result there was growing consciousness among the people, academicians, administrators etc regarding population expansion and its adverse effects. This development has naturally encouraged geographers also to take up the in such regarding population and study from spatial perspective.

Lastly creation of institutional framework both at national and international level to promote and organize the work involving various population related issues helped the development of population geography. UNEPA, WHO population crisis committee, population reference bureau etc are some of the first category organisation at the global level. International parenthood, American home of economic association, International women's committee, Family health international etc are the second category organization. D.K.Tyagi fund, population services social development centre etc are the III category organization. Besides several educational and research institution universities, NGO 's also take up research and training programme relating to population. All these institution have made significant contribution towards generating awareness regarding approaches problems. These intuitional make contributions through publication of materials providing fund or technical assistance to the people who take up studies about population related problems. Thus the institutional framework created all over the world has helped the development of not only population geography but also population studies in general. Thus all the factors mentioned above were together responsible for the development of population geography as a sub-discipline of geography.

1.5 NATURE AND SUBJECT MATTERS OF POPULATION GEOGRAPHY

There are two terms in population geography first one is 'population' which refers to the subject matter and second is 'geography' which refers to the perspective of investigation. Thus as already pointed out earlier, population geography can be interpreted as the study of population from spatial perspective. Trewarth argues that population geography is concerned with the understanding of the regional differences in the earth's covering of the people. Just as area differentiation is the themes of geography in general, so is of population geography in particular.

Trewarth gave a comprehensive outline of the content or subject matter of population geography which could be broadly grouped into three categories they are,

1. A historical account of population (pre-historic and post-historic)
2. Dynamics of number, size, distribution and growth pattern.
3. Qualities of population and their regional distribution.

Historical account of population is not easy because of the lack of statistical evidence for the period earlier to 200 years or so from the present. In such cases geographers should collaborate with anthropologist, demographers and historians and adopt indirect methods to construct the past and pre-historic population for different regions of the world.

Another important part of analysis in population geography is spatial analysis of world population pattern, population dynamics in terms of fertility and mortality, population distribution in the world and settlement types, inter regional and international migration etc.

Analysis of the qualities of population is the third important aspect in population geography. Trewarth suggested two broad groups as far as qualities of population is concentrated

1. Physical qualities which includes race, sex age, health etc and
2. Social economic qualities which consists of religion, education, occupation, marital status etc

Trewarth a has dealt with all these topics in his book- A Geography of population: world patterns, published in 1969.

After trewarth a, it was John.I. Clarke who made significant contribution for the development of population geography. According to Clarke population geography is mainly concerned with demonstrating how spatial variation in population and its attributes such as composition, migration, growth etc are related to the spatial variation in the nature of place. In his book population geography 1972, he opines that the main endeavour of population geography is to bring to light the complex relationship between the population phenomenon on the one hand and the environment on the other.

W. Zelinsky a contemporary of Clarke defines population geography as "a science that deals with the ways in which geographic characters of places is formed by and in turn reacts upon a set of population phenomenon that vary within it through both space and time". He wrote a book on population geography in 1966.

J.Beaujeu Garnier a French geographer in her book Geography of population published in French 1956-58 and in English in 1966 argued that geographic analysis of population is confined to 3 main aspects,

1. Distribution of population on the globe
2. Evaluation of human society
3. Degree of success which they have achieved.

In 1970 a book viz., population geography – A Reader was edited by Geoge E.Demko and others in which the authors have stated that population geography is concerned with the analysis of the spatial variation in various demographic and non-demographic qualities of human population.

Daniel Ndin in 1979, expressed in his book geographic de la population that population geography is concerned mainly with the distribution of population, components of its growth and characteristics. Again in 1979 G.L peters and R.P Larken in their book viz., population geography – problems, concepts and prospects accepted the definition given by earlier scholar. According to R.J.Proyer in 1984, population geography deals with the analysis and explanation of interrelationship between population phenomena and geographic character of places as both these variables differ over space and time.

R.Woods added a new dimension to the study of population geography. He wrote two books viz, population analysis in geography (1979) and theoretical population geography (1982) in which he extensively used various models and qualitative techniques to analyse the behaviour of demographic variables. He gave a special emphases for the analyse of components of population change viz, fertility, mortality and migration.

R.C.Chandana and M.S.Sidhu brought out a text book on population geography in 1980 which was infact a first attempt by scholars of third world countries. According to these population geography is concerned with,

1. temporal-spatial expansion of population attributes.
2. explanation for such temporal and spatial expressions and
3. the process involved in the creation of such temporal-spatial expansions.

Among the scholars of former Soviet Union Melezin and Pokshishevskii are important. Melezin describes population geography as the study of population distribution and productive relationships existing within various population groups, the settlement network and its fitness,

usefulness and effectiveness for productive goals of society. According to Pokshishevskii the basic goal of population geography was the discovering and application of laws that govern,

1. Distribution and dynamics of population
2. Formative processes affecting settlements network and
3. Development of settlement and their relationships.

But these kind of explanation of population geography is difficult to be accepted as it leads to population geography becoming more of a settlement geography.

In conclusion, it may be pointed out that population geography is concerned with three aspects mainly,

- Size and distribution of population
- Analysis of population dynamics-population growth and its spatial variation, components population change i.e. fertility, mortality and migration
- Population composition and structure such as age-sex-composition, marital status, religion and linguistic composition, race and ethnicity, literacy and educational level and occupational structure.

In addition to the above, population geography also deals with various other aspects like Population polices of the government, relationship between population and economic development, population and environmental quality and similar other issues.

1.6 RECENT DEVELOPMENT AND CONTEMPORARY ISSUES IN POPULATION GEOGRAPHY

The sub-discipline population geography has witnessed enormous growth and diversification after 1950's or so. Many universities all over the world have introduced the subject as an independent sub-discipline at the graduate and post graduate levels. Further many text books on the subject have emerged in different part of the world during the last 50 years or so.

In addition to the study of distribution and composition of population, the study of population dynamics also received the attention of geography especially migration analysis. R.I.Woods suggested that population geographer should redefine the core of this subject and master the modern techniques. After that, there has been a reordering of emphasis and resultant

significant contribution from population geography in the areas of modelling and estimation, policy oriented research etc. which aim at assessing the impact of population programmes and causes of long term demographic changes.

At present population geographers are concentrating on assessing the relationship between population and food supply, urbanization, status of women, ageing of population, gender inequality, demographic regions, demographic dividend etc. Population geography thus occupies a pivotal position in research and teaching fields.

1.7 LET US SUM UP

We have so a discussed regarding various aspects of population geography including the meaning, subject matter, evolution, the factors conductive for the development of population geography. In conclusion it can be stated that population geography is a recent branch of geographical science and its deals with population related issues from the spatial prospective. We also noted that Glan T.Trewarth made a strong plea for the development of population geography in 1953. His plea was very will received by geographers all over the world and helped the evolution of population geography as a separate branch. In addition to this there were many inter-related factors which were responsible for the evolution of this subject.

1.8 KEY WORDS

Demography, population studies, population geography, population ageing, Demographic dividend, demographic regions, population mapping.

1.9 QUESTIONS FOR SELF STUDY

1. Define population geography.
2. Distinguish between population geography and population studies.
3. Bring out the nature and subject matter of population geography.
4. Explain the evaluation of population geography.
5. Explain the factors responsible for development of population geography

1.10 FURTHER READING

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UNIT : 2 POPULATION GEOGRAPHY IN INDIA AND APPROACHES TO POPULATION GEOGRAPHY

Structure

2.0 OBJECTIVES

After studying this unit you will be able to,

- Trace the growth of population Geography in India.
- Identify the persons contributed for the development of population Geography in India.
- Understand the various approaches to the subject of population geography.
- Define system and understand its structure.
- Understand the relevance of behavioural approach to population geography.

2.1 INTRODUCTION

Population Geography in India as in the case of elsewhere in the world, is a recent development. It was started only in 1960's but it is developed as a very important branch all over the country. There is in fact no P.G. dept in Geography which is not offering population as a subject. It is therefore necessary to understand the process of development of population geography as a separate branch of geography in India and to highlight the contribution responsible for its development.

Every subject has its own approach of study. In population geography also there are mainly two approaches viz, system approach and behavioural approach which have to be examined. These two approaches are dealt with briefly in the following pages.

2.2 POPULATION GEOGRAPHY IN INDIA

As in the case of population geography at the global level population geography in India also had a late start. Yet the progress made in the field of population is remarkable.

Population geography as a separate branch of geography was started in India only during early 1960's or late 1950's. Geographers from Punjab University, Chandigarh played a pioneering role in providing initial framework for the development of this sub-discipline in the country. It was G.S.Gosal of Punjab University who did his doctoral work in 1956 under the guidance of G.T. Trewartha on population from a geographical perspective. After he came to India from USA he guided other geographers of Punjab university, Chandigarh to get their doctorate degrees in the field of population. R.C.Chandna, Gopal Krishnan, Swarnajith Mehta were able to get their doctorate degree working on various aspects of population geography under the guidance of G.S.Gosal in late 1960's or so from Punjab Univeristy.

Punjab university was also the first university to introduce teaching and research in population geography at the P.G. level in Geography in early 1960's. The department of Geography of the Punjab University later emerged as a major centre of research activities in population geography. In fact first text book on population geography viz 'An Introduction to population geography' was brought by R.C.Chandna and M.R. Sidhu of Punjab University n 1980. After words population geography was introduced both at undergraduate and post graduate levels in other universities of the country. Today probably there is no post graduate department of geography in the country which does not offer population geography as a sub-discipline. It shows the kind of development the sub discipline has made during relatively short span of its existence in the country.

Today there are many text books on population geography written by many scholars in India, R.C. Chandna, Lal H.Ojua, M.J. Hussain, R.K.Tripati etc not only in English but also in Hindi. In addition to the text books in every university quite a large number of teachers and researchers are engaged in research activities relating to various aspects of population geography.

The philosophy of population geography in India is same as that of geography in general. In case of population geography also the dominant mode of enquiry is spatial perspective. As Gosal has pointed out population geography in India focuses itself on spatial distribution, spatial relationship and spatial interaction while dealing with any demographic phenomenon.

After reviewing the literature Gosal also has pointed out that the studies on population geography have been mainly empirical in nature. It means there are not many attempts towards theorisation process. But there are attempts in recent years by doctoral students towards adopting "Theory to facts" approach. What is required however is a balanced application of the two approaches viz, empirical and theoretical, which promote not only the development of population geography but also geography in general in the country.

Adequate training in quantitative techniques and exposure to methods of other social sciences also is an important requirement for population geography to adopt theoretical approach in their field. At present population geographers in the country have not been extensively adopting model ,building theory formulation and hypothesis testing Process in their research. This is very important challenge for population geographers of India in future.

Another trend that is noticed among the studies made by population geographers in India is that secondary data is the dominant sources of data and attributes of population for which secondary data is available are normally taken up by researchers and spatial pattern

for these attributes are described. That way the tradition of conducting field work and collecting primary data is not still very common among the population geographers. Among the secondary sources census data is very significant sources. Hence census of India has been instrumental in the evolution and development of population geography in India.

In addition to data from secondary sources, scholars in India of late started conducting primary survey and collecting primary data at this level for their research relating to various attributes of population, during the last two decades or so.

Besides collecting data from the field investigation population geographer of India also required to acquire adequate knowledge about demographic and sophisticated statistical techniques and incorporate them not only in teaching of population geography but also in their research work.

2.3 APPROACHES TO POPULATION GEOGRAPHY

Every discipline or sub-discipline has its own approach of study. Population geography is not exception to this general rule. Before Trewartha the study of population was part of regional geography and regional geography of all the regions included a chapter on population geography of concerned region. However after 1953 population study in geography was shifted from the realm of regional geography to that of systematic geography thus adapting a topical approach. Since then population geography has emerged an independent systematic branch of geography.

In addition to systematic approach, to study population geography there are at present many more approaches which are adapted among them behavioural approach and systematic approach are note worthy. Here these approaches are dealt with briefly in the following pages.

2.3.1 Systems Approach

It has now become customary to seek answer to many problems of geography within the framework of systems theory. The systems approach can provide a methodology that can handle very complex situation. Hence this approach possesses great potentiality as a research tool not only in geography in general but also in population geography.

It is therefore necessary to deal with various aspects of systems approach and to understand this approach properly before thinking of adopting this approach in the research. Our understanding of the concept of systems itself is very important before application of systems analysis in our discipline. Hence it is necessary to define the concept of system first.

- **Concept of system**

A system refers to "A whole which functions as a whole". It could be a person, a state, a culture etc. it refers to a set of objects which have inter dependency.

Various phenomena operate in space act and interact upon each other not in isolation but in integration, with other phenomena which together constitute a system. For instance various parts of human body function as a whole, but not when they these are isolated. Similarly whatever happens to one organ or part of the body will have its impact on all other parts since all of them are interrelated and inter dependent. Thus they work as one unit and not as a separate part. This principle applies to any set of objects which have inter-relationship with each other. Hence systems analyse provides a research methodology and possess great potential as a research tool in various disciplines including geography.

The roots of system approach lies in general system theory that was developed by biologist in 1920's. It was Ludwig Von Bertlanffy who advocated that the system approach is needed to understand the laws which govern the life of any organism. It means all the organs or parts of an organism should be treated as a system and every part of that system needs to be understood to know the overall functioning of that organism.

After words researchers have realised that this approach can be applied to non-biological systems also. A general system is a higher order generalisation of a multiplicity of systems which individual sciences have recognised. This is a way of unifying sciences, which has led to inter-disciplinary approach in research. The general system theory is thus a theory of general models which could be applied to any scientific research including geography and population geography.

A system is a set of objects and 'set' implies that each unit is constrained by, conditioned by or dependent upon the state of other units- thus a system consists of

1 A set of elements identified with some variable attributes of objects.

2 A set of relationships between these attributes of objects.

3 A set of relationships between these attributes of objects and the environment.

- **Structure of a system:**

  After a system is defined it is essential now to understand what makes up a system. It means we have to understand its structure.

  Every system consists of elements and links between these elements. Hence it is necessary to understand the terms 'elements' and 'links' in order understand the structure of system.

- **Elements of a system:**

  Elements are the basic units of any system. From the mathematical point of view an element is a primitive term that has no definition. However, the structure of a system is the sum of the elements and the relations between them.

  The definition of an element depends mainly upon two aspects. One is the scale at which we conceive of a system, for instance a country may be considered as an element of a global system, but a country itself is a system at the lower level having states as elements. Similarly, a car may be an element of a traffic system but a car can be considered as a system by itself consisting of various parts. Same way each individual may be regarded as a biological system though at higher level all individuals make up a social system. Thus it is clear that the definition of an element depends on the scale at which we conceive of the system.

  Another problem in system building is that of identification of elements. Identification of element in very difficult. In mathematical terms there is an element in a variable. In geography or population geography we have to construe the element as an attribute of some defined individual rather than as the element itself.

- **Links or Relationships:**

  The links or the relationships between the elements are the second component of a system. Various elements of the system may be linked with each other in a number of ways which need to be explained. The various forms of relationships may be explained as follows,

  1 Series relations.

  2 Parallel relations.

  3 Feedback relations.

  4 Simple compound relations.

  5 Complex compound relations.

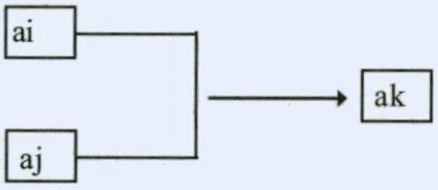
Of the five relationships mentioned above three basic forms of relationships are explained below.

1. Series relations :

As shown in the figure this is the simplest form and is characteristic of elements connected by irreverable link. Thus ai-aj forms a series relations which indicate only cause and effect relations, Where one variable effect the other for instance irrigation effects the yield of a crop.

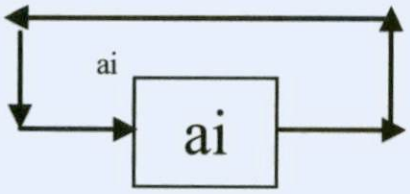
2. Parallel relations :

This form of relationship refers to a situation where two or more elements affect the third element. Thus ai&aj together affect ak. For instance precipitation and temperature influence vegetation.



3. Feedback relations:

This relationship describes a situation in which one element influence itself. For example the leguminous crops sown in the field enrich nitrogen of the soil and thus the crops get effected, Here aj is affected by aj itself.



The relationships thus form a kind of 'wiring system' connecting the elements in various ways.

- **Behaviour of a system**:

  Behaviour of a system refer to inter-relationships among the elements and reciprocal effect on each other. Behaviour is thus concerned with flows, stimuli and responses, inputs and outputs etc. Both the internal behaviour of a system and its relation with environment are to be examined to understand the systems approach properly.

Systems approach and population geography:

The geographers can make use of system approach while dealing with various demographic attributes. This will help them in generating models which can be ultimately lead to the formulation of theories. There is as vast scope in population geography to apply this approach. For instance in the study of migration, the elements of the system of rural-urban migration may consists of potential migrants, institutions and job providing organisations, distances etc... which are inter connected. Similarly in the study population growth many variables such as fertility, mortality and migration could be considered as elements. Fertility again can be a system with various elements such as literacy level, income, social status etc. Thus in many demographic situations the systems approach can very successfully be adopted that can help in generating models and formulation of theories.

It is clear from the above analysis that the systematic approach facilitated by the use of traditional tools helps in unfolding the spatial distributions while the other two approaches viz, behavioural and systems approaches offer new models of explanations for the reasons behind these spatial patterns.

2.3.2 Behavioural Approach:

In the study of population geography more emphasis was given by geographers on economic, cultural and environmental explanation of the spatial pattern of various attributes of population. The behavioural revolution that took place in geography in 1970's added a new dimension to the explanation in geography.

The application of behavioural approach to geographic study of any phenomenon has brought a qualitative change in geographic analysis. Under behavioural approach more importance was put on the behavioural aspect of the human beings and on the way their behaviour influences the decision making process relating to attributes such as fertility, migration, literacy and education, occupation etc.

The interview techniques used in disciplines like sociology, anthropology, psychology etc and simulation techniques have found favour with these who advocate the use of behavioural

approach to the study of population phenomenon in geography. Thus human behaviour is considered as an important indicator which influences the trend and spatial patterns of various demographic attributes over time and space.

2.4 LET US SUM UP

Let us now sum up the whole discussion that we have made above. It is clear from our discussion that the growth of population geography in India has been phenomenal though it had a late start as elsewhere in the world. The subject owes its origin to Punjab University, Chandigarh, especially to the efforts made by Prof.G.S.Gosal. Then it has spread gradually to other parts of the country and at present there is no P.G department in Geography which probably does not offer population geography as an optional paper. In addition to this there are large numbers of scholars engaged in research relating to various aspects of population geography.

Coming to the approaches to the population geography we have identified mainly three approach viz, Systematic Approach, Behavioural Approach and Systems Approach, which are useful in the study of population geography. All these approaches are very relevant and have their own merits. These approaches can be adopted depending upon the purpose of study, kind of attributes one wants to study etc.

2.5 KEY WORDS

Systematic approach, Behavioural Approach, Systems Approach, elements, links, series relationship, parallel relationship, feedback relationship, structure of a system

2.6 QUESTIONS FOR SELF STUDY

1 Write a note on the development of population geography in India.

2 Explain various approaches to the study of population geography.

3 Explain behavioural approach and its relevance to population geography.

4 Define systems approach. Explain the structures of a system.

5 Bring out the importance of systems approach in population geography.

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UNIT : 3 SOURCES OF POPULATION DATA AND PROBLEMS

Structure

3.0 OBJECTIVES

After studying this unit, you will be also to

- Identify the sources from which data relating to population can be obtained.
- Explain the meaning and nature of census.
- Understand the defects of census data.
- Understand the others sources of population data.
- Identify merits and demerits of various sources of population data.

3.1 INTRODUCTION

The study of any subject or topic requires relevant and reliable data. The data need to be collected from various source adopting different techniques of data collection. In population geography also vast and variety of data are required on number of attributes at various levels right from house hold to village level, taluk level up to national level, micro to macro level. Therefore it is necessary for a population geographer to understand what are sources from which data related to various demographic aspects are available, type of data that is available and the level at which the data is available. It is in this context, a brief analysis of the sources of population data is made below.

3.2 BASIC SOURCES OF DATA

Population geographers requires large variety of data pertaining to various attributes of population for number of regions or countries at a given point of time. The type of data required also depends upon the scale of the inquiry. The data could be from either the primary sources or secondary sources.

The census, surveys, the registrations, migration reports, estimates and projections are among the primary sources of demographic data as they are collected through field sources. The data available in statistical abstracts, year books, journals, text books, research projects reports etc are important among the secondary sources.

Let us now discuss briefly about the various sources of data mentioned above.

3.3 THE CENSUS

The census is the most important source of data for the population geographers at present even though the quantity and quality of data varies from one world to another one from country to country.

Though modern census is the phenomenon of relatively recent period i.e 17th century and on words, there are evidences to indicate that enumeration of people were carried out in different parts of the world during the ancient time also. It had its beginning in Egypt, babylonia, china, palentine, Rome etc. However the purpose of such enumerations was very limited to heads of households, males of military age, tax payers, adult citizens etc and women and children were kept out of census.

The modern census which was started in seventieth and eighteenth centuries in countries like Quebe in Canada in 1665, Ireland 1703, USA 1790, is a different from the ancient type of census.

The modern census is defined as "the total process of collecting, compiling and publishing demographic and social data pertaining to all persons of a defined territory at a specified time. It is done at regular intervals such as once in five years, ten years etc. In case of India it is done once in every ten years starting from 1871. After that census in India has been conducted regularly once in ten years. The latest census in India was conducted in 2011. Though census the information on the number of people, rural and urban distribution Age, Sex, Religion, Literacy, Occupation, Migration etc are collected.

Over a period of time modification have been introduced in the census in order to improve the qualities of the census data and to widen the scope of census data. There has been modification in the definition of urban centre, concept of workers and in the classification of industrial categories which have improved the quality of the census in India. In addition to this new concepts also are added from census to census.

Two approaches are normally adopted in census. They are defacto and dejure. In defacto approach each individual is recorded at the place where he/she is found at the time of enumeration. In dejure approach each individual is recorded at his/ her normal or usual place of residence. Further the entire population is counted simunsteneously at a specified point of time. Say a week or a fortnight. The particular time and data of the actual counting is referred to as references date or census moment.

3.3.1 Limitations / Problems of Census data

The censuses even though very significant sources of data suffer from many problems/ limitations. One of the important limitations is that of its quality Zelinsky has pointed out there is correlation between the stage of economic development of a country and the quality of its census. In less developed countries there is a problem of funds and personnel. In addition to this, these countries have the problems such as illiteracy, ignorances, suspicion, low level of technological development etc because of which the task of census enumerator is quite difficult which result in lower quality of data. In MDCs on the other hand census data in general are more accurate and reliable compared to that of LDCs.

Frequent boundary changes both at international and intranational level is another limitation of census data. Boundary modifications introduced from time to time restrict the utility of census data especially when we want to make a temporal analysis for instance disintegration of formers USSR and formation of old countries reunification of west and east Germany etc at the national level and frequent formation of new districts in Karnataka formation of new state in India etc at the international level.

Another problem with regard to census data is that there is wide gap between censuses during which considerable changes take place in various demographic attributes. Most of countries conduct decennial census having a long gap of ten years. It is therefore suggested that sample surveys may be conducted after five years of census which may fill the gap between two census.

One more problem that is observed is that there is also wide gap between the enumeration and publication of census data. Provisional statistics are provided soon after the census enumeration. Much of the basic information is made available within year or so. But for some attributes such as migration etc it takes four to five years. This impedes the utility of census data.

In more developed countries where enough funds are available the task of census counts is entrusted to either statisticians or demographers who are very well trained in this field. But in less developed countries due to pare city of funds little trained petty government offices are intrusted with the task of census taking. This has its impact on the quality and reliability of census data.

In addition to the limitations mentioned above, we find that there are still many countries where census are not conducted for example Ethiopia Lebenon, Yamen etc. Further is some countries where census is conducted it is limited only to some demographic attributes only.

Thus international comparison of demographic situation is not possible for all the countries and for all the attributes.

In spite of the problems mentioned above the census continuous to be one of the most important primary sources of population data not only for population geographers but also for all the social scientists. Keeping this in view the process of improving the census taking continues in all census taking countries. More and more countries are joining the family of census taking countries. The UNO also is assisting the LDCs in conducting the census operations in a more scientific manner so that the data becomes more and more reliable.

3.4 SAMPLE SURVEYS

Collection of data from the entire population of the country is known as a census, on the other hand collection of data only from a part of the population i.e from a selected households in a village / urban centre is regarded as a sample survey. Surveys can be conducted for supplementing the census data or for further investigating the determinants of a particular attribute such as fertility, mortality, migration, unemployment, health, education and welfare etc.

These kinds of survey are increasing now a days both in MDCs and LDCs. In India national sample survey organization was established in 1950 for collecting comprehensive and continuing information on socio-economic and demographic variables through sample surveys on country wide basis.

The sample surveys have many advantages over the census.

1. The sample survey updates the census count taken some time in the past.
2. It also supplements the census data.
3. It requires a smaller number of staff and hence it is less expensive.
4. Information on required topics can be obtained in detail which is not possible in census.
5. More skilled people can be involved and properly designed questionnaire can be used.
6. Because skilled people are involved the data can be accurate and more reliable.
7. Sample surveys can be conducted more frequently.

In spite of these advantages, the sample surveys cannot replace the census. Hence sample surveys and the census are complementary to each others.

Several demographic surveys have been conducted in India using the technique of sample survey. The important demographic surveys are survey conducted by the institute of politics and economics Poona (1952-56), The Mysore population study (1953), The Patna demographic survey (1955), The family planning, survey conducted by ORG (1970). The national family health survey (NFHS) (1992) etc.

3.5 VITAL STATISTICS OR REGISTRATION OF VITAL EVENTS

Vital statistics refers to record of those events which are considered to be vital in the life span of a person. The events are birth, death, migration, marriage, divorces etc. These events occur continuously in all the societies. Hence such events are continuously recorded. This recording or registration of vital events is known as the vital registration system or civil registration system.

This vital statistics is an important tool for studying the dynamics of population. This vital registration system is very perfect in MDCs such as USA, Canada, U.K, France, Sweden etc. In LDCS however hours this system is not perfect since in these countries such as India, Pakistan, Bangladesh etc a sizable number of births and deaths are not reported. As a result records remain incomplete and imperfect. The inaccurate data on vital events in the LDCs due to poor coverage is a major hurdle for researchers in these countries to make analysis on population dynamics.

The history of registration of vital events is a long one. It was first done by church and other religious bodies and it was started some time in fifteenth century. Later it was adopted by several countries of Western Europe during nineteenth century. Today many countries of the world have adopted the system.

The system of registration of vital statistics was adopted in India during British regime about hundred years back. Registration of births and deaths was made compulsory in India by an act passed in parliament in 1969. But the coverage of registration in India is far from satisfaction the extent of non-reporting of birth and death is found to be very large especially in rural areas due to illiteracy, ignorance etc. Hence this statistics can not be very fruitfully used by researchers in India.

3.6 INTERNATIONAL PUBLICATION

In additional to the sources mentioned above publication by united nations and other international organisations such as world bank etc are very important sources of data for population geography. Some of these publications which are very important are mentioned below

1 Demographic year book: United nation publishers this book annually which contains data for the while world and the different countries. It provides data on wide ranging topics such as population size, area, density, urban population, population growth age-sex composition, birth rate, death rates etc. Sometimes the special volume includes the date on marriage, diverse, migration, mortality, fertility etc.

2 Statistical year book: This also is united nations publication which contains the data for various countries of the world on national accounts facilities of hospitals and doctors, energy consumption, food production, labour force etc.

3 Epidemiological and vital records: This is a monthly periodical published by WHO. It Provides information on public health and mortality for various countries of the world.

The United Nations development programme (UNDP) also publishes annual Human Development report giving data on socio-economic and demographic aspects for the world and various countries.

Other international publications which provide population related data are production year book of FAO, year book of labour statistics of ILO World development report by UNO.

3.7 MISCELLANEOUS SOURCES

Apart from the sources discussed above population geographers can also make use of migration reports, linguistic reports, estimations and projections.

These are a few countries which maintain good migration records especially MDCs. Similarly the estimates are attempted annually in different countries which can be used by population geography. These estimates for current years may be based on in the sample surveys the previous census etc.

Population projection which is an estimate of population for features is another form of data for population geographers. These kind of projection may be made for total population or by age, sex, man power, school enrolment, urban population etc. Many countries publish their own projections which can be used by researchers.

In addition to all these sources these are several agencies research institutions, Universities and individual scholars engaged on research relating to various aspects of population which again provide useful data for population geographers. Thus these are large numbers of sources from which data on population can be obtained.

3.8 LET US SUM UP

We have pointed out in the preceding sections that there are various sources of data for population geographers. Among them the census, surveys, Registration of vital events, International publications and Miscellaneous sources are the important ones from which data related to various attributes of population for various countries and the world can be obtained. Census are by far the most important sources which provide large data for a quite larger areas. Other sources infact supplement the census data by providing detailed information on many variables. However all the sources suffer from one or the other limitations.

3.9 KEY WORDS

Census, Vital events, Registrations, Sample survey, LDCS, MDCs, Demographic year book, Statistical year book, Human Development Index, Population estimation, Population Projection.

3.10 QUESTIONS

1 Explain the various sources of data for population geographers.

2 Explain the importance of census data and bring out their limitations.

3 Explain vital registration as a source of data and mention its limitations.

4 Explain the merits and demerits of different sources of data.

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UNIT : 4 DISTRIBUTION AND DENSITY OF POPULATION IN THE WORLD-FACTORS AFFECTING THE DENSITY AND DISTRIBUTION OF POPULATION

Structure

4.0 OBJECTIVES

After studying this unit you will be able to,

- Distinguish between population distribution and density.
- Understand various measures of density and distribution of population.
- Identify the pattern of distribution of population in the world.
- Identify the spatial pattern of population density in the world.
- Understand the factors affecting population distribution and density in the world.

4.1 INTRODUCTION

There are nearly 700 crores of people inhabiting the earth according to the latest estimates. But these billions of people are not uniformly distributed over the surface of the earth, so also is the density of population. There are many factors which govern the pattern of distribution and density of population in any region or country even the world. It is therefore essential to deal with the pattern of population distribution and density first and then to understand the factors behind this pattern. It is also necessary to define the concept of density and distribution and to explain various measures of population and distribution. All these are explained in detail in the following sections.

4.2 POPULATION DENSITY AND DISTRIBUTION

The concepts of density and distribution are normally used interchangeably though these concepts connote distinghtingly different meanings. Population distribution is more locational while the density is more proportional. The distribution refers to the actual pattern of spacing of units of individuals, while density is in expression of ratio between land and area. Thus the distribution is more concerned with the pattern of spread of population where as density is mainly concerned with some kind of man land ratio.

4.3 MEASURES OF DISTRIBUTION AND DENSITY

4.3.1 Measures of Distribution:

There are many measures adopted by geographers in the analysis of population distribution they are,

1 Percentage distribution

2 Rank order

3 Medium point

4 Mean point

5 Minimum aggregate travel

6 Population potential

7 Standard distance deviation

8 Lorenz curve

9 Gini's Co-efficient

1. **Percentage distribution:**

Percentage distribution is one of the very simple ways of measuring population in a given area in relation to the population of a large area in which that given area is included. For instance population in Karnataka can be expressed as percentage to the total population of India. Similarly population of USA in 1970 was 5.36 percent of the world population in that year. Population of Bangalore can be expressed as percentage to the population of Karnataka.

2. Rank order:

In this measure geographic areas of different level or various classes are listed in different rank order. For e.g.: U.P. gets first rank in terms of population in the nation followed by other states. Similarly Bangalore gets first rank among the population of urban centres of Karnataka followed by Mysore etc...

3. **Median Point:**

In case of spatial distribution median centre refers to the intersection of two orthogonal lines each of which has equal population on either side. Such median points can be calculated for a country or a region. It can also be calculated for various time periods to understand the redistribution trends over time.

4· Mean Point:

It can be defined as the centre of gravity of population distribution over the space. It implies the point upon which the plane world balance if it were a plane without weight

and the population distributed through each individual being assumed to have equal weight and to exert pressure on the central point proportionate to this distance from the point. Thus mean point unlike median point is influenced by the distance of an individual from it.

5· **Minimum Aggregate travel point:**

This is the point in the distribution from which the sum of the distances to all the points is minimum. This measure is particularly useful in estimating the optimum travel location for some centralised services in a region.

6. **Population potential:**

This technique is used to compute and draw the contours of population potential for a country or a region. It applies to accessibility of a point to the population. According to this the influences of each individual at a point is understand to be inversely proportional to this distance from it. The total potential of population at the point will be the sum of reciprocals of the distances of all individuals from the point. Thus it is measure of nearness of people to a point.

7. **Standard Distinct Deviation:**

This is a technique used to calculate the extent of dispersion of population in a region. It is the most commonly used one and it is very simple to understand. It describes the areal spread of population around the centre.

8. Lorenz Curve:

It is a technique to measure the pattern of spatial distribution of any phenomenon over the surface of the earth. It shows the degree of uniformity in the distribution. Concentration is maximum where the entire population is concentrated at one point and minimum where the population is distributed uniformly. These are the two hypothetical extremes of distributions. The trend of a population distribution towards either of these two extremes can be a measured by mean of a graphical device which is called as Lorenz curve.

9· Gini's Co-efficient:

The overall concentration found trend in any curve may also be measured and expressed in numerical terms which is known as Gini's co-efficient. In case of uniform distribution the ratio of Gini's co-efficient is 0 where as in case of extreme concentration it is equal to Unity (one). Hence the ratio varies between 0 and 1.

4.3.2 Measures of Density :

Population density is a single concept of finding relationship between population size and land area in order to assess the kind of population pressure on the resources of an area. It is generally expressed in terms of number of people per square kilometre or per square mile.

Geographers have devised various types of densities for different situations. The following are various types of densities used normally by geographers.

1. Arithmetic density.
2. Physiological or nutritional density.
3. Agricultural density.
4. Economical density.
5. Comparative density.
6. Room density.

1. Arithmetic Density:

It is also called crude density. Arithmetic density refers to simple ratio between total population and the total land mass and expressed as the number of people per unit of area may be per square kilometres or square mile. For instance India has an average density of population per km^2 and Karnataka 320 per km^2. This kind of density can be worked out for rural and urban areas separately.

Arithmetic density suffers from some limitations. It takes into account the total area and total population. Total area includes all types of land such as desert, mountain etc which are not habitable. For example Egypt has total Geographical area of about 1005 thousand per km^2 but 98% of that area occupied less than 5% of the total population of Egypt and 2% area has 95% of the population. But the density of population is only 72 person per km^2 in 2003, because the entire area of Egypt is taken into consideration. Hence this density is only one dimensional and tells little about the opportunities and obstacles that are there in the relationship between population and land.

2. Physiological or nutritional density:

Physiological or nutritional density is obtained by relating the population size with the

area of land cultivable. It is expressed as number of people per km^2 of cultivable land. This is more Meaningful index of relation between land and people. In case of Egypt again while the arithmetic density is only 72 physiological density is 2500 per km^2. Thus physiological density is a refined method of calculating man-land ratio. However a limitation of this density is that not all the people in a country depend upon agriculture. Hence it does not provide a clear picture regarding the pressure of population on land.

3· Agricultural Density:

Agricultural density is a further refinement which is obtained by dividing only the agricultural population by the total cultivable land in the country. It is the ratio between the number of people engaged on the land and the total farm land. Agricultural density is normally very low in LDC's compared to MDC's. But a limitation in this use is that not all cultivable land is uniform in terms of productivity. Further it does not take into consideration the value of non-arable land.

4· Comparative Density:

Vincent has given this concept of comparative density which is calculated by correlating the total population to the land which is weighted according to its productivity for example, something like one hectare cultivated land can be equated with three hectares of grass land or so.

5. Economic Density:

George has suggested this concept of economic density. It refers to ratio between the requirements of a population and the resources made available to it by production in the areas it occupies. But this kind of density is highly complex one and very difficult to calculate economic density especially for an industrial economy.

6· Room Density;

In the countryside which are more urbanised and industrialised vertical expansion of residential complexes are more common. This vertical expansion in validate the relationship between population and the areas. Hence many of the measures discussed above do not have any validity for these countries. Because these measures do not reveal anything about the concentration of people within the buildings. Hence room density which indicates average number of people per room is widely used by scholars in these days.

4.4 PATTERN OF POPULATION DISTRIBUTION AND DENSITY IN THE WORLD :

The total population of the world at present is estimated to be around 6892 millions living in nearly 136 million km^2. This population however is not uniformly distributed over the surface of the earth. The pattern of population distribution and density in various continents of the world is shown in the table below.

Population distribution and density in the world

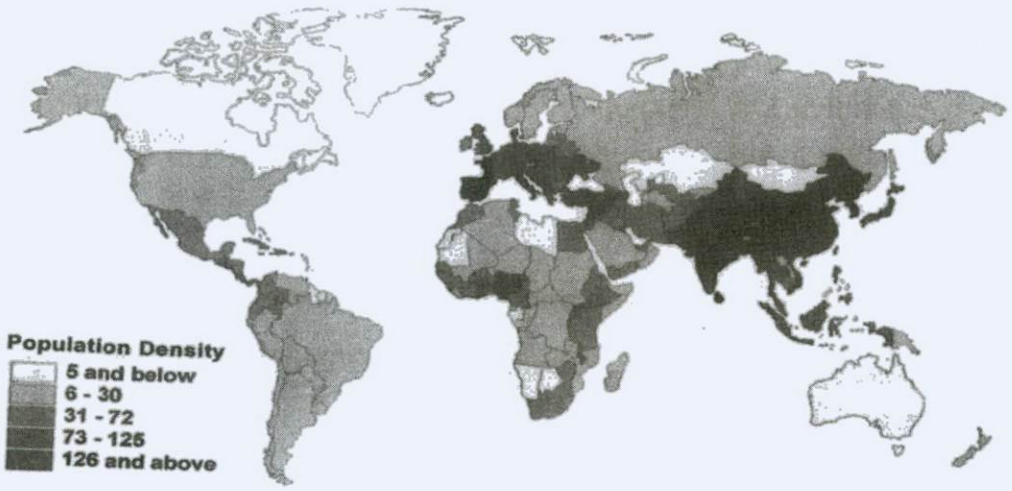
Continents	Population in millions	% of world population	Density per sq^2
World	6892	100	51
Asia	4157	60.32	87
Africa	1030	14.94	33
Europe	739	10.72	70
North America	534	8.62	23
South America	392	5.69	21
Oceania	35	0.58	4

Source: Internet source

It is very clear from the table that there is marked spatial variation in the distribution and density of population in the world from one continent to another. Asia with 60% of the total population of the world is the most crowded part which is also the old world where as the new world is less populous. MDC's have little over 19% of the world's population while LDC's have as high as more than 80%.

World population Distribution in 2003

World population Density in 2003



The distribution of population is also uneven even among various countries of the world and various parts within the continents. The south and south western parts in Asia are more populated than the northern and western parts. Eastern part of North America along the Atlantic coast also is more populous than the other parts of the continent. Again North-western part of Europe has higher concentration of population compared to other part of Europe.

The distribution of population is also very uneven by countries. China has almost 20% of the total population of the world; with 1338 million followed by India with around 1200 million both put together accounting for 17.5% of the world's population. Other countries which follow are USA 309 million, Indonesia 235 million, Brazil 193 million, Pakistan 193 million, Bangladesh 165 million, Russia 142 million, Japan 127 million.

Another significant feature of the distribution of the population in the world is that more than 90% of the world's population is confined only to Northern Hemisphere and only 10% is found in the Southern hemisphere. There is also sharp contrast if one looks at the latitudinal distribution. For instance 0-20 ? North latitudinal zone accounts for 10% of the population, 20 – 40^{O} North zone has more than 50% of the world's population, 40-60 ? North zone has 30% of the population and less than 1% is confined to the regions north of 60 ? North latitude. According to Trewartha almost 50% of the world's population is confined only to 5% of the total area and remaining 50% of the population is spread over 50-60% of the area. Population is also concentrated in the rim lands of all the continents where as the interiors are devoid of concentration. Nearly 3/4th of the world's population is found with 1000 km from the sea and 2/3 within 500 km.

On the basis of the inhabitants the world is broadly divided into two types of areas.

1 Ecumene: This refers to the areas which are permanently inhabited lands.

2 Non-Ecumene: which are either inhabited intermittently or very sparsely inhabited lands.

It has been estimated that nearly 60% of the earth's land may be ecumene and the rest is non-ecumene. It is however very difficult to precise boundary between economic and non-ecumene. Even within the ecumene one may come across the areas of sparse population and within non-ecumene areas densely populated nodes are found.

About 75% of the world's population is concentrated in four major clusters given below.

1 East Asia comprising China, Japan is the largest cluster with 25% of the total population of the world.

2 The second largest cluster is in South Asia consisting India, Pakistan, Bangladesh etc. This cluster also has $1/4^{th}$ of the world's population.

3 The third major cluster is in Europe including Arab GIS countries with $1/5^{th}$ of the world's population.

4 The fourth cluster is in the Eastern part of North America. This is the smallest cluster with 5% of the world's total population.

4.4.1 Pattern of population density:

In terms of population density there is a marked variation from continent to continent and country to country. The world on an average has a population density of 51 persons per sq km. Asia is most densely populated continent with a density of 87 per sq km followed by Europe(70), Africa(33), North America(23), South America(21) and Oceania(4).

Among the countries of the world, also density varies very significantly. Singapore has the highest density among the countries of the world with 7665 per sons per km^2. Bangladesh comes next with 1046 persons per km^2 followed by India (378), Japan (334), U.K (258) etc.

The East Asia and South Asia together constitutes the world's largest belt of very high density, where as the vast stretch of North and South America, Oceonia and much of Eurasia constitute the least densely populated belts of the world.

4.5 FACTORS AFFECTING DISTRIBUTION AND DENSITY OF POPULATION IN THE WORLD

We have noted in the previous sections that there are striking contrasts in the distribution and density of population at various levels i.e. continental, national and regional levels. This wide regional contrast in the concentration of population is the outcome of many factors which have either jointly or individually affected the population concentration.

Let us now deal with the factors which affect the population distribution. There are number of factors which influence the distribution. These factors can be grouped into various categories such physical factors, socio-economic factors, historical & political factors demographic factors etc.

4.5.1 Physical factors:

Physical factors are by far the most significant in determining population distribution. Among physical factors climate, landforms, soils, minerals & energy resources, locational factors, raw materials and space relationships are very important.

Locational factors like latitude and altitude have a strong influence on uneven habitation. High latitude areas because of extreme cold and low latitude areas because of high temperature are less favourable for habitation of mankind. Similarly high altitude sets is limit on human existence due to low atmospheric pressure and the oxygen.

The location of a place in relation to other areas is another factor which affects population distribution. For example a major reason for the development of industries in and around Pune is because of its proximity to Mumbai.

Climate is another geographical factor, which has played dominant role in determining the population concentration throughout the history of mankind. It plays vital rate in the formation of biosphere of any region which in turn affects the human life. Therefore the importance of climate in human life can hardly be over emphasised even though man has been able overcome some of the adverse of effects of climate with the technological progress and increasing control over nature. The elements of climate such as temperature, humidity & rainfall have their effect on the concentration of people. Extreme cold conditions in the high latitudes have prevented human habitation. Similarly extremely high temperature also as in the use of hot deserts will not attract population. Low and unreliable rainfall in desert areas make the agriculture of these lands most unprofitable, because of which population density is negligible in these areas. On the other hand because of the good supply of water ancient civilization flourished along

the banks of rivers. Normally population is heavily concentrated in the well watered river and coastal plains.

Another important physical factor which affect the population distribution is the nature of terrain. The difference between mountainous areas and plain area in the concentration of population is in fact most striking evidence of the impact of terrain upon population distribution. In mountainous areas population density is low because of many factors such as limited arable land, high cost of construction of transport facilities difficulty in carrying out agricultural operations etc. it is estimated that high mountains which are not very conducive for human settlements occupy more than 1.6 million sq km of the land area of the earth. Low-lying areas are on the other hand, very favourable for human settlements. The plain of North America and Europe, Gangetic plains of India are good examples for this. It is also estimated that only 20% of the population of the world is found above 500 meters of altitude from the sea level where as 56% is confined to below 200meters of altitude. Thus there is inverse relationship between population density and altitude. Hence demographic relief is generally opposite of physiographic relief.

Soil is yet another determinant of the population concentration. The fertile soil such as alluvial deltaic soils, can be support higher population. The deltas of India, Indochina nile valley are all naturally the examples for rich soil. That is why great civilization has flourished also the great rivers. Even in the regions of uniform climate, landforms, vegetation and accessibility also, the variations in soil characteristics may result in soil variation in land use, cropping pattern etc which result in variation in population distribution.

In the present industrial society also the role of soil cannot be insignificant, about half of the world's population is depending on agriculture for its livelihood. Application of modern technology recently has greatly enhanced the profitability of agriculture in many parts of the world.

The mineral and energy resources available have also lead to the dense concentration of population is various parts of the world. Kalgoorlie, a gold mining town in Australia desert is a very good example for this. This kind of examples are found in many parts of the world including South Africa, Canada, USA, Russia, India etc... However the influence of mineral and energy resources depends upon many other factors such as availability of water, transport network, capital, market demand etc...

Power resources like coal has influenced the concentration of population in Great Britain, France, Germany, Poland, Russia, USA in chotanagpur area in India is another example for the role of mineral and energy resources in attracting population.

Accessibility is another factor among the physical factors which affect the population concentration. Rim lands of all the continents are densely populated mainly because of their easy accessibility.

It is very clear from the above analysis that no single factor in isolation affects the population distribution but in combination. Again it is important to point out that these physical factors in combination with the factors such as socio-economic, political, technological etc. Will affect the population concentration.

4.5.2. Socio-economic factors:

As the society becomes more complex because of higher level of technological development man gains more control over nature. As a result man is less inclined to accept the natural features as they are found but wonts to modify the features to suit his requirements. Hence socio-economic factors become more important in determining population concentration. Clarke also observed diminishing influence of physical environment upon the population distribution during recent times.

Among the socio-economic facots the type and scale of economic activities are very important. Technological and economic progress also affects the population distribution. Agriculture can relatively support fewer people compared to industrial activities. Hence industrialised countries are for more advanced than the agricultural countries. The concentration of people in urban areas is mainly because of the diversity in activities compared to rural areas where mono kind of economic activity like agriculture only takes place. The diversified economic activities include manufacturing, wholesale & retail trade finance & business, health and educational services so on. These diverse type of activities undertaken in small land can lead to inhabitation of large population.

4.5.3. Technological development:

Economic activities and type technology are closely inter related. Advancement made in the field of technology may bring a significant change in the diversification of an economy which in turn include the supporting capacity of land leading to higher density of population. Technology also makes human habitation possible in areas which were devoid of human population. For example extension of irrigation facilities in dry area may lead to higher concentration of population. Similarly discovery of various sources of minerals and energy resources have brought about re-distribution of population. Industrialisation and urbanization also have the same kind of impact on population distribution. High yield varieties of seeds,

chemical fertilizers, modern method of cultivation are all the accomplishments of technological advancement which again led to increase in agricultural productivity and as a result increasing population concentration.

4.5.4.Political and historical factors:

Political factors have also affected population distribution in different areas at various points of time. These factors are the emergence of political boundaries, buffer zones and public policies of the government.

Political events such as wars partition of a country colonisation etc have caused redistribution of population between different areas. Examples are post-partition of population movement between India and Pakistan migration of Tibetans to India etc.

Public policies were also emerged as an important determinant of population distribution in several parts of the world. In former USSR the government has directed the population to settle in Siberian plains. In China also in 1960's and 1970's 10 to 15 million people were relocated to the rural areas to ease population pressure on urban areas. Other policies which indirectly affect population distribution are establishment of large scale industries, licensing policies, construction of large irrigation dams which affect population distribution through spatial mobility.

Historical factors also are important determinants of population distribution. One reason for current inequalities in the distribution of population in the world is the differences in the process of settlements in different parts of the world. Those areas which have a long history of human habitants like India, China etc... are also continued to be densely populated regions of the world at present. Those areas which have been recently habituated continued to be sparsely populated. However, this kind of relationship need not necessarily be true always. There are several examples of formerly prosperous and densely populated areas which here become sparsely populated at present for example parts of North Africa & Mesopotamia, Eastern Srilanka etc...

4.5.5. Demographic factors:

The demographic factors like fertility, mortality and migration, which are considered as vital events in ones life are the most influential factors in determining the population distribution of any area. Differential fertility and mortality leads to difference in growth rate which in turn largely affect the distribution and density of population. The rate of natural increase in the old world is higher compared to the new world. As a result the old world which is already crowded is experiencing much more crowding with the passage of time.

Migration also influence the population distribution to a large extent. Migration takes place to big industrial centres, irrigated belts and developed parts of the world, thus bringing about population redistribution. International level migration takes place from labour surplus country to labour deficit country provided employment opportunities are available there.

Sometimes, existing high concentration of population in an area acts as a catalyst in further concentration of population. Many industries are to be set up in proximity to the consumers for products and industries are also set up near the area of higher concentration because of the availability of cheap labour. Once the industries are established that area attracts again more people leading higher density.

In addition to the physical, socio-economic, political-historical and demographic factors discussed above, some physical and social disasters also are the factors which at least temporarily alter the population distribution. Earthquakes, volcanoes, landslides, floods, glacial advances, epidemics, fire, droughts, wars, genocides, racial & religious, violence are the examples in this category.

Zelinsky has very ably summarised the entire gamut of factors responsible for population distribution with remarks that in order to understand the meaning lying behind the contemporary patterns of population, one must wield encyclopaedic knowledge of the area's physical setting, the minutes of its economic behaviour, the broader lineaments of its cultural and social structure and virtually all aspects of human Geography.

4.6. LET US SUM UP

We have so far discussed various aspects pertaining to density and distribution of population in the world. Various types of density such as arithmetic density, physiological density, agricultural density, economic density, comparative density and room density have been defined. We also have noted down various measures of population distribution rank order, median point, mean point etc... we have pointed out there are wide variations in the distribution and density of population at the international levels. There are many factors like physical, socio-economic, historic and political, demographic etc which are mainly responsible for the spatial variation in the distribution and density of population.

4.7. KEY WORDS

Population density, population distribution, arithmetic density, physiological density, agricultural density, economic density, comparative density, room density, percentage distribution, rank order, mean point, median point, minimum aggregate travel, population potential, standard distance deviation, Lorenz curve, gini-coefficient, Ecumene, non-ecumene.

4.8. QUESTIONS FOR SELF STUDY

1 Define population density and explain various types of density.

2 Explain the various measures of population distribution.

3 Explain the spatial pattern of population distribution and density in the world.

4 Explain the factors responsible for the spatial variation in population distribution and density.

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UNIT : 5 POPULATION GROWTH IN THE WORLD: TREND AND PATTERN

Structure

5.0 OBJECTIVES

After studying this unit, you will be able to

- Define population growth
- Understand various measures of population growth
- Know the trend of population growth in the world during different periods
- Understand the difference in the growth of population between LDC's & MDC's
- Understand the spatial pattern of population growth in the world.

5.1 INTRODUCTION

The study of population growth is of per mount importance especially in the modern days of planning and development. Scholars have founded out there are three major obstacles to the progress of the world viz.

(a) Hydrogen bomb

(b) Gap between the rich and the poor and

(c) The population explosion.

Population is rapidly growing in major parts of the world which act as a is a significant hindrance To the growth of the world economy.

Every country needs to study and understand its population growth trend so that it can prepare suitable plan for the development of its economy. Hence the past trends of population growth and likely trend in future needs to be carefully studied and understood before formulating any plan for the economic development. Thus population growth is pivotal to the country's demographic dynamisum. The trend of growth of population throws light on country's economic development, social awakening historical and cultural background and political ideology. All other characteristics of population such as density distribution, fertility, mortality, migration etc are very closely inert-related with the growth of population in any region. Hence understanding the growth of population is very important to understand the entire demographic structure of any region or country.

5.2 POPULATION GROWTH-MEANING

The growth of population of any region refers to the change in the number of inhabitants in that region during a specified period of time. This change could Either be positive or negative. Further, such change could be measured both in absolute terms and in terms of percentage. The change in absolute number can easily be determined by subtracting the population of earlier period from the population of the later period of an area. If the absolute change in the number is divided by the earlier population and multiplied by hundred we get the percentage of population growth, for a specific period.

5.3 MEASURES OF POPULATION GROWTH

Population growth of an area is normally expressed in terms of growth rate per year. It is also expressed in the form of decadal growth since census takes Place most of the countries once in ten years.

The rate of population growth is measured in many ways which are called as Measures of population growth. In all these measures, figures on population size is required for two points of time for which the growth rate is required to be calculated.

Arithmetic rate of population growth is of course most simple and commonly used measure of population change.this measure is base on the assumption that population growth takes place arithmetically by a constant number. According to this the arithmetic rate of population growth between two points of time is

$$r = \frac{(P_t - P_0)}{P_o}$$

where

R = rate of population growth

Po= population at the base year

Pt= population at the terminal year

T= interval between base and terminal year.

Another measure of population growth is annual compound rate of growth. It can be expressed as,

$$Pt=Po(1+r)t$$

It is also known as geometric law of population growth. it is assumed that a population growing at the rate of 1 percent per year will take 70 years to double itself under annual compound growth rate and 35 years at the rate of 2 percent.

One more measure of population growth is exponential rate of growth. It is based on the assumption that population growth follow an exponential distribution, which is a generalisation rate of the geometric function, when time t is considered To be a continuous variable. Exponential growth rate can be worked out using the following formula...

$$Pt=Po.e^{rt}$$

5.4 TREND OF POPULATION GROWTH IN THE WORLD

According to the latest demographic information available the population of the world is around 6892 million. One of the striking features relating to the growth of population in the world is that the annual growth rate of population has been considerably declining from 1950's onwards. The growth rate was about 2% during 1955-60. Come down to 1.8% during 1970's, 1.7% in 1980's, 1.6% in 1990's, 1.4% during 2000-2005 and 1.3%during 2005-2009. It indicates that the peak rate of population growth is definitely over and it starts of world declining even through the present growth rate also is not very low. It is because the decline in the growth rate of the net annual addition of population has also declined from its peak of 86 million during 1985-90to 78 million during 2000 and later. It is expected to decline further to 64 million during 2015-20 and to 30 million during 2045-50. The world population is expected to reach about 9000 million by 2054 or so.

From the early beginning of homosapiens to the present the history of population growth is based only on speculation because evidence in the form of data on population was either not available or very scanty. Population census is a phenomenon of recent time i.e. 17th century. It was started only in late 19th and early 20th century in most countries of the world. Hence the population figures for most part of the historical period is only estimation by scholar based on fragmenting information supplemented by informed guesses. on the basis of the fragmentary historical, anthropological and biological evidence scholars have build up a consistent pictures of the world population growth from the beginning up to modern time.

If we examine carefully the trend of growth of population in the world since the appearance of mankind on the surface of the earth to the present day, We can notice that the growth of population in the world is marked by three different periods of accelerated growth.

these periods are around 10,000 years B.P, 1750 AD and 1950 onwards. those three periods are marked by three important events viz., agricultural revolution, industrial revolution and the spread of medical technology especially in less developed parts of the world.

To understand the trend of population growth in the world it is necessary to divide the entire history of mankind into different periods. We shall now try to understand trends of growth in different periods.

5.4.1. Population growth during pre agricultural period:

Agriculture was not known to mankind before 10,000 years from present or before 8000 B.C. During this period of pre-historic or initial phase history, the human population grew only at a snail speed .the climatic conditions was hazardous against which man was not equipped in any way to protect himself. Man was engaged during this time on food gathering and hunting. He was undernourished those condition were not favourable for population growth.

It has been estimated that population of the world in 8000 B.C. or 10,000 B.P. was around 5 million. They lived in bands of 50 people. There was no area on earth with large population, average density was just 4 persons per $100km^2$. Each band of population lived in isolation.

The death and birth rate were very high during this period. The death rate was very high much more than the birth rate that restricted population growth. In addition to high death rate population was restricted deliberately also through various birth control measures such as restricted several intercourse prolonged, breast feeding, abortions, infanticide and the use of plants with contraceptive powers. It was done in order to see that population size did not exceed the carrying capacity of the territory being used for hunting and gathering.

Those hunters and gatherers consciously tried to space the birth of their children because of inability of mother to carry more than one child while moving from place to place. Further, the environment locked the soft food required by the children. Therefore the growth of population during pre-agricultural stage was zigzag and registered only a very gradual increase.

The growth of world population from 10000 B.C to present

Year	Population	% increase per year
10,000 B.C	100000-10000000	Insignificant rate
8000 B.C	5000000-20000000	Insignificant rate
5000 B.C	5000000-20000000	Insignificant rate
1 A.D	256 million	Insignificant rate
1650	500 million	0.1
1750	700 million	0.3
1800	1200 million	0.5
1930	2000 million	1.07
1975	4000 million	2.03
1999	6000 million	1.40
2012	7000 million	1.30

5.4.2. Population growth after agricultural revolution to 1900 A.D

It is generally stated in many historical records that the agriculture was started around 8000 B.C which has necessitated the sedantery life for mankind. The total population of the world in 8000 B.C is estimated to be somewhere between 50 million and 200 million.

Population started increasing with the advent of agriculture because the need for child spacing disappeared. In fact agriculture and high notality go hand in hand because the economic value of the children to farming family is perceived to be very high. All over the world we find that areas dominated by agriculture experience high fertility. Thus it has led to gradual increase in the population of the world after agriculture was started as an economic activity the population of the world at the time of 1st A.D was around 250 million and it got doubled To 500 million by 1650 A.D. Hence it took about 1650 years for the world population to get doubled

After 1650 A.D population started increasing steadily. It reached 1000 million mark by 1850 thus taking only 200 years to double itself. By 1900 it reached 1600 million. It was during this time some fairly densely population belts were developed in the world. It was also during this period industrial revolution took place in some parts of the world.

5.4.3. Population growth from 1900-1970:

The population of the world increased rapidly in the 20th century with revolutionary changes in agriculture, industry, medical technology etc. those changes brought down the death rates drastically which led to sudden surge in the growth of population. The spread of medical technology from MDCs to LDCs led to a decline in the death of LDCs also. The growth rate of population during 1900-1950 was about 0.8% per year on an average.

After 1950 the world population continued to grow at an accelerated speed. The annual growth rate of population received around 2% during the middle of the 20th century. The highest ever annual growth rate of population in the world was 2.08% in 1970.

The highest growth rate during 1950 onwards up to 1970 was due to many reasons.

1 There was economic recovery in the western world after the second world war which led to baby boom in this part of the world.

2 During this time almost all the LDCs gained freedom from the colonial rule and took lot of measures to improve socio-economic conditions of their people.

3 Technological advancement growth and expansion of public health services have contributed for drastic decline in the death rates in these countries.

4 The decline in death was not followed by proportional decline in birth rate in the LDC's which has led huge increase in population growth.

It is because of these reasons the growth rate rose to over 2% per year and in some parts of the African ,Latin American countries it was more than 3% during 1950-1965.

5.4.4. Population growth after 1970:

The growth of population after 1970 in the world started declining and it witnessed 1.77% per year in 1980's and further it came down to 1.6% in 1990's and during 2000-2005 it was 1.4%, which come down further to 1.3% during 2000-2010. This decline in the growth rate of population in the world is attributed mainly to decline in the growth of two highly populated giants in the world viz China and India. The strict enforcement of population policy in China and continuous efforts of India since first five year plan to reduce population growth rate in the country have resulted in the decline of growth rate in the world. This trend has occurred in most of the LDC's after 1970 or so. In spite of the general decline in the growth rate in the world there are some countries in Latin America and African which are still witnessing higher growth of population.

5.5 SPATIAL PATTERN OF POPULATION GROWTH IN THE WORLD:

We have so far understood the trend of population growth in the world since the beginning of homosapiens. One of the significant points that can be noticed in the analysis made above is that the growth of population was more rapid only recently that is about 150 years or so. But this growth also is not even all over the world. The growth rate varies over the space. There is contrast is the growth rate between the developed and developing blocks of the world, among the continents of the world and also among the countries of the world. It is therefore very important to analysis the spatial pattern of population is the world which is attempted below.

5.5.1. Population growth rate in MDCS and LDCS:

Population growth is uneven over space. The most important dimensions of this uneven growth is the contrast between more developed and less developed regions of the world. The table below clearly demonstrates the differences in the growth rate.

Annual growth rate of population in MDCs and LDCs

Period	Growth rate per year in %	
	More Developed Region	LessDeveloped Region
1650-1750	0.33	0.34
1750-1800	0.62	0.47
1800-1850	0.83	0.31
1850-1900	1.05	0.53
1900-1920	0.92	0.52
1930-1940	0.91	1.11
1930-1940	0.85	1.28
1940-1950	0.35	1.44
1950-1960	1.35	2.32
1960-1970	1.10	2.77
1970-1980	0.81	2.36
1980-1990	0.61	2.21
1990-2000	0.47	2.11

It is very clear from the table above that not only population was very low during 1650-1750 both in MDCs and LDCs but also identical. After the industrial revolution it started increasing in the MDCs and high growth rate was recorded in these countries during 1850-1950. After words however the growth rate started declining in the developed parts of the world expect during the time of Baby Boom during 1950's or so.

On the other hand the growth rate was less in LDC's up to 1920 or so after foods it started increasing and reached the highest during 1960-70. After 1970 it started declining trend in these countries but only at a very slow rate. Though there has been a declining trend in these countries the growth rate is still over 2 percent which is considered to be high growth rate. It again affects the average growth rate of the world population since almost 80% of the total population of the world at present lives in LDCs. Further during 1995-2000 97% of the net increase in world population was contributed by LDCs only.

5.5.2. Population growth in various continents of in the world:

The unevenness in the growth rate is also noticed among various continents of the world. Different continent have followed different courses of population growth over time. A brief account of trend of growth in various continents is given below.

Europe:

Growth of population in Europe during 17th century was very slow and erratic because of mony disasters like cold waves crop failures, famines, wars, epidemics etc.. During the 18th century there was socio-economic development in the continent following agricultural and industrial revolution. The mortality rate was reduced because of better standard of living, availability of food supply, advances in medical technology reforms in the field of public health etc.. Throughout 19th century the growth rate continued to be very rapid. But after 1920 or so it started declining because of world war and economic depression after the second world war there was economic recovery which has once again led to "Baby Boom" causing high rate of growth. After 1956 population growth started declining and this trends continues to occur later and presently growth rate is very low in Europe.

North America:

In North America the growth of population was 3.65% in later part of 18th century which was highest ever recorded. This was due to two reasons firstly because of continuous migration from European countries and secondly very high fertility rate. The growth rate was high during the beginning of 19th century also. Afterwards it started declining, the growth rate fell to 0.8% in 1930-40 mainly because of economic depression. After the economic recovery there was "Baby Boom" here also as in the case of Europe. The growth rate increased almost up to later part of 1950's. after 1960 the growth rate started declining and it was almost similar to what has happened in Europe.

Latin America:

The growth rate in Latin America started increasing from later part of the 19th century and the trend continued up to 1960. Decline in mortality and continuation of high fertility are the two factors responsible for high growth rate. But after 1960 there was some decline the growth rate but it was still as high as 2.30% during 1980-85. But it come down to 1.84% during 1995-2000.

Asia:

In Asia the growth of population low and erratic almost up to the beginning of the 20th century. It began however to rise after 1920 and continued up to 1970. It began to decline after 1970. The growth rate during later half of the 20th century had been moderate in East Asia, very high in south Asia and middle south Asia and highest in western south Asia.

Africa:

Absence of recorded history and the lack of statistical data have made the estimation of population growth for Africa to be based on conjectures. It seems that North and South Africa differ from each after in respect of population trends. The trend in North Africa appears to be similar to that in Asia. In South Africa growth was negative Up to about 1800. In West Africa, East Africa and Middle North Africa growth rate was rapid after 1950. In fact both fertility and mortality rates are highest in Africa compared to other continents of the world.

Oceania:

In Australia and New Zealand growth rate was high in later part of 19th century, but started declining during the beginning of 20th century. After the II world war here also there was on increase in growth rate because of high fertility. Immigration to this part of the world continued on a considerable source which also contributed for higher growth rate.

5.6 LET US SUM UP

Let us now try to summarise the whole discussion made above. The study of population growth is very significant for various reasons including the socio-economic planning. Growth refers to change in the size of population for a particular period of time. These are various measures of population growth i.e. arithmetic rate of growth and annual compound rate of growth.

We have also identified our significant trends in the growth of world population viz pre agriculture period, post agricultural revolution, during 20th century and post 1970. The growth rate was different in all these period.

Not only growth rate varies over the historical periods but also it varies over the space i.e., between MDCs and LDCs among various continents of the world. All those have been discussed in detail in the previous sections.

5.7 KEY WORDS

Population growth, Arithmetic growth rate, Agricultural revolution, industrial revolution, homosapiens, MDCs, LDCs, Baby Boom, Fertility, Mortality, Exponential rate of growth.

5.9 QUESTIONS FOR SELF STUDY

1 Define population growth and explain trends of population growth in the world during the 20th century?

2 Explain various measures of population growth and narrate the growth trend of population during pre-agriculture period and post-agricultural revolution it 1900 A.D

3 Explain the trend of population growth in the world after the II world war

4 Explain the spatial pattern of population growth in the world.

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UNIT : 6 THEORIES OF POPULATION GROWTH: MALTHUSIAN THEORY

Structure

6.0 OBJECTIVE

After studying this unit you will be able to

- Mention various theories of population
- Understand about Malthus as a scholar
- Understand the views of Malthus on population
- Point out the criticisms against Malthusian theory of population.
- Understand relevance of Malthusian theory to society in different points of time.

6.1 INTRODUCTION

It is necessary to trace the development in the thinking of scholar in various points of time on the population phenomena within different socio-economic-political context it is necessary because some scholars have argued in favour of continues increase in population where as others regard the rapid growth of population as a cause for various catastrophes such as wars, famine, epidemics etc. including poverty. It therefore appropriate to give an overview of the opinions of different scholar on the growth of population and its socio economic implication. Malthus one of the prominent scholars who have tried to give conceptualised view on the phenomena of population. His views have received very wide attention in the academic world and he is considered as one of the top most scholars in the field of population studies. Hence his views needs to be understood by any student studying on population

6.2 THEORIES ON POPULATION

The problem of population has been addressed by many scholars right from the time of Greek and Roman philosophers. Scholars during medieval and modern period also gave their own views on the problem of population. Prominent among them were Plato, Confucius Aristotle Bruckner (1728-1804)James steurt (1712-1780) Robert wellvice (1687-1771), Karl marx etc. Hence scholars ideas on the problem of population are categorised in to 4 groups.

1 Ideas of the early period

2 Ideas of the pre Malthusian period.

3 Ideas of Malthusian period

4 Ideas of post Malthusian period

6.3 MALTHUSIAN PERIOD

Even through many people before Malthus had studied the problem of population a population theory as such was emerged only during the Malthusian period that too by Malthus himself. Before Malthus only a stray thoughts were expressed, but the issue received a concrete shape only by Malthus and his contemporaries.

Thomas Robert Malthus is well known for his theory of population. He was a British professor of history and economics. He was born on 14-2-1766and educated at Cambridge University. In 1804 he became a professor of history and political economy. And he lived till 1834.

Malthus published his famous monumental work "essay on population" in 1798 anonymously because of some fear at that time. In 1803 he published is 2nd edition and 6th edition was published in 1826. 7th edition was published posthumously in 1872.

6.4 MALTHUS THEORY - MAIN FEATURES

Malthus began stating his theory on the bases of two postulates

Firstly food is necessary to the existence of man.

Secondly, the passion between the sexes is necessary and will remain nearly in its present state

These two are :

1. Immutable
2. Natural
3. Antagonistic

On the basis of these two postulates, Malthus proceeded to frame some basic propositions,

1. Power of population is indefinitely greater than the power on the earth to produce means of subsistence.
2. Population when unchecked will increases in geometrical ratio like 2, 4, 8, 16, 32, 64 etc. While the means of subsistence increases only arithmetical ratio like 1,2,3,4,5,6 etc.

3. If unchecked population tends to double itself every twenty five years while even under the most favourable conditions food supply will increase each 25 year by an equal quantity.

Malthus therefore argued that effects these two unequal powers must be kept equal. This implies a strong and constantly operating checks on population. He recognised two types of checks to obstruct population growth.

1 The first of these may be called preventive checks which are the result of exclusively human action. These checks reduce the birth rate through late marriage, moral restraint etc.

2 The second kind of check which obstruct population growth are positive checks which tend to shorten human life in the form of increasing death rate and they occur because of both human activity and natural factors. They include wars dangerous occupation, bad and insufficient food and clothing, infanticide, epidemics, calamities etc.

Malthus believed that some of these checks are in constant operation in all the societies in varying degrees. But he says positive and preventive checks are inversely related to each other. It means whenever one kind check are very effective the other kind of checks are less effective and vice versa.

Malthus advocated preventive checks which are better than positive checks which are crude preventive checks are indicative of higher civilization. Moral restraint is a virtue ordained by all the major religions of the world. Malthus therefore exhorts mankind to practise preventive checks in order to escape the wrath of nature.

6.5 CRITICAL EVALUATION OF MALTHUSIAN THEORY

Malthus theory is studied thread bare by scholars all the over world from the time of its publication. Probably this is the most criticised theory and at the same most defended one in the field of social sciences. Scholars call this theory as "that black and terrible demon that is always ready to stifle the hopes of mankind".

Let us now narrate the major criticism against Malthusian theory :

1. One of the weakest points of this theory is geometric and arithmetic growth. Scholars have pointed out that the ratios concerning population growth and means of subsistence are based on slender foundation and were never really proved.

2. His views on doubling period of population also are wrong. It is nowhere near reality. It varies from country to country and from time to time depending upon many factors such as stage of economic development scientific and technological advancement etc. For instance USA at present rate of growth takes 120 years to double its population, Where as its neighbour Mexico takes only 20 years or so.
3. His assumption on passion between is sexed is also questioned. The critics have point out that desire to have sex need not be mixed up with desire to have children. One is biological where as anther is social Instinet.
4. According to Malthus preventive checks include only moral restraint, celibacy and late marriage. He could not think of contraceptives which are playing the major role in reducing birth in Morden time all over the world and in all the religions.
5. Advancement in science and technology plays a major role in changing the attitude, belief of the people towards life. This aspect also has been ignored by Malthus.
6. Malthus argument that human beings multiply if unchecked is also wrong because these is biological limitation. Population cannot grow beyond a certain limit.
7. Means of subsistence refers to vast species of animal and vegetable kingdom which also double as in the case of population. It is because whatever biological laws apply to population will also apply to animals and plants.
8. Arithmetic ratio has lost its relevance in view of Morden development in the fields of agriculture. Fertilizes, irrigation, modern methods of cultivation, high yield varieties of seeds etc have brought about radical changes in the yield of crop. That is way .arithmetic ratio is the most vulnerable point. Most easy to criticise and most difficult to defend.
9. During the time of Malthus only nowhere in the world did population double in 25 years except in these countries where immigration played a major role.
10. Malthus underestimated the role of industrial revolution, which has helped to maintain or even increase the standard of living in all the countries.
11. Karl Marx has criticised Malthus on the ground that Malthus had taken the monastic view of celibacy. Malthus was married and had three children.
12. Some scholars have doubted originality of Malthus in understanding the problem. They consider him in a plagiarist. koutsky says "it is as in correct to name population theory after Malthus as to name America after Amerigo vespusi. Both did no more than spared

the views of what other have discovered". Macchiavelli and Botero had earlier stated that population increase faster than the means of subsistence.

In spite of its several weakness as mentioned above the Malthusian theory has been successful in highlighting the urgency of maintaining a balance between population and means of subsistence. Moreover he was able to bring the study of population into the fold of social sciences. His work is of great value for it has been able to initiate the theory building process in the field of population science.

Kingsley Devis therefore said that doctrine of Malthus though not empirically valid they are theoretically very significant.

6.6 RELEVANCE OF MALTHUSIAN THEORY

In spite of many weakness the theory has been revived time and again.

In 1900 the theory was almost completely neglected when population growth came down in MDCs and LDCs as It was slow. In 1920s it came again in to prominence since most of the LDCS started registering higher growth rate of population. By 1934 the theory was subsided since population growth rate came down. After 1947 the interest on Malthus was received because of many reasons such a, increased rate of population growth, greater awareness of the consequences of rapid population growth, realisation that certain natural resources are on the verge of exhaustion. In fact it is because of the fear of rapid population growth; people today feel the need to limit population size within certain level. This itself speaks volumes on the relevance of Malthusian theory.

The theory has been refuted many times and this itself proves its validity. Growth rate in south Asia, southeast Asia, Latin America, and Africa is high even at present. It takes only 25 or less than 25 years to double itself in some LDCS. Moreover all the problems confronting the society are because of population. mention any problem its roots can be traced to population explosion especially in LDCS. Food problem unemployment etc. are all because of population growth. 50 crore of people are suffering from starvation in the world, 150 crores are suffering from malnutrition, famines are rampant in African countries. Resources are getting depleted. Hence it is coined "womb has become a bomb". Every night has become a night mare. Growth is abnormal and even the erstwhile socialistic countries are facing food short age. All these remind us of Malthusian writings. Hence all models of growth need to incorporate Malthusian realities.

6.7 LET US SUM UP

We have pointed above that Malthus was the first person to make attempt towards the process of conceptualisation of the problem of population. The theory states that there will be imbalance between the growth of population and means of subsistence. That is why there is need to keep the population size within the reasonable limit. He pointed out that there are two kinds of checks viz,. Positive and preventive Malthus was in favour of preventive checks. The theory of Malthus however has been criticised by several scholars on many grounds. In spite of these criticisms the theory has been able to draw the attention of many pertaining to the problem of rapid population growth and need to maintain the balance between population and means of subsistence.

6.8 KEYWORDS

Arithmetic ratio, Geometric ratio, means of subsistence ,doubling period.

6.9 QUESTIONS FOR SELF STUDY

1. Explain the salient features of Malthusian theory of population.
2. Explain the relevance of Malthusian ideas to the contemporary problems of population.
3. Give a critical evaluation of the Malthusian theory of population.

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UNIT : 7 DEMOGRAPHIC TRANSITION THEORY

Structure

7.0 OBJECTIVES

After studying this unit you will be able to

- Define the concept of demographic transition
- Understand various stages of demographic transition
- Understand the views of various scholars on demographic transition
- Understand the spatial dimension of demographic transition

7.1 INTRODUCTION

Demographic transaction is considered as the most significant and best documented event in the demographic history of the world. Many of the western countries have experienced the demographic transaction by moving from a condition of high fertility and high mortality to a condition of low fertility and low mortality. It is on the basis of this demographic experience of these countries different scholars have tried to conceptualise the process of demographic growth and they have different views on this process of demographic transition with their own typology . prominent among them are Landry, W.Thompson, C.P.Blacker and F.W.Notestern. The transition is described in various stages and a different kind of demographic situation exists in each of this stages which is explained in detail in the forthcoming sections.

7.3 DEMOGRAPHIC TRANSITION

The population explosion /demographic transition was earlier designated as " demographic inflation or vital revolution" but these description of population growth did not however became popular and only demographic "transition" got prominence and came to stay in the academic world.

This demographic transition has actually occurred in the western countries which have moved from a condition of high birth rate and high death rate with consequent low growth of population to condition of low birth rate and low death rate once again leading to slow growth of population. many demographer have attempted to construct a typology to describe this transition from high birth rate and high death rate to condition of low birth rate and low death rate. Let us briefly describe the view of various scholars on this transition.

Laundry in 1909 had identified there distinct demographic regimes related with productivity i e., the primitive, intermediate and the modern. In the primitive regime the birth

rates were high and remained stable not affected by any socio economic features. In the intermediate regime birth rate began to get affected by socio economic features. In the modern regime birth rate continuous to decline further because of the change in the aspiration and rationales value of the people towards standard of living.

In 1929 Warren Thompson gave his own typology to describe the process of demographic transition occurred in the western world. He had identified three categories of countries on the bases of their stages of demographic transition.

1. The first category consist of those critics where fertility and mortality rates are high but mortality rate is little less leading to high population growth rate.
2. The second category includes those countries where both fertility and mortality rate are declining but decline in mortality is much faster than the decline in fertility causing again rapid growth of population.
3. In the third category he puts those countries which experience rapidly declining birth rate causing slow growth of population.

In 1947 C P Blacker had identified five stages of demographic transition as mentioned below.

1. 'high stationary stage' with high birth rate and death rates.
2. 'Early expending stage 'with high birth rate but declining death rate.
3. 'late expending stage' with declining birth rate rapidly declining death rate
4. 'low stationary stage' with low birth rate and death rates
5. 'Declining stage' with both birth rate and death rates at low level but the death rate exceeds the birth rate.

In spite of the views expressed by above stated demographers none of them however could be called as father of demographic transition theory. In 1945 and again in 1957 it was F.S.Notestein who perfected the theory with sufficiently explanation for changes in fertility and mortality levels in different periods of time . Hence he may be given the credit for scientifically explaining the theory of demographic transition.

The theory of demographic transition postulates that these in a change in the pattern of demography from high fertility and mortality to low fertility and mortality in any country. This demographic change is result of change of the society from a largely rural agrarian and illiterate to a dominantly urban, industrial and literate one. Hence there is a close relationship between the socio-economic change and demographic change in the society.

Notestain has pointed out that there are tree hypotheses involved in the process of demographic transition. They are

1. The decline in mortality comes before the decline in fertility.
2. The fertility also eventually declines to match mortality.
3. socio-economic transformation of the society takes place simultaneously with the demographic transformation.

During this course of movement form high fertility and mortality to low fertility and mortality every society experiences an intermediate stage, When there will be a wide gap between mortality and fertility giving rise to population explosion.

At present various countries of the world are at different stages of demographic transition .This is largely due to the dual nature of man as pointed out by Trewartha. Man is same biologically everywhere but culturally he differs from space to space. It is this cultural differences over space, that leads to variation in fertility and mortality over space resulting in different countries at different stages of demographic transition.

Note stein has suggested three stages in the demographic transition. Which are generally identified with pre-industrial, early western and late western stage. However literature on demographic transition theory shows that three to five stages are assigned to this theory.

Let us confine confine our self to only three stage model and try tounderstand the features of each stage. These stages are;

1. High stationary stage which is indentified with pre- industrial societies characterised by high fertility and high mortality and very little growth of population.
2. Expanding stage with high fertility and declining mortality. This stages is identified with early western stage.
3. low stationary stage where both fertility and mortality are low and balance each other resulting in constantly. Low growth thus completing the cycle. This stage is identified with late western period.

It is now necessary to examine the major demographic and socio-economic features in each of the above mentioned stages.

7.3.1 I Stage

In the first stage both fertility and mortality are very high. Fertility is over 35 per 1000 it is and it remains stable at that level whereas mortality is also over 35 per 1000 but its behaviour is erratic depending upon many factor such as availability of food supply, frequency of famines and epidemics . The growth of population is actually very low and people in this stage are engaged in wasteful process of reproduction. Society in this stage are characterized by predominance of agriculture, backwardness, low population density, lower production, illiteracy, technological and urbanisation level is limited, non agricultural activities are not developed, life expectancy is low, large facilities are common etc. That is way this stage is called pre-industrial and pre modern stage. Before the industrial revolution the all the countries of world were in this stage of demographic transition. But at present no country is probably found at this stage specially because of declining death rates all over the world.

7.3.2 II Stage

In this stage, fertility continuous to be high but with a declining trend of about30 per 1000 . This stage is characterized by most importantly the sharply reduced mortality rate of around 15 per 1000. This drastic reduction in mortality is attributed to many factors such as improvement in sanitation and health facilities, improvement in general productivity and distribution system. This wide gap between fertility and mortality results in population explosion at least in the early phase of the second stage of demographic transition.

The second stage is often divided into two sub stage viz early second stage and late second stage which again have different demographic, socio-economic features.

The early second stage is called as early expanding stage. In this stage fertility is very high but mortality declines. The decline in mortality is due to

1. Greater and more regular availability of food supply as the country is little developed.
2. More effective control of diseases and epidemics.
3. Spread of drugs and medicine.

In the late second stage a process of decline in fertility also sets in. however mortality continuous to decline sharply

Thus the population in the stage as a whole increases first at generally increasing rate followed by gradually subsiding rate later. In both the cases population growth is significant

because of the wide gap between birth and death rate. This population explosion during this stage leads to problem of resource mobilisation. The economy experiences higher degree of industrialisation and urbanisation, health facilities get improved, life expectancy improves and large families are no longer considered as asset. All these lead to significant decline in fertility at the end of the second stage.

Most of the LDCS are passing through different sub stages of this explosive stage of demographic transition. Mortality rate is reduced radically in these countries because of penetration of modern medicine and sanitary measures to every nook and corner of these countries but fertility appears to be still high in these countries though the process of decline in fertility sets in .India, Pakistan, Nepal, Indonesia, Bangladesh etc. are in the later part of second stage of demographic transition. India especially is at present experiencing not only decline in fertility but also considerable decline in the growth rate of population compared to earlier decades.

7.3.3 III Stage

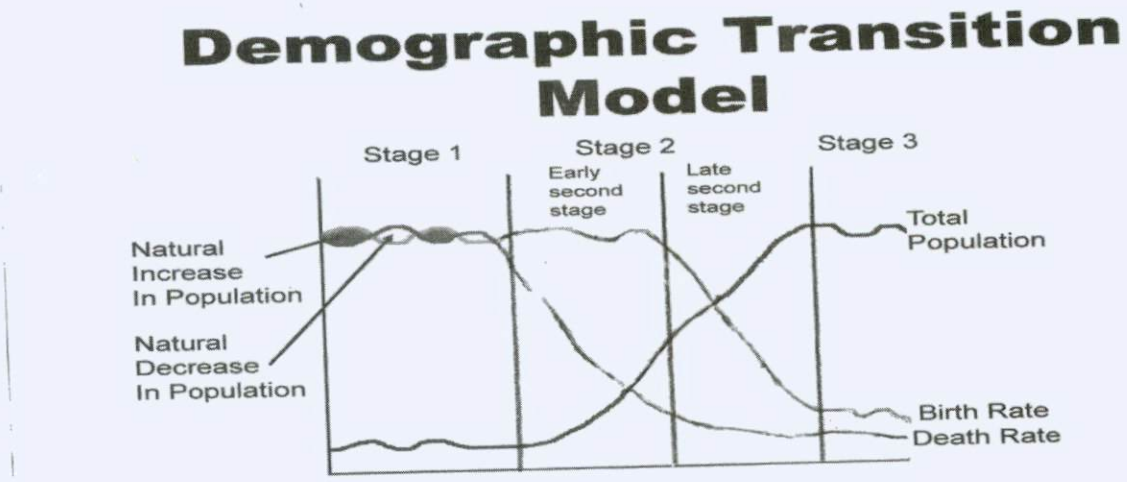
This is the final stage of the demographic transition. This stage is attained when both fertility and mortality reach lowest possible levels. Population growth in this stage is either stable at lower level or grows slowly or even the growth fluctuates sometime registering negatively growth rate, thus completing the cycle of demographic transition

Even through the growth of population is slow both in the first and the final stages. The reasons behind this slow growth are contrastingly different. In the first stage slow growth is due to approximation of mortality and fertility at a fairly higher level whereas the same slow growth in the final stage is due to approximation of fertility and mortality fairly at a lower level. In the first stage fertility is high and stable while mortality is high but fluctuating. In the final stage mortality is low and stable while fertility is low and fluctuating. Thus the roles of fertility and mortality are reversed in the first and third stages.

Socio-economic condition of the society in final stage also are different. In third stage economy is highly modernised, urbanised and developed. Technology is well advanced, level of education and literacy is highest. specialisation labour is very common. Non-agricultural activities dominate the economy. Income level is high and standard of living also is very high. In this stage deliberate control of family size is very common. Health facilities are highly developed. It is because of these factors both fertility and mortality are almost equal at lower levels and the result is the zero population growth. Thus there is demographic transition which brings back the countries to the position found at the beginning of the cycle.

All the MDSC including the countries of Anglo-America, Europe , Australia Newzland, Japan, china etc are in this stage of demographic transition.

Demographic transition model



7.4 SPATIAL DIMENSION OF DEMOGRAPHIC TRANSITION

The concept of demographic transition was first evolved keeping in mind the demographic evolution experienced by the western countries. However all the countries which have experienced this transition did not show only similarities in the trend from high fertility and mortality to low fertility and mortality, even in the western countries the time span and sequential pattern of fertility and mortality decline varied from one country to another. Hence it is very difficult to say which is the country that has experienced this transition first and from which country to which country this process of transition diffused. However one can say that this process diffused from one world to another world.

In the first word consisting of north western Europe, North America, Australia, newzeland, south Africa the tradition was completed during the last 19th or early 20th century. When the rest of the world was still in the first stage.

The demographic transaction in the second world consisting mainly eastern Europe was started in the early decades of the 20th century and the transition was completed in most of the countries like Australia, Czechoslovakia, Ireland, Switzerland, Thailand, Japan and east while USSR completed the transaction by 1950.

However the experience of the third world countries including the countries of Asia, Arabic, Latin America is very much different. These countries are largely populated countries and they have entered the transition phase from 1950 onwards. Still these countries are passing through the late 2nd stage, except china which has recently reached the final stage with low fertility and mortality, India is expected to reach this stage in a decade or so.

Thus the demographic experience of various countries shows that there lot of variation from one group of countries to another. Group and different countries are in different stages of transition.

7.5 CRITICISMS OF DEMOGRAPHIC TRANSACTION THEORY

Critics of this theory have pointed out that this is only a broad generalisation of the experience of western countries. But the problem is that experience of different countries were not uniform. Hence the sequence of the stages as described in theory are not same among different countries. Some studies have related that in Spain and in some southern and eastern European countries decline in fertility occurred even when mortality was high.

According to this theory industrialisation and urbanisation brings down the fertility rate. But France has disproved this hypotheses by controlling fertility even at the low level of social development. China is another example where fertility and mortality are brought drown even when urbanisation and industrialisation are not up to level envisaged in this theory.

Theory also cannot explain the phenomena of "baby boom" occurred in the western countries after the 2nd world war.

The stages mentioned in this theory need not be sequential and inevitable.

In spite of all these criticisms the theory helps in generalising demographic history of the world. The theory provide a satisfactory framework and means for wider empirical generalisation.

7.6 LET US SUM UP

It is very clear from the above discussion that demographic transaction model is based on the empirical experiences of the western countries. There are mainly three stages in this model as identified by Notestein. These stages are indentified with pre-industrialised, Early western and late western societies. There is also relationship between demographic

characteristics and social-economic characteristics of a society. At present different countries of the world are at different stages of the demographic transition model depending upon their social-economic and technological levels of development.

7.7 KEY WORDS

Demographic transition, primitive society, modern society, pre-industrialised society, early western society, late western society, stationary stage, high stationary, low stationary.

7.8 QUESTIONS FOR SELF STUDY

1. Define demographic transition and explain the features of different stages of demographic transition theory.
2. Bring out the salient features of the demographic transition theory.
3. Critically evaluate the demographic transition model.
4. Explain various stages of demographic transition and explain the spatial dimension of demographic transition.

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UNIT : 8 MIGRATION – TYPOLOGY, MEASURES, DETERMINANTS AND CONSEQUENCES

Structure

8.0 OBJECTIVES

After studying this you will be able to

- Define migration
- Measure migration
- Classify migration
- Understand the uses of migration
- Understand the consequences of migration

8.1 INTRODUCTION

There are mainly three factors which are responsible for change in the size of population of any country or region. These are called as components of population change. These factors are fertility, Mortality and Migration. Migration is thus the third factor of population change. This migration is very important from geographers point of view since it takes place over space and powerful instrument of cultural diffusion over space. Since geography is spatially oriented subject migration is of central interest to geography.

Migration has three folds affects. It affects

1 The area experiencing in migration

2 The area experiencing the out migration and

3 The migrants themselves

Migration as a factor of population change brings about change in population size of an area. But it is different from fertility and mortality in the sense that it is not a biological variable. On the other hand it is a product of social, cultural, economic, political, and geographical factors. Let us discuss all these aspects in the following sectors.

8.2 CONCEPT OF MIGRATION

Migration is a form of geographical mobility or spatial mobility of people with change of residence. It to change of residence from one clearly defined spatial or geographical unit to another within the national boundary. Migration thus involves two acts

1 Movement for some physical distance

2 Change of residence.

Hence all sorts of territorial movements can not be called as migration.

Migration can be either internal or external. Movement of people from one part to another within the country is called internal migration whereas movement of people between different countries is external migration. Internal migration is further classified into in migration and out migration whereas external migration is classified into immigration and emigration.

Another concept used in migration analyses is migration stream. Migration stream refers to a body of migrants who have a common area of origin and a common area of destination. Place of origin or departure is an area from which people move out whereas place of destination or arrival is the area to which people move. It is on the basis of this place of origin or destination migrants are classified in to in migrants and out migrants or immigrants and emigrants.

8.3 TYPOLOGY OF MIGRATION

Migration has been classified into various types on the basis of many criteria such as duration, distance, motivation, areal unit etc. let us now examine different types of the phenomena of migration.

8.3.1 On the basis of distance:

Migration is classified into two types on the basis of the distance moved by the Migrant

1. Short distance migration and
2. Long distance migration

The short distance and long distance are just relative in the sense one is called as short distance in relation to another for example a movement up to 10 km is short distance compare to 50 km and 50 km distance is short compared 250 km. There is no fixed critical unit in terms of distance to classify migration into short and long distance migration.

8.3.2 On the basis of duration of residence:

Migration is also classified in to different types on the basis of the duration of stay of the people at the place of arrival or destination.

a. **Casual or commuters :**

The people who move to other place very frequently or even daily for work are called as commuters or casual movers because they have not changed their usual residence.

b. **Periodical or seasonal migration :**

This is an important form of migration in the Context of India. In this case people infact migrants to other places for work not permanently but only for a certain specified period in a year or so. They move during a particular season only. Hence it is called seasonal or periodic migration. For instance people from dry belts move to Kodagu, Chikkamagalur district during the time coffee plucking for about 3 to 4 months. This is period is agriculturally slack period at the place of origin of these migrants. Similarly people from surrounding villages of big cities also more to cities during summer when they do not have any work at their native place. This kind of migration is very prominent form of migration in India.

c. **Cyclical migration :**

This kind of migration involves change of place of destination Frequently. The movers do not stay at one place for a long time. They keep on moving from place to place in search of better employment opportunities. Hence it is called cyclical movement or cyclical migration.

d. Temporary migration :

Migrants sometimes do not leave their place of origin permanently once for all. They move out only for a specific period for a specific purpose. Example people move for education, training or even temporary employment. But they came back to their original place after their purpose is achieved.

e. Permanent migration :

It refers to migration of people from the place of origin Permanently. Most of the time people in this case sell all their property at the place of origin and more away from that place. This may be because they get employment outside their place of origin or start business activities etc.

8.3.3 On the basis of political or Administrative unit :

Migration always involves movement from one administrative unit to another. It involves crossing of clearly defined administrative or political boundary. It may be from one state to another or one district to another. On this basis and in the context of India migration is classified into various types as given below.

a. Inter-state migration

b. Inter – district migration

c. Inter-zonal migration

d. Inter – taluk migration

e. Inter – village migration

In all these case migration involves crossing of administrative or political boundaries.

8.3.4 On the basis of type place of origin or destination :

Migration take place from one type of place to another type. Type of place here refers to nature of places such as rural and urban. This is the common type of internal migration all over the world. On this basis migration is normally divided in to four types.

a. Rural to rural migration:

It refer to movement of people from one rural area to another rural area. This kind of migration is very common in agrarian societies and also in primitive societies. People here move in search of land for cultivation. This kind of migration also happens extensively in areas experiencing irrigational development. People from surrounding dry belts move to irrigated belts not only for cultivation of land but also in search of employment opportunities in the irrigated belts. People also move to plantation areas in search of employment.

b. Rural to Urban migration :

In this case people move from rural to urban areas for various purpose such as Job, Education, business activities etc. People in this case change their jobs also mainly from agricultural to non-agriculture. This form of migration is very prominent in all the developing countries including India since people from rural areas in these countries move to urban areas in search of employment not only in form as of sector but also is in-formal sector. In these countries rapid urban development is taking place resulting in more employment opportunities in urban areas and rural areas have higher population densities. Thus push of the rural areas and pull of the urban areas generate this kind of rural to urban migration on a large scale. The push factors of the rural areas are abject poverty, unemployment, low wages, small and marginal landholdings, poor education, health, recreational facilities etc while the pull factors of the urban areas are good employment opportunities, higher and regular wages, good education, health facilities and better living standards. That is why it is said that bright city lights attract people from rural areas.

One of the adverse consequences of the large scale rural urban migration is the creation of slum in urban areas which again do not provide comfortable living facilities for the people.

c. Urban to urban migration :

This form of migration involves movement of people from one urban centre to another and this is a phenomena mostly of the MDCs where percentage of people living in urban areas is more than 70 – 80%. This type of migration takes place also in LDCs but on relatively a small scale. people in this case move from one urban centre to another in order to improve their economic condition and educational status. In LDCs especially people from small urban centre move to big urban centre to acquire skills. This kind of migration to large urban centres from small urban centres create a vacuum in small urban centres which will be filled up by movements of people from surrounding rural areas to small urban areas. This form of migration is normally referred to as 'step-migration'.

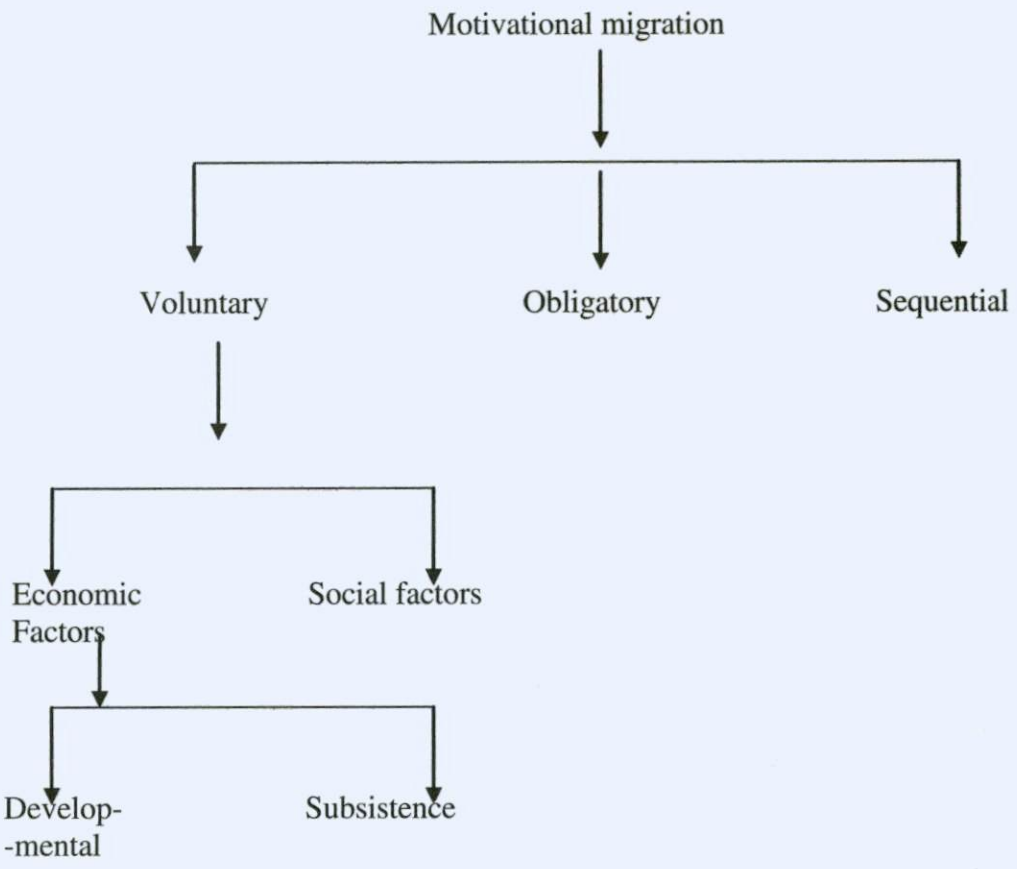
d. **Urban to rural migration :**

This is not a very common types of migration. It is very Less in LDCs and it is relatively more in MDCs where people move from urban areas to rural areas to escape from over congestion. This happens mainly in the countries which achieved advanced stage of urbanization and industrialization it also happen in India where some retired personal move to their native villages because they still own property and houses in their native places. It is however becoming less and less over time.

8.3.5 On the basis of Motivation :

On the basis of circumstances and the reasons or motivations which generate movement of people migration is classified in to various categories. This classification is infact very significant one in any migration analysis. The detailed classification is given below,

Migration on the basis of motivation



Migration can be a voluntary or otherwise. In case of voluntary migration it takes place because of the individual's own will and wish. There is no any sort of compulsion or force from other people. Individuals themselves take decision to migrants from their place of origin in order to improve their economic conditions or for other social factors. But voluntary migration occurs mainly because of economic factors all over the world and all the time. Here again there are two types – Developmental and Subsistence. Developmental migration take place because people what to further improve their economic conditions. Here pull factors operate more than the push factors. People may move for a higher job or better business set up or even for a better agricultural opportunities etc. The subsistence type of migration on the other hand takes place because of abject poverty at the place of origin which push people out of their native place. They move out in search of some job, either in rural or urban areas in order to keep their body and soul together. People move out to irrigated areas in such of coolie jobs or to urban areas in search of jobs in urban informal sector search as construction works, work in hotels etc.

Voluntary migration also takes place for social reasons such as after retirement people may move to their place of choice to lead their future life.

Obligatory migration is another kind of motivational migration in which case people migrate not because they want to migrate but because of certain factors which force them to migrate. These factors could be transfer in case of employees or marriage etc which people to migrate. Sometimes government policies also are responsible for this kind of migration. Construction of irrigation dams and some other projects are responsible for displacement of people from their original inhabitation. They have to be rehabilitated somewhere else. Thus there are some obligation on the part of the people to migrate.

Sequential migration is another form of migration where people just follow their elders. For instance children and other family members follow parents or head of the household.

8.3.6 Miscellaneous migration :

Migration is also classified into various types on the basis of fact whether the place of origin of the migrants is their birth place or not. On this basis migration is classified into three types,

a. **Primary migration**: If the place of origin of the migrants is their birth place, then it is called primary migration provide movement takes place for the first time.

b. **Secondary migration**: If the place of origin of the migrants is not their birth place then it is called secondary migration.

c. **Return migration**: If the place of destination is also the place of birth of the migrants then it is called return migration. It means people move away from their birth place and stay in other place, finally they decide to move back to their place of birth.

8.4 MEASURES OF MIGRATION

There are various techniques that are used to measure or estimate the magnitude of migration. All these techniques are classified into two categories. Direct techniques . Indirect techniques.

8.4.1 Direct Measures :

The direct measures of estimating migration are based on the data obtained by asking the people direct question at the time of census enumeration. The questions on the place of birth previous place of residence of a person duration of stay at the present place of residence are directly asked which help to asses the movement of people and migration is measured on this basis.

Place of birth :

This is very important factor to classify people into migrants and non-migrants in a given place. Migrants are those who are enumerated at a place which is different from their place of birth. Non migrants are there who are enumerated at the place where they are born. This is very simple method and easy to calculate migration. With the help of this we can identify the magnitude of rural-urban, inter-state migration etc.

However this method suffers from some limitations. It assumes only a single movement from their place of birth but people may keep on moving from place to place after they have left their birth place. Another limitation is that it excludes return migrants. Some people have moved out of their birth place and stay elsewhere for a long time and they have moved back to their birth place a few days or a few weeks before the census enumeration.

Duration of Residence and place of last residence :

The information on duration of residence place of last residence and places of residence at a fixed prior date help as to overcome some of lacunaen of place of birth data with the help of these information one can distinguish between non migrant and return migrants and between single movement and multiple movements.

However main disadvantage is that it needs accurate data. If data is not accurate it leads to wrong conclusions.

8.4.2 Indirect measures :

The indirect techniques of measuring migration are not based on any specific questions. In this case migration can be estimated only on the basis of age-sex distribution of population obtained from census taken at two or more different points of time. There are two methods which can be adapted to estimated migration.

a. **Vital statistics method:** In this method a simple equation in the form of balancing

Equation is used to estimate the migration. The estimate of net migration can be made by subtracting the natural increase from the total increase of population. The equation used in this case is

$$M= (P_1-P_o) - (B - D)$$

M= Net migration

P_o= population at the earlier census

P_1= Population at the later census

B= number of births in that area during the intercensal period

D= Number of deaths in that area during the inter censal period

Example: suppose in a place population in 2011 is 10000 and population in 2001 was 8000 the total number of birth during 2001 – 2011 in that place was 1800 and total number of deaths was 500. Then the migration can be computed as follows,

$M= (P_1-P_o) – (B - D)$

$M= (10000 - 8000) – (1800 - 500)$

$M= (2000) – (1300)$

$M = 700$

The natural increase in that place during 10 years period was only 1300but the actual increase of population was 2000. Hence it can be inferred that additional increase of 700 is because of migration to that place.

The main problem in this methods is that it is very difficult to get the accurate and reliable data especially in LDCs where both birth and death data may not be entirely reliable.

b. Survival Ratio method: This method is very suitable and appropriate to get age-sex distribution of net migration. We need only age-sex distribution of population at two censuses. We assume that the population of earlier census are survived. Then if we subtract the survives of the earlier census from the population of the later census we get the net migration. The example below makes it clear

Age group in 2001	Population In 2001	Age group In 2011	Population In 2011	Differences
0-4	150	10-14	180	30
5-9	130	15-19	135	05
10-14	140	20-24	130	-10
15-19	150	25-29	160	10
20-25	160	30-34	190	30

It is clear from the table above that the population, that was 150 in the age group of 0-4 in 2001 should have been again 150 ten years later i.e 2011 assuming all the children in 2001 in that age group 0-4 are survived till 2011. It is also assumed that the children in 0-4 age years in 2001 will have attend the age of 10-14 in 2011 Any change in this number indicates either in migration or out migration. If change is positive it indicates in migration and if it is negative it indicates out migration. This method can be applied to find out the migration trend separately for males and females.

Every method of measuring migration however suffers from its own limitations.

8.5 DETERMINANTS OF MIGRATION

Man has been migratory by nature right from his appearance on the surface of the earth. He was migrating from place to place during Palaeolithic and Mesolithic, Neolithic period. Afterwards also he has been moving from place to place during ancient, medival and modern periods. The causes for this migration are numerous and keep varing from one period to another period, because migration is a complex phenomena and different situations generate different types of reasons for migration. Reasons for migration vary from time to time, area to area, group of people to group of people and individual to individual. Hence there are innumerable number of causes for migration. It is why different to list out all the reasons for migration. However very broadly the factors could be grouped into two categories viz.,

1. Push factors which repell people to move out and these factors such poverty, unemployment, etc operate at the place of origin.
2. Pull factors which attract people to some place and these factors such as employment opportunities, irrigational facilities, urban amenities, etc operate at the place of destination.

   Sometimes both push and pull factor may also operate in the same area. Hence it is also difficult to distinguish between push and pull factors.

As migration is a complex phenomenon, so also are the causes for its generation. For the convenience of understanding the causes may be grouped in to various broad categories as given below,

1. **Economic causes :**

Economic factors are by far the most important causes for migration through out the world and at all the times in human history. People migrate for jobs for good land for cultivation, for better opportunities to set up their business etc.

It was for economic reasons people from African were transported to North America to work in plantations. people from poverty striken areas of drought prone region move to metropolitan areas in search of coolie. Jobs or they even move to command areas of irrigation projects to work in agricultural lands.

Poverty, unemployment etc generate out migration whereas availability of good agricultural land, better employment opportunity etc attract migration. Areas with depressed economic conditions generate out migration while the areas with economic prosperity attract people from other areas.

Dry farming, pressure on land resources, non – availability of jobs are the push factors availability of land for cultivation in irrigation command areas such as Tungabadra and large scale land available in Dandakarnya, terai region and availability of jobs in urban – industrial regions are the pull factors for migration.

2. **Technological factors :**

Technological advancement of a society is also a major factor for migration. People with more advanced technology attract people from the regions of less advanced technology. That is why people from LDCs move to MDCs not only for jobs but also for higher education. During the ancient time also Romans conquered areas of Europe, North America and South West Asia and during the same period people migrated to Rome for better economic and employment opportunities since Romans were technologically more advanced at that time only. Similarly during the medival period. Arabs with better technology were able to conquer large territories in central Asia, north Africa, eastern Europe etc. During the modern time European moves to North America, Australia, New Zealand, south America, Africa to colonise these areas because Europeans were more advanced technologically during that time.

3. **Demographic factors:**

Among the demographic factors for migration over population is the most dominant factor. Over population exist at various levels i.e national, regional and local levels. An excess of population in an area in relation to available resources and technology

leads to over population. Thus over population results in unemployment, poverty, under nourishment etc which force people to move out of that region or country.

Over population has played a major role in including out migration from a region or a country throughout the human history. Emigration of people from European countries to other parts of the world was because of over population. Even at present from LDCs of Asia, Africa, Latin America people move out because of over population. They move to Anglo-America, European countries, Gulf countries, Australia – New Zealand not only to work as academicians, doctors, engineers, technicians etc but also to work as domestic servants, agricultural labours and unskilled workers.

4. Social factors:

Social factors also play important role in the process of migration. People want to lead their life with the people of their ethnic, religious and social groups. Hence people migrate to join their own group. We have the examples in the history such as emigration of balkan people owing to dominance of Muslim turks in the middle ages. There was expulsion of Jews from Germany, Spain and erstwhile USSR. In India also migration of Kashmiri pandiths and Punjab hindu has taken place.

Other social factors such as Education, social amenities, health facilities also are important in causing migration of people.

Marriage is another social factor responsible for migration of especially females. This is particularly relevant in Indian context. Almost half of the population migrate because of this factor only.

General increase in the aspiration levels of the people with the advancement in science and technology is another factor responsible for migration. People want to enjoy better standard of living. That is why many doctors, engineers and other professionals from developing countries move out to developed countries.

Another reason for migration is the availability of information through well developed communication network cultural contacts and spatial interaction. The societies which are more open, progressive, socially awakened and have more contact and explore with the out side world, are more mobile societies compared to those which are conservative traditional, orthodox etc. The diffusion of information takes place at a faster rate in the progressive societies compared to conservative societies.

5. **Political factors :**

Political factors have gained importance as cause for migration, after the second world war. Political refugees has become a worldwide phenomenon afterwards. Political migration includes turkies, Armenians and white Russians in early 20 the century after the II world war Palestinians, chines, Cubans, Indians, Pakistanis, Bangladeshis, Kashmiris, Tamilians, Vietnams, Afghan, Iranian, Tibetan etc. All these are the examples at the international level.

In addition to this, the political factor in the form of government policy also affect migration especially within the political boundary of a country. Every country has got its own population policy which either favourably or adversely affect pattern of population migration. Most of the countries today discourage immigration to their respective country. In China during early 1950's large number of people moved to urban areas from rural areas because of the collectivisation of farms.

6. **Other factors :**

Political conflicts or wars between the nations also are responsible sometimes for migration. For example nearly 6 million people were displaced in the Ist world war and 60 Million people were displaced in the II nd world war. Similarly during turk –greek war in early twentieth century thousands of people moved from Greece to turkey. During the time of partition in 1947 many people from India moved to Pakistan and from Pakistan to India.

In 2001 when Afghanistan was attacked by the U.S.A. millions of refugees moved various countries such as Iran , Pakistan ,Uzbeaistan and Tajakistan.

Lastly migration itself is a case for migration. Migration generates further migration. It is like a sin, once committed becomes easy to repeat.

It is very clear form the discussion made above that there are number of factors which determine migration and it is not easy to trace all the factors involved in the proses of migration. Further the spectrum of factors becomes wider and wider as one moved from international level to local level.

8.6 CONSEQUENCES OF MIGRATION

Migration has a profound impact on the area of out migration the area of in migration and the migrants themselves. It is effect the society, economy and the environment

of both origin and destination areas. These effects may either favourable or harmful. That is why consequences of migration are no less important than the causes migration. The major consequences of migration are briefly discussed below.

Most important effect of migration is that it leads to reallocation of human resources. The demographic structure of both origin and destination areas will undergo change because of migration. All demographic features such as size of population, density, growth, fertility, mortality, age and sex composition, literacy level and occupation composition of both sending and receiving reasons get modified.

People generally move from crowded areas to sparsely populated areas with strong resource base. As a result there will a better balance between population and resources. Thus population resource relationship of the two areas undergo significant modification. Sometimes there may be negative impact on population resource relationship because an increase in the population in the destination area lead to higher pressure on resources on the other hand the iumigrants at the place of destination may enhance the capacity to explicit the resources that are available thus leading to higher productivity. Similarly out migration of skilled, educated and young population effects the origin area adversely. Thus both the area destination areas will be effected either positively or negatively.

Diffusion of culture, language and religion is another significant impact of migration. Migrants along with them carry their language, religion and culture. For instance English has spread to most parts of the world because of migration of people from England to other parts of the world. It also leads to conflict between the two – groups as happened between Tamils and Sinhalese in Srilanka, French and English in Canada etc. Religion and cultural values also spread from region to another with the migration process.

The migration also will have profound impact on migrants themselves. The most important change is that the migrants will improve their capability in terms of educational qualification, training etc which bring out positive change in their life . These improvements may fetch then good jobs and improve their earning capacity. Apart from these positive impact on migrants there are some negative impacts also especially when people from rural areas migrate to urban areas. These people suffer from problems in urban areas such as lack of

pure air, open space. Besides they may it difficult to adjust themselves to urban food habits and food timing.

Thus migration will have far reaching consequences. Once migration takes place, the areas of in migration, areas of out migration and the migrants themselves will never remain the same.

8.7 LET US SUM UP

Migration is a very significant component of population change and it involves the movement of people from place to place along with the change of their residence. There are various types of migration classified on the basis of different criteria such as distance, time, nature of areas motivation etc. Migration measure could be either direct or indirect measure. The determinants of migration are numerous including economic, social, political, geographical, technological, demographical factors. These determinants of course vary from region to region individual to individual. Migration has also has got far reaching impact on the society, economy and environment of both the origin and destination areas. Thus migrantion is an important demographic feature.

8.8 KEY WORDS

Migration, Migration stream, in migration, out migration, inmigration, emigration, seasonal migration, place of origin, place of destination, determinants of migration, rural-rural migration, rural-urban migration, voluntary migration, obligatory migration, sequential migration, developmental migration, subsistence migration, vital statistics method, survival ratio method.

8.9 QUESTIONS FOR SELF STUDY

1. Define migration. Explain various types of migration.
2. Explain different methods of measuring migration.
3. Explain the major determinants of migration.
4. Explain the consequently of migration.

8.10 FURTHER READINGS

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UNIT : 9 COMPONENTS OF POPULATION CHANGE: FERTILITY

Structure

9.0 OBJECTIVES

After studying this unit you will able to

- Know the measurement of fertility
- Know the determents of fertility rate
- Studying the spatial pattern of fertility rate in world and India

9.1 INTRODUCTION

According to United Nations, "Natural fertility refers to the fertility which exists in the absence of deliberate birth control". The term birth control is used in a broad sense to include in.tensional abortions, sterilization and complete abstinence from coitus. Fertility "refers to the actual reproductive performance applied to an individual or a group". **(Vatsayanam)** On the other hand, fecundity refers to "the capacity of a man, a women or a couple to participate in reproduction, fertility can be measured through birth rate. Fecundity however cannot be measured.

Some writers have used the two terms fecundity and fertility as synonymous but there are differences between them. The total number of children born to a couple is known as family size. The sequence of births of children is birth order. This sequence in case of mothers is known as parity, which is decided by the number of children born alive. The biological limits of childbirth are known as reproductive Span. The physiological limit of childbearing capacity and period is known as theoretical maximum fertility. Abortions and stillbirths are classified as reproductive wastage, birth control by self it known as voluntary abstinence. All these concepts must be clearly understood in order to understand the trend and cause of fertility.

Estimate of fertility rates are available from the SRS (Sample Registration survey), and the census data which provide data about births during the previous year. Different types of measures are adopted for computing fertility according to the source of fertility data. The basic measure of fertility is the crude birth rate, which is the ratio of the total registered live birth in a specified year in particular area to the total midyear population of that area multiplied by one thousand. Crude birth rate is crude measures of fertility; it is simple and easy to calculate.

9.2 MEASURES OF FERTILITY

As has been already pointed out, the main sources of data about fertility are: census vital registration system and sample fertility survey. Different types of measures are adopted for computing fertility according to the source of fertility data. The main sources of data provide the following types of information

9.2.1 vital registration System

a) The number of registered births, usually on in one year.

9.2.2 Census

a) The number of children ever born.

b) Census age distribution

c) The number of birtts during the last twelve months.

9.2.3 Sample fertility survey

a) The number of children ever born

b) The number of births during the last twelve months

Basic measures of fertility

The basic measures of fertility are of three types

The first type of measures are related to particular period and based on peculiar to it. These are therefore, termed as period measures. The vital registration system provides data for one year. Therefore, the question on the number of birth during the last one year is asked in a census or sample survey.

Another measure of fertility refers to the reproductive performance of women up to a certain time. Therefore, question on the number of children ever born is asked in census of sample surveys.

Yet another measure of fertility attempts to measure it indirectly on the basis of the age and sex distribution of the population.

The followings are the most important measure of fertility

9.3 THE CRUDE BIRTH RATE

The crude birth rate is the ratio of the total registered live births in a specified year in particular area to the total mid.year population of that area multiplied by one thousand. This is expressed by the following formula:

B/P x I

Where :

B is the total number of live birth during a year

P is the total population in the middle of the year; and

I is 1,000

Example: in 2007, there were 3,250 births in a city with population of 223,000.

Therefore :

CBR = (3,250/223,000)*1,000

CBR = 14.57

So, there were 14.57 births for every 1,000 people in the city.

As the name suggest, crude birth rate is a crude measure of fertility. It is simple and easy to calculate since it requires the minimum data. However, it suffers from several limitations.

Advantages

Bringing out exact rate at which the population increases through birth

Disadvantages

Denominator includes largest mass of population.

It does not take in to account the age and sex composition and marital status of the population concerned.

It gives only a general ideal about the fertility.

9.3.1 The General Fertility Rate

Another measure of fertility, which is frequently has been used, is known as genral fertility rate (GFR). This is a refinement of the crude birth rate. It is the ratio of total live births in some specified year in a particular area to the number of women in the child bearing age, multiplied by 1,000; this is expressed by the following formula.

B/P x I

Where :

B is the total number of live birth during a year

P is the mid.year population of women between the age of 15 and 44 0r 49; and

I is 1,000

The general fertility rate in the sample area of Bangalore city during 2010 may then be computed as follows:

Number of live births during 2009.10 = 163

Mid.year female population in the age group 15.44 during 2009.10 = 1,882

Therefore :

General Fertility rate of indicates that, in 2009.10 in the sample area of Bangalore city, there were 86.61 births per 1000 women in the child.bearing age group of women.

9.3.2 Age Specific Fertility Rates :

The general fertility rate is not a very effective refinement of crude birth rate. It loses sight of the fact that fecundity of women changes during the span of the child bearing period. Therefore, further refinement of fertility measures leads to the development of age specific fertility rates, which are computed as follows:

B1/P1 x I

Where :

B1 is the number of live birth to mother of a specified age group in the population during a year,

P1 is the mid.year population in the same age group and

I is 1,000.

The age specific fertility rate for women in the age group 20 to 24 in the sample area of Bangalore city during 2009.10 is

Number of live births to women in the age group 20.24 during 2009.10 =57

Number of women in the age group 20.24 during 2009.10 =387

Therefore :

The age specific fertility rate for the age group 20.24 during 2009.10

= 57378*1000

=147.29

Age specific fertility rates are not affected by variations in age structure. Therefore, these are considered to be refined since these rates are with reference to married women they are called age specific marital fertility rates. These are further refined. However, the comparison between two population groups on the basis of age specific fertility rates is full of difficulties. Therefore, a total fertility rate is required for such purpose.

9.3.3 Total Fertility Rate :

Total fertility rate is the sum of the age specific fertility rates of women in each five year age specific fertility rates of women in each five year age group from 15 to 49 this is compared. This is computed by dividing the number of births with the number of women multiplied by 1000. For example, age specific fertility rate for the sample area of Bangalore city during 2009.10 is calculated as follows:

Sum of all the age specific fertility rate of women in each

5 year age group from 15.44 = 467.15

Total fertility rate = (467.15)*5/1,000

= 2.34

The total fertility rate, according to George W. Barklay, is a hypothetical rate indicating, "the total number of children that would ever be born to a (hypothetical) group of women, if the group passed through its reproductive duration of life with these birth rates in each year of age". It is believed that the women in this hypothetical group would survive till the end of the reproductive period. Total fertility rate is particularly useful for comparisons between the reproductive performance of two groups of women in two countries or in the same country.

9.3.4 Gross Reproduction Rate :

While the total fertility rate refers to the total number of children a group of women is expected to have, the gross reproduction rate is restricted only to the number of female children. This is computed by summing up age specific fertility rates, multiplying the sum by 5 and finally dividing the product by 1,000. For example the gross reproduction rate for the sample area in Bangalore city will be computed as follows:

Total fertility rate = 2.34

Gross production rate = 2.34*0.49=1.15

In the above calculation the digit 0.49 has been arrived by assuming that the sex ratio at birth is 105 male babies per 100 female babies. Therefore, in order to arrive at the percentage of female births in the total population, the former is so divided by 205 which is approximately 0.49. The value of the gross reproduction rate is thus about one half of that of the total fertility rate. In it is also it is assumed that the women in the reproductive age groups would survive till the end of their child bearing period. Gross reproduction rate indicates the number of daughters a group of women is expected to produce. The net reproduction rate indicates the number of daughters ever born. It measures the extent to which a group of newly born girls will replace their mothers under predetermined schedules of fertility and mortality.

9.3.5 Sex Age Adjusted birth rate :

According to the united nations, the Sex.Age Adjusted birth rate, is "the number of births per 1000 of a weighted aggregate of number of women, in the various five years age groups from 15.44. The united nations has recommended a standard set of weights in computing this aggregate. These are 1,7,7,6,4,1, which correspond to the average pattern of age specific fertility rates for the five year age groups.15.19, 20.24, 25.29, 30.34, 35.39 and 40.49 respectively. The weights are "roughly proportional to the typical relative fertility rates of various age groups.

The Sex.Age Adjusted birth rate may be computed as follows

Where:

$$\text{Sex.Age Adjusted birth rate} = \frac{\text{Number of live births during the year}}{1xF1+7xF2+7xF3+6xF4+4xF5+1xF6}$$

F1, F2, F3, F4, F5 and F6 are the number of female in the age groups 15.19, 20.24, 25.29, 30.34, 35.39 and 40.49 respectively.

The above method is used due to the reason that even in countries with different levels of fertility; the relative levels of age specific rates for women are rather similar. Absolute age specific fertility rates can be neither high nor low. The percentages of births at a given age do not differ very much.

9.3.6 Measures Based Upon Census Age :

Census age distribution is utilized to calculate the child women ratio. This is the ratio of children under five years of age to women in the child bearing ages. The formula for this computation is as follows;

Where ;

$P_{0.4} / W_{15.44} * I$

$P_{0.4}$ is the number of children of both sexes under the age of 5,

$W_{15.44}$ is the number of women between the ages of 15.44 and

I is 1000;

For example, the child women ratio for India in 2001 was

Number of children under 5 in 2001=

Number of women in the age group of 15.44 in 2001 =

Therefore the child women ratio for India in 2001

Thus in 1971 in India, there were ... children per 1000 women in the age group 15.44. Child women ratio suffers from serious limitations due to under enumeration in the census and due to the influence of infant and child mortality. Therefore it is not considered to be very much important, though used for several propose.

9.3.7 Measures Based On Number Of Children Ever Born :

Census survey and fertility surveys collect information on the number of children ever born from every married woman. The same source also provides data concerning the present age of the mother. Now, by cross classifying the age of the currently married women and the number of children ever born this measure is known as complete fertility or completed family size. It is a cohort measure against current measures based on reproductive performance in one year.

9.4 DETRIMENTS OF FERTILITY

The basic determinants of fertility include fecundity, age at marriage, duration of marriage, marriage system, sexual habits, etc Not only above said factors are important while economical, social and cultural determinants are also important. The present day distinctions in fertility in different countries and in different regions of the same country are

particularly due to social norms. For our convenience, we may classify these factors into five categories of biological, psychological, demographic, socio cultural and economic factors are the determining fertility.

9.4.1 Biological determinants

9.4.2 Psychological determinants

9.4.3 Socio.cultural determinants

9.4.4 Demographic determinants

9.4.5 Economic determinants

9.4.1 Biological Determinants :

As has been already pointed out, fertility is basically biological thought it is very much governed by the social norms. The following are the biological factors determining the fertility.

Race: race is the one of the important biological factors affecting the fertility. Different racial groups have been found to exhibit varying birth rates. However, since there has been large scale combination of various racial groups and also different racial groups are confined to different environment context, therefore, it becomes very difficult to isolate the role of race. Chandana and sidhu (1980) to find out the different race group have diverse fertility in the same environment existing.

- **Fecundity** :

  It another significant role in biological aspect has an effect on fertility, which is refers to the fertility potential of women. The biological limits of childbirth are known as reproductive Span. The biological limit of childbearing capacity and period is known as theoretical maximum fertility. Women restricted the reproductive span, birth control by self it known as voluntary abstinence. All these concepts must be clearly understood in order to understand cause of fertility. The role of fecundity in determining the fertility behaviour of a population should be most impressive. However, due to its near universality, its role as a determinant of birth rate and regional differences in the same is, therefore, quiet.

- **General Health Condition :**

  It is one of the fundamental biological causes for the control the fertility while it is very difficult to establish a direct relationship with individual health and their fertility potential.

Nevertheless there is no rejecting the fact that bad hygienic conditions can lead to partial or complete sterility. Generally good health and sanitation conditions have indirectly affecting the fertility patterns of the any area. Similarly, poor health and sanitations environment results in high incidence of mortality.

9.4.2 Psychological determinants :

As has been already pointed out, fertility is basically biological though it is very much governed by the social norms. While the physiological basis of fertility is almost universal, the present day distinctions in fertility in different countries and in different regions of the same country are particularly due to social norms. The following are the physiological factors determining fertility :

- **Adolescent Sterility** :

  Raymond Pearl, in his study of 142 countries in 1948, found that the onset of the first menstrual period called menarche occurred generally during the period of 13 to 17 years of age. Recent studies however, have pointed out that menarche varies with time and place. According to another study, during the last 100 years, the menstrual age of European girls has come down settling at present at 13 years. This change is due to environmental factors. In the study by Pearl mentioned above it was noted that cessation of fecundity in females occurred at an average age of 46, the range being 44 to 49 years. In India Kumi.dini Dandekar conducted a survey and concluded that in rural India menstrual period started at the age of 13.8 years and the meno.pausal age was before 50 years in most of the women. In another study by Kamat and Kamat the meno pausal age was fixed at 42.2 years. It may be concluded that the period of fertility is on an average, from the age of 15 years to 49 years in a woman. This is known as reproductive span. In other words reproductive span is between 30 and 35 years. It is not so easily identified among males, in whom it is considerably longer.

- **Post.partum Sterility :**

  Post partum sterility means the sterility during the period after the birth of a child, temporarily for . some time. During this period the possibility of conception is very rare. Menstruation is sometimes not resumed for 2 to 3 years. This period is known as post.partum amenorrhea period. This period is longer for Indian women than for the women in Western Countries due to breast feeding. For example, according to *a* study 82% of rural Indian women were found to have resumed menstruation after a year or

more of child birth. In the case of women in Belgium however, this period was only 6 months. Due to this prolonged period the gap between 2 births for Indian women was found to be 34 to 36 months. Another social factor influencing this tendency is the voluntary abstinence from sexual intercourses following child birth in India.

- **Primary Sterility :**

  This is another physiological factor determining fertility among women or couples. Primary Sterility means the innate capacity of production of children. Complete absence of this characteristic is known as primary, sterility, or childlessness. In India the percentage for this is six in married below 15 years and 10.5 in married above 25 year of age. Thus primary sterility varies with the female age at marriage. This again, has been found to differ a little in different areas. Primary sterility is less in India as compared to developed countries. Secondary sterility means fecundity impairment due to so many reasons, natural or otherwise. For example, it may be due to certain pathological conditions:

- **Reproductive wastage** :

  One of the physiological factors affecting fertility is reproductive wastage, which means abortions and still births. This has been found to be different in different countries and at different times. For example, according to Bourgeois.Bichat. about 30% of conceptions result in reproductive wastage. If this wastage may be checked the reproduction rate could increase by 15%.

  The above discussion makes it clear that fertility is*not uninhibited but checked by so many factors. Therefore, inspite of the absence of artificial birth control some limits to fertility are seen everywhere.

9.4.3 Socio-cultural determinants :

Besides the physiological determinants pointed out above social and cultural determinants of fertility are equally important. Kingsley Davis and Judith Blake have developed a model classifying the intermediate variable through which social factors affect the stages of child bearing. This model is as follows:

I. Factors Affecting Exposure to Intercourse ("Intercourse Variables"):

(A) Those governing the formation and dissolution of unions in the reproductive period.

(1) Age of entry into sexual unions.

(2) Permanent celibacy: proportion of women never having sexual union.

(3) Part of the reproductive period spent after or between unions.

(a) When unions are broken by divorce, separation or desertion;

(b) When unions are broken by death of husband.

(B) Factors Governing Exposure to Intercourse within unions.

(4) Voluntary abstinence.

(5) Involuntary abstinence (from impotence, illness, unavoidable but temporary separations).

(6) Coital frequency (excluding periods of abstinence).

II. Factors Affecting Exposure to Conception ("Conception Variables"):

(7) Fecundity or infecundity as affected by involuntary causes. ,

(8) Use or non use of contraception.

(a) By Mechanical or chemical means;

(b) By other means.

(9) Fecundity or infecundity as affected by voluntary causes (sterilization, sub.incision, medical treatment, etc.}

III. Factors Affecting Gestation and Successful parturient ("Gestation Variables"):

(10) Foetal mortality from involuntary causes.

(11) Foetal mortality from voluntary causes.

The above intermediate variables governed the influence of social and cultural factors on fertility. This influence is positive or negative. For example, the practice of contraception by a significant proportion of couples has a minus value and its absence have a plus value. In other words, the fertility level in society is determined by the combined influence of the II variables mentioned in the model devised by Davis and Blake. As they have pointed out, "All of these variables are present in every society.each one can operate to reduce or to enhance fertility. It" abortion is not practiced the fertility value of variable II is plus." Most of these variables function almost everywhere with local distinctions. The following discussion of the more important variables will further establish this fact :

- **Intercourse Variables. :**

As has been shown in the model given above, sexual intercourse in a society is governed *by* age of marriage, celibacy, voluntary abstinence, involuntary abstinence and coital frequency, etc Of these, the most important is the female age at marriage. Formerly, it was generally very low, encouraging prolific child bearing. In the industrial countries at present it is fairly high resulting into low fertility and narrow reproductive span. According to Kingsley Davis the postponement of marriage was utilized by Japan to bring about a reduction in her fertility rates. According to S. N. Agarwala, if all the Indian women married after the age of 19 there would have been a 30% reduction in the birth rate by 1991.1992. In Ireland fertility is appreciably low since the proportion of females unmarried upto the age of 45 is unusually high and also high is the female age at marriage.

- **Voluntary Abstinence :**

Among Hindus in India, since the beginning of Aryan Culture, the ideal of Brahmacharya has been emphasised, according to which males and females were asked to lead a life of voluntary abstinence upto the age of 25. This resulted in higher age at the time of marriage influencing, fertility considerably. Again, sexual intercourse has been forbidden on various occasions by the different religious scriptures. Among Hindus the prohibition extends upto 80 to 100 days in a year. Among Muslims however, it is for a shorter duration. This results into higher fertility among Muslim couples as compared to the Hindus. Similar injunctions may be found in religious scriptures of Christians, Jews etc., which considerably influence fertility patterns. Nowadays, the influence of religious scriptures is waning fast. Therefore, voluntary abstinence is no more an important variable determining fertility, ft has been substituted by method. of birth control which are now being more and more popularized.

- **Sterilization and other methods of birth control :**

The most important single variable determining fertility today is the method of control including abortion and sterilizations besides practices checking conception known as contraceptive practices or techniques. A brsef enumeration of these is necessary to understand fertility variables In a study conducted by Royal Commission on population in 1946.47, it was found that only 16% couples married before 1910 had been using control methods in U.K. The percentage of users during the period 1935.1939 rose to 66. The second national survey conducted by, Population Investigation Committee in 1967.1998 found this percentage 82.1 which further rose to91.4 during the period

1961.1965. In 1975 nearly 70% women were using some kinds of contraception. Among the most important contraception methods are oral pills, IUD and sterilisation. These have made tremendous progress not only in developed countries but also in developing countries like Hong Kong and Singapore. The family planning movement is progressing in India right from the start of Five Year Plans. Thus the most important variable affecting fertility in most of the societies today is the methods of contraception.

- **Norms about family size :**

Most of the great religions have laid down norms about family size which generally favour high fertility. For example, among Hindus the blessing on marriage to a girl is "may you have eight sons." This is so since every religion wanted to multiply the number of its followers. However, notions about family size have changed drastically in recent times. Psychological researches in the West have shown that the urge to motherhood is not innate but acquired due to cultural factors. Some women have shown definite aversion to motherhood. While some women want to procreate more than half a dozen children, most of the educated women today do not want to procreate more than two to three children. The general norm about the family size today is two to three children. In China it is only one child per family. The present norm in India is two children per family. In most of the developed countries, the family size is reducing. So many males and females prefer to remain unmarried. Most of them marry sufficiently late. The number of children is generally kept to the minimum. Thus, change in the norms about family size has been the most important variable determining population today.

- **Intermediate variables :**

Sexual practices and marriage customs in every society are governed by the contemporary norms. Pre.marital and extra.marital sex relationships arc very much governed by the current norms. In most of the modern societies norms about these are fairly lax leading to a lot of premarital and extra marital sexual activity without any child birth. The ages of marriages of males and females are rising everywhere. In so many countries divorce has become rather easy. The most important hurdle in divorce are the children. Therefore, most of ihe couples are against procreating too many children. The increasing number of divorces has an adverse affect on birth rate.

- **Age at Marriage :**

  The societies that are characterized by low age at marriage shows high fertility rate, implying an reverse relationship with birth rate and the age at marriage.

  The above discussion shows the social and cultural determinants of fertility. It is clear that in modern societies these are much more important than the biological determinants. Most of the governments today are actively popularizing methods of birth control. These include Coitus Interrupts, Male Sterilization or Vasectomy for males and Rhythm Method, the Calendar Method, the Temperature Method, Mechanical and Chemical contraceptives. The Intra-muterine (IUD), oral contraception and female sterilization. Contraceptive technology is being improved everywhere particularly concerning abortions. In most of the countries laws have become very liberal about induced abortions thus the growth of population no more depends on biological factors but may be controlled by human efforts.

9.4.4 Demographic determinants

Age structure, sex composition, degree of urbanization, duration of marriage, working, and non working status of families are prominent are demographic determinants of fertility.

- **Age Structure :**

  It one of the basic determinant of human fertility, because the proportion of population in reproductive age group will have a direct bearing upon birth rates. The countries having young population are the leading contributors to growth of population. Viz. Asia, Africa and Latin America.

- **Sex composition :**

  It is another vital role in the demographic determinant of fertility. The role of factor of sex composition becomes clearer when the birth rates of population having unbalanced sex ratios are observed.

  Ex: the Indian urban areas are attract the more male in.migrants and thus suffer from paucity of females, hence, it shows the low birth rates.

- **Urbanization n :**

  Urban society, as compared to the rural society, lays more emphasis upon enjoyment, individualism, small family, high standard of living, social change etc. Almost all the characteristics of modern society favour low fertility.

- **Working, and non working status of families :**

  In most of the developed countries a significant factor influencing rate of fertility is the economic status of the families. For example, a study conducted in Europe in 1970 revealed that the wives of the farmers and farm workers recorded a higher fertility as compared to wives of men engaged in non agricultural occupation. Similar results have been arrived at in other countries. Everywhere workers were found to be having more children than non workers.

9.4.5 Economic determinants

These include industrialization and higher standard of living. Industrialization has compelled so many males to stay in urban areas away from their females resulting in lower birth rate, raising of the standard of living has led to the desire for a small family to maintain the standard. Therefore, in the higher economic groups in developed societies, the rate of birth has fallen very appreciably, so much so that childlessness is an increasing phenomenon.

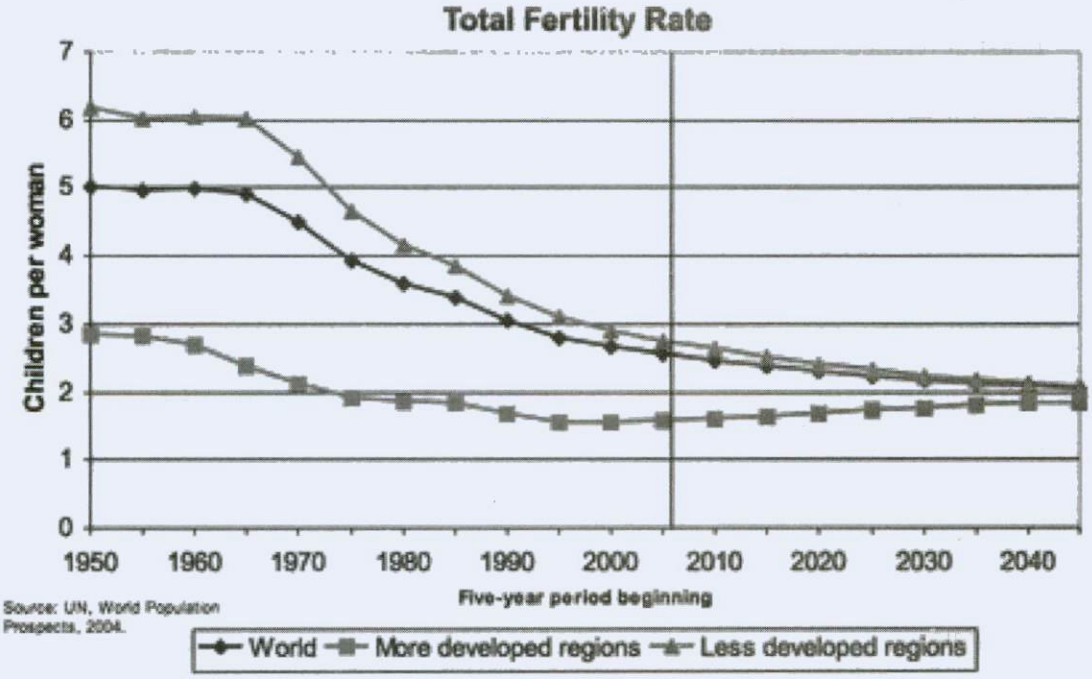
Fertility patterns of population determined by the combined effect of biological, psychological, biological, socio-cultural, demographical and economic factors. It may neither be possible nor advisable to isolate the role of any single factors because birth rate is product of all these factors.

9.5 PATTERNS OF FERTILITY IN THE WORLD

According to United Nations population studies, the estimated birth rate of world population was 315 per thousand during 1970-75. For more developed regions the corresponding figures are – 17.4 and 22.9 respectively. On the other hand for less developed regions the corresponding figures were 37.5 and 42·1 respectively. This shows the great difference between the birth rates of the more developed and less developed countries. For example in 1950-55 the birth rate for the Africa continent was 48.1, while the same was 25.1 for North America and 19.8 for Europe. Similarly, in 1970-75, while the birth rate fell everywhere, the distinction between more developed and less developed regions was clearly perceptible. The birth rate during this period was 16.3 in Africa, 16.5 in North America and 16.2 in Europe. During the same period the birth rate in Western Africa was 48'7 while in Western Europe it was as low as 14·6,

WORLD FERTILITY PATTERNS 2009. TOTAL FERTILITY PER WOMAN		
Country or area	**1970 - 1975**	**2005 - 2010**
World	**4.7**	**2.6**
More developed regions	**2.3**	**1.6**
Lessdeveloped regions(excluding the least developed countries)	**5.6**	**2.5**
Least developed countries	**6.3**	**4.4**
AFRICA	**6.5**	**4.6**
Eastern Africa	6.5	5.3
Middle Africa	6.2	5.7
Northern Africa	6.2	2.9
Southern Africa	5.1	2.6
Western Africa	7.1	5.3
ASIA	**5.4**	**2.4**
Eastern Asia	5.2	1.7
South.Central Asia	5.6	2.8
South.Eastern Asia	5.3	2.3
Western Asia	5.9	3.0
EUROPE	**2.3**	**1.5**
Eastern Europe	2.1	1.3
Northern Europe	2.3	1.8
Southern Europe	2.6	1.4
Western Europe	2.2	1.6
Caribbean	**4.6**	**2.4**
Central America	**6.4**	**2.5**
South America	**4.8**	**2.2**
NORTHERN AMERICA	**2.4**	**2.0**
OCEANIA	**3.6**	**2.4**
Australia/New Zealand	2.9	1.9
Melanesia	6.6	3.9
Micronesia	5.7	2.5
Polynesia	6.5	3.0

Fertility levels are lower in developed countries than in developing nations because more women in developed countries work outside of the home and tend to marry later and to use contraception and abortion to delay or prevent childbearing. Nevertheless, fertility rates in nearly all countries have been falling since the 1950s (Fig. 1). Most of the exceptions are in Central and Western Africa.



Fertility patterns can vary widely within countries. Racial and ethnic minorities may have higher fertility rates than the majority, and families with low incomes or low levels of education typically have more children than those that are affluent or well-educated. Women who work outside the home generally have fewer children than those who stay home, and rural families have more children than city dwellers. In 2006, the number of births per 1,000 people worldwide averaged 21, with extremes ranging from a low of 8 or 9 (mainly in northern and Western Europe and some former Soviet republics) to 50 or more in a few west African nations

9.5.1 Fertility Trends In Developed Countries :

As has been pointed out above, the birth rate in developed countries is much lower as compared to the developing countries. Some of these countries however, were having quite a high birth rate, some time back. In 18th century the birth rate in most of the present day

developed countries was between 30 to 40. It was 37 in France, between 32 and 35 in Sweden and between 29 and 33 in Norway. The decline in birth rate is a phenomena particularly of the 28th century. The process however, started in 19th century. In 1974 the crude birth rate in the well known developed countries was as follows: Canada 15.4, United States 14.9, Argentina 22·7, Japan 18.6, Israel 28'2, Denmark 14.1, France 15.2, German Democratic Republic 10'4, German Feckm! Republic lO'l, Ireland 22.3, Norway 150, Romania 20'3, Spain 194, Portugal 19'6, Sweden 13'5, United Kingdom 13.1, Yugoslavia 15.1, Australia 18.1, USSR 18.0. Thus the developed countries have moved from high fertility to low fertility In Europe the Eastern and Central countries have slightly higher birth rates than the Northern and the Western countries. In 1904 almost 66% of the developed countries had birth rate below 18. During the period 1900, 1994 the birth rate per thousand for some of the more developed countries was as follows: Denmark 29 0, Finland 31 3, Ireland 23·l, Norway 98 5, Sweden 26.4, UK 28.2. Australia 35.7, Belgium 27.9, Germany 34.3, France 21 2. Netherland 31.5, Switzerland 28'2. The Crude birth rates in these countries during the year 1974 were : Denmark 14.1, Finland 13'3, Ireland 32.3, Norway 15'0, Sweden 13.5, UK 13.2, Austria 12'9, Belgium 12.7, Germany 10.1, France 15.2, Netherland 137. Switzerland 13M. Of these countries while the first six were from Northern Europe, the last six were from Western Europe. These may be compared to the countries of Eastern Europe and Southern Europe to see the difference. For example, in 1974 the following countries of Eastern Europe had crude birth rates as follows ; Bulgaria 17'2. Czechoslovakia 19 8, GDR 10.4, Hungary 17.S, Poland 18.4. Romania 20'3, Greece 16.0, Italy 15.7, Portugal 18'4, Spain 19'4 belong to Southern Europe. This transition from high to low birth rate was however not in a straight line. During the First World War it declined only temporarily. It went up during 1920.1924. It declined till 1930 and then during the period 1940.45. the period of Second World War, one finds a babv boom. It was particularly so in Switzerland and Sweden where it almost reached its peak, though started declining thereafter. In the countries directly involved in war, particularly France. England and Wales, the birth rate went up after the Second World War. In USA the birth rate during 1930. 34 and 1935.39 were the lowest. It went up after the Second World War and continued upto 1957 when it was 25.0. It declined after 1957 and very rapidly after 1965. An identical pattern was noticed in Canada. In USSR the rise was not very significant. The rise in birth rate is attributed to several factors such as early marriages, remarriages, demobilization of soldiers, etc.

9.5.2 Fertility Trends In Developing Countries :

As has been already pointed out, the fertility trend in developing countries has been always more than those of the developed countries. However, in these countries also the birth rate has come down particularly in the 20th century. In 1950 the crude birth rate in some of the selected developing countries was as follows

It is clear from the table given above that almost all the developing countries have shown decline in fertility rate during recent years. This will be further supported by the following crude birth rate for 1950 and 1974 for the 8 largest developing countries in the world.

9.6 TRENDS IN FERTILITY IN INDIA

While it is generally accepted that fertility in India was high in the distant past, good estimates are not available as the vital registration system had not functioned well. But indirect estimates by census actuaries and demographers (Davis, 1951) show that at the beginning of the twentieth century the Crude Birth Rate (CBR) was in the range 45-50 per thousand. Estimates by the Registrar General show some fall in the 1940s but this is not corroborated by independent estimates by Bhat (1998) using the variable-r method according to which the CBR was just above 45 and the Total Fertility Rate (TFR) around 6 up to the 1950s, with only minor fluctuations (Fig.1). Applications of the modified Rele method by Rele (1987) and Ram and Ram (2009) also show the TFR to be around 6 through the 1950s. Given that the TFR was just about 6, one could say that at the national level fertility was moderately high through the middle of the century.

During the 1960s, especially the late 1960s, some fall in fertility was evident. Fairly reliable direct estimates of fertility from the Sample Registration System are available since the 1970s allowing a detailed assessment of trends. The decade of 1970s saw perceptible fall in fertility, the CBR fell below 40 and the TFR below 5. While some under-registration cannot be ruled during the early phase of the SRS, as the census based estimates for this period are higher than the direct SRS estimates, the decline was clearly established. Fertility stagnated in the early 80s, but the decline resumed soon with the TFR falling below 4 points by the end of the decade. The decline was quite substantial throughout the country; the TFR fell by one full point and the CBR by five points between 1984 and 1993, the steepest decline seen in any ten-year period. Steady decline has continued ever since, with the CBR falling to 22.6 and the TFR to 2.6 in 2009.

Trends in Crude Birth rate and total Fertility Rate, India 1901-2009

Period	CBR		TFR	
	Census based	Variable-r method	Rele's method	Variable-r method
1901-10	49.2	46.8	6.3	5.77
1911-20	48.1	46.0	6.6	5.75
1921-30	46.4	46.4	6.4	5.86
1931-40	45.2	46.6	5.8	5.98
1941-50	39.9*	45.4	5.6	5.96
1951-60	41.7	45.7	6.0	6.11
1961-70	41.1	40.9	5.9	5.72
	SRS estimates			
1971-75	35.6		5.0	
1976-80	33.4		4.5	
1981-85	33.6		4.5	
1986-90	31.4		4.0	
1991-95	28.9		3.5	
1996-2000	26.6		3.3	
2001-05	24.6		3.0	
2006-09	23.0		2.7	

Sources: CBR: Census based: 1901-41: Davis (1951); 1941-71 by Registrar General cited in Rele (1982); Variable-r method: 1901-71: Bhat (1998); SRS estimates: 1971-2009: computed from Registrar General (2010a, 2010b, 2011b).

TFR: Rele?s method: 1901-51: Ram and Ram (2009); 1951-81 Rele (1987); Variable-r method: 1901-71: Bhat (1998); SRS estimates: 1971-2009: averages computed from Registrar General (2010a, 2010b, 2011b).

Contribution to fertility decline came from both a rise in age at marriage and fall in marital fertility. But the latter has made a greater impact on fertility than the former. Between 1971 and 2009, TFR fell by 2.55 points, of which 0.58 points or only 23 percent may be attributed to the fall in proportions married and 1.97 points to fall in marital fertility. Age at marriage rose gradually, with the singulate mean age at marriage for females going up from 15.9 years in 1961 to 17.2 in 1971, 18.3 in 1981, 19.3 in 1991, and 20.2 in 2001 (Goyal, 1988; India, Registrar General, 2008). As fertility takes place mostly within marriages, the effect was felt primarily in lowering fertility in the 15-19 age group; percentage females never married in this age group rose from 29 in 1961 to 75 in 2001.

Marital fertility declined as contraceptive use increased. In the 1950s, contraceptive practice was negligible in India. Some of the early surveys, in Western Maharashtra (Sovani and Dandekar, 1953) and in the Mysore State (United Nations, 1961), revealed hardly any use of contraception. The family planning programme was introduced in India in 1951 and provided free contraception but acceptance was uncommon. The programme was strengthened in the 1960s, with the introduction of the extension approach, sterilization camps, incentives for contraceptive acceptance, and enhanced availability of contraceptive services through a large network of health centres. Yet, in 1970, only about 10 percent of couples of reproductive age used any contraception (ORG, 1971). The programme intensified during 1976, coinciding with the national emergency, and the acceptance increased. This raised contraceptive prevalence to over 20 percent. However, the backlash due to the emergency period excesses in family planning caused stagnation in contraceptive prevalence for some time. But after the mid-1980s, the upward trend in contraceptive prevalence resumed. Though the programme estimates show a plateau after the mid-1990s, independent estimates from surveys show quite clearly that the rising trend has continued. According to the three rounds of the National Family Health Survey (NFHS-1, NFHS-2 and NFHS-3) the prevalence of modern contraception rose from 37 percent in 1992-93, to 43 in 1998-99, and 49 in 2005-06 (IIPS, 1995; IIPS and ORC Macro, 2000; IIPS and Macro International, 2007). The contraceptive use has been dominated by sterilization.

9.6.1 Spatial Variations :

Given India?s proverbial diversity, it is not surprising that fertility too varied across regions of the country. Even during the pre-transition period, the southern states had lower fertility (TFR below 6) than the northern. In particular, TFR in Tamil Nadu was around 5 for some time even before 1950 (Guilmoto, 1992; Ram and Ram, 2009). The track of fertility

differed substantially across states. Transition began early in some states, in the 1960s and in some in the 1970s. The pace also differed spatially. If we accept 10 percent decline from a plateau and continuing decline for some time thereafter as fertility transition, some states entered the phase as early as 1961-66, these are Gujarat, Punjab and West Bengal and had pre-transition TFR of 6 or higher; the change is assessed on the basis of the estimates up to 1981 by Rele (1987) and after 1981 from the SRS (2010a). Kerala followed during 1966-71 and Haryana, Karnataka, Maharashtra and Tamil Nadu during 1971-76. But since the initial level differed as did the pace of decline, some of the late entrants completed transition to low fertility much before the others. Among large states, Kerala has been the leader reaching a TFR of 2.4 in 1984 (and 2.1 by 1988) followed by Tamil Nadu (TFR of 2.4 in 1990 and 2.1 in 1993); generally TFR of 2.1 is considered as equivalent to replacement level fertility in low mortality situations but here TFR of 2.4 is treated as „replacement level low fertility? since given the current level of mortality, this value of TFR yields a net reproduction rate close to 1 for most states of India. The bunch of Himachal Pradesh (1997), Andhra Pradesh and West Bengal (1998), Karnataka and Punjab (2000), Maharashtra (2001), and Jammu and Kashmir (2002) reached the TFR of 2.4 around the turn of the century and Odisha joined the league in 2007. Some of the north-eastern states have also reached low fertility as have Chandigarh and Pondicherry. For small states and union territories, the SRS estimates are sometimes not reliable. But the NFHS data indicate that Goa reached low level replacement fertility before 1992-93 and Delhi around 1998-1999 (IIPS, 1995; IIPS and ORC Macro, 2000; IIPS and Macro International, 2007). These states and union territories together constitute about half of India?s population. In many of these fertility has now fallen below low replacement level. On the other hand, in 2009, Bihar (3.9), Uttar Pradesh (3.7), Madhya Pradesh and Rajasthan (3.3), Jharkhand (3.2), Chhattisgarh (3.0), Assam (2.6), Gujarat and Haryana (2.5) as well as some small states and union territories were yet to break the barrier of 2.4 (India, Registrar General, 2011b). Assam, Gujarat and Haryana are very close to it but Uttar Pradesh and Bihar have a long way to go. Yet even in the latter states fertility has declined and the decline is continuing. There are variations within states as well; a disaggregated analysis of trends in the spatial pattern can be seen in the paper by Guilmoto and Rajan (2002).

9.7 LET US SUM UP

Since the 1970s the world has experienced profound changes in fertility, union formation and contraceptive demand. Fertility has declined throughout the world, early childbearing and marriage are less common and the percentage of women and men using contraception,

especially modern methods, has risen. Nevertheless, the level and pace of change in fertility and the proximate determinants of marriage and contraceptive use have varied markedly among countries such that major differences in fertility levels persist across countries and regions of the world. The paths that childbearing, union formation and contraceptive use have taken in countries have crucial implications for the sustainability of development efforts and for the health and well-being of individuals.

The global decline in fertility in recent decades is one of the major events in the world's demographic history. For a variety of reasons, people around the world are deciding to have fewer children than their parents and grandparents. Such decisions are already beginning to have worrying consequences that governments will have to attempt to address.

Key word: Fertility, Determents, measures, Social factors, Spatial Patterns

9.8 QUESTIONS FOR SELF STUDY

- Explain the basic measures of fertility
- Discus the social, economic and cultural determents of fertility
- Describe the global pattern of fertility.

To ***explain*** the pattern of fertility in India.

9.9 FURTHER READING

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UNIT : 10 COMPONENTS OF POPULATION CHANGE : MORTALITY

Structure

10.0 OBJECTIVES

After studying this unit you will able to :

- Know the measurement of Mortality
- Know the determents Mortality rate
- Studying the spatial pattern of Mortality rate in world and India
- The present chapter deals with meaning and definition of mortality, measurement, determinants and pattern of mortality rate.

10.1 INTRODUCTION

Mortality is one of the three components of population change, the other two being fertility and migration. Historically, the factor of mortality has played a dominant role in determining the growth of population, the size of which fluctuated in the past mainly in response to variations in mortality. Mortality is incidence of death in a population. It is measured in various ways, often by the probability that a randomly selected individual in a population at some date and location would die in some period of time.

In fact, the single most important contribution of demography has been the revelation of the fact that sharp declines in mortality rates, rather than any rise in the fertility rates, have been responsible for bringing about a rapid growth of population. The study of mortality is useful for analysing current demographic conditions as well as for determining the prospects of potential changes in mortality conditions of the future.

The public health administration depends heavily on the study of mortality, for statistics on death in the population cross-classified by age; sex and the cause of death are of great value for the formulation, implementation and evaluation of public health programmes. Statistics on deaths also form the basis of the policies of insurance companies. It is, of course, possible to study mortality, from several angles, for various biological, social, economic and cultural factors affect the health of an individual and consequently the mortality rate in society.

According to the United Nation mortality is the percentage of death in the copulation. Death has been defined by the World Health Organization as follows: "Death is the permanent disappearance of all evidence of life at any time after birth has taken place (post natal) cessation of vital functions without capacity of resuscitation." This definition however, popu-

lates that death can occur only after live birth. Therefore mortality is closely linked with live birth. The United Nations has defined live birth as follows: "Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached ; each product of such a birth is considered live-born." Death prior to a live birth is not included in mortality. It is known as still birth.

10.2 MEANING AND DEFINITION

Meaning : Mortality is a term which means "death" or describes death and related issues. The word "mortality" is derived from "mortal" which came from the Latin "mors" (death).

Definition : The ratio of deaths in an area to the population of that area; expressed per 1000 per year. According to the "United nation" mortality rate is the percentage of deaths in the population. A death has been defined by the world health organization as fallows. "Deaths are the permanent disappearance of all evidence of life at any time after birth has taken place. It is an end of vital functions with out capacity of resuscitation". This definition however postulates that death can occur only after live birth. Therefore, mortality is closely linked with live birth. Death prior to a live birth is not included in mortality, it is known as stillbirth.

10.2.1 Source of Data :

The above explanation of the concept of mortality implies sources of data about it. An important source of data is the registration of vital event. This however, is very inadequate in developing countries except in some major cities. It is only rarely that mortality data are gathered through census. On the world level *The Demographic Year Book* of the United Nations provides data on mortality including number of deaths, death rates, death by age .and sex, infant deaths, infant mortality rates, causes of death etc. Statistical report of the World Health Organization also provides information on mortality.

10.3 MEASUREMENT OF MORTALITY RATE

A wide variety of factors influence mortality: age, sex, race, socioeconomic status, occupation, environment, heredity, smoking and other personal habits, and place of residence. Some of these determinants of mortality are discussed in detail by Kitagawa and Hauser 1 and Erhardt and Berlin2

10.3.1Crude Death Rate

In order to interpret mortality data meaningfully, information about the population at risk is needed. The *number* of deaths is seldom useful for comparative purposes; the number needs to be related to the population at risk. This is done by calculating a rate. The crude annual death rate per 1,000 population for an area is defined as the total number of deaths of area residents for the year divided by the midyear population of the area multi-plied by one thousand:

$$\text{CDR} = \frac{\text{Number of deaths during the year}}{\text{Population of the area at the midpoint of the year}} \times 1{,}000$$

For example, there were 1,934,388 resident deaths in the any area in particular period and the estimated population was 211,389,000. Thus the crude death rate was 9.5; the term 'crude' has rightly been used as it suffers from a number of deficiencies. Firstly, it yields only an average value. This may be significantly influenced by extreme

The crude death rate expresses the frequency of deaths in total population as a single number. For example, if it is said that in 1973 the crude death rate in Greater Bombay was 9.5, it means that 9.5 deaths occurred per 1000 population. The crude death rate provides the basis for computing the rate of natural increase in population by comparison with the crude birth rate. It is the most widely available index of mortality. It may be compared with similar data from other countries to know the trend in mortality. However it is not a refined measure. It suffers from severe limitations, the most glaring of which are the following:

1. Its coverage of death statistics is inadequate.
2. It hides the experience of population group with varying mortality.
3. It gives a greater weight age to the mortality experience of a large group in the population.
4. It does not take cognizance of the differences in the age-sex structures of different populations.

To overcome the above mentioned limitations are used age specific death rates.

Average life expectancy - This is average expectation of life at birth. It is a useful measure of mortality because it is not influenced by the age structure. It is derived from the life table which is constructed to summaries the mortality experience, of a single hypothetical generation. Average life expectancy means the average number of years of life which cohort of new- born babies may be expected to live This measure is rather complicated to live. This measure is rather complicated to calculate. However, it is most easily understood by the common man. Therefore, it is widely used in different countries.

10.3.2 Age specific death rate (DasR)

Disaggregation of mortality rates by age and sex (DasR) yields a more critical measurement of fertility. the age and sex specific mortality rates can be expressed in terms of number of deaths during a year of persons of a given age and sex per thousand of that age and sex. These can be calculated as under:

$$\text{DasR} = \frac{\text{Number of deaths specific age and sex}}{\text{Total population of specific age and sex}} \times 1{,}000$$

10.3.3 Infant mortality rate (IMR)

According to George W. Barclay, "Infants are defined in demography as an exact age group namely, age zero, or those children in the first year of life who have not yet reached age one." The infant mortality rate is a measure of the risk of death between the birth of the baby and its first birth day. It is computed as follows:

$$\text{IMR} = \frac{\text{Number of deaths of children under one year}}{} \times 1{,}000$$

As long as birth rates remain higher than death rates one a global scale. World population grows. The wider the gap, the greater the growth. Yet what are the many and complex factors that determine fertility? it is the outcome of a combination of economic, religious, social and political consideration.

10.4 DETERMINANTS OF MORTALITY

United Nations and ether agencies have tried to analyse the causes of high death rate, particularly up to the 19th century, almost throughout the world. It has been found that the most important reasons for high mortality rates were as follows:

1. Famines and food shortages- During the period 1,000 AD to 1885 AD almost 450 localized famines were recorded in Western Europe. The situation was even worse in Asia, famine was an at most constant factor. During the period 108 BC-1911 AD China experienced 1828 famines, almost one each year. Besides famines, good shortages were due to insufficient food supply resulting into malnutrition, diseases and deaths.

2. Epidemics- Until two centuries back scientific knowledge about diseases did not exist and therefore communicable diseases took a heavy toll of life. These included typhoid, dysentery, Small pox, malaria, typhus, tuberculosis, pneumonia. yellow Fever and plague. Child mortality was high due to communicable diseases such as gastro enteritis, measles, whooping cough, scarlet fever, diphtheria, etc.

3. Recurrent wars-Recurrent wars in different countries have taken a heavy toll of life. For example, in the Franco-Prussian War of 1870-71 13.000 amputations had to be performed of which 10 thousand were fatal. In 20th century the two great wars brought death of such a wide magnitude in such a broad area that war is considered to be the most important cause of deaths.

4. Poor sanitary conditions- Before the present century, in preindustrial times the sanitary conditions were very poor in most of the countries. Even in industrial societies the environments were filthy. Most of the cities suffered from overcrowding and poor sanitary conditions. Upto 13th century the use of soap was almost unknown.

5. Biological factors- Biological factors include age of the mother, order of birth, time interval between births etc These may be classified into endogenous factors. Endogenous factors arc biological factors related to the formation of the foetous in the world. These include besides the factors mentioned above, weight at birth and multiple births or premature births etc. It has been observed that foetal neo-natal mortality rates are higher at the younger age of the mother (below 19), at first parity and for the first birth order. Upto the age of 29 of the mother these mortality rates decline and increase after it. The maturity of an infant is an important factor. Similar is the factor of the weight of the baby at birth. In 1950 low birth weight was the cause of 2/3rds of all the

neo-natal deaths in USA. Chances of survival increase with the increase of weight. Endogenous factors are also known as genetic factors.

6. Environmental or exogenous causes- These include social, cultural, economic and environmental factors effecting infant mortality particularly during the post-neo-natal period. One of the causes of high infant mortality in some countries is the lack of availability of medicine. Most of the post-neo-natal deaths are due to communicable diseases of digestive and respiratory system such as diarrhea and pneumonia etc. The adverse environmental factors include congestion, insanitation, lack of sufficient sunshine and fresh air. Among the environmental causes an important socio-cultural cause in illegitimacy. There is high rate of mortality among the illegitimate infants.

It should be remembered that biological and environmental factors interact and do not work separately. Both the factors have their roles 'almost everywhere. However, in developing countries the environmental factors and in developed countries biological factors are more important and less favourable. On the other hand, in developed countries biological factors are more important since environmental facilities are available. In India Kerala has the lowest infant mortality rate (56.8 per thousand in 1969). Uttar Pradesh has the highest rate of infant mortality showing 1787 per thousand in 1969. In rural India infant mortality differs in different states. While it is as low as 82 in Punjab and below 80 in Kerala and Haryana, it is 140 + in Gujrataj Rajasthan and Uttar Pradesh. It also varies in different religions with Christians and Muslims having lower mortality. Among Hindus it varies in different castes, with higher castes showing low mortality.

High birth rate is a special feature of all the developing economies. The other factors responsible for high birth rate are discussed below.

10.4.1 Climatic factor :

India is a hot country. In the hot climate girls get puberty at an early age which lengthens the fertility period. In the cold countries, girls get puberty late which reduces their effective period to produce children. In India, this climatic factor along with other socio-economic factors has in a high birth rate.

10.4.2 Socio-Cultural Factors :

- **Universal and Early Marriage System :**

  In India universal marriage is a social custom. 76 percent of ladies between the age group 15-44 are married. Since marriage among women is almost universal, birth rate

becomes higher. Further, Indian women marry comparatively, at an early age. The average marriage age of women is about 16 years. As the child-bearing capacity is more at an early age, birth rate tends to be higher.

- **Craze for a male child :**

In Indian society, more importance is given to the male child as certain religious duties have to be performed only by sons. So they go for more and more child expecting a son to come. This lades to a high birth rate.

- **Joint-family System** :

='?In India there is joint family system, which induces the young couples to have more children though they are individually not able to support them. An additional child brings no immediate hardship to parents. This is another factor responsible for high birth rate.

10.4.3. Economic Factors

- **Poverty :**

Some demographers establish a casual relationship between poverty and high birth rate. In poor families children are considered an asset as they add to family income from an early age. Further, a large family acts as a social security for the old age. Besides, it is believed that the reproductive capacity of the poor is intense as sex is the only form of entertainment for them. According to one economist, sexual play is the national play of India. Thus a high birth rate is always associated with poverty of the people.

- **Illiteracy and Unemployment :**

In India people are illiterate and ignorant. In 1991, 60 percent of Indian women were illiterate. Further, 68 percent of women were unemployed and confined to four corners of the house. They did not know the benefit of family planning measures. This results in high birth rate.

- **Partial success of Birth Control Measures :**

Birth control measures have not been fully successful in India. This is evident from the fact that in 1981, every Indian women in the age group of 15 - 49 years gave birth to 5 children on an average. This partial success of birth control measures is regarded as one of the causes of high birth rate.

10.5 FACTORS REDUCING MORTALITY

All the above mentioned factors have led to high mortality rates upto 19th century. However, after the agricultural and industrial revolutions mortality rates have fallen everywhere. Among the most important factors determining deduction in mortality rates in the developed countries in the past two centuries may be mentioned the following :

1. Agricultural revolution started in England around 1700 AD and spread throughout Europe and the European settlements in the world.
2. The development of the steam engine led to the growth of transport facilities due to which food could be easily sent to different areas.
3. Increase in per capita income led to availability of nutritious food resulting in decline in mortality.
4. Advances in technology and improvements in the standards of living led to decline in mortality.
5. Mortality was reduced due to improvements in sanitary conditions and public health measures particularly in developed countries.
6. Social reforms decreased industrial hazards and improved health of working population.
7. The development of asepsis (precautionary exclusion of pathogenic micro organisms) and antisepsis (killing or inhibiting the growth of micro organisms already present) helped in the reduction of mortality.
8. Another important cause of decline in mortality was the development of immunology. This checked chicken pox, cholera, sheep anthrax, hydrophobia and diphtheria. It also typhoid, yellow fever, scarlet fever, poliomyelitis, influenza, measles, whooping cough, etc.
9. In late 1930 chemotherapy or -use of drugs to cure or inhibit the progress of diseases was advanced Considerable decline in mortality was noticed after the second world war by the use of anti tuberculosis drugs. Today fearful diseases like small pox and plague have almost disappeared.
10. Increase in the supply of food in almost all the countries of the world have led to decline of mortality.

11. The above mentioned factors are responsible for recent mortality decline particularly in the more developed countries and also to a great extent in developing countries. As compared to developed countries, the above advantages are not so much available in developing countries. Therefore, the decline in mortality in these countries is considerably low.

The most important factors about infant mortality are genetic, besides there are environmental factors. The following is the explanation of the factors effecting infant mortality:

The demographic study of mortality, therefore, does not usually take into consideration the genetic factor. The remaining two factors, namely, the constitutional and the environmental factors, on the other hand, provide the basis of a demographic analysis of mortality.

Of the various constitutional factors including the physical, physiological, anatomical and psychological characteristics of man the most important for the demographic study of mortality are age and sex.

10.6 LIFE EXPECTANCY

Life expectancy means the average expectation of life at birth. In other words it represents the average number of years of life which a new born may be expected to live. The following two factors have been important variables in life expectancy.

Sex distinctions

As general rule females have higher life expectancy than males, in most of the countries. This sap is wider in the developed countries as compared to the developing countries. The extent of this gap has however, changed at times and places. In developed countries the gap between female and male average life expectancy has widened over a period of 70 years. In most of the countries of the world the crude death rate as well as the age specific death rate is higher for male than for females. Evidence is available to prove that males ate at a definite disadvantage in life expectancy. The causes of this gap have been studied almost even-where. Besides the biological factors the environmental factors have also been found working for this gap. The constitutional difference has little support to be the main cause. Most of the reasons are environmental such as social and economic roles, problems of outdoor life etc. The question still remains unsolved.

Age-Another important variable for life expectancy is age. Death rates vary with age. Therefore, age specific death rate has been an important measure of mortality in a country. This term means the number of deaths of persons of a given age per 1,000 during a given year. It is computed similar to the crude death rate. It is found different in developed and developing countries. For example in 1970 age specific death rate was 19.1 in India for all ages while in USA it was 4.7 in 1971. The corresponding flan res are for Japan 3.4, for UK 2.9, for Sweden 1.5: in 1973. Compared to under developed and developing countries, it may be noted that these rates are very low Again, the death rates differ at different ages. More deaths are reported during infant and old age.

Life expectancy from birth is a frequently utilized and analyzed component of demographic data for the countries of the world. It represents the average life span of a newborn and is an indicator of the overall health of a country. Life expectancy can fall due to problems like famine, war, disease and poor health. Improvements in health and welfare increase life expectancy. The higher the life expectancy, the better shape a country is in.

As you can see from the map, more developed regions of the world generally have higher life expectancies (green) than less developed regions with lower life expectancies (red). The regional variation is quite dramatic.

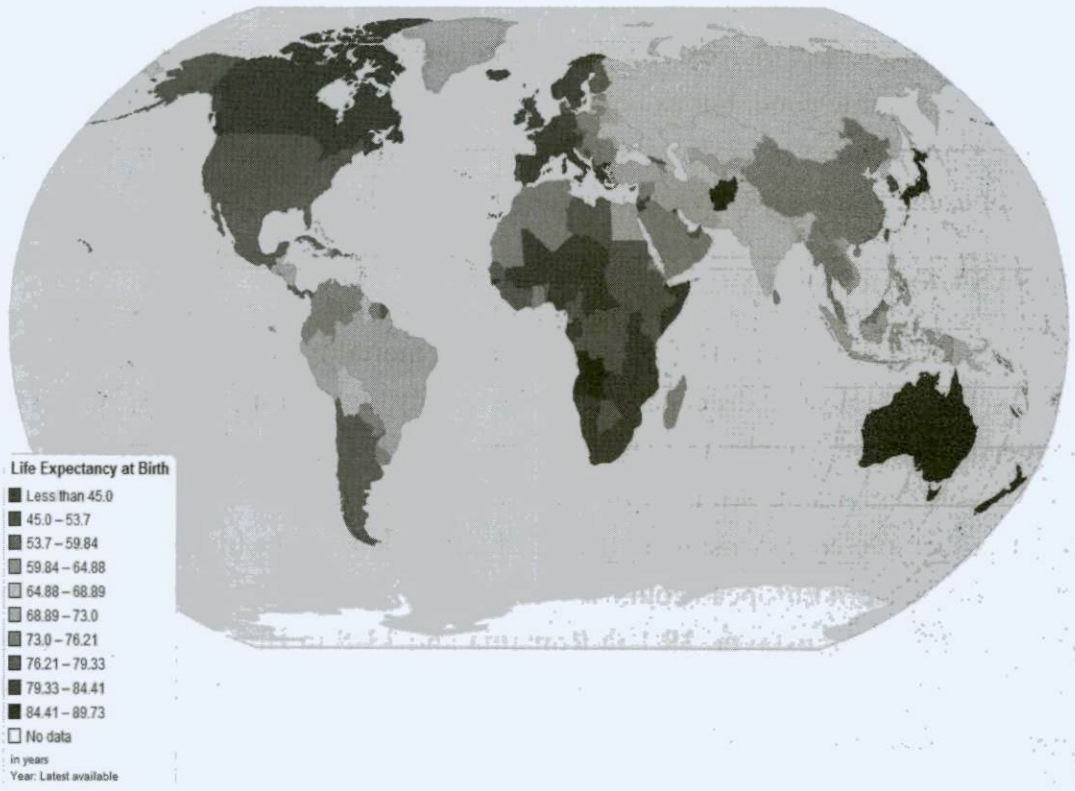
However, some countries like Saudi Arabia have very high GNP per capita but don't have high life expectancies. Alternatively, there are countries like China and Cuba that have low GNP per capita have reasonably high life expectancies.

Life expectancy rose rapidly in the twentieth century due to improvements in public health, nutrition and medicine. It's likely that life expectancy of the most developed countries will slowly advance and then reach a peak in the range of the mid-80s in age. Currently, microstates Andorra, San Marino, and Singapore along with Japan have the world's highest life expectancies (83.5, 82.1, 81.6 and 81.15, respectively).

Unfortunately, AIDS has taken its toll in Africa, Asia and even Latin America by reducing life expectancy in 34 different countries (26 of them in Africa). Africa is home to the world's lowest life expectancies with Swaziland (33.2 years), Botswana (33.9 years) and Lesotho (34.5 years) rounding out the bottom.

Between 1998 and 2000, 44 different countries had a change of two years or more of their life expectancies from birth and 23 countries increased in life expectancy while 21 countries had a drop. Below table and figure shows the top ten countries with the highest and lowest life expectancy (in years) in 2010.

	The countries with the Highest life expectancy (in years).		The countries with the lowest life expectancy (in years).	
1.	Monaco	89.7	Haiti	29.9
2.	Macau	84.3	Angola	38.4
3.	San Marino	82.9	Mozambique	41.3
4.	Andorra	82.3	Afghanistan	44.6
5.	Japan	82.1	Nigeria	47.2
6.	Guernsey	82.0	Zimbabwe	47.5
7	Singapore	82.0	Swaziland	47.9
8.	Hong Kong S.A.R.	81.9	Chad	47.9
9.	Australia	81.7	Guinea-Bissau	48.3
10.	Canada	81.2	South Africa	49.2



10.6.1 Sex Differences

Women almost always have higher life expectancies than men. Currently, the world-wide life expectancy for all people is 64.3 years but for males it's 62.7 years and for females life expectancy is 66 years, a difference of more than three years. The sex difference ranges from four to six years in North America and Europe to more than 13 years between men and women in Russia.

The reasons for the difference between male and female life expectancy are not fully understood. While some scholars argue that women are biologically superior to men and thus live longer, others argue that men are employed in more hazardous occupations (factories, military service, etc). Plus, men generally drive, smoke and drink more than women - men are even more often murdered.

10.6.2 Historic Life Expectancy

During the Roman Empire, Romans had a approximate life expectancy of 22 to 25 years. In 1900, the world life expectancy was approximately 30 years and in 1985 it was about 62 years, just two years short of today's life expectancy.

10.6.3 Aging

Life expectancy changes as one gets older. By the time a child reaches their first year, their chances of living longer increase. By the time of late adulthood, ones chances of survival to a very old age are quite good. For example, although the life expectancy from birth for all people in the United States is 77.7 years, those who live to age 65 will have an average of almost 18 additional years left to live, making their life expectancy almost 83 years.

10.7 INFANT MORTALITY

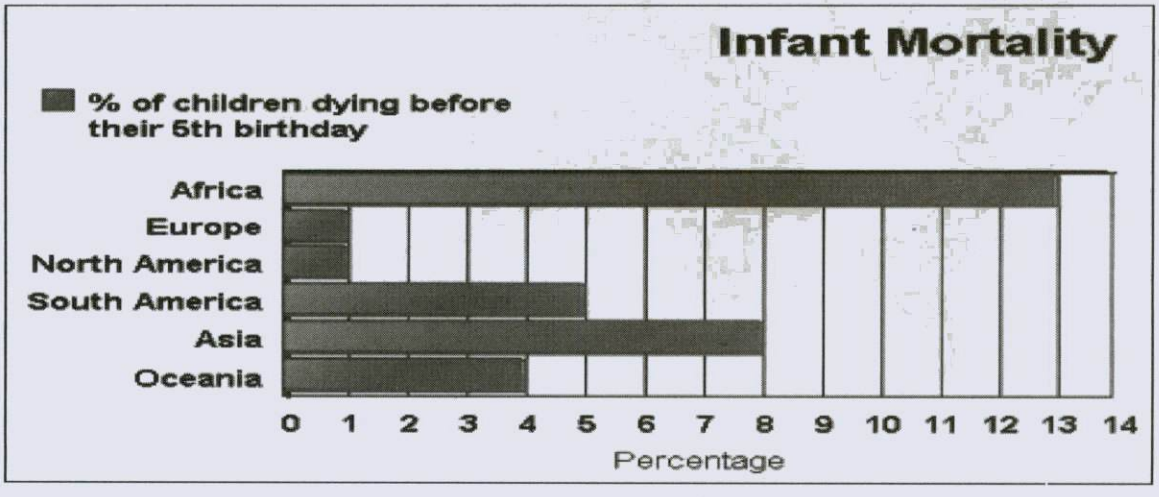
Yet another important index of mortality is infant mortality. It is particularly important due to the fact that in almost all the countries it is invariably high during the first year of life. It varies tremendously from country to country. While it was 131.0 in 1971 in India, it was only 9-9 in 1973 in Sweden. Again, while it was 116 in Egypt in 1972 it was 11.3 in 1973 in Japan. However, it has beeifnoted that inspite of the fact that Sweden has the lowest infant mortality rate in the world. Eastern European countries show higher infant mortality as is clear by the data that it is 44.2 in Yugoslavia, 38.1 in Romania and 33-8 in Hungary. These rates are higher even in comparison to some developing countries, such as Hong Kong (16'4 in 1973), Singapore (19.7 in 1970) and Trinidad and Tobago (23-5 in 1972). In 1971 Chile, a more

developed country, had an infant mortality rate of 78.8. Some 150 years back infant mortality rates in industrialized countries were around 200. In 1870 they ranged from 100 in Norway to three hundred in Germany in Europe. In late 1950 and 1960 it was 200 in Africa. Even in the beginning of 20th century it was more than 15t) in Austria. Bulgaria, Hungary, Japan, Spain and Portugal. The fall of infant mortality had been spectacular in 20th century. In USSR it was 269 in 1913 and only 29 in 1964. In Japan ii was 110.4 in 1935-59 and only 20.4 in 1964 This is also true in developing countries. In Singapore the infant mortality rate was 152 in 1935-39 and it was only 20 in 1973. Similar decline of almost 60% has been recorded in Sri Lanka, West Malaysia, Mauritius etc. Thus the infant mortality rate is declining everywhere. In India according to The Sample Registration System, the infant mortality rate In the years 1968. 1969, 1970 and 1971 was 137, 140, 133 and 131 respectively. This was in the rural areas In the urban areas however it was a bit lower, 86 during 1970 and 81 in 1971. The total infantile mortality rate in India was 125 in 1970 and 122 in 1971.

The infant mortality rates are higher in developing countries. The reasons for these higher rates are that developing countries often have

- A shortage of medical services
- A greater number of children born to mothers
- Poor nutrition of mothers and babies
- Less knowledge of health matters
- Dirty water supplies

The chances of surviving to your fifth birthday depend on where you are born in the world Death Rates



Differences Between Developed and Developing Countries

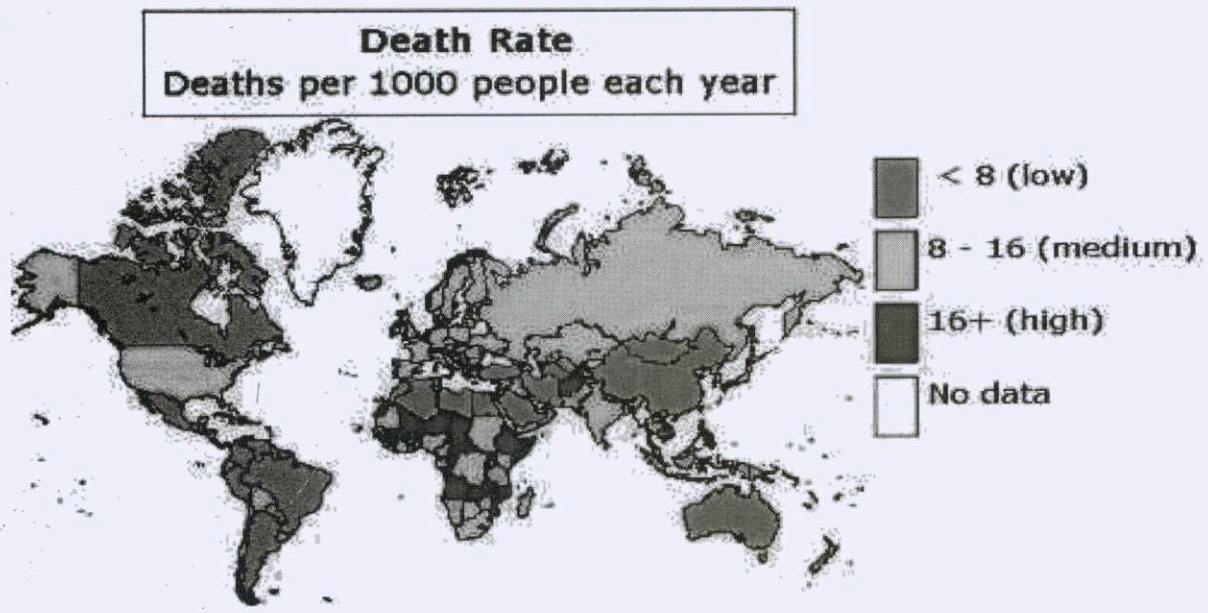
Developing countries have high death rates because, in many cases, there are

- Dirty, unreliable water supplies
- Poor housing conditions
- Poor access to medical sevices
- Endemic disease in some countries
- Diets that are short in calories and/or protein

Developed countries have low death rates because, in many cases, there are

- Good housing conditions
- Safe water supplies
- More than enough food to eat
- Advanced medical services which are easy to access

Some developed countries have a high death rate as they have an ageing population with many older people.



10.8 SPATIO- TEMPORAL VARIATION OF CRUDE DEATH RATE IN INDIA

Data on crude death rate shows that it differs in developed and developing countries. It has gradually changed almost everywhere but particularly in developed countries. This is the calculated with the help of various measures. Crude death rate is ratio of the total registered deaths of a specified year to the total mid year population multiplied by thousand.

Temporal Variation of Crude Death Rate in India

Years	CDR	Years	CDR
1950–1955	19.5	2000–2005	8.6
1955–1960	17.3	2005–2010	8.5
1960–1965	15.5	2010–2015	8.3
1965–1970	13.2	2015–2020	8.3
1970–1975	11.4	2020–2025	8.3
1975–1980	10.7	2025–2030	8.5
1980–1985	10.3	2030–2035	8.8
1985–1990	9.7	2035–2040	9.2
1990–1995	9.4	2040–2045	9.6
1995–2000	8.9	2045–2050	10

Child survival strategies are beginning to pay dividends with India, for the first time ever, reporting a consecutive drop of three points in Infant Mortality Rate (IMR) for the second year in a row. The country's latest IMR is 47 as against 50 in 2009, indicating a reduced mortality of three infants per 1000 live births. If this rate of drop is sustained, India could achieve the target of bringing down infant deaths to 30 by 2015, as planned.

The highlights of 2010 Sample Registration System (SRS) data, released by the Registrar General of India, is: greater reduction in rural IMR (four points) as against urban IMR (3 points); massive improvements in problem States, with Himachal Pradesh and Madhya Pradesh leading the national IMR declines by reporting the highest reduction of 5 points each in IMR in the respective States.

Infant mortality rate in Major States of India

SL No.	Major States	IMR Rate
1	Andhra Pradesh	52
2	Assam	64
3	Bihar	56
4	Chhattisgarh	57
5	Delhi	35
6	Gujarat	50
7	Haryana	54
8	Himachal Pradesh	44
9	Jammu and Kashmir	49
10	Jharkhand	46
11	Karnataka	45
12	Kerala	12
13	Madhya Pradesh	70
14	Maharashtra	33
15	Orissa	69
16	Punjab	41
17	Rajasthan	63
18	Tamil Nadu	31
19	Uttar Pradesh	67
20	West Bengal	35

Overall, rural IMR came down from 55 to 51 while urban IMR dropped from 34 to 31, nationally. The heartening news is that almost all States managed to report IMR reductions, particularly in rural IMR, indicating better delivery of child related health services in villages.

Nine States reported a 4 point drop in IMR. These include Bihar, Odisha, Punjab, Tripura, Rajasthan, Tamil Nadu, Meghalaya and Sikkim. Andhra, Assam, Chhattisgarh, Haryana, Karnataka, Maharashtra, Delhi, Nagaland, Uttrakhand and Chandigarh saw a decline of 3 points in IMR between 2009 and 2010. Jharkhand, UP, West Bengal, Jammu and Kashmir, Manipur and Andaman and Nicobar Islands fared the worst nationally, with only 2 point drop in infant death rates. In Lakshadweep and Puducherry the IMR remained unchanged.

10.9 LET US SUM UP

The preceding analysis identified the specific causes of death that impede continued progress through the demographic and epidemiologic transitions. These causes continue to challenge the world's regions as they strive to achieve or surpass the longevity enjoyed by the world's longest-lived populations, with life expectancies at birth greater than 80 years in 2005-2010.

10.11 QUESTIONS FOR SELF STUDY

1. What is mortality? What are source of data?
2. Explain the measures of Mortality?
3. What is Crude Death Rate? What are its Determints?
4. Explain the Life Expectancy?
5. Write short note on infant mortality?

10.10 FURTHER READING

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UNIT : 11 COMPONENTS OF POPULATION CHANGE -POPULATION COMPOSITION

Structure

11.0 OBJECTIVES

After studying this unit you will able to

- Know the measurement of Sex Ratio
- Studying the spatial pattern of Sex ratio in world and India
- To analyze the Factors Determining Sex Ratio
- To analyze the Age Structure and Age Pyramids

11.1 INTRODUCTION

The most important aspect in Demography is the study of the structure and characteristic of the population. This includes the personal, social and economic characteristics including age, sex, race, nationality, religion, language, a marital status, family composition, literacy and educational attainments, employment status, occupation and income etc. Each population may be classified into different groups according to the above motioned characteristics. For example, Indian population may be classified into males and females: Indians and foreigners, literate and illiterate; employed and unemployed: children, youth and old, Rural and urban. Among these this chapter deals with Sex ratio and age structure of population.

Uses of Population Characteristics

The above discussion incidentally, shows the uses of the study of population structure and characteristics. The following uses are more important:

1. It helps in judging the quality of the population.
2. It helps in making comparisons and identifying the level of development.
3. It is useful in the preparation of inventories of human resources necessary for all developmental planning.
4. It gives data concerning births and deaths, age and sex distribution etc. useful for various purposes.
5. It provides material for the study of social changes.
6. It provides data for the study of present economic structure as well as the possibilities of future growth.

7. It provides data concerning health of people in the country so that planning may be made in this direction.

8. It presents an outline of the most glaring social and economic problems which may be given priority for solution

Thus it is clear that the study of the structure and characteristics of population is a prelude to all successful planning for development.

Population composition is the description of population defined by characteristics such as age, race, sex or marital status. These descriptions can be necessary for understanding the social dynamics from historical and comparative research. This data is often compared using a population pyramid.

Population composition is also a very important part of historical research. Information ranging back hundreds of years is not always worthwhile, because the numbers of people for which data are available may not provide the information that is important (such as population size). Lack of information on the original data-collection procedures may prevent accurate evaluation of data quality.

11.2 SEX RATIO

The sex composition of population is the basic demographic characteristics depending on directly incidence of birth, death and marriage. The migration rates, occupational structure do exert influence on sex ratio. It is an index of prevailing socio-economic conditions in any region. The sex ratio consists of three factors, namely sex ratio at birth, difference in mortality in two sexes and sex selectivity among migrants. It plays a role in religions, national income, education, housing etc. Many social-economic relationships are intimately related to the balance or disparity in between them. It is an important indicator of gender relations within the society and varies from one social group to another.

When men and women have near equal chances for survival, there are bound to be near-equal number of males and females in society. In India, however, the female population is much lower than the male population due to higher mortality among females, particularly during their reproductive span.

The sex ratio in the Indian population has been falling consistently. From 972 women per 1,000 men in 1901, the sex ratio fell to 933 women per 1,000 men in 2001. This is a cause for concern as it is a telling indicator of the health and social status of women in society, which has a direct and immediate bearing on other key indicators like child mortality.

11.2.1 Measures of Sex Ratio

Sex ratio has been defined as the number of females per 1000 males in the population. It is expressed as 'number of females per 1000 males'.

$$\text{Sex-ratio} = \frac{\text{Number of females}}{\text{Number of males}} \times 1000$$

Sex ratio is also calculated for various age groups, the most important being 0-6 years. An adverse sex ratio here shows that less girls are being born compared to boys and so indicates discrimination against the female foetus - this could be at the time of conception, gestation or delivery. An adverse 0-6 sex ratio also reveals that socio-cultural factors are determining survival chances of the female.

Child Sex ratio (0-6 years)

Child Sex ratio has been defined as the number of females in age-group 0-6 years per 1000 males in the same age-groups in the population. It is expressed as 'number of female children age (0-6) years per 1000 male children age (0-6) years'.

$$\text{Child Sex Ratio (0-6 years)} = \frac{\text{Number of female children (0-6 age group)}}{\text{Number of male children 0-6 age groups}}$$

Sex composition of the human population is one of the basic demographic characteristics, which is extremely vital for any meaningful demographic analysis. Indian Census has the tradition of bringing out disaggregated information by sex on various aspects of population. The first and foremost is the simple count of males and females. Changes in sex composition largely reflect the underlying socio-economic and cultural patterns of a society in different ways. Sex ratio defined here as the number of females per 1000 males in the population, is an important social indicator to measure the extent of prevailing equity between males and females in a society at a given point of time. It is mainly the outcome of the interplay of sex differentials in mortality, sex selective migration, sex ratio at birth and at times the sex differential in population enumeration.

11.2.2 Types of sex ratio

Sex ratio is the ratio of males to females in a population. The primary sex ratio is the ratio at the time of conception; secondary sex ratio is the ratio at time of birth; and tertiary sex ratio is the ratio of mature organisms.

In humans, the secondary sex ratio – sex at the time of birth – is commonly assumed to be 105. That is, 105 boys are born for every 100 girls. While this varies by country, it means 51% of babies born worldwide are boys and 49% are girls.

The secondary sex ratio in the United States, where more than 4 million babies are born each year, is consistent with the worldwide sex ratio of 105.

In 2008, approximately 2.16 million boys (51%) were born in the U.S. versus 2.08 million girls (49%). That's nearly 85,000 more boys.

The tertiary sex ratio (adults) in the U.S. is about 103. So there are more male adults than female adults. There continue to be more males than females until about age 40. Somewhere between the ages of 40 and 64, males start dying off more quickly than females. By age 65, there are only 75 males for every 100 females. That represents a loss of more than one-fourth (28%) of the male population for any given birth year (males who die before the age of 65). For 2008, that would mean approximately 605,000 of the 2.16 million males born will die before the age of 65.

Table 1. Women per 100 men

Europe & North America	105
Latin America	100
Caribbean	103
Sub Saharan Africa	102
South East Asia	100
Central Asia	102
South Asia	95
China	92
India	94

Source: The world's Women-Trends and Stastics, Dept of Economics and social Affairs, United Nation,NY 2010

The composition of population by gender is not uniform and shows diverse patterns across different countries of the world. Table 1 present the sex ratio in the ten most populous countries in the world during 2001 and 2011. It has been estimated that around the year 2011, the world will have 984 females against 1000 males. As is evident from the Statement, in USA, Russian Federation, Japan and Brazil females outnumber males, in the other six countries the balance is tilted towards the males. When compared to the previous decade, China, Indonesia, Nigeria and USA have shown a decline in the sex ratio in the present decade. The decline has been particularly sharp in Nigeria and Indonesia. The sex ratio in USA, Russian Federation and Japan has always remained above unity despite minor variations.

Table 2. Sex ratio of the total population (males per 1000 females)

Major area, region, country or area *	1950	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
WORLD	998	1003	1006	1006	1010	1012	1012	1013	1015	1016	1017	1017	1017
More developed regions	909	915	920	927	930	933	932	934	938	940	941	943	946
Less developed regions	1044	1045	1045	1040	1041	1041	1039	1037	1037	1037	1036	1035	1034
Least developed countries	1005	1004	1004	1003	1002	997	996	999	999	999	1000	1001	999
Less developed regions, excluding least developed countries	1049	1051	1050	1045	1047	1046	1045	1043	1042	1043	1041	1041	1040
Less developed regions, excluding China	1029	1029	1031	1031	1029	1029	1028	1026	1025	1025	1023	1022	1020
Sub-Saharan Africa	981	981	982	982	984	987	989	990	990	991	993	996	999
AFRICA	985	985	986	988	987	990	993	994	994	994	996	998	1000
Eastern Africa	980	979	979	979	979	979	979	980	979	979	982	986	989
Middle Africa	926	934	941	949	955	961	967	973	977	981	984	988	990
Northern Africa	1002	1001	1003	1007	997	1003	1009	1011	1011	1010	1010	1008	1005
Southern Africa	985	989	990	978	981	984	981	980	973	968	968	973	981
Western Africa	999	997	997	998	1000	1002	1006	1006	1007	1009	1011	1014	1016
ASIA	1054	1056	1056	1051	1053	1052	1051	1050	1050	1051	1050	1050	1048
Eastern Asia	1054	1058	1058	1046	1053	1053	1052	1051	1053	1056	1059	1061	1062
South-Central Asia	1086	1085	1085	1084	1081	1078	1075	1072	1069	1066	1063	1060	1054
Central Asia	937	930	933	938	941	950	952	958	964	969	969	966	966
Southern Asia	1091	1092	1092	1091	1087	1084	1081	1077	1074	1070	1067	1063	1057
South-Eastern Asia	981	985	989	992	994	996	989	991	992	994	992	991	990
Western Asia	999	998	1009	1010	1009	1015	1025	1028	1035	1043	1034	1054	1071
EUROPE	872	883	892	903	910	914	918	921	926	928	927	928	930
Eastern Europe	808	830	845	860	871	876	885	891	898	899	895	887	883
Northern Europe	930	933	938	945	947	950	949	947	947	948	951	958	966
Southern Europe	940	943	944	946	949	953	955	957	956	953	951	957	964
Western Europe	895	902	908	921	927	932	932	933	941	949	952	955	959
LATIN AMERICA AND THE CARIBBEAN	1000	1001	1000	999	999	997	995	991	988	984	982	978	976
Caribbean	1006	1003	997	993	997	995	995	993	990	989	987	986	986
Central America	994	996	997	998	999	998	997	991	989	984	980	974	972
South America	1001	1002	1001	1000	999	997	994	991	988	984	982	979	976
NORTHERN AMERICA	1001	989	984	977	968	969	950	951	954	959	965	971	975
OCEANIA	1036	1036	1031	1024	1023	1016	1009	1007	1004	1001	996	997	1002
Australia/New Zealand	1015	1023	1019	1013	1013	1004	996	994	990	987	981	982	988
Melanesia	1115	1089	1082	1070	1067	1063	1060	1051	1046	1043	1041	1042	1042
Micronesia	1351	1241	1146	1120	1097	1073	1044	1059	1071	1042	1004	1007	1016
Polynesia	1050	1039	1033	1030	1033	1051	1060	1065	1074	1065	1060	1047	1042

Source: The world's Women-Trends and Stastics, Dept of Economics and social Affairs, United Nation,NY 2010

The overall sex ratio - the number of females per 1,000 males — is falling across the world. While the global sex ratio was 986 females per 1,000 males in 2001, it reduced to 984 in 2011. However, according to the Registrar General of India's (RGI) records, some big countries across the globe have reported a sharp decline in the number of women. China is a case in point. The country's sex ratio in 2001 was 944, and it fell to 926 in 2011. Bhutan's sex ratio saw a major drop: from 919 in 2001 to 897 in 2011. America's sex ratio also fell from 1,029 in 2001 to 1,025 in 2011.

Table 3 World Sex Ratio

SLNo	Country	2001	2011
	World	986	984
1	China	944	926
2	India	933	940
3	USA	1,029	1,025
4	Indonesia	1,004	988
5	Brazil	1,025	1,042
6	Pakistan	938	943
7	Russian Fed	1,140	1,167
8	Bangladesh	958	978
9	Japan	1,041	1,055
10	Nigeria	1,016	987

Indonesia's overall sex ratio fell from 1, 004 (2001) to 988 (2011), while Nigeria's sex ratio stood at 987 in 2011 as against 1, 016 in 2001.

Union health ministry officials said, "India's child sex ratio (0-6 years) has declined from 927 in 2001 to 914 in 2011. As per Census 2011, the urban child sex ratio is 902 as compared to 919 in rural areas. However, while some countries have seen a dip in sex ratio, some countries have also recorded an increase in their overall sex ratio."

According to RGI's records, some countries also saw an increase in the sex ratio. For instance, in Bangladesh, the sex ratio was 958 in 2001, which increased to 978 in 2011. Japan's sex ratio improved from 1, 041 (2001) to 1055 (2011), Russia's improved from 1, 140 (2001) to 1, 167 (2011) and Pakistan's from 938 (2001) to 943 (2011). Brazil too saw an increase – from 1, 025 (2001) to 1, 042 (2011). While Sri Lanka's sex ratio stood at

1,034 in 2011 as compared to 1, 010 in 2001. Nepal's sex ratio also improved from 1, 005 females per 1, 000 males in 2001 to 1,014 in 2011, and Myanmar's was 1,011 (2001) as against 1,048 (2011).

11.2.3 Trends In Sex Ratio In India -An Over View

bThe sex ratio in India has been historically negative or in other words, unfavourable to females. A look at the Figure 18 reveals that in the pre- independence period, the sex ratio declined consistently up to 1951 when it rose marginally (Table-4). In the post independence period, the trend continued and the sex ratio slipped down for two consecutive decades after 1951 to reach 927 in 1991 after that is improved.

Year	Sex Ratio
1901	972
1911	964
1921	955
1931	950
1941	945
1951	946
1961	941
1971	930
1981	934
1991	927
2001	933
2011	940

Sex ratio in India's population worsened through the twentieth century, reaching a low of 927 females per 1000 males(or 107.9 M/100F)in 1991. Some improvement was seen in 2001 and the 2011 census shows further rise to 940(106.4 M/100F). This ratio is still more masculine than the global level but has moved in the direction of balance.

Three reasons may be stated: 1. Women are no longer disadvantaged in survivalin contrast to the situation some time back, 2. The age structure is changing with share of older ages, where sex ratiofavoursfemales, rising, and 3. Selective female under-enumeration has declined. A systematic demographic analysis of age-sex distributions, once these become available, can reveal the relative contributions of these factors.

The sex ratio of the population shows a seven point increase during the last decade, that is the sex ratio has increased from 933 females per 1000 males in 2001 to 940 in 2011. In 2011 male female sex ratio in India is 940, that means there are 940 females per 1000 males in the country. If reversed it is 1063 males per 1000 females. Children under 6 years of age has a ratio of 944 females per 1000 males. India ranks number 21 for male per female sex ratio in the World. Some countries like UAE and Quatar has double number of males than females.

In 2001 sex ratio in India was 933 females per 1000 males. During the last decade sex ratio in India has increased 0.75% and it is still not satisfied.

All states except Bihar, Gujarat and Jammu & Kashmir indicate the rising trend in the sex ratio. The ratio favourable to females is considered as an indicator of social development. Kerala and Pondicherry are the only two states having favourable sex ratio. In Kerala there are 1084 women against 1000 men in 2011, while in 2001 it was 1058. In Pondicherry the ratio is 1038. Among the districts of Kerala, Kannur has the highest sex ratio, 1133 and Idukki has the lowest-1006. The sex differentials can be seen in the case of literacy also. Seventy four percent of the Indians are literate, there is about 17 point difference between male and female literacy rate. Among males 82.14 percent can read and write but only 65.46 percent women can read and write. In Kerala the total literacy rate is 93.91 percent, male and female literacy rates are 96.02 and 91.98 percent respectively.

An increase in the sex ratio of children particularly under age six was observed in India and in some states in 1991 census onwards. Under six years of age there were 945 girls for1000 boys in 1991 census, it reduced to 927 in 2001 and this child sex ratio reached to 914 in the latest census, 2011. That is, we have failed to stop the declining trend in the sex ratio of children. The child sex ratio is the lowest in Haryana and Punjab. In Haryana there are only 830 girls for1000 boys , in Punjab it is 846 followed by Delhi with 866 girls per 1000 boys. Mizoram reported the highest child sex ratio with 971, followed by Kerala with 959 girls for 1000 boys. This new trend in the sex ratio of young children is an important point in the history of demography of the country. Usually females are thought to be genetically

more resistant to disease than males and have likely to survive infancy. For female babies this power of resistance seems to disappear in India recently. This new trend in the sex ratio of young children is certainly without any unexpected happening. The higher child mortality for girls than that of boys clearly indicates the existence of female disadvantage in the society.

A number of scholars have pointed out the signs of excess female mortality in north India. Recently in India, a reduction in mortality rate was observed, particularly in female mortality. But this favorable trend was nullified by the increasing sex ratio at birth. These variations in the sex ratio at birth are due to the demographic characteristics of the children and parents.

Here, the urgent need is to find out the reasons for higher level of recent sex ratio of children. Several explanations were provided by many scholars for the decline in overall sex ratios (f/m) in India. The possible causes are: (i) undercount of women, (ii) increasing discrimination against women, (iii) sex selective migration, (iv) progressive reduction in reproductive wastage which affects sex ratio at birth and (v) increasing incidence of female feticide. Another explanation is that the decline in sex ratio (f/m) in the country in the recent decade is due to an increasing trend in female life expectancy and the possibilities of large scale under enumeration of females in the 1991 census, in some states.

The reasons like sex selective migration, inclusion of institutional population and higher female life expectancy will not affect the group of young children. Even in the case of overall sex ratio also, the migration factor will not affect considerably when we are dealing with the country as a whole. Another reason for the discrepancy between the two sexes is reported as the relative undercount of females. Its chances would be very low because of the improvements in female counting in different surveys. Hence the possible reasons may be sex selective abortions and neglect and increased discrimination against girl children (including infanticide). The poverty in the family, illiteracy, dowry are the other reasons behind the feticide. The hereditary male dominance existing in the Indian society and social customs and taboos are also encourage the female feticide.

The other four major factors which contribute to the increase in sex ratio at birth and infancy, which is adverse to females are: (i) the declining infant mortality rate with relatively greater chances for the survival of infant boys, (ii) the increasing ability of the couples to achieve the desired family size, (iii) the increase in the proportion of the first order births as a result of the shrinking family size and (iv) the practices of decision making in family planning, which are related to son preference.

Finally it was emerged that, the neglect and discrimination against girl children are the main reasons for higher sex ratio among children. Higher practices of female infanticide and increasing female child mortality are the results of the discrimination against female children. Some girl children are killed or abandoned soon after birth. There is no clear evidence how common or widespread this practice is, but some scholars have doubted its existence. As mentioned earlier, in India there was excess female mortality in some age groups, especially in childhood, adolescence and in child bearing years. The age specific death rate based on various sources support, the above argument. It is estimated that India lost 1.8 million children under five in 2008. That is, more than 200 child deaths every hour , each day, or more than three deaths every minute. Out of 25 million babies born every year in India, one million die. UNFPA reported that there are about seven lakhs feticide are occurring in India in every year and again UNICEF also reported in 2009 that nearly nine lakhs girls are missing in each year. Most of those who survive do not get to grow up and develop well. About 48 per cent are stunted and 43 per cent are under weight. Further about one-third babies are born with a low birth weight of less than 2.5 kgs.

The discrimination of girl children is seen mainly in providing the minimum nutrition, access to health and other amenities. In some places boys get more benefits and better food than girls. Girls are sick as often as boys, but boys sometimes receive better treatment. The differential treatment of children might be due to their understanding of the differential survival capabilities of the two sexes. The main causes of poor coverage of interventions include ineffective planning and implementation, mainly due to weakness in the health system. Public health expenditure in India has remained at a low of about one per cent of GDP-for quite some time. This needs to be increased. Considering that about 75 per cent of the health care is accessed from the private sector in the country , better regulation and participation of private health service providers must be ensured.

The consequences of sex ratio imbalances in a population are discussed in this section. In a fertility declining population (for example, China and Korea) there are chances of high sex ratio at birth. Some studies have mentioned that the countries which have completed their demographic transition have experienced an increase in the proportion of the male children born. The control in the infant mortality, especially neonatal mortality, increases the chances of survival of the male babies. Improvements in maternal as well as infant care, is beneficial for the live birth and survival of children, but male children gain more than the girls, thereby contributing to an increase in sex ratios at birth as well as during infancy.

Next we turn to the another implication of imbalanced sex ratio, that is of possible marriage squeeze in the society. Mate selection becomes crucial in a population, which is experiencing increasing sex ratio of children. According to NFHS reports there was on an average five years age difference between husbands and wives in India. This higher sex ratio of children will continue to the coming generation also. Then the surplus males will find it very difficult get mates from the younger generation. Thus men will be forced to marry very younger women (this may increase the age difference between spouses) or older women. The latter is a positive aspect in societies where women have longer life expectancy than men which will reduce the loneliness of women at older ages. Another positive consequence of higher sex ratio is the improvement in the position of women in the society and thus it will result in the avoidance of dowry system, but on the other side this will result in more atrocities, rapes, forced marriages, prostitution, sale of bride and polyandry. Thus the sex ratio imbalance will affect the entire social equilibrium of a population.

As per sections 299, 312 to 315 of the Indian penal code illegal abortion is a crime. Medical termination of pregnancy (MTP) Act was passed in 1971 and in 1994 illegal abortion and the sex determination of the fetus were banned by law in India. That means it is not due to the lack of enough rules and regulations but they are not being strictly implemented in our country. However, the culprits are escaping using the loopholes in these laws. India is a country providing both the girls and boys, without gender discrimination, equal justice, freedom and rights. The National Women Policy of 2011 underlines in no uncertain terms the need for bringing about gender equality in the country. One of the main aims of having declared 2001 as the year of Empowerment for Women was to prevent discrimination against girls. In spite of the fact that India is a signatory to numerous international pacts and women summits aimed at achieving this goal, the Census Report of 2011 shows that discrimination against girls has been on the increase in the country.

There is no denying that the imbalance in sex ratio would adversely affects the all-round progress and development of the country. It could not only lead to male domination, gender discrimination, polygamy, human trafficking, child marriage, but also endanger the very existence of humanity in the country. The only solution to this problem, as the 2011 Census Report points out, lies in strictly implementing the existing laws in letter and spirit and organizing programmes to better the social status of girls and women.

Top five states with highest female sex ratio in India are –

1. Kerala has the highest sex ratio of 1084 female per 1000 male.
2. Puducherry(U/T) has a sex ratio of 1038 female per 1000 male.
3. Tamil Nadu has a sex ratio of 995 female per 1000 male.
4. Andhra Pradesh has a sex ratio of 922 female per 1000 male.
5. Chhattisgarh has a sex ratio of 991 female per 1000 male.

Bottom five states with lowest female sex ratio in India are -

4 of bottom five are 4 union territories and that includes Delhi at number four.

1. Daman in Daman & Diu(U/T) has the lowest sex ratio of only 618 females per 1000 male.
2. Dadra & Nagar Haveli another union territory also has a very low sex ratio of 775 female per 1000 male.
3. Chandigarh has a sex ratio of 818 female per 100 male.
4. NCT of Delhi has a sex ratio of 866 female per 100 male.
5. Haryana has a sex ratio of 877 female per 100 male.

There have been some huge negative changes of female sex ratio in states like Daman Diu and Dara & Nagar Haveli. Sex ratio dropped 12.96% during last decade in Daman Diu and 4.56% in Dadra Nagar Haveli. Jammu & Kashmir also has a nagetive change of 1.01%.

Though Delhi has a positive change of 5.48% in female sex ratio but it is still in the bottom five list. Chandigarh also shows some improvement of 5.28% from last census. Female sex ratio increased about 4% in states like Mizoram, Andaman & Nicobar Islands and some other.

Table 4 State wise Change in total sex ratio and Child Sex Ratio during the decade in India

	States/Union Territory #	Total 2001	Total 2011	Change	0-6 in 2001	0-6 in 2011	Change
	India	993	940	0.75%	927	914	-1.40%
1	Jammu & Kashmir	892	883	-1.01%	941	859	-8.71%
2	Himachal Pradesh	968	974	0.62%	896	906	1.12%
3	Punjab	876	893	1.94%	798	846	6.02%
4	Chandigarh #	777	818	5.28%	845	867	2.60%
5	Uttarakhand	962	963	0.10%	908	886	-2.42%
6	Haryana	861	877	1.86%	819	830	1.34%
7	NCT of Delhi #	821	866	5.48%	868	866	-0.23%
8	Rajasthan	921	926	0.54%	909	883	-2.86%
9	Uttar Pradesh	898	908	1.11%	916	899	-1.86%
10	Bihar	919	916	-0.33%	942	933	-0.96%
11	Sikkim	875	889	1.60%	963	944	-1.97%
12	Arunachal Pradesh	893	920	3.02%	964	960	-0.41%
13	Nagaland	900	931	3.44%	964	944	-2.07%
14	Manipur	974	987	1.33%	957	934	-2.40%
15	Mizoram	935	975	4.28%	964	971	0.73%
16	Tripura	948	961	1.37%	966	953	-1.35%
17	Meghalaya	972	986	1.44%	973	970	-0.31%
18	Assam	935	954	2.03%	965	957	-0.83%
19	West Bengal	934	947	1.39%	960	950	-1.04%
20	Jharkhand	941	947	0.64%	965	943	-2.28%

21	Orissa	972	978	0.62%	953	934	-1.99%
22	Chhattisgarh	989	991	0.20%	975	964	-1.13%
23	Madhya Pradesh	919	930	1.20%	932	912	-2.15%
24	Gujarat	920	918	-0.22%	883	886	0.34%
25	Daman & Diu #	710	618	-12.96%	926	909	-1.84%
26	Dadra & Nagar Haveli #	812	775	-4.56%	979	924	-5.62%
27	Maharashtra	922	925	0.33%	913	883	-3.29%
28	Andhra Pradesh	978	992	1.43%	961	943	-1.87%
29	Karnataka	965	968	0.31%	946	943	-0.32%
30	Goa	961	968	0.73%	938	920	-1.92%
31	Lakshadweep #	948	946	-0.21%	959	908	-5.32%
32	Kerala	1058	1084	2.46%	960	959	-0.10%
33	Tamil Nadu	987	995	0.81%	942	946	0.42%
34	Puducherry #	1001	1038	3.70%	967	965	-0.21%
35	Andaman & Nicobar Islands #	846	878	3.78%	957	966	0.94%

11.2.4 Child sex ratio

0 to 6 years child sex ratio in India is even worse than sex ratio of total population. 2011 census in India revels the true fact of gender discourse in India. Male female sex ratio of children under 6 years of age is just 914 female child per 1000 male child. This dropped 1.40% during the last decade while allover sex ratio raised 0.75% in India.

As of census 2011 top three states for child sex ratio are

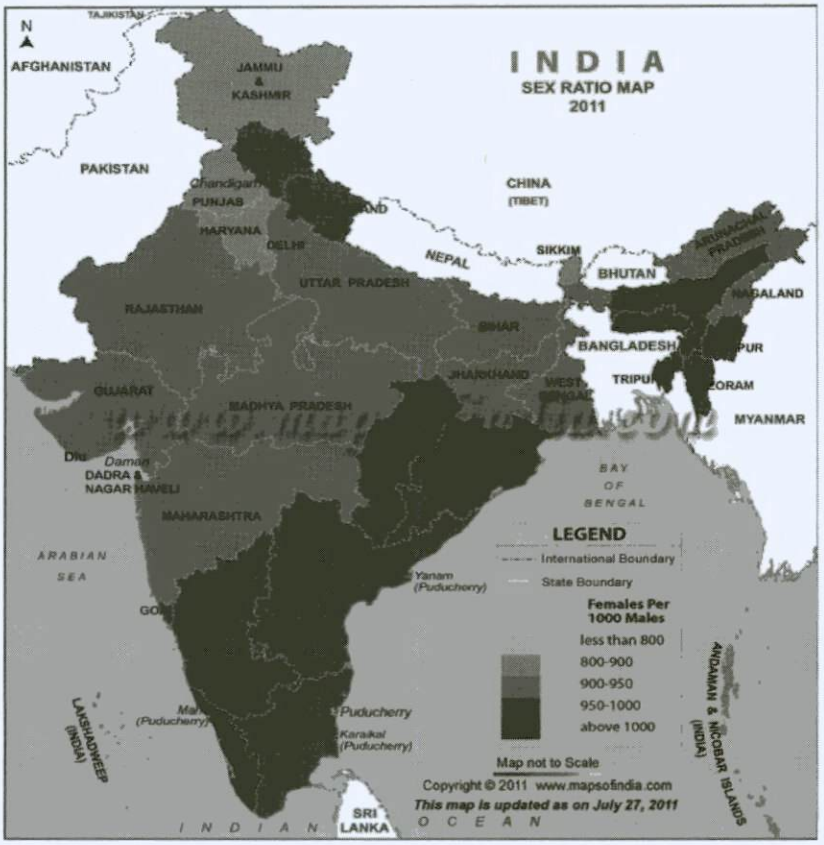
Mizoram has the highest child sex ratio of 971 girls per 1000 boys followed by Meghalaya with 970 girls per 1000 boys and Andaman & Nicobar Islands with 966 girls per 1000 boys. Though Meghalaya has a negative growth of 0.31% for child sex ratio, the state still sands on the second position.

Bottom three states for child sex ratio in India are

Haryana with only 830 girls per 1000 boys. Next is Punjab with 846 girls per 1000

boys and Jammu & Kashmir with 859 girls per 1000 boys. Punjab registered the highest growth of 6.02% in child sex ratio during the decade. Unfortunately Jammu & Kashmir has a whopping -8.71% negative growth and that bring the sex ratio from 941 to just 859.

In last 10 years only 6 states and 2 union territories out of 35 states/union territories in India have a positive growth in child sex ratio. Only 4 out of this 8 states/UTs have a change of above 1%. Those are Punjab with 6.02%, Chandigarh(UT) with 2.60%, Haryana with 1.34% and Himachal Pradesh with 1.12%.



11.3 FACTORS DETERMINING SEX RATIO

The sex ratio of a country is determined by the following factors :

11.3.1. Sex ratio at Birth-

The examination of the sex ratios of registered births for a number of countries over a considerable period shows that the sex ratio of births generally remains in favour of male babies. This average varies between 'lOI-2 to 106'6 in different countries. For example, it is 106-7 in Ireland and Norway. It is more than 106-0 in Canada, Belgium, Poland, Romania and U.K. -On the other hand, South Africa shows 106'7 ratio, the lowest in the world. Sex ratio at birth is generally determined biologically, probably due to nature's balance in favour of males. Sex ratio at birth depends upon sex ratio at the time of conception and sex ratio due to deaths. It has been found that foetal deaths are generally higher in male babies. Sex ratio is also partly determined by demographic factors such as the age of mothers arid the order of live births. There appears to be an inverse correlation between the age of mother and the birth order of the child and sex ratio at birth. Comparatively more male babies are found among .the first and second born children. Lower ages of mothers generally lead to the birth

of female babies. Thus, there is a negative correlation between the age of the mother and the sex ratio of the births.

11.3.2 Sex Ratio of Diseased persons-

Differential mortality is an important factor determining sex ratio. It has been found by some studies that in a number of countries more than one hundred males die per 100 females The male foetus is biologically more delicate than the female foetus. Therefore, there is a lighter proportion of mate babies in still birth. Even after birth, the male baby continues to be at a disadvantage In most of the countries, the crude death rates for males are higher than those for the female. Again, the expectation of the life at birth for females is almost universally higher than that of the males India and Pakistan are exception to this rule. In developed countries the death rates are higher for males than the females, in every age group Th.- overall mortality for males is therefore generally higher. This results into imbalance in sex ratio. As the age advances, the sex ratio exhibits an increasing number of females. In ail the regions of the world the sex ratio is favourable to females above the age group of 65. The same can be said about other age groups. Some causes for this tendency include male deaths during wars, reflected in sex ratios in most of the countries in post war period.

11.3.3 Sex ratio of net migrants-

Vet another factor effecting sex ratio is the sex ratio of net migrants. Migration is generally sex selective. For example, in India it is male dominated. Internal migration is also sex selective While it has been male dominated in India, it is female dominated in many European countries as well as in USA

All the above mentioned three factors determine sex ratio in different countries. As has been already pointed out, the picture in the West, particularly about migration, is different from the East besides the Biological factors, social and cultural factors have also been influential.

11.4 AGE STRUCTURE

The age structure of a population is the distribution of people among various ages. In graphic form, age structure is portrayed as an age pyramid whose relatively broad base indicates the number of children while the peak reflects the increasing likelihood of death as people age. A population whose age structure has a very broad base and a sharp narrow peak is said to be "young," while a structure whose base is not much wider than the rest of the pyramid is "old."

This entry provides the distribution of the population according to age. Information is included by sex and age group (*0-14 years*, *15-64 years*, *65 years and over*). The age structure of a population affects a nation's key socioeconomic issues. Countries with young populations (high percentage under age 15) need to invest more in schools, while countries with older populations (high percentage ages 65 and over) need to invest more in the health sector. The age structure can also be used to help predict potential political issues. For example, the rapid growth of a young adult population unable to find employment can lead to unrest.

The most important demographic characteristic of a population is its age-sex structure. Age-sex pyramids (also known as population pyramids) graphically display this information to improve understanding and ease comparison.

According to United Nations age is, The estimated or calculated interval of time between the date of birth and the date of census, expressed in completed solar years " It has been recommended that the information on age should be collected by asking the date of birth of individual in terms of day, month and year of the last birth day. This information obviously provides more accurate data. However, in countries like India, not many people keep a record of their birth, therefore information on age in collected by asking about "the age completed on the last birth day." This is particularly true in the case of illiterate and semi-literate people. Many of them do not know their age. If questioned, they tell it by guess which may be wrong even by a decade. Again due to absence of proper provision for registration of births in rural areas birth certificate cannot be used to know the age. Since most of the people do not need Birth certificate at any time in their lives, therefore nobody cares to get it. It has been found that there is a general tendency among Indians to report their age in numbers ending with 0 or 5, resulting in concentration of population at a certain age in census data. Further mistakes might be committed due to carelessness on either part or deliberate mischief In order to rectify these possibilities of errors the demographers try to determine the nature and magnitude of errors and make necessary adjustments. According to 2011 census age data in India it was found that the figures for the ages 9. 10 and 11 were respectively 5,976,600; 10,548,600; and 4,666,600 respectively. This clearly shows the tendency of preferring the 0 digit as mentioned above.

11.4.1 Analysis of Age Data

For Demographic purposes age data is classified in the year age groups such as 0-4, 5-9, 10-14, 15-20, 2-24, and so on. Thus classified, the age data are used for analysis of the age structure in any population. The age structure is generally studied with the help of percent distribution or age pyramid. Other measures used for the purpose are the average age and a few other indices. The simplest measure of age structure is the percentage distribution. It indicates the number of persons to an age group, taking the total number of persons as one hundred. This helps in arriving at an idea about the age structure of any population. It may be also useful to compare the age structures of two or more populations at a point of time. This is particularly true in the case of Age-Sex histograms or Age-Sex pyramids as shown in the following Age-Sex table of Indian population in 1971. This may be compared with data from other census report.

An important measure in the analysis of age structure is known as the dependency ratio. This indicates the number of dependents per 100 workers. It may be computed on the basis of three broad age groups. Suppose these age groups are: 15-59, 15-64 and 19-60, in this data those having age below 15 are young dependents while those above 60 or 65 are old dependents. The dependency ratio, computed is as following:

Age Groups: 0-14, 65+and 15-64.

Formula: dependency ratio $= \frac{PO_{-14}+P_{65+} \times K}{P_{15-64}}$

Where $PO_{-14}+P_{65+}$, and P_{15-64} denote the population in age groups 0-14, 65+and 15-64 respectively and where *K* is 100.

11.5 THE CHANGING AGE DISTRIBUTION OF THE WORLD AND THE DEVELOPMENT GROUPS

As described above, the different stages of the demographic transition give rise to various changes of the age distribution over time. At the world level, the population in 1950 was relatively young, having 34 per cent of its members under age 15 and barely 8 per cent aged 60 or over (table 1). Between 1950 and 1975, as mortality decline accelerated, particularly in the less developed regions, both the proportion under age 15 and that aged 60 or over increased, to reach 37 per cent and about 9 per cent respectively. Overall, therefore, the population of the world became slightly younger from 1950 to 1975. But after 1975, as

fertility reductions in the developing world accelerated, the proportion of children at the world level began to decrease, so that by 2005 the population under age 15 accounted for just 28 per cent of the total. Given that fertility at the world level started declining in the 1970s, by 2000 there had also been a slight reduction in the proportion of the population aged 15-24, from 19 per cent in 1975 to 18 per cent in 2005. However, as expected, the proportion aged 25-59 had risen markedly, passing from 36 per cent in 1975 to nearly 44 per cent in 2005. These trends suggests that the world population is already well into the period in which the demographic bonus can be reaped. Furthermore, if fertility and mortality trends continue as projected in the medium variant of the official United Nations population projections, the bonus will persist until at least 2025, since still by then it is projected that the proportion of the population aged 25-59 will continue to increase, albeit slightly.

These trends at the world level are mainly the result of the average trends for the less developed regions, where the age distribution also showed an increase in the proportion of children and youth between 1950 and 1975, followed by a decline in both proportions between 1975 and 2005. But just as at the world level, this decline is compensated by a marked increase in the proportion aged 25-59 which is expected to continue rising until at least 2025 and could remain almost unchanged until 2050 (at close to 45 per cent). In addition, the proportion aged 60 or over in the less developed regions has been rising steadily and is expected to pass from 8 per cent in 2005 to 13 per cent in 2025 and might reach nearly 20 per cent by 2050. That is, the ageing of the population of less developed regions is expected to accelerate, particularly after 2025.

Table-5 Population by Major age Group and percent age distribution by age group for the world and the development groups 1950, 1975, 2005, 2025 and 2050

	Population (millions)					Percentage				
Age group	1950	1975	2005	2025	2050	1950	1975	2005	2025	2050
					World					
0-14	864	1 498	1 821	1 909	1 833	34.3	36.8	28.2	24.2	20.2
15-24	459	757	1 159	1 211	1 225	18.2	18.6	17.9	15.3	13.5
25-59	991	1 469	2 812	3 593	4 051	39.3	36.1	43.5	45.4	44.6
60-79	192	318	586	1 032	1 574	7.6	7.8	9.1	13.1	17.3
80+	14	31	87	160	394	0.5	0.8	1.3	2.0	4.3
Total	2 519	4 074	6 465	7 905	9 076	100.0	100.0	100.0	100.0	100.0
					More developed regions					
0-14	222	254	206	196	193	27.4	24.2	17.0	15.7	15.6
15-24	138	176	165	140	133	17.0	16.8	13.7	11.2	10.8
25-59	357	456	596	570	510	43.9	43.5	49.2	45.7	41.2
60-79	87	143	200	275	284	10.7	13.7	16.5	22.0	23.0
80+	9	18	44	68	116	1.0	1.8	3.7	5.4	9.4
Total	813	1 047	1 211	1 249	1 236	100.0	100.0	100.0	100.0	100.0
					Less developed regions					
0-14	642	1 244	1 615	1 713	1 639	37.6	41.1	30.7	25.7	20.9
15-24	321	581	994	1 071	1 091	18.8	19.2	18.9	16.1	13.9
25-59	634	1 014	2 216	3 023	3 541	37.1	33.5	42.2	45.4	45.2
60-79	105	175	386	757	1 290	6.1	5.8	7.3	11.4	16.5
80+	5	13	42	92	278	0.3	0.4	0.8	1.4	3.6
Total	1 707	3 027	5 253	6 656	7 840	100.0	100.0	100.0	100.0	100.0

Source: *World Population Prospects: The 2004 Revision*,

In contrast with the less developed regions, whose population is still fairly young, the more developed regions have an older population. Already today, 20 per cent of the population in the more developed regions is aged 60 years or over, a proportion that might be reached by the less developed regions only by 2050. However, because of the very low fertility that the more developed regions have had since the 1980s, their age distribution today is somewhat more advantageous that the one projected for less developed regions in 2050, in the sense that the proportion of persons aged 25-59 in more developed regions today is 49 per cent or 4 percentage points higher than the proportion projected for less developed regions in 2050.

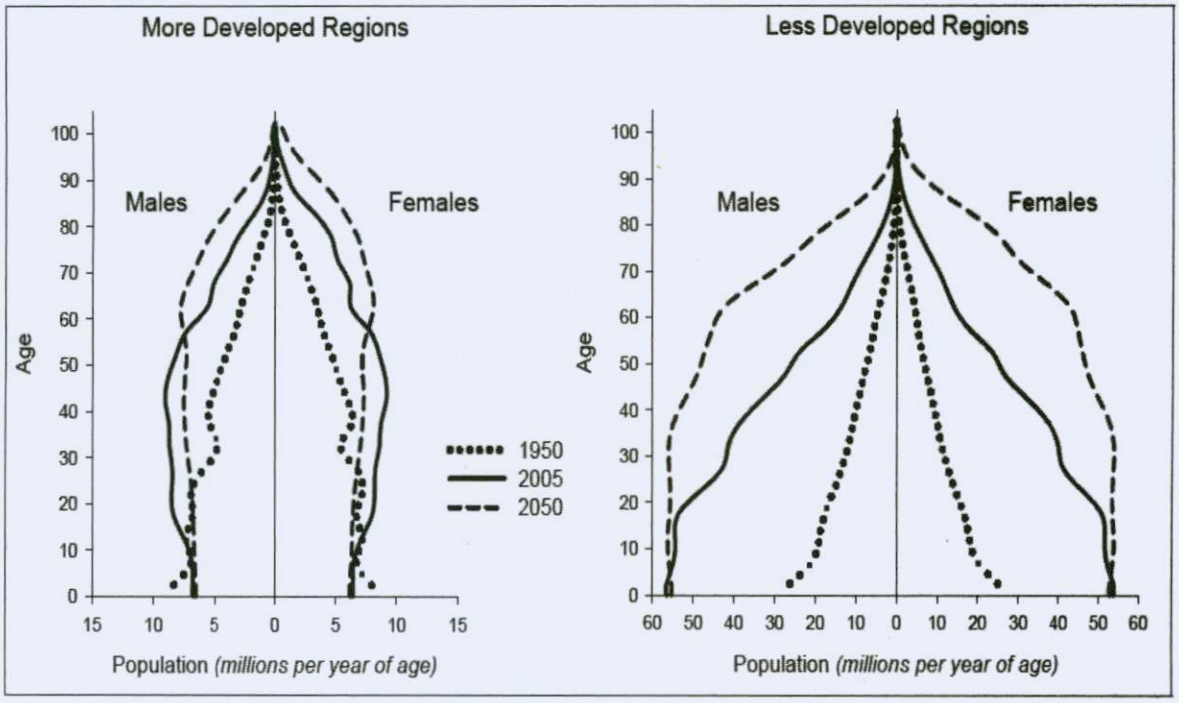
Another way of assessing the implications of population distribution for economic and social development is to consider the number of persons aged 25-59 per 100 persons in other age groups. This ratio is a rough indicator of the number of persons in the economically productive ages to the number of persons of other ages who are more likely not to be productive, either because they are studying or because they are no longer economically active. Table 2 shows the evolution of this ratio between 1950 and 2050 for the world and

the development groups. The ratios indicate that since 1950, the more developed regions have had a considerably more advantageous ratio than the less developed regions. Especially today, there are 97 persons aged 25-59 in more developed regions to every 100 persons in the other age groups, whereas in the less developed regions that ratio, which is at an all time high, is just 73. Over the next 20 years, the situation in the less developed regions continues improving while the ratio for the more developed regions declines, but by 2025 both sets of countries are expected to have similar overall ratios. After 2025, the ratio for the more developed regions declines markedly while that for the less developed regions remains almost unchanged. This measure corroborates therefore that the less developed regions, as a whole, still have the opportunity to reap the benefits of the demographic bonus and some time to adapt to the rapid population ageing that they will experience once the bonus ends.

It should be noted that although the proportion of the population aged 25-59 is expected to remain nearly constant in the less developed regions between 2005 and 2050, the age distribution of those potential workers is also expected to become older, as illustrated in figure 1. Thus, whereas in 1950 the age distribution of the working-age population in the less developed regions resembled a pyramid, with a broad base at the younger working ages and decreasing numbers at higher ages, by 2050 the expected distribution is expected to become closer to a rectangle, although the younger cohorts in the less developed regions still tend to be somewhat larger than the older cohorts. In the more developed regions, the distribution of the group aged 25-59 today is closer to an inverted pyramid, with the older cohorts being larger than the younger ones, and the expected distribution by 2050 also becomes considerably more rectangular. Furthermore, whereas in the less developed regions the population continues to increase until 2050 for every age group above age 10, the population of the more developed regions is smaller in 2050 than it is expected to be in 2025 for every age group above age 10.

Table 6. Number of persons aged 25-59 per 100 persons in the other age groups for the world and the development groups, 1950-2050

	1950	1975	2005	2025	2050
World	65	56	77	83	81
More developed regions	78	77	97	84	70
Less developed regions	59	50	73	83	82



In sum, the world population as a whole is today in a relatively favourable position regarding the size of its population of working age relative to that of children and older persons. Furthermore, although the more developed regions are more advanced in the process of population ageing than the less developed regions, they are still in a relatively advantageous situation because they have a fairly high proportion of persons in the economically active ages and a moderate proportion of older persons (20 per cent). Their main concern, therefore, should be to make provisions for the rapid ageing that lies ahead. For the less developed regions as a whole, the situation is also propitious and the expectation is that it will improve further over the short term as fertility continues to decrease. However, this development will help accelerate the ageing process so that by mid-century the less developed regions are likely to be in a position similar to that of more developed countries today.

11.6 POPULATION PYRAMID

A Population pyramid, also called an age structure diagram, is a graphical illustration that shows the distribution of various age groups in a population (typically that of a country or region of the world), which forms the shape of a pyramid when the population is growing. It is also used in Ecology to determine the overall age distribution of a population; an indication of the reproductive capabilities and likelihood of the continuation of a species.

It typically consists of two back-to-back bar graphs, with the population plotted on the X-axis and age on the Y-axis, one showing the number of males and one showing females in a particular population in five-year age groups (also called cohorts). Males are conventionally shown on the left and females on the right, and they may be measured by raw number or as a percentage of the total population.

Population pyramids are often viewed as the most effective way to graphically depict the age and sex distribution of a population, partly because of the very clear image these pyramids present.[1]

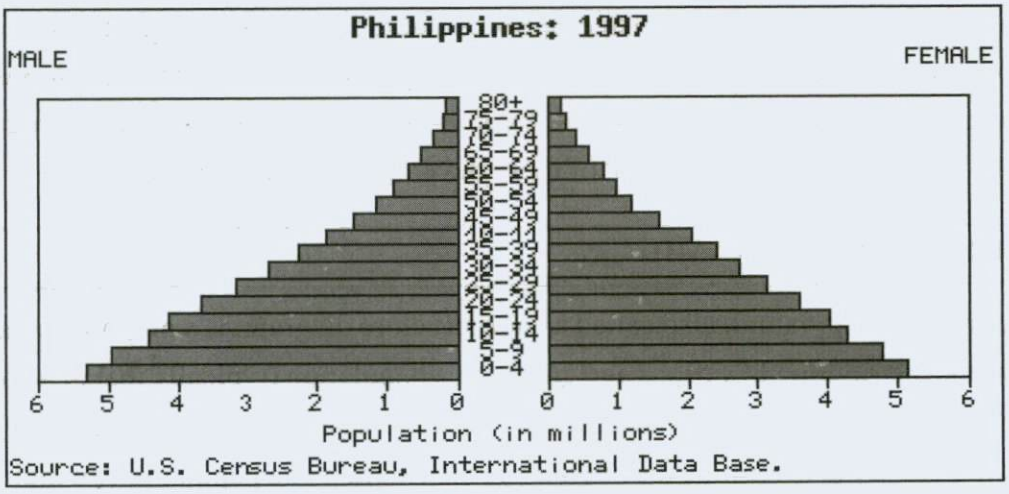
A great deal of information about the population broken down by age and sex can be read from a population pyramid, and this can shed light on the extent of development and other aspects of the population. A population pyramid also tells how many people of each age range live in the area. There tends to be more females than males in the older age groups, due to females' longer life expectancy.

11.6.1 Types of population pyramids

Age-sex pyramids display the percentage or actual amount of a population broken down by gender and age. The five-year age increments on the y-axis allow the pyramid to vividly reflect long term trends in the birth and death rates but also reflect shorter term baby-booms, wars, and epidemics.

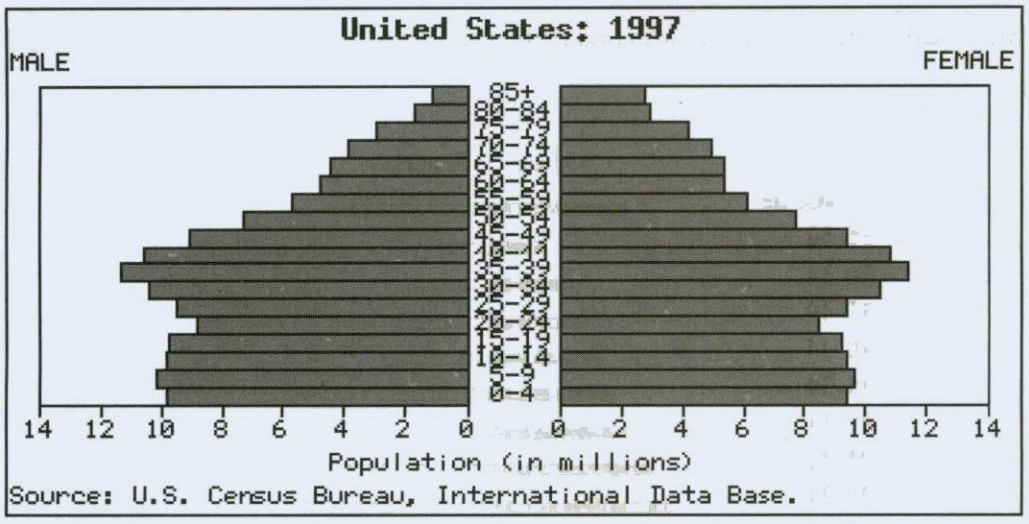
There are three key types of population pyramids:

11.6.2 Rapid Growth



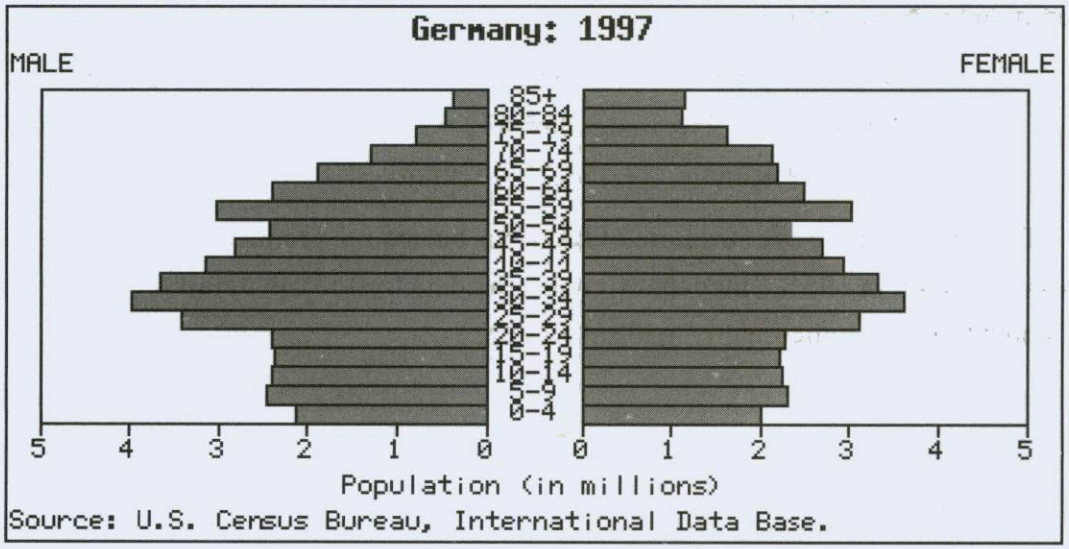
This pyramid of the Philippines shows a triangle-shaped pyramid and reflects a high growth rate of about 2.1 percent annually.

11.6.3 Slow Growth

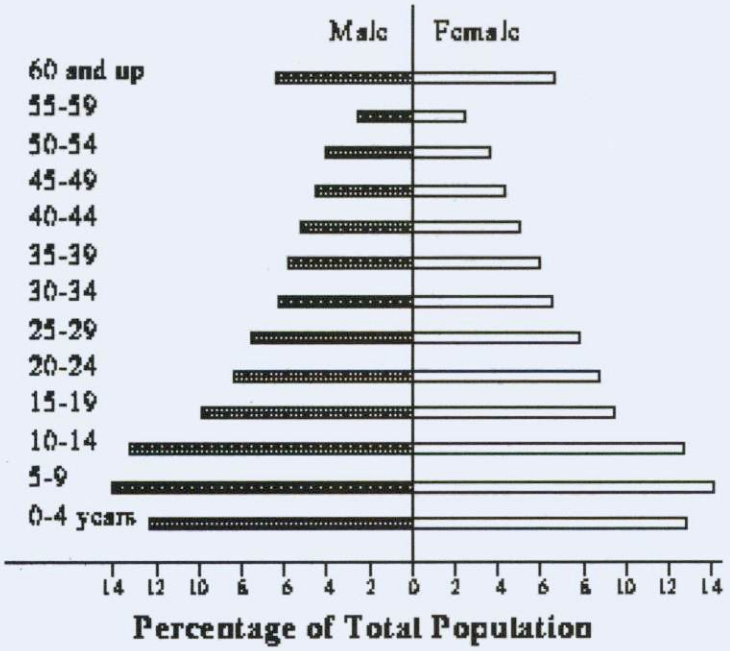


In the United States, the population is growing at a rate of about 1.7 percent annually. This growth rate is reflected in the more square-like structure of the pyramid. Note the lump in the pyramid between the ages of about 35 to 50. This large segment of the population is the post-World War II "baby boom." As this population ages and climbs up the pyramid, there will be a much greater demand for medical and other geriatric services. An online animated population pyramid from 1950 to 2050 shows the aging of the boomers.

11.6.4 Negative Growth



Germany is experiencing a period of negative growth (-0.1%). As negative growth in a country continues, the population is reduced. A population can shrink due to a low birth rate and a stable death rate. Increased emigration may also be a contributor to a declining population.



India's population pyramid is bottom-heavy; around 40% of the people are under age 15. This makes it an enormous market for goods and services targeted at the young age groups. Even though the share of the older ages in the population is low, there are still 117 million people above age 60.

0–14 years: 30.8%, male: 188,208,196, female: 171,356,024

15–64 years: 64.3%, male: 386,432,921, female: 364,215,759

65+ years: 4.9%, male: 27,258,259, female: 30,031,289 (2007 est.)

The change in the age structure of India has been quite gradual since the first complete Census conducted in 1951. Since that Census, the data to study in detail the age structure of India's population is authentically made available.

Table 7 age structure of India's population

Years	Male	Female	Total	Male%	Female%	Total%
0-4	62623	58772	121395	11.8	11.8	11.8
5-9	64237	59074	123310	12.1	11.9	12.0
10-14	63163	56713	119876	11.9	11.4	11.7
15-19	55114	48924	104038	10.4	9.9	10.1
20-24	47168	43866	91034	8.9	8.8	8.9
25-29	41817	41124	82941	7.9	8.3	8.1
30-34	38188	37650	75838	7.2	7.6	7.4
35-39	34928	33043	67971	6.6	6.7	6.6
40-44	30251	27267	57518	5.7	5.5	5.6
45-49	24937	21974	46911	4.7	4.4	4.6
50-54	19594	17565	37158	3.7	3.5	3.6
55-59	15194	14739	29932	2.9	3.0	2.9
60-64	12592	13099	25692	2.4	2.6	2.5
65-69	10043	10471	20514	1.9	2.1	2.0
70-74	7950	8046	15996	1.5	1.6	1.6
75-79	2832	2476	5309	0.5	0.5	0.5
80+	1525	1651	3176	0.3	0.3	0.3
Total	**532157**	**496454**	**1028610**	**100.0**	**100.0**	**100.0**

Broadly, the age groups have been studied under three categories. The first one is 0-14 age-group, which is predominantly young age group largely dependent on their parents for their well-being. This age group contributes little but consumes more of the resources. The second one is of 15-64 age-group, which is the main working group. This group is the contributor to the national income by their labour. The third group is of population aged sixty plus. The first and the last group are demographically labelled as dependent population where as the middle one is the independent population. In this section, census data of the last twelve decades (since 1881) has been examined to identify the changes in the age-sex structure of India's population.

Table 8 Pattern of Change in the Age structure of India

	Age							Total
Time	0-4	5-14,	15-64	60+	65+	80+	Median Age	Popn. ('000)
INDIA								
1950	15.2	23.5	58.0	5.6	3.3	0.3	20.4	357561
1960	16.2	23.6	56.8	5.7	3.4	0.3	20.4	442344
1970	15.6	24.8	55.9	6.0	3.7	0.3	19.9	554911
1980	14.0	24.5	57.5	6.5	4.0	0.3	20.6	688856
1990	13.4	23.0	59.3	6.8	4.3	0.4	21.9	844886
2000	11.5	22.0	61.5	7.6	5.0	0.6	23.7	1008937
2010*	9.7	19.5	65.0	8.7	5.8	0.8	26.2	1164020
2020	8.0	16.7	68.1	11.0	7.2	1.1	29.6	1291290
2030	7.6	14.8	68.1	14.0	9.5	1.5	32.9	1408923
2040	6.9	14.1	66.9	17.1	12.1	2.2	35.8	1503345
2050	6.6	13.1	65.5	20.6	14.8	3.1	38.0	1572055

The data reveals that India's population in the 0-14 age group has remained close to 38-39 percent from 1881-1951. There was a sudden increase in 1961, when the percentage of population in 0-14 age group crossed the mark of forty one percent (41%) and in 1971; it reached its peak by crossing forty two percent (42%). This is evidently because of the decline in the mortality rate during this period and not due to a significant decline in the fertility rate. And then onwards, fertility has experienced a declining trend till date. Census 2001 data indicates that 0-14 age-group constitutes 35.35 percent of the total population which has been the lowest ever.

In 1881, the percentage of population in 15-59 age-group was 56.35. In 2001, it was little over 56.93 %. The lowest percentage of population in this group was in the year of 1971, when it dipped to 52 percent. In the census year of 1911, 1951 and 2001 there has been almost same percentage of population at about fifty seven percent. Since 1971, there has been continuous and uniform increase in the percentage of population in this age group.

60+ Age-Group

This age-group has been experiencing an increasing trend ever since 1881. There have been few census decades, which have shown interruption in the otherwise smooth trend. The lowest percentage of population (5.08) in this age group has been recorded in the year of 1901. In this year, the percentage of population in this age group was 5.08. In 1881, the percentage was 5.25 percent. There had been very slight differences in the percentage of sixty plus population till 1931. The proportion hovered around five percent. But, since 1941, there had been a continuous rise in the proportion of the elderly population. The maximum percentage in this group is recorded in the 2001 census. In this census year, the persons over 60 years of age were at 7.72 percent.

11.7 AGE STRUCTURE IN DETAILED AGE-COHORTS SINCE 1881-2011

The trend in age-structure is further revealed through the analysis of detailed age-cohorts from 1881 to 2011. In the first two age-cohorts i.e., of 0-4 and 5-9 years, there is a decline in their proportion in the total population of India after 1961. This trend is maintained even in the 2001 census. The proportion of population in the 0-4 age cohort was the highest in the year 1961, when it reached 15.06 percent. The census of 2011 recorded the lowest proportion of population in the same age-group at 10.74 percent. In the 5-9 years age-cohort, the lowest proportion is recorded in the 2001 census. There is a sudden decline in the proportion in the year 1951.

In the 10-14, 15-19 and 20-24 years age-cohorts, fluctuations have been observed within a limited range with a tendency towards increase in the proportion of population in these age-groups since 1881. In the first age-cohort, the peak reached in the year of 1981, when it remained just short of thirteen percent. In the second age-cohort, the peak reached in 2001 census, when it was just below ten percent. In the third age-cohort (20-24 years), the proportion ranged between eight and nine percent, the peak having reached in 1991. The difference between the highest and the lowest proportion of population is very low in this age-cohort.

In the 25-29, 30-34 and 40-44 years age-cohorts, first we have declining trend and this decrease reaches its nadir at 7.45%, 6.35% and 5.07% in respective age-cohorts from where it again ascends. But, in all of these three age-cohorts the summit of the trend line is in the year of 1881. The proportion of population in these age-cohorts, hence, had its peak in 1881 and then onwards it declines only to increase during the latest census in the end of the studied period.

The age-groups 35-39 years, 45-49 years and 55-59 years show similar trends. In these three age-cohorts, the population has indicated increasing trend since 1881. It has its lowest proportion in the beginning of the trend line and highest in 2001. This trend is similar to 10-14 and 15-19 years age-cohorts, difference being in the smooth trend line in the former and the fluctuating trend line in the latter. Only difference among these three cohorts is the proportion. In the first, the proportion varies between five to seven percent. In the second, this varies between three to five percent and in the third, it varies from one to three percent.

In the 50-54 years age-cohort, the proportion of population has declined throughout the years under study. This trend is opposite to the immediate previous age-cohort. It has its highest percentage in the beginning of the trend line and the lowest in the end. The 60+ age-group has a totally unique trend in the sense that it had more or less smooth curve, with proportion ranging between five and six percent till 1971, and then it increases suddenly at a fast rate. In 2001 census, the proportion of population in this age group was highest ever at 7.72 percent. The data of the twelve census years reveals the pattern of demographic transition where, in general, there is decline in the first two age-cohorts and increase in the last age-cohort.

11.8 CHANGE IN THE AGE-SEX STRUCTURE OF INDIA

An analysis of the change in the age-sex structure in each census from 1881 to 2001 reveals that there is an increase in the base population (0-14 years of age group) in both the sexes. There is however, a decline in the other two age-groups i.e., 15-59 and 60 plus age-group in both the sexes, though this decline is very marginal. The population in both male and female declined in 1901 from 1891. In 1901, the 0-14 age group male population declined by 0.74 percent and female population declined by 0.80 percentage point. The proportion of decline in the old age population continued in 1901. But, there was some increase in the 15-59 age group population. Behaviour of individual age-cohort remained the same. In 1911, there was again a decline in the young age-group. In 1901, the 0-4 age group contributed in the decline of the young age group population. Change is observed in the decline was mainly because of 5-9 and 10-14 years age-group population during 1911. The 0-4 years age–cohort witnessed an increase in its proportion during the same period. There is an increase in the sixty plus population. In the productive (15-59) age-group, there is a decline in the proportion of the female population whereas an increase is recorded in its male counterpart.

In the year of great divide i.e., 1921, the male/female population behaved differently. There was a sudden decline in the proportion of male population, whereas, at the same time there was surprisingly increase in the female proportion of population. The only increase recorded in the male proportion was in the sixty plus age group and the only decline witnessed in the female proportion was in the productive age-group. The 5-9 age-cohort indicated a sharp decline in the male proportion and increase in the female proportion, which shows the aftermath of the calamity of the decade.

In 1931, the proportion of old age population declined in both male and female. There was increase in the male population in both the age groups, whereas there was decline in the proportion of the female population in all the three broad age-groups. In 1941, there was increase in the proportion of population in all the three individual age-cohorts. There was decline in the 15-59 years age group in both male and female. The old age population also registered an increase. In 1951, there was a surge in the proportion of working population. It was recorded highest in the entire census period. This proportion was almost revisited in 2011 census. There was a decline in the young age population in both male and female. During 1961 and 1971, there was increase in the proportion of young and old age population. In fact, the proportion of old age population has never shown downward trends since then in both male and female. Since 1981, there is continuous decline in the proportion of the young age-group population. Also, there is continuous increase in the proportion of the productive age group population since then. Hence, since 1961, there is a clear trend, which is almost in consonance with the trend in the birth rate and death rate.

11.9 FACTORS DETERMINING AGE STRUCTURE

The age structure of a population is determined by the following factors :

Fertility :

During the 1950, researches of various demographers such as V. G Valaorus ('950), Frank Lorimer (1951), Alfred Sauvey (1954), Ansley Coale (1956) and the United Nations (1958) demonstated that the aging of the population in most of the western Countries is due to a decline in the fertility rates. The increase in the proportion of the old people and persons in the medium age was a product of falling birth rate. However, it was realised later on that mortality is an equally important factor In the economically developed countries aging of population is particularly due to declining fertility. On the other hand, increased fertility has checked the aging of population in developing countries.

Mortality :

It has been now realised that mortality is an equally important' factor in the determination of age structure in a population. It effects the age distribution though to a much lesser extent than fertility, [t has been demonstrated that reductions in mortality have resulted in a younger age distribution. The medium age of Indian populations has dropped because of the decline in mortality. The same has been observed in Latin America during the period 1930-1960. The decline in mortality rate is particularly due to improvement in health and medical services and technology. While it has led to survival of children it has also prolonged life in the older generation. This has led the French demographer Bourgeois Pichat to calculate that if fertility in France has remained unchanged from 1J76 to 1951, while mortality declined according to the actual pattern, the population in 1951 would still have been a young population. The decline in mortality leads to younger age group in a country passing from high levels of mortality to low levels. On the other hand, if the mortality level is already low and the expectation of life is nearly 70 years, there is not much scope for increase in young population. This leads to aging of the population as found in developed countries.

The above discussion shows that the fertility and mortality together affect the age structure of a population.

Migration :

The effects of fertility and mortality are however changed considerably by the effects of migration, particularly the age distribution of the net migrants and volume of net migration. For example, if the proportion and number of young adults is large among the net migrants, the aging of the population is retarded. On the other hand the aging process tends to get accelerated if the net migrants include persons above 30 years of age. The influence on age structure of a population is effected both by international as well as internal migration. For example, internal net migration has influenced age-sex distribution in the population of Andaman and Nicobar Islands in India.

War :

As has been clearly shown by the last two great World Wars, the age-sex structure of a population is considerably effected by war. War causalities mainly include males in the younger age groups. Wars also adversely effect fertility since most of the males in the participating countries are separated fertility from their wives for long period. This also leads to "baby boom" in post war period since it leads to more marriages and more sexual activity. The age sex pyramid shows smaller sized cohorts during the war and bigger sized cohorts after the war.

11.10 LET US SUM UP

The most important aspect in Demography is the study of the structure and characteristic of the population. This includes the personal, social and economic characteristics including age, sex, race, nationality, religion, language, a marital status, family composition, literacy and educational attainments, employment status, occupation and income etc. Each population may be classified into different groups according to the above mentioned characteristics.

11.12 QUESTIONS FOR SELF STUDY

1. What are population characteristics ? What are their uses and types ?
2. Explain The Patterns Of Sex Ratio In India?
3. Write short note on Importance of Sex and Age Characteristics?
4. Explain Age Structure. Give examples. Point out factors determining it?

11.11 FURTHER READING

1 Huw Roland Jones(1990), Population geography Sage Pub, London

2 Mohammad Izhar Hassan (2005) Population Geography, Rawat Publications, New Delhi.

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Perspectives in human geography series, Anmol Pub, Delhi.

4 John Innes Clarke (1972), Population geography, Pergamon Press, USA.

5 Gary L. Peters, Robert P. Larkin (2008) Population geography, Kendall/Hunt Publishing Company, USA.

6 Sudesh Nangia, (1985) Population geography Heritage Publishers, Delhi.

UNIT : 12 COMPONENTS OF POPULATION CHANGE - OCCUPATIONAL STRUCTURE

Structure

12.0 OBJECTIVES

After studying this unit you will able to

- Know the classification occupation
- Analyze the world employment pattern
- Analyze the occupation structure
- Importance of literacy rate and world pattern
- Examine the spatial pattern of literacy rate in India
- Distribution of rural and urban population of the world

12.1 I NTRODUCTION

The occupational classification of population is significant to the economic geographer because on it is based the functional grouping of population. A region with a high proportion of its population working in tertiary activities is considered a developed region while one with a high proportion in primary activities (generally an agricultural or mining region), is considered backward. The economic characteristics of a region can be accessed from the occupational structure of the population. The validity and reliability of such an assessment will, however, depend largely on the detailed data available regarding the functions the people are engaged in.

The distribution of the population according to the different types of occupations is referred to as the occupational structure. Occupations are generally classified as primary (agriculture, mining, fishing, etc.), secondary (manufacturing industry, building and construction work, etc.) and tertiary (transport, communications, banking, etc.).

The proportion of people working in different activities reflects the economic development of a country. Developed nations have a high proportion of people in secondary and tertiary activities. Developing countries tend to have a higher proportion of their workforce engaged in primary activities.

The percentage of population that is economically active is an important index of development. The distribution of the population according to different types of occupation is referred to as the occupational structure. An enormous variety of occupations are found in any country.

Occupations are generally classified as primary, secondary, tertiary and Quinary.

12.2 PRIMARY SECTOR

The primary sector of the economy is the sector of an economy making direct use of natural resources. This includes agriculture, forestry and fishing, mining, and extraction of oil and gas.

12.2.2 Secondary Sector

The secondary sector of the economy manufactures finished goods. All of manufacturing, processing, and construction lies within the secondary sector. Activities associated with the secondary sector include metal working and smelting, automobile production, textile production, chemical and engineering industries, aerospace manufacturing, energy utilities, engineering, breweries and bottlers, construction, and shipbuilding.

12.3 TERTIARY SECTOR

The tertiary sector of the economy is the service industry. This sector provides services to the general population and to businesses. Activities associated with this sector include retail and wholesale sales, transportation and distribution, entertainment (movies, television, radio, music, theater, etc.), restaurants, clerical services, media, tourism, insurance, banking, healthcare, and law.

In most developed and developing countries, a growing proportion of workers are devoted to the tertiary sector. In the U.S., more than 80% of the labor force are tertiary workers.

12.4 QUINARY SECTOR

Some consider there to be a branch of the quaternary sector called the quinary sector, which includes the highest levels of decision making in a society or economy. This sector would include the top executives or officials in such fields as government, science, universities, nonprofit, healthcare, culture, and the media.

The proportion of people working in different activities varies in developed and developing countries. Developed nations have a high proportion of people in secondary and tertiary activities. Developing countries tend to have a higher proportion of their workforce engaged in primary activities. In India, about 64 per cent of the population is engaged only in agriculture. The proportion of population dependent on secondary and tertiary sectors is about 13 and 20 per cent respectively. There has been an occupational shift in favour of secondary tertiary and Quinary sectors because of growing industrialisation and urbanisation in recent times.

12.5 GLOBAL EMPLOYMENT SCENARIO

Contrary to what may be expected, global employment has continued to grow throughout the crisis, though at less than half the rate observed prior to the crisis (see table 1 &2). Employment contracted sharply in 2009 in the Developed Economies and European Union (–2.2 per cent) and Central and South-Eastern Europe (non-EU) and CIS (–0.9 per cent) regions, but total employment continued to grow in all other regions during the crisis. In many developing regions, particularly the least developed and those with rapid population growth, employment growth is driven primarily by demographic trends, as the majority of workers do not enter into formal wage employment, but rather they are engaged in self-employment or unpaid family work, such as subsistence farming. As a result, macroeconomic shocks in these regions tend to have only a limited impact on overall employment growth.

While global employment continued to grow, the employment-to-population ratio, which represents the share of people of working age in employment, declined from 61.7 per cent in 2007 to 61.2 per cent in 2009 and was little changed at 61.1 per cent in 2010 (confidence interval from 60.9 to 61.3). In the Developed Economies and European Union region, the employment-to-population ratio dropped from 57.1 per cent in 2007 to 55.5 per cent in 2009, with a further drop to 54.7 per cent in 2010 (confidence interval from 54.5 to 54.9 per cent). Clearly, many developed economies are simply not generating sufficient employment opportunities to absorb growth in the working-age population, which again reflects the ongoing lag between economic recovery and a recovery in employment in this region. This contrasts with many developing regions, some of which saw an initial decline in the employment-to-population ratio but, in all developing regions except East Asia, the estimated employment-to-population ratio in 2010 is little changed versus 2007.

Table 1 Employment to population rate by sex, world and region (%)

Both sexes	2000	2004	2005	2006	2007	2008	2009	2010*		
								CI lower bound	Preliminary estimate	CI upper bound
World	61.5	61.4	61.4	61.6	61.7	61.6	61.2	60.9	61.1	61.3
Developed Economies and European Union	56.7	55.9	56.2	56.7	57.1	57.1	55.5	54.5	54.7	54.9
Central and South-Eastern Europe (non-EU) and CIS	51.7	51.9	52.4	52.8	53.7	54.1	53.4	53.3	53.6	53.8
East Asia	73.5	72.5	71.9	71.4	71.0	70.4	70.0	69.8	69.9	70.1
South-East Asia and the Pacific	67.1	65.8	65.6	65.6	66.0	66.0	65.9	65.6	65.8	66.1
South Asia	57.5	58.4	58.5	58.7	58.8	59.0	59.0	58.9	59.1	59.2
Latin America and the Caribbean	58.1	59.2	59.9	60.6	60.9	61.3	60.6	60.4	60.7	61.0
Middle East	44.8	44.9	45.1	45.3	45.3	45.1	45.2	45.1	45.4	45.8
North Africa	43.9	45.2	45.4	46.0	46.1	46.5	46.4	46.2	46.6	46.9
Sub-Saharan Africa	63.5	64.2	64.3	64.8	65.1	65.2	65.2	64.9	65.2	65.5

Males	2000	2004	2005	2006	2007	2008	2009	2010*		
								CI lower bound	Preliminary estimate	CI upper bound
World	74.3	73.9	73.9	73.9	74.0	73.8	73.1	72.7	72.9	73.2
Developed Economies and European Union	65.8	64.1	64.4	64.8	65.2	64.9	62.4	61.2	61.4	61.6
Central and South-Eastern Europe (non-EU) and CIS	60.8	60.8	61.5	61.8	62.8	63.4	62.5	62.4	62.8	63.1
East Asia	79.2	78.4	77.8	77.2	76.8	76.1	75.7	75.5	75.6	75.8
South-East Asia and the Pacific	79.3	78.4	77.9	77.9	77.9	77.6	77.5	77.2	77.4	77.7
South Asia	79.6	79.8	79.8	79.7	79.5	79.6	79.2	78.9	79.1	79.3
Latin America and the Caribbean	74.7	74.7	75.1	75.6	75.7	75.9	74.8	74.2	74.6	74.9
Middle East	68.5	67.7	68.1	68.0	67.9	67.5	67.7	67.6	68.0	68.3
North Africa	67.1	68.5	68.7	69.4	69.1	69.7	69.7	69.3	69.8	70.2
Sub-Saharan Africa	73.6	73.8	73.8	74.2	74.4	74.5	74.3	74.1	74.3	74.6

Females	2000	2004	2005	2006	2007	2008	2009	2010*		
								CI lower bound	Preliminary estimate	CI upper bound
World	48.6	48.8	48.9	49.2	49.4	49.5	49.2	49.0	49.2	49.4
Developed Economies and European Union	48.1	48.1	48.4	49.0	49.5	49.7	48.9	48.2	48.3	48.4
Central and South-Eastern Europe (non-EU) and CIS	43.6	44.0	44.4	44.9	45.7	45.9	45.3	45.2	45.5	45.7
East Asia	67.6	66.5	65.9	65.3	65.0	64.4	64.1	63.9	64.0	64.1
South-East Asia and the Pacific	55.2	53.6	53.7	53.7	54.4	54.7	54.6	54.4	54.6	54.8
South Asia	33.9	35.7	36.0	36.6	36.9	37.3	37.6	37.8	38.0	38.1
Latin America and the Caribbean	42.3	44.4	45.4	46.4	46.8	47.4	47.1	47.2	47.5	47.8
Middle East	18.6	19.6	19.7	20.1	20.2	20.3	20.5	20.4	20.7	21.0
North Africa	20.8	22.1	22.3	22.8	23.2	23.4	23.4	23.3	23.6	23.8
Sub-Saharan Africa	53.7	54.9	55.1	55.7	56.0	56.2	56.3	56.1	56.3	56.6

* 2010 are preliminary estimates; CI = confidence interval.

Source: ILO, *Trends econometric models*, October 2010

Tabale 2 Annual Employment growth, world and regions (%)

Region	2001–06	2007	2008	2009	2010*		
					CI lower bound	Preliminary estimate	CI upper bound
World	1.9	1.8	1.5	0.7	1.0	1.3	1.7
Developed Economies and European Union	0.9	1.4	0.6	-2.2	-1.2	-0.9	-0.5
Central and South-Eastern Europe (non-EU) and CIS	1.0	2.1	1.1	-0.9	0.1	0.6	1.2
East Asia	1.1	0.7	0.2	0.5	0.7	0.9	1.1
South-East Asia and the Pacific	1.8	2.5	1.9	1.7	1.3	1.7	2.0
South Asia	2.7	2.4	2.6	2.2	2.0	2.3	2.7
Latin America and the Caribbean	2.8	2.2	2.3	0.5	1.5	2.0	2.5
Middle East	3.6	2.9	2.3	3.0	2.1	2.9	3.6
North Africa	3.5	2.6	3.1	2.1	1.7	2.5	3.2
Sub-Saharan Africa	3.2	3.1	3.0	2.6	2.4	2.8	3.2

* 2010 are preliminary estimates; CI = confidence interval.

Source: ILO, *Trends econometric models*, October 2010

12.6 LABOUR FORCE PARTICIPATION

The *Global Employment Trends 2010* report noted that labour force participation rates and labour force levels can also be affected by an economic crisis, but because there can be offsetting effects across different groups of workers and across countries, there tends to be little discernable impact at the global or regional levels. The labour force data analysed for this current report, which include yearly country-level participation rates for 2009 and hence include the period of the crisis, largely confirm this earlier observation. The global labour force participation rate stood at 65.3 per cent in 2009, unchanged as compared with 2007 (see table 4). Participation rates only varied to a substantial amount over the period from 2007 to 2009 in two regions: Central and South-Eastern Europe (non-EU) and CIS and East Asia. In the former, the regional participation rate rose by 0.8 percentage points between 2007 and 2009, while in the latter, the participation rate declined by 0.6 percentage points. Yet, in both cases, these changes are directionally in line with ongoing longer-term trends in participation.

Table 3. Labour force participation rate by sex, world and regions (%)

Both sexes	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
World	65.6	65.5	65.7	65.6	65.5	65.5	65.4	65.3	65.4	65.3
Developed Economies and European Union	60.8	60.5	60.3	60.2	60.2	60.3	60.5	60.6	60.8	60.5
Central and South-Eastern Europe (non-EU) and CIS	58.0	58.1	58.1	57.5	57.6	57.9	58.3	58.8	59.2	59.6
East Asia	77.0	76.7	77.1	76.5	75.8	75.0	74.3	73.8	73.5	73.2
South-East Asia and the Pacific	70.6	70.7	70.4	70.4	70.3	70.1	69.8	69.7	69.7	69.5
South Asia	60.1	60.4	60.7	61.0	61.3	61.4	61.6	61.6	61.6	61.7
Latin America and the Caribbean	63.6	63.5	63.9	64.0	64.6	65.0	65.6	65.5	65.6	65.6
Middle East	50.1	50.1	50.2	50.4	50.6	50.8	50.7	50.6	50.2	50.4
North Africa	51.1	51.0	51.0	51.2	51.3	51.3	51.4	51.3	51.4	51.5
Sub-Saharan Africa	69.7	69.8	69.9	70.1	70.2	70.4	70.5	70.6	70.8	70.8

Males	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
World	79.2	79.0	79.0	78.8	78.7	78.5	78.4	78.2	78.1	77.9
Developed Economies and European Union	70.2	69.8	69.4	69.1	68.9	68.9	69.0	69.0	69.0	68.4
Central and South-Eastern Europe (non-EU) and CIS	68.1	67.9	67.6	67.1	67.5	67.9	68.2	68.8	69.4	69.9
East Asia	83.4	83.1	83.6	83.0	82.3	81.6	80.8	80.2	80.0	79.7
South-East Asia and the Pacific	83.5	83.6	83.4	83.3	83.3	82.8	82.5	82.1	81.8	81.7
South Asia	83.3	83.3	83.4	83.4	83.4	83.4	83.3	83.0	82.8	82.6
Latin America and the Caribbean	80.6	80.3	80.2	80.0	80.2	80.2	80.5	80.2	80.1	79.9
Middle East	75.1	74.9	74.8	74.8	74.8	75.0	74.6	74.2	73.5	73.7
North Africa	76.2	76.1	75.9	75.8	75.8	75.7	75.7	75.5	75.6	75.6
Sub-Saharan Africa	80.4	80.3	80.3	80.3	80.3	80.3	80.4	80.4	80.6	80.4

Females	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
World	52.1	52.1	52.4	52.4	52.4	52.5	52.5	52.6	52.7	52.7
Developed Economies and European Union	51.9	51.8	51.7	51.9	52.0	52.2	52.5	52.7	53.0	53.1
Central and South-Eastern Europe (non-EU) and CIS	49.1	49.4	49.7	49.0	48.8	49.0	49.5	49.9	50.1	50.4
East Asia	70.3	70.0	70.3	69.7	69.0	68.3	67.6	67.2	66.8	66.5
South-East Asia and the Pacific	58.1	58.1	57.9	57.8	57.7	57.7	57.5	57.7	57.9	57.6
South Asia	35.5	36.1	36.6	37.2	37.8	38.2	38.6	39.0	39.3	39.6
Latin America and the Caribbean	47.3	47.4	48.3	48.7	49.8	50.5	51.4	51.4	51.8	52.0
Middle East	22.6	22.8	23.1	23.4	23.8	24.1	24.3	24.5	24.6	24.8
North Africa	26.2	26.1	26.2	26.7	27.0	27.1	27.2	27.3	27.5	27.6
Sub-Saharan Africa	59.4	59.7	59.9	60.2	60.5	60.7	60.9	61.0	61.3	61.3

While broad global aggregates indicate that there was no major change in trends in participation rates during the crisis, disaggregated data reveal a very different picture: participation rates among some groups of workers have clearly been affected. Figure 6 examines percentage point changes in male and female labour force participation rates over the period from 2007 to 2009 in comparison with the average two-year trend over the five years preceding the crisis. Four regions with sufficient data to provide a reliable analysis at the regional level are included.

In the Developed Economies and European Union and Latin America and the Caribbean regions, the crisis period corresponded with a drop in male labour force participation rates that was substantially larger than what would be expected based on pre-crisis trends. At the same time, the increase in female participation rates in the two regions was lower than expected based on trend growth rates, particularly in the Latin America and the Caribbean region. Both of these trends point to a major shock to labour markets with rising levels of discouragement whereby workers who otherwise would have been economically active do not even attempt to seek employment, owing to a lack of available or perceived employment opportunities. Importantly, these discouraged workers are not included in estimates of unemployment, which underscores the need to look at other labour market indicators in conjunction with unemployment rates to adequately assess labour market trends.

In South-East Asia and the Pacific, there was little difference between changes in participation rates prior to and during the crisis. This may reflect the lack of a social safety net in many countries in the region, whereby workers affected by the crisis were forced to seek other forms of employment, perhaps in the informal economy, rather than joining the ranks of the unemployed or economically inactive. In the Central and Eastern Europe (non-EU) and CIS region, participation rates rose during the crisis for both men and women more than expected based on pre-crisis trends, which could reflect workers being pulled into the labour force to offset lost family income. In both regions, further investigation at the country level would be needed to identify the key factors underlying these trends.

12.7 EMPLOYMENT BY SECTOR

What can be said about trends in employment across the three broad economic sectors: agriculture, industry and services? At the global level, a long-term trend is observed in which employment in agriculture has been on a steady downward march in terms of the share of total employment, while employment in services has steadily risen (see figure 10). Employ-

ment in services surpassed employment in agriculture in 2001 and the gap between the two has grown ever since. Employment in industry shows more variation at the global level, with little change observed between 1999 and 2004 and then a moderate increase between 2004 and 2007.

While employment in agriculture has been on a steady decline, there were still an estimated 1.068 billion workers in the agricultural sector in 2009, and the number of workers in agriculture actually grew over the past decade, though the share of workers in the sector declined as employment grew at a faster rate in the other sectors. Total employment in the services sector reached 1.317 billion in 2009, an increase of more than 300 million from 1999. Employment in industry stood above 660 million in 2009, growing by more than 130 million since 1999.

A larger share of women works in the services sector (46.8 per cent in 2009 versus 40.7 percent for men), while a smaller share works in the industrial sector (15.6 per cent versus 26 percent) (see table A10). The gaps between the sexes have grown somewhat in both sectors over the past decade. Women are also engaged to a slightly greater degree than men in the agricultural sector (37.6 per cent versus 33.3 per cent).

In terms of regional developments, the number of workers in agriculture is declining in the Developed Economies and European Union, Central and South-Eastern Europe (non-EU) and CIS, East Asia and Latin America and the Caribbean regions, but is rising in all other regions (see table 5-6). In Sub-Saharan Africa, growth in agricultural employment accounted for half of all employment growth between 1999 and 2009. In South Asia, nearly 33 per cent of all employment growth since 1999 was in agriculture. Clearly, developments in the agricultural sector have a major impact on welfare throughout much of the world, particularly given that large shares of the working poor are engaged in subsistence agriculture.

Employment by sector and sex, world and regions (Millions)

Both sexes	Agriculture				Industry				Services			
	1999	2007	2008	2009	1999	2007	2008	2009	1999	2007	2008	2009
World	1038.9	1056.8	1061.2	1068.1	533.2	659.5	668.5	666.4	1010.8	1267.3	1299.2	1316.7
Developed Economies and European Union	24.8	18.7	17.8	17.5	122.0	119.3	117.9	109.8	296.1	338.4	343.3	341.1
Central and South-Eastern Europe (non-EU) and CIS	39.1	32.0	32.6	32.3	35.3	40.9	40.8	39.5	70.1	87.2	88.4	88.6
East Asia	354.3	314.2	305.1	299.7	176.1	219.0	222.3	226.0	209.5	273.7	281.3	287.3
South-East Asia and the Pacific	115.8	122.2	123.7	124.5	37.4	48.8	49.2	49.9	81.5	100.4	103.8	106.8
South Asia	299.7	330.4	339.3	346.6	77.7	117.0	119.7	122.2	126.2	170.6	175.1	179.0
Latin America and the Caribbean	43.4	41.7	41.4	41.2	43.3	55.5	57.3	56.1	115.5	148.9	153.2	155.9
Middle East	10.1	12.2	11.9	12.0	11.8	15.8	15.9	16.4	23.7	31.6	33.2	34.4
North Africa	14.4	17.9	18.2	18.4	10.1	13.7	14.4	14.9	24.7	31.3	32.3	32.9
Sub-Saharan Africa	137.5	167.5	171.2	175.9	19.4	29.5	30.9	31.7	63.4	85.3	88.7	90.7

Males	Agriculture				Industry				Services			
	1999	2007	2008	2009	1999	2007	2008	2009	1999	2007	2008	2009
World	597.0	599.6	601.6	605.5	378.6	469.5	477.0	474.0	584.2	716.8	732.3	741.6
Developed Economies and European Union	15.4	11.9	11.3	11.1	91.4	91.9	91.3	85.3	142.7	160.0	161.7	159.6
Central and South-Eastern Europe (non-EU) and CIS	21.6	17.7	18.0	18.0	23.9	28.4	28.8	27.1	34.3	41.7	42.2	43.0
East Asia	173.2	155.9	152.0	149.7	111.4	138.8	140.9	143.3	122.4	150.3	153.3	155.8
South-East Asia and the Pacific	66.5	70.7	71.5	72.3	24.8	32.1	32.5	33.0	45.2	55.1	56.3	57.7
South Asia	191.5	196.8	200.5	203.1	61.6	91.3	93.4	94.9	106.2	141.1	145.0	148.2
Latin America and the Caribbean	33.1	31.7	31.6	31.6	33.4	42.1	43.5	42.3	61.3	75.4	77.1	78.5
Middle East	6.9	7.8	7.5	7.5	10.1	13.5	13.7	14.1	19.6	25.7	26.7	27.6
North Africa	11.2	12.8	13.0	13.2	8.3	11.4	12.0	12.4	17.9	22.8	23.5	23.8
Sub-Saharan Africa	77.7	94.2	96.2	98.9	13.7	20.1	21.0	21.5	34.5	44.7	46.5	47.4

Females	Agriculture				Industry				Services			
	1999	2007	2008	2009	1999	2007	2008	2009	1999	2007	2008	2009
World	441.9	457.2	459.6	462.6	154.6	190.1	191.5	192.4	426.6	550.5	566.9	575.2
Developed Economies and European Union	9.4	6.8	6.5	6.3	30.7	27.4	26.6	24.5	153.4	178.4	181.6	181.4
Central and South-Eastern Europe (non-EU) and CIS	17.5	14.3	14.7	14.4	11.5	12.5	12.0	12.4	35.7	45.5	46.2	45.6
East Asia	181.1	158.3	153.1	149.9	64.7	80.2	81.4	82.7	87.1	123.4	128.0	131.6
South-East Asia and the Pacific	49.3	51.5	52.1	52.2	12.6	16.7	16.7	16.9	36.3	45.4	47.5	49.2
South Asia	108.2	133.6	138.9	143.5	16.1	25.8	26.3	27.2	20.0	29.5	30.1	30.8
Latin America and the Caribbean	10.3	10.0	9.8	9.6	9.9	13.4	13.9	13.7	54.2	73.4	76.1	77.4
Middle East	3.1	4.4	4.4	4.5	1.7	2.3	2.3	2.3	4.1	5.9	6.4	6.8
North Africa	3.2	5.1	5.2	5.2	1.8	2.3	2.4	2.5	6.8	8.5	8.8	9.1
Sub-Saharan Africa	59.8	73.2	74.9	77.0	5.7	9.4	9.9	10.3	28.9	40.5	42.2	43.3

Note: Totals may differ due to rounding.

12.8 OCCUPATIONAL STRUCTURE IN INDIA

Since the early 1950s, successive governments have implemented various schemes, under planning, to alleviate poverty, that have met with partial success. Programmes like Food for work and National Rural Employment Programme have attempted to use the unemployed to generate productive assets and build rural infrastructure. In August 2005, the Indian parliament passed the Rural Employment Guarantee Bill, the largest programme of this type, in terms of cost and coverage, which promises 100 days of minimum wage employment to every rural household in 200 of India's 600 districts. The question of whether economic reforms have reduced poverty or not has fuelled debates without generating any clear cut answers and has also put political pressure on further economic reforms, especially those involving downsizing of labour and cutting down agricultural subsidiary.

India's labor force exhibits extremes ranging from large numbers of illiterate workers unaccustomed to machinery or routine, to a sizable pool of highly educated scientists, technicians, and engineers, capable of working anywhere in the world. A substantial number of skilled people have left India to work abroad; the country has suffered a brain drain since independence. Nonetheless, many remain in India working alongside a trained industrial and commercial work force. Administrative skills, particularly necessary in large projects or programs, are in short supply, however. In the mid-1990s, salaries for top administrators and technical staff rose sharply, partly in response to the arrival of foreign companies in India.

A nation's economy can be divided into various sectors to define the proportion of the population engaged in the activity sector. This categorization is seen as a continuum of distance from the natural environment. The continuum starts with the primary sector, which concerns itself with the utilization of raw materials from the earth such as agriculture and mining. From there, the distance from the raw materials of the earth increases.

Indian Economics divide all occupations into three sectors

1 Primary Sector: it includes such economic activities as are related to agriculture, animal husbandry, forestry, fisheries, etc. in all countries, in the initial stages of economic development, primary occupations remained dominant. But as a country heads towards economic development. Proportionate share occupations in the national income goes on diminishing. Those countries, in whose national income engaged in these occupations, are called underdeveloped countries.

2 Secondary sector: it includes manufacturing industries, village and small scale industries, mining, etc. this sector is less developed in underdeveloped countries.

3 Tertiary sector: it is also referred to as "service Industry" by Collin Clark. It includes trade, transport, communication, banking, insurance, etc. productivity of labour and income in this sector are more than the other two sectors. Growth of this sector is indicative of economic development of the country. Service sector is growing faster than the manufacturing and is a dominant source of quality employment. Over 70 percent of the growth in the employmet opportunities generated over the next 10 years would be in the services sector.

According to Collin clark, engagement of large proportion of population in secondary and tertiary sectors instead of primary sector, is an index are shown table 5.

Changes in the occupational distributional of population in India are shown table 5

Table 5. Occupational Distribution of Population in India

Occupation	**1901**	**1971**	**1981**	**1991**	**2001**
Primary sector	71.7	72.1	69.4	67.37	57.4
Agriculture	50.6	43.3	41.46	38.41	31.7
Agricultural labourer	16.9	26.3	25.12	26.44	23.3
Forestry, Fisheries Animal husbandry plantation	4.2	2.4	2.25	1.90	1.70
Mining	0.1	0.5	0.58	0.62	0.70
Secondary Sector	12.61	11.2	12.98	12.13	16.8
Cottage Industry	-	3.5	3.45	2.42	2.1
Manufacturing Industry	11.7	5.9	7.55	7.76	12.5
Building Construction	0.8	1.2	1.96	1.95	2.2
Tertiary sector	15.7	16.7	17.63	20.50	25.6
Commerce &trade	6.1	5.6	6.33	7.46	11.1
Transport, communication and storage	1.1	2.4	2.75	2.81	4.1
Other services	8.5	8.7	8.55	10.23	10.6
Total	100	100	100	100	100

Source: Census Report, NSSO Survey

12.9 COMPOSITION OF WORKING POPULATION

The population of India according to their

economic status is divided into three groups, namely; main workers, marginal workers and non-workers.

It is observed that in India, the proportion of workers (both main and marginal) is only 39 per cent (2001) leaving a vast majority of 61 per cent as non-workers. This indicates an economic status in which there is a larger proportion of dependent population, further indicating possible existence of large number of unemployed or under employed people.

Standard Census Definition

Main Worker is a person who works for at least 183 days in a year.

Marginal Worker is a person who works for less than 183 days in a year.

12.10 TRENDS IN OCCUPATIONAL STRUCTURE

That there has been no significant change in the occupational structure of India for the last 90 years is quite evident from the following table.

Trend in occupational structure of India

	1901	195	1981	1991	2001	2011
Primary activity	71.8	70.2	69.41	67.37	57.4	55.6
Secondary activity	12.6	12.5	12.96	12.13	16.8	18.1
Territory activity	15.7	17.3	17.63	20.50	25.8	26.3

Source: Census Report, NSSO Survey)

In the last 110 years, pressure of population on primary activities has lessened by 15 percent only all these comparisons clearly prove that rate of economic growth in india is very low. Above table shows that in 1901, percentage of population engaged in primary activities was 72 percent which has come down to 55.6 percent. Secondary activities engaged 12.6 percent population in 1901 which decreased slightly to 18.1 percent in 2011. In tertiary activities, 15.7 percent of population was engaged in 1901 which increased to 26.3 in 2011. In the last 110 years, pressure of population on primary activities has lessened by 15 percent only.

The above discussion proves that occupational structure of india reflects that a substantial part of country's population still depends on agriculture. There are three main reasons for it (1) slow rate of economic development. (2) More importance to basic and heavy industries which are capital intensive. Consequently, opportunities of employment have increased very little. (3) Number of Laboureres had been increasing very rapidly. As a result, change in occupational structure in becoming impossible.

12.11 LITERACY AND EDUCATION

Literacy is very important – many would say a human right. A good quality basic education equips pupils with literacy skills for life and further learning; literate parents are more likely to keep their children healthy and send their children to school; literate people are better able to access other education and employment opportunities; and, collectively, literate societies are better geared to meet development challenges. Indeed, the emergence of knowledge societies makes literacy even more critical than in the past. Achieving widespread literacy can only happen in the context of building literate societies that encourage individuals to acquire and use their literacy skills.

Literacy has been described as the ability to read for knowledge and write coherently and think critically about the written word. Literacy can also include the ability to understand all forms of communication, be it body language, pictures, video & sound (reading, speaking, listening and viewing). Evolving definitions of literacy often include all the symbol systems relevant to a particular community. Literacy encompasses a complex set of abilities to understand and use the dominant symbol systems of a culture for personal and community development. In a technological society, the concept of literacy is expanding to include the media and electronic text, in addition to alphabetic and number systems. These abilities vary in different social and cultural contexts according to need and demand.

The standards for what level constitutes "literacy" vary between societies. Other skills such as computer skills or basic numeracy may also be included, as there are many people who cannot read letters but can read numbers, and even learn to use a computer (in a limited way) while remaining unable to read text. These and the increasing inclusion of sound, still and moving images and graphical elements in digitally based communication call for an even broader concept of literacy. Recently the National Council of Teachers of English have added "visually representing" to the list of communicative competences that are considered to constitute literacy.

Many policy analysts consider literacy rates a crucial measure of a region's human capital. This claim is made on the grounds that literate people can be trained less expensively than illiterate people. Policy makers also argue that literacy increases job opportunities and access to higher education. In Kerala, India, for example, female and child mortality rates childrates declined dramatically in the 1960s, when girls schooled to literacy in the education reforms after 1948 began to raise families. Recent researchers, however, argue that correlations such as the one listed above may have more to do with the effects of schooling rather than literacy in general.

12.12 UNDERSTANDING LITERACY IN INTERNATIONAL AND ACADEMIC DISCOURSE

Although it was realised that this was an enormous challenge, in the early days of UNESCO, during the 1950s to 1960s the focus was on the eradication of illiteracy (UNESCO, 1953; UNESCO, 1957), seen as a problem of providing sufficient opportunities for illiterates to learn how to read and write. Illiterates were seen as victims so that their illiteracy was an effect rather than a cause of their marginal condition. Indeed, the launch of the Experimental World Literacy Programme in 1967 was seen as testing the most appropriate approaches and methods for designing and implementing programmes to eradicate illiteracy (UNESCO, 1975).

During the 1970s and 1980s, there was a disinvestment by international aid programmes in adult literacy programmes, which were seen as being complicated to design and implement. The majority of the programmes that remained were relatively small-scale, carried out by non-governmental organizations (NGOs). With rare exceptions, this is still the case.

12.13 MEASURING LITERACY

According to Smyth (2005), this study drew two conclusions regarding educational policy at the international level. One was very general: "Although the phenomenon of illiteracy is on the decline throughout the world, it is still of such magnitude as to challenge the efforts of all who believe in the wide diffusion of the arts of written communication among people living in modern society". The other was more specific. Drawing on its analysis of the experience of selected countries, "where historical data on both [school] enrolment and literacy rates are available", and the study concluded that "the evidence clearly points to the supreme importance of extending universal primary education as the basic approach towards the elimination of illiteracy". This reflected the prioritisation in the 1950's that the UNESCO education programme gave to promoting free and compulsory education. However, this ignored the

possibility that many countries would undertake national mass campaigns specifically focused on the promotion of literacy among adults.

The similarity among the majority of national censuses in their definitions of literacy/ illiteracy probably facilitated agreement on the standard definitions that were included in the Recommendation concerning the International Standardization of Educational Statistics (ISES) adopted by UNESCO's General Conference in 1958.

"A person is literate who can with understanding both read and write a short simple statement on his (her) everyday life. (b) A person is illiterate who cannot with understanding both read and write a short simple statement on his (her) everyday life".

The world data on literacy are not meaningfully comparable as some countries published their literacy data by taking into account the population below four years of age, while others exclude this category of children. Some other countries exclude the age below 6 years (India) and ten years of calculating literacy.

The United Nations compiles information on literacy and educational attainment for all countries of the world in the annual publication *The Demographic Year Book.* In order to calculate the level of literacy in a population the following formula is used:

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Many policy analysts consider literacy rates a crucial measure of a region's human capital. This claim is made on the grounds that literate people can be trained less expensively than illiterate people. Policy makers also argue that literacy increases job opportunities and access to higher education. In Kerala, India, for example, female and child mortality rates childrates declined dramatically in the 1960s, when girls schooled to literacy in the education reforms after 1948 began to raise families. Recent researchers, however, argue that correlations such as the one listed above may have more to do with the effects of schooling rather than literacy in general.

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$$\textbf{Crude Literacy Rate} = \frac{\text{Number of Literate persons X 100}}{\text{Total Population}}$$

$$\textbf{Effective Literacy Rate} = \frac{\text{Number of Literate persons aged 7 and above X 100}}{\text{Population aged 7 and above}}$$

The Crude Literacy Rate for the population in 2011 may be computed as follows:

$$\text{Crude Literacy Rate} = \frac{778454120}{1,210,193,422} \times 100$$

$$= 74.04$$

This Crude Literacy Rate of 64.32 based on one percent sample data of the 2011 Census, indicates that, in 2011. 64.32 percent of the Indian population was literate, and that35.68 percent was illiterate.

$$\text{Effective literacy rate} = \frac{778454120}{1051404135} \times 100$$

Effective Literacy=/x100

(India, 2011) =74.04

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This Effective Literacy Rate of 74.04 based on one percent sample data of the 2011 Census, indicates that, in 2011. 74.04 percent of the Indian population was literate, and that25.96 percent was illiterate.

12.14 LITERACY DIFFERENTIALS

Literacy pattern are different in different countries, and also in different parts of the same country. The varying literacy rates are to be found the following spheres.

The rural population has a lower literacy rate than the literacy of the urban population. The rural people don't get sufficient opportunities to get themselves educated in a formal way. The urban people, on other hand get sufficient opportunities for getting education. The urban population is socially more awakened and economically better off. The socio-economic pattern of urban places requires higher level of education for jobs and vocations. Moreover, the females in urban areas enjoy relatively higher status than their counterparts in the rural area.

Therefore, they get higher education and freedom. The gap between the rural and urban literacy rates, however, is gradually narrowing down.

Occupation plays an important role I literacy. Agricultural occupation does not require any formal education but occupation in the non agricultural sector do require much higher level of literacy and education. Therefore, the people of Primary occupation have less formal education than the people of industrial occupation and tertiary occupations.

The developed countries have a higher literacy rate as compared to less developed countries. This may be due to many factors involving economic, social and cultural life. But the most important factor is the advanced technology and skill requirement in the productive activities of the developed countries as compared to the less developed ones.

Generally speaking, males are more literate than the females. This is particularly true in developing countries. In less developed area, females are comparatively less free and do not have the opportunities for formal schooling. The females there have larger amount of domestic work. Moreover, female education in rural areas does not get social approval.

Caste is also an important factor responsible for different patterns of literacy. For example, Muslims are less educated than the other caste. Similarly scheduled caste and tribes are less educated than the non SC/STs. These castes are not only less literate, but on the whole are also economically more backward.

The socio economic status groups are also important consideration for literacy. People having better socio economic status are more literate than the people at the lowerlevels. The may be due to the necessity and capability of getting higher and better education. For instance, certain occupations like teaching, administrations, health services and so on, have higher functional value of literacy. The socially and economically more awakened sections are more literate as compared to the backward people. The institutional structure also palys a decisive role in the matter of acquiring education.

Other things remaining the same, at developed stages of society, the literacy rate goes up and, at the backward stages of society, the literacy rate generally remains low.

12.15 Determinates of literacy

There are many determinants of literacy. Literacy mainly depends on the three factors- the willingness to learn, ability to learn and learning institution. Early malnutrition and disease can adversely affect a child's ability to read write and perform arithmetical operations and to

think clearly and logically in school (his cognitive ability). Children from poor families with low level of living are placed at a comparative disadvantage against the children of rich families. The following are the most important factors in the determination of a child's capacity to learn: (a) Family environment, including income level, parent's education, housing condition, number of children in household, etc. (b) peer group interactions, example, the type of children with whom child mixes; (c) personality, i.e., the children's inherited intelligence and abilities; and (d) early nutrition and health. If a child enters school deficient in all the above factors, the educational process will have little effect on him.

There is positive correlation between the degree of economic progress and the degree of literacy. A civilized society will have a higher level of literacy than a tribal society. The rate of literacy diffusion, if low, can be an obstacle. Literacy and economic progress go hand in hand. But literacy is mainly the product of the sociuo economic milieu. In this socio economic matrix will come many factors such as the value system, development of communication and transport, degree of urbanization, status of women in the society, development of technology, ethnographic setup, public policy and so on.

It has been found that there is a high degree of positive correlation between the degree of economic diversification and the pattern of literacy in a society. In many cocities, literacy as required for getting suitable jobs in the market. A positive correlation also exists between the proportion of workers engaged in agriculture and the literacy pattern. A country which is mainly agricultural will have lower literacy than the country which is predominantly industrial. In this respect, interesting comparison can be made between less developed countries and the developed countries.

Literacy will depends partly on the availability of opportunities for getting education and the cost and benefit of such education in getting jobs and earning income. The larger the number of schools, the higher the rate of literacy, other things remaining the same. When the cost of education is very low, the rate of literacy goes up. The demand for education is dependent its cost and the opportunities. As the availability of education is abundant. Its demand also increases considerably. The demand for education will be inversely relative to the direct cost, as well as on the indirect or opportunity costs of education. When a person gets regular education, he is sacrificing his income which he could expect to earn during the years of his learning. This opportunity cost of education must also be included as variable affecting its demand. The greater the opportunity cost of education the lower would be its demand.

The demand for education and hence literacy, is dependent on the possibility of earning a higher wage in the modern sector as compared to the wage of the traditional sector. Literacy is positively relative to the modern traditional sector wages differential. It also depends on the probability of success in finding modern sector employment. Since the probability of success is inversely related to the unemployment rate. One can argue that the demand for education will be low when the educated unemployment rate is high in the country. The demand for education will in fact depend on the difference between the benefits and the cost of education. If the difference is positive and high, the literacy rate will be high. If the difference between these two variables is negative or zero, the demand for education would be absent.in less developed countries, the poor schildren are more likely to drop out because of the high cost of education and high propensity of earning income

The literacy rate is positively correlated with the standard of living and level of income of the parents. If the income of the parents is high, the literacy rate in the family is generally very high. Poor parents cannot afford to give proper education to their children up to the desired level. Rather, the parents want their children to earn some income so that the total family income becomes sufficient for subsistence.

In the areas where transport and communication are developed and the movement of people is not restricted, the literacy rate generally goes up. Since the distances between a rural area and a town is not served by proper transportation facilities. Rural children do not get sufficient incentive to go and get education in the towns. This happens particularly in the less developed countries. The more urbanized places have higher rates of literacy as compared to the places which are less urbanized. The urban areas have higher demand for and also higher supply of education. The occupation structure in the urban areas necessities higher learning than occupation structure in the rural areas. The technological development in the urban areas is generally high. Educated people are required to create and diffuse the urban technology. This is another reason why urban people have higher learning as compared to their rural counterparts. In technologically advanced countries, literacy rates are higher than those of technologically underdeveloped countries. Thus there seems to be a positive correlation between literacy and technological development.

The value system in the society determinants the attitudes towards learning. A traditional society does not believe in formal education. A higher degree of social awakening is essential for attaining higher literacy rate. Public policy is also oriented by the existing value system. If the government is interested in diffusing education on a larger among the masses, the literacy

rate is bound to go up. In many countries including the USSR, education has been made free and compulsory. The adult education programme can really go a long way to improve the rate of literacy in a country. The establishment of a larger number of educational institutions such as schools, collages, and universities can be helpful for raising the literacy rate. The status of women in society also determines the rate of literacy, in a society where the status of women is higher is higher, the rate of literacy is also generally higher. In less developed countries, women's education is not generally favoured. It is pointed out that the proper place for women is in kitchen. Ethnographic structure of a society is also an important determinant of literacy rate. A society inhabited by different groups people having different cultures is capable of establishing different types of educational institutions and keeping alive the spirit of competition. This automatically leads to higher literacy rate.

As pointed out earlier, literacy (L) is influenced by many factors, such as literacy in the family (Lf), income of the parents, dependency load of the parents (Dj), stages of economic development (Ed_, non-economic factors (n) like culture, attitudes and values towards life, ability to learn (a), willingness to learn (w), in institutions (i), state policy (s), and the positive difference between benefit and cost of education (b-c) and many other environmental situations (e), and a host of many other factors (u), which will include population pressure on land, technological development, wage differentials, demonstration effect and so on. Thus, the determinants of literacy can be conveniently expressed in the form of the following functions;

$$L=f(Lf,Dj,Ed,n,a,w,i,s\ (b-c),e,u\ )$$

Generally speaking, there is a very high correlation between parental income and literacy rate. The higher the parental income (dependency load being constant), the higher the literacy of children, other things remaining the same.

As income goes on increasing, literacy will also go on increasing. This situation will continue up to the point of equilibrium where both these rates will coincide. After the equilibrium is crossed literacy would be much higher than the rate of growth of parental income. This is perhaps because the student will meet a large part of his educational expenditure from out of his own income once he gets a particular level of education, and also a particular level of income.

12.16 WORLD PATTERN OF LITERACY

The percentage of adults, persons of age 15 and over, who are illiterate has fallen since 1970 from 39 to 14 percent in world wide. The world is making progress in literacy but the challenge remains huge. The number of adults who are not literate has fallen from 871 million between 1985 – 1994, to 774 million between 2000 – 2006. Between these periods, the global adult literacy rate rose accordingly from 76 per cent to 83.6 per cent, with the largest increase occurring in developing countries – from 68 per cent to 79 percent. However, 774 million is believed to be an underestimation as there exist many more adults in so-called 'developed' and 'developing countries' who do not have an adequate level of literacy to meet the demands of their work and social networks.

There are huge variations in literacy rates between different regions of the world and within certain regions. In developing countries overall, increases totaled 11 percent. Looking at specific regions, the Arab States and South and West Asia made the greatest relative progress, with 13.8 per cent and 16.1 per cent increases respectively. Rates in Sub-Saharan Africa rose by 8.3 per cent. Though Latin America and the Caribbean had only a 4 per cent average increase, the literacy rate was already over 86 per cent in the 1985–1994 period.

The Fig(1) for the Arab States region and Sub-Saharan Africa show that countries vary greatly in their achievements. Between the periods 1985 – 1994 and 2000 – 2006, it is heartening to note that some of the greatest progress has occurred in countries with the lowest literacy rates: Algeria (25per cent increase), Egypt (27 per cent) and Yemen (20 per cent) among the Arab States, and Burundi (22 per cent), Central African Republic (15 per cent), Malawi (22 per cent) and Senegal (15 per cent) in Sub-Saharan Africa. Other countries such as Burkina Faso, Chad and Ethiopia remain in need of considerable support. Mali and Niger, not shown in the chart, also fall into this category.

Global Literacy Rates

Source: UN Human Development Report 2011

Reducing illiteracy rates by 50 per cent is one of the six Educations for All goals, which the Global Monitoring Report assesses each year. The 2008 Report indicates that 26 countries have achieved this goal, and that 30 more are likely to do so by the 2015 target date. It further notes that 43 countries are unlikely to meet the goal, and that 25 of them are at serious risk of not doing so. A further 28 countries are showing good progress, but moving too slowly. Fully 76 countries have insufficient or no data and include some in a critical situation such as Afghanistan.

Country	Adult Literacy Rate	Youth Literacy Rate
China	94	99.4
Sri Lanka	90.8 (2007)	98
Burma	89.9% (2007)	94.4% (2004)
Iran	82.4% (2007)	95% (2002)
World Average	84% (1998)	88% (2001)
India	74.04% (2011)	82% (2001)
Nepal	56.5 (2007)	62.7
Pakistan	62.2 (2007)	83.9(2010)
Bangladesh	53.5 (2007)	74
Brazil	90	98
Egypt	66	85
Indonesia	92	95
Mexico	93	99
Nigeria	61	72

The table below shows the adult and youth literacy rates for India and some neighboring countries in 2002. Adult literacy rate is based on the 15+ years age group, while Youth literacy rate is for the 15–24 years age group (i.e. youth is a subset of adults).

Last update: December 2011

Country or area	Year	Adult (15+) literacy rate			Youth (15-24) literacy rate		
		T	M	F	T	M	F
Albania	2008	96	97	95	99	99	99
Algeria	2006	73	81	64	92	94	89
Angola	2009	70	83	58	73	81	66
Antigua and Barbuda	2009	99	98	99	...	...	...
Argentina	2009	98	98	98	99	99	99
Armenia	2009	100	100	99	100	100	100
Aruba	2009	98	98	98	99	99	99
Azerbaijan	2007	100	100	99	100	100	100
Bahrain	2009	91	92	90	100	100	100
Bangladesh	2009	56	61	51	75	74	77
Belarus	2009	100	100	100	100	100	100
Benin	2009	42	54	29	54	65	43
Bhutan	2005	53	65	39	74	80	68
Bolivia (Plurinational State of)	2008	91	95	87	99	99	99
Bosnia and Herzegovina	2009	98	99	96	100	100	100
Botswana	2009	84	84	84	95	94	97
Brazil	2008	90	90	90	98	97	99
Brunei Darussalam	2009	95	97	94	100	100	100
Bulgaria	2009	98	99	98	97	98	97
Burkina Faso	2007	29	37	22	39	47	33
Burundi	2009	67	73	61	77	77	76
Cambodia	2008	78	85	71	87	89	86
Cameroon	2007	71	79	63	83	89	77
Cape Verde	2009	85	90	80	98	97	99
Cayman Islands	2007	99	99	99	99	99	99
Central African Republic	2009	55	69	42	65	72	57
Chad	2009	34	44	23	46	54	39
Chile	2009	99	99	98	99	99	99
China	2009	94	97	91	99	99	99
China, Macao Special Administrative Region	2006	93	96	91	100	100	100
Colombia	2009	93	93	93	98	97	98

Comoros	2009	74	80	69	85	86	85
Congo	2005	...	...	...	80	87	78
Costa Rica	2009	96	96	96	98	98	99
Côte d'Ivoire	2009	55	65	45	67	72	61
Croatia	2009	99	99	98	100	100	100
Cuba	2009	100	100	100	100	100	100
Cyprus	2009	98	99	97	100	100	100
Democratic People's Republic of Korea	2008	100	100	100	100	100	100
Democratic Republic of the Congo	2009	67	77	57	65	69	62
Dominican Republic	2007	88	88	88	96	95	97
Ecuador	2009	84	87	81	97	97	97
Egypt	2006	66	75	58	85	88	82
El Salvador	2009	84	87	82	95	95	95
Equatorial Guinea	2009	93	97	90	98	98	98
Eritrea	2009	67	78	56	89	92	86
Estonia	2009	100	100	100	100	100	100
Ethiopia	2005	30	42	18	45	56	33
Gabon	2009	88	91	84	98	99	97
Gambia	2009	46	58	36	65	71	60
Georgia	2009	100	100	100	100	100	100
Ghana	2009	67	73	60	80	81	79
Greece	2009	97	98	96	99	99	99
Guatemala	2009	74	80	69	87	89	84
Guinea	2009	39	51	28	61	68	54
Guinea-Bissau	2009	52	67	38	71	78	64
Haiti	2006	49	53	45	72	74	70
Honduras	2007	84	84	83	94	93	95
Hungary	2009	99	99	99	99	99	99
India	2006	63	75	51	81	88	74
Indonesia	2008	92	95	89	99	100	99
Iran (Islamic Republic of)	2008	85	89	81	99	99	99
Iraq	2009	78	86	70	83	85	80
Italy	2009	99	99	99	100	100	100
Jamaica	2009	86	81	91	95	92	98

Jordan	2007	92	95	89	99	99	99
Kazakhstan	2009	100	100	100	100	100	100
Kenya	2009	87	91	84	93	92	94
Kuwait	2008	94	95	92	99	99	99
Kyrgyzstan	2009	99	100	99	100	100	100
Lao People's Democratic Republic	2005	73	82	63	84	89	79
Latvia	2009	100	100	100	100	100	100
Lebanon	2007	90	93	86	99	98	99
Lesotho	2009	90	83	95	92	86	98
Liberia	2009	59	64	55	76	70	81
Libyan Arab Jamahiriya	2009	89	95	82	100	100	100
Lithuania	2009	100	100	100	100	100	100
Madagascar	2009	64	67	62	65	66	64
Malawi	2009	74	81	67	86	87	86
Malaysia	2009	92	95	90	99	98	99
Maldives	2006	98	98	98	99	99	99
Mali	2006	26	35	18	39	47	31
Malta	2005	92	91	94	98	97	99
Mauritania	2009	57	65	50	68	71	64
Mauritius	2009	88	91	85	97	96	98
Mexico	2009	93	95	92	99	99	98
Mongolia	2009	97	97	98	96	95	97
Morocco	2009	56	69	44	79	87	72
Mozambique	2009	55	70	41	71	78	64
Myanmar	2009	92	95	90	96	96	95
Namibia	2009	89	89	88	93	91	95
Nepal	2009	59	72	47	82	87	77
Netherlands Antilles	2009	96	96	96	98	98	98
Nicaragua	2005	78	78	78	87	85	89
Niger	2005	29	43	15	37	52	23
Nigeria	2009	61	72	50	72	78	65
Occupied Palestinian Territory	2009	95	97	92	99	99	99
Oman	2008	87	90	81	98	98	98
Pakistan	2008	56	69	40	71	79	61
Panama	2009	94	94	93	96	97	96

Papua New Guinea	2009	60	64	57	67	65	70
Paraguay	2007	95	96	93	99	99	99
Peru	2007	90	95	85	97	98	97
Philippines	2008	95	95	96	98	97	98
Poland	2009	100	100	99	100	100	100
Portugal	2009	95	97	93	100	100	100
Puerto Rico	2009	90	90	91	87	87	88
Qatar	2009	95	95	93	98	98	98
Republic of Moldova	2009	98	99	98	99	99	100
Romania	2009	98	98	97	97	97	98
Russian Federation	2009	100	100	99	100	100	100
Rwanda	2009	71	75	67	77	77	77
Samoa	2009	99	99	99	99	99	100
Sao Tome and Principe	2009	89	94	84	95	95	96
Saudi Arabia	2009	86	90	81	98	99	97
Senegal	2009	50	62	39	65	74	56
Serbia	2009	98	99	96	99	99	99
Seychelles	2009	92	91	92	99	99	99
Sierra Leone	2009	41	53	30	58	68	48
Singapore	2009	95	97	92	100	100	100
Slovenia	2009	100	100	100	100	100	100
Solomon Islands	1999	77	84	69	85	90	80
South Africa	2007	89	91	87	98	97	98
Spain	2009	98	98	97	100	100	100
Sri Lanka	2008	91	92	89	98	97	99
Sudan	2009	70	80	61	86	89	83
Suriname	2008	95	95	94	99	99	99
Swaziland	2009	87	88	86	93	92	95
Syrian Arab Republic	2009	84	90	78	94	96	93
Tajikistan	2009	100	100	100	100	100	100
TFYR of Macedonia	2009	97	99	96	99	99	99
Thailand	2005	94	96	92	98	98	98
Timor-Leste	2007	51	59	43	…	…	…
Togo	2006	57	70	44	76	85	68
Tonga	2006	99	99	99	99	99	100
Trinidad and Tobago	2009	99	99	98	100	100	100

Tunisia	2008	78	86	71	97	98	96
Turkey	2009	91	96	85	98	99	97
Turkmenistan	2009	100	100	99	100	100	100
Uganda	2006	71	81	62	84	87	81
Ukraine	2009	100	100	100	100	100	100
United Arab Emirates	2005	90	89	91	95	94	97
United Republic of Tanzania	2009	73	79	67	77	78	76
Uruguay	2009	98	98	99	99	98	100
Uzbekistan	2009	99	100	99	100	100	100
Vanuatu	2009	82	84	80	94	94	94
Venezuela (Bolivarian Republic of)	2007	95	95	95	98	98	99
Viet Nam	2009	93	95	91	97	97	96
Yemen	2009	62	80	45	84	96	72
Zambia	2009	71	81	61	75	82	67
Zimbabwe	2009	92	95	89	99	98	99

12.17 LITERACY IN INDIA

With almost two-thirds of India's population aged 7 years of age and above now literate, India has made very significant progress in this direction. An important finding of the 2001 census count is that more than half of the females are now literate and male-female differential has narrowed down to 21.7 percent from 24.8 percent in 1991. The other important finding of the 2001 census is that, in the country, the absolute number of illiterates in population aged 7 + has declined for the first time by almost 32 million (21.4 million among males and 10.5 million among females). The earlier data from 1961 to 1991 indicated that the absolute number of illiterates was increasing from one decade to another. There are, however, states – Bihar, Manipur and Nagaland – and the union territories of Delhi and Chandigarh - where the number of illiterates has increased further during the 1990s.

The male-female differentials in literacy rates are examined in some details. The status of the top 20 districts in terms of literacy rates in 1991 census is considered as of 2001 census as to how many have maintained their position and how many have slid down and the factors accounting for the same. Similarly, the position of those 20 districts that had the lowest literacy rates in 1991 is examined in the 2001 census particularly looking at their present position. Considering the decline in the number of illiterates in the country for the first time,

the paper examines the nature of changes that have taken place as also the distribution of the districts where the number of illiterates has still increased. Their state wise distribution and the factors responsible for a slow growth in literacy therein would be considered.

12.18 TRENDS IN LITERACY RATES

It may be noted at the outset that, prior to the 1991 census, the Indian census was excluding only children aged 0-4 years in counting the literate population. The literacy rates were computed by taking the total population in the denominator. On the eve of the 1991 census it was decided that all children in the 0-6 age group will be treated as illiterate by definition and literacy rates would be computed for population aged 7 years and above. In comparison to such (net) literacy rates, those computed by taking the total population in the denominator are called "crude literacy rates." As it is not feasible to work out net literacy rates right from 1901 onward, Table 1 gives crude literacy rates for India for the past one century, from 1901 to 2011.

Table 1: Crude literacy rates by sex, India, 1901-2011

Census year	Crude literacy rates			Decadal change (in percentage points)		
	Persons	Males	Females	Persons	Males	Females
1901	5.4	9.8	0.6	--	--	--
1911	5.9	10.6	1.0	0.5	0.8	0.4
1921	7.2	12.2	1.8	1.3	1.6	0.8
1931	9.5	15.6	2.9	2.3	3.4	1.1
1941	16.1	24.9	7.3	6.6	9.3	4.4
1951	16.7	25.0	7.9	0.6	0.1	0.6
1961	24.0	34.4	13.0	7.3	9.4	5.1
1971	29.4	39.4	18.7	5.4	5.0	5.7
1981	36.2	45.9	24.8	6.8	6.5	6.1
1991	42.8	52.7	32.2	6.6	7.8	7.4
2001	55.3	64.1	45.8	12.5	11.4	13.6
2011	74.04	82.14	65.46	19.0	18.0	19.66

The crude literacy rates in various censuses from 1901 onward show an increase for both males and females. The rates were very low till 1931 but there was a sudden jump in 1941, from 9.5 percent to 16.1 percent. It, however, remained almost stationary at 16.7 percent in 1951. This may be due to the fact that earlier figures were for undivided India and, secondly, after the partition of the country into India and Pakistan in 1947, almost eight million people came to the Indian Union from newly created Pakistan, and around six to seven million Muslims went from India (Premi 1995: 628). It is almost impossible to assign reasons for the observed figures.

There has been a monotonous increase of 5 to 8 percent in the literacy rates after 1951, it becoming 19.0 percent in the 2001-11 decade. Thus the literacy rate has become more than three times during the past half-a-century.

It is noteworthy that, in recent years, the increase in female literacy rate has been higher than in male literacy rate narrowing the male-female gap particularly during the 1980s and 1990s. This can be explained partly by the general expansion of education, partly by the present policies of positive intervention followed in favour of girls and by implementation of programmes like DPEP, literacy promotion programmes through NLM and Adult Literacy Programme etc.

Net Literacy Rates

Literacy rates for the population aged 7 years and above presented in Table 2 indicate a very significant increase for both males and females particularly during the 1990s. As of 2011 census, almost two-thirds of India's population is now literate, the male literacy rate has risen to three-fourths while females literacy rate at 65.5 percent indicates that more than half the female population in the country is now literate, that is, has the ability to read and write with understanding. An important finding of Table 2 is the reduction of gap in male and female literacy rates from 26.6 percent in 1981 to 16.6 percent in 2011.

Table 2: Literacy Rates by sex, India, 1981-2011

Year	Literacy rate			Male –female
	Person	Male	Female	Gap
1981	43.6	56.4	29.8	26.6
1991	52.2	64.1	39.3	24.8
2001	65.4	75.8	54.2	21.6
	74.0	82.1	65.5	16.6

Source: RGCCI 2001 (2001a: 115)

Literacy Rates by Zones and States

The national level literacy rate for persons aged 7 years above conceals more than what it reveals as there are great statewide disparities. For example, Kerala with literacy rate of 93.91 percent has secured first rank closely followed by Mizoram. Among the other six states/UTs with more than 80 percent literacy rate, the five are union territories and Goa is the only state in this category.

Improvement in Literacy Rates

At the national level the literacy rate in population 7+ improved from 65.4 percent in 2001 to 74.04 percent in 2011, an improvement of 8.66 percentage points during the decade. It is only Kerala and Goa in the south, Mizoram in the northeast, Himachal Pradesh in the north and Maharashtra in the west zone that recorded literacy rates of more than 75 percent in 2011. All the UTs except Daman and diu have also recorded literacy rate of more than 80 percent (Table 3).

Table 3: Percentage of Literates to Population age 7 Years and above by Zones and States, 2001 and 2011

Zone/State and Union Territory	2011 Census			2001 Census			Gains in literacy rates (LR 2011-LR 2001		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
India	**74.04**	**82.14**	**65.46**	**65.38**	**75.85**	**54.16**	8.66	6.29	11.30
Haryana	76.64	85.38	66.77	67.91	76.1	59.61	8.73	9.28	7.16
Himachal Pradesh	83.78	90.83	76.6	76.48	85.35	65.61	7.30	5.48	10.99
Jammu and Kashmir	68.74	78.26	58.01	55.52	66.6	42.22	13.22	11.66	15.79
Punjab	76.68	81.48	71.34	69.65	79.66	60.53	7.03	1.82	10.81
Rajasthan	67.06	80.51	52.66	60.41	70.32	43.85	6.65	10.19	8.81
Chandigarh	86.43	90.54	81.38	81.94	88.42	75.37	4.49	2.12	6.01
Delhi	86.34	91.03	80.93	81.67	87.33	75.24	4.67	3.70	5.69
Northern Zone	**77.95**	**85.43**	**69.67**	**66.50**	**77.60**	**54.1**	**11.45**	**7.83**	**15.57**
Bihar	63.82	73.39	53.33	47	59.68	33.12	16.82	13.71	20.21
Sikkim	82.2	87.29	76.43	68.81	77.38	59.63	13.39	9.91	16.80
West Bengal	77.08	82.67	71.16	68.64	77.02	59.61	8.44	5.65	11.55
Orissa	73.45	82.4	64.36	63.08	71.28	50.51	10.37	11.12	13.85
Chhattisgarh	71.04	81.45	60.59	64.66	75.7	55.73	6.38	5.75	4.86

Jharkhand	67.63	78.45	56.21	53.56	63.83	38.87	14.07	14.62	17.34
Andaman and Nicobar Islands	86.27	90.11	81.84	81.3	86.76	74.71	4.97	3.35	7.13
Eastern zone	**74.50**	**82.25**	**66.27**	**59**	**70.1**	**47**	**15.50**	**12.15**	**19.27**
Assam	73.18	78.81	67.27	63.25	75.23	51.85	9.93	3.58	15.42
Arunachal Pradesh	66.95	73.69	59.57	54.34	65.43	40.23	12.61	8.26	19.34
Manipur	79.85	86.49	73.17	70.53	80.33	61.46	9.32	6.16	11.71
Meghalaya	75.48	77.17	73.78	62.56	71.18	50.43	12.92	5.99	23.35
Mizoram	91.58	93.72	89.4	88.8	92.53	86.75	2.78	1.19	2.65
Nagaland	80.11	83.29	76.69	66.59	76.04	56.87	13.52	7.25	19.82
Tripura	87.75	92.18	83.15	73.19	82.42	64.33	14.56	9.76	18.82
North east zone	**79.27**	**83.62**	**74.72**	**65.8**	**73**	**58**	**13.47**	**10.62**	**16.72**
Madhya Pradesh	70.63	80.53	60.02	63.74	75.35	54.61	6.89	5.18	5.41
Uttar Pradesh	69.72	79.24	59.26	56.27	67.3	43	13.45	11.94	16.26
Uttarakhand	79.63	88.33	70.7	71.62	81.02	63.36	8.01	7.31	7.34
Central zone	**73.33**	**82.70**	**63.33**	**60.1**	**72.8**	**46.2**	**13.23**	**9.90**	**17.13**
Gujarat	79.31	87.23	70.73	69.14	78.49	60.4	10.17	8.74	10.33
Maharashtra	82.91	89.82	75.48	76.88	85.97	67.03	6.03	3.85	8.45
Dadra and Nagar Haveli	77.65	86.46	65.93	57.63	68.82	43.53	20.02	17.64	22.40
Daman and Diu	87.07	91.48	79.59	78.18	86.14	67.42	8.89	5.34	12.17
West zone	**81.74**	**88.75**	**72.93**	**73.5**	**82.9**	**63.4**	**8.24**	**5.85**	**9.53**
Andhra Pradesh	67.66	75.56	59.74	60.47	71.16	50.29	7.19	4.40	9.45
Goa	87.4	92.81	81.84	82.01	88.62	76.47	5.39	4.19	5.37
Karnataka	75.6	82.85	68.13	66.64	76.06	57.8	8.96	6.79	10.33
Kerala	93.91	96.02	91.98	90.86	94.24	87.72	3.05	1.78	4.26
Lakshadweep	92.28	96.11	88.25	86.66	90.72	80.47	5.62	5.39	7.78
Puducherry	86.55	92.12	81.22	81.24	86.33	73.9	5.31	5.79	7.32
Tamil Nadu	80.33	86.81	73.86	73.45	83.28	64.91	6.88	3.53	8.95
Southern zone	**83.39**	**88.90**	**77.86**	**70.4**	**78.7**	**62**	**12.99**	**10.20**	**15.86**

At the zonal level, in 2011 it is the west zone that has reported the highest literacy rates well above the south zone. This is because both Gujarat and Maharashtra have registered literacy rates higher than Andhra Pradesh and Karnataka that fall in the south zone. Although central zone is constituted by erstwhile Madhya Pradesh and Uttar Pradesh, both regarded as low literacy states, it is the east zone that is marked by lowest literacy rate primarily because of very low literacy rate in Bihar and Orissa (Table 3).

As regards the gains in literacy rates between 2001 and 2011, all the states and union territories without exception have registered positive increase. Dadra and Nagar Haveli recorded a maximum increase of 20.2 percent followed by Bihar (16.6 percent), Tripura (14.6 percent), Jharkhand (14.07 percent) and Sikkim (13.39 percent) (Table 3). Thus, among the so called BIMARU states, Rajasthan, Madhya Pradesh including Chhatisgarh, and Uttar Pradesh have made significant progress in their literacy drives. Detailed literacy rates by age groups would indicate whether the increment in literacy rates is largely contributed by the adult males and females or by the children in the school going age. The first factor would mean that efforts of the National Literacy Mission (NLM) and Adult Literacy Mission (ALM) and other related programmes have succeeded while the second may suggest success of the DPEP and other projects like *Lok Jumbish* in Rajasthan have helped in reduction in school dropouts. Both these aspects are meaningful from societal perspective and need more detailed examination.

Male-Female Difference in Literacy Rate

It is heartening to note that, at the national level, male-female difference in literacy rate has declined from 21.7 percent in 2001 to 16.68 percent in 2011 due to faster increase in female literacy rate than male literacy rate during the 2000s. Consequently, the male-female gap in literacy rate declined in all the states and union territories except Dadra & Nagar Haveli during this period.

Table 4: Literacy rates by sex and their decadal differences between 2001 and 2011, India and States/Union Territories

Zone/State and Union Territory	2011			2001			Decadal difference in literacy rates	
	Males	Females	Gap in M-F literacy rate	Males	Females	Gap in M-F literacy rate	Males	Females
India	**82.14**	**65.46**	**16.68**	**75.85**	**54.16**	21.69	6.29	11.30
Haryana	85.38	66.77	**18.61**	76.1	59.61	16.49	9.28	7.16
Himachal Pradesh	90.83	76.6	**14.23**	85.35	65.61	19.74	5.48	10.99
Jammu and Kashmir	78.26	58.01	**20.25**	66.6	42.22	24.38	11.66	15.79
Punjab	81.48	71.34	**10.14**	79.66	60.53	19.13	1.82	10.81
Rajasthan	80.51	52.66	**27.85**	70.32	43.85	26.47	10.19	8.81
Chandigarh	90.54	81.38	**9.16**	88.42	75.37	13.05	2.12	6.01
Delhi	91.03	80.93	**10.10**	87.33	75.24	12.09	3.70	5.69
Northern Zone	**85.43**	**69.67**	**15.76**	**77.60**	**54.1**	23.50	7.83	15.57
Bihar	73.39	53.33	**20.06**	59.68	33.12	26.56	13.71	20.21
Sikkim	87.29	76.43	**10.86**	77.38	59.63	17.75	9.91	16.80
West Bengal	82.67	71.16	**11.51**	77.02	59.61	17.41	5.65	11.55
Orissa	82.4	64.36	**18.04**	71.28	50.51	20.77	11.12	13.85
Chhattisgarh	81.45	60.59	**20.86**	75.7	55.73	19.97	5.75	4.86
Jharkhand	78.45	56.21	**22.24**	63.83	38.87	24.96	14.62	17.34
Andaman and Nicobar Islands	90.11	81.84	**8.27**	86.76	74.71	12.0	3.35	7.13
Eastern zone	**82.25**	**66.27**	**15.98**	**70.1**	**47**	23.10	12.15	19.27
Assam	78.81	67.27	**11.54**	75.23	51.85	23.38	3.58	15.42
Arunachal Pradesh	73.69	59.57	**14.12**	65.43	40.23	25.20	8.26	19.34
Manipur	86.49	73.17	**13.32**	80.33	61.46	18.87	6.16	11.71
Meghalaya	77.17	73.78	**3.39**	71.18	50.43	20.75	5.99	23.35
Mizoram	93.72	89.4	**4.32**	92.53	86.75	5.78	1.19	2.65
Nagaland	83.29	76.69	**6.60**	76.04	56.87	19.17	7.25	19.82
Tripura	92.18	83.15	**9.03**	82.42	64.33	18.09	9.76	18.82
North east zone	**83.62**	**74.72**	**8.90**	**73**	**58**	15.00	10.62	16.72
Madhya Pradesh	80.53	60.02	**20.51**	75.35	54.61	20.74	5.18	5.41
Uttar Pradesh	79.24	59.26	**19.98**	67.3	43	24.30	11.94	16.26
Uttarakhand	88.33	70.7	**17.63**	81.02	63.36	17.66	7.31	7.34
Central zone	**82.70**	**63.33**	**19.37**	**72.8**	**46.2**	26.60	9.90	17.13
Gujarat	87.23	70.73	**16.50**	78.49	60.4	18.09	8.74	10.33
Maharashtra	89.82	75.48	**14.34**	85.97	67.03	18.94	3.85	8.45
Dadra and Nagar Haveli	86.46	65.93	**20.53**	68.82	43.53	25.29	17.64	22.40
Daman and Diu	91.48	79.59	**11.89**	86.14	67.42	18.72	5.34	12.17
West zone	**88.75**	**72.93**	**15.82**	**82.9**	**63.4**	19.50	5.85	9.53
Andhra Pradesh	75.56	59.74	**15.82**	71.16	50.29	20.87	4.40	9.45
Goa	92.81	81.84	**10.97**	88.62	76.47	12.15	4.19	5.37
Karnataka	82.85	68.13	**14.72**	76.06	57.8	18.26	6.79	10.33
Kerala	96.02	91.98	**4.04**	94.24	87.72	6.52	1.78	4.26
Lakshadweep	96.11	88.25	**7.86**	90.72	80.47	10.25	5.39	7.78
Puducherry	92.12	81.22	**10.90**	86.33	73.9	12.43	5.79	7.32
Tamil Nadu	86.81	73.86	**12.95**	83.28	64.91	18.37	3.53	8.95
Southern zone	88.90	77.86	**11.04**	**78.7**	**62**	16.70	10.20	15.86

An examination of the decadal difference in literacy rates by gender for 2001 and 2011, however, indicates that out of 13 states and UTs where the literacy rates are below the national average of 65.4 percent, nine occupy the first nine positions in male-female gap. These states are Rajasthan (a gap of 27.85 percentage points), Jharkhand (22.24 percent), Chhatisgarh (20.86percent), Madhya Pradesh (20.51 percent), Jammu and Kashmir (20.25 percent) Bihar (20.1 percent), Orissa (25 percent), and the UT of Dadra and Nagar Haveli (20.53 percent Their ranking in terms of the gap in male-female literacy rate has remained almost the same between 1991 and 2001 (Table 4). In contrast, male-female gap in literacy rate in 2011 is less than ten percent only in the states of Kerala, Meghalaya, Mizoram, Nagaland and the union territory of Chandigarh. These are the states where females have high status in their respective societies.

Looking at the data in Table 4, one may conclude that the states where the overall literacy rate is low, they continue to have large gap in male female literacy rates even after substantial improvement in female literacy. It also seems that low urbanization and low density of population also influence the gap in male-female literacy rates. One may also say that status of women continues to remain low in those states.

12.19 THE ILLITERATE POPULATION

Despite the rise in literacy both among males and females, there has been an increase in absolute number of illiterates (in the total population) in the country in each of the censuses up till 2001 (Table 6). The number of illiterates increased from 334 million in 1961 to 454.1 million in 2001. The 2011 census has, however, indicated a decline in their numbers, more so among males, even though the 2001-2011 growth in literacy rate has been higher among females.

Table 6: Number of illiterates in India by sex in different censuses (Figures in millions)

Year	Persons	Males	Females
1961	333.9	148.5	135.4
1971	386.5	171.9	214.6
1981	424.2	182.6	241.6
1991	479.2	205.6	273.6
2001	454.1	188.6	265.5
2011	272.9	96.5	176.3

There is a wide gender disparity in the literacy rate in India: effective literacy rates (age 7 and above) in 2011 were 82.14% for men and 65.46% for women. The low female literacy rate has had a dramatically negative impact on family planning and population stabilization efforts in India. Studies have indicated that female literacy is a strong predictor of the use of contraception among married Indian couples, even when women do not otherwise have economic independence. The census provided a positive indication that growth in female literacy rates (11.8%) was substantially faster than in male literacy rates (6.9%) in the 2001-2011 decadal period, which means the gender gap appears to be narrowing.

Kerala is the most literate state in India, with 93.91% literacy, followed closely by Lakshadweep at 92.28%. Bihar is the least literate state in India with 63.82% literacy. Several other social indicators of the two states are correlated with these rates, such as life expectancy at birth (71.61 for males and 75 for females in Kerala, 65.66 for males and 64.79 for females in Bihar), infant mortality per 1,000 live births (10 in Kerala, 61 in Bihar), birth rate per 1,000 people (16.9 in Kerala, 30.9 in Bihar) and death rate per 1,000 people (6.4 in Kerala, 7.9 in Bihar).

Every census since 1881 had indicated rising literacy in the country, but the population growth rate had been high enough that the absolute number of illiterates rose with every decade. The 2001-2011 decade is the second census period (after the 1991-2001 census period) when the absolute number of Indian illiterates declined (by 31,196,847 people), indicating that the literacy growth rate is now outstripping the population growth rate.

Bihar is the only remaining Indian state in the 2011 census where less than 65% of the population was literate. It is also only one of two states where less than 75% of the male population (the other being Arunachal Pradesh) was literate and only one of two states where less than 55% of the female population (the other being Rajasthan) was literate. Six Indian states account for about 70% of all illiterates in India: Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Andhra Pradesh and West Bengal.[1] Slightly less than half of all Indian illiterates (48.12%) are in the six Hindi-speaking states of Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh, Jharkhand and Chhattisgarh.

Large variations in literacy exist even between contiguous states. While there are a few states at the top and bottom, most states are just above or below the national average.

Ranking of States in India by Literacy Rate				
S.No	**State**	**Literacy Rate**	**Male Literacy Rate**	**Female Literacy Rate**
		(2011 Census)	**(2011 Census)**	**(2011 Census)**
1	Andaman & Nicobar Islands	86.30%	90.10%	81.80%
2	Andhra Pradesh	67.70%	75.60%	59.70%
3	Arunachal Pradesh	67.00%	73.70%	59.60%
4	Assam	73.20%	78.80%	67.30%
5	Bihar	63.80%	73.50%	53.30%
6	Chandigarh	86.40%	90.50%	81.40%
7	Chattisgarh	71.00%	81.50%	60.60%
8	Dadra & Nagar Haveli	77.70%	86.50%	65.90%
9	Daman & Diu	87.10%	91.50%	79.60%
10	Delhi	86.30%	91.00%	80.90%
11	Goa	87.40%	92.80%	81.80%
12	Gujarat	79.30%	87.20%	70.70%
13	Haryana	76.60%	85.40%	66.80%
14	Himachal Pradesh	83.80%	90.80%	76.60%
15	Jammu and Kashmir	68.70%	78.30%	58.00%
16	Jharkhand	67.60%	78.50%	56.20%
17	Karnataka	75.60%	82.80%	68.10%
18	Kerala	93.90%	96.00%	92.00%
19	Lakshadweep	92.30%	96.10%	88.20%
20	Madhya Pradesh	70.60%	80.50%	60.00%
21	Maharashtra	82.90%	89.80%	75.50%
22	Manipur	79.80%	86.50%	73.20%
23	Meghalaya	75.50%	77.20%	73.80%
24	Mizoram	91.60%	93.70%	89.40%
25	Nagaland	80.10%	83.30%	76.70%
26	Orissa	73.50%	82.40%	64.40%
27	Puducherry	86.50%	92.10%	81.20%
28	Punjab	76.70%	81.50%	71.30%
29	Rajasthan	67.10%	80.50%	52.70%
30	Sikkim	82.20%	87.30%	76.40%
31	Tamil Nadu	80.30%	86.80%	73.90%
32	Tripura	87.80%	92.20%	83.10%
33	Uttar Pradesh	69.70%	79.20%	59.30%
34	Uttarakhand	79.60%	88.30%	70.70%
35	West Bengal	77.10%	82.70%	71.20%
-	**INDIA**	74.04%	82.14%	65.46%

The state of Literacy in India as per the provisional population totals of Census 2011 presents a highly encouraging picture. The highlights have been the decline of the number of illiterates and the increase in the number of literates across the country. The most encouraging trend has been the narrowing down of the gender gap in literacy. Though a detailed analysis would reveal more contours, a prima facie inference is that a large proportion of the children born after 2001 are becoming literate. A note of caution has however to be struck. A few States have shown a tendency to slip back into illiteracy after having attained a certain level of literacy. This slide back has to be arrested and the momentum to be sustained in order to achieve the cherished goal of universal literacy.

12.20 RURAL-URBAN COMPOSITION

An **urban area** is characterized by higher population density and vast human features in comparison to areas surrounding it. Urban areas may be cities, towns or conurbations, but the term is not commonly extended to rural settlements such as villages and hamlets.

Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analyzing population density and urban sprawl, and in determining urban and rural populations. Unlike an urban area, a metropolitan area includes not only the urban area, but also satellite cities plus intervening rural land that is socio-economically connected to the urban core city, typically by employment ties through commuting, with the urban core city being the primary labor market. In fact, urbanized areas agglomerate and grow as the core population/economic activity center within a larger metropolitan area or envelope.

Rural areas or the **country** or **countryside** are areas of land that are not urbanized, though when large areas are described, country towns and smaller cities will be included. They have a low population density, and typically much of the land is devoted to agriculture and there may be less air and water pollution than in an urban area. The degree to which areas of wilderness are included in the term varies; very large wilderness areas are not likely to be described by the term in most contexts.

In most parts of the world rural areas have been declining since the 19th century or earlier, both as a proportion of land area, and in terms of the proportion of the population living in them. Urbanization encroaches on rural land, and the mechanization of agriculture has reduced the number of workers needed to work the land, while alternative employment is typically easier to obtain in cities. In parts of the developed world urban sprawl has greatly reduced the areas that can be called rural, and land use planning measures are used to protect the character of rural areas in various ways.

Population is divided into two parts-rural and urban on the basis of the size and location of settlements. The rural population is one that lives in large size settlement i.e. towns and cities. However, more importantly this division is based on occupational structure. In India, rural area is defined as one where three fourths or more of its population is engaged in primary occupations such as farming, animal raring, forestry, fishing, quarrying etc. on the other hand, urban area is one where three fourths or above of its population is engaged in non-agricultural activities such as manufacturing, trade, transport, communication, banking and social services like health, education, administration etc.

Rural population lives in the villages and has three fourths or more of its population is engaged in primary occupations

Urban population lives in towns and cities where three fourths or more of its number is engaged in non agricultural pursuits of secondary and tertiary sector.

12.21 LEVELS AND TRENDS IN POPULATION DISTRIBUTION

A. Urbanization and growth

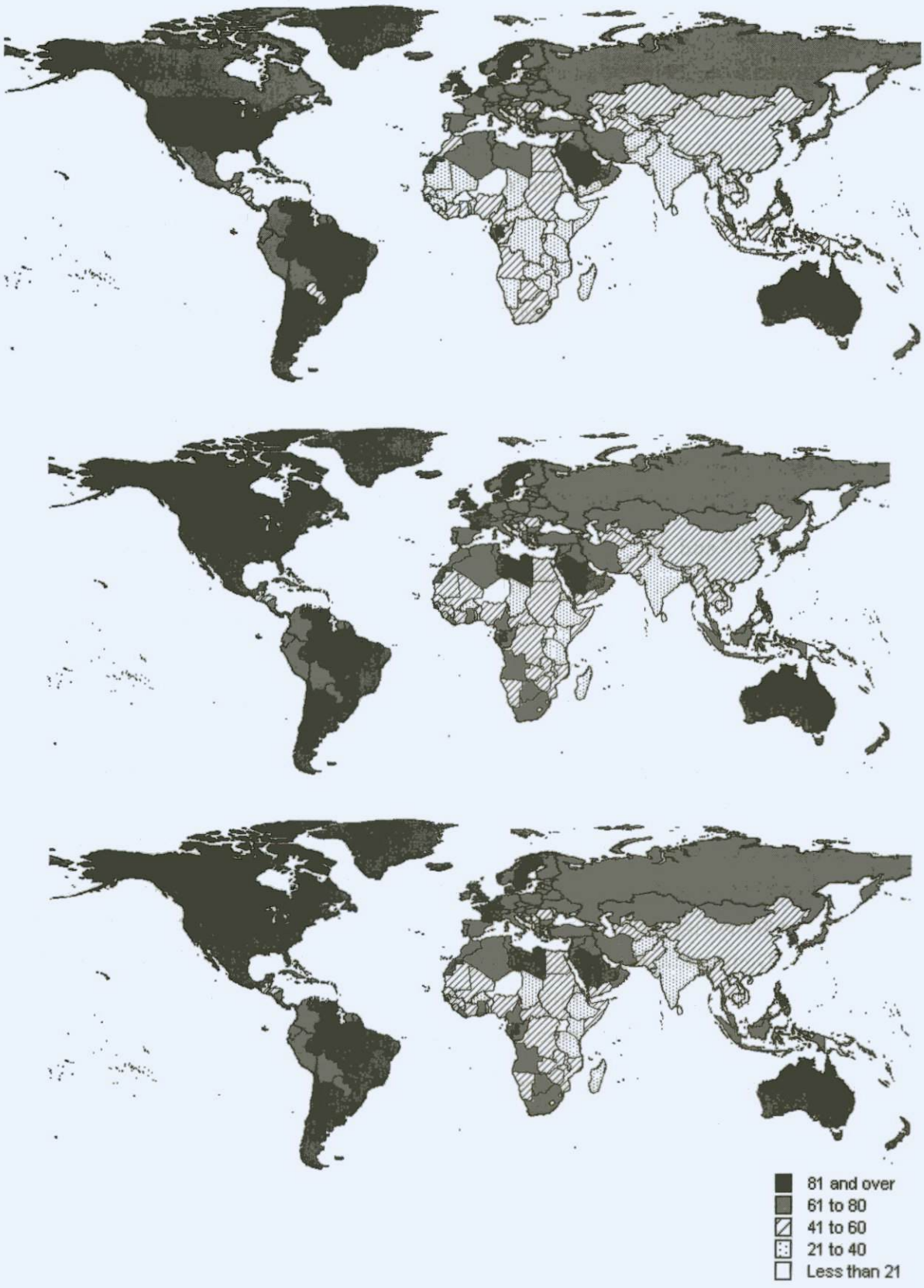
In 2008, half of the world population is expected to live, for the first time in history, in urban areas. Yet major disparities remain in the level of urbanization attained by different countries and regions (figure I and table 1). The transformative power of urbanization was felt earlier in today's more developed regions and they have reached high levels of urbanization, surpassing 80 per cent in Australia, New Zealand and Northern America. Europe is the least urbanized major area in the developed world, with 72 per cent of its population living in urban areas. Among the less developed regions, Latin America and the Caribbean has an exceptionally high level of urbanization (78 per cent), higher than that of Europe. Africa and Asia, in contrast, remain mostly rural, with 38 per cent and 41 per cent, respectively, of their populations living in urban areas. Yet, half of the urban population in the world lived in Asia in 2007. Europe had the second highest share at 16 per cent.

Over the coming decades, the level of urbanization is expected to increase in all major areas, with Africa and Asia urbanizing more rapidly than other major areas even if their expected rates of urbanization are lower than they have been in the past (table 1). Nevertheless, by mid-century, Africa, Asia and developing Oceania are expected to have lower levels of urbanization than the more developed regions or Latin America and the Caribbean. Overall, the world population is expected to be nearly 70 per cent urban in 2050. At that time, most of the urban population will be concentrated in Asia (54 per cent) and Africa (19 per cent).

The evolution of the urban and rural population, the world and major regions, 1950-2050

Development group or major area	*1950*	*1975*	*2007*	*2025*	*2050*	*1950-1975*	*1975-2007*	*2007-2025*	*2025-2050*
	Population in urban areas (millions)					*Rate of urban population change (percentage)*			
World	737	1,519	3,294	4,584	6,398	2.9	2.4	1.8	1.3
More developed regions	427	702	910	995	1,071	2.0	0.8	0.5	0.3
Less developed regions	310	817	2,384	3,590	5,327	3.9	3.3	2.3	1.6
Least developed countries	15	53	225	452	967	5.0	4.5	3.9	3.0
Africa	33	107	373	658	1,234	4.8	3.9	3.1	2.5
Asia	237	574	1,645	2,440	3,486	3.5	3.3	2.2	1.4
Latin America and the Caribbean	69	198	448	575	683	4.2	2.5	1.4	0.7
Northern America	110	180	275	337	401	2.0	1.3	1.1	0.7
Europe	281	444	528	545	557	1.8	0.5	0.2	0.1
Oceania	8	15	24	30	37	2.6	1.4	1.2	0.9
	Population in rural areas (millions)					*Rate of rural population change (percentage)*			
World	1,798	2,558	3,377	3,426	2,793	1.4	0.9	0.1	-0.8
More developed regions	386	346	313	264	174	-0.4	-0.3	-0.9	-1.7
Less developed regions	1,412	2,211	3,064	3,162	2,619	1.8	1.0	0.2	-0.8
Least developed countries	185	305	580	734	775	2.0	2.0	1.3	0.2
Africa	192	309	592	736	764	1.9	2.0	1.2	0.1
Asia	1,174	1,820	2,384	2,339	1,780	1.8	0.8	-0.1	-1.1
Latin America and the Caribbean	98	126	124	113	87	1.0	-0.1	-0.5	-1.1
Northern America	62	64	63	56	44	0.1	0.0	-0.7	-1.0
Europe	267	232	204	170	107	-0.6	-0.4	-1.0	-1.8
Oceania	5	6	10	12	11	0.9	1.6	0.8	0.0
	Percentage in urban areas					*Rate of urbanization (percentage)*			
World	29.1	37.3	49.4	57.2	69.6	1.0	0.9	0.8	0.8
More developed regions	52.5	67.0	74.4	79.0	86.0	1.0	0.3	0.3	0.3
Less developed regions	18.0	27.0	43.8	53.2	67.0	1.6	1.5	1.1	0.9
Least developed countries	7.5	14.8	27.9	38.1	55.5	2.7	2.0	1.7	1.5
Africa	14.5	25.7	38.7	47.2	61.8	2.3	1.3	1.1	1.1
Asia	16.8	24.0	40.8	51.1	66.2	1.4	1.7	1.2	1.0
Latin America and the Caribbean	41.4	61.1	78.3	83.5	88.7	1.6	0.8	0.4	0.2
Northern America	63.9	73.8	81.3	85.7	90.2	0.6	0.3	0.3	0.2
Europe	51.2	65.7	72.2	76.2	83.8	1.0	0.3	0.3	0.4
Oceania	62.0	71.5	70.5	71.9	76.4	0.6	0.0	0.1	0.2

Source: *World Urbanization Prospects: The 2007 Revision*, United Nations (forthcoming).


81 and over
61 to 80
41 to 60
21 to 40
Less than 21

The urban population is highly concentrated in a few countries (table 2). In 2007, three-quarters of the 3.3 billion urban dwellers on earth lived in 25 countries whose urban populations ranged from 29 million in South Africa to 561 million in China. China, India and the United States of America accounted for 35 per cent of the world's urban population. Most of the 25 countries with the largest urban populations are highly urbanized, but seven have levels of urbanization ranging from 26 per cent to just over 50 per cent and they include some of the most populous countries in the world: Bangladesh, China, India, Indonesia, Nigeria and Pakistan.

Most countries have small urban populations. In 2007, two thirds of the 229 countries or areas considered had fewer than 5 million urban dwellers and they accounted for 5.8 per cent of the world urban population. Among them, 60 per cent had urban populations below one million and accounted for 0.6 per cent of all urban dwellers on earth. By 2050, just half of all countries or areas are expected to have fewer than 5 million urban dwellers and to account for barely 2 per cent of the world urban population.

Between 2007 and 2025, the world urban population is expected to increase by 1.3 billion people. China, with an increase of 261 million, and India, with 197 million, are expected to account for 36 per cent of the global increment. Nine additional countries are projected to contribute 29 per cent of the urban increment, with increases ranging from 20 million to 62 million. The countries involved are: Nigeria and the Democratic Republic of Congo in Africa; Bangladesh, Indonesia, Pakistan and the Philippines in Asia; Brazil and Mexico in Latin America, and the United States. Among them, those in Africa and Asia will experience high rates of urban population growth, surpassing 2 per cent or even 3 per cent per year (table 2). A further urban increment of 1.8 billion people is expected globally during 2025-2050, with India being the major contributor (377 million) and China following (205 million). Together, China and India are projected to account for 32 per cent of urban growth during the period. Bangladesh, the Democratic Republic of Congo, Nigeria and Pakistan will likely contribute jointly a further 17 per cent or 309 million. In 2050, China will still have the largest urban population (1 billion), followed by India (0.9 million).

Over the coming decades, world population growth will largely be determined by growth in the urban areas of developing countries (figure II). At around 2019, when the world rural population reaches 3.5 billion, it is expected to start declining because the number of rural inhabitants in the less developed regions will begin a slow descent. The rural population of the more developed regions has been declining since the 1960s and their urban population will

increase by just 85 million between 2007 and 2050. In a few developed countries, the urban population will decrease (e.g. the Russian Federation and Ukraine). Consequently, the annual increment of the urban population in the less developed regions will dominate population growth over the foreseeable future (figure III). That annual increment, which today amounts to 62 million people, is expected to peak at 72 million around 2030 and decline to 63 million by midcentury. In comparison, the urban population of the more developed regions will gain no more than 2 million or 3 million people annually.

Countries accounting for 75 per cent of the world urban population in 2007

	Country	Rural population (millions)	Urban population (millions)	Proportion urban	Percentage of world urban population	Cumulative percentage	Growth rate (percentage) 2007-2025	Urban population in 2025 (millions)
	World	3,377	3,294	49.4	100.0	100.0	1.8	4,584
1	China	767	561	42.2	17.0	17.0	2.1	822
2	India	828	341	29.2	10.4	27.4	2.5	538
3	United States of America	57	249	81.4	7.6	35.0	1.1	305
4	Brazil	28	163	85.2	5.0	39.9	1.3	207
5	Indonesia	115	117	50.4	3.5	43.5	2.4	179
6	Russian Federation	39	104	72.8	3.2	46.6	-0.4	96
7	Japan	43	85	66.3	2.6	49.2	0.1	86
8	Mexico	25	82	76.9	2.5	51.7	1.2	102
9	Nigeria	78	71	47.6	2.1	53.8	3.3	127
10	Germany	22	61	73.5	1.8	55.7	0.1	62
11	Pakistan	105	58	35.7	1.8	57.4	3.2	104
12	Philippines	31	57	64.2	1.7	59.2	2.4	86
13	United Kingdom	6	55	89.9	1.7	60.8	0.5	60
14	Turkey	24	51	68.2	1.6	62.4	1.6	68
15	Iran (Islamic Republic of)	23	48	68.0	1.5	63.8	1.8	67
16	France	14	48	77.1	1.4	65.3	0.7	54
17	Bangladesh	116	42	26.6	1.3	66.6	3.3	77
18	Italy	19	40	67.9	1.2	67.8	0.3	42
19	Republic of Korea	9	39	81.3	1.2	69.0	0.4	42
20	Argentina	3	36	91.8	1.1	70.1	1.0	43
21	Colombia	12	34	74.2	1.0	71.1	1.4	44
22	Spain	10	34	77.0	1.0	72.1	0.5	38
23	Egypt	43	32	42.6	1.0	73.1	2.0	46
24	Ukraine	15	31	67.9	1.0	74.1	-0.5	28
25	South Africa	19	29	60.2	0.9	75.0	1.2	36

Source: *World Urbanization Prospects: The 2007 Revision*, United Nations (forthcoming).

Countries accounting for 75 per cent of the world urban population in 2007

Country	Rural population (millions)	Urban population (millions)	Proportion urban	Percentage of world urban population	Cumulative percentage	Growth rate (percentage) 2007-2025	Urban population in 2025 (millions)
World	3,377	3,294	49.4	100.0	100.0	1.8	4,584
China	767	561	42.2	17.0	17.0	2.1	822
India	828	341	29.2	10.4	27.4	2.5	538
USA	57	249	81.4	7.6	35.0	1.1	305
Brazil	28	163	85.2	5.0	39.9	1.3	207
Indonesia	115	117	50.4	3.5	43.5	2.4	179
USSR	39	104	72.8	3.2	46.6	-0.4	96
Mexico	25	82	76.9	2.5	51.7	1.2	102
Japan	43	85	66.3	2.6	49.2	0.1	86
Nigeria	78	71	47.6	2.1	53.8	3.3	127
Germany	22	61	73.5	1.8	55.7	0.1	62
Pakistan	105	58	35.7	1.8	57.4	3.2	104
Philippines	31	57	64.2	1.7	59.2	2.4	86
UK	6	55	89.9	1.7	60.8	0.5	60
Turkey	24	51	68.2	1.6	62.4	1.6	68
Iran	23	48	68.0	1.5	63.8	1.8	67
France	14	48	77.1	1.4	65.3	0.7	54
Bangladesh	116	42	26.6	1.3	66.6	3.3	77
Italy	19	40	67.9	1.2	67.8	0.3	42
Korea	9	39	81.3	1.2	69.0	0.4	42
Argentina	3	36	91.8	1.1	70.1	1.0	43
Colombia	12	34	74.2	1.0	71.1	1.4	44
Spain	10	34	77.0	1.0	72.1	0.5	38
Egypt	43	32	42.6	1.0	73.1	2.0	46
Ukraine	15	31	67.9	1.0	74.1	-0.5	28
South Africa	19	29	60.2	0.9	75.0	1.2	36

12.22 RURAL POPULATION TRENDS

15. In 2007, 3.4 billion persons lived in rural areas (table 1). In contrast with the urban population, the rural population is growing slowly globally and declining in all major areas except Africa and Oceania. Asia, with 2.4 billion rural inhabitants, accounts for 70.6 per cent of the world rural population. Africa, with 0.6 billion, accounts for 17.5 per cent. The rural share of all other regions is 12 per cent. By 2050, Africa's rural population is expected to increase by 29 per cent, to reach nearly 0.8 billion in 2050 or 27 per cent of the world rural population. Asia's rural population will decline markedly, to 1.8 billion in 2050, so its share will drop to 64 per cent. Consequently, over the coming decades, just one in every ten rural inhabitants will live outside Africa or Asia.

The rural population is even more highly concentrated in a few countries than the urban population. In 2007, 18 countries accounted for 75 per cent of the rural population and all but three (Japan, the Russian Federation and the United States) are countries in Africa or Asia. India has the largest rural population (828 million), followed by China (767 million). Together, they account for 47 per cent of the world rural population. Bangladesh, Indonesia and Pakistan follow, each with over 100 million rural inhabitants. In Africa, the largest rural populations are located in Nigeria (78 million), Ethiopia (69 million), Egypt (43 million), the Democratic Republic of Congo (42 million), the United Republic of Tanzania (30 million) and Kenya (30 million). During 2007-2025, the rural populations of most of these African countries are projected to increase at rates equal to or higher than 1 per cent per year, the only exception being Nigeria. Among populous countries in Asia, Pakistan will have the highest rural growth rate during 2007-2025 (0.8 per cent per year). In contrast, in eight of the 18 countries with large rural populations the rural population is declining, with China, Indonesia, Japan, the Russian Federation and the United States having the fastest rates of decline.

By 2025, India's rural population will be near its peak at 909 million and by 2050 it is expected to decrease to 743 million. China's rural population will be decreasing steadily in future decades, to reach 382 million in 2050, about half its current level. Most of the other countries with large rural populations are expected to see them peak after 2020. The rural populations of the Democratic Republic of Congo, Ethiopia and Nigeria are projected to gain between 27 million and 37 million each by 2050, thus having the highest increments among populous countries. In contrast, Indonesia's rural population is projected to decrease by 53 million.

As in the case of the urban population, most countries have small rural populations. In 2007, 69 per cent of the 229 countries or areas considered had at most 5 million rural inhabitants and accounted for 4.8 per cent of the world rural population. In three quarters of them, the rural population is projected to decrease during 2007-2050.

12.23 CITY SIZE AND GROWTH

19. Today's 3.4 billion urban dwellers are distributed unevenly among urban settlements of different size. In discussing urbanization, the focus often is on large cities, that is, cities with more inhabitants than many countries in the world. Naturally, those cities or urban agglomerations tend to be concentrated in populous countries. In 2007, 19 urban agglomerations qualify as megacities, that is, they have at least 10 million inhabitants (table 3). The most populous, Tokyo, has nearly 36 million inhabitants but it encompasses all contiguous densely inhabited districts in Tokyo-to (ku-bu) plus those in 87 surrounding cities and towns, including Yokohama, Kawasaki and Chiba, important cities in their own right. The term urban agglomeration is used to indicate that the settlements considered are often a combination of several distinct units located close to one another and having a variety of functional linkages.

In addition to Tokyo, Asia has ten additional megacities; Latin America has four; Northern America, two; and Africa and Europe have one each. Eleven of these megacities are capitals of their countries. By 2025, there will be an additional eight megacities, for a total of 27. Asia would have increased its number by five; Africa by two, and Europe by one. Despite their visibility and dynamism, megacities account for a small though increasing proportion of the world urban population: 8 per cent in 2005, 10 per cent in 2025 (figure IV). 21. The next tier of large cities, those with populations ranging from 5 million to just under 10 million, numbered 31 in 2005 and are expected to number 48 in 2025, but account for just 7 per cent of the urban population on both dates. Three quarters of these "megacities in waiting" are located in developing countries. 22. The cities with fewer than 5 million inhabitants but more than a million are considerably more numerous (361 in 2005 increasing to 526 in 2025) and they account for 22 per cent of the urban population in 2005. Smaller cities, having fewer than a million inhabitants but more than half a million, are also numerous (448 in 2005 rising to 551 in 2025) but because of their small populations their share of the overall urban population is a low 10 per cent. As time elapses and cities pass from one category to the next, the combined shares of these two categories are expected to decline somewhat, from 32 per cent in 2005 to 31 percent in 2025.

Population of the world's megacities, 1975 to 2025 (millions)

	City	*1975*	*City*	*2007*	*City*	*2015*	*City*	*2025*
1	Tokyo	26.6	Tokyo	35.7	Tokyo	36.4	Tokyo	36.4
2	New York-Newark	15.9	New York-Newark	19.0	Mumbai (Bombay)	21.9	Mumbai (Bombay)	26.4
3	Mexico City	10.7	Mexico City	19.0	São Paulo	20.5	Delhi	22.5
4			Mumbai (Bombay)	19.0	Mexico City	20.2	Dhaka	22.0
5			São Paulo	18.8	New York-Newark	20.0	São Paulo	21.4
6			Delhi	15.9	Delhi	18.7	Mexico City	21.0
7			Shanghai	15.0	Shanghai	17.2	New York-Newark	20.6
8			Kolkata (Calcutta)	14.8	Kolkata (Calcutta)	17.0	Kolkata (Calcutta)	20.6
9			Dhaka	13.5	Dhaka	17.0	Shanghai	19.4
10			Buenos Aires	12.8	Karachi	14.9	Karachi	19.1
11			Los Angeles[1]	12.5	Cairo	13.5	Kinshasa	16.8
12			Karachi	12.1	Buenos Aires	13.4	Lagos	15.8
13			Cairo	11.9	Los Angeles[1]	13.2	Cairo	15.6
14			Rio de Janeiro	11.7	Beijing	12.8	Manila	14.8
15			Osaka-Kobe	11.3	Manila	12.8	Beijing	14.5
16			Beijing	11.1	Rio de Janeiro	12.8	Buenos Aires	13.8
17			Manila	11.1	Lagos	12.4	Los Angeles[1]	13.7
18			Moscow	10.5	Osaka-Kobe	11.4	Rio de Janeiro	13.4
19			Istanbul	10.1	Kinshasa	11.3	Jakarta	12.4
20					Istanbul	11.2	Istanbul	12.1
21					Jakarta	10.8	Guangzhou[2]	11.8
22					Moscow	10.5	Osaka-Kobe	11.4
23					Guangzhou[2]	10.4	Moscow	10.5
24					Paris	10.0	Lahore	10.5
25							Shenzhen	10.2
26							Chennai (Madras)	10.1
27							Paris	10.0

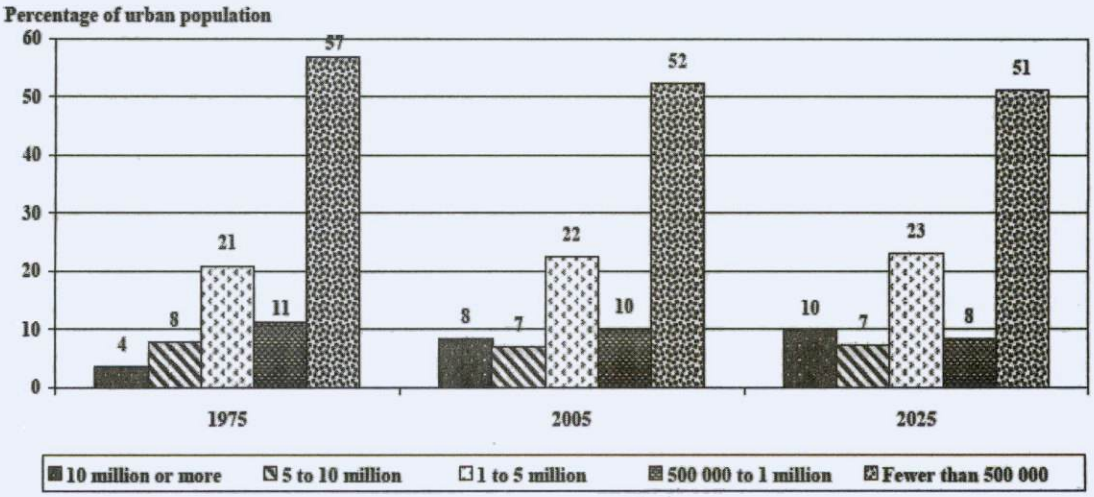
Source: *World Urbanization Prospects: The 2007 Revision*, United Nations (forthcoming).

[1]Los Angeles-Long Beach-Santa Ana

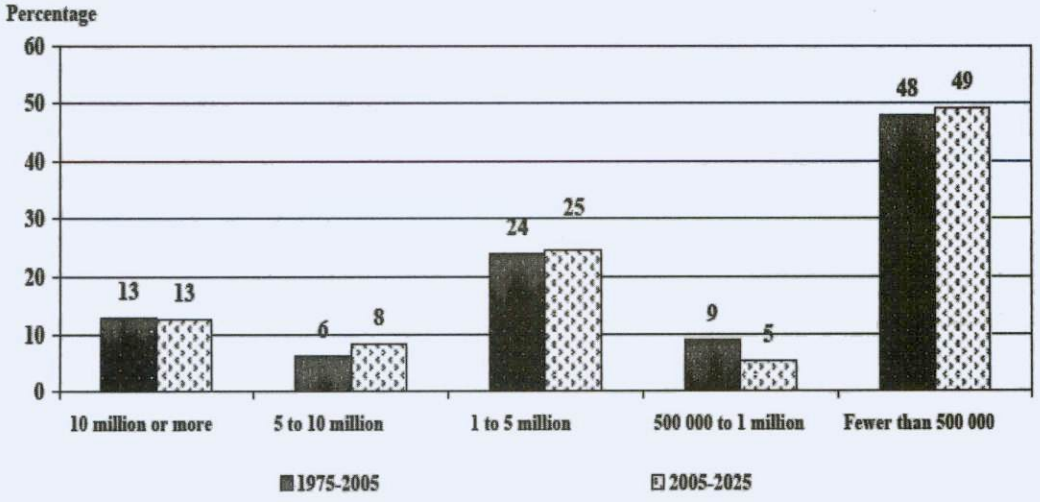
[2]Guangzhou, Guangdong

All the size categories considered so far account for 48 per cent of the urban population, implying that smaller cities comprise over half of the urban population. There is no complete listing of all the small cities, since many have only a few thousand inhabitants, but the increases observed in the urban population are driven in large part by the increasing population in small urban centres. Between 1975 and 2005, 48 per cent of the increase in the world urban population was accounted for by the rise in the population of small cities (figure V) and that share is expected to remain nearly unchanged during 2005-2025. In comparison large cities, including megacities, account for about a fifth of urban growth, while medium-sized cities account for about a third.

Distribution of the world urban population by city size class, 1975, 2005 and 2025



Share of the world urban increment accounted for by cities in different class sizes, 1975-2005 and 2005-2025



In absolute numbers, urbanization expands more at the base (table 4). Between 2005 and 2025, the population of small cities is expected to increase by nearly 700 million, that of medium-sized cities (500,000 to 5 million inhabitants) by just over 400 million and that of large cities (5 million or more) by 300 million. The emergence of new urban settlements, fuelled by the transformation of rural localities into small cities, contributes to the expansion of the base.

Urban population by city size class, 1975, 2005 and 2025

	Population (millions)			*Increment (millions)*		*Growth rate (percentage)*	
City size class	*1975*	*2005*	*2025*	*1975-2005*	*2005-2025*	*1975-2005*	*2005-2025*
World urban population	1,519	3,165	4,584	1646	1420	2.45	1.85
10 million or more	53	268	447	215	179	5.39	2.55
5 to 10 million	117	217	337	100	119	2.06	2.19
1 to 5 million	317	711	1,060	394	349	2.69	2.00
500 000 to 1 million	168	314	390	147	75	2.10	1.07
Fewer than 500 000	863	1,653	2,351	790	698	2.17	1.76

Source: World Urbanization Prospects: The 2007 Revision, United Nations (forthcoming).

Relative to its initial population size, the fastest growing size class is that of megacities, partly because this group tends to grow by "quantum leaps" of at least 10 million inhabitants. However, as the number of megacities increases, their growth rate declines. Thus, the average annual growth rate of the megacity class is expected to drop from 5.4 per cent in 1975-2005 to 2.6 per cent in 2005- 2025. This overall growth rate for the megacity class does not imply that each megacity grows that fast. Because of their large populations, megacities tend to grow more slowly than less populous cities. Exceptions exist, however. Among the megacities of 2007, the fastest growing are Dhaka, with an annual growth rate of 3.3 per cent during 2005-2010, Delhi with 2.5 per cent, and Karachi with 2.4 per cent. All other megacities in Africa and Asia have current annual growth rates ranging from 1.6 per cent to 2.0 per cent, while those in other regions have annual growth rates below 1.4 per cent. By comparison, there are 176 additional cities with at least 750,000 inhabitants growing at an annual rate of 2.5 per cent or higher.

Percentage of Rural and Urban population in India 1901-2011

Census year	RURAL	URBAN
1901	89.2	10.8
1911	89.7	10.3
1921	88.8	11.2
1931	88.0	12.0
1941	86.1	13.9
1951	82.7	17.3
1961	82.0	18.0
1971	80.1	19.9
1981	76.7	23.3
1991	74.3	25.7
2001	72.2	27.8
2011	68.8	31.2

The total population of India spreads over than 6.3 lakhs of village 5082 towns. India morverbially is considered to be country of villages. Even today 68.2 of the total population of India lives in villages. But the proportion of rural population has been decreasing in each successive census (table ..) consequently the proportion of urban population to total population has been increasing slowly but steadily. It was as low as 10.8 percent in 1901 and rose 31.2 by 2011. The question arises why is it so? It is because the rate of growth of urban population is higher than that of rural population. In contrast to an average growth rate of about 15.1 in 2011. The urban population has registered a groth rate of 25 percent. However, all this growth is not a result of only the natural increase of population. In fact, much of the growth of urban population is due to high rate of migration of people from rural to urban areas. This also indicates a slow change in the occupations of people from primary to secondary and tertiary activities. Very often limits of municipal or city corporation areas are extended to cover neighbouring villages or suburbs.

Hal f of the total urban population of india lives only in five states. These five states are Maharastra, Uttar Pradesh, Tamil Nadu, West Bengal and Andraprades, Madya Prades, Gujarat, Karnataka, Bihar and Rajastan have more than thirty percent of urban population rest of the urban population (about 20%) is spread over the remaining states and seventerritories.

Maharashtra has highest number of people living in urban areas (5.08 crores) With an urban population of 45.23%, Maharashtra is third most urbanized among major states, behind Tamil Nadu (48.45%) and Kerala (47.72%). It was second most urbanized in 2001 Urban population growth accounted for 62.8% of total population growth in Maharashtra Mumbai, Thane, Nagpur and Pune are the most urbanized districts. Gadchiroli, Sindhudurg and Hingoli are least urbanized.

12.25 CENSUS DEFINITION OF URBAN AREA

Same definition that was used in census 2001 has been used during 2011 census also. An urban area, according to the Census definition, consists of:

1) all statutory towns : All places with a municipality, corporation, Cantonment Board or notified town area committee, etc. so declared by state law. And

2) Census towns : Places which satisfy following criteria :-

    a. a minimum population of 5000 ;

    b. at least 75 percent of male working population engaged in nonagricultural pursuits; and

    c. a density of population of at least 400 persons per sq km.

In addition, some areas falling in the vicinity of city or town are also considered as urban area if they are treated as the out growths (OGs) of the main urban unit. Such OGs are shown as urban agglomerations. As per the census definition, Urban Agglomeration is a continuous urban spread constituting a town and its adjoining urban outgrowths (OGs) or two or more physical contiguous town together and any adjoining urban outgrowths (OGs) or two or more physical contiguous town together and any adjoining urban out growths of such towns.

12.26 CENSUS 2011 - FINDINGS

As per the 2011 provisional population totals of Maharashtra, during census there are 11,23,72,972 persons of which 6,15,45,441 are in rural and 5,08,27,531 are in urban. In terms of percentages, 45.23 percent of population is in urban as against 31.16 percent at national level. The urban population grown by 23.7 percent and of rural by 10.3 percent during 2001-11. The respective figures at national level are 31.8 percent and 12.2 percent.

During the decade 2001- 11, about 1,54,94,345 population is added in the State, of this 97,26,551 is only in urban and remaining 57,67,794 is in rural. In terms of percentages 62.8

percent of population added during 2001-11 is in urban area only whereas this figure at national level is 50.1 percent.

Highest percentage of urban population (i.e., cent percent) is found in two districts viz., Mumbai and Mumbai (suburban). Other districts having highest percentage share of urban population are Thane (76.92 percent), Nagpur (68.30 percent) and Pune (60.89 percent). On the other hand highest percentage of population in rural area is found in Gadchiroli (89.00 percent) followed by Sindhudurg (87.40 percent) and Hingoli (84.83 percent).

12.27 RURAL- URBAN GROWTH RATES

It was seen in the past that the population is shifting from rural to urban due to various reasons. Growth rate of population in Maharashtra during 1991-2001 was 15.25 percent in rural and 34.57 percent in urban and collectively 22.73 percent of growth rate was found for the State as whole. The same pattern is seen in provisional totals of 2011 where the growth rate during 2001-2011 is 10.34 percent for rural and 23.67 percent for urban and collectively 15.99 percent over all.

Table-1: Percentage rate of growth of population:1991-01& 2001-11

	1991-2001			2001-2011		
T/R/U	P	M	F	P	M	F
Total	22.73	23.45	21.95	15.99	15.80	16.21
Rural	15.25	15.99	14.50	10.34	11.02	9.64
Urban	34.57	34.70	34.43	23.67	21.99	25.58

Sex-wise urban growth rate of population during 1991-01 was roughly same for both males and females (34.7 and 34.4 respectively). But during 2001-11, the growth rate of females 25.58 percent is higher than for males (21.99 percent).

12.28 LET US SUM UP

The above chapter analyze the occupational structure, literacy rate and rural and urban population. The proportion of people working in different activities varies in developed and developing countries. Developed nations have a high proportion of people in secondary, and tertiary activities. Developing countries tend to have a higher proportion of their workforce engaged in primary activities. In India, about 64 per cent of the population is engaged only in

agriculture. The proportion of population dependent on secondary and tertiary sectors is about 13 and 20 per cent respectively. There has been an occupational shift in favour of secondary and tertiary sectors because of growing industrialisation and urbanisation in recent times.

Literacy is very important for the development of the individual and for the nation as well. A literate or educated person has a high self esteem, he or she is fairly independent and is aware of his/her rights and duties and so he or she can't be exploited.

Compared to developed countries, number of cities and the ratio of population living in urban areas are very low. Just 26 percent of population lives in urban areas, as against 80 percent in England, 74 percent in USA, 72 percent in Japan, 60 percent in Russia and 52 percent in France. Ratio of rural urban population of a country is an index of the level of industrialization of that country. As the industries get momentum, ratio of urban population go on increasing. As India is predominantly agricultural country, ratio of urban population is less as compared to rural population.

12.30 QUESTIONS FOR SELF STUDY

1 Point out the occupational structure of the world?

2 To describe the Global Employment Scenario?

3 To examine trends of literacy rate in India?

4 Write short note on measuring literacy?

5 Point out the value of literacy and Educational attainment in population. Give examples. ?

6 Write short note on literacy in India. ?

7 What is Urban Area explain it?

8 Levels and trends in rural and urban population distribution?

9 To examine the Rural-Urban Growth Rates population in India?

12.29 FURTHER READING

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UNIT - 13: NATURE OF POPULATION POLICES AND POPULATION POLICIES IN MORE DEVELOPED COUNTRIES

Structure

13.0 OBJECTIVES

After reading this unit student will able to understand

- Meaning and definition of population policy
- Nature of population policies in world
- How population polices are evolved etc,.
- Characteristics of Population polices in More developed countries.

13.1 INTRODUCTION

A population policy is a set of measures taken by a State to modify the way its population is changing, either by trying to increase its size by promoting natality or immigration, or by trying to decrease its size through limitation of births . A population policy can also aim to modify the distribution of the population over the country, by encouraging migrations or by displacing populations. The French State has long been concerned by the natality of its population, which, for nearly two centuries, was lower than the natality of its neighbours. It has developed a pronatalist policy aiming to encourage births through various grants and allowances, for birth, housing, single wage-earners, etc. and to limit birth control by preventing distribution of contraception and by forbidding abortion. The birth control aspect of the French pronatalist policy disappeared in the nineteen sixties with the lifting of the bans on contraception and on abortion, and only the incentives part of the policy or "family policy" remains. Conversely, China is a State which has intervened to reduce fertility, in particular by forbidding couples to have more than one child.

Population policies are deliberately constructed or modified institutional arrangements and/or specific programs through which governments influence, directly or indirectly, demographic change. For any given country, the aim of population policy may be narrowly construed as bringing about quantitative changes in the membership of the territorially circumscribed population under the government's jurisdiction. Governments' concern with population matters can also extend beyond the borders of their own jurisdictions. Thus, international aspects of population policy have become increasingly salient in the contemporary world. Additions to the population are primarily the result of individual decisions concerning childbearing. Within the constraints of their social milieu, these decisions reflect an implicit calculus by parents about the private costs and benefits of children. But neither costs nor

benefits of fertility are likely to be fully internal to the family: they can also impose burdens and advantages on others in the society. Such externalities, negative and positive, represent a legitimate concern for all those affected. The paper briefly discusses how individual and collective interests were reconciled in traditional societies, summarizes the population policy approaches adopted by the classic liberal state, and sketches government responses to the low-fertility demographic regime that emerged in the West between the two World Wars. In greater detail it considers international population policies after World War II and contemporary population policy responses to below-replacement fertility. Population policy may be defined as deliberately constructed or modified institutional arrangements and/or specific programs through which governments influence, directly or indirectly, demographic change. The generality of the definition lends itself to varying interpretations. For any given country, the aim of population policy may be narrowly construed as bringing about quantitative changes in the membership of the territorially circumscribed population under the government's jurisdiction. Additions to membership are effected only through births and immigration; losses are caused by emigration and by deaths. Concern with this last component is usually seen as a matter for health policy, leaving fertility and migration as the key objects of governmental interest in population policy. More broadly, policy intent may also aim at modification of qualitative aspects of these phenomena—fertility and international migration—including the composition of the population by various demographic characteristics and the population's spatial distribution.

Furthermore, governments' concern with population matters can also extend beyond the borders of their own jurisdictions. International aspects of population policy have become increasingly salient in the contemporary world.

13.2 NATURE OF POPULATION POLICIES

The term 'Population Policy' refers to the legislative measures, administrative programmes and other government actions in a country intended to regulate population size and its various attributes in the larger interest of the social, political and economic goals. The United Nations has defined population policy as "measures and programmes designed to the achievement of economic, social, demographic, political and other collective goals through affecting critical demographic variables". In other words, Population Policy refers to a set of government actions-legislative and administrative-which intend to influence, alter or modify some aspects of population (Chaubey, 20001:9). It may be noted here that in addition to the

specifically designed measures, population policy also includes those aspects of overall public policy of a country that affect its demographic attributes. Thus, Population policy embraces both direct as well as indirect measures that influence demographic variables for the achievement of the desired national goals. As it actually happens, in many cases, a population policy is not explicitly stated, but is found contained in many of the programmes launched by the government, or in legislative measures, which are adopted by it (Chaubey, 2001:9). Also interesting to note that in most of the cases, when it is explicitly stated, attention is focused upon regulating the size of population, i.e., to maintain the numbers, or to increase or decrease it. Nevertheless, concern regarding the composition and geographical distribution of population also forms a crucial part in a population policy. The desired national, social, economic and political goals of a country can be achieved through any or more of the three components of population change, namely, fertility, mortality and migration. Needless to say that through these components not only the size and numbers but also the composition and geographic distribution of population in a country can be regulated in a desired direction.

Government concern over issues related to size, distribution and characteristics of population is not a phenomenon of the modern times alone. Even, during the ancient periods, state interventions in the form of laws or decrees governing size and growth of population existed in some of the earliest civilizations in the world. Ancient Greeks, for instance, were particularly concerned with the size and quality of their populations. Similarly, early Romans, characterized by a fertility cult, had state-sponsored provisions of a number of privileges to the married couples with children, while at the same time additional financial burden in the form of taxes used to be imposed on the childless couples and unmarried persons. These provisions were aimed at encouraging procreation. Later, under the influence of mercantilism, which equated power and prosperity with the large size of population, most of the European countries adopted measures encouraging marriage and procreation. In such countries, while immigration was always encouraged, emigration was completely banned under the state law. The pro-natalist population policy reached a climax in some of the European countries like Germany and Italy during the intervening period between the two wars. Closely linked with the political and territorial ambitions, the populationist policies of these counties were implemented in the form of certain rewards and incentives to the families with large number of children. At the same time, birth control measures were suppressed under the pro-natalist policy. A similar policy existed in Japan also during the period. All the measures adopted by these countries reflect the drive for large native and racially 'pure' populations.

In countries like France and Austria also strict measures were taken to encourage growth in population. In these countries, however, the pro-natalist approaches were backed by a different rationale. These countries were experience in excess of death over births, which posed an imminent threat of population decline. Consequently, the attempt to sustain or increase the birth rate got linked to the development programmes in France and Austria. Unlike the case of Germany and Italy, the policy measures in France and Austria were not expansionist in the imperialist sense, but were necessitated by the threat of population decline. Similar pro-natalist policies existed in the erstwhile USSR and some East European countries also. The expansionist policies in these counties stemmed from the works of Marx and other socialist writers, who strongly argued that the problem of 'over population' is unique and inevitable feature associated with capitalist mode of production.

In the Post-World War II period, with the emergence of large number of independent nations, population policies representing a different point of view began to develop. All the newly emerging nations, which were earlier colonies of one or the other European power, were characterized by mass poverty and underdevelopment. In many of these developed countries death rates had begun declining rapidly in the wake of the spread of large-scale preventive and curative measures developed in the west. Since birth rates continued at a very high level, these countries began experiencing population growth at rates hitherto unknown in entire human history. It was increasingly being realized that all efforts to raise the standard of living would be jeopardized if rapid increase in population were not checked. Policies favoring stable or declining population begun to evolve in some of the most densely populated countries including India. In the period leading up to the International Conference on Population and Development (ICPD), "population policy" might well have been defined as:

> "A deliberate attempt by government to influence one or more of the key demographic parameters, fertility, mortality and migration" (Isaacs, Cairns and Heckel, 1991).

In theory, such an effort at social engineering might be attempted through a whole range of direct and indirect policy interventions which could impact on the demographic

objectives of the government in a desirable way. For example, nutrition and health improvements could be expected to raise life expectancy and lower mortality, especially infant and child mortality; industrial, infrastructural and locational policies might be expected to change the set of constraints and incentives facing entrepreneurs and individuals and help to determine where they locate their businesses and families; and patterns of fertility could be influenced by efforts to change desired family size (through population education and information, education and communications interventions) and the establishment of family planning services to meet the contraceptive needs of individuals and couples wishing to space or limit the size of their families.

In practice, however, a specific fertility goal – especially reduced fertility in order to lower the national population growth rate – invariably became the prime objective of early national population policies. Indeed, rapid population growth continues to be viewed by many political leaders and academics around the world as a serious impediment to the realization of the goal of socio-economic and sustainable development and a national population policy has often evolved as a response to such conceived constraints. Such a reduced national population growth rate has become the overriding concern of many population policies. After early warnings from academics, a few politicians and otherwise concerned citizens about the likely deleterious consequences of rapid population increase for achieving socio-economic development, it often took years for a national population policy to be officially adopted and effectively implemented because key senior Government officials, principally the head of state or head of government, remained unconvinced.

Yet, Ibrahim and Ibrahim (1998) for Egypt, Visaria and Chari (1998) for India and Ajayi and Kekovole (1998) for Kenya have narrated how, even after the adoption of formal population policies, their effective implementation depended heavily on key political figures – Presidents and Prime Ministers – first becoming convinced that population growth presented a constraint on national development and then becoming pro-active to promote the implementation of the policy.

Thus, in a traditional, pro-natalist cultural environment, the launching of an anti-natalist, 'top-down' population policy took much courage and political conviction (Jain, 1998). Meanwhile, religious leaders, nationalists and traditionalists often could be relied upon to voice fierce opposition. The rationale for the policy was sometimes explained in terms of the aggregate benefits for the nation from having a lower dependency ratio, with a concomitant reduction in the need to cater for an ever-growing population demanding social services

including education, health services and jobs. Such social investment could then be redirected to improve the quality of such services already provided as well as to raise the rate of economic growth via investment in directly productive activities. The health benefits accruing to the individual family, particularly the mother and her children, from better spacing of pregnancies and reducing the number of births, were highlighted as a means of rationalising the use of contraceptives and family planning.

Because of the emphasis given to the goal of reducing the national population growth rate, population policies invariably became identified with the provision of family planning services and responsibility for implementation vested in Ministries of Health. These policies, in turn, were 'sold' to a suspicious and skeptical public as part of a Maternal and Child Health (MCH) programme, whereby the use of contraceptives to space children – but not necessarily to limit childbearing – would have beneficial effects for the health of mothers and their children. Yet, couples who maintain strong desires to produce large families are unlikely to adopt family planning methods despite their ample provision. Thus, population policies incorporated activities to change family size attitudes through information dissemination to the public at large, stressing the health and economic benefits to the family from the adoption of family planning. The introduction of a population education syllabus in schools also attempted to form smaller-size family norms in children at an impressionable age. Trade unions, cooperatives, workplaces and women's groups became the targets of IEC activities in many countries.

Meanwhile, progress in economic development, as reflected by such social indicators, as increased literacy, higher school enrolment rates, particularly for girls, resulting in a delayed age at first marriage, urbanisation, greater diversification in employment opportunities, again particularly for girls – as well as declining infant mortality and rising household incomes, all contributed to lowering desired family size and the greater likelihood of couples adopting family planning methods, especially the use of modern and effective contraceptives.

Much has been written about the relative importance of family planning service provision versus improvements in these development indicators in inducing a demographic transition and fertility decline (Mauldin and Ross, 1991; Pritchett, 1994 a and b; Knowles, Akin and Guilkey, 1994). We would argue that attributing the demographic transition solely to either family planning programmes or to socio-economic development is a pointless and trivial exercise. The shaping of fertility goals and the decision to adopt family planning and the use of contraceptives are highly complex human decisions and depend on a multitude of closely

interrelated social, cultural and economic influences. Attempting to unravel the relative strength of demand and supply-side factors is a fruitless task.

The effective implementation of a comprehensive population policy, incorporating the priority objective of lowering fertility and reducing the national rate of population growth, clearly depends on successfully constructing an efficient family planning programme as well as making progress in many of the indicators of development that would serve as instruments to induce a change in the demand for children. For the effective implementation of such a broad-based policy, a government would need to mobilise a multi-sectoral, cross-ministerial, integrated population programme that would incorporate many of the essential policy instruments to be utilised to attain the desired national demographic goal. Worldwide, such integration and coordination in policy implementation has been extremely rare.

Indeed, nowhere has population policy implementation ever commanded such a high-profile campaign-like adherence across ministries and sectors, as well as involving some of the actors in civil society, such as NGOs. Perhaps a cause and a consequence of this non-collaboration has been the manner in which population-related issues have been conceived as the sole responsibility of the Ministry of Health or, in particular, of a vertically constructed, stand-alone family planning programme in the national Health Ministry. Yet, Governments have often attempted to create multi-sectoral National Coordinating Committees and at a higher level of seniority, National Population Councils, made up of Cabinet Ministers and/or Permanent Secretaries or their equivalents as Departmental Heads, to oversee and give direction to the implementation of the population policy. However, representatives of the Ministry of Finance, holding the purse-strings of any policy implementation plan, have been frequently overlooked as members of such coordinating bodies. The result has been that the Councils or Committees became 'talking-shops' and lacked the necessary teeth and spending authority to effectively implement the policy. Nor has membership of these coordinating bodies been at a consistently senior level to influence the patterns of investment in other ministries and sectors, which would have promoted the attainment of the goals of the population policy. Indeed, only if population policy were being implemented and monitored at the Cabinet level of Government could such intersectoral coordination of expenditure patterns have been realised. Again, this would require very senior political commitment to address national population issues and a bureaucratic mechanism to ensure consistency between population policies and other social and development policies.

Furthermore, linkages from the central policy coordinating body to the state, district

and community level, where the practical implementation of policy is effected, have often remained weak. Local level officials have not been readily apprised of policy-decisions made at the centre, and data and information collected at the local level, which are essential for monitoring the progress made in policy implementation and for changing policy direction at the centre have been frequently sparse and inadequate. Failure to convince community and religious leaders of the significance of population-related problems at the national and local level has contributed to the relatively low profile of population issues and the slow rate of implementation of policy.

No doubt, the international climate for population policy formulation has had a significant impact on the evolution of national policy. At the 1974 World Population Conference in Bucharest some of the LDCs emphasized that economic development is "the best contraceptive" as opposed to the construction of family planning programmes. Yet, population policies continued to be centred in family planning programmes while interventions to improve health, education, the environment, and issues of employment generation, were espoused on their own merits and incorporated as goals of national development plans without articulating the linkages to population policy. Demographic dynamics and population policies were never adequately integrated into the national development planning process in most countries, reflecting the failure of population issues to rise to the top of the policy agenda.

The 1984 International Population Conference in Mexico endorsed the importance of family planning programmes to attain the goals of fertility reduction and a decline in the national rate of population growth. As fertility has declined in many parts of Asia and Latin America in the past 2-3 decades, and some countries in Africa are experiencing the onset of a demographic transition, family planning programmes have indeed registered considerable success according to this criterion. Yet, some programmes in Asia were criticized for introducing targets and quotas for individual service-providers which may have led to incidents of coercion in some cases, particularly in India. At the same time, socio-economic change has also contributed to changing fertility desires at the household level, resulting in reduced childbearing and falling population growth rates.

13.3 POST-ICPD 1994

The International Conference on Population and Development held in Cairo in 1994 and its Programme of Action (POA) is credited with marking a paradigm shift in the emphasis given by the international community and national governments to the importance of improving

the state of individual well-being, especially women's reproductive health. Although mention is made in the ICPD's POA of "the crucial contribution that early stabilization of the world population would make towards the achievement of sustainable development" (UN, 1994 para. 1.11), reduced population growth does not feature as a major objective of the POA.

The result has been that the principal goal of population policies, at least for the principal UN population and development agencies, has now shifted to an enhancement of individual well-being. A reduced rate of population growth, perhaps induced through an improved reproductive health status of women, through greater gender equity, equality and the empowerment of women, and a wider, more informed choice and greater uptake of modern contraceptive methods, is conceived to be an intermediary objective, automatically following on from the attainment of these health and gender goals, all of which contribute to the overriding goal of improved individual well-being. And implementation of programmes to attain the latter – most notably reproductive health and family planning programmes, which may have the incidental effect of reducing rates of population growth – must respect basic human rights. Because reproductive health is conceived to be a basic human right, under no circumstances should quotas for service providers, demographic targets for policy makers and planners, and incentives for clients, be employed in population policies and reproductive health and family planning programmes.

The POA recognizes women's education, equality and empowerment as paramount and family planning should be provided within the context of full sexual and reproductive health care. Coercion, violence against women and discrimination are to be eradicated. In addition, the POA recognises the central role of sexuality and gender relations in women's health and rights. It assets that men should be fully involved, without veto powers, in decisions involving fertility, sexual behaviour, sexually transmitted disease prevention and the welfare of their partners and children, and recognises unsafe abortion as a major public health issue. The neglected sexual and reproductive health needs of adolescents must be rectified and they should become prime targets in reproductive health programmes.

Furthermore, population is conceived as part of the necessary investment in people, without which no solutions to development and environmental problems will be found. A clarion call is made for the education of girls, while women must be treated as equal partners in development. The reduction of infant and child mortality, the promotion of safe motherhood, the assurance of access to quality family planning services, tackling the problems of STDs, particularly HIV/AIDS, and the provision of clean water and adequate food and nutrition, are

all related to improved reproductive health. Some critics, however, have argued that traditional family planning programmes were down-played and marginalized in the wider context of reproductive health by ICPD (Caldwell, 1996; Kane, 1999). They lament the seeming lack of attention to family planning by the POA since they argue that contraception is the major component of preventive health interventions and is worthy of greater recognition in strategies to improve reproductive health.

Can and should the newer vintage population policies incorporate such a worthy and ambitious agenda? And to what extent should a reproductive health programme actively encourage individuals to have fewer children in the context of improving their reproductive health status, rather than merely providing the services for birth control and informing them about the mechanics of safe and effective birth control?

13.4 CONSTRAINTS ON POPULATION POLICY IMPLEMENTATION

Jain (1998) has suggested that broader public policies to affect human behavioural change have generally not been very successful in developing countries. He suggests that this was often due to the absence of a charismatic leader who could generate public sympathy for unpopular causes. This was particularly pertinent for population policies in post-Independence Africa and, as we shall suggest later, in the Pacific Island countries. In Africa, ex-President Kenyatta in Kenya was openly pro-natalist despite his country having the highest population growth rate in the world and, at the same time, an explicit population policy which was being implemented in a lukewarm fashion by an indifferent bureaucracy. Elsewhere in Africa, Presidents Sadat, Nyerere, Nkrumah, Kaunda, Banda, Mobotu and Mugabe of Egypt, Tanzania, Ghana, Zambia, Malawi, Zaire and Zimbabwe, respectively, were never readily supportive of anti-natalist population policies and failed to utilize their own personal charisma and popularity to further the policy goal of lowering the national rate of population growth. In India, the opposite was the case to some extent, with the excesses of the Indira Ghandi administration of the late 1970s, including quotas and targets for service providers and often forced sterilization, retarding the long-term objectives of the policy. In the Pacific island countries no post-Independence political leader has publicly addressed population issues in a consistent and explicit manner.

Bureaucratic inefficiencies have also contributed to the failure of old-style population policies through the inadequate allocation of resources to the implementation of a policy, poor quality and inadequate access to resources, and the establishment of unrealistic goals.

Only when a large majority of men and women want small families and the policy is efficiently implemented through the availability of fertility regulation mechanisms can a population policy which has a fertility-reducing objective be effectively implemented.

In contrast, the ICPD strategy implies the need for a more balanced, comprehensive, and humane approach to the reduction of fertility and population growth. At the heart of the strategy to ultimately stabilize the size of world population is the realisation of gender equality. Development policies which reduce gender disparities in the sectors of health, education and employment need to become the primary goal. But advocates of traditional population policy might ask: is this the most cost-effective way to reduce fertility and national population growth? Advocates of the ICPD POA would respond that gender equity and the empowerment of women must stand in their own right as desirable development objectives. At the same time, the ICPD emphasized the need to provide a wider choice of contraceptive methods within a broader range of reproductive health services. Yet, the ICPD POA stressed that public policies to establish gender equity and improved reproductive health services should be justified as basic human rights and desirable ends in themselves, and it did not dire- ly link these goals to national and international concerns with reducing population growth.

One major problem with past population policy implementation around the world has been that the single agency most concerned with reducing the rate of population growth, usually a Population Planning Unit housed in the National Planning Office, has had neither the status, control nor influence over the development expenditures of the principal development-oriented Ministries and Departments that are supposedly responsible for implementing gender-sensitive social and economic policies. Nor do departments responsible for family planning have any leverage over the allocation of funds necessary for women to be empowered in order to exercise their reproductive choices voluntarily, in accordance with the goals of the ICPD. Unlocking these constraints would facilitate the implementation of newly conceived population policies in an effective manner.

"Consequently, when discussion occurs between a donor and a government about issues related to population policy, it takes place between the department of family planning and the officer in charge of population within the donor organization. This limits the scope of discussion to the issues related to service delivery. The implementation of a broader population policy would require that such discussions take place between parties responsible for the entire development process. It would then be possible to place the need to implement gender-sensitive social and economic policies on the agenda of both groups – those interested in reducing population growth and those interested in economic development" (Jain, 1998, p.198).

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Unfortunately, no bureaucratic mechanism seems to exist in practice to ensure compatibility between the goals of population, health and reproductive health, and development policies. In theory, a truly multi-sectoral policy requires interventions by all the key players; in practice, 'population' has very often been identified with 'family planning' whose principal stakeholders and officials have only a mandate to implement a family planning programme, and not an all- embracing population policy as part of an overall development policy and programme.

13.5 POPULATION POLICIES OF MORE DEVELOPED COUNTRIES

Although birth control measures are universally practiced in more developed countries, yet very few such countries have formulated explicit national policy on population growth, apart from enacting laws regulating international migrations. Some European courtiers. Still have pro-natalist policies based on their concern about population decline. However, many laws and regulations enacted for economic, health, and welfare reasons do have demographic implications. These include laws governing the availability of contraceptives, sterilization abortions marriage divorce income taxes family allowances and immigration.

The United States does not have a specific population policy, although there are various laws that regulate immigration and as such have demographic consequences. Until 1960s the population policies, if any, in the United States, were implicitly pronatalist. It was in 1970 that the family planning services and population services and population research act was passed with an objective of extending family planning services to all those who needed them. In 1972, the United States Commission on Population Growth and the American Future concluded that there were no substantial benefits to be gained from continued population growth and that indeed there were many serious disadvantages. This commission recommended liberalization of abortion laws and many other population related policies. It strongly recommended that the contraceptives be made available, to all, including minors; that hospital restrictions on sterilization be relaxed; that sex education be made universally available; and that health services related to fertility be covered by health insurance. The most important recommendation of this commission was that the country should plan for a stabilized population. Unfortunately, nothing much has been done at official level to implement these recommendations. It is interesting to note that although the United States has not hesitated to advocate anti-natalist policies in less developed countries, yet it has not established one for itself.

The Population policies in Canada have been on the similar lines as those in the United States. In Canada, it was in 1969 when a government family planning programme was launched. Consequently, prohibitions on distribution of contraceptives were withdrawn and abortion was made more liberal, though easy access to abortion in Canada is by no means a reality. Canada has been more concerned about the role of immigration in its population growth. Canada is currently promoting liberal immigration policies with a view to meeting its labour shortages especially of professionals.

Most of the West European countries have no official population policy other than the Pro-natalist policy, which in most cases is the legacy of pre-world war II concern for slow growth. Europe has had a long tradition of use of contraceptive methods. However, till recently, only the traditional contraceptives were in use, although use of pill has increased recently. Sweeden has been an exception in European countries in the sense that it has an official population policy since 1930s. The Population policy of Sweden has advocated for sex education in schools, abortion under some circumstances and family planning services as part of the national health organization.

In England, it was in 1974 that contraceptives and abortions received official recognition. In most of the Catholic countries, birth control measures have remained illegal, though late marriage; illegal abortions, rhythm method etc. have helped these countries in keeping their growth rates low. In France, Belgium and Netherlands, till recently, dissemination of family planning materials and information was hampered by laws. France legalized contraceptives in late 1960s. The birth control devices are still illegal in Ireland, Spain and Portugal. Italy has legalized the pill for medical purpose. It was in 1975, that new laws authorized the governments to promote family planning in Italy.

In Russia, the communist ideology officially called for a pro-natalist population policy and the government encouraged people to have more children by way of number of economic incentives and rewards. In the European countries also, pronatialist policies are being followed mainly due to their concern about future labour supplies.

Australia and New Zealand have considered themselves as Under-populated. Therefore, their policies have been pro-natalist and por-immigration. However, the recent concern about the population in the world led to the establishment of zero population growth movement in Australia in 1971. The growth pattern of Australia and New Zealand compares fairly well with those of the West European countries, although it is inflated by high immigration rate.

Japan is the only country in Asia, which has been successful in reducing its birth rate to the level of the developed counties, largely by legalizing abortions. The population policy of Japan, which was promoted through massive educational and community programmes in 1950, strongly discouraged a family with more than two children. Consequently, the fertility level of Japan has been close to the replacement level since then. The labour shortages in Japan in 1970s caused an alarm and the Japanese industry started campaigning for bigger

families. Fortunately, the post war baby boom children were in their twenties, the prime reproductive period, and the marginal fertility rise effectively silenced the campaign for higher fertility.

The Preceding discussion reveals that the explicit policies in the more developed countries are the exceptions. Wherever legal provisions affecting demographic trends have existed, these have generally been indirect. Since late 1970s, however, most of the developed countries are liberalizing their laws against abortions. This is more true of West European countries, France, Germany, Austria, Denmark, Finland, Norway, Iceland, Greece Italy, Netherlands, Switzerland etc.,

13.6 GOVERNMENT POLICIES (Related to Population control) IN DEVELOPED COUNTRIES

13.6.1 Europe and Northern America

Nearly three fourths (73 per cent) of European countries provided either direct or indirect support for contraceptive methods by 1996. By 2001 the proportion rose to 88 per cent. Ireland, the last country in Europe to permit the use of modern contraception, began providing direct support in the early 1990s. Several countries, however, provide no support for contraceptive methods, including Andorra, Germany, Greece, Italy, Slovakia and Switzerland. Others—for example, Bosnia and Herzegovina, Czech Republic, France, Luxembourg and the Netherlands—provide only indirect support. The majority of countries, however, provide direct Government support for contraceptives.

In Eastern European countries, liberal abortion laws were enacted during the 1950s, and by the mid-1970s, abortion ratios in Eastern Europe and the Union of Soviet Socialist Republics were among the highest in the world (United Nations, 1992). Abortion became a major means of birth 26 regulation, partly because modern contraceptives (other than condoms) were essentially unavailable. Only, in the 1980s, did the situation begin to improve (United Nations, 1996). Prevalence rates for modern contraceptives, however, continue to be low in Eastern Europe compared with rates in other developed countries. Following the dissolution of the former Union of Soviet Socialist Republics and Yugoslavia, and the division of Czechoslovakia, the number of countries that provided direct support for family planning through Government facilities increased significantly. A more recent development, in the second half of the 1990s, is the shift from direct to indirect support, as the State partially withdrew from health and welfare activities in former communist countries. Furthermore, in many countries

of Europe, the widespread use of modern contraceptives and the increased involvement of non-governmental organizations and the private sector have contributed to a decline in Government support. Countries that shifted from direct to indirect support between 1996 and 2001 include Austria, Canada, Denmark, Kazakhstan, Latvia and Lithuania.

The United Nations Economic Commission for Europe (ECE) has convened a series of intergovernmental meetings on population-related issues and policies over the last three decades. The regional preparatory meeting for the Bucharest conference was held in Geneva in 1974 (United Nations, 1974c); the regional event for the Mexico City conference was conducted in Sofia in 1983; and consultations leading to the ICPD in Cairo were held in Geneva in 1993 (United Nations, 1994c). The regional meeting in 1974 was one of the first among the member States of the ECE to address broad population questions from a policy point of view. Many delegations were concerned about declining population growth in some countries in the region, as well as high population growth in less developed countries. However, there was full agreement that population policies should be integrated with development policies as a whole and that "nations have the sovereign right to determine their population policies" (Principle h). Reference to family planning and contraception was made in the framework of maternal and child health care: "good maternal and child health contribute to the well-being of the family and the nation and are facilitated by small numbers of births" (Principle f). It was also mentioned in the context of improving the status of women: status would be improved by giving women "the opportunity to plan births" (Principle g).

An emphasis on curbing population growth rates in the countries where they were still high was included in the Recommendations for Action in the final document.

In the early 1980s many Governments realized that their countries were experiencing major demographic changes. Declining fertility resulted in low population growth and the ageing of their populations. These topics, as well as several others, such as the high number of unwanted pregnancies in some member States and questions of population distribution and internal and international migration, were priority areas dealt with at the Second Regional Meeting on Population in 1983 (United Nations, 1983). Family planning was also discussed at this meeting, and all participating Governments considered that it was "a fundamental right of all couples and individuals to decide freely and responsibly the number and spacing of their children" (recommendation 32). They further considered that access to relevant information as well as to effective means of birth control should be assured by the Governments (recommendation 37). With regard to the need for international cooperation, all heads of

state supported the view that "the rate of population growth in many developing countries is still very high and continues to be an important obstacle to the improvement of life" (recommendation 66). Delegates strongly endorsed the call to increase international assistance for population activities.

The European Population Conference, held in Geneva in 1993 (United Nations, 1994c), continued to endorse reproductive health and family planning (recommendations 8 to 10), but it was now in the context of reproductive rights and reproductive health. The conference recommended that Governments adopt measures to make available efficient family planning methods to all in need and to provide access to appropriate information and services related to reproductive health through governmental and non-governmental channels. It was stressed that all services should be available only upon request and that no "coercive, discriminatory or prejudicial approaches" should be applied (recommendations 56 and 57). As was the case in 1983, all Governments strongly supported the continuation of international cooperation in the field of population services (recommendation 47) in developing countries.

There is no direct relationship between the level of governmental support and the use of contraceptive methods in Europe. Some countries with supportive policies do not necessarily have the highest prevalence rates. This is the case in Belarus, Poland, Portugal, Romania and Ukraine. Countries that have continuously supported family planning services, such as Canada, the United States and the Scandinavian countries, are more likely to have high prevalence rates.

13.6.2 Australia, New Zealand and Japan

The Governments of Australia and New Zealand have had similar views on their level of fertility. Both countries have considered the level of fertility to be satisfactory sine 1976. In Japan, however, the Government changed its view in 1996 from satisfactory to too low. The three countries do not intervene to modify fertility, but all provide some support for access to contraceptive methods. Support in Australia has been indirect since 1976; Japan and New Zealand, which both provided direct support in 1996, changed to indirect support in 2001. The low birth rate in Japan led the Government to propose legislation in 2002 that would review working conditions of both men and women with the aim of making careers more compatible with child rearing. All major companies would be asked to develop plans to improve child-care leave, provide shorter working hours for parents and offer work-share arrangements. The plan, known as the Plus One Proposal to End the Low Birth Rate, would encourage couples to have an additional child.

In Australia, a range of family-friendly measures aims to allow parents to choose between labour market activities or child-rearing, although options for part-time work and flexible working hours are not widely available. Social support is targeted on low-income families and especially single parents (OECD, 2002). Recent data indicating that Australia's total fertility rate had dropped to 1.73 children per woman have increased pressure on the Government to implement a scheme for paid maternity.

13.7 LET US SUM UP

In more developed countries the population policies is at replacement level and created a problem of ageing, these ageing problems are due to the social securities and medical facilities. It is awareness to the future population geographers to give more focus on the problems of population of these developed countries.

13.8 KEY WORDS

Pro-natalist anti-natalist

Population policy

13.9 QUESTIONS FOR SELF STUDY

1. Explain the meaning and nature of population policy.
2. Discuss how general developmental policies of the government influence on population control.
3. Briefly analyse population polices of the More Developed countries in the world.

13.10 FURTHER READINGS

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UNIT -14: POPULATION POLICIES IN LESS DEVELOPED COUNTRIES

Structure

14.0 OBJECTIVES

After reading this unit student will able to understand

- To Understand Population policies in less developed countries.
- To know the characteristics of Population policies in Less Developed countries.

14.1 INTRODUCTION

The explosive growth of world's population, with its consequent demand for more foodstuffs, keeps the world in a state of perpetual crisis. The Greek Revolution in different parts of the world, which brought out more productive cereals, like the 'miracle-rice' in Philippines and Sri Lanka and 'wheat' in Mexico, India, Pakistan, let the populationist score a point only temporarily over the pragmatism of the conservationists who consider stabilized population as an issue of great priority (Chandna, 1979, P-355).Japan, which achieved perception decline in the birth rates mainly through abortions, still remains the prime example of the East to have contained the crisis successfully.

Ironically, the population control measures in the recent past have not been very effective in the largr sized less developed countries like india, china, Indonesia, Pakistan, Bangladesh where the crisis is felt most strongly. In such countries the problems are several: the numbers are great, the annual increment is substantial, the masses are illiterate and the majority of population continues to struggle to wrest a meager harvest from small landholdings with slowly improving farm technology. Under the circumstances the measures of greater productivity still appears to lie in more manpower, and that inhibits the acceptance of the concept of small families. In such societies, not only is the realization about the need for birth control measures meager but also the dissemination of the required information and devices to control births is slow and difficult.

Any programme for successfully alleviating the set of problems described in the foregoing paragraphs must include measures to control thr growth of population. the possible objectives of such measures in order of their possible achievement would be:

i. To reduce the size of population growth rate not necessarily to zero;

ii. To stabilize the size of population by achieving a zero population growth rate; and

iii. To achieve a negative rate of growth with a view to reducing the size of population.

Given the present socio-economic milieu, there would be perfect agreement among scholars that the only humane way of achieving any of the above mentioned objectives would be to reduce the birth rate instead of permitting the death rate to increase. Given this consensus that curbing of population growth is necessary and that limiting births is the best approach, there may be very little agreement on as to how far and how fast the population limitation should be achieved.

Those who advocate the achievement of the first objective mentioned above recognize the obvious adverse consequences of rapid population growth, i.e., dilution/neutralization of economic progress in less developed countries, and aggravation of environmental and social problems in both developed and less developed countries. Those who are for achieving the second objective of zero rate of population growth recognize that earth's capacity to support human population is limited and many problems are related to optimum population size rather than to its rate. Once the objective of optimum size of population is accepted, it would appear that the population size in the world has already crossed the limits for which the earth has the capacity to support. Therefore, there is an urgent need to control the rate of population growth. The third objective of reducing the existing size of human population is perhaps the most controversial. Accepting this objective would mean that the optimum size of population that the earth can ever support has already been achieved. Hence there is need to reduce the growth rate to lower than the replacement level.

Given the threat to the environment posed by today's population and given the standard of living suffered by larger section of today's world population, it is clear that the human population is already above the optimum size. How far above the optimum size is, of course, difficult to determine. It is also conceivable that technological and social changes in the coming future may push up the optimum to some extent. More probably the population size shall have to be reduced eventually to ensure better quality of life for all. Whatever may be the approach of future population policy, the objective would be the same, to gain control over population growth.

14.2 POPULATION POLICIES OF LESS DEVELOPEDCOUNTRIES

Since most of the less developed countries are experiencing population explosion, family planning programmes have been officially adopted by their governments. Some of the

counties like China, India, Indonesia, Pakistan, South Korea, Sri Lanka, Singapore, Tunisia, Egypt have gone beyond family planning progrmme and have adopted social policies to supplement family planning. Most of the less developed counties, which have adopted population policies, have aimed at a growth rate of around 1 percent.

On the continent of Africa, one finds the most rapidly growing nations of the world. The concern over rapid growth and action to curb it is still in the formative stage in most of the African Counties. Since many African countries still have a very high death rate, the interest in population control remains low in these countries. A belief that more people are needed for development is still quite common among African counties south of the Sahara. It is interesting to note that the countries, which are former English colonies were first to establish family planning policies while the countries, which were colonies of such Catholic nations as France, Belgium, Spain, Italy and Portugal still lag behind. Kenya and Ghana have the distinction of having the oldest and the strongest family planning programmes. Nigeria, the most populous country had just begun to show interest in family planning programmes in late 1970s. Some North African countries like Egypt, Tunisia and Morocco have fairly strong antinatalist policies. Credit must be given to Tunisia, which despite being an Islamic country has come out with a bold population policy of banning polygamy and legalizing abortions, apart from many other measures. The former French, Portuguese and Spanish colonies of Africa have also started adopting favorable family planning programmes.

Most of the Latin American countries, though experience high population growth, have been very reluctant to accept population growth measures. The influence of the Roman Catholic Church and wide spread belief about the vast untapped resources of the continent are the chief factors responsible for such a reluctance. The Latin American counties are propagating family planning mainly on health and welfare grounds and as a means of reducing illegal abortions. Some countries have now started realizing the implication of galloping population growth rate. Chile Colombia, Caribbean and Central American countries have not adopted explicitly and natalist policies. At the other extreme, Brazil and Argentina still have policies promoting high population growth. Brazil does not permit private family planning groups to operate.

Asia, accounting for over half the population of the world, presents a widely varied picture with regard to population policies. China, India, Indonesia, Thailand, Sri Lanka, Hong Kong, Singapore, South Korea etc. Constitute one extreme where strong family planning policies are supplemented by variety of social and economic measures. No wonder, these countries

have recorded a substantial decline in their fertility rates. Pakistan, Bangladesh, Nepal, Malaysia and Philippines have also adopted family planning programmes but the impact has been negligible so far. Countries like Mynamar, Cambodia, Vietnam and Southeast Asian countries still seem to be pursuing pro-natalist population policies. Countries of the Middle East are also largely pronatalist in their outlook, except Turkey and Iran. Countries like, Iraq, Jordan, Lebanon, Syria seem to be interested in family planning services for health reasons only. Afghanistan does not seem to be concerned about population problem. Israel continues to favour rapid growth for obvious reasons. Saudi Arabia lies at the other extreme and has outlawed the import of contraceptives.

14.3 GOVERNMENT POLICIES (related population control) IN LESS DEVELOPED COUNTRIES

14.3.1 Africa

With the exception of Equatorial Guinea, Gabon and Libyan Arab Jamahiriya, all countries in Africa either directly or indirectly support the distribution of contraceptives. The large majority of these countries—48 out of 53—provide direct government support for the distribution of familyplanning methods, whereas several countries—Somalia in Eastern Africa, Cameroon, Central African Republic and Chad in Middle Africa and Sierra Leone in Western Africa—make contraception available by supporting the activities of non-governmental agencies.

In the early 1970s, the situation was quite different (UN ECA, 2002a). Only 26 countries out of 48 provided direct or indirect support for contraception, while almost half the countries prohibited contraception. The earliest support for contraceptive methods was in the countries of Southern and Northern Africa. The countries of Middle and Western Africa have traditionally given little support. One reason for the lack of support was the perception in the 1970s that Africa was under populated, and that overpopulation was mainly a matter of uneven spatial distribution. Only a few countries in Africa had explicit population policies targeted towards curbing population growth. Several countries supported family planning programmes as part of basic reproductive health services, but most of this support was indirect and was channeled through NGOs. This approach was preferred even by countries that had no explicit policies in place to alter population growth or fertility. By the mid 1970s, nine countries (Democratic Republic of the Congo, Ghana, Kenya, Madagascar, Mauritius, Seychelles, Uganda, United Republic of Tanzania and Zambia) had adopted legislation that

was supportive of family planning. In Southern Africa, all countries excepting Namibia, which only gained independence in 1990, were early supporters of contraception. Countries in Northern Africa, with the exception of the Libyan Arab Jamahiriya, were also early supporters of family planning. Most Governments, however, believed that problems related to population were due to a lack of economic growth and development. This was the essential message of the First African Population Conference held in Ghana in 1971. The conference also acknowledged the need for trained professionals in demography and demonstrated that African Governments were becoming increasingly more aware of population problems. Some Governments, particularly in the francophone countries of Middle and Western Africa, had pronatalist policies inherited from their colonial past. Family planning activities and contraceptives were not permitted in the former French colonies because of the existing 1920 French law forbidding both abortion and the promotion of contraception. This situation has changed over time. Countries have either repealed the law or no longer enforce it. A pioneer was Tunisia, which in 1961 repealed the former colonial law that prohibited the advertisement of contraception. Among the francophone countries to follow suit were Mali in 1972, Cameroon and Senegal in 1980, Côte d'Ivoire in 1982 and Burkina Faso in 1986. All these countries abrogated laws that had made contraceptives illegal.

In many African countries, family planning services and contraceptives first became available after the Alma Ata Conference in 1978 (WHO, 1978), when many Governments, particularly in Africa, adopted a primary health-care strategy with integrated family planning services. This approach provided the framework for countries to re-orient official policies: contraception was made available as a way to assist couples to have the number and spacing of children they desired, and as a means to improve the quality of life for women and children in particular. Thus, Governments such as Benin, Cameroon and Mali, which while pronatalist, began to provide indirect support for family planning services. A major milestone in the history of contraceptive policies was the Second African Population Conference held in Arusha in early 1984 (United Nations, 1984). This conference was also an essential part of the preparatory process leading up to the international conference in Mexico City later that year. The Arusha Conference adopted the Kilimanjaro Programme of Action, which provided the framework for the formulation and implementation of population policies and programmes in Africa. The Programme of Action was still strongly linked to the socio-economic development of the region, but it increasingly recognized the importance of family planning services. Recommendations concerning family planning included the following:

1. Governments should acknowledge that family planning and child spacing strengthen the stability of the family

2. Countries should incorporate family planning services into maternal and child health-care services;

3. Governments should ensure the availability and accessibility of family planning services to couples or individuals seeking them and should offer services free or at subsidized prices

4. Governmental national family planning programmes should make available a variety of methods to allow choice to all users.

5. The integration of family planning programmes into maternal and child health services during the late 1970s and early 1980s put new emphasis on allowing Governments to assist couples.

6. To plan the size of their families and the timing of childbirth. This provided an incentive for some Governments with restrictive policies to revise their policies.

The clear endorsement of family planning programmes, both in the Kilimanjaro Programme of Action and the Mexico City recommendations, gave Governments a strong rationale to modify their stance. Some Governments moved from prohibiting the distribution of contraception towards official support. For example, in Eastern Africa, Burundi, Comoros, Malawi, Somalia and Zimbabwe began providing support, as did Cameroon, Central African Republic and Sâo Tome and Principe in Middle Africa. In Western Africa, Guinea and Niger also modified their policies in this direction. Some countries that had permitted the distribution of contraceptives through NGOs, established Government facilities to provide family planning services. These countries included Angola, Democratic Republic of the Congo, Ethiopia, Nigeria, Senegal, Sierra Leone and Togo. Other francophone countries—Benin, Burkina Faso, Côte d'Ivoire and Chad—derived considerable impetus from the preparatory process and follow-up events surrounding the international population conference in 1984. The Governments of these countries began to support the work of Non-governmental organizations in providing contraceptive services and eventually moved towards directly providing family planning services. Only Djibouti tightened policies in the 1980s and abandoned all governmental support until the late 1990s, when it adopted a more supportive position.

The increased availability of timely and accurate population data and demographic analysis afforded policy makers the possibility of understanding the relationships between

population and development and the consequences of high fertility, young age structure, urbanization and the spread of the HIV/AIDS virus. These pressing demographic concerns were discussed at the Third African Population Conference held in Dakar in 1992 (United Nations, 1992). The outcome of the conference, the Dakar/Ngor Declaration, clearly reflected the growing commitment of African heads of state to finding solutions for the most urgent demographic concerns in order to enhance the quality of life. The Declaration recommended the establishment of a follow-up mechanism to accelerate the implementation of the Kilimanjaro programme, and, for the first time in the African context, it recommended quantitative population targets:

Recommendation 1: Population policies and programmes should be integrated into development strategies. 2. They should focus on strengthening social sectors with a view to influencing human development and they should work towards the solution of the population problem by setting quantified national objectives for the reduction of population growth. 3. The aim is to bring down the regional natural growth rate from 3.0 to 2.5 per cent by the year 2000 and to 2.0 per cent by the year 2010. 4. The recommendations also established quantitative targets for contraceptive prevalence for the first time. 5. Steps should be taken to make available and promote the use of all tested available contraceptive and fertility regulation methods, including traditional and natural family planning methods. A choice of methods should be available, and a goal should be set for doubling regional contraceptive prevalence, from about 10 to about 20 per cent by the year 2000 and 40 per cent by the year 2010.

14.3.2 Asia and Oceania

Asia and Oceania encompass a large variety of countries, including developed countries, less developed countries and least developed countries. They represent a wide variety of socioeconomic situations and cultural diversity and are home to some of the most populous countries in the world—China, India, Japan and Indonesia—as well as countries with small populations, such as Brunei Darussalam, Maldives and the small island nations in Oceania. Most countries in the regions supported access to contraceptive methods in 2001, and most Governments provided direct support. Of the 45 countries in the regions (not including Western Asia), 80 per cent directly supported access and 13 per cent provided indirect support. Only Brunei Darussalam, Lao People's Democratic Republic and Turkmenistan provided no support. All countries in Eastern Asia and Oceania provided either direct or indirect support for access to contraceptive methods, and all three of the most populous countries (China,

India and Indonesia) provided direct support. Countries in these regions were among the first to recognize the negative consequences of rapid population growth and to search for solutions. In general, there has been more emphasis in these regions than others on modifying fertility to reduce population growth. By the early 1960s, knowledge and understanding of the demographic situation was common in some of the most populous Asian countries. The impact of high population growth on socio-economic development was at the top of the agenda at the First Asian Population Conference in 1963. By the early 1970s, the majority of countries had initiated Government programmes to provide family planning services and contraceptives.

The declarations of the various regional population conferences reflect a strong commitment to support family planning. The recommendations of the Second Asian Population Conference held in Tokyo in 1972 emphasized the need for strong family planning programmes to curb high population growth (United Nations, 1972). At the Third Asian and Pacific Population Conference, held in Colombo in September 1982 (United Nations, 1982), the emphasis shifted from limiting fertility to acknowledging the pivotal interrelationships between demographic factors and development policies. The Conference's recommendations again stressed the need to provide family planning information and to make available a variety of methods. Moreover, a broader approach that linked family planning efforts to health programmes and other aspects of social development was considered crucial for improving the quality of life. This new focus was reflected in the change of policies in Maldives and Myanmar, which were among the last countries in the region to adopt supportive policies. The Bali Declaration on Population and Sustainable Development, which was the final document adopted at the Fourth Asian and Pacific Population Conference in 1992, further stressed the fact that family planning and maternal and child health programmes have played an integral role in influencing population growth and improving the quality of life (United Nations, 1992). For the first time, special attention was given to the need to design information programmes and services for youth and adolescents.

14.3.3 Western Asia

Western Asian countries supported access to contraception by a large majority (88 per cent) in 2001, even though there are as many countries in the region that want to raise fertility as want to lower it. (Two countries, Azerbaijan and Qatar, want to maintain fertility at the current level; both provide direct support for contraceptives.) Of the countries that provide support, two thirds provide direct support. Only Oman and United Arab Emirates provide no support for contraceptive access. Saudi Arabia, which had limited access to contraceptive methods from 1976 to 1996, was providing indirect support by 2001.

In the early 1970s, many countries of Western Asia considered their population growth to be too low and provided no support for contraception and family planning. But in the following years, awareness increased of the negative consequences of high population growth. Bahrain, Iraq, Jordan and the Syrian Arab Republic were early supporters of policies in favor of contraception. For many countries in the region, however, the most urgent population issues were spatial distribution, internal migration and refugees rather than fertility and family planning. This was the background for the First Regional Population Conference in Beirut in early 1974 (UN ECWA, 1974) and the Regional Consultation Meeting held in Damascus (United Nations, 1974b) that same year. At these conferences there was much debate on the terminology of family planning. Up until that time, family planning had been based on a broad social welfare and health outlook. Only later in the 1970s were national policies formulated to reduce population growth. Under the topic "Population and Health," the conferences agreed to "give attention to family health and its relationship to the size of the family and spacing between pregnancies". Family planning as a separate issue and the use of modern contraception were not further discussed at these two meetings. As a consequence of the preparatory process leading to the International Population Conference held in Mexico City in 1984, some countries increased support for family planning activities and the use of contraception. In the late 1980s, for example, Bahrain modified its policies and moved from providing indirect support to direct governmental support for the use of contraception.

The introduction to the Amman Declaration of Population in the Arab World, which was the outcome of the Second Regional Population Conference held in Amman in 1984, emphasized that "as a result of this rapid and continuous increase in the population, it was imperative to formulate appropriate plans and policies to meet their basic human needs..." (United Nations, 1984c). The Preamble of the declaration states that "the Regional Population Conference in the Arab World is convinced that the new circumstances...make it necessary to consider the formulation of an Arab Plan of Action for population policies in the coming decade." The consensus reached by participating member states on the issue of birth control and family planning demonstrated a general shift towards support for birth control in the context of primary health care, particularly to improve the health conditions for women and children.

"The practice of birth control by couples is a human right guaranteed by international covenants...The Arab countries should endeavor to safeguard this right by providing facilities for the dissemination of knowledge and effective means for the practice of family planning on the basis of free choice..."

The next round of regional and sub-regional meetings was held in the early 1990s in preparation for the International Conference on Population and Development held in Cairo in 1994. Rapid population growth and high infant and child mortality in the region necessitated urgent action. The regional Arab Population Conference convened in Amman in 1994 adopted the Second Amman Declaration on Population and Development (United Nations, 1994b). In point 8 of the General Principles, the Declaration articulated the "right of couples to choose freely the number and spacing of their children. To enable them to exercise this right, they must have access to the necessary education, information and services. Present and future demand for family planning must be met. The Arab States should be called upon…to provide for family planning services as a basic human right of couples."

One objective of the Declaration was for countries to achieve appropriate population growth rates. In the case of countries wishing to reduce population growth, family planning services would need to be developed and enhanced. Several recommendations strongly supported the provision of information on and access to family planning within the maternal and child healthcare framework, as well as the integration of family planning services into the primary health-care system. These principles—particularly placing family planning and contraception services within the framework of primary health care—provided the impetus for some countries to begin supporting contraceptive services, at least indirectly. In the late 1990s, Kuwait and Qatar made family planning services and counseling available through public and private health facilities. The Government of Saudi Arabia moved from a rather restrictive approach to indirect support for activities conducted by non-governmental organizations. Iraq, after a decade of rather restrictive policies, moved to direct support of contraception.

14.3.4 Latin America and the Caribbean

Support for access to contraceptive methods was very strong in Latin America and the Caribbean in 2001. Of 33 countries in the region, 31 (94 percent) provided direct support and 2 (6 percent) provided indirect support. Support was nearly as strong in 1996, when 29 of 33 offered direct support and 3 provided indirect support. Only Argentina provided no support in 1996. This near unanimity with regard to access to contraceptives shows a dramatic change in the region in the last few decades. Until the 1960s, many Latin American Governments were generally not supportive of family planning efforts and the use of contraception. However, rapid population growth and its socio-economic implications, particularly in urban areas, persuaded some Governments to consider the relationships between

population and development. Consequently, contraception has been widely available in Government facilities in most of the countries in Latin America and the Caribbean since the early 1970s. Only the Bahamas had initially channeled support through nongovernmental institutions. The region is noteworthy for Government recognition of the unmet demand for contraceptives and family planning services.

Several countries in the region, however, did not provide access to contraceptive methods until the early or mid 1980s. Among them were Argentina, Belize, Bolivia, Guyana, Suriname and

Uruguay. Nevertheless, by 2001, almost all countries in Central and South America, with the exception of Argentina and Belize, had policies in place to provide direct support for contraception. The Economic Commission for Latin America and the Caribbean (ECLAC) has played an important role in providing research and analysis on the interrelations between population and development. High population growth, high abortion rates and significant rural-urban migration flows were the background against which population issues and their social and economic implications were discussed at the Latin American Preparatory Meeting for the World Population Conference, held in Costa Rica in 1974 (United Nations, 1974d). Most Governments acknowledged the need to support family planning programmes in general, but their strategies for implementation differed widely. However, the need for families to "decide freely on the number and spacing of the children" (paragraph 22) was recognized by all countries. In the decade following the conference, many countries gradually adopted policies in support of family planning and contraception. In the early 1980s, during the preparatory process for the Third International Population Conference in Mexico City, some countries that were not supportive of family planning moved towards providing access to contraception through Government facilities. These countries included Bolivia, Guyana and Uruguay. The recommendation referring to contraception adopted at the regional preparatory meeting strongly supported access to contraception as part of the basic human right to decide freely on the number and spacing of children (United Nations, 1984d). By this time almost all countries had official maternal and child health/family planning programmes, whose common objectives were to provide family planning information and services and to improve coverage in rural areas and marginal urban areas. However, the severe economic crisis of the 1980s forced some Governments to cut back expenditures in this area, which seriously curtailed the availability of services. In spite of budget constraints, Governments strongly recommended support for reproductive health care and family planning during the Latin American and Caribbean Regional Conference on Population and Development, held in Mexico City in 1993.

The document further considered that "the opportunity to regulate fertility is a universally recognized human right" (recommendation 35). A major objective was to improve living conditions, particularly for marginalized segments of the population in rural and less developed urban areas.

14.4 LET US SUM

Less developed countries are facing the problems of high birthrate infant mortality, lack of medical facilities, insecurity regarding the survival of new born babies, poverty etc. It is an exception to the countries like China the other less developed countries requires more attention towards the population policies such focus on to check infant mortality, health cares etc.

14.5 KEY WORDS

Less developed countries, Pro-natalistic , antinatalistic , Asia, Africa, Latin America , Oceania

14.6 QUESTIONS FOR SELF STUDY

1. Briefly explain population policies in the less developed countries.
2. Discuss population policies in Asian countries.

14.7 FURTHER READINGS

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UNIT-15: POPULATION POLICIES IN INDIA

Structure

15.0 OBJECTIVES

After reading this unit student will able to understand

- To know the population Policies in India during various times.
- To under stand the implementation of family planning programmes in India.
- To know about Characteristics of National Population policies of 1976 and 2000.

15.1 INTRODUCTION

Population policy refers to the Government policy to control the population. Government has realized the problem of rising population on economic development of a country. Improvement in standard of living of the people needs a significant decline in the growth of population.

Improvement in health facilities leads to decline in death-rate. It implies that decline in birth-rate is necessary to control the growth rate of population.

Family planning measures have been adopted by the Government for the effective control of birthrate. Government does not make any coercive method to implement the family planning programme. Family planning is democratic in nature. It means married people are persuaded to limit the size of their family. It persuades couple to limit the size of the family and also gives incentive for the family planning. Different steps which are taken by the Government in the family planning programme are given below:

Family Planning Programme:

Government gives different advertisements on radio, television, newspapers and films to educate the couple about the benefits of small family and teaches people those children by choice and not by chance. This type of advertisement gives incentive for the people to control their family.

People are now being educated about the problems of large family and different methods to control birth.

(i) Birth control facilities are now being provided in different health centre and hospitals.

(ii) Financial incentives are. Now being given to the couple for vasectomy operation,

(iii) Green card is now being provided to the couple who have operated two-child-norm. This card helps people to get facilities in employment and promotion.

Other Measures:

Except these above stated programmes other steps are now being adopted to reduce birth-rate.

(i) Child marriage is prohibited. The marriage age for male and female has been increased lo 21 years and 18 years respectively.

(ii) Educated couples are generally interested for small family. So education is being given to the females to reduce birth-rate. If females are educated, they will prefer small family and late marriage. Due to more incentive for the female education, it is expected to control the growth rate of population.

(iii) The measures which are now being taken in different five year plans will help to control birth-rate because, due to economic development standard of living of the people rises. So to maintain a high standard of living, people should be interested to adopt small family norm.

15.2 PRE-INDEPENDENCE SCENARIO

As noted earlier, from the middle of the twentieth century onwards, a growing concern regarding the adverse effects of population growth on development and Prosperity was witnessed in the less developed parts of the world. India was the first country to have awakened to the need of a firm policy of population control. However, the concern regarding population problems in India dates back to pre-independence period. Although, the British rules had shown their reluctance to interfere with the controversial issue of birth control, some intellectuals had begun expressing their concern on population issues as early as in the beginning of the twentieth century. In 1916, one P.K.Wattal published a book entitled 'The population Problems in India', in which he discussed population issues in health and socio-economic perspective. According to him, population growth was the main factor behind a widespread poverty and ill-health. He, therefore, strongly recommended measures for population control. Although, his work did not evoke much of response, it was perhaps the first well-known public advocacy for family planning in India. Soon after this, some enlightened scholars like Prof. N.S.Phadke and G.D.Kulkarni formed 'Birth Control Leagues' in the cities of Bombay and Pune (Premi, 2003:244). In 1925, a 'birth control' clinic was opened in

Bombay. The Credit for this goes to R.D.Karve, a lecturer in Mathematics in a college run by Christian missionary. Karve had to lose his job for this bold initiative in the wake of stiff opposition from his orthodox employers.

In 1930, the worlds' first government sponsored 'birth control' clinic was opened in Mysore at the behest of the Maharaja. Similar clinics were opened in the State hospitals in Madras in 1933. Growing concern with population issues ultimately got incorporated in the programme of national movement for independence. In 1935, the Indian National Congress set up a National Planning Committee under the chairmanship of Jawaharlal Nehru. The deliberation of one of the sub-committees chaired by Radhakamal Mukherjee was exclusively devoted to the problems of rapid growth in population in the country. The committee in its report identified the size of India's population as a basic issue in national economic planning, and recommended measures for the spread of the knowledge of cheap and safe methods of population control. In addition, the committee also recommended an increase in age at marriage. Remarkably, some of its recommendations, particularly the one on sterilization of person suffering from certain diseases, were influenced by eugenic, movement. In 1938, Radhakamal Mukherjee published a book on Food Planning for Four Hundred Millions (Premi, 2003:244), in which he highlighted the impending scarcity of food in the wake of rapidly growing population in the country.

Towards the close of 1930s, the arguments in favour of population control further got momentum, and several 'birth control' clinics were opened in the northern states. These developments prompted the British government to take active interest in population related issues. In 1945, the government set up a Health Survey and Development Committee under the chairmanship of Sir Joseph Bhore. The committee suggested measures of strengthening birth control services for promoting the health of mothers and children (Bhende and Kanitkar, 2000:489). Mahatma Gandhi, the leader of the masses, also shared the concern regarding the adverse social and economic effects of rapidly growing population. However, he strongly differed on the methods of birth control. He was of the opinion that on moral ethical grounds, measures such as brahmcharya and abstinence from marriage, and not any artificial measure of contraception, should be encouraged for population control.

Initially, the issue of birth control remained the concern of a small group of intellectuals, and the actual practice of birth control was confined to the select westernized urban elite. The overall social atmosphere in the country remained hostile to the propagation of the artificial measures of birth control. Some other intellectuals and public figures, to whom foreign

dominance, and not population growth, was the main factor responsible for underdevelopment and poverty in the country, also opposed the move.

The outbreak of the Second World War in 1939, for the time being, diverted the attention of the people from population issues. The war ended in 1945, and two years later India got independence. With this began the era of concerted efforts by the government towards improving the socio-economic conditions of its people. The government accorded a very high priority to the population issues in its overall policy of economic development.

15.3 POST-INDEPENDENCE DEVELOPMENT

Soon after independence, the Government of India set up the Planning Commission in 1950 to assess the Country's need of material capital and human resources so as to formulate a plan for their balanced and effective utilization. Thus, the country embarked upon the era of planning, and the First Five-Year Plan was launched in 1950-51. This was followed by a series of five-year plans, apart form some annual plans in between. A review of the development plans evidently indicates that population-related issues have occupied a prominent position in India's planning.

Considering population as a strategic component of the development plan, the Draft Outline of the First Plan devoted a whole section to the problems of population pressure. It recognized the urgent need of a population policy in the overall planning for development in the country. Although, a policy was formally not announced, the government initiated family planning in the country in 1952 itself. This was the first official national family planning programme in the world. China, the largest populous country in the world, followed the suit only in 1956. In the draft outline of each successive five-year plan in the country, population issues have occupied a very high priority. The growing importance of population issues is also reflected in the budget allocation, at least in absolute terms, for family planning programmes during different five-years plans.

15.4 FAMILY PLANNING PROGRAMME IN INDIA

Ever since its inception in 1952, family planning programme has undergone several changes. Since India was the first country in the world to implement a nationwide family planning programme, the planners heavily depended on the experiences of developed countries of the West concerning their Planned Parenthood Organizations. Under the Planned

Parenthood Organisation, family planning clinics were set up, and the couples who needed family planning services visited those clinics. A similar approach often termed as 'clinic approach', was initially adopted in India as well. Obviously, the clinic approach had its own limitations. Under the Socio-economic and psychological atmosphere that prevailed in the country, the approach could reach only a small fraction of the population. The clinic approach was, therefore, replaced later in the early 1960s by the 'extension approach'.

The extension approach involved the adoption of an educational approach in bringing about changes in knowledge, attitude and behavior of the people with regard to family planning. It also meant a change in the focus from individuals or couples to the group. This change in focus stemmed from the growing realization the "the power inherent in a group itself to bring about changes in deeply rooted practices among the members of the group is greater that the influence of individual instruction by outsiders" (Bhende and Kanitkar, 2000:498). The Approach, thus, meant identifying some influential formal or informal leaders in each group, and then encouraging them to acquire knowledge concerning population-related problems. These prominent leaders were expected to popularize small family norms among the people of their respective groups. This extension approach also called for associating the local bodies such as Panchayat Samitis, Village Development Committee and the like in family planning programmes. Due emphasis was also placed on the supply side of family planning measures. Thus, the underlying principles of the extension approach were group acceptance, knowledge about family planning and easy availability of supplies and services.

Although, since its inception, family planning programme concerned itself primarily with birth control, issues related with maternal and child health care was also given its due attention. But it was not until the Fifth plan that an explicit commitment in this regard was seen. In order to achieve a wider acceptance of family planning measures among the people, the approach in the Fifth Plan treated 'maternal and child health and nutrition services' as an integral part of family planning programme. This was necessitated by the fact that in the event of a persisting high death rate among infants and children in the country, it was very difficult to achieve the targets of birth control. Such an approach, it was believed, would provide a wider credibility to the services related to family planning. This integrated approach has continued up to the present time. The broadened scope of family planning operations, thus, included:

- Immunization of infants and pre-school children against DPT;
- Immunization of expectant mothers against tetanus;

- Prophylaxis against nutritional anaemia among mothers and children; and
- Prophylaxis against blindness caused in children by the deficiency of vitamin a

15.5 DEVELOPMENT SINCE MID-1970S

Towards the middle of 1970s, family planning programme in India entered a new phase. A state of national internal emergency was promulgated in June 1975, which continued up to February 1977. Family planning programmes were persued vigorously all over the country, often in association with state sponsored coercion. In the year 1976, first National Population Policy was announced. But some other events that preceded this development also shaped future policy on population control programmes. The 1971 census had revealed a decadal growth of over 25 percent in the population. a rate that was still higher than the previous decades. This had frustrated the policy makers who had rather anticipated a decline in the rate of growth over the previous decade. The other event that influenced family planning programmes in the country was the deliberations at world population conference at Bucharest in 1974.

In the mean while, in June 1975, internal emergency was clamped in the country. The approach to family planning took a swift turn. The Union Minister of Health and Family Planning, contrary to his earlier stand, suggested the need of 'some elements of compulsion' in the matter of family planning in one of his official notes to the then Prime minister. The Period was marked with some other rapid developments. The 20-point programme of the Prime Minister, announced soon after the promulgation of emergency, was revised to include the issue of population control in its framework. Till that time population programme was under the legal jurisdiction of the state governments. The constitution was amended to include the subject in the concurrent list, which provided an upper hand to the central government in the event of any conflict between the state and the centre. A sudden change in the approach came with a major dependence on compulsion. The then Prime Minister had remarked in January 1976 that "we must now act decisively and bring down birth rate. We should not hesitate to take steps, which might be described, as drastic" (Shah Commission of Enquiry quoted in Chaubey, 2001:88). The government soon began a vigorous implementation of birth control programme. In April 1976, the first national Population policy was announced. Prior to that population policy in the country was generally equated with family planning policy.

15.6 NATIONAL POPULATION POLICY OF 1976

The First formal policy document National Population Policy: A Statement was announced by the Central government on April 16, 1976. The statement of the population policy took into account a broader perspective of India's population problem as it related with social, economic and political aspects. It was emphasized that the country cannot wait for education and economic development to bring about decline in birth rate. The policy statement prescribed for direct assault on fertility in the form of a set of incentives as well as certain degree of compulsion or coercion. Each state was given the option to frame its own legislation in this regard, which was to be uniformly applicable to all the people without any regard to caste, creed or religion. Although, many of the features of the statement policy already existed, the element of compulsion was for the first time incorporated in the population control programme.

The broad features of the policy statement were as follows:

Minimum age at marriage was raised from 15 to 18 years for girls, and 18 to 21 years for boys. The statement policy provided that any violation of this would be treated as a cognizable offence. It was argued that in the long-term effect, the proposed change would bring about a responsible parenthood and a better health condition for the mother and the child.

The Policy statement placed an emphasis on female education at least up to middle level. It was argued that progress in literacy and education among women would atomically result in decline in birth rates.

The policy statement recommended freezing the representations in the Lok Sabha and the state Legislatures on the basis of 1971 census up to 2001. This was aimed at remedying the situation of growing representation of the states in the parliament whose performance in family planning programmes was weak.

The Policy statement provided for the allocation of central assistance to the state plans, the devolution of taxes, duties and grants-in-aid on the basis of 1971 census up to 2001.

The policy statement provided that 8 percent of the central assistance to the state plans would be made against the performance of each state in the field of family planning.

The 1990s, however, witnessed a marked shift in the approach of family planning programme in the country.

The Salient influences of Cairo conference on India's population programme can be listed as follows (Bhende and Kanitkar, 2000:538):

The Emphasis shifted from demographic goals to meeting individual needs for improving the quality of life.

The RCH approach to the family welfare programme was adapted, with a package of essential services offered for meeting the needs of individuals.

The method-specific target approach was withdrawn and the community need-based approach was adopted for determining the path to be followed.

Incentives for acceptors for family planning and their motivators were withdrawn.

Intensive efforts for improving the quality of services offered in the family werlfare programme continue to receive serious attention.

The focus is now on achieving horizontal integration of services for achieving convergence of services at the users level rather than the Reproductive and Child Health Programme being a vertical one.

15.7 NATIONAL POPULATION POLICY OF 2000

As noted already, towards the close of the 1980s there was a growing realization among the planners and policy makers that the country needed a fresh policy on Population. In 1991, therefore, the National Development Council appointed a committee on Population under the chairmanship of Shri Karunakaran. The committee in its report submitted in 1993 proposed the formulation of a national Population Policy taking a holistic view of population-development inters linkages. Subsequently, an expert group, headed by Dr. M. S. Swaminathan, was appointed for preparing the draft of a National Population Policy (NPP). The committee submitted its repot in 1994, which was then circulated among the members of the parliament and various agencies of central and state governments. In 1997, the cabinet approved the draft, but the same could not be placed before the parliament in the wake of the dissolution of the Lok Sabha.

The objectives of the NPP 2000 have been classified as under

- **Immediate Objective:** To address the unmet needs of contraception, health infrastructure and health personnel as well as to provide integrated service delivery for basic reproductive and child healthcare.

- Medium- To bring the total fertility rate (TFR) to replacement level by 2010, through vigorous implementation of inter-sectoral operation strategies.
- Long term Objective: To achieve a stable population by 2045 at a level consistent with the requirenment of sustainable economic growth, social development and environmental protection.
- In pursuance of these objectives, the policy document outlines 14 national socio-demographic goals to be achieved by 2010. These goals relate to the following:
- Making school education free and compulsory up to the age 14 and reducing the drop out rate to less than 20 percent;
- Reducing IMR to below 30 per 1,000 and material mortality rate to less than 100 per 1,00,000 live birth;
- Achieving universal immunization of children against all vaccine preventable diseases;
- Promoting delayed marriage for girls;
- Achieving 80 percent institutional deliveries and 100 percent deliveries under the care of trained persons;
- Universal access to information and counseling, and services for contraception with a wide basket of choices;
- Achieving 100 percent registration of vital events including pregnancy; and
- Prevention and control of communicable diseases especially AIDS.

The policy document hopes that if NPP 2000 is fully implemented, India's population in 2010 would be 1,107 million as against 1,162.3 million as projected by the Technical Group on Population Projection. In other words, the absolute population would be lower by over 55 million if TFR is brought down to replacement level by 2010. The policy document further identifies a set of strategic themes, which are to be pursued vigorously in order to achieve national socio-demographic goals within the stipulated time framework. These themes are:

- decentralized planning and implementation through Panchayati raj institutions;
- Convergence of health services a the village level;
- Empowering women for improved health and nutrition;

- Child health and survival;
- Diverse health care providers;
- Strengthening information, education and communication (IEC) component;
- Increased collaboration with NGOs and private sector;
- Mainstreaming Indian System of medicine and homeopathy;
- Contraceptive technology and research on reproductive and child health.

In addition, the document states a special strategic theme for under-served population. This includes slum population, tribal communities, hill area population, displaced and migrant population, and adolescents. The new population policy is to be implemented largely at the Panchayat and nagarpalika levels with the support of the administration of respective states/ union territories.

Summary

India's population control programme, as also in other less developed countries, has for a long time been marked with an overwhelming responsibilities imposed on women for decline in fertility levels. Critics have regarded this as a serious infringement on women's fundamental right. They have argued that the bias in the family planning approach has caused great amount of sufferings of women. Towards the middle of the 1990s, therefore, reproductive and child health(RCH) approach was adopted in the country, and method-specific-target-based approach was completely withdrawn. Scholars have, however, expressed their apprehension about the efficiency of the newly introduced approach. It is argued that since the package of the programme under RCH requires much-enlarged budget, " the emphasis on contraceptive services will get diluted when budgets are not adequately increased to cover the wider goals of RCH programme"(Srinivasan, 1998:14-15). Some Scholars have even expressed their apprehension that emphasis on RCH would amount to the neglect of primary healthcare. Further, it is also argued that with abolition of demographic targets, the family planning performance is likely to suffer a setback at least in the initial phase.

15.8 LET US SUM UP

Till 1976 no specific population policies were existed in India. Whatever the population policies that are existed in India are give more focus to control birth rather than people welfare. Indian population policies require more attention towards the health and welfare of women

and child. No doubt there is a guarantee regarding the food, drinking water and health care in the Indian population policies but we required more and elaborative policies which converts the people in to human resources.

15.9 KEY WORDS

Pre –independent scenario of population Policy , National population policy 1976, and 2000, RCH programmes , Family planning

15.10 QUESTIONS FOR SELF STUDY

1. Explain the pre-independent population policies in India .
2. Discuss the importance of population policies in controlling the population growth.
3. Briefly the national population policies in India.

15.11 FURTHER READINGS

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UNIT - 16: POPULATION PROJECTION

Structure

16.0 OBJECTIVES

After reading this unit student will able to understand

- To know the definition and meaning of population projection
- To know the various methods of calculation of population projection.
- To understand the importance and advantages of population projection.

16.1 INTRODUCTION

The prediction of future populations based on the present age-sex structure, and with the present rates of fertility, mortality, and migration. The simplest projections are based on extrapolations of current and past trends, but a set of very differing projections can be calculated, based on a series of differing assumptions—for example, that current rates of increase will be maintained, will increase, or will decrease. The definition of population is when people are inhabiting a specific area. The total number of people that live all in the same area. For example: when someone says whats the population of certain state, they are asking how many people live. A population forecast provides estimates of the most likely future trends in population size and in demographic indicators such as population distribution by age and sex. A forecast is based on the current understanding of the roles played.

16.2 POPULATION PROJECTION METHOD

The cohort component method to project the total population size as well as the number of males and females for each 5-year age group for a future date

The cohort component technique uses the components of demographic change to project population growth. The technique projects the population by age groups, in addition to other demographic attributes such as sex and ethnicity. This projection method is based on the components of demographic change including births, deaths, and migration. The processes or stages of the projection tool are summarized below in Equation.

16.3 ABOUT THE COHORT COMPONENT METHOD

Equation:1

Cohort Component Summary Equation

$$P_{t+n} = \text{survived population} + \text{births} + \text{net migrants}$$

To project the total population size and the number of males and females by 5-year age groups, find the number of people who survive or are expected to be alive in the future. Add to the survived population number, the number of births that take place and the number of net migrants.

There are several approaches to using the cohort component technique. The approach described here is easy to use, and requires minimum demographic information. Isserman (1993) offers planners an alternative way to employ this tool. Isserman's alternative method uses a different approach to input fertility, mortality, and migration data.

Assumption

When the cohort component method is used as a projection tool, it assumes the components of demographic change, **mortality, fertility, and migration,** will remain constant throughout the projection period. As a forecasting tool, planners can alter the vital statistics and migration estimates to reflect their view of the future. For the purposes of this section, the tool is presented as a projection method.

Strong Suggestion

When making a 10-year projection, it is best to perform two separate projections: ***a projection for the first 5 years and then a projection for the next 5 years.*** The result of the first projection is used to perform the second round of the projection. In some cases, planners alter demographic rates to reflect their vision of the future for a locale. For example, they may observe declines in fertility levels and alter age-specific fertility rates using some of the extrapolation tools or ratio methods presented in Lesson 6.

When to Use this Method

Use the cohort component method when population projections by age and sex are needed for 5 years, 10 years or longer periods of time. This projection tool allows planners to examine the future needs of different segments of the population including the needs of children, women in their reproductive years, persons in the labor force, and the elderly. It also allows planners to project the total size of the population. The results can be used in all aspects of local and regional development plans.

16. 4 STEPS FOR USING THE COHORT COMPONENT METHOD

Step 1: Collecting Information

The cohort component method requires information from both the most recent and the prior census of the locale. Collect information on the number of births during the past 10 years. Ideally information on births should be compiled by the age of the mother so that age-specific fertility rates can be calculated. These rates are used to project the number of births that occur during the projection period. ***Use the general fertility rate when births by age of mother are not available.*** A life table or calculated survival rates are also needed.

Step 2: Aging a Population into the Future

The cohort component method takes each age group of the population and ages it over time using survival rates.

1. Obtain census information distributed by sex and age (usually 5-year age groups)
1. Multiply the base census population of a given age group by survival rates to obtain the population still alive 5 years later
2. What is the number of women aged 25-29 who will be alive in 5 years?
3. Women aged 25-29 alive in 5 years = (population women $_{\text{aged 20-24}}$) (survival rate)

Step 3: Adding Births

Next, calculate the number of births taking place during the projection interval. Age-specific fertility rates are used to estimate the number of births that take place. The rates are multiplied by the number of women in their reproductive years. The results give an annual number of expected births. They are then multiplied by the projection period, usually 5 years, to obtain the total number of births that take place in the future.

An age-specific fertility rate indicates the probability that a woman in her reproductive years will give birth in a given year.

Use the Sex Ratio equation as shown in equation 2 to find the number of male and female babies born.

Equation-2
Sex Ratio

$$\text{finding proportion of male births} = \frac{\text{sex ratio of males ages}_{0\text{-}4}}{(\text{sex ratio of females ages}_{0\text{-}4} + 100)}$$

$$\text{finding proportion of female births} = 1 - \text{proportion of male births}$$

Once the number of male and female births has been determined, the results are multiplied by a survival rate to determine how many babies survive into the future as shown in equation 8-3.

Equation3:

Surviving Population

$$\text{male births that survive} = (\text{male births})(\text{survival rate})$$

Adding Net Migrants

Next add the number of net migrants. This can be a positive or negative number. Obtaining the number of net migrants is a 2-stage process. First, calculate net migration rates. Then multiply these rates by the survived population to obtain the number of net migrants.

Estimating Net Migration

The last part of the projection involves accounting for population movements in and out of the projection area. Two methods of estimating the number of net migrants will be introduced in this section. Both methods rely on survival rates and census information. First, it is important to be familiar with the definitions for migration and net migration.

Definition

Migrations are movements across political boundaries that are semi-permanent or permanent in nature. Net migration can be defined as the number of in-migrants minus the number of out-migrants divided by the population exposed to the possibility (or risk) of migration, as shown in Equation 4.

Equation4:

Net Migration Rate

$$\text{net migration rate} = \frac{\text{immigrants} - \text{out-migrants}}{\text{population}} * k$$

K is a constant, usually 100.

Obtaining Migration Information

The process of obtaining migration information has two approaches, the Direct Method and Indirect Measures.

1. Direct Method:

a. Continuous registration system: individuals report their change in residence immediately to a local government office.

b. Use of census information: based on census question of "Where were you living 5 years ago"? In this case, planners compare the place of residence with the place of prior residence.

1. **Indirect Measures**:

a. Vital statistics or residual method

b. Survival ratio method

Most planners rely on indirect measures for obtaining migration information. This section will present different methods to calculate net migration using indirect measures.

The residual method is shown in Equation 8-5.

Equation8-5:
Residual Method

$$\text{population}_{t+n} = \text{population}_{t-1} + \text{births} - \text{deaths} + \text{net migrants}$$

$$\text{net migrants} = (\text{population}_{t+n} - \text{population}) - (\text{births} - \text{deaths})$$

Where,
population_{t+n} = current population
population_{t} = the last census

In most cases, planners use survival rate methods to estimate net migration rates. The forward and the reverse methods estimate net migration by age and sex. The forward method is shown in Equation 6, and the reverse method in Equation 7.

Equation6:
Forward Method

$$m_{x+t} = pt_{x+t} - sp^{0}{}_{x}$$

Where,
m_{x+t} = net migration of persons age $_{x+t}$
$_{x}$ = an age or age group
$p^{0}{}_{x}$ = population age x at the first census
$p^{t}{}_{x+t}$ = population at the next census at age $_{x+t}$
s = the survival rate

The survival rate is multiplied by the prior census population, $P^{\circ}{}_{x}$. The result provides an expected population for the present census period. Subtract the expected population from the present census period, $P^{t}{}_{x+t}$. The difference is assumed to be due to migration. The forward method estimates the number of net migrants at the end of the period and assumes that:

- All migration takes place at the end of the period
- All deaths occur in the community for which the estimates are being prepared, or all deaths are to non-migrants. One problem is that residents and migrants are moving and dying throughout the period.

Equation7:
The Reverse Method

$$m = \frac{p^{t}{}_{x+t}}{s} - p^{0}{}_{x}$$

The reverse method uses a slightly differentapproach. The terminal population (population in the last census) is being revived to the initial census date thereby estimating the number of persons that would have been alive at the earlier date. Then, subtract the expected population from the prior census data. Those persons who cannot be accounted for are assumed to be migrants. The reverse method assumes that deaths occur to people after they

migrate. The reverse method produces more net migrants. The differences are greatest at the older ages, where mortality is highest. Most demographers compute both methods and average the results.

Assumption: Both methods of estimating net migration assume that population change not accounted for by fertility and mortality is due to migration.

Population change not accounted for by fertility and mortality may be due to:

- Migration
- Errors in the census counts
- Boundary changes from one census period to the next

16.5 ADVANTAGES OF POPULATION PROJECTION

The total size of the world population is likely to increase from its current 7 billion to 8–10 billion by 2050. This uncertainty is because of unknown future fertility and mortality trends in different parts of the world. But the young age structure of the population and the fact that in much of Africa and Western Asia, fertility is still very high makes an increase by at least one more billion almost certain. Virtually, all the increase will happen in the developing world. For the second half of the century, population stabilization and the onset of a decline are likely. In addition to the future size of the population, its distribution by age, sex, level of educational attainment and place of residence are of specific importance for studying future food security. The paper provides a detailed discussion of different relevant dimensions in population projections and an evaluation of the methods and assumptions used in current global population projections and in particular those produced

The population projections have been computed for the state and the constituent counties using the Cohort-Survival method. The Cohort-Survival method uses three components—birth, death and net migration which are projected separately as detailed below. While the projected number of births and deaths determines the natural increase of a population, net migration accounts for the additional population changes.

Projected Number of Births:

To project the number of births, one needs to first project the age- and race-specific fertility rates.

Projected Number of Deaths

The number of deaths was computed in a manner similar to the number of births. It is assumed that changes in the age-, sex-, and race-specific mortality rates fallow the national trends.

The projected mortality rates are then applied to the appropriate age, sex and race population categories to derive the projected number of deaths for each respective characteristic.

Calculation of the Closed Population

The natural population increase through births and deaths, when added to the base population, yields an estimate for the "closed population" for the next five years. The closed population is composed of the original population age five years and above, plus expected births and minus deaths.

Net Migration

To the closed population was added the net migration. Net migration is viewed as the balance between labor force supply and labor force demand. In other words, it is simply the difference between labor supply and labor demand.

Labor Force Supply

Labor force supply is defined as the number of employed and unemployed persons. Two steps are involved in projecting labor force supply:

1. The propensity for different population groups to be in the labor force was first projected. Labor force participation rates were projected in a manner similar to the fertility and mortality rates. It was assumed that changes in the labor force participation rates will follow the national trend.
2. The projected labor force participation rates were applied to the working age population to estimate the actual labor force supply or the size of the labor force.

16.6 LET US SUM UP

Population projection is an inevitable toll for all the countries which helps in designing the people welfare policies and programs of all age groups planning will not be possible without consideration of future population

16.7 KEY WORDS

Population Projection, Cohort Component Method, Direct Method, Indirect Method.

16.9 QUESTIONS FOR SELF STUDY

1. Explain the importance of population projection in future planning.
2. Discuss various methods of population projection methods.
3. Explain cohort component method of population projection.

16.8 FURTHER READINGS

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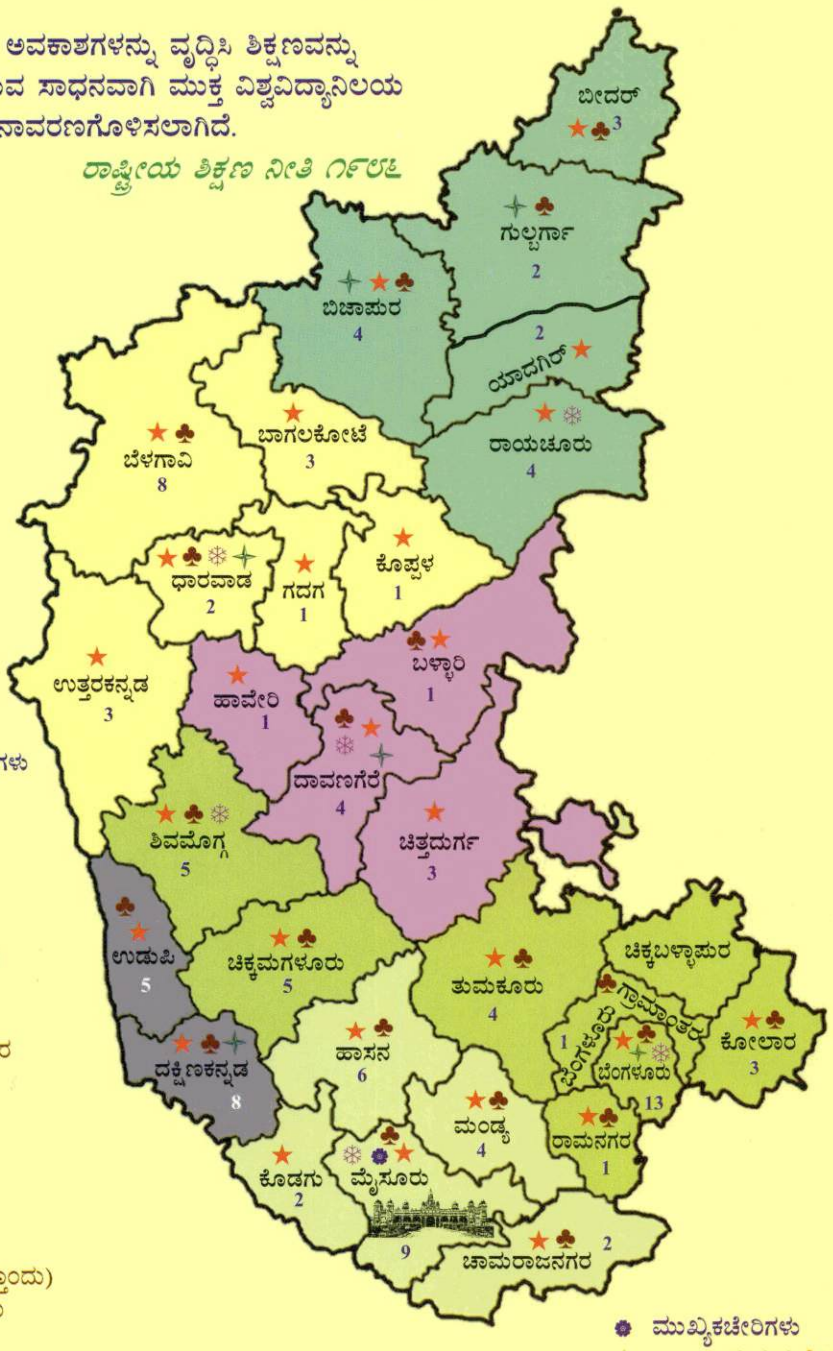

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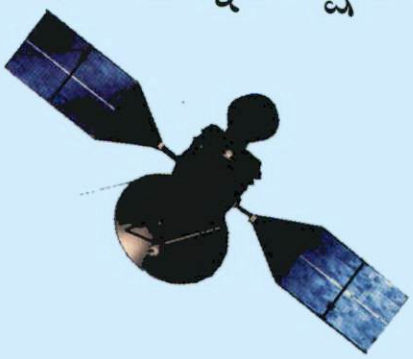

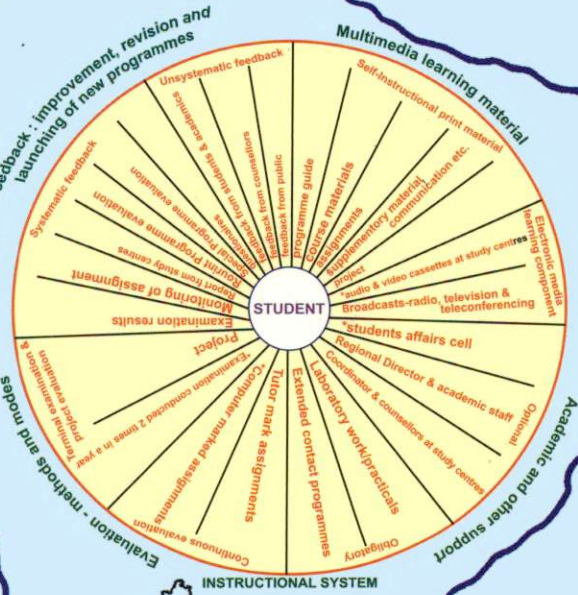

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