PREFACE

With its grounding in the "guiding pillars of Access, Equity, Equality, Affordability and Accountability," the New Education Policy (NEP 2020) envisions flexible curricular structures and creative combinations for studies across disciplines. Accordingly, the UGC has revised the CBCS with a new Curriculum and Credit Framework for Undergraduate Programmes (CCFUP) to further empower the flexible choice based credit system with a multidisciplinary approach and multiple/ lateral entry-exit options. It is held that this entire exercise shall leverage the potential of higher education in three-fold ways – learner's personal enlightenment; her/his constructive public engagement; productive social contribution. Cumulatively therefore, all academic endeavours taken up under the NEP 2020 framework are aimed at synergising individual attainments towards the enhancement of our national goals.

In this epochal moment of a paradigmatic transformation in the higher education scenario, the role of an Open University is crucial, not just in terms of improving the Gross Enrolment Ratio (GER) but also in upholding the qualitative parameters. It is time to acknowledge that the implementation of the National Higher Education Qualifications Framework (NHEQF) and its syncing with the National Skills Qualification Framework (NSQF) are best optimised in the arena of Open and Distance Learning that is truly seamless in its horizons. As one of the largest Open Universities in Eastern India that has been accredited with 'A' grade by NAAC in 2021, has ranked second among Open Universities in the NIRF in 2024, and attained the much required UGC 12B status, Netaji Subhas Open University is committed to both quantity and quality in its mission to spread higher education. It was therefore imperative upon us to embrace NEP 2020, bring in dynamic revisions to our Undergraduate syllabi, and formulate these Self Learning Materials anew. Our new offering is synchronised with the CCFUP in integrating domain specific knowledge with multidisciplinary fields, honing of skills that are relevant to each domain, enhancement of abilities, and of course deep-diving into Indian Knowledge Systems.

Self Learning Materials (SLM's) are the mainstay of Student Support Services (SSS) of an Open University. It is with a futuristic thought that we now offer our learners the choice of print or e-slm's. From our mandate of offering quality higher education in the mother tongue, and from the logistic viewpoint of balancing scholastic needs, we strive to bring out learning materials in Bengali and English. All our faculty members are constantly engaged in this academic exercise that combines subject specific academic research with educational pedagogy.We are privileged in that the expertise of academics across institutions on a national level also comes together to augment our own faculty strength in developing these learning materials. We look forward to proactive feedback from all stakeholders whose participatory zeal in the teaching-learning process based on these study materials will enable us to only get better. On the whole it has been a very challenging task, and I congratulate everyone in the preparation of these SLM's.

I wish the venture all success.

Professor Indrajit Lahiri
Authorised Vice-Chancellor
Netaji Subhas Open University
(NSOU)

Netaji Subhas Open University

Four Year Undergraduate Degree Programme

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First Edition : February, 2025

Printed in accordance with the regulations of the Distance Education
Bureau of the University Grants Commission.

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Module V : Migration

Module VI : Population, Development and Environment

Module I

Introducing Population Studies

Unit 1 ❑ Social Demography: Nature and Scope

Structure

1.1 Objectives

This course provides a comprehensive survey of the field of social demography the scientific study of population. The course begins by focusing on understanding the core social demographic variables (e.g., fertility, mortality, morbidity, migration), and how these variables influence population growth, composition, and structure. Population will be examined in relation to its sociological determinants and consequences. Upon successful completion of this module students will:

- Understand basic demographic measures
- Know how to choose among alternative demographic measures to describe a population
- Be able to identify alternative sources of demographic data

In the latter part of the course, we will shift our attention to the relationship between population and issues such as urbanization, family change, population aging and health, economic growth, and the environment.

1.2 Introduction

Demography is the statistical and mathematical study of the size, composition, and spatial distribution of human populations and how these features change over time. Data are obtained from a census of the population and from registries: records of events like birth, deaths, migrations, marriages, divorces, diseases, and employment. To do this, there needs to be an understanding of how they are calculated and the questions they answer which are included in these four concepts: population change, standardization of population numbers, the demographic bookkeeping equation, and population composition.

Demographic analysis can be applied to whole societies or to groups defined by is usually considered a field of sociology, though there are a criterion such as

education, nationality, religion and ethnicity. Institutionally, demography is usually considered a field of sociology, though there are a number of independent demography departments. Formal demography limits its object of study to the measurement of population's processes, while the broader field of social demography population studies also analyze the relationships between economic, social, cultural, and biological processes influencing a population.

1.3 Meaning of Demography

The word Demography is a combination of two Greek words, 'Demos' meaning people and 'Graphy' meaning science. Thus, demography is the science of people. In the middle of the 19th century in 1855, the word first used by French writer Achille Guillard. Even though, the term "population studies "is more popular, the word 'Demography' is under wider use these days. It is considered and important subject capable throwing light on the nature of population education. Since antiquity a number of thinkers have expressed their views on the level of economic development and the size of population. During the time of Confucius, many Chinese and Greek writers, and following them Aristotle, Plato and Kautilya have expressed their thoughts on the subject, population education is as old as human civilization.

Writers like William Peterson, Hauser and Duncan consider "population studies" and "demography" to be different, according to them, "Demography" encompasses limited is spheres and it studies only the decisive factors of population growth, whereas in Population Studies" besides the social, economic, geographical, political and biological aspects of population, their ensuing relationships are also studied.

1.4 Definition of Demography

The term demography has been defined both in a narrow and broad sense. The Oxford Dictionary of Economics defines demography as "the study of the characteristics of human population". According to the United Nation multilingual demographic dictionary, "Demography is the scientific study of human populations primarily with respect to their size, their structure and their development". According to Thomson and Lewis, "The population student is interested in population size

composition and distribution and in changes in these aspects through time and causes of these changes".

According to Frank Larimer, "In broad sense demography includes demographic analysis and population studies, A broad study of demography studies both qualitative and quantitative aspect of population". According to Donald. J. Brogue, "Demography is a statistical and mathematical study of the size composition spatial distribution of human population and of changes over time in this aspect through the operation of the five processes of fertility, mortality, marriage, migration and social mobility. Although it maintains continuous descriptive and comparative analysis of trends, in each of these processes and in its net result its long run goal is to develop a body of theory to explain the events that it charts and compeers". Broad definitions take into view not only the size composition and distribution of population and changes in them in the long run but also imply human migration and change in the status of population through education, employment, social status, etc.

1.5 Nature of Social Demography

When the study of population was emerging as a discipline, Warren. S.Thompson in his book "Entitled Population Problems" described population studies as being concerned with the following questions related to three areas of study:

i. What are the changes that are taking place in the size of population and how are these changes brought about? What is the significance of these changes from the standpoint of human welfare?
ii. Where people and what are the changes taking place in their distribution in communities and in areas?
iii. What kind of people are found in any given population group and how do those in one group differ from those in the other?

These questions clearly indicate that the study of population is concerned with its size on numbers, its structure and characteristics, its distribution and the changes taking place in it over a pert time is also implied in this description that the subject matter of population studies includes the study of fertility mortality migration and social mobility that is the components of change in the size, structure, characteristics, and distribution of population.

Before delving any further into the details of the nature of population studies it is important at this juncture to have a broad understanding of the various concepts used in the description of the scope of population studies.

One important area of study covers the components of population change for the factors responsible for change population. It must be understood that the population of any place at a specific time is a function of three types of events: births, deaths and migration. There are four ways in which the number of if in any area can under go change:

i. Children may be born in that area
ii. The inhabitants of that area may die
iii. People from other areas move into that area
iv. Inhabitants of that area may move out.

These components of population change namely births, deaths and migration are identified as fertility, mortality, and migration respectively and known as demographic population variables because the size, growth, structure, and distribution of any population are determined by them. A study of any population is made through a study of these demography variables.

It is important to understand at this stage the meaning of population structure and population characteristics. Population structure implies that age and sex structure of the population and population characteristics include such characteristics as marital status, literacy and educational status, labor force status, etc. Population characteristics, however, can and do change through "social mobility", that is true movements of individuals from one status to another, for example from "single" to "married" status, and also through fertility mortality and migration.

The scope of population studies is quite wide. On the one hand, this subject is concerned with a quantitative study of the size, structure, characteristics and territorial distribution of human population and the changes occurring in them in the other hand; it is concerned with the study of the underlying causes of population phenomena. This student of population is engaged is describing and comparing the size, structure, characteristics and territorial distribution of population, and the changes occurring in it through the study of fertility, mortality, migration, and social mobility. He also attends to explain population phenomena and situations and the changes in them in the context of the biological, social, economic, and other setting. For instance,

population phenomena take place in a social setting and cannot be studied in isolation. Hence, while describing comparing for explaining the determinants and consequences of population phenomena, social phenomena have to be taken into consideration.

It can be seen that the study of population is multidisciplinary in nature, involving and understanding of Biology, genetics, mathematics, statistics, economics, sociology, cultural anthropology, psychology, politics, geography, medicine, public health, ecology etc. The multidisciplinary nature of population studies and its relationship with other science will be discussed later in this chapter, after this discussion the difference between "population studies" and "demography" and interesting the origin and development of population studies.

The discipline of the study of human population is known by two terms:

i. Population studies
ii. Demography

Population studies can be understood easily as studies concerned with population, where demography can be explained by pointing out that it is derived from the Greek word demos meaning people and hence is the science of population. Though these terms are often used interchangeably, some scholars have tried to distinguish between "demographic analysis" and "population studies". It is considered that, "demographic analysis is confined to study of the components of population variation and change", whereas population studies are concerned not only with population variables but also with the relationships between population changes and other variables, social, economic, political, biological, genetic, geographical and the like.

The term "demography" may be used in a narrow sense, as synonyms with "demographic analysis" or "formal demography", which is primarily concerned with quantitative relations among demographic phenomena in obstruction from their association with other phenomena. Democracy may also be concept in a broad sense to include, in addition to the quantitative study of population the study of interrelationship between population and socio economic, cultural, and other variables. Mini population scholars do not approve of creating search and artificial distinction between democracy and population studies. According to Larimer, "demography and limited to the nearly formal treatment of changes in fertility mortality and mobility would be in a position like that of a formal chemist observing the compression of Mercury with no information about associated changes in temperature of the

Constitution of the liquid. The concept of pure demography except as the skeleton of science is therefore and illusion. Any meaningful study of population, therefore, has to be interdisciplinary.

1.6 Scope of Social Demography

The scope of demography is very wide. Includes the subject matter of demography is it a micro or macro study? Weather it is a science or art? These are vexed questions about the scope of demography about which there is no unanimity among writers on demography. The scope of social demography may be discussed under the following points.

i. Size of population
ii. Composition of population
iii. Distribution of population
iv. Fertility, mortality, and migration
v. Labor force
vi. Social demography
vii. Population policy

The discussion is as follows.

1.6.1 Size of Population

Population studies are fundamentally study and the form of its size. The student of population study is interested in studying the size of population. The want to know the changes that are taking place in the size of population. Three important components should bear mind:

a. Place: The population studies explain the population phenomena that take place situation and the changes in the contents of biological, social, economic setting.
b. Size: May be affected because of higher or lower birth and death rates and migration factors. These components affect the size of the population.
c. Time: The size and time do not remain the same the population changes from time to time and it depends on the socio-economic conditions.

1.6.2 Composition of Population

Composition of population includes the measurable characteristic of population of community in a country during the particular period. The characteristic of population age, sex, marital status, educational level, religion, caste, race, and health etc. Population study tries to find out the changes in the characteristic which influences on size and distribution of population because this characteristic generally changing. The population study not only studies the changing factors but also the variables responsible for the changes.

1.6.3 Distribution of Population

The distribution of population generally studied according to geographical area. It includes percentage and density of population the factors affecting population distribution is geographical, social, and economic etc. It was studied by classification of residence includes rural and urban rural population, locality of residence inhabitance etc. Population study conducted the concerning levels and trends of population distribution. It tries to study density and the percentage causes and factors affecting the population.

1.6.4 Fertility, Mortality, and Migration

The important field of birth rate, birth order, family size, sterility, and conception etc. Population studies influence of biological limits social norms upon fertility. It also studies the reproductive stand in addition to those physiological, social, and cultural factors affecting fertility, the interval between the successive work reproductive wastage etc.

Another important field of studies is mortality it includes studies of sex, age pattern, causes of death level and trends of mortality and difference in mortality such as rural urban occupation etc. Migration it studies the general trends of migration movement place of origin and destination migration intervals and streams it was a studies differential migration as age sex, marital status and educational attainment and also national and international migration.

1.6.5 Labor Force

Study is made of economically active population both employed and unemployed that is not economic league active such as homemakers' students and income recipients the basic measure of economic activity or labor force analysis include the

labor force the age six specific labor force participation the standardized labor force participation rate etc. Besides and international employment and unemployment are undertaken.

1.6.6 Social Demography

Social demography includes study of demographic aspect of social institution particularly family and marriage. The study of marriage includes marital status, age at marriage, time and trends, marriage frequency, marriage by religious group education level etc. It was a studies extent of window hood age by religion, duration of reunion, method of computation.

1.6.7 Population Policy

The development of country today very much depends upon population policies, population policies include features of guiding principle of organizational structure and service and supplies educational motivation family planning target and family planning progress and achievement etc.

The above discussion the nature and scope of demography include only the major and established areas. The scope of democracy has been constantly increasing; therefore, the new area of research and study is between explored. Thus, the scope is constantly widened.

1.7 Development of Population Studies in India

The current rapid growth of population in India is due to a marked decline in mortality, even before significant economic and social development. The future growth of India's population will depend largely upon the future prospects of the fertility decline. The birth rate in India has been lower in the urban areas compared to the rural areas. However, prior to 1965, it was essentially due to the age, sex, and marital status composition of the urban population. The lower marital fertility of urban women is a recent phenomenon, observed after 1965. The available evidence is clearly indicative of an inverse relationship between women's education and fertility. Development, which promotes urbanization and education, will have the effect of reducing marital fertility in India. Through an overview of the various periods in India, the development of population studies in India may be traced.

1.7.1 Pre-Independence Period

In the ancient history of India, a few references are found to the collection of population data. Detailed description of how to conduct a population, economic and agricultural census is available in the Arthashastra, a treatise on policy attributed to Kautilya, the prime minister of Chandragupta Maury, The Ain-I-Akabari, compiled by Abul Fazal during the reign of Akbar, contains comprehensive data of population industry, wealth, and characteristics of the population such attempts to collect data were, however, few and far between and are today of purely historical interest.

1.7.2 Census in British India

Data on Population became available on a regular basis in India only after the establishment of the system of decennial census in 1872. The beginning of census taking may therefore be considered as the starting point of population studies in India. Many of the earliest census reports have a heavy anthropological slant, for they were written by British administrators who were interested in getting a broad understanding of the unknown strange land they had colonized and the equally unknown strange people whose culture was totally different from their own. These administrators and scholars made a tremendous contribution to the development of population studies in India the British census actuaries contributed much studying the Indian age data and by constructing life tables based on the census data. This is a contribution not only to the development of population studies but also to the discipline of mathematics. Based on census report from 1872 to 1941, Kingsley Davis, the well-known demographic, produced his monumental work the population of India and Pakistan, which is valued even today for its contribution to the progress of population studies in India.

1.7.3 The Imperial Gazetteers

While tracing the development of population studies in India; it will not be out of place to mention the Imperial Gazetteers, which content through an exhaustive account of India and her people. The Imperial Gazetteers where first published in 9 volumes appeared in 1882 and was entitled the Indian Empires.

The first volume of the Imperial Gazetteers, intersection on public health and vital statistics, contents a discussion on such matters as nutrition, early marriages, birth rates, the relationship between marriage customs and birth dates, rural-urban

birth and death rates, differential in mortality, by sex, religion, rural-urban residence, infant mortality, causes of death, health conditions in the European and the native army, etc. It is interesting to note, as one looks back that these are precisely the topics who is sir today included in population studies.

1.7.4 The Role of the Intelligentsia

While voluminous scholarly census reports and imperial Gazetteers were being prepared by foreign administrators, even if only for their own use, the Indian intelligence did not show any interest in the study of population till the late 1930s. One reason for this lack of interest was that the rate of population growth was not very high at that time and did not cause any serious concern. The other reason was the Nations preoccupation with the struggle for independence.

P.K. Wattal may be considered as the pioneer in trying to focus the attention of Indian leaders and thinkers on the population problem in India, when he wrote about it in 1916. His pleas, however, went unheeded, for Indian leaders and thinkers where more concerned about political, social and educational problems than about the population problem. Both the press and public ware inclined to treat it more or less as a joke. In 1933, Wattle brought out new edition office work, Population Problem in India, incorporating the result of the 1931 census of India. In the late 1930s some interest in the study of the population of India was generated in the first Indian population conference was held in 1936 under the auspices of the University of Luck now, at which paper on the Future Growth of India's Population was presented and the need for birth control was discussed.

The second world India conference on population and the First Family Hygiene Conference were jointly held in Bombay in 1938. Apart from discussing the social and medical aspect of birth control and human sexuality several other subjects related to population studies were covered. These included differential fertility, maternity and child welfare, infant mortality, housing and health, nutrition, morbidity, vital statistics, logistic law of growth of the Indian population, economic problems associated with population size and growth, such as population and unemployment poverty and population, optimum theory of population, sociology analysis and forecast population growth. This long list indicates the interest of Indian scholars in various aspect of the study of population and highlights their multidisciplinary approach to this study. Prior to Independence, however, the outstanding students of

population by the economists, and discussions of Indian population center Mile around the question of whether or not India was overpopulated moreover, authors during this period largely concentrated on relating India's population to the Nation's economic condition.

The forecast that the Indian population would reach the 400 million mark by 1941 provoked Dr. Radha Kamal Mukherjee to write on Food Planning for Four Hundred million (1938). While emphasizing the need for agricultural development, Dr. Mukherjee also took many other relevant points into account. Face book followed by the publication of India's Teeming Millions (1939) by Professor Gyan Chand, in which the population problem was viewed from the economic point of view.

A significant development in the population field took place in 1938 when the Indian national Congress set up subcommittee of the national planning committee under the chairmanship of Pandit Jawaharlal Nehru to study the problem from the point of view of food supply nutrition social reform and employment and social welfare.

1.7.5 Government's Concern

The Government of India, realizing the importance of population data, setup population data committee in 1944 under the chairmanship of W.M.Yeats with Sir Theodore Gregory, Professor P.C. Mahalanobis, Professor K.B. Madhava and Dr. K.C.K.E. Raja is its members. This comity adds special attention to the statistical problems arising out of the tabulation of the 1941 census data and recommended the use of sampling methods for the estimation of vital

In 1946, the government of India appointed the Health Survey and Development Committee to study health conditions in India and to make recommendations for their improvement. This committee made shoes study of the activities in the field of population and recommended the appointment of a Registrar-General of Vital and Population Statistics. One of the important recommendations of this committee was that "the population problem should be the subject of continuous study".

1.7.6 Field Enquiries

Professor P.C. Mahalanobis and the Indian statistical institute had by this time started taking a keen interest in population research. As early as 1937, Indian statistical institute collected data on fertility through field Enquiries. About 1945, The

All-India Institute of Hygiene and Public Health, Calcutta, initiated several studies under the guidance of Dr. C. Chandra Sekhar an important field study undertaken by this Institute was the study of the productive patterns of 8000 women selected from the city of Calcutta and the surrounding rural areas. This is study attempted to analyze the effect of socio-economic conditions or reproductive patterns. The Gokhale Institute of Politics and Economics, Pune, was another Institute which took interest in population studies. In 1942, Professor N.V.Sovani of this Institute published a study entitled The Population Problem in India: A Regional Approach.

1.7.7 Post-Independence Developments

After independence, interest in population studies has been tremendous. Each decade is SIM to surface the previous on when the progress in the field of population studies is considered. The 1951 Census: the report of the first post-independence census taken in 1951 prepared by R.A. Gopalaswamy, the census commissioner departed considerably from the previous census reports in respect of the treatment of data. The report covered changes in the size and structure of the Indian population and underscored their implications for the level of living of the population. Foreseeing the dangers population growth, Gopalaswamy declared, “it is extremely important that the attention of the people should be focused on this factor of improvident maternity...”The occurrence of improvement maternity should evoke social disapproval as any other form of social indulgence”. An important contribution of Gopalaswamy was the introduction of the rural-urban dichotomy in census tabulations. She was also responsible for emphasizing the economic aspect of population analysis.

As the result of the 1951 census brought the population question into focus, political leaders, planets, and policymakers were alarmed by the high rate of growth of the population. The first five-year plan, therefore, considered the emerging population problem of India and its social and economic consequences and, in 1952, the National Family Planning Programme was launched. India thus achieved the distinction of being the first country in the world with a national family planning programmed. The adoption of this program gave fresh impetus to population studies and its various aspects. In addition to the 1951 Census of India, another study which focused attention on the implications of population growth in India, mall in the economic sphere, was the study of population growth and economic development in

India by Anstey J. Coaler and Edgar M. Hoover, two American demographers. This was the first systematic authoritative study to bring out the economic implications of different states of population growth in India.

1.7.8 The National Sample Survey

The dearth of data on various social, economic and population aspect was keenly felt when the five years plans while being drafted. Reliable estimates of birth and death rates and rates of natural increase in the population why are not available because of the inheritance of the vital registration system. The Nationwide National Sample Survey System was, therefore, established in 1949 to meet this need and produce data for the evaluation up development plans.

The National Sample Survey (NSS) started collecting data on birth and death rates and on the rates of population growth from its 14th around taken in 1958-59. It also collects data on differential fertility, family planning knowledge, attitude and practice for rural and urban areas, internal migration, and employment.

1.7.9 Early Field Survey

An important population study successful carried out during 1952-53 Mysore population study, jointly sponsored by the United Nations and the government of India. This is study brought about various social and cultural factors affecting fertility in India. Equally important is the fact that this study has contributed to the development of population research in many ways and has served as a model for the many other fertility survey which followed. The field survey on fertility and mortality conducted by Professor V.M. Dandekar and Professor Kumudini Dandekar in Nasik, Satara and Kolaba districts also contributed to a better understanding of fertility behavior in India.

1.7.10 Demographic Centers

The Central Family Planning Board, set up in 1956, appointed is subcommittee on demographic studies under the chairmanship of Dr.V.K.R.V. Rao. This subcommittee recommended the establishment of four demographic research center in different parts of the country where is studies might be conducted in fertility mortality and associated factors. As a result, the Demographic Training and Research Centre was established in Bombay in 1956,the demographic research center in Calcutta, Delhi,

and Trivandrum in 1957; and the owner at David was established in 1960. At present there are in addition to the IIPS, fifteen Population Research Centers in different part of the country and four more centers have recently been sanctioned.

1.7.11 Demographic Research

In 1959, the demographic Advisory Committee was appointed by the Ministry of Health, mainly to co-ordinate research on population. The Family Planning Communication Action Research Committeeman set up in 1960 to co-ordinate and promotes research in family planning communication and motivation. The two Committees were merged in 1967 to form the Demographic and Communication Action Research Committee which became defunct when its term expired on November 3, 1971. This committee was constituted on December 6, 1972, as the committee on socio economic studies on family planning to cover economic, sociological, educational, psychological, communicational, and demographic aspects of population growth and family planning.

The 1961 Census of India provided wealth of data to students of demography, and a large number of reports and monographs, based on this data were published. In 1963, India hosted the first Asian Population Conference in New Delhi-an important event in the history of demographic research in India. The sample registration scheme initiated by the Registrar-General of India in 1964-65, was a step forward in solving the problem of obtaining reliable estimates of birth and death rates and rates of natural growth. The progress made by the system in obtaining reliable estimate has been quite promising. Indian demographics have also made important contribution to the methodology and technique of population analysis. Sum of these contributions may be listed as this stage. The formula developed by Chandrasekhar and deeming to estimate the missing event of birth from vital registration and retrospective survey are now widely used. Jain developed new techniques for evaluating and adjusting Indian is data. Zither 1961 Census of India provided wealth of data to students of demography, and a large number of reports and monographs, based on this data were published. In 1963, India hosted the first Asian Population Conference in New Delhi-an important event in the history of demographic research in India. The sample registration scheme initiated by the Registrar-General of India in 1964-65, was a step forward in solving the problem of obtaining reliable estimates of birth and death rates and rates of natural growth. The progress made by the system

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1.8 Conclusion

The word 'demography' is often used to refer to the study of population statistics. It not only studies population statistics but also the causes and consequences of population changes, dependent on birth and death rates which are influenced by social factors like age at marriage. These social factors form the subject matter of sociology. Demographers also study geographical variations and historical trends in their effort to develop population forecasts. Thus, demography is the scientific study of population in order to understand the social consequences of population.

Pointing out the importance of demography, Kingsley Davis (1949) said, 'demography' is the essential basis for understanding the human society. He has demarcated the following functions of demography: to know the population of a particular area; to ascertain as to which factors are influencing the population of that particular area; to explain the factors relating to changes in population; and to study the population trends on the basis of the above three factors.

1.9 Summary

Demography is the scientific study of human populations, primarily with respect to their size, their structure, and their development. According to Donald J. Brogue, "Demography is a statistical and mathematical study of the size, composition, special distribution of human population and of changes over time in this aspect through the operation of the five processes of fertility, mortality, marriage, migration, and social mobility. Although it maintains continuous descriptive and comparative analysis of trends, in each of these processes and in its net result, its long run goal is to develop

a body of theory to explain the events that it charts and compares". Demographic analysis can be applied to the whole societies, or two groups defined by is usually considered a field of sociology, though there are a number of independent demography department.

The word Demography is a combination of two Greek words "Demos" meaning people and "Graphy" meaning science. Demography is the science of people. Even though the term 'population studies' is more popular than the term demography. Thinkers like William Peterson, Hauser and Duncan think 'population studies and demography to be different. According to them demography studies only the factors of population growth whereas population studies cover the social, economic, geographical, political and biological aspects of populations, their ensuing relationships are also studied.

The scope of demography is very wide. This scope may be discussed under the following points:

1) Size of population
2) Composition of population
3) Distribution of population
4) Fertility, mortality, and migration.
5) Labour force
6) Social demography
7) Population policy etc

The future growth India's population will depend largely upon the future prosperity of the fertility decline. The birth rate in India has been lowered in the urban areas compared to the rural areas.

1.10 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. Define demography.
ii. Define population studies.
iii. State of the stages of development of population studies in India.

G-B (10 Marks each)

iv. What is the scope of social demography?

v. What is the nature of social demography?

1.11 Suggested Readings

i. https://www.yourarticlelibrary.com/essay/demography-meaning-and-functions-of-demography/31392

ii. http://www.africapopulation.net/ips/uploads/Demography.pdf

iii. https://www.nationalgeographic.org/encyclopedia/demography/#:~:text=Demography%20is%20the%20statistical%20study,populations%20over%20space%20and%20time.&text=Demography%20is%20useful%20for%20governments,economic%20trends%20related%20to%20population.

iv. https://en.wikipedia.org/wiki/Demography

v. https://www.sciencedirect.com/science/article/abs/pii/S0047248478800384

Module II
Theories of Population

Unit 2 ❑ Pre-malthusian Theories of Population

Structure

2.1 Objectives

The traces of some ideas which have gained prominence in recent theoretical writing on population may be noticed in the writings of some ancient thinkers and philosophers. The current unit traces the development of population theories right from the contributions of Chinese Thinkers to that of Roman and Greek Thought. Emphasis is also laid on the population theories that arose with the Mercantilist School and the Physiocratic School.

2.2 Introduction

Since the early age of civilization scholars and thinkers have concerned themselves with the question of population. The size and growth of population has been viewed as an important factor underlying the development of any country. The different points of view is expressed by the scholars with respect to population phenomena

within the socio-economic, political context. In ancient times several statesman and thinkers applied their minds to the question of the desirable size of population and the need for either encouraging or discouraging population growth. The basis for such concern was mainly practical, covering military, political, social, and economic issues and usually led to the formulation of a specific public policy. These thinking cannot be e taken as any statement of a consistent population theory.

In the real sense of the term a population theory can be considered to have emerged only in the 18th century when the great work of Thomas Robert Malthus was published. Although some thought was given to population issues in earlier periods.

The traces of some ideas which have gained prominence in recent theoretical writing on population may be noticed in the writings of some ancient thinkers and philosophers.

2.3 Confucius and the Chinese Thinkers

The great Chinese philosopher Confucius and those belonging to his school of thought as well as a few other Chinese thinkers had given some thought to the concept of optimum population as it related to agricultural land. They had also considered population growth in relation to the availability of resources and the possible checks on this growth. However, it must be pointed out that the doctrines of Confucius on marriage family and procreation were generally in favour of population increase (united nation p. 33-34).

2.4 Greek Thinkers

The population theories and policies of the Greeks may best be understood with reference to their ideas. In the Greek scheme of political life, the individual was only a part of the state and had to play subordinate role to it. This view was reflected in their thinking on various social institutions. In ancient Sparta marriage was considered as an institution created by the legal and political system to provide the state with inhabitants and citizens. The real purpose of marriage was therefore emphasized as being the production of children. Continual wars, which decrease the population size, demanded a constant supply of men. Therefore, all Spartans were compelled to get married.

On the other hand, in Athens the rules concerning procreation were somewhat less rigid to Athenian customs and laws also encouraged frequent childbearing. However, it must be remembered that like the Spartans the Athenians were also interested in maintaining and improving the quality of the population from this it is obvious that the Greek were concerned about the size of the population more from the point of view of defense security and governance than from that of economic resources. Great Greek philosopher Plato was more specific on this. When he stated that if the highest good was to be achieved the city state should have 5040 citizens and land houses and property should be equally divided among them. It may be noted that Plato referred only to citizens and did not include women children and slabs in this ideal number of 5040. The total population of such an ideal city state was about 50000. The purpose of this choice of figure in Plato's planned state was simply aid in maintaining an equal division of property. Plato wanted the city state to be large enough to ensure economic self-sufficiency and military defense but small enough to permit a constitutional government. In a nutshell Plato's views on population as expressed in his Laws, were based upon his ideal of the city state rather than upon a broad view of human society (Eversley p.1-21,89-121,184-284).

Aristotle was on the opinion that an excessive number of people would give rise to poverty and other social evils since it was not possible to increase land and property as rapidly as the size of the population. Aristotle even proposed limit on the number of children each couple should have (Canan p54).

Therefore, we can say that the Greek were interested in maintaining population size which was appropriate for a city state.

2.5 Roman Thought

The Romans viewed the question in the context of their idea of the state involving issues concerning conquest, power, and empire. Therefore, they needed and expanding population.

The period of the Renaissance or the revival is known for the rapid changes which took place in several aspects of human life. The old feudal system collapsed, making way for capitalism. This period was also notable for the emergence of such

powerful states as England, France, Spain and Portugal. It was inevitable that all these changes should have some impact on the thinking on economy and population.

2.6 The Mercantilist School

In the history of economic thought, mercantilism is considered to be a link between the mediaeval period and the modern period. Almost all the trading Nations adopted this economic policy of mercantilism with a view to increasing national wealth and power by encouraging exports of goods in return of gold. Such policies open resulted in rivalry between Nations give rise to rapid economic growth and full utilization of national resources. For an effective implementation of mercantile policy, the size of the population was an important asset. As stated by Eli Heckscher, "an almost frantic desire to increase population prevailed in all the countries" (Heckscher p. 158). The general opinion at that time was that birth rates should be increased for purposes of economic and political gains by the adoption of such measures as- a) placing various disabilities on celibates; b) encouraging marriages directly; c) encouraging fertility; d) making punishment for illegitimate births less severe our abolishing punishment entirely; and e) encouraging immigration and preventing emigration (Stangelandp. 123-137).

Among the early mercantile writers the most important are Niccolo Machiavelli (1469-1527)and Giovanni Botero (1540-1617). Machiavelli was perhaps the first to view population from the modern angle by observing that excessive population would diminish through want and disease. In the sense that he saw the relationship between population growth and resources, he may be considered one of the predecessors of Malthus. Botero, an Italian citizen was also one of the first to study population phenomena in a broad scientific manner. Along with Machiavelli he may be considered one of the predecessors of Malthus. His work contained the basic thoughts of Malthusian doctrines. According to his thought a population after increasing for some time cannot continue to increase at the same rate; eat may grow slowly or may even start declining. In his opinion the limitation of the means of subsistence was the reason why population growth had to be limited. Though Botero was convinced that food for subsistence was necessary for any population,

he still regarded a large population is a source of strength for a country. (Stangeland p.92-93)

2.7 The Physiocratic School

The physiocratic school of economic thought emerged in France about the middle of the 18th century. This school of thought was the expression of a reaction against the mercantilist ideas and politics. The mercantilist had neglected agriculture in their thought, on the other hand the basic assumption of the physiocratic school was that land was the source of all wealth and hence it was necessary to emphasize the importance of agriculture and internal tax reforms. As a reaction against mercantilist the physiocrats did not favor population increase at the cost of standards of living. They approved of such increase only if it was possible to expand agricultural production. Quesney (1694-1774), the founder of the physiocratic school maintained that a large population was desirable only if it could be made comfortable. Similarly, Mirabeau, Mercier de la Riviere and Cantillon, and other physiocrats gave same line of thought. (EncyclopaediaBritannica vol. P. 1031)

2.8 Population, Choice, and the State

The essayists, historians, and jurists who gave us the first modern theories of the State usually had something to say about a large population as its foundation. This reference went beyond the role of numbers in immediate practical matters (war, labor, tax revenue) to the strength of states as an expression of natural (and, for most authors, divine) order. Two fundamental links between population and choice were noted.

The first sense in which individual choice is crucial lies in those decisions by which people choose to band together-decisions that actually make a human aggregate not just a great higgledy-piggledy of people, but a self- governing population or society. Only where the natural rights of individuals were duly observed could people's diverse interests and energies be reconciled and become, literally, a "commonwealth." The various writers noted, how- ever, that individual freedom of choice is observed to greater or lesser extent in different states. The character and

identity of polities were determined by the extent to which an ideal of balance in the rights and obligations of men- variously described as "the social contract," "Leviathan," "divine right," "micro- and macro cosmos," and so forth-was actually maintained in state policies and their execution. States would only grow and become strong where natural rights and relations were encouraged or at least allowed within the terms of prescribed checks and balances established by the State. The second link follows from this: evidence of balanced population growth and distribution was a sign or test of whether policies did indeed conform to universal order. Many writers continued to understand this test in its Medieval and biblical sense as well, in which natural increase was evidence of divine favor.

Except in those writings that regarded kingship as divine right, the State was not itself seen as a natural and divinely inspired entity, but as a contrivance by which men agreed, or were compelled, to cede individual rights to a prince or assembly in the interests of development and peaceable rule. Choice, in other words, always involves an element of compromise. The critique of absolutism, from Machiavelli to Rousseau, gradually established that it is a matter of individual conscious choice to decide which collectivities are deserving of allegiance, and what the principles of group membership are. Hence the population of states, while recognized as based ultimately in procreation, was of more immediate and practical interest as an aspect of the Realpolitik of group affiliation: Which states, and which cities, factions, or other groups within them, could attract and sustain the most, and the most balanced organization of, manpower? This emphasis on membership (see Berki, 1977: 118-119) meant that early modern writers, though often careful to note biblical sanctions promoting fertility, nonetheless gave much more attention to the significance of population composition and distribution. The family is taken for granted as the context of reproduction; its primary significance in these writings was as the model of State membership and authority, and also of the dangers of dissent.

This politics of population membership was not viewed in isolation. As we shall see, natural balances were conceived as essential not only in regulating the political rights and responsibilities of individuals, families, and the wider communities to which they belonged, but also in the organization of matters such as trade, agriculture, and defense. A commonwealth that was able to augment, distribute, and deploy its members in ways which enabled it to gain the most favorable balances in military and economic affairs was considered likely thereby to become a greater force than

its neighbors. Such a desirable outcome made the establishment of an effective polity an even greater priority, since only then would individuals come to see regulating their own actions in ways that preserved and enhanced the State as the best way of furthering their own interests.

The importance assigned to population as the foundation and arbiter of State policies might lead us to expect that great impetus would be given to enumeration and quantitative inquiry by early modern writers. It is well known, however, that despite the efforts of Graunt and his followers, the mathematics of population developed very slowly between 1650 and 1800, and the role of states in data collection did not begin in earnest until the end of the period. Such institutional developments presuppose an idea of the State in which a population is not simply part of a ruler's or family's domain, but a unit of self-government guided by legal and social responsibilities to every individual. This presupposes, in other words, a theory of individual choice and the State of the kind that only gradually developed during this period.

To begin with, we must ask why and how early modern writers came to see the numbers and composition of people as fundamental to the relationship between individual choice and the State. "Population" was not a common term before the later seventeenth century; its emergence would appear to be in direct proportion to the need for a more critical reference for "the multitude," a term then generally used to refer to the mass of common people as an indiscriminate body. Historical studies of early modern economic (Appleby, 1978) and biological (Jacob, 1974) writings suggest that population was likely to figure prominently in the thought of the period, since reasoning relied upon sixteenth- and seventeenth-century concepts of re-production and production as processes of "generation." This concept, as we shall see, contrasts sharply with subsequent modern fertility concepts; it nonetheless defined a "calculus" of individual choice in relation to population and the State on which later work still rests. Let us look more closely at the sources cited above, and see how they gave rise to the specific questions and measures that characterized the practice and the limitations of political arithmetic.

The Generation of a Commonwealth

The elementary distinction that Hobbes makes between vital and voluntary human action (n.d.: 31) can serve as our starting point. Hobbes postulated that vital action is "begun in generation" (i.e., from birth) and consists in more or less

unthinking bodily functions (breathing, eating, circulation of the blood, etc.). Voluntary actions, in contrast, are characterized by speaking and physical movement. While the latter also depend on man's vital endowment, their development is more by virtue of the growth of man's powers of imagination, and hence depends on the nature of his association with other men. The natural rights of individuals-their entitlement to free conscious choice-also derive from generation: men are born equal; birth gives a person possession of his or herself, or in other words, liberty. However, because individual interests are bound to conflict, man's freedom and natural endowments can only develop if men enter voluntarily into lasting and peaceable agreements with one another. In short, they must set up a State, or succumb to the famous Hobbesian image of a society that is "a war as is of every man, against every man."

The "generation of a commonwealth" is Hobbes's phrase for the act by which the formation of states is accomplished. It is achieved by voluntary choices to curb and direct vital endowments toward the common good. Hobbes reasons here by analogy to the family: a numerous population is necessary to the development of a strong State in the same way that many offspring assist the power and capacities of a family. But such increase is for not unless the collectivity is well-ordered. A multitude of people only becomes a commonwealth or State by choosing one person or assembly of persons (called Leviathan, or sovereign) in which all authority to maintain natural order is invested. Authority, following the family analogy, is paternal. Most states, Hobbes says, are erected by the fathers of families. "Cities and Kingdoms . . . are but greater families," which unite for security and development. Sovereign power parallels the dominion of a father over his child, but the source of this authority is not "because he beat him." Contrary to Bodin, Filmer, and the divine right of kings, procreation does not legitimize a divinely sanctioned patriarchy. Hobbes, as also Locke, Montesquieu, and Rousseau, accepted that sovereign parental authority enjoys for a time ad- vantages of experience and physical force; but family/State authority rests on the consent of the children/people. Children may choose to leave, or depose the father; and so too, they may choose to leave states or depose their rulers. The overriding desirability of stable order, and the lack of alternatives to legitimate family models, however, led these authors to caution against such extreme action.

The analogy between the family and the State thus rested on a concept of generation in which we can recognize two distinct meanings. The State, like the family, was rooted in generation (in the sense of the vital endowment of procreation, which is the ultimate source of population). But the State and the family also rest

strategically on the generation of their population in a second sense: those more or less voluntary choices to remain members of a collectivity and observe its laws, which effectively constitute and give continuing existence to that collectivity.

The original state of nature was generally accepted by early modern authors as having a bounteous surplus of food, land, and the like. However, because the rights that the individual acquired in nature included his or her own person, and hence the right to dispose of personal labor, men thereby possessed rights over property that was the fruit of their labor. In more strictly patriarchal or divine-right approaches, rights over wives and children and their labor accrued to household heads. In either case, rights in persons extended to the disposal of personal property. For Hobbes, all men and women had in the state of nature a right not only over their own person and possessions, but to all of nature, and hence to everyone else's property. Covetousness and differences over property could thus arise long before any absolute resource shortages occurred, and they could be inherited and built up over generations. Or, as Locke preferred to say, where mechanisms such as money and credit increased differences among men, so that increase of population led to a scarcity of land, the need to agree about laws arbitrating the division of property grew. In Montesquieu, laws promoting liberty like- wise promoted population and commerce; their development was in contrast to absolutism and the continuing power of the Church (Tomaselli, 1989). Population growth was thus seen as necessary to the development of a strong state; however, states could only develop their demographic and other resources if their populations were well-ordered. The need of States to have enough people was thus an argument for their role as a regulator of individual choice.

From the first of the early moderns-Machiavelli and his immediate follower, Botero-it was recognized that limited natural resources must ultimately restrict population growth. If the balance between subsistence and population did not much concern such early writers, it was because the concepts of balance and imbalance, described in the preceding paragraphs, were recognized as prior and as of more immediate practical significance. Indeed, the logic of these writers remains hard to fault in their view, the limits set by men in their relationships with one another become important long before root imbalances between man and nature, such as between the size or structure of a population and its sheer material supports; an imbalance of population and resources, therefore, is determined by the character of the collectivity to which men belong.

The Symmetry of a Commonwealth

Given that imbalances occur, and may be subject to man's control, several questions arise. If a large population is desirable, what sizes or levels are conducive to a strong and balanced State? Can particular forms of demo- graphic organization be determinant of different kinds of State? What are the implications of different population sizes and compositions for maintaining free choice and the exercise of legitimate authority?

Then, as now, no precise answer to the question of an optimum population was possible, although once again early modern approaches can be summarized effectively by referring to the concept of generation. As a root value, the "best" size was not so much indeterminate as predetermined: it belonged to the realm of natural and divine order and was consequently beyond human analysis in crucial respects. Second, as a strategic value, the best population size and structure inevitably varied from state to state, as determined by differing arrangements of authority, choice, and their implications for membership and development.

Filmer's *Patriarcha* (1680) gives examples of a concept of State built entirely on root values of generation. The king, as divine patriarch by birth, has indisputable power over the life and death of his subjects and can move them around as he pleases. Hence the strategic issue of population membership in the generation of commonwealths, together with the need to generate manpower for defense, trade, and so forth, is completely determined by the root values given to kings and fathers in procreation. These values cannot be questioned without questioning man's genesis, for legitimate authority is by direct descent from the authority God gave the original patriarch, Adam, over all Creation. Because the question of numbers in the family and the body politic is a matter of unquestioning obedience, Filmer confines himself to citing the biblical injunction to "be fruitful and multiply.

Although *Patriarcha* acquired an important following, it was not an adequate response to the experience of the period in the political domain. Recurring upheavals-exemplified by such events as the Huguenot rebellion in France, successive French, German, and Spanish invasions of Italy, the English Civil War, the mounting struggle to dominate international trade- persuaded even those writers who had expressed republican sentiments, including Bodin, Hobbes, Machiavelli, and Starkey, that since serious conflicts persist, the overriding need for peace and order requires

some system of absolute princely authority. As I have noted, the development and defense of states meant for these writers that a large population was desirable; but large populations could by definition only accumulate where conflicts did not split them apart. A prince could only build a great state where his authority was accepted, and this meant some system of concessions that allowed individual choice but controlled its fractious tendencies.

The systems put forward by early modern authors differed from one another in many respects, but in their treatment of the question of human numbers the issues and positions are remarkably consistent. Balance is achieved by strategies or policies that, by encouraging people to identify their interests with those of the State, keep them as loyal members. Further, policies that enable a State to attract and incorporate other populations were seen as desirable.

Machiavelli, in addition to being the earliest modern political theorist to write in this vein, gave these issues the most attention. The cyclic model of history pervading all his major works rests on alternating demographic regimes: one of sustained political, demographic, and military expansion keep a strong state from emerging, or vitiate it, thus leading to its decline (Kreager, 1988b). He duly acknowledges the ideal of "generativa," or vital endowments in human and agricultural fecundity, as the natural source of greatness in all spheres political, economic, moral, and military. But most of his attention is addressed to obtaining strategic advantages by neutralizing potential internal factions and co-opting the populations of other families, cities, and states.

In Machiavelli's view, a large native population is preferable chiefly because native troops are more to be trusted; it is, after all, their own families and property they are enlarging or defending. But this does not mean that high fertility is necessary. Florence and Rome were notably deficient in this respect, but by adroit policies they managed to expand through assimilating surrounding peoples into their polities. Machiavelli points also to Venice and Pisa as examples of successful states based on peoples of diverse origins, where the ability of men to band together overcame natural deficiencies in the land available for cultivation. Resources in people and territory are, in short, open to manipulation.

There is no best population size. While a small state is preferable, since it is more likely to permit equality of rights and a republican constitution, such states inevitably become the prey of larger ones; to survive, a state must expand. But as the

number of people increases, government becomes less direct and the opportunity for internal conflict grows; only an absolute prince is likely to be able to control such conflict and then only for a time. Much of what is archetypally "Machiavellian" in Machiavelli's writings concerns what are, in effect, population policies-including the use of conspiracy and fraud-through which the population necessary to the security and development of a state may be built up and efficiently deployed. It is characteristic of Machiavelli, for example, that in writing his History of Florence, he often shows us how individuals and heads of families act, willfully in ways contrary to the interests of the population of the state as a whole; and how the outcome of such actions is that individuals, families, and the members of wider factions are forced to leave the community, permanently or temporarily, unless some compromise (or trick) can be effected that will keep them as loyal members.

In other words, it is not the actual size and composition of a population that matters, but the effective or strategic size and composition-the numbers available that will act cohesively, or can be contrived to do so. As Hobbes remarks, "the multitude sufficient to confide in for our security is not determined by any certain number, but by comparison with the enemy we fear" (n.d.: 110); and the proof of this is that conflict is likely to ensue only where each side has failed to convince the other of its military, demographic, or other advantage. Similarly, Bodin, in constructing his system of commonwealth, explicitly rejects limiting population growth; this argument occurs, as in so many of these writings, in the context of a discussion of the problem of factions and perceived inequalities. The problem is one of obtaining the right balance of groups and property within the State. Small states, in Bodin's view, are no less prey to these problems than large ones, but the greater complexity of a large population tends to check seditious factions, since "there will be many in an intermediate position between the rich and the poor, the good and the bad, the wise and the foolish" (n.d.: 159). Rousseau likewise affirms that there is no best population size for all states, although a large and increasing population is the surest sign of prosperity. He defines the different kinds of State by the ratio of the size of the governing body to the population. Like his predecessors, Rousseau sees monarchies and aristocracies, in which the number of governors is small in proportion to the number of people, as the only form of state likely to permit large populations. Absolutism provides the necessary centralized management, whereas democracies, although preferable, require small population sizes that leave them vulnerable to conflict within and without, to which no enduring solution seems possible.

2.9 Conclusion

The ascription to pre-Malthusian writers of a cornucopian view of nature needs similarly to be re-examined and the concepts involved clarified. In particular, we must be wary of a modern critical elision — adumbrated in Candide and other eighteenth-century expressions of enlightened irreverence — between providential and anthropocentric views of nature, on one hand, and arbitrarily optimistic expectations of natural bounty, or even of anthropogenic transformations of the natural order, on the other. The idea that Creation was a moral drama did not imply that it was a comedy. Malthus attacked the latter suggestion with Voltairean wit; but he shared the former belief in full measure.70 This is most obvious in the closing chapters of the 1798 Essay, which explicitly set out the divine economy behind the principle of population.71 But it is no less present – and is indeed more carefully and empirically integrated – in the later editions, which quoted medical arithmeticians such Short and John Aikin to the effect that epidemics were providential instruments, and recommended the evangelical John Bird Sumner's comments on the "calculated" link between the people's need to compete for resources and the "improvement of human virtue". Malthus explicitly related both the imbalance between human multiplication and the production of food that constituted the "principle of population", and the oscillation between positive and preventive checks that its operation entailed, to the divine purposes of replenishing the earth, "improving the human faculties", and furnishing first "admonitions" and ultimately "penalties" for human "disobedience". This was a much more systematic expression of divine demographic justice and its mechanisms than Durham's or Short's works could furnish. But it was not very different in its assessment of nature's indifference to human feeling or the suitability of nature's laws for human improvement.

2.10 Summary

This unit traces the development the population theories from Chinese thinkers to that of Roman and Greek thought. Different points of view are expressed by these scholars regarding population problems. Confucius and other Chinese thinkers had

given valuable contributions to the concept of population. Confucius was in favour of population increasing. On the other hand, in ancient Sparta marriage was considered as an institution created by the legal and political systems to provide the state with inhabitant and citizen. Therefore, all Spartan were compelled to get marriage, because continual wars decrease the population size and demanded a constant supply of manpower. Like Spartans, Athenians, on the other hand, were also interested in maintaining and improving the quality of the population from the point of view of defense security. The Romans also needed an expanding population. The Mercantilist school tried to link between the medieval period and the modern period.

As a Mercantilist thinker Giovanni Betero and M. Machiavelli regarded a large population is a source of strength for a country. Quesnay (1694-1774) the founder of the Physiocratic School maintained that a large population was desirable only if it could be made comfortable.

2.11 Questions

G-A (5 Marks each)

i. What do mean by Commonwealth in case of population problems?

ii) How many links are there regarding population?

iii) What do mean by individual choice theory?

G-B (10 Marks each)

i. Write a note on the contribution of Chinese Thinkers to the development of population theory.

ii. What is the contribution of Roman Thought to the development of population theory?

iii. What is the contribution of Greek Thought to the development of population theory?

iv. Analyze the contribution of Mercantilist School to the development of population theory.

v. Analyze the contribution of Physiocratic School to the development of population theory.

2.12 Suggested Readings

i. Stangeland, Charles Emil (1904): Pre- Malthusian Doctrines of Population, A Study in the History of Economic Theory, New York: The Columbia University Press.

ii. Chand, Gyan (1979): Population in Perspective, New Delhi: Orient Longmans.

iii. United Nations (1973): The Determination and Consequences of Population Trends, Population Studies No. 50.

iv. Edwin, Cannan (1914): Wealth, London: King and Son.

v. The Mcgraw-Hill Dictionary of Modern Economics (1973): New Delhi.

vi. Heackscher, Eli F. (1935): Mercantilism, Vol. 2, London: Allen and Unwin.

vii. Encyclopaedia Britannica (1967): Vol. 17.

viii. https://www.researchgate.net/publication/281111291_Who_Were_the_Pre-Malthusians

Unit 3 ❑ Malthusian Theory of Population

Structure

3.1 Objectives

- To learn about the principles of population
  - To understand the postulates of the Malthusian Theory of Population
  - To understand the relation between Population and Food Supply
  - To understand the Positive Checks and Preventive Checks
- To understand the Malthusian Trap

3.2 Introduction

The Malthusian Theory of Population is a theory of exponential population growth and arithmetic food supply growth. Thomas Robert Malthus, an English cleric, and scholar, published this theory in his 1798 writings, An Essay on the Principle of Population.

The 18th century was a period of profound change in intellectual arena. These changes where to have a great influence on social economic as well as population theory. From the middle of the 18th century almost all writings on population contained some reference to the point that population increases more rapidly than food supply, a point which was letter to be elaborated by Malthus and which came to be known as the Malthusian theory of population. Many writers anticipated the theory latter elaborated by Malthus. Botero has already been referred to as his first important forerunner. In 1677, Matthew Hale referred to the capacity of mankind to increase in geometrical proportion, doubling in numbers in the course of 34 years or even also referred to corrective checks for controlling human population. Other writers who thought in the same line were Robert Wallace, John Bruckner, James Stewart, and Joseph Townsend.Thomas Robert Malthus was the second and last son in a family of eight. He was born on 14 February 1766.

Thomas Robert Malthus was a famous 18th-century British economist known for the population growth philosophies outlined in his 1798 book "An Essay on the Principle of Population." In it, Malthus theorized that populations would continue expanding until growth is stopped or reversed by disease, famine, war, or calamity. He is also known for developing an exponential formula used to forecast population growth, which is currently known as the Malthusian growth model.

i. Understanding the Ideas of Thomas Malthus

In the 18th and early 19th centuries, philosophers broadly believed that humanity would continue growing and tilting toward utopianism. Malthus countered this belief, arguing that segments of the general population have always been invariably poor and miserable, which effectively slowed population growth.

After observing conditions in England in the early 1800s, Malthus penned "An Inquiry into the Nature and Progress of Rent" (1815) and "Principles of Political Economy" (1820), in which he argued that the available farmland was insufficient to feed the increasing world population. Malthus specifically stated that the human population increases geometrically, while food production increases arithmetically. Under this paradigm, humans would eventually be unable to produce enough food to sustain themselves.

This theory was criticized by economists and ultimately disproved. Even as the human population continues to increase, technological developments and migration

have ensured that the percentage of people living below the poverty line continues to decline. In addition, global interconnectedness stimulates the flow of aid from food-rich nations to developing regions.

In India, which boasts the world's second-biggest population, the Green Revolution in the state of Punjab helped feed its growing population. In western economies like Germany, which was battered during World War II, population increases did not hamper development.

Famous naturalist Charles Darwin partially based his natural selection theory on Malthus' analysis of population growth. Furthermore, Malthus' views enjoyed a resurgence in the 20th century, with the advent of Keynesian economics.

ii. Background of Thomas Malthus

On February 13, 1766, Malthus was born into a prominent family near Guildford, Surrey, in England. Malthus was home-schooled before he was accepted to Cambridge University's Jesus College in 1784. There he earned a master's degree in 1791 and became a fellow two years later. In 1805, Malthus became a professor of history and political economy at the East India Company's college at Haileybury.1

Malthus became a fellow of the Royal Society in 1819. Two years later, he joined the Political Economy Club, along with economist David Ricardo, and Scottish philosopher James Mill. Malthus was elected among the 10 royal associates of the Royal Society of Literature in 1824. In 1833, he was elected to both the Académie des Sciences Morales et Politiques in France, as well as Berlin's Royal Academy. Malthus also co-founded the Statistical Society of London in 1834. He died in St. Catherine, near Bath, Somerset in 1834.

3.3 An Essay on the Principle of Population

In 1798 Malthus published his first essay on population which was mainly directed against the optimistic view of William Godwin an English writer and philosopher, and against Marie Jean Antonie Condorcet, French mathematician economist and philosopher. The title of the essay was: An Essay on the Principle of Population as at affects the Future Improvement of Society, with Remarks on the Speculations of Mr Godwin, Mr. Clandorcet and Others. This famous work of Malthus is a landmark in the history of population studies. It has become one of the most famous and one of the most controversial books of modern times. It brought

great honour to its author as well as abuse and criticism. It is to mention that the year of the publication of this book is determined as a base year for the study of population doctrines. Many ages to come all views on population were classified as pre- Malthusian, Malthusian, anti - Malthusian, and neo-Malthusian. He developed his idea on population in his essay. He was the first to develop a consistent and comprehensive population theory in relation to economic conditions and his writings exercised a great influence on population and economic theory. (Smith p. 4)

The first edition of the essay was essentially directed against the utopian writers, William Godwin and Condorcet who had more optimistic views concerning the possibilities of supporting and increasing cause and ardent French revolutionary who was tried in absentia and was sentenced to death. While hiding in a student's boarding house, he wrote his famous treatise on the history of human progress. According to Condorcet, "All inequalities of wealth, of education, of opportunity, of sex, would soon disappear." (Petersen p 32-33)

In 1793 that was about the same time Condorcet set went into hiding, Godwin published his book entitled Enquiry Concerning Political Justice. He had optimistic utopian ideas of a perfect society where 30 minutes work per day would fully satisfy the needs of all save draught.

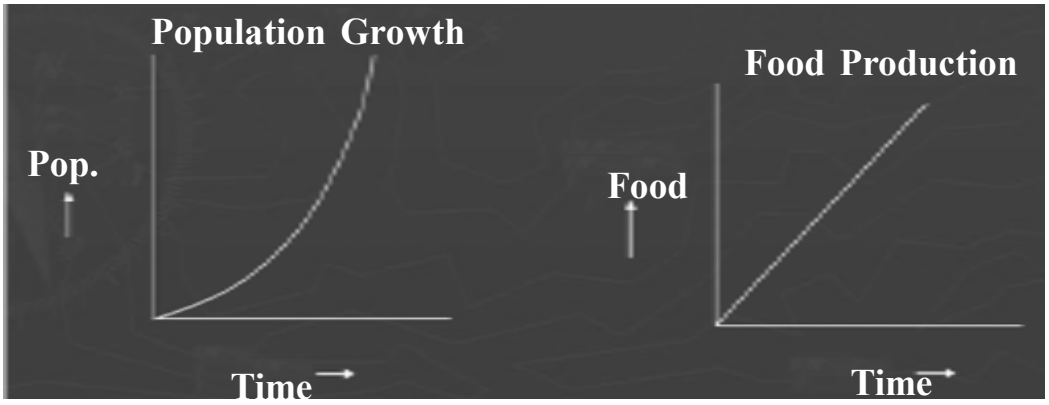
The theme of the essay of Malthus was mainly to counter the Utopian view of Godwin and Condorcet. He argued that the tendency of the population to grow faster in relation to its means of subsistence had led to human misery and placed several obstacles in the path of human progress. In 1803 Malthus published second edition of his essay which was a much expanded and changed edition, not merely a reprint. This edition contained substantial statistical data in support of the many arguments put forward and proposed moral constraint as a preventive check on rapid growth. Malthus spent the next five years in studying other authors' writings on population issues, visited continent, collected relevant statistical data and brought out another revised edition. Subsequently four more editions were published. The sixth edition was published in 1826. This edition was entitled An Essay on the Principle of Population or a View of its Past and Present Effects on Human Happiness, with an Inquiry into our Prospects Respecting the Future Removal or Mitigation of the Evils which it Occasions. The final and seventh edition was published after his demise in 1872.

3.4 Postulates of the Malthusian Theory of Population

In the first edition of the essay, Malthus began with two postulates: "first that food is necessary to the existence of man. Secondly the passion between the sexes is necessary and will remain nearly in its present state." Assuming then my postulate as granted say that the power of population is definitely greater than the power in the earth to produce subsistence for man. Population when unchecked increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison with the second. (Malthus essay 1798p. 11)

In chapter two of the sixth edition of the essay Malthus puts forth the following propositions, "(1) Population is necessarily limited by the means of subsistence: (2) Population invariably increases where the means of subsistence increases unless prevented by some very powerful and obvious checks: (3) These checks and the cheques which repress the superior power up population and its effects on a level with the means of subsistence are all resolvable into moral restraint vice and misery." (Malthus essay 1798 p. 11)

Accepting the fact that the factors obstructing the growth up population where constantly in operation Malthus father attempted to investigate what the natural increase in population would be if left unchecked and the rate at which the means of subsistence would be increased. On the basis of these two questions, he framed to office basic prepositions that – population tends to double itself every 25 years, thus increasing in a geometrical ratio while even under the most favourable conditions agricultural produce increases each 25 years only by an equal quantity, thus increasing only in an arithmetical ratio. (Malthus essay 7th edition book 1 chapter 1)



3.5 Population and Food Supply

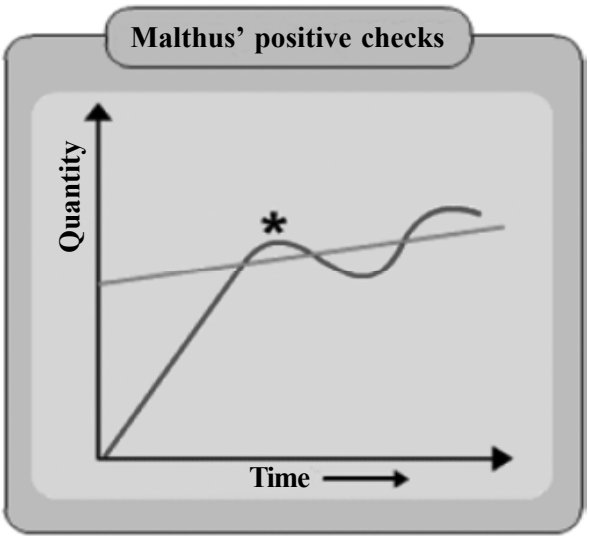
Thomas Malthus theorized that populations grew in geometric progression. A geometric progression is a sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio. For example, in the sequence 2, 10, 50, 250, 1250, the common ratio is 5.

Additionally, he stated that food production increases in arithmetic progression. An arithmetic progression is a sequence of numbers such that the difference between the consecutive terms is constant. For example, in series 2, 5, 8, 11, 14, 17, the common difference of 3. He derived this conclusion due to the Law of Diminishing Returns.

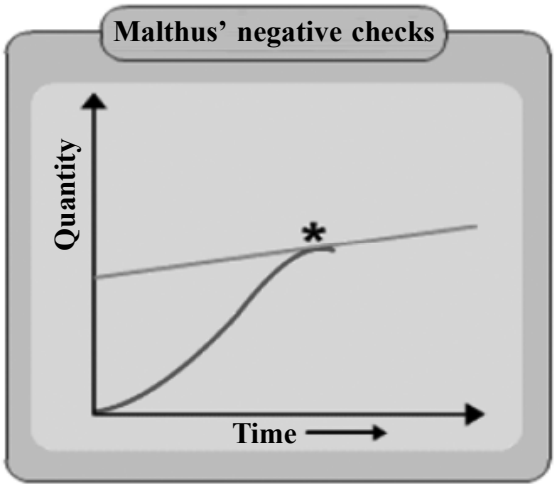
From this, we can conclude that populations will grow faster than the supply of food. This exponential population growth will lead to a shortage of food.

3.6 Positive Checks and Preventive Checks

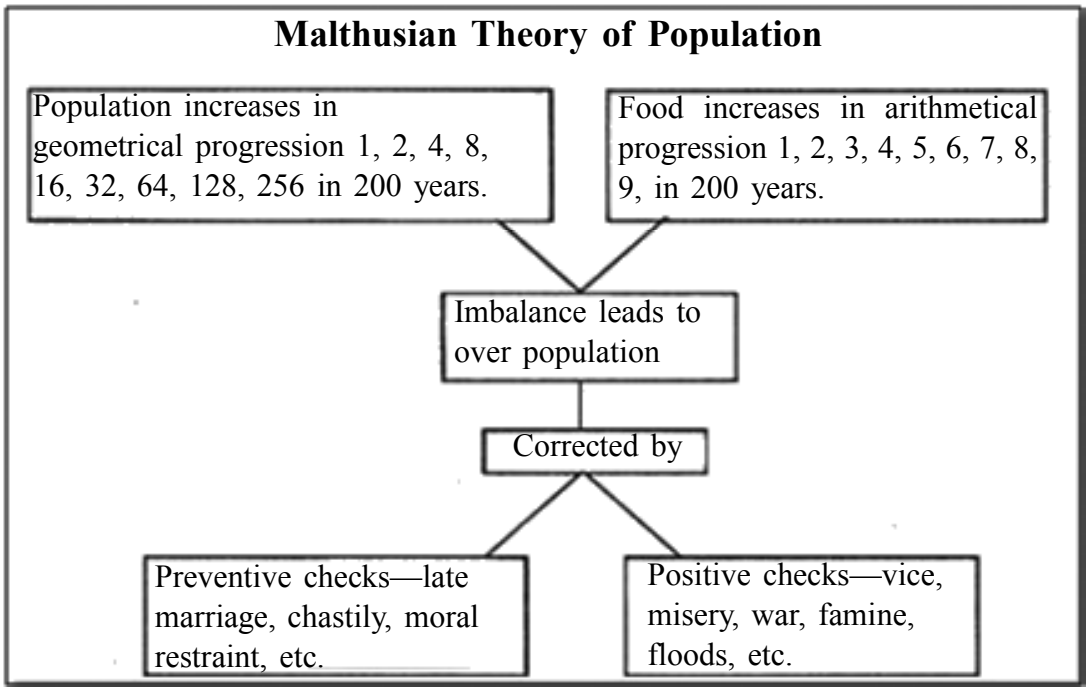
According to Malthus population could not continue unchecked. He classified two different types of checks – preventive checks and positive checks of population. Malthus included moral restraint and vice as voluntary checks based on man's reasoning. Further elaborating on these two preventives checks he describes moral restraint as "abstinence from marriage, either for a time or permanently from prudential consideration, with a strictly moral conduct towards the sex in the interval. And this is the only mode of keeping population on a level with the means of subsistence which is perfectly consistent with virtue and happiness". According to Malthus vice was prevention of the birth of children – "short of intercourse which renders some of the women of large towns unprolific", extra marital sexual relations and prostitution. (Malthus A summary view of the principle of population p. 114)



The positive checks referred in general to all the factors which tended to human life: "Such as unwholesome occupations, severe labour and exposure to the seasons, bad and insufficient food and clothing arising from property, bad nursing of children, excesses of all kinds, great towns and manufactories the whole train of common diseases and epidemics, war, infanticide, plague, famine". Malthus classified these positive checks into two categories the first which were brought about by natural causes and which he labelled as "exclusively misery", the other being that which mankind brought upon itself, such as wars, excesses up all kinds, which wear avoidable but, which were brought about by vice and were the consequences of misery. (ibid 153)



It's true that Machiavelli and Botero had earlier stated that population increases faster than the means of subsistence. Many of his arguments had already been put



forward by such thinkers as Sir Walter Raleigh, Francis Bacon, John Graunt, William Petty, Sir Matthew Hale, Benjamin Franklin, Joseph Townsend, Sir James Stewart, Hume, Robert Wallace, Arthur Young Archdeacon, Paley, and others. (Stangeland p. 355)

3.7 The Malthusian Trap

The Malthusian Trap (or "Malthusian Population Trap") is the idea that higher levels of food production created by more advanced agricultural techniques create higher population levels, which then lead to food shortages because the higher population needs to live on land that would have previously used to grow crops.

Even as technological advancement would normally lead to per capita income gains, theorizes Malthus, these gains are not achieved because in practice the advancement also creates population growth. Once the population exceeds what food supplies can support, this supposedly creates a Malthusian crisis with widespread famine as well as rampant disease. This ends up decreasing the population to earlier levels. The reality, however, has been that population growth has not itself created the crisis that Malthus predicted.

Though it is true that the idea of Malthusian theory is based had been prevalent for several years, but Malthus put these ideas in a larger framework and examine the inter relationship between population growth on the one hand and economic and political developments on the other hand. He modestly recognised that his work was not an original doctrine, at the same time pointing out that his presentation of the same ideas was better and some systematic, especially in the proposition that population tends to increase at a geometrical ratio and the means of subsistence at and arithmetical ratio.

3.8 Criticism

Malthus's theory of population has been criticized by numerous thinkers, writers, academician, and politician on several grounds.

First, Malthus's argument was based on two ratios – the geometrical and the arithmetical. According to his many critics this was the weakest point of his theory Kenneth Smith pointed out that these ratios concerning population growth and the

means of subsistence were based on a very weak foundation and were never really proved. Malthus concluded that population would double in a period of 25 years was based on the evidence of doubtful American statistics. It has never been proved empirically. (Smith p.326)

Secondly, the classification of checks on population growth into the two categories of preventive and positive also came in for criticism and was cited as an example of "poor classification" for the two do not form "independent categories". It was pointed out that Malthus had not succeeded in connecting his positive and preventive checks. (Smith p.244)

Thirdly, Malthus's theory was based on weak relationship between population and food supply. In fact, the right relationship is between population and total wealth of the country. The argument is that if a country is rich materially and even if it does not produce enough food for its population, it can feed the people well by importing food in exchange for its products or money.

Fourthly, Malthus neglected the manpower aspect in population growth. According to Cannon we forgot that "a baby comes to the world not only with a mouth and a stomach, but also with a pair of hands".

Fifthly, Malthus underestimated the importance of industrial and agricultural revolution, and did not take into consideration the faster and more reliable modes of transport.

Sixthly, on the other hand Kingsley Davis admitting that doctrine of Malthus where not empirical valid, emphasized that they were nevertheless theoretically significant. (Davis p.256-257)

Lastly, Malthus's theory was based on a static economic law at any one time that is the law of diminishing return.

3.9 Is Malthusian Theory Valid Today?

We must, however, add that though the gloomy conclusions of Malthus have not turned out to be true due to several factors which have made their appearance only in recent times, yet the essentials of the theory have not been demolished. He said that unless preventive checks were exercised, positive checks would operate. This is true even today. The Malthusian theory fully applies in India.

We are at present in that unenviable position which Malthus feared. We have the highest birth-rate and the highest deathrate in the world. Grinding poverty, ever-recurring epidemics, famine, and communal quarrels are the order of the day. We are deficient in food supply.

Our standard of living is incredibly low. Who can say that Malthus was not a true prophet, if not for his country, at any rate for the Asiatic countries like India, Pakistan, and China? No wonder that intense family planning drive is on in India at present.

3.10 Neo-Malthusian Theory of Population

The term neo-Malthusianism was first used in 1877 by Dr. Samuel Van Houten, one of the vice- presidents of the Malthusian League. Neo- Malthusianism was not just a campaign in favour of birth control; it was particular perspective on the effects of population on human conduct and behaviour.

The neo-Malthusian movement, therefore, was different from conventional Malthusian position on two counts: it stressed on birth control methods and also identified the working class with the problem of overpopulation. The overcrowded industrial slums were identified as sites of moral degeneration.

This diverted the debate on population from issues of poverty and unequal access to resources, to birth control per se. In fact, the assumption was that access to commons or availability of resources would give the poor little reason to abstain from having more children. Neo- Malthusianism thereby reinforced the ideology of private property, individualism, and capitalism. The neo-Malthusian position found favour with the elite sentiments on the issue of overpopulation. The elite, threatened by the growing numbers of commoners, considered birth control as an important means of checking future conflict over their property.

The French delegates tried to maintain a stance of ambivalence though they were wary of contraception on the grounds that it encouraged the idea of seeking sexual pleasure without taking the responsibility of the consequences of the act. According to them, it devalued the institution and sanctity of marriage and family values. For the Catholic Church, birth control was illicit and immoral and went against the basic tenet of Christianity. Till the 1920s, most medical opinion was also against birth control, as it considered it unhealthy and immoral.

The attitude started changing subsequently, as evidenced by the effort made by the British medical professionals in 1921 to appeal to the Anglican Church to reconsider their position on birth control in the light of existing medical knowledge. In America too, after a court ruling in 1929 that upheld the right of doctors to prescribe contraceptives for health reasons, birth control was included in medical curricula. Birth control clinics were set up in different parts of Europe and America and marked the new phase of the birth control movement. Birth control came to be popularised by taking recourse to the less "offensive" and more "social" terms like "family planning" or "planned parenthood", and the emphasis was on spacing of children and women's health.

In its bid to control sexuality and the domestic sphere of a person's life, birth control went against the modern values of individual freedom and the right of an individual to her/his privacy. On the other hand, it also questioned the orthodoxy of the times and presented birth control as an attempt to present a choice to the individual to have a child or not.

However, the source of the birth control debate was not whether individual freedom should be protected or not, but on how to control overpopulation, depopulation or under population and its consequent effect on the world. Central to the debate were the issues of migration, availability of labour, conflict over resources, and poverty. The concerns were developmental and political.

The erstwhile Soviet Union was the first country whose government attempted to make birth control advice and services freely available. Lenin, a key supporter of family planning, distinguished neo-Malthusian propaganda from what he termed as "the freedom of dissemination of medical knowledge and the defence of the elementary democratic rights of citizens of both sexes".

The socialists consistently maintained that the hue and cry over population was a way to divert the focus from the core issues of inequality and class struggle. For the socialists, the real issue was unequal access to resources than rising population. According to them, there was enough for everyone, provided resources are shared equally. The problem lay in the lack of equal distribution, with the bourgeois and the propertied class unwilling to give up the large share of resources under their control.

After World War II, the situation altered with a number of newly independent states joining the United Nations. By then the neo-Malthusian demographic transition theory was well accepted. According to this theory, all countries pass through four

stages of demographic evolution. The first phase is the pre- industrial stage, marked by a high birth and death rate and slow population growth. The second stage is characterised by a population explosion, with improvement in technology and social conditions of life.

The death rate is low, but the birth rate remains high leading to a high population growth rate. The third stage marks the beginning of the decline in the birth rate due to socio-economic changes and the fourth stage stabilises this trend and establishes a low and steady population growth rate. The interesting aspect of the theory is that population growth was supposed to reflect the level of economic development of a society. It established a low population rate as a key indicator of an economically developed country.

The post-colonies or the countries of the 'third world' stood out in terms of the neo-Malthusian analysis. The countries that break oil of the ditches of colonial rule seemed to be undergoing the second stage of demographic transition, that is, they were experiencing high birth rates and low death rates. With better medical facilities and infrequent famine conditions, population had not only stabilised but also increased at a rapid rate.

They were considered as backward, far behind the advanced societies in terms of economic development and technological growth, which was reflected in the persistent high rate of population growth rate. These were a matter of concern for the developed world. Years of colonialism had left these countries poor, with a large population to provide for.

Reduction of population became a priority with the UN. The focus was on raising nutrition levels in developing countries and providing better health facilities to women and children. The proposal to set up the Population Commission came up in 1945, which was opposed by former USSR and Yugoslavia on the grounds that another Commission would only confuse matters, given the proliferation of international bodies within the UN. But the main reason for opposing the Commission was because it focused primarily on "population changes" and the impending doom following the population explosion, rather than on "growth".

It ignored the role of global capitalist development in the production of economic backwardness in developing countries. The Commission was nonetheless formally established in 1946. Although it had no decision-making power, it worked in

collaboration with the other specialized agencies of the UN such as the International Labour Organization (ELO), Food and Agriculture Organization (FAO) and the World Health Organization (WHO).

3.11 Conclusion

Malthus's theory of population may have many limitations but cannot be considered fully irrelevant in human society as a whole. This theory may not be applicable to develop industrialist northern countries of the globe but its influence spreads over the two third of the universe that the agricultural underdeveloped southern countries of the globe. So, we can conclude the topic with the words of John Robinson. He said," of all economic doctrines, the one most relevant to the under developed countries is that associated with Malthus".

3.12 Summary

From the middle of the 18th Century almost all writings on population contained some reference to the point that population increases more rapidly than food supply. Thomas Robert Malthus sincerely elaborated this which came to be known as the Malthusian theory of population. Malthus was a famous British economist. 'An essay on the principle of population' was his famous book published in 1798. In his book he theorized that populations would continue expanding until growth is stopped or reversed by disease, famine, war, or calamities. Malthusian growth model is also important.

3.13 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. Name Malthus' book on Population growth.
ii. What are positive and preventive checks?
iii. What is the Malthusian Trap?
iv. How is population and food supply related, according to Malthus?

G-B (10 Marks each)

i. What are the propositions of the Malthusian theory of population growth?
ii. State the criticisms of Malthusian Theory of Population.
iii. Discuss the theory that Malthuse laborated to deal with population growth.
iv. What is the Law of Diminishing Returns?

3.14 Suggested Readings

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vi. Coontz, Sydney H. (1968): Population Theories and Economic Interpretation, London: Routledge Kegan Paul.
vii. Gupta, R. (2010): Elementary Geography, New Delhi: S. Chand Publication.
viii. Beale, H.L. (1958): Historical Context of the Essay on Population, D.V. Glass(ed.) Introduction to Malthus, London: Frank Cass and Company.
ix. Griffith, G. Talbot (1967): Population Problems of the Age of Malthus, New York: Frank Cass and Company.
x. https://www.intelligenteconomist.com/malthusian-theory/

Unit 4 ❑ Theory of Optimum Population

Structure

4.1 Objectives

The Optimum Theory of Population appeared as a reaction to the Malthusian theory. It is also called modern theory of population. In recent years, Prof. Robbins, Dalton and Carr- Saunders have refined and polished the theory and put it in a more presentable form.

This theory is an improvement over the Malthusian Theory. The founders of the theory state it as "Given the natural resources, stock of capital and the state of technical knowledge, there will be a definite size of population with the per capita income. The population which has the highest per capita income is known as optimum population".

4.2 Introduction

Optimum population theory appeared as a reaction to the Malthusian theory of population in 1924 when modern English economist Edwin Cannan published his book Wealth in that year. Edwin Cannan and Carr Saunders of London School of Economics developed a new theory as optimum population theory. It is also called modern theory of population. In recent years Prof. Robbins Dalton and Carr - Saunders have refined and polished the theory and put it in a more presentable form. This theory is an improvement over the Malthusian theory.

Although the beginning of this concept may be traced to the writing of a German professor, Karl Winkelblech, who describing population theory and policy classified Nations into three categories according to the size of their population: (1) under populated nation; (2) overpopulated Nations; and (3) Nations with normal populations meaning a size favourable to the greatest possible used the term optimum population as synonyms with best possible population and clarified this in the following words," At any given time the population which can exist on a given extent of land consistent with the greatest productiveness of industry at that time is definite."

Unlike the Malthusian theory, the optimum theory does not establish relationship between population growth and food supply. Rather, it is concerned with the relation between the size of population and production of wealth. The Malthusian theory is a general theory which studies the population problem of a country in keeping with its economic conditions. Thus, the optimum theory is more realistic than the Malthusian theory of population. The optimum population is the ideal population which combined with other available resources or means of production of the country will yield the maximum returns or income per head.

Given these assumptions, the optimum population is that ideal size of population which provides the maximum income per head. Any rise or diminution in the size of the population above or below the optimum level will diminish income per head. Given the stock of natural resources, the technique of production and the stock of capital in a country, there is a definite size of population corresponding to the highest per capita income. Other things beings equal, any deviation from this optimum-sized population will lead to a reduction in the per capita income. If the increase in per capita income, the country is under -populated and it can afford to increase its population till it reaches the optimum level. On the contrary, if the increase in

population leads to diminution in per capita income, the country is over -populated and needs a decline in population till the per capita income is maximised.

4.3 Optimum Population

The concept of optimum population has been interpreted in various ways," to mean the size of the population which results in the highest per capita income the highest productivity as measured in different manners. "Some other writers, considering the concept of the economic optimum as being too restrictive have included in it the total well-being health longevity of a nation the ideal family size the conservation of natural resources power defence and other spiritual cultural and aesthetic factors. According to do most writers the economic optimum where's the main consideration in the optimum population theory and gradually the idea of population of optimum size for maximum production was accepted. 1 important aspect the concept of optimum population was that it was a reconciliation of the optimistic and pessimistic theories of population because it implied that the growth of population was beneficial up to a certain point after which any further growth was harmful. The Economist like Carr Saunders considered optimum population as that which produces maximum welfare. On the other hand, Prof. Cannan defined this theory in terms of "return to labour." He remarked, "Knowledge and circumstances remaining the same there is what may be called maximum return when the amount of labour is such that both increase and decrease in it would diminish proportionate return." Similarly, Bounding has rightly observed, "optimum population is that at which standard of living is maximum."

Optimum population theory is a landmark in study of demography, sociology and other social sciences. It explains the problems of population in a comprehensive way from the production side. It also explains the relationship between productive efficiency and production. This theory provides more detailed analysis as it considers over and under population and brings out the evils of both.

Car-Saunders defines optimum population as "that population which produces maximum economic welfare". By optimum population we mean the ideal number of populations that a country should have considering its resources. The optimum size of population is which along with the existing natural resources and a given state of technology, yields the highest income per capita in a country. The optimum, population means the best and the most desirable size of a country's population. The optimum theory of population is based on two important assumptions. First, it is

assumed that the proportion of working population to total population remains constant as the population of the country increases. Secondly, it is assumed that as the population of a country increases, the natural resources, the capital stock, and the state of technology remains unchanged.

As the population of a country increases, the number of workers also increases. At the same time, the average product per man increases, but beyond that point it starts diminishing. Edwin Cannan says," at any given time, increase of labour up to a certain point is attended by increasing proportionate returns and beyond that point further increase of labour is attended by diminishing proportionate returns. At that very point where the average productivity of labour begins to decline, the income per capita is the highest. This is the point of maximum returns or optimum population."

The optimum population is liable to change in accordance with the quantitative and qualitative changes taking place in the means of production. The optimum point, therefore, keep shifting upwards or downwards. We cannot fix the optimum population of a country on a permanent basis because its productive factors, techniques keep changing from time to time.

Under population – If the population of a country is below the optimum, i.e. below what it ought to be, then the country is said to be under-populated. The number of the people is not sufficient to utilize the resources of the country. The resources are vast, much can be produced, but men are not sufficient. The community will not be able to reap the economies of large-scale production. Under such conditions, an increase in population will be followed by an increase in the per capita income. When the shortage has been made up, the per capita income will reach the maximum and the optimum is reached.

Over-population – If the population still goes on increasing and the optimum is exceeded then there will be over-population stage. There will be too many people in the country. The country's resources will not be sufficient to provide gainful employment to all. The average productivity will diminish, per capita income will diminish; standard of living will fall. These are the symptoms of over-population. Food shortage, diseases and death, overstraining resources, increase in dependents, open and disguised unemployment are the economic effects of over population.

Both under – population and over-population have disadvantages. It is the optimum population, with the highest per capita output, that is the best for a country to aim at. The concept of optimum population, under-population and over-population comprises the modern theory of population.

4.4 Under Population

Under population is if the actual population in a country is less than the optimum or ideal population, there will not be enough people to exploit all the resources of the country fully. Thus, the population and the per capita income will be lower. In other words, if the per capita income is low due to too few people, the population is then under population.

Under population exists when a population is too small, therefore unable to fully utilise the available resource endowments. Under population is also characterised by a situation where the available resources are capable of supporting a much larger population with no reduction in living standards. The situation is found in regions of low technical development such as equatorial Congo, Amazon River basin or the rich Prairie region of North America.

Relative under population is more common than absolute under population. Indeed, absolute under population is rarely seen and may be found in completely secluded societies where, the degree of replacement of population is less than unity. Relative under population occurs due to insufficient resource development. In developed economies, rural under population is more visible, whereas in backward countries, under population is linked to high mortality rate.

4.5 Over Population

The term ‘overpopulation’ means too great a population for a given region to support. There may be two causes: (i) population growth exceeds the existing resource base; (ii) existing resources have been depleted.

Some authors distinguish absolute overpopulation (where the absolute limit of production has been attained but standards of living remain low) from relative overpopulation (where present production does not support the population but the production can be augmented).

The situation of overpopulation displays the following socio-economic characteristics: high unemployment, low-incomes, low standards of living, high population density, malnutrition, and famine.

Malthus, for the first time, identified the problems related to overpopulation. Later on, the Neo-Malthusians also viewed overpopulation as a major problem. Marxists argue that overpopulation is the result of the mal-distribution of resources.

Nowadays, some western geographers view overpopulation as the cause of pollution and the increasing migration from the countryside in the western countries of Europe and North America. Overpopulation strikes the lower strata of the society the hardest particularly in developing countries such as India, Nepal, Myanmar etc. Overpopulation may occur either at national level or at regional level.

Regional overpopulation when found in rural areas is attributed to:

(i) Rapid increase of rural population,

(ii) Skewed distribution of agricultural land,

(iii) Agricultural mechanisation,

(iv) Lack of development of non- agricultural sector,

(v) Low agricultural yield,

(vi) Lack of social development, and

(vii) Non-resilience of the agricultural sector.

Over population is if the actual population is above the level of optimum population there will be too many people to work efficiently and produce the maximum goods and the highest per capita income. As a result, the per capita income becomes poorer than before. This is the stage of over population. In other words, if the per capita income is low due to too many people the population under these circumstances would be over population.

According to the founders of the theory the statement of the theory is "Given the natural resources, stock of capital and the state of technical knowledge, there will be a definite size of pollution with the per capita income. The population which has the highest per capita income is known as optimum population."

4.6 Concept of Optimum Population

Optimum population has been defined as that size of population enabling per capita output of the maximum orders accompanied by the highest possible standards

of living under a given set of economic and technological conditions. Therefore, optimum population lies between two extremes, i.e., overpopulation and under-population, although the size of optimum population is not sacrosanct.

It is a theoretically perfect situation difficult to estimate or define. The Penguin Dictionary of Geography characterises optimum population as a situation when the number of individuals can be accommodated in an area to the maximum advantage of each individual.

Thus, optimum population yields highest quality of life, which means each person has access to adequate food, water, energy and air of highest quality, adequate medical care, recreational facilities, and cultural outlets. In other words, optimum population permits the highest per capita output; therefore, the marginal productivity exceeds the average productivity whereby the rates of growth of total production are the highest.

4.7 Assumptions of the Theory

The optimum population theory is based on two important assumptions:

i. The proportion of working population to total population remains constant as the population of the country increases.

ii. As the population of the country increases, the natural resources, the capital stock and state of technology remain unchanged.

4.8 Diagrammatic Representation of the Theory

In the diagram volume of population is shown along OX axis and income per head along OY-axis. OS is the income per head which gives only subsistence wage rate to the population. This level of wages puts the minimum limit to the income per head.

The subsistence income per head can prevail with two levels of population:

i. When population is too small to exploit the country's resources with maximum efficiency. This is the level of OA population.

ii. When population is too large and the efficiency falls to give only a subsistence income to the labour force. This is the level of OC population.

OB shows optimum population which uses the available resources to give itself the maximum income per head. For a population less than OB, income per head increases with the increase in population. For a population higher than OB, income per head can increase with the decrease in population through preventive checks.

The dotted curve in the diagram shows the level of income per head with an improvement in technology or expansion of foreign trade. This will help to raise the income curve and generate population growth until wages are once again equal to subsistence level.

4.9 Dalton's Formula

Dalton expresses the theory in the form of a formula which is given below.

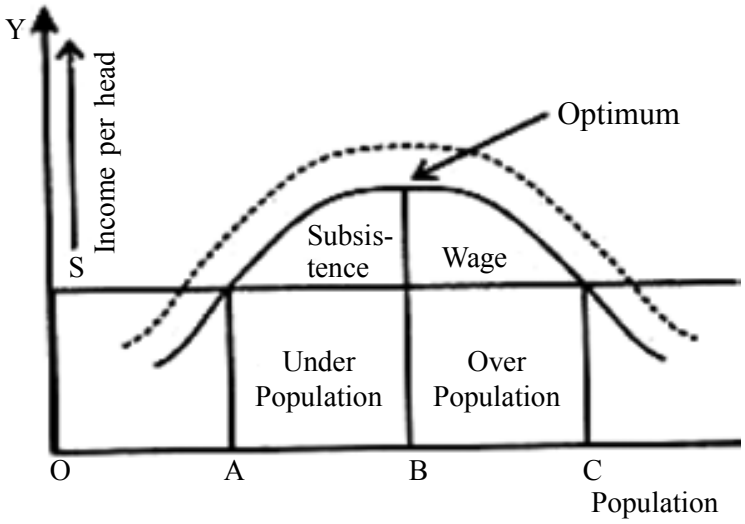
$$M = \frac{A - O}{O}$$

Where

M - Maladjustment or deviation from optimum population

A - Actual population

O - Optimum population



If M is zero, population is optimum, when M is positive, it is over population, when M is negative, it is under population. Therefore, optimum population is not fixed and a rigid one. It is rather variable and related to resources and technology. Optimum population is not just an economic concept but qualitative in has rightly remarked, "it is being perpetual altered by the progress of knowledge and other changes affecting the economic system. It is thus, a dynamic concept. It may be higher or lower as different methods of production are used."

4.10 Superiority of Optimum Population Theory over Malthusian Theory

The optimum theory of population is superior to the Malthusian theory on the following grounds.

i. The Malthusian law is a general study of the population problem because it is applicable to all countries irrespective of their economic conditions. The optimum theory is superior to the Malthusian theory because it studies the population problem in relation to the economic conditions of a particular country.

ii. Malthus had a narrow vision. He related the growth of population to food supply. Cannan, on the other hand, had a much wider outlook. He related the problem of population to the total production of the country, both industrial and agricultural.

iii. The Malthusian theory is a static concept which applies to a period of time. The optimum theory is a dynamic one because over a period of time the per capita income may rise with the expansion in output due to improvements in knowledge, skill, capital equipment and other elements in production. This may raise the optimum level of population. Thus, the optimum theory is more realistic.

iv. The Malthusian doctrine is simply theoretical and is devoid of all practical considerations. It regards all increases in population bad, for they bring untold miseries to the people. Malthus wrote, "The table of nature is laid for a limited number of guests and those who come uninvited must starve." On the other hand, the optimum theory is very practical because it regards an increase in population not only desirable but also necessary for the maximum utilisation of the country's natural resources.

v. The Malthusian theory of population is based on the unrealistic assumption of the niggardliness of nature. This belief arises from the operation of the law of diminishing returns in agriculture. But the optimum theory takes a realistic view when according to this the law of diminishing returns does not operate in agriculture immediately but after the optimum point is reached. In other

words, first the law of increasing returns operates up to the optimum point and the law of diminishing returns after it.

vi. Malthus was so much obsessed by the fear of over-population that he ignored a fundamental fact that a newly born child 'comes not only with a mouth and a stomach but also with a pair of hands'. The optimum population theory allays all such fears of the Malthusians by stressing the fact that increasing population increases the labour force which helps raise the optimum expansion of the country's natural resources.So long as the actual population is less than the optimum, the increase in population is safe and good. It is only when the actual population exceeds the optimum that the increase in population needs control Thus unlike the Malthusian theory which necessitates the use of preventive checks all the time for fear of the country being over-populated, the optimum theory is free from all such taboos and is silent about any type of checks to control population.

vii. Malthus was essentially a pessimist who portrayed a gloomy picture about the future of mankind which was full of misery, vice, floods, droughts, famines, and other natural calamities. The optimum theory: is superior to the Malthusian theory because it does not suffer from any pessimism, rather it adopts an optimised, and realistic attitude towards the problem of population when it relates population to the wealth of the country.

4.11 Merits of the Theory

The theory is a landmark in the science of demography. Its merits are under noted as follows.

i. Comprehensive Approach

It explains the problems of population in a comprehensive way from the production side. It also explains the relationship between productive efficiency and production.

ii. Qualitative Nature of the Theory

Prof. Bye said, "Optimum population is difficult to find because size of population must lead to the fullest development of social and economic life."

iii. Pragmatic Approach

This theory is also pragmatic, i.e. it is concerned with practical results.

iv. More Detailed Analysis

The optimum theory of population provides more detailed analysis as it considers over and under- population and brings out the evils of both.

4.12 Weakness of the Theory

Despite the superiority of the optimum theory over the Malthusian theory of population, it has serious weaknesses.

i. No Evidence of Optimum Level

The first weakness of the optimum theory is that it is difficult to whether there is anything like an optimum population. There is no evidence about the optimum population level in any country. In fact, it is impossible to measure it. For optimum population implies a qualitative; well as a quantitative ideal population for the country. The qualitative ideal implies not only physique knowledge and intelligence, but also the best age composition of population. These variables are subject change and are related to an environment. Thus, the optimum level of population is vague.

ii. Correct Measurement of Per Capita Income not Possible

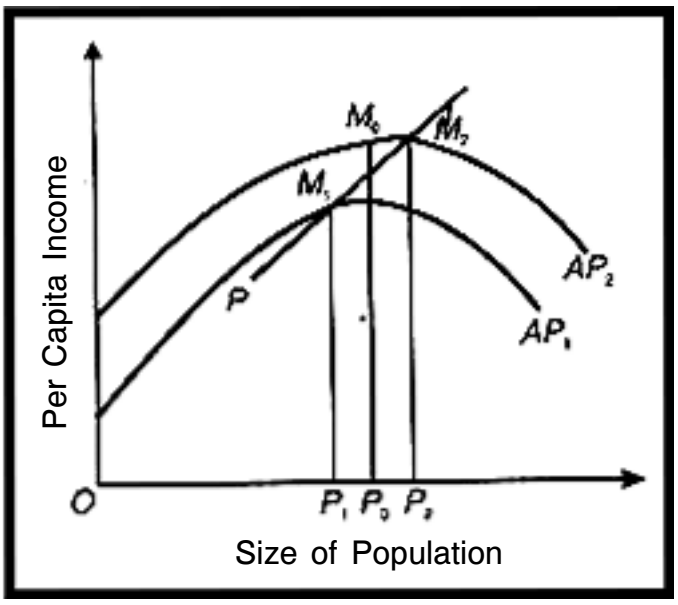
Another difficulty pertains to the measurement of per capita income in the country. It is not an easy task to measure changes in the per capita income. The data on per capita income are often inaccurate, misleading, and unreliable which make the concept of optimum as one of doubtful validity.

iii. Neglects the Distributional Aspect of Increase in Per Capita Income

Even if it is assumed that per capita income can be measured, it is not certain that the increase in population accompanied by the increase in per capita income would bring prosperity to the country. Rather, the increase in per capita income and population might prove harmful to the economy if the increase in per capita income has been the result of concentration of income in the hands of a few rich. Thus, the optimum theory of population neglects the distributional aspect of increase in the per capita income.

iv. Optimum Level not fixed but oscillating

The concept of the optimum population assumes that the techniques of production, the stock of capital and natural resources, the habits and tastes of the people, the ratio of working population to total population, and the modes of business organisation are constant. But all these factors are constantly changing. As a result, what may be the optimum at a point of time might become less or more than the optimum over a period of time.



AP1 is the average product of labour or per capita income curve. Suppose there is an innovation which brings a change in the techniques of production. It shifts the per capita income curve to AP2. As a result, the optimum level of population rises from OP1 to OP2 with the increase in per capita income E from P1M1 to P2M2. If the per capita income rises further due to a change in any of the above assumed factors, the AP2, curve will shift upward. The AP2 or AP1 curve can also shift downward if, for instance, the capita income falls due to an adverse change in the given factors. If the locus of all such S. points like M1 M2 etc., are joined by a line, we have the PI curve which represents the path of the movement of the optimum population as a result of changes in the economic factors. If, however, the actual level of population is assumed to be OP0 and the optimum level OP1 then the country is over- populated. If OP1 is the optimum level, then the country is under-populated. Thus, the optimum is not a fixed level but an oscillating one.

v. Neglects Social and Institutional Conditions

The optimum theory considers only the economic factors which determine the level of population. Thus, it fails to take into consideration the social and institutional conditions which greatly influence the level of population in a country. A lower level

of optimum population may be justified from the economic viewpoint, but such a level may be harmful keeping into view the defence considerations of the country. For instance, economic consideration may prevent us from having a large population but the danger from foreign aggression may necessitate a very large population to safeguard our territorial integrity. Thus, the optimum theory is imperfect and one-sided.

vi. No Place in State Policies

The concept of optimum population has no place in the policies of modern states. While fiscal policy aims at increasing or stabilising the level of employment, output and income in a country, no reference is made to the optimum level of population. This theory is, therefore, of no practical use and is regarded as useless.

4.13 Criticism

Optimum population theory has its own limitations. So, the theory has been criticized on various grounds by several writers and critics.

First, it is extremely difficult to know the optimum population of a country at any time. Many factors like technical knowledge, stock of capital, per capita income, and natural resources etc. have to be taken into account for this purpose.

Secondly, the optimum theory is criticized as a static short period theory. It ignores the changes in natural and human resources which affect per capita income. This theory is also silent about the important questions of the determinants of population growth.

Thirdly, some critics also argue that this theory has not taken into account the biological and sociological factors which govern the size and growth up population. Precisely it can be said, this theory is not our theory of population. It simply explains the state of population with reference to per capita income.

Fourthly, it is pointed out that two assumptions of which the theory has been based are not realistic. So, the practical value of this theory is reduced.

Fifthly, the critics also pointed out that the theory takes into account purely economic factors which determine the optimum size of the population of a country. It should also be considered the social, political, and other non-economic factors.

Sixthly, the theory avoids the distributional aspect of the problem. This theory considers simple population to income per head. This increasing population and national income cannot be useful to a country if the increase national income is not properly and equitable distributed among the different sections of society. Therefore, practicable and useful theory must account for in income distribution as a factor in determining the optimum population.

4.14 Conclusion

In spite of various criticism levelled against the optimum population theory, it is to be said that it is an improvement over Malthusian theory. This theory is an important landmark in the science of demography. Although this theory is not a guiding principle to any economic policy, it can be useful by recasting in a dynamic setting. This theory attracts much attention in the 1920s and the 1930s. Sauvey has again discussed this theory at great length and has defined optimum population as that population which best assures the realization of a predetermined objective, not so much as an absolute theoretical concept but as a convenient tool.

4.15 Summary

Malthusian theory of population had been criticized in many ways. The optimum theory of population came into existence as a reaction to the Malthusian theory. This theory is an improvement over the Malthusian theory. As a result, it is called Modern theory of population in 1924. Unlike the Malthusian theory the optimum theory does not establish relationship between population growth and food supply. Rather, it is concerned with the relation between the size of population and production of wealth.

4.16 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. Why did the theory of Optimum Population emerge?

ii. Elaborate the concept of Optimum Population theory.

iii. What is over population?

iv. What is under population?

v. Why is Optimum Population theory considered superior over Malthusian theory?

G-B (10 Marks each)

vi. Write a note on Dalton's formula of Optimum Population theory.

vii. What are the assumptions of the Optimum Population theory?

viii. State the merits of Optimum Population theory.

ix. List the criticisms of Optimum Population theory.

4.17 Suggested Readings

i. Thomlinson, Ralph (1965): Population Dynamics, New York: Random House.

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iv. Economic Discussion (2014): The Optimum Theory of Population, http// www. economicdiscussion.net.

v. Your Article Library (2015): Optimum Theory of Population, http://www. yourarticlelibrary.com

vi. Petersen, William (1965): The Politics of Population, New York: Doubleday and Company.

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viii. Adarkar, B. P. (1938): The Optimum Theory of Population, papers contributed to The Second All India Population and First Family Hygiene Conference, Bombay.

ix. Sauvey, Alfred (1966): General Theory of Population, London: Wicdenfeld and Nicolson.

x. https://www.economicsdiscussion.net/population/the-optimum-theory-of-population-with-diagram/4473

xi. https://www.yourarticlelibrary.com/population/the-optimum-theory-of-population-economics/10891

Unit 5 ❑ The Theory of Demographic Transition

Structure

5.1 Objectives

- To understand the theory of Demographic Transition
- To understand the views of Warren S. Thompson and Frank Notestein
- To understand the types of Population according to Frank Notestein
- To understand the views of C.P. Blacker
- To understand the views of Ansley J. Coale and Edger M. Hoover
- To present a criticism of the theory.

5.2 Introduction

The demographic transition theory is one of the most important population theories which is the best documented by the data and statistics of recent demographic history. The theory explains the effects of changes in birth rate and death rate on the growth rate of population.

According to E.G. Dolan, "Demographic transition refers to a population cycle that begins with a fall in the death rate, continues with a phase of rapid population growth and concludes with a decline in the birth rate."

According to this theory, every country passes through three different stages of population growth. In the first stage, the birth rate and the death rate are high and the growth rate of population is low. In the second stage, the birth rate remains stable, but the death rate falls rapidly. As a result, the growth rate of population increases very swiftly. In the last stage, the birth rate starts falling and tends to equal the death rate. The growth rate of population is very slow.The theory of demographic transition is based on the actual population trends of advanced countries of the world.

Other population theories like Malthusian or Marxian are basically speculative theory on the other hand the theory of demographic transition is an empirical, database or factual theory or based on actual demographic experience. Earlier demographers such as Landry (in 1909) and Warren Thompson (in 1929) (Thompson, p. 959-975) had attempted to construct a typology to describe the transition from conditions of high mortality and high fertility two conditions of low mortality and low fertility.

The theory of demographic transition is based on the actual population trends of the advanced countries of the world. According to this theory, every country passes through three different stages of population growth. In the first stage, the birth rate and the death rate are high, and the growth rate of population is low. In the second stage, the birth rate remains stable, but the death rate falls rapidly. As a result, the growth rate of population increases very swiftly. In the last stage, the birth rate starts falling and tends to equal the death rate. The growth rate of population is very slow.

5.3 Views of Warren S. Thompson and Frank Noteste in

The demographic transition theory in its original form was given by W.S. Thompson and Frank W. Notestein who based their statements on the trends in fertility and morality being experienced by Europe, America, and Australia. There were three distinct parts of the theory: (i) descriptive; (ii) theoretical and (iii) predictive. The first part was concerned with the simple description of the trends in

morality and fertility through time. The second part related to the causal mechanisms that create the pattern of trends described in the first part and hence was purely theoretical. The third predictive part postulated as to what will happen in future.

Broadly speaking, the theory postulates a particular pattern of demographic change from a high fertility and high morality to a low fertility and low morality when a society progresses from a largely rural, agrarian, and illiterate society to a dominantly urban, industrial, and literate society. The three very clearly stated hypotheses involved in the process are (i) that the decline in mortality comes before the decline in fertility; (ii) that the fertility eventually declines to match mortality; and (iii) that socio-economic transformation of the society takes place simultaneously with its demographic transformation. However, during this course of progression, all societies experience an intermediate stage when there occurs a wide gap between mortality and fertility giving rise to not only huge increments in population numbers but also to significant changes in their demographic structure.

In the present-day world, as would be true of any point in time, different countries of the world are at different stages of the demographic transition. According to Trewartha, this is largely due to the dual nature of man. According to him, biologically, man is same everywhere and is engaged in the process of reproduction but culturally man differs from one part of the world to another. It is the cultural diversity of man that gives rise to varying fertility patterns in different areas resulting in different stages in demographic transition.

Similarly, since socio-economic and demographic transitions progress simultaneously, different countries in the world would require different time span to complete the process in consonance with their own pace of economic transformation. Moreover, in the present-day world, countries at a low level of advancement can also have an easy access to the medicines being developed by the countries that are at a relatively higher level of technological advancement. Therefore, the demographic transformation in a country is not necessarily in tune with its technological achievements.

The demographic transition theory is characterized by conspicuous stages. Note Stein suggested the existence of three stages in the transition (i) high growth potential exists before fertility begins to decline; (ii) population growth slackens once fertility

decline becomes well established in the transition growth stage; and (iii) incipient decline occurs when fertility falls below the replacement level and when mortality has already stabilized at a low level (Woods, 1979, p.4).

The original statements of Thompson and Notestein on the transition theory were subsequently refined and reformulated with the passage of time. A wide variety of literature brought out on the demographic transition theory shows that three to five stages have been assigned to the theory. Generally, a transition theory three-staged model has been identified with pre-industrial, early western, and late western stage. These have also been called as high stationary stage with high fertility and high mortality providing very little natural growth; expanding stage with high fertility and decline in mortality providing explosive population increments; and low stationary stage with fertility and mortality levelling out each other at low level to re-establish a stationary population and, thus, completing the cycle.

i. The First Stage

In the first stage, the fertility is over 35 per thousand and is almost stable. The mortality in this stage is also high being more than 35 per thousand but its behavior is erratic due to epidemics and variable food supply. This stage, thus, postulates stable and slowly growing population where the people are engaged in wasteful process of reproduction. This stage occurs in agrarian societies where the population densities are low or moderate, general productivity level is low, large families are an asset, life expectancy is low, the development of non-agricultural sector is at its infancy stage, masses are illiterate, technological know-how is lacking and urban development is limited.

About 200 years ago, all the countries of the world were at this stage of demographic transition. At present, it may be difficult to ascertain whether any country in the world would still be at this initial stage of the demographic transition because the data pertaining to fertility and mortality for such areas would either be lacking or would not be completely reliable. Moreover, the diffusion of modern technology has also been so fast particularly in the field of medicines, that it is very difficult to find a solitary example of a country which may still be unaffected by the mortality declines taking place all over the world. It is in this context, that the first stage has been called as the pre-industrial and the pre-modern stage.

ii. The Second Stage

The second stage of demographic transition is characterized by a high and gradually declining fertility of over 30 per thousand and a sharply reduced mortality rate of over 15 per thousand. In this expanding stage of demographic transition, while the improvements in sanitation and health conditions, general productivity and distribution system result in sharp declines in the mortality rates, the fertility maintains a high level, at least in the early second stage. As the second stage prolongs, the fertility also shows signs of gradual decline.

A distinction has often been made between the early second stage with high fertility and declining mortality and late second stage with slowly declining fertility and sharply declining mortality. In the second stage, as a whole, the population expands, firstly, at a gradually increasing rate and afterwards at a gradually subsiding rate. In the wake of population explosion associated with the widening gap between the two vital rates, the problem of resource mobilization becomes significant. The life expectancy starts improving. The efforts to mobilize resources become more vigorous.The processes of industrialization and urban development become prominent. The large families are no longer an asset. Consequently, the fertility undergoes a gradual decline leading to a gradual squeeze of rate of natural increase at the tail end of the second stage.

Most of the less developed countries of the world are passing through this explosive stage of demographic transition because widespread penetration of modern medicines and sanitation measures have drastically reduced their mortality rates whereas their fertility levels are high and obliging. The countries like India, Pakistan, Bangladesh belong to the late second stage where the fertility rates have started declining gradually but since the decline in the mortality rates has been sharper there are large increments in their population numbers. However, they have yet to reach the tail end of the second stage as their fertility rates are not appreciably low.

iii. The Third Stage

The last stage in the demographic transition is attained when both birth and death rates decline appreciably. The population is either stable or grows only

slowly. Although populations grow slowly both in the first and the last stage, yet these are the product of contrastingly different situations. Whereas the slow growth of population in the first stage is the result of approximation of mortality and fertility rates at a high level, the slow population growth of the third and final stage is the product of approximation of fertility and mortality rates at a low level. Moreover, while in the first stage the fertility is high and stable, the mortality is high and erratic, in the third stage, the roles are reversed, the mortality is low and stable, and fertility is low but fluctuating. Not only that, the set of socio-economic conditions also associated with the first stage and the third and final stage of the demographic transition completely different. In the first stage, the society is traditional and primarily agrarian whereas in the third stage the population is highly urbanized. The technical know-how is abundant, the deliberate controls on family-size are common, the literacy and education levels are high, and the degree of labor specialization is high.

Anglo-America, Europe, the U.S.S.R., Japan, Australia, New Zealand are supposed to have reached this stage of demographic transition. Recently, China seems to have succeeded in bringing down its fertility and mortality rates drastically. Its achievements in the field of containing its natural rate of increase to a level of highly advanced countries in such a short span of time may, in times to come necessitate rethinking on the demographic transition model itself.

5.4 Types of Population according to Frank Notestein

In 1945 it was, Frank W. Notestein who presented the theory of demographic transition in an almost complete form with explanations for the changes in fertility. For this reason, Notestein may be called the father of the theory of demographic transition.

Main focus point of this theory is “All Nations in the modern era, which have moved from a traditional agrarian based economic system to a largely industrial urbanized base have also moved from a condition of high mortality and fertility to low motility and fertility”. (Stolnitz, p. 30)

Notestein identified that the rapid growth up population during the past three centuries was mainly due to the decline in the death rate resulting from the process of modernization which involved rising standard of living rising incomes and advances in sanitation and in medical knowledge. Throughout the modern West birth rates reached very low levels by the middle of 1930s. This decline or achieved because of the widespread acceptance of contraception under the influence of the new idea of the small family. (Notestein, p. 41)

Notestein characterized three types of population according to their stage of demographic evolution.

i. Population in the "stage of incipient" decline where fertility had fallen below the replacement level for those approaching this stage.

ii. Population in the stage of "transitional growth" where birth and death rates are still high and growth is rapid but the decline of the birth rate is well established.

iii. Populations in the stage of high growth potential where mortality e is high and variable and is the cheap determinant of growth while fertility is high and thus fore has shown no evidence of a downward trend.

In these populations rapid growth is to be expected just as soon as technical development make possible a decline in mortality. (Notestein, p. 41)

5.5 Views of C.P. Blacker

In 1947 C.P. Blacker attempted to identify the following five phases of the demographic transition: (Blacker, p. 88-101)

They are: (i) the high stationary phase marked by high fertility and mortality rates; (ii) the early expanding phase marked by high fertility and high but declining mortality; (iii) the late expanding phase with declining fertility but with mortality declining more rapidly; (iv) the low stationary phase with low fertility balanced by equally low mortality; and (v) the declining phase with low mortality, lower fertility and an excess of deaths over births. But we shall explain only the three commonly discussed stages combining Blacker's stages (iii) and (iv) as the third stage and leaving his stage (v) which is applicable only in France. In the figure, the time for different stages is taken on the horizontal axis and annual birth and death rates per thousand on the vertical axis. Before the 19th century in the first stage, birth rates

in Western Europe were 35 per thousand and death rates fluctuated around 30 per thousand. Thus, the growth rate of population was about 5 per thousand. In the second stage, death rates began to decline gradually from 30 per thousand to 20 per thousand from the middle of the 19th century to the end of the century. In the third stage beginning with the 20th century, birth rates began to decline from 35 per thousand and have continued so for about a century now nearing 15 per thousand. Death rates also continued to decline but seem to have stabilized between 12 to 15 per cent in Western Europe.

i. The First Stage

In this stage, the country is backward and is characterized by high birth and death rates with the result that the growth rate of population is low. People mostly live-in rural areas and their main occupation is agriculture which is in a state of backwardness. There are a few simple, light and small consumer goods industries. The tertiary sector consisting of transport, commerce, banking, and insurance is underdeveloped. All these factors are responsible for low-incomes and poverty of the masses. Large family is regarded as a necessity to augment the low family income.

Children are an asset to the society and parents. There being mass illiteracy, the society is not expected to educate them and thus burden itself. The existence of the joint family system provides employment to all children in keeping with their ages. Thus, a child becomes an earning member even at the age 5 when he becomes a helping hand to his parents in domestic affairs.

More children in a family are also regarded as an insurance against old age by the parents. People being illiterate, ignorant, and superstitious and fatalist are averse to any methods of birth control. Children are regarded as God-given and preordained. Being childless is regarded as a curse and the parents are looked down upon by the society. All these economic and social factors are responsible for a high birth rate in the country.

Along with high birth rate, the death rate is also high due to non-nutritional food with a low caloric value, and lack of medical facilities and of any sense of cleanliness. People live in dirty and unhealthy surroundings in ill-ventilated small houses.

As a result, they are disease-ridden and the absence of proper medical care results in large deaths. The mortality rate is the highest among the children and the next among women of child-bearing age. Thus, unhygienic conditions, poor diet and the lack of medical facilities are the reasons for a high mortality rate in this stage. This stage continued in Western Europe approximately up to 1840.

ii. The Second Stage

In the second stage, the economy enters the phase of economic growth. Agricultural and industrial productivity increase and the means of transport develop. There is greater mobility of labour. Education expands. Incomes increase. People get more and better-quality food products. Medical and health facilities are expanded.

Modern drugs are used by the people. All these factors bring down the death rate. But the birth rate is almost stable. People do not have any inclination to reduce the birth of children because with economic growth employment opportunities increase and children are able to add more to the family income. With improvements in the standard of living and the dietary habits of the people, the life expectancy also increases.

People do not make any efforts to control the size of family because of the presence of religious dogmas and social taboos towards family planning. Of all the factors in economic growth, it is difficult to break with the past social institutions, customs, and beliefs. As a result of these factors, the birth rate remains at the previous high level.

iii. The Third Stage

In this stage, the fertility rate declines and tends to equal the death rate so that the growth rate of population declines. As growth gains momentum and people cross the subsistence level of income, their standard of living rises. The leading growth sectors expand and lead to an expansion in output in other sectors through technical transformations.

Education expands and permeates the entire society. Popular education leads to popular enlightenment and opens the way to knowledge. It creates self-discipline, power to think rationally and to probe into the future. People discard old customs, dogmas, and beliefs, and develop individualistic spirit and break with the joint family.

Men and women prefer to marry late. The desire to have more children to supplement parental income declines. People readily adopt family planning devices. They prefer to go in for a baby car rather than a baby. Moreover, increased specialization following rising income levels and the consequent social and economic mobility make it costly and inconvenient to rear a large number of children.

All this tends to reduce the birth rate which along with an already low death rate brings a decline in the growth rate of population. The advanced countries of the world are passing through this last stage and the population is increasing at a slow pace in them.

5.6 Views of Ansley J. Coale and Edger M. Hoover

Ansley J. Coale and Edger M. Hoover have studied the changes in the birth and death rates associated with economic development. They sum up in the following ways: the agrarian present economy is characterized by high death and birth rates. Death rates are high because of poor diet primitive conditions of sanitation and lack of preventive and curative medical and public health programs. The birth rates are high due to the value, norms, customs, social systems, and the structure of the economy prevail in that time. When the agrarian economy starts undergoing it becomes interdependent on other economist has high levels of production and becomes highly industrialized market oriented and urbanized. When it happens, death rates register strikingr eduction because of better and regular supply of food as well as improved medical knowledge and care. The acceptance of the idea of small family size comes about initially in urban groups at the higher end of the socio-economic scale and then spreads to two small cities lower income groups and eventually to rural areas. The decline in the birth rate usually occurs after a substantial time lag as compared to the decline in the death rate. This delayed response of the birth rate to economic change comes about because any decline in fertility results only when changes occur in long standing attitudes and customs prevailed in society. Finally, reductions in the death rate become increasingly difficult to achieve the birth rate again approaches the level of the death rate and population grows only at a very slow rate. (Coale and Hoover, p. 9-13)

5.7 Criticism

The theory of demographic transition is greatly accepted as a useful tool in describing demographic history. But several questions raised in this context: Can this theory provide theoretical explanation of the forces that caused demographic changes? Has it have any predictive value? Can it be used for predicting the sequence through which developing countries would pass? Search questions lead to a several criticisms of the theory of demographic transition.

This is to be noted that this theory is based on the actual experience of the changes in the vital rates in western countries during the various stages of their

industrial and economic development. The critics of this theory point out that the experiences of the various European countries why are not uniform in the sense that the sequences of the stages as described in the statement of the theory where not the same. (Glass, p. 8)

Another criticism of this theory arises out of defect that it does not provide a theoretical explanation of an important force that is fertility which brought about the demographic transition. Recently demographers have arrived at the conclusion that the decline in fertility in Europe is very complex phenomena which has not yet been fully understood. British demographers David Glass despairingly pointed out that even the English people do not have an adequate knowledge of their own demographic transition.

The theory of demographic transition cannot really be called a theory because it does not fulfil an important criterion of any theory, that is, to extract fundamental process from a phenomenon and identify crucial variables. This theory does not provide fundamental explanations of fertility decline. Therefore, it does not have any predictive value.

The most crucial question to be asked is: Can the theory of demographic transition be applied to developing countries? Will these countries have to wait for economic and social development till they bring down the birth rate and bring about a reduction in the growth rate? It is difficult to maintain any degree of confidence that the theory of demographic transition is also applicable to developing countries and what happened in the West in respect of population growth would be duplicated in developing countries.

5.8 Conclusion

The theory of demographic transition is the most acceptable theory of population growth. It neither lays emphasis on food supply like the Malthusian theory, nor does it develop a pessimistic outlook towards population growth. It is also superior to the optimum theory which lays an exclusive emphasis on the increase in per capita income for the growth of population and neglects the other factors which influence it.

The demographic transition theory is superior to all the theories of population because it is based on the actual population growth trends of the developed countries of Europe. Almost all the European countries of the world have passed through the first two stages of this theory and are now in the final stage. Not only this, the theory is also equally applicable to the developing countries of the world.

Very backward countries in some of the African states are still in the first stage whereas all the other developing countries of the world are in the transitional stage two. It is on the basis of this theory that economists have developed economic-demographic models so that underdeveloped countries should enter the final stage and attain the stage of self-sustained growth. Thus, this theory has universal applicability.

5.9 Summary

The theory of demographic transition is the most acceptable theory of population growth. It neither lays emphasis on food supply like the Malthusian theory, nor does it develop a pessimistic outlook towards population growth. It is also superior to the optimum theory which lays an exclusive emphasis on the increase in per capita income for the growth of population and neglects the other factors which in fluence it.

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Although old-age support is a plausible element that may affect the level of fertility, it appears as a minor force in the context of the demographic transition. First, since there are only rare examples in nature of offspring that support their

parents in old age, it appears that old-age support cannot be the prime motivation for child rearing. Second, institutions supporting individuals in their old age were formed well before the demographic transition. For instance, evidence suggests that, as early as the sixteenth century, parents in England did not rely on support from children in their old age (Pelling and Smith, 1991; Hindle, 2004). In particular, the Poor Law Act of 1601 was interpreted by the English courts as giving the impoverished parent no claims for assistance from a child, but instead a claim for assistance from the community.

The rise in fertility rates prior to the demographic transition, in a period of improvements in credit markets, raises further doubts about the significance of this mechanism. Moreover, cross-sectional evidence shows that in the pre-demographic transition era wealthier individuals, who presumably had better access to credit markets, had a larger number of surviving offspring, increasing the skepticism about the importance of this hypothesis. Thus the decline in the importance of old-age support is unlikely to be a major force behind the significant reduction in fertility – at a rate of 30-50% – that occurred during the demographic transition.

5.10 Questions

G-A (5 Marks each)

i. Point out the limitations of democratic transition theory of population.

ii. Explain Notestein's view on demographic transition theory.

iii. What are the three parts of the demographic transition theory of W.S. Thompson?

iv. What are the types of population according to Frank Notestein?

v. Why is the demographic transition theory superior to all other theories of population?

G-B (10 Marks each)

vi. Explain in detail the demographic transition theory of W.S. Thompson.

vii. What is the pattern of demographic change as in demographic transition theory of W.S. Thompson?

viii. Write a note on the views of Ansley J. Coale and Edger M. Hoover on population growth.

5.11 Suggested Readings

i. Thompson, Warren S.(1929): Population, American Journal of Sociology, Vol. 34 No. 6.

ii. Blacker, C.P. (1947): Stages in Population Growth, The Eugenics Review, Vol. 39. No. 3.

iii. Notestein, Frank W. (1945): Population: The Long View, Theodore Schultz (ed.), Food for the World, Chicago: The University of Chicago Press.

iv. Caldwell, John (1976): Toward a Restatement of Demographic Transition Theory, Population and Development Review, Vol. 2, No. 3 and 4.

v. Stolnitz, George (1964): The Demographic Transition: From High to Low Birth Rates and Death Rates, Ronald Freedman (ed.) Population: The Vital Revolution, New York: Doubleday and Company.

vi. Coale, Ansley J. and Hoover, Edger M. (1958): Population Growth and Economic Development in Low-income Countries, Princeton: Princet on University Press.

vii. Coale, Ansley J. (1965): The Factors Associated with the Development of Low Fertility: A Historic Summary, World Population Conference, Belgrade, Vol. 2.

viii. https://www.yourarticlelibrary.com/population/the-theory-of-demographic-transition-population/10895

ix. https://www.shareyouressays.com/knowledge/what-is-demographic-transition-theory-of-population/111296

x. https://www.sociologydiscussion.com/demography/population-demography/the-theory-of-demographic-transition-with-criticisms/3096

Module III

Population, Social Structure and Processes

Unit 6 ❑ Population size and growth, Population explosion

Structure

6.1 Objectives

By reading this unit the student will be acquainted with the following:

- The concept of population.
- Definition of Population Size and Population Growth

- Analyse the factors affecting population growth
- Understand Population Explosion
- Causes of Population Explosion
- Understand the problems of population explosion

Thus, the study of population broadly classified as the scientific study of human populations. Major areas studied include broad population dynamics; fertility and family dynamics; health, aging, and mortality; and human capital and labour markets.

6.2 Introduction

A population is generally a group of individuals of a particular species occupying a particular area at a specific time. Population is the key component of the society as well as nation. Populations are characterized with such characteristics as dispersion, fluctuation in numbers, sex ratio, birth rate and death rate etc. The population generally arises as a result of reproduction.

The data on population, its phenomena, growth, and other things pertaining to population have special significance in sociology. Sociology primarily deals with social relationship along with the study of social structure and social organization. It deals with various facts of social life like social stratification, group cohesion and progress of society. So, the study of population is most significant area of sociology.

6.3 Population Size

Population size is expressed as the actual number of individuals in a population. More informative are estimates of population density, which is calculated as population size divided by total land area.

Since the patterns of dispersion of population in nature are different it becomes important to distinguish between crude density and specific density. Crude density is the density per unit total space. Specific or ecological density is the density per unit of habitat space, the area that can actually be colonized by the population. Population is changing entity, so, we are not only interested in its size but also in nature of its change. The nature of changing is varying from place to place, population density also varies in time. Population may remain constant; it may fluctuate, or it may steadily increase or decrease.

6.4 Population Growth

Population growth refers to the increase in number of inhabitants of an area or a territory over a specific period of time. It has been observed that population of the world has been consistently increasing especially after II world war. Population growths are influenced by several factors of the environment as well as by the characteristics of the individuals of the species itself. Under favorable conditions the group of individuals increase in numbers. Natality and immigration lead to an increase in density, while mortality and emigration lead to a decrease in density. The growth rate of a population is the number of inhabitants added to the population per time. The change in number can be measured in two ways, by absolute numbers or by percentage. It is customary to abbreviate the change in something by writing the symbol Δ (delta) in front of the letter representing the thing changing. Thus, if N represents the number of inhabitant and at the time, then -

ΔN = the change in number of inhabitants.

$\Delta N/\Delta t$ = the average rate of change in the number of inhabitants per time. This is growth rate.

Another formula to calculate growth rate is $GR = \frac{P2-P1}{P1} \times C$

Where P1 = Previous Population, P2 = Present Population, C = Constant (Like, %).

6.5 Causes of Population Growth

The causes of population growth may be shortlisted to the following.

i. **Fertility:** Fertility refers to the occurrence of birth or the reproduction capacity of women.

ii. **Advanced of science:** Especially the modern medical science and health policy of a nation has reduced the rate of mortality.

iii. **Migration behavior:** Any type of migration modifies the ways of life and this may result in demographic change and population growth.

iv. The tradition and culture and religious believe of the people motivate people towards having more children are large in numbers.

v. Lack of education and poor economic condition also reinforce the population growths.

Effect of the population growth at macro level can be seen in the economic and social development of the nation.

6.6 Consequences of Population Growth

The rapid population growth has both the macro and the micro level effect over the environment. At micro level it affects the individuals at all levels. The factors which affect at micro level may be summarized as food, health, housing, education, employment opportunities and recreation etc. related to individual's life of people.

6.7 Optimum Population

Sauy (1966), Tacuba (1970) and Robinson (1964) gave the economic concept of optimum population. The optimum size of population for an area was defined as "The optimum level is that size of population which yields the highest quality of life. The optimum population is a state in which an equilibrium maintained between the population and carrying capacity of the land. Depending upon the quality of land and resources every nation has the limited capacity to provide quality of life. The criteria for computing optimum population are as follows:

i. Per capita production
ii. Average standard of life
iii. Social harmony
iv. Per capita food consumption
v. Quality in the use of goods
vi. Balanced Demography
vii. Degree of employment etc.

Thus optimum population yields highest quality of life, which means each person has access to adequate food, water, energy and air of highest quality, adequate medical care, recreational facilities and cultural outlets. In other words, optimum population permits the highest per capita output; therefore the marginal productivity exceeds the average productivity whereby the rates of growth of total production are the highest.

6.8 Over Population

The concept of over population is explained by demographers and economist. If the size of population of the country or region exceeded by more than the supporting capacity of the region the area is said be over-populated. In this case available resources and population size are not balanced. If the population size is more than reasonable limits, problems will crop up, where quality of life, social and economic development will hamper.

The term 'overpopulation' means too great a population for a given region to support. There may be two causes: (i) population growth exceeds the existing resource base; (ii) existing resources have been depleted.

Some authors distinguish absolute overpopulation (where the absolute limit of production has been attained but standards of living remain low) from relative overpopulation (where present production does not support the population but the production can be augmented).

Malthus, for the first time, identified the problems related to overpopulation. Later on, the Neo-Malthusians also viewed overpopulation as a major problem. Marxists argue that overpopulation is the result of the mal-distribution of resources.

Overpopulation may occur either at national level or at regional level. Regional overpopulation when found in rural areas is attributed to:

i. Rapid increase of rural population.
ii. Skewed distribution of agricultural land.
iii. Agricultural mechanisation.
iv. Lack of development of non- agricultural sector.
v. Low agricultural yield.
vi. Lack of social development, and
vii. Non-resilience of the agricultural sector.

The situation of overpopulation displays the following socio-economic characteristics: high unemployment, low-incomes, low standards of living, high population density, malnutrition and famine.

6.9 Causes of Over Population

The various causes of over-population may be listed as follows.

i. The Decline in the Death Rate

At the root of overpopulation is the difference between the overall birth rate and death rate in populations. If the number of children born each year equals the number of adults that die, then the population will stabilize.Talking about overpopulation shows that while there are many factors that can increase the death rate for short periods of time, the ones that increase the birth rate do so over a long period of time. The discovery of agriculture by our ancestors was one factor that provided them with the ability to sustain their nutrition without hunting. This created the first imbalance between the two rates.

ii. Agricultural Advancements

Technological revolutions and population explosions occur at the same time. There have been three major technological revolutions. They are the tool-making revolution, the agricultural revolution, and the industrial revolution. Agricultural advancements in the 20th century have allowed humans to increase food production using fertilizers, herbicides, and pesticides and yields further. This allowed humans with more access to food that leads to subsequent population explosions.

iii. Better Medical Facilities

Following this the industrial revolution started. Technological advancement was perhaps the biggest reason why the balance has been permanently disturbed. Science was able to produce better means of producing food, which allowed families to feed more mouths. Besides, medical science made many discoveries, thanks to which they were able to defeat a whole range of diseases. Illnesses that had claimed thousands of lives until now were cured because of the invention of vaccines. Combining the increase in food supply with fewer means of mortality tipped the balance and became the starting point of overpopulation.

iv. More Hands to Overcome Poverty

However, when talking about overpopulation, we should understand that there is a psychological component as well. Poverty is considered as the leading cause of overpopulation. In the absence of educational resources, coupled with high death rates, which resulted in higher birth rates, that is why impoverished areas are seeing large booms in population. For thousands of years, a very small part of the population had enough money to live in comfort. The rest faced poverty and would give birth to large families to make up for the high infant mortality rate. Families that have been through poverty, natural disasters, or are simply in need of more hands to work are a major factor for overpopulation.As compared to earlier times, most of these extra children survive and consume resources that are not sufficient in nature. According to the UN, the forty-eight poorest countries in the world are also likely to be the biggest contributors to population growth. Their estimates say that the combined population of these countries is likely to increase to 1.7 billion in 2050, from 850 million in 2010.

v. Child Labour

It is no less than a tragedy that child labour is still in practice extensively in many parts of the world. As per the UNICEF, approximately 150 million children are currently working in countries having few child labour laws. The children being seen as a source of income by impoverished families begin work too young and also lose the educational opportunities reflected, particularly when it comes to birth control.

vi. Technological Advancement in Fertility Treatment

With the latest technological advancement and more discoveries in medical science, it has become possible for couples who are unable to conceive to undergo fertility treatment methods and have their own babies. Today there are effective medicines that can increase the chance of conception and lead to a rise in the birth rate. Moreover, due to modern techniques, pregnancies today are far safer.

vii. Immigration

Many people prefer to move to developed countries like the US, UK, Canada, and Australia, where the best facilities are available in terms of medical, education, security, and employment. The result is that those people

settle over there, eventually making those places overcrowded. If the number of people who are leaving the country is less than the number of people who enter, it usually leads to more demand for food, clothes, energy, and homes.This gives rise to a shortage of resources. Though the overall population remains the same, it just affects the density of the population, making that place simply overcrowded.

viii. Lack of Family Planning

Most developing nations have a large number of people who are illiterate, live below the poverty line, and have little or no knowledge about family planning. Besides, getting their children married at an early age increases the chances of producing more kids. Those people are unable to understand the harmful effects of overpopulation, and lack of quality education prompts them to avoid family planning measures.

ix. Poor Contraceptives Use

Poor family planning on the part of partners can lead to unexpected pregnancies though contraceptives are easily available in developed countries. As per statistics, 76% of women aged between 16 and 49 in Great Britain used at least one form of contraceptive, leaving a quarter open to unexpected pregnancies. Whereas a study by the World Health Organization (WHO) shows that this figure drops to 43% in underdeveloped countries, which leads to higher birth rates.

Nowadays, some western geographers view overpopulation as the cause of pollution and the increasing migration from the countryside in the western countries of Europe and North America. Overpopulation strikes the lower strata of the society the hardest particularly in developing countries such as India, Nepal, Myanmar etc.

6.10 Effects of Over Population

Over population can have the following fatal effects.

i. Depletion of Natural Resources

The effects of overpopulation are quite severe. The first of these is the depletion of resources. The Earth can only produce a limited amount of water

and food, which is falling short of the current needs.Most of the environmental damage seen in the last fifty-odd years is because of the growing number of people on the planet. They include cutting down forests, hunting wildlife in a reckless manner, causing pollution, and creating a host of other problems. Those engaged in talks about overpopulation have noticed that acts of violence and aggression outside of a war zone have increased tremendously while competing for resources.

ii. Degradation of Environment

With the overuse of coal, oil, and natural gas, it has started producing some serious effects on our environment. Besides, the exponential rise in the number of vehicles and industries has badly affected the quality of air. The rise in the amount of CO2 emissions leads to global warming. Melting of polar ice caps, changing climate patterns, rise in sea levels are a few of the consequences that we might have to face due to environmental pollution.

iii. Conflicts and Wars

Overpopulation in developing countries puts a major strain on the resources it should be utilizing for development. Conflicts over water are becoming a source of tension between countries, which could result in wars. It causes more diseases to spread and makes them harder to control.Starvation is a huge issue that the world is facing, and the mortality rate for children is being fueled by it. Poverty is the biggest hallmark we see when talking about overpopulation. All of this will only become worse if solutions are not sought out for the factors affecting our population. We can no longer prevent it, but there are ways to control it.

iv. Rise in Unemployment

When a country becomes overpopulated, it gives rise to unemployment as there are fewer jobs to support a large number of people. The rise in unemployment gives rise to crime, such as theft, as people want to feed their families and provide them basic amenities of life.

v. High Cost of Living

As the difference between demand and supply continues to expand due to overpopulation, it raises the prices of various essential commodities, including

food, shelter, and healthcare. This means that people must pay more to survive and feed their families.

vi. Pandemics and Epidemics

Poverty is linked to many environmental and social reasons, including overcrowded and unhygienic living conditions, malnutrition and inaccessible, inadequate, or non-existent health care, for which the poor are more likely to be exposed to infectious diseases. Further, high densities of population increase the chance of the emergence of new pandemics and epidemics.

vii. Malnutrition, Starvation and Famine

When the availability of resources is scarce, starvation, malnutrition, along with ill health and diseases caused by diet-deficiency such as rickets become more likely. Famine is typically associated with less-developed regions, and there is a high correlation with poverty levels.

viii. Water Shortage

Roughly 1% of the world's water is fresh and accessible. Overpopulation is a major issue that creates immense pressure on the world's freshwater supplies. As per the study, the human demand for freshwater would stand at approximately 70% of freshwater available on the planet by 2025. Therefore, people living in impoverished areas that already have limited access to such water will be at great risk.

ix. Lower Life Expectancy

A large proportion of the world's population growth occurs in less developed countries. Therefore, lower life expectancy caused by the booms in population is experienced by less-developed nations.This causes a shortage of resources in these countries resulting in less access to medical care, freshwater, food and jobs, and ultimately in a sharp fall in life expectancy.

x. Extinction

The impact of overpopulation on the world's wildlife is severe. As demand for land grows, the destruction of natural habitats, such as forests, becomes common. Data has also been collected to show a direct link between increases in human population and decreases in the number of species on the

planet. If present trends continue, as many as 50% of the world's wildlife species will be at risk of extinction, some scientists warn.

xi. Increased Intensive Farming

With the growth of population over the years, farming practices have evolved to produce enough food required to feed a larger number of people. However, this intensive farming methods cause damage to local ecosystems and the land that may pose problems in the future.Furthermore, intensive farming is also contributed to climate change due to the machinery required. If the population continues to grow at its current rate, this effect will likely intensify.

xii. Faster Climate Change

Overpopulation forces larger nations, like China and India, to continue to develop their industrial capacities. They now rank as two of the three largest contributors to emissions in the world, other than the United States. According to 97% of the scientific community, human activities are changing global temperatures. If more is not done to reduce individual carbon footprints on a wide scale, larger populations may speed these changes up.

6.11 Solutions to Over Population

Following are the incredible solutions to tackle over population.

i. Better Education

One of the first measures is to implement policies reflecting social change. Educating the masses helps them understand the need to have one or two children at the most.Similarly, education plays a vital role in understanding the latest technologies that are making huge waves in the world of computing. Families that are facing a hard life and choose to have four or five children should be discouraged. Family planning and efficient birth control can help in women making their own reproductive choices. Open dialogue on abortion and voluntary sterilization should be seen when talking about overpopulation.

ii. Education for Girl Child

Currently, over 130 million young women and girls around the globe are not enrolled in school. The majority of these live-in male-dominated societies, particularly in sub-Saharan Africa and South and West Asia, that does not give women equal right to education as men. Entrenched gender norms and child marriage further disrupt their access to education. The girl who receives less education is more likely to have children early and vulnerable to exploitation. Moreover, impoverished families are less likely to enroll their female children in school.

iii. Making People Aware of Family Planning

As the population of this world is growing at a rapid pace, raising awareness among people regarding family planning and letting them know about serious after-effects of overpopulation can help curb population growth. One of the best ways is to let them know about various safe sex techniques and contraceptive methods available to avoid any unwanted pregnancy.

iv. Tax Benefits or Concessions

The government of various countries might have to come up with various policies related to tax exemptions to curb overpopulation. One of them might be to waive a certain part of income tax or lowering rates of income tax for those married couples who have single or two children. As we humans are more inclined towards money, this may produce some positive results.

v. Knowledge of Sex Education

Imparting sex education to young kids at the elementary level should be a must. Most parents feel shy in discussing such things with their kids that results in their children going out and look out for such information on the internet or discuss it with their peers. Mostly, the information is incomplete, which results in sexually active teenagers unaware of contraceptives and embarrassed to seek information about the same. It is, therefore, important for parents and teachers to shed their old inhibitions and make their kids or students aware of solid sex education.

vi. Social Marketing

Social marketing has already been started by some societies to educate the public on overpopulation effects. The intervention can be made widespread at

a low cost. A variety of print materials (flyers, brochures, fact sheets, stickers) can be distributed in places such as at local places of worship, sporting events, local food markets, and schools and at car parks.

6.12 Population Explosion

Population explosion is a term used for excess or uncontrolled increment in population. It is the highest level of over population. Generally, when growth rate of population of a country increased by more than 2% it indicates population explosion. Alarming growth of population has become one of the most formidable problems of developing and underdeveloped countries. Tremendous growth of population loses its balance with the natural ecosystem and poses serious threat towards socio-economic development of a country.

6.13 Causes of Population Explosion

Various factors have contributed to the rapid growth of population among which the following can be noted.

i. Excess of Birth over Death

Growth of population depends on the excess of births over deaths. Nowadays death rate has been declining rapidly and birth rate is still high. The gap between birth rate and death rate has widened leading to an increase in the population.

ii. Progress of Medical Science

Progress of medical science has reduced the death rate. It has help us to control the spread of diseases and protected the lives of people from the jaws of death.

iii. Agrarian Economy

In an agricultural economy child find work easily in farms, uncertainty in the field of agriculture have largely been removed with the help of science and technology. Food production has considerably increased. Consequently, in agrarian society children are never considered an economic. The result is that agrarian countries have bigger families on economic grounds.

iv. Certain Social Factors like Universal Marriage Child Marriage and Early Marriage

This factor has also contributed to the population explosion. Countries like India where consider marriage as a social application and almost all marriageable persons are in a married state. Lifelong bachelor ship is look down. Particularly for women marriage is almost an inescapable obligation. Lower age at the time of marriage is highly responsible for high fertility.

v. Longing for Sons

The birth of a male child is always welcome because they help and support their parents in old age, and also perform all the religious duties. Besides, the carry on the family name after the death of the father. The greater the numbers of sons, the larger, will be the addition to the family income. Person having two or three daughters do not go for family planning methods till they be get a son.

vi. Lack of Conscious Family Planning

There is the lack of consensus family planning on the part of the married people. The use of contraceptives is unknown to the illiterate masses. People feel that more children are wanted for economic purposes. Further, blind faith in faith and the existence of joint family system induces thoughtlessness in the matter of begetting children.

vii. Lower Standard of Living

The standard of living of country like India is low as compared to their counterparts in well-educated and advanced countries. In backward are as, children are not educated. As soon as they are able to earn something, they are married. Besides, they consider it a means of entertainment.

viii. Social Attitudes

Social attitudes also favor and increase in population. Poverty, illiteracy, ignorance, absence of recreational facilities, attitudes of conservatism, orthodoxy, feeling of dependence on God, a sense of resignation towards life, looking up children as old is pension etc. are all responsible for the rapid growth of population.

ix. The Climatic Condition

Favourable climatic condition also very conducive to the growth of population. Montesquieu said that people of farmland are more sex indulgent. Father girls become physically mature at an early age ranging from 11 to 15 years of age. Immediately after puberty pushed into marriage and they begin to bear children. Child-bearing capacity of women lasts in the tropical places.

x. Ignorance and Illiteracy

In developing countries literacy rate is very low, where many children are born due to lack of education. People are not aware about the consequences of over population.

xi. Migration Factor

Migration from one place to another place results change in population growth. The higher rate of migration causes population explosion.

6.14 Effects of Population Explosion

If the growth rate of population and equilibrium with the growth rate of resources it will not pose any problem. If the growth rate exceeds the reasonable limits, problems will crop up and that has happened in India.it means population in excess of demand or need troops to be a great liability to the society. Unprecedented growth of population has a series of serious consequences. Some of the main effects of population explanation maybe described here.

i. Population and Poverty

Poverty and population very often go hand in hand in fact poverty is both the cause and effect of rapid growth of population. Poverty is one of the most significant product of population explosion. When Population size exceeds the limit, finite resources cannot fulfill the basic need of people.

ii. Unemployment and Underemployment

It is not easy to create jobs in accordance with the growth of population. Due to tremendous growth of population unemployment and underemployment occurs.

iii. Low Per Capita Income

It has been observed that during the past 50 years of planning, in India the national income of the country has increased by about 3.6% per annum but the per capita income has increased only by 1.5 % per annum, this low per capita income of the people in India is attributed to the rapid growth of population.

iv. Shortage of Food

The rapidly growing population led to the problem of shortage of food supply. Due to improper distribution all the people do not get subsequent food to sustain their health. As a result, many people suffering from malnutrition and not getting quantum of energizing food.

v. Increased Burden of Social Overheads

When there is a rapid growth of population in the country, the government is required to provide the minimum facilities for the people for their comfortable living. Hence it has to increase educational, housing, sanitation, public health, medical, transportation, communication, and other facilities. This will increase the cost of social overheads. Government finds it difficult to find sufficient funds to meet these unproductive expenses.

vi. Degradation of Standard of Living

The standard of living denotes the way in which people live. It reflects the quantity and the quality of the consumption of the people. Due to the rapid growth of population standard of living of the people has been adversely affected.

vii. Pressure on Land

Overpopulation inevitably leads to heavy pressure on land. Since land is limited and fixed in supply, an increase in population can only bring more pressure on it.

viii. Slow Economic Development

Economic development is bound to be slower in a country in which the population is growing at a very fast rate. Absence of savings results in low

capital formation. The shortage of capital has restricted investments and contributed to the slow economic growth of the country.

ix. Effects on Public Health

Population explosion has effect on public health and nutrition. Due to the rapid growing population size, health related infrastructure is not improving.

x. Increased Unproductive Consumers

When there is a rapid growth of population in a country like India, there will be large proportion of unproductive consumers. In fact, today about 51% of the total population of India is unproductive. Rapid increase in population contributes to an increase in the dependency ratio.

xi. Political Unrest

Unmanageable population size may contribute to political instability and unrest. The failure of the government to provide the basic minimum facilities to the people contributes to agitation and unrest among the masses.

xii. Effect on Environment

Rapid growth of population loses its balance with the natural ecosystem. People cut forest for making their living commodities and shelter. Excessive growth of population leads human being to interfere in imaginatively with nature which exerts adverse effect on the life of the people by degrading the condition of air, soil, and water.

6.15 Conclusion

Population study is striking and important phenomena of present time. Population dynamics is the change of population of an area over a period of time. Population growths have direct impact on society building and its development. Uncontrolled population growth inversely affects the healthy and prosperous life of human beings. In all over the world especially developing and under developed countries are suffering due to over population. The population and sociological study analyse the growth rate and fertility rates all over the recognized countries of the world. For this reason, population policies are implemented and studied in relation to human resource development and resource potentialities of the country.

6.16 Summary

In sociology, population refers to a group of human beings with some pre-defined criterion in common such as location, race, ethnicity, nationality, or religion. The total number of people living in a particular area in a particular time is known as the population. The population is one of the important factors which helps to balance the environment, the population should in a balance with the means and resources. Any country needs to know the size and composition of its population- around age and sex structure, among other factors that helps to plan how many schools, clinics, hospitals, and jobs a country need.

The main objection is to achieve a stable population at a level consistent with the requirements of sustainable economic growth, social development, and environmental protection. Several policies have been formulated in different five-year plans by the government of India for population control.

Demography is the study of a population, the total number of people or organizations in a given area. Understanding how population characteristics such as size, spatial distribution, age structure, or the birth and death rates change over time can help scientists or governments make decision. The study of population is a most significant area of sociology. Population size, population growth- causes of population growth, consequences of population growth, optimum population, over population, causes of over population. Effects of over-population, solution to over population, population explosion, effects of population explosion- are important and to be discussed. Population growths have direct impact on society building and its development. Uncontrolled population growth inversely affects the healthy and prosperous life of human beings.

6.17 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. What do you mean by Population Growth?

ii. Write a note on Population Size.

iii. What do you mean by Population Explosion?

G-B (10 Marks each)

iv. Discuss the causes of population growth.

v. Discuss about Population explosion in India.

vi. What are the causes and effects of population explosion?

6.18 Suggested Readings

i. Goswami M.K. (2013) Environmental Education and Population Education, Delhi, Asian Book Pvt. Ltd.

ii. Pachauri Suresh (2012) Environmental Education, New Delhi, Pearson

iii. Rao, C.N.S. (2015) Sociology, New Delhi, S. Chand

iv. Chandana. R.C. (2000) Geography of population: concept, determinants and pattern, New Delhi, Kalyani Publisher

v. https://www.ncbi.nlm.nih.gov/pubmed/12281798

vi. https://www.conserve-energy-future.com/causes-effects-solutions-of-overpopulation.php

vii. https://mahb.stanford.edu/blog/overpopulation-in-india/

viii. https://www.dw.com/en/lets-talk-about-overpopulation/a-37481009

ix. https://www.theguardian.com/global-development-professionals-network/gallery/2015/apr/01/over-population-over-consumption-in-pictures

Unit 7 ❑ Fertility and Reproduction: Determining factors

Structure

7.1 Objectives

After going through this Unit, you will be able to:

- Understand the meaning of fertility
- How to measure the fertility rate
- Analyse the determining factors of fertility

Fertility, ability of an individual or couple to reproduce through normal sexual activity. About 90 percent of healthy, fertile women are able to conceive within one year if they have intercourse regularly without contraception.

7.2 Introduction

Fertility is the reproductive capacity of women is a measure of the average number of children of a woman will have during her childbearing years. Fertility, ability of an individual or couple to reproduce through normal sexual activity. About 90 percent of healthy, fertile women are able to conceive within one year if they have intercourse regularly without contraception. Normal fertility requires the production of enough healthy sperm by the male and viable eggs by the female, successful passage of the sperm through open ducts from the male testes to the female fallopian tubes, penetration of a healthy egg, and implantation of the fertilized egg in the lining of the uterus (see reproductive system). A problem with any of these steps can cause infertility.

7.3 Fertility and Fecundity

Demographers distinguish between fecundity, the underlying biological potential for reproduction, and fertility, the actual level of achieved reproduction. (Confusingly, these English terms have opposite meanings from their parallel terms in French, where fertility is the potential and fécondité is the realized; similarly ambiguous usages also prevail in the biological sciences, thereby increasing the chance of misunderstanding.)

The difference between biological potential and realized fertility is determined by several intervening factors, including the following:

i. most women do not begin reproducing immediately upon the onset of puberty, which itself does not occur at a fixed age;
ii. some women with the potential to reproduce never do so;
iii. some women become widowed and do not remarry;
iv. various elements of social behaviour restrain fertility; and
v. many human couples choose consciously to restrict their fertility by means of sexual abstinence, contraception, abortion, or sterilization.

The magnitude of the gap between potential and realized fertility can be illustrated by comparing the highest known fertilities with those of typical European

and North American women in the late 20th century. A well-studied high-fertility group is the Hutterites of North America, a religious sect that views fertility regulation as sinful and high fertility as a blessing. Hutterite women who married between 1921 and 1930 are known to have averaged 10 children per woman. Meanwhile, women in much of Europe and North America averaged about two children per woman during the 1970s and 1980s—a number 80 percent less than that achieved by the Hutterites. Even the highly fertile populations of developing countries in Africa, Asia, and Latin America produce children at rates far below that of the Hutterites.

The general message from such evidence is clear enough: in much of the world, human fertility is considerably lower than the biological potential. It is strongly constrained by cultural regulations, especially those concerning marriage and sexuality, and by conscious efforts on the part of married couples to limit their childbearing.

Dependable evidence on historical fertility patterns in Europe is available back to the 18th century, and estimates have been made for several earlier centuries. Such data for non-European societies and for earlier human populations are much more fragmentary. The European data indicate that even in the absence of widespread deliberate regulation there were significant variations in fertility among different societies. These differences were heavily affected by socially determined behaviours such as those concerning marriage patterns. Beginning in France and Hungary in the 18th century, a dramatic decline in fertility took shape in the more developed societies of Europe and North America, and in the ensuing two centuries fertility declines of fully 50 percent took place in nearly all of these countries. Since the 1960s fertility has been intentionally diminished in many developing countries, and remarkably rapid reductions have occurred in the most populous, the People's Republic of China.

7.4 Procedures to Measure Fertility Rate

The following procedures are adopted to measure the fertility rate.

i. Crude Birth Rate

The crude birth rate is statistical value that can be used to measure the growth or decline of population. This is the most common procedure used to

measure the human fertility. The birth weight is measured by the rate of births population of 1000. It is determined by taking the total number of live births in a population and dividing the value by a number to obtain the rate per 1000. If crude birth rate be CBR and BI stands for live births over a year and P is the estimated mid-year population, then crude birth rate will be-

CBR = BI/P × 1000

Birth date is called crude because CBR does not considered the age, marital status, and its composition. It only gives and overall idea about the fertility.

ii. General Fertility Rate (GFR)

It is the number of live births per 1000 females of childbearing age between the ages of 15 to 44 years. If BI denotes live birth in a year, and P stands for number of women in normal childbearing age, then:

General fertility rate (GFR) = BI/P × 1000

Here P is the number of women in a normal reproductive age which generally ranges from 15 years to 44 years. This age range may not be always constant, it may vary in different situations. The reproductive rate is higher in the age group 20+ to 29+ Year. It is also depending on health condition of women fit up to 44 years of age and where early marriage is granted.

iii. Fertility Ratio (FR)

It is calculated by using female in the reproductive age group that is 15 to 49 years. It takes into account child women ratio. Calculate the number of children below 5 years of age for1000 females within the reproductive age ranging from 15 to 49 years of age.

Fertility Ratio (FR): P (0-5)/P (15-49)

P (0-5) represents the number of children below 5 years. This measure of fertility is important for less developed societies where, but registration system is very poor. It counts for only living children below 5 years.

iv. Standardized Birth Rate (SBR)

To compare the fertility of different populations standardized birth rate are often used to eliminate the effect on the birth weight of certain differences in structure of the population. It measures the number of expected births for

each specific age groups. It is calculated by total of the expected birth for all age groups is to be divided by the total population and multiplied by 1000.

v. Total Fertility Rate (TFR)

Total fertility rate in simple terms refers to total number of children born or likely to be born to a woman in her lifetime if she were subject to the prevailing rate of age specific fertility in the population. It is measured by something of the age specific birth rates and multiply it by number of mothers in the age interval.

7.5 Reproduction

Reproduction, process by which organisms replicate themselves. In a general sense reproduction is one of the most important concepts in biology: it means making a copy, a likeness, and thereby providing for the continued existence of species. Although reproduction is often considered solely in terms of the production of offspring in animals and plants, the more general meaning has far greater significance to living organisms. To appreciate this fact, the origin of life and the evolution of organisms must be considered. One of the first characteristics of life that emerged in primeval times must have been the ability of some primitive chemical system to make copies of itself.

At its lowest level, therefore, reproduction is chemical replication. As evolution progressed, cells of successively higher levels of complexity must have arisen, and it was absolutely essential that they had the ability to make likenesses of themselves. In unicellular organisms, the ability of one cell to reproduce itself means the reproduction of a new individual; in multicellular organisms, however, it means growth and regeneration.

7.6 Biological Factors affecting Human Fertility

Reproduction is a quintessentially biological process, and hence all fertility analyses must consider the effects of biology. Such factors, in rough chronological order, include:

i. the age of onset of potential fertility (or fecundability in demographic terminology);

ii. the degree of fecundability—i.e., the monthly probability of conceiving in the absence of contraception;

iii. the incidence of spontaneous abortion and stillbirth;

iv. the duration of temporary in fecundability following the birth of a child; and

v. the age of onset of permanent sterility.

The age at which women become fecund apparently declined significantly during the 20th century; as measured by the age of menarche (onset of menstruation), British data suggest a decline from 16–18 years in the mid-19th century to less than 13 years in the late 20th century. This decline is thought to be related to improving standards of nutrition and health. Since the average age of marriage in western Europe has long been far higher than the age of menarche, and since most children are born to married couples, this biological lengthening of the reproductive period is unlikely to have had major effects upon realized fertility in Europe. In settings where early marriage prevails, however, declining age at menarche could increase lifetime fertility.

Fecundability also varies among women past menarche. The monthly probabilities of conception among newlyweds are commonly in the range of 0.15 to 0.25; that is, there is a 15–25-percent chance of conception each month. This fact is understandable when account is taken of the short interval (about two days) within each menstrual cycle during which fertilization can take place. Moreover, there appear to be cycles during which ovulation does not occur. Finally, perhaps one-third or more of fertilized ova fail to implant in the uterus or, even if they do implant, spontaneously abort during the ensuing two weeks, before pregnancy would be recognized. As a result of such factors, women of reproductive age who are not using contraceptive methods can expect to conceive within five to 10 months of becoming sexually active. As is true of all biological phenomena, there is surely a distribution of fecundability around average levels, with some women experiencing conception more readily than others.

Spontaneous abortion of recognized pregnancies and stillbirth also are fairly common, but their incidence is difficult to quantify. Perhaps 20 percent of recognized pregnancies fail spontaneously, most in the earlier months of gestation.

Following the birth of a child, most women experience a period of temporary infecundability, or biological inability to conceive. The length of this period seems to be affected substantially by breast-feeding. In the absence of breast-feeding, the interruption lasts less than two months. With lengthy, frequent breast-feeding it can last one or two years. This effect is thought to be caused by a complex of neural and hormonal factors stimulated by suckling.

A woman's fecundability typically peaks in her 20s and declines during her 30s; by their early 40s as many as 50 percent of women are affected by their own or their husbands' sterility. After menopause, essentially all women are sterile. The average age at menopause is in the late 40s, although some women experience it before reaching 40 and others not until nearly 60.

7.6.1. Contraception

Contraceptive practices affect fertility by reducing the probability of conception. Contraceptive methods vary considerably in their theoretical effectiveness and in their actual effectiveness in use ("use-effectiveness"). Modern methods such as oral pills and intrauterine devices (IUDs) have use-effectiveness rates of more than 95 percent. Older methods such as the condom and diaphragm can be more than 90-percent effective when used regularly and correctly, but their average use-effectiveness is lower because of irregular or incorrect use.The effect upon fertility of contraceptive measures can be dramatic: if fecundability is 0.20 (a 20-percent chance of pregnancy per month of exposure), then a 95-percent effective method will reduce this to 0.01 (a 1-percent chance).

7.6.2 Abortion

Induced abortion reduces fertility not by affecting fecundability but by terminating pregnancy. Abortion has long been practiced in human societies and is quite common in some settings. The officially registered fraction of pregnancies terminated by abortion exceeds one-third in some countries, and significant numbers of unregistered abortions probably occur even in countries reporting very low rates.

7.6.3. Sterilization

Complete elimination of fecundability can be brought about by sterilization. The surgical procedures of tubal ligation and vasectomy have become common in diverse nations and cultures. In the United States, for example, voluntary sterilization has become the most prevalent single means of terminating fertility, typically adopted by couples who have achieved their desired family size. In India, sterilization has been encouraged on occasion by various government incentive programs and, for a short period during the 1970s, by quasi-coercive measures.

7.7 Determinants of Fertility and Reproduction

There are many determinants of fertility. The formidable determinants are as follows.

i. Demographic Trends

This can be seen is many factors such as postponement of marriage, increasing age of first birth, increasing divorce rates, lower marriage rates, more births outside marriage, and increasing number of women in the labour force, greater label of education for women, a decreasing need for children to support elderly parents, a shift from rural to Urban societies, and government program to encourage discourage having children. Combination of all these factors has resulted in three men demographic trends that is reduction in infant mortality, increasing life expectancy and decreasing fertility rates.

ii. Race

A recent study shows that there are interesting reasons as to the differences in fertility rates. United State historical data show that the major difference between white and black fertility is timing that is blacks tend to have their children at early ages then whites. (Current U.S population Reports, 1996, page 27).

iii. Education

Education is a key factor of fertility. It has been observed that educated people are associated with more prenatal care. The lifestyle and health behaviour during pregnancy are determinantal to the birth outcome. Overall higher female education is universally associated with lower and delayed fertility. Significant differences in fertility are usually found between higher educated women and uneducated women.

iv. Religion

Religion plays an important role in the movement of fertility rates. However, it depends on the religion practiced by is society and many other factors linked with this like the use of contraceptives.

v. Contraceptive Use and Abortion

The use of contraception and abortion facilitates the prevention of unwanted pregnancies and the planning of desired births.

vi. Marriage, Cohabitation and Divorce

The family model is now very different compared to past decades. The relationship between men and women have changed. Studies shows that there are increase the number of young couples that are deliberately choosing childlessness. This trend is supported by an increasing use of contraception family planning and social equality in sex roles. Another factor that makes fertility rates fall is the decrease in marriage and the rise in divorce rates.

vii. Postponement of Age of Marriage

Another trend is that average is at marriage is increasing, couples are getting married at older ages. The postponement of marriage is related to the increase popularity of living together without marrying which in in some cases replaces marriages. This trend decreases the fertility rate.

viii. Women in the Labour Force

Over the last few decades one of the most important demographic changes has been the constant increase in female labour force participation which has been a generalized tendency around the world. Changing role of women has produced several transformations of the family structure. This trend has impact on childbearing practices, therefore, decreased fertility rates.

ix. Government Programs

Initiatives taken by the government to control the population have impact on fertility rates. Countries like China, India where population is a great concern of development, government tries to control population by various programs.

x. Economic Factors

Finally, economic determinants other level of income standard of living and nature of diet in addition of these psychological factors are also important factor for fertility and reproduction rates.

There exist many factors that affect the decision to have children or not. These factors include the increase cost of raising a child for the change in the attitude of women towards work. It is a fact that women have increasingly altered that reproductive behavior they can control their fertility with improved birth control methods. The decision to have children is related to the size of a family they want. Now, couples are able to decide whether to have children, when to start, and the space between children.

Fertility rates are different in all over the world. It is still at very high levels in Africa and some Arabic countries and Asian countries, followed next by the countries of Central and South America. Lower rates are found in Europe and other industrialized countries like Canada and Japan.

7.8 Foods that can affect Fertility

Infertility affects about 9% of married women who are of childbearing age, according to a national survey conducted by the Centers for Disease Control and Prevention. While couples can't control all of the causes of infertility, they can control their eating habits. And nutrition and a healthy body weight for both partner scan have a significant impact on the ability to conceive.

i. Women and Fertility

To prepare for pregnancy and enhance fertility, maintain a healthy weight and choose foods that will create a safe and supportive home for your baby's nine-month stay. This should include sources of folic acid, iron, and other important nutrients.

ii. Men and Fertility

Men also should try to maintain a healthy body weight and follow a balanced eating pattern, since male obesity may alter hormone levels. Plus, low sperm count, and poor sperm motility are common in men with overweight and obesity. When it comes to food choices, load up on fruits and vegetables, which contain vitamins, minerals and antioxidants that may help create strong sperm.

iii. Find Your Healthy Weight

Increase your chance of leading a balanced life by achieving and maintaining a healthy weight. Weight extremes can alter hormone levels and throw ovulation off schedule. For women who are considered to be overweight or obese, due to a body mass index (BMI) equal to or greater than 25, weight loss may improve fertility. On the other hand, women who are classified as being underweight, with a BMI below 18.5 (18.5 to 24.9 signifies a normal weight), may experience irregular menstrual cycles or stop ovulating altogether. Those who regularly participate in high-intensity exercise—such as gymnastics or dancing, have an eating disorder or follow restricted diets—often are at an increased risk.

Avoid going on fad diets, which can deplete your body of the nutrients it needs for pregnancy and find a healthy eating plan that works for you by talking to a registered dietitian nutritionist.

iv. Include Adequate Amounts of Iron

An eating pattern, rich in iron that comes from vegetables and supplements may lower the risk of ovulatory infertility, according to results from The Nurses' Health Study II, which followed 18,500 female nurses trying to get pregnant. Ovulatory infertility is only one cause of infertility. Vegetarian foods with iron include beans, lentils, spinach, fortified cereals, long-grain enriched rice and whole grains. Add vitamin C from citrus fruits, bell peppers or berries to your meals to enhance iron absorption.

v. The "Fertility Diet" Pattern

Published by a team of Harvard researchers in 2007, the "Fertility Diet" study—found women with ovulatory infertility who followed this eating pattern had a 66% lower risk of ovulatory infertility and a 27% reduced risk of infertility from other causes than women who didn't follow the diet closely.

Women following the "fertility diet" chose:

- Less trans-fat and more monounsaturated fat (from foods such as avocados and olive oil)
- Less animal protein and more vegetable protein
- More high-fiber, low-glycemic carbohydrate-rich foods (including whole grains)
- More vegetarian sources of iron and fewer meat sources
- Multivitamins
- High-fat dairy instead of low-fat dairy

In general, eating more vegetables and a variety of types, eating healthy monounsaturated fats instead of saturated and trans-fats, making at least half your grains whole, and getting enough calcium-rich foods—including dairy—will help you meet nutrient needs and promote a healthy weight.

vi. Don't Forget Folic Acid

While it won't make you more fertile, it is crucial that women trying to conceive obtain 400 micrograms per day of folic acid from supplements (if considering taking any supplements, including folic acid, talk to your health care provider first) and include foods such as dark leafy green vegetables and fortified grains. Folic acid is needed to prevent neural tube defects. The

neural tube develops into the brain and spine three to four weeks after conception, before most women even realize they're pregnant.

For more information on foods for fertility and creating a personalized eating plan one must consult a registered dietitian nutritionist.

7.9 Fertility Rate and Population Growth

Fertility rate is the average number of children born to women during their reproductive period. Most important factor for population growth is the total fertility rate (TFR). If overall total fertility rate of an area is 2.1 then the population of that area remains stable, excluding immigration and emigration. TFR 2.1 of area is known as replacement rate. Generally, if total fertility rate of a given area is more than 2.1 then population of that area will increase and when it is less than 2.1, the population of that given area will eventually be decreased considering no emigration and immigration.

7.10 Conclusion

Population study is striking and important phenomena of present time. Population dynamics is the change of population of an area over a period of time. Population growths have direct impact on society building and its development. Uncontrolled population growth inversely affects the healthy and prosperous life of human beings. In all over the world especially developing and underdeveloped countries are suffering due to over population. The population and sociological study analyse the growth rate and fertility rates all over the recognized countries of the world. For this reason, population policies are implemented and studied in relation to human resource development and resource potentialities of the country.

7.11 Summary

Fertility is the capability to produce offspring through reproduction following the onset of sexual maturity. The fertility rate is the average number of children born to a female during her lifetime and is quantified demographically. In other words,

fertility is the capability of an individual or a couple to reproduce offspring through normal sexual activity. Crude birth rate, general fertility rate, fertility ratio, standardized birth rate, total fertility rate- are the procedures to measure fertility.

Reproduction is a process by which organism replicate themselves. In a general sense, reproduction is one of the most important concepts in biology; it means making a copy, a likeness and thereby providing for the continuous existence of species. Reproduction is a quite essentially biological process, and hence all fertility analyzes must consider the effects of biology. Most important factor for population growth is the total fertility rate.

7.12 Questions

Answer the following questions in your own words.

G-A (5 Marks each

i. Differences between fertility and fecundity?
ii. Define fertility rate.
iii. What is reproduction?
iv. How does diet affect fertility?
v. What are the biological factors that affect human fertility?

G-B (10 Marks each)

vi. Write a note on contraception, abortion, and sterilization.
vii. Discuss various procedures to measure fertility rate.
viii. Discuss the determinants of fertility and reproduction.

7.13 Suggested Readings

i. Goswami, M.K. (2013) *Environmental Education and Population Education*, Delhi, Asian Book Pvt. Ltd.
ii. Pachauri Suresh (2012) *Environmental Education*, New Delhi, Pearson
iii. Rao, C.N.S. (2015) *Sociology*, New Delhi, S. Chand
iv. Chandana. R.C. (2000) *Geography of population: concept, determinants and pattern*, New Delhi, Kalyani Publisher

Module IV
Mortality, Morbidity and Health

Unit 8 ❑ Mortality—Trends, Levels and Determinants in India

Structure

8.1 Objectives

The purpose of this unit is to discuss the following:

- The concepts of mortality, morbidity, and health.
- The mortality trends and levels.

- The infant mortality rate and its types.
- The reasons for infant mortality rate.
- The major determinants of mortality in India.

8.2 Introduction

Mortality is considered to be the outcome of sickness and the population of sick people who die. In order to control mortality, the medical measures to curb illness and other health related issues are very much essential. Mortality is considered to be important for measuring the health risks, improvement in the quality of health care and for comparing the overall health of different groups in the population.

Mortality is one of the major components responsible for bringing changes in human population along with fertility and migration. These variables are associated with factors like age of marriage, the proportion of marriage, contraceptive use, level and types of morbidity, rural urban migration etc. All of these factors are also linked with social factors like levels and distribution of income, levels of education, and position of women in society, religion, and economic development. In order to understand mortality, we have to take into consideration the crude death rate, age specific death rate, infant rate etc. (Singh 2009:93). It has been observed since long time that mortality has played an important role in determining the population growth. Since the seventeenth century, human population increased in the industrial and developed countries mostly due to the fall in death rates rather than the rise in the fertility rate. The demographic transition in developing countries was also facilitated mostly due to mortality. The outcome was the rapid population growth. Mortality is important for studying the demographic conditions of existing human societies and also useful for determining the prospect of potential changes in mortality conditions of the future (Bhende and Kanitkar 2004:160).

Mortality can be studied from various angles, as various biological, social, economic, and cultural factors affect the health condition of members of the society and consequently affect the mortality rate of society. The factors that affect mortality can be classified under three themes namely heredity, constitution, and environment. When mortality is viewed from a demographic standpoint then the changing size and structure of population is given more emphasis than the medical factors. Here, the

genetic factors are not considered. The constitutional and environmental factors provide the grounds for demographic analysis of mortality. The constitutional factors of mortality include physical, physiological, anatomical, and psychological characteristics of human being. The environmental factors include the natural environmental/physical setting of humans and their social, economic, environmental and personal habits. The most important factors for studying mortality are age and sex (Bhende and Kanitkar 2004:160).

8.3 Meaning and Measurement of Mortality

The study of mortality is used to understand the effects of death on population. The United Nations and World Health Organization have defined "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)". A death takes place only after a live birth and the period between birth and death is life (Bhende and Kanitkar 2004: 161).

According to Gordon Marshall (2006:432) mortality rate is the death rate that is generally standardized by age and sex in order to make comparisons between areas and social groups. Heer and Grigsby (1992:30) have argued that "an exact comparison of mortality in two different populations can be made by a separate presentation of the death rates in each age-sex group of each population". Mortality is useful for measuring the health risks, improvements in the quality of health care and for comparing the overall health of different groups in the population. Mortality is used as a very reliable indicator of social and economic change, for comparing living standards and also used by medical scientists for monitoring the death risks from infectious diseases (Marshall 2006:432). Mortality is most commonly measured in crude death rate which is defined as "the ratio of the number of deaths that occur within a given population during a specified year to the size of that population at midyear". However, crude death rates do not provide an accurate indicator of mortality conditions as the age structure affects its measurement. An exact comparison of mortality can be made by analyzing the death rates on the basis of sex and age of the given population (Heer and Grigsby 1992:30). Age standardized death rates are calculated separately for male and females to produce overall Standard Mortality Ratios (SMR) for each sex or sexes combined together.

8.4 Mortality Trends and Levels

The increase of country's population is related primarily with two biological variables birth and death. The survival rate gives us the net increase in population, that is, the difference between births and deaths. The population problem of India arises particularly because of extremely high fertility along with high mortality which is gradually declining (Madan 2005: 284). India is witnessing a demographic transition with the expansion in population and decline in growth as both fertility and mortality levels have been falling considerably. India's mortality level started declining since 1921 and the Crude Death Rate (CDR) fell from a high 40-45 percent per 1000 population to around 32-33 during the independence in 1947 and further lowered to 15 by 1971.

Three distinct stages of mortality history can be traced in case of India. Mortality was high and fluctuating till 1921 due to famines, epidemic and pestilences. In the course of next 30 years, it declined slowly. Development in the field of medical science, implementation of public health policies, control of communicable diseases, malaria eradication program was responsible for lowering the death rates in this period. There was only one major famine after 1921 that is the Bengal famine of 1943. Epidemics and fatal diseases were kept under control. After 1951 mortality has declined in a faster pace. The main reason for the decline was the communicable diseases were monitored and controlled in an effective manner, the famine and epidemics were absent, and the social and medical health infrastructure improved in almost every region of the country. Post-independence there have been a remarkable progress in all the three indicators. Death rate has declined from 32-33 to 9, infant mortality rate declined from 200 to 63 in 2002 and years expectation of life at birth from 32 years to about 63-64 years after 55 years since independence (Majumdar 2013: 280-281).

8.5 Inter-State and Rural-Urban Areas

The approach to lower mortality has been uneven in India like in other parts of the world. Mortality rates have been found to be peculiarly higher in rural areas than urban areas. The mortality differences between the rural and urban dwellers are quite

striking. The life expectancy of urban males and females is almost 6 to 8 years more than that of the people living in the rural areas. The mortality difference between the different states of India is more wider and varying. In almost all the parameters in the South Indian states of Kerala and Tamil Nadu are ahead of other Indian states. Both fertility and mortality in these two states are low. In case of Kerala the rural and urban mortality difference is minimum. After Kerala, West Bengal too has been capable of narrowing the rural and urban mortality gap.

The infant mortality rate of Kerala is phenomenal, that is 13 per 1000 live births and life expectation at birth above 70 years. These two indicators of Kerala are remarkable and can be compared with the developed first world countries. In case of lowering mortality, states like West Bengal, Himachal Pradesh and Punjab have also made significant progress. Orissa, Uttar Pradesh, and Madhya Pradesh continue to have a large urban-rural mortality difference. Despite of having a low urban rural mortality difference in south India their sex differences in mortality stands out to be the highest as compared to other Indian states. Excluding Rajasthan and Bihar the female mortality rate is smaller in most other states than that of male mortality rates. Although the mortality rate has declined over the years, the interstate and regional variations have sustained, and it requires region specific attention and intervention.

Some of the major causes for differences in the mortality rates of rural urban regions are as follows:

i. The urban people unlike their rural counterparts are more health conscious, with better education and have exposure to better medical and health facilities.

ii. A huge proportion of urban people are employed in organized sectors, they receive health allowances, have health insurances from their employers or are entitled to receive reimbursement for certain kind of health expenses.

iii. There is more number of public or private health institutions in urban areas. Therefore, the urban people get better medical facilities. In fact, 75 percent of health budget of the government are invested in urban areas where only 28 percent of the total population lives.

iv. The urban areas have arrangements for purified drinking water to almost every household while their rural counterparts still lack such facilities.

v. The waste management, drainage and sanitation facilities are cities are better as compared to that of villages and small towns. Only 31 per cent of India's population has the privilege to sanitation facilities.

A comparison of death rates between 1988-1990 and 1998-2000 exhibits that out of 16 large states 15 states have reduced the Crude Death Rate (CDR). In both the urban and rural areas there is a marginal growth in CDR in Kerala. Prof. Mitra argues that while other Indian states were busy in making strategies to control the death rates, Kerala had already revolutionized its health system which helped the state to lower the fertility and mortality rates quickly (Majumdar 2013:280-281).

8.6 Age-Sex Differences

According to the demographic point of view two major specific death rates are age and sex specific mortality rates. The gender difference in case of India's mortality condition has been very disturbing. It is observed that young girls are experiencing higher mortality compared to young boys. According to NFHS-2, female mortality rate below 5 was bit higher than male mortality rate (105 per 1,000 live births for females compared to 98 per 1,000 for male births). This kind of trend is present in rural areas and absent in urban areas. As compared to other countries of the world it is found that in India the female mortality rate is very high. The primary reason is that as compared to boys the girls get less medical and health attention and when the females receive medical treatment it is too late or inadequate. The discrimination of girl children in the age group of 5 to 14 is more in rural areas as compared to urban areas. However, it is also astonishing to know that when girls enter the active age group and also gets involved in reproductive tasks and other additional risks like child rearing, home-making or other activities then their death rates is found to be lower than that of their male counterparts.

It is found that in all societies the mortality is highest among the infant but as the child crosses the first birthday then there is a sharp decline in their mortality rate. After the child reaches the age of 15 then the mortality rate increases very gradually until they attain the age of 40, after which the age specific death rate increases. When the person reaches 70 years of age then the death rate is almost to that of 0 years. This is applicable in case of both males and females although there may be minor differences.

It is observed that in all countries that at birth the male babies slightly out number female babies. According to SRS in India it is 110 male babies for every 100 female babies. The parity between the male and female babies is reached before they reach their adolescent age and mortality is bit higher among the male babies as against the female babies in the initial years. Till about 1980 females were lagging behind the males in terms of life expectancy. However, after 1980s the female life expectancy has increased at a much faster pace. There was a sharp drop in death rate from around 52 to only 20 in the age group of 0-4 in just 30 years.

Although the death rate of India has declined after independence but the inter-state differences of death rate particularly in former years is bewildering. The death rate of the age group of 0-4 in Rajasthan is as high as 39.4 and the lowest is 4.9 in Kerala. The death rate of very young children is very high in almost all the states except Kerala. Although Tamil Nadu and West Bengal have also progressed in lowering the death rate of young children, they are still behind Kerala by about 10 points. In India the infant mortality accounts for 20.5 percent of all deaths in the country. In between the age group of 5 – 59 years total death rate accounts for only 33.5 percent. The old age death proportion to all deaths is as high as 69 percent in Kerala to a lowest of 31 percent in Assam followed by 32.8 percent in Rajasthan and 33.7 percent in Uttar Pradesh.

In case of India the dying patients in earlier times received little medical attention. In 1981, 39 percent of all deaths occurred where there was no medical intervention of any type. At present 21 percent of all deaths occurs either at hospitals, nursing homes or health centres and another 66 percent occurs at homes where the dying patients are attended by professional medical professionals. It is argued that most of the dying patients in urban areas get medical treatment and attention but the same cannot be said of rural areas. At the national level only 9.2 percent of dying patients received institutional care before dying in 1981. However, in 2000 it accelerated to 20.9 where it varied from 9.8 percent in Assam and 80.4 percent in Kerala. 65.9 percent of the patients received medical attention in private medical institutions at the time of death and 12.7 did not receive any medical attention.

In Orissa 44 percent people died without receiving any medical treatment and it is also shocking to see that more advanced states like in Tamil Nadu and Kerala as many as 36.1 percent and 31.2 percent dying patients did not receive any medical

attention. These three states are also in the top list for both the rural and urban deaths without any medical attention. Maharashtra is the only state where almost all the dying people gets at least one time medical attention (Majumdar 2013: 280-281).

8.7 Infant Mortality Rate

The infant mortality rate is the number of deaths within the first year of life divided by the number of live births in the same year times 1000 (Marshall 2006:432). The Infant Mortality Rate (IMR) of a country is used by the demographers to understand the condition of health, hygiene and also the socio-economic development of that particular country. The development of urban facilities, health infrastructure and increasing urban population IMR as an indicator has lost its ground. IMR in developed nations have come down from 22-25 to 6-7 between 1970-1999. The top 30 countries with high human development record have IMR ranging between 3 and 7 in 1999 as against 11-31 in 1970. In developing nation like India IMR fell down from 142 in 1970 to 70 in 1999. In case of China the IMR has declined down from 85 to 33 in between 1970 to 1999. A small country like Sri Lanka has an IMR of 17 in 1999. Bangladesh is ahead of India in case of IMR reduction with 58 in 1999.

Since 1921, general mortality rate has declined faster in India primarily due to prevention of diseases like Tuberculosis, Plague, Malaria, Cholera and other water borne and communicable diseases. Along with the development in medical infrastructure the food security measures were also improved which further added towards the lowering of IMR. The IMR of India declined very fast since 1981 and 2001. However, it is also to be noted that the decline has been uneven in different states. The IMR in case of Tamil Nadu, Andhra Pradesh and Haryana has infact increased during 1981 to 2001. It is also to be noted that the Schedule Castes, Schedule Tribes and Other Backward Classes witnessed much higher IMR as compared to the upper castes and classes.

Every year 27 million infants are born in India. About 5 percent of them do not live for another 5 years. India accounts for 25 percent of the over 10 million under five deaths in the world. Proportion of infant mortality to total deaths in India is alarming at 20.5 percent. Infant and child mortality claims 2.2 million lives every year. For every 100 male infants deaths there are 135 female infant deaths in Punjab,

125 in Assam, 114 in Madhya Pradesh and Gujarat. In case of rural India Punjab 145, Assam 125, Madhya Pradesh 120, Tamil Nadu 115, Gujarat and Uttar Pradesh 110. Few states like West Bengal, Andhra Pradesh, Himachal Pradesh, Karnataka and Orissa the female IMR is less than that of male. In case of Karnataka there are only 72 female babies deaths for every 100 male babies before they reach one years old (Majumdar 2013:280-281).

8.8 Classification of Infant Mortality

Bourgeois Pichat (1952) has classified mortality into two causal type, namely (i) endogenous and (ii) exogenous infant mortality rate. Endogenous refers to "those cases in which the child bears within itself, from birth, the cause resulting in its death, whether that cause was inherited from its parents at its conception, or acquired from its mother during gestation or delivery." While the exogenous infant mortality refers "to those cases in which the infant picks up the factors which causes its death in the environment in which it lives."

McNamara (1982) considers endogenous death as the death that is caused by "factors such as the congenital malformations, the circumstances of prenatal life, and the birth process." Exogenous infant death is caused by infection, parasitic and respiratory diseases, accidents and other environmental and external causes." Endogenous causes are usually the causes of neonatal death may extend beyond infancy and may cause severe diseases in the later part of life like diabetes, cancer, heart diseases, AIDS etc. Exogenous causes of deaths are avoidable through medicinal preventions, education, medical knowledge, technology, and better nutrition.

It is also to be kept in mind that illegitimacy also accounts for factor contributing towards a high infant mortality rate. The illegitimate child is often unwanted by mother and society and the child does not receive much medical attention and nutrition that it needs which further may lead towards the increment of infant mortality (Bhende and Kanitkar 2004: 174).

There are also some other age-standardized mortality rates like neonatal mortality rate, perinatal mortality rate and maternal mortality rate. The neonatal mortality rate is the number of deaths within the first four weeks of life divided by the number of live births in the same year times 1000. The perinatal mortality rate is the number

of still births plus the number of deaths within the first two week of life, divided by total births (still births and live births) in the same year, again times 1000. The maternal mortality rate is the number of maternal deaths divided by total births times 1000 (Marshall 2006: 432).

8.9 Causes of Infant Mortality

The Infant and Child mortality Survey in India was conducted by the Registrar General in 1979. It was observed that the infant and child mortality was quite high in case of mothers who were better educated. The survey also reported that the infant and child mortality were closed linked to the living standard of the family. In 1998-99 the Central Statistical Organisation (CSO) compiled the National Family Health Survey II and it reported that girls were ahead of their male counterparts in child mortality despite of less attention they receive from parents as compared to males. It was also found that illiteracy and young age among mothers play a major role in the infant and child mortality. Studies have highlighted that even few years of schooling for mothers can reduce as much as 40 percent of infant mortality. This finding of CSO contradicts with the findings of the Registrar General. The NFHS II report also suggested that IMR can be lessened if birth took place in medical institutions or under the care of doctors or trained medical staff.

Studies have also shown that baby girls are more likely to die in families where there is an older male sibling. It arouses an issue of gender discrimination. Pre-maturity, respiratory infections, diarrhea, anemia, neonatal injuries and birth injuries account to 70 percent infant deaths in India. The major reason for infant deaths (25 percent) is because of pre-maturity, Acute Respiratory Infection (ARI) and pneumonia. One of every three malnourished child lives in India and according to UNICEF almost 50 percent child deaths in India is due to malnutrition (Majumdar 2013: 280-281).

8.10 Determinants of Mortality in India

Mortality is considered to be the outcome of morbidity or sickness and of the case fatality rate that is the proportion of sick person who die. Curative measures in

the form of medical institutions and medical professionals try to control the morbidity and aims to reduce the case fatality. Preventive measures focus on reducing both morbidity and case fatality. Some instances of preventive measures are providing a required level of nutrition and exercise, upgrading public health infrastructure, implementing immunization programs and doing away with unhealthy behaviours like smoking cigarettes or alcohol consumption. Although malnutrition is not the primary cause for death it is makes people susceptible for being infected with severe diseases. Moreover, it takes a longer time for the malnourished people to get healed or recovery from illness (Heer and Grigsby 1992: 33).

According to the findings on Survey of Causes of Death 1964-1994 the combined share of fever, digestive disorder and cough was more than half of the total number of deaths in India in 1971. By 1991 their share decreased to 33 percent of all deaths. Cough remains the major killer in India particularly in the states of Uttar Pradesh and Rajasthan. Bronchitis and asthma accounted for 8 percent of the total deaths in India while Tuberculosis accounted for 6.1 percent.

Deaths occurring from natural calamities and accidental deaths are gradually rising at an alarming level. Such death rate has increased from 3.9 percent in 1971 to 8.3 percent in 1991. Natural calamities like tsunami, earthquakes, super cyclones and heavy downpours, rail and road accidents along with suicides and homicides and deaths from terrorist attacks mostly in Jammu Kashmir and North eastern states are also responsible as factors of death in India. The provision for the supply of potable water along with liquid and solid waste management is still challenging in the public health sector. Though deaths by gastro-enteritis and dysentery have decreased over the period of time but diarrheal continues to be a major factor for illness and death. The government has also started various programs to cut down the problems of morbidity and mortality. Presently, India and China has become the garbage dumping zone of toxic materials and e-garbage from USA and other advanced countries. The unscientific recycling of mobile phones and other electronic gadgets pollutes the atmosphere with carcinogens. The modern-day competition in terms of gaining success and changing lifestyles are affecting the circulation and nervous system, thereby pushing up the deaths level. World Health Organization (WHO) studies the diseases of different countries. In 1998 halves of the burden of disease for India was

communicable diseases, maternal and pre-natal conditions, and nutritional deficiencies. Three major diseases which are regarded as changing the causes of mortality are tuberculosis, malaria, and HIV/AIDS. These diseases have been dealt in detail (Majumdar 2013: 314-315).

8.11 Tuberculosis (TB)

On average 2 million Tuberculosis cases are reported in India. TB kills almost 0.4 million Indians every year. The number of people killed by TB is less than the number of deaths related to malaria, meningitis, hepatitis, nutritional deficiencies, leprosy, sexually transmitted diseases, and tropical diseases which together accounts for 2,58,000 deaths per year in India according to the WHO report 1999. National Tuberculosis program was launched in India in 1962. Unfortunately, it could not achieve its targets due to many flaws like over dependence on x-rays for diagnosis, lack of systematic records and low treatment completions. The revised national tuberculosis program was again implemented in 1993. The WHO recommended Directly Observed Treatment Short Course (DOTS) was undertaken. This program was one of the largest public health policies and was fairly successful. The curative success rate was 89 percent in 2001. However, the emergence of HIV/AIDS problematized the health scenario in India. Those affected by HIV was more likely to develop TB. About 7 percent of HIV patients were affected by TB in India. Among the communicable diseases' asthma, bronchitis, TB, and pneumonia are more prominent. The dependence for wood for cooking fuel with lack of proper ventilator was responsible for bronchitis and asthma among the women of rural areas. The prevalence of TB is about 131 per 1,00,000 in India while the world average is only 60. TB happens to be one of the major killers in rural India. The stigmatization of the disease, lack of awareness and detection was one of the reasons for the failure of reducing the number of TB infected people in the country. It is reported that more women aged 30 years and older people suffer from TB.

8.12 Malaria

According to the malaria eradication report malaria has increased from 9.72 in 1972 to 35.5 percent in 1995. Although the number of people dying from malaria is

comparatively less as compared to HIV but the impact of malaria over morbidity and economic productivity is remarkable. With the greater urbanization and industrialization malaria has found ways in the urban areas mostly as well as other non-rural ecological regions. In 1953, the National Malaria Control Program (NMCP) was introduced. Then 75 million cases of malaria were reported per year out of which 800,000 ended up in deaths. The NMCP was reinforced with the new name, National Malaria Eradication Program and by 1965 malaria was totally controlled by using the DDT spray. Then after, 1,00,000 malaria cases were reported with zero deaths. Unfortunately, again from 1970s onwards malaria has re-emerged as a death taking diseases. The worst malaria affected Indian states in 1970s were Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa, Karnataka, and Pondicherry. At present malaria is mostly found in poor and densely populated areas of Uttar Pradesh, Bihar, and Bengal. 2.01 million cases of malaria were reported in 2001 in India.

8.13 HIV/AIDs

In the last 30 years new deadliest diseases have been discovered. Out of the many dangerous diseases HIV/AIDS is one of the deadliest diseases. Human Immunodeficiency Virus is lentrivirus. A person with HIV can live a long normal life until the fully develop Acquired Immunodeficiency Syndrome (AIDS) starts to affect the health system. This disease can be spread rapidly through sexual relations. HIV is a retrovirus. It converts the genetic materials from RNA to DNA. The first case of HIV/AIDS in India was reported from Tamil Nadu in early 1986. In the same year another person was detected with the same in Mumbai. After 1994 it has rapidly spread in the country. In 2003 the number of people living with HIV/AIDS reached 5.1 million. Out of which 26 percent were females and 74 percent males. Almost 60 percent of the reported cases were from rural areas. 86 percent of HIV/AIDS cases were because of the unprotected heterosexual sex about 2.4 percent is transmitted from blood or products related to blood and about 2 percent by sharing of injection needles and syringes associated with intravenous drug use. HIV/AIDS is spreading like a fire in India in Maharashtra 3 percent of the commercial sex workers were infected with HIV/AIDS North-Eastern in 1987 but the figure has rouse to 70 percent in 1997. The number of HIV/AIDS infected people is found more in southern states

of India. In case of Manipur, the northeastern state HIV/AIDS is spreading rapidly due to intravenous drug use.

Tamil Nadu has the largest share of reported HIV/AIDS cases followed by Maharashtra, Andhra Pradesh, Gujarat and Karnataka. These five states account for about 80 percent of total reported HIV/AIDS cases in India. a separate body for HIV/AIDS has been set up by the national government, the National AIDS Control Organization to control the diseases with the help from state health departments. Electronic and other forms of media are used vigorously to spread awareness among the people. Every year 0.6 million people in India are reported have affected by HIV/AIDS. Adults between the age group of 25 to 40 are mostly vulnerable to HIV/AIDS. Human Development Report of India 1999 stated that there are more than 33 million people living with HIV/AIDS in India. The number increased to 42 million in 2002. More than 5.1 million populations in India are affected by HIV/AIDS (Majumdar 2013: 314-318).

Despite of various challenges, problems and tensions growing from different emerging diseases the mortality rate has been kept in control up to a certain level by the government, medical professionals, and civic body members by adopting certain measures. Some major factors responsible for low death rates are as follows:

i. Elimination of Famines

During the British rule India witnessed several famines which resulted in loss of many lives. However, after independence the country has improvised the food security measures and famines are the things of the past. Government has very effectively handled the famine situation.

ii. Control of Epidemics

Many Indians in earlier days died because of epidemic diseases. At present times the government has routed out the dreaded diseases. Cholera, smallpox two major life taking diseases have been effectively controlled. This has resulted in bringing down the death rate of the country. Moreover, Government has also launched special programs for eliminating diseases like polio, malaria, tuberculosis etc.

iii. Better Health Care Programmes

Various health care programmes have been launched by the government to reduce child deaths and care of pregnant women. Increase in number of

health care centres, implementation of national rural health mission program and other progressive health care policies has helped in cutting down the death rates in the country. Adequate attention has been given for sanitation, hygiene, supply of pure drinking water. Immunization programmes for bringing down death rates from several diseases has also shown positive results.

8.14 Conclusion

What sense can we make of all of these disparate accounts in different contexts, and what can we expect for the path of mortality in the future? There is no consensus on these issues. Here, we hazard our own best guess, recognizing that the evidence is weak or missing for many of the links in our argument. Knowledge, science, and technology are the keys to any coherent explanation. Mortality in England began to decline in the wake of the Enlightenment, directly through the application to health of new ideas about personal health and public administration, and indirectly through increased productivity that permitted, albeit with terrible reversals, better levels of living, better nutrition, better housing, and better sanitation. Ideas about the germ theory of disease were critical to changing both public health infrastructure and personal behavior.

However, changes in knowledge, science and technology will often increase the gradient in health, at least for a time. There was no health gradient between English aristocrats and ordinary people prior to the Enlightenment, but one developed soon thereafter, so that average life expectancy and the gap between rich and poor rose together. There was no gradient in infant mortality between the children of physicians and non-physicians prior to an understanding of the germ theory of disease. More educated people quit smoking faster after the health consequences were understood. The incentives for research and discovery are much weaker or absent for the diseases, such as malaria or tuberculosis that are largely confined to the poor of the world. Even when treatment is available in rich countries, there is no guarantee that it can be made available elsewhere, as we have learned during the AIDS pandemic and indeed from the several million people who die each year from vaccine-preventable

diseases. Steepening gradients within and between nations are likely to provoke much soul-searching, and it is clearly an appropriate aim of public policy to improve equality of access for everyone to new, life-saving technologies. Yet, if we are right, increases in the gradient also have a silver lining. They indicate that help is on the way, not only for those who receive it first, but eventually for everyone.

8.15 Summary

Mortality is one of the major components for bringing changes in human population along with fertility and migration. These variables are associated with factors like age of marriage, the proportion of marriage, contraceptive use, level, and types of morbidity, rural urban migration, etc. Mortality is important for studying the demographic condition of existing human societies. Mortality can be studied from various angles as various biological, social, economic, and cultural factors that can be classified into three themes namely heredity, constitution, and environment. Mortality is used as a very reliable indicator of social and economic change, and mortality is useful for measuring the health risk, improvement in the quality of healthcare. An exact comparison of mortality can be made by analyzing the deathrates on the basis of sex and age of the given population.

The population problems of India arise particularly because of extremely high fertility along with high mortality. Mortality was high due to famines, epidemic, and pestilences. After 1951 mortality declined in a faster pace. The main reason for the decline was the communicable diseases were monitored and controlled. The famine and epidemics were absent, the social and medical health infrastructure improved in almost every region of India. In post-independent India there have been a remarkable progress in following three indicators:

i) As per capita income rises, life expectancy rises.

ii) Nutritional status affects mortality. The ability to fend off disease is directly linked to nutrition.

iii) Public health issues, things like access to a clean water supply and effective waste removal, are also determinants of mortality.

8.16 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. What do you understand by the term mortality?
ii. What is infant mortality rate?
iii. How is mortality measured?
iv. Discuss the reasons for infant mortality rate.
v. Explain the types of mortality.
vi. Examine the age-sex mortality difference in India.

G-b (10 Marks each)

vii. Briefly discuss the mortality trends and levels in India.
viii. Discuss the mortality condition of age and sex in India.
ix. Discuss the major determinants of mortality in India.
x. Examine the inter-state and rural-urban mortality condition of India.

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Unit 9 ❑ Health, Sanitation and Morbidity: Issues and Problems

Structure

9.1 Objectives

The purpose of this unit is to discuss the following:

- The relationship between health and society.
- The historical background of human health system.
- The development of health system and sanitation.
- Health condition in India and factors affecting it.

9.2 Introduction

Health is regarded as an important factor for enhancing progress in any society. It implies the measure of energy and productive capacity of the human beings. Bad health affects the efficiency and production system in the human society. Health does not only mean the absence of sickness or disease but the adaptive potential of humans in the physical and social environment. It is only in a good state of well-being that humans can develop physical and mental capacities. Thus, health does not only include medical factors but also involves social, economic and educational factors (Madan 2005: 286). The World Health Organisation (1946: 3) has defined health as "a state of complete physical, mental, and well-being." Health is not only a personal choice or biological issue but the state of well-being and illness are grounded on the organisation and functioning of society (Macionis 2006: 552). The Health Survey and Development Committee states "the term health implies more than absence of sickness in the individual and indicates a state of harmonious functioning of the body and mind in relation to his physical and social environment so as to enable him to enjoy life to the fullest possible extent and to reach his maximum level of productive capacity" (Health Survey and Development Committee Report 1946: 7).

The statistic on good health is quite difficult to obtain but the negative side of health can be understood by considering the statistics of mortality and average expected life. In most cases the vulnerable group in any community are children, women during reproductive stage and old people. Almost 40 per cent death of the total deaths takes place among children under 10 years and half of the death takes

place in the first year after being born. In 1951, maternal mortality was about 20 per thousand. Most of the deaths were caused by epidemic diseases such as cholera, smallpox, plague and other diseases like fever, diarrhea, dysentery, and tuberculosis.

9.3 Health and Society

Health is shaped by society in many ways. Some of the major ones are listed below.

i. Health is defined by cultural patterns

The level of health varies from society to society. In Sub-Saharan Africa, centuries ago yaws, a skin disease was common to people and people considered it normal. People in America eat healthy food and many people suffer from overweight. For people what is healthful is also something morally good. In America competition is considered a virtue but it may cause heart problems and other sickness. Therefore, ideas related to health also arise from the social values and conformity.

ii. Cultural value of health changes over time

In the early part of the twentieth century doctors claimed that women should not undertake higher education as it stressed the brain. Masturbation was considered to have negative impact on health. Both these understandings are now considered to be false. In the mid nineteenth century doctors advocated the dangers of cigarette smoking or standing in scorching sun to be harmful for health. These principles are still followed and accepted today. Similarly, the basic idea of sanitation also changes or evolves over time. For instance, in 1950's only 30 per cent of the Americans took bath everyday while at present almost 75 per cent of Americans take bath on everyday basis.

iii. Health is also affected by society's technology

In America during 1950's the major reasons for death were influenza, pneumonia, stomach, heart disease, kidney disease, cerebral hemorrhage, cancer, accidents among others. With the development in medical science the deaths occurred by these diseases have been lowered. The poor sanitation condition and lack of proper medical facilities have been considered as the major reason for deaths in poor countries.

iv. Health is also affected by social inequality

The resources of society are distributed unequally. The rich and the powerful people have better access to health facilities while the poor people do not receive equal amount of health attention (Macionis 2006).

9.4 Historical Background of Human Health System

The human society began from the hunting and gathering communities. They had little technology or knowledge about their health. With minimum wisdom of health, they could only progress a bit in the health sector. Many children were left by their parents due to the food scarcity and many died while infants. As society progressed people started to cultivate food. In this agricultural phase food become plentiful but social inequality also increased. The rich and powerful enjoyed better food and health conditions. The poor people often lived in crowded, unhygienic conditions and lacked proper food or diet. In medieval Europe the human waste was piled up in streets and this led to the emergence of infectious diseases and plague became widespread. Due to poverty, there is a problem of food shortage and many people in poor countries dies even before reaching their teens. In poverty-stricken Africa the average life expectancy is 50 years while in developed countries like Japan it exceeds beyond 80 years. World Health Organization has reported that about one billion people i.e., one person out of six, suffers from serious sickness due to poverty. Many people die because of eating same food or due to lack of food. Malnutrition kills people of all ages and is more popular among the children.

In low-income countries many people also die due to improper sanitation. People do not have safe drinking water and unsafe water carries properties of infectious diseases like pneumonia, influenza, and tuberculosis. These diseases have been major killers in the poor countries. The medical facilities are also very limited in low-income countries. It is said that many people in central Africa have never attended a physician. In such countries 10 per cent of the children die in the first year of their birth, half of the children never reach adulthood and those who survive are mostly sick and get entrapped in the circle of poverty. Until and unless a proper medical support and provision is given to them their health and well-being may not improve.

Industrial revolution of 17th century transformed the western societies. It pulled the people from rural areas to move to cities for job opportunities. Very soon it was found that the industrial cities were overcrowded and affected the health and serious sanitation problems. Factories produced smoke that affected the air and accidents in the workplace became common phenomena. Industrialization slowly changed the health system of the industrialized European and American societies by providing better nutrition and safer housing or accommodations. The medical science also developed at the same time physicians as Jenner, Snow, Lister, Fleming discovered many remedies for infectious diseases. By the beginning of 20th century death rate had fallen sharply in the industrial developed countries (Macionis 2006).

9.5 Development in Health System and Sanitation

English barrister, Charles Chadwick has discussed the casual relationship between sanitation and disease. He argues that government should allocate every local unit with at least one health officer. John Snow, a British physician argues that cholera was primarily caused due to the low-quality drinking water. William Budd, another British doctor is also of the opinion that typhoid fever was due to unhygienic water. Apart from pure drinking water medical facilities, use of antibiotics, pesticide use for killing mosquitoes and other death causing insects, fire safety, proper transportation system, improved food delivery system are all important for preventive and curative reasons.

In 1771, Edward Jenner started the immunization against certain diseases likes smallpox. Louis Pasteur, Robert Koch, and others developed the bacteriological and viral theory of disease. They successfully invented vaccines for rabies. Since then various types of vaccines have been developed for fighting against various forms of diseases. Mass immunization has also helped the developed and developing countries to cut the death rate from infectious diseases. It is also to be noted that unhealthy habits also lead to infectious and degenerative diseases. Improving personal hygiene like bathing, washing hands, laundering and hygiene living places also helped in curtailing the mortality rate. In twentieth century, public health education on dangers of cigarette smoking, alcohol consumption and other life taking drug addiction has also been initiated. Another important lifestyle in the modern world is carrying out physical exercise for reducing the cardiovascular diseases.

Joseph Lister developed antiseptics which helped in reducing the risk of infection during and after surgery. In 1928, Alexander Fleming invented penicillin, a major antibiotic that helped in death reduction arising from wounds and other diseases like tuberculosis, bubonic plague, typhoid, and typhus. Moreover, many medical technologies have developed over the time like medication for hypertension, diabetes, cardiac therapy, kidney dialysis, organ transplant angioplasty, open heart surgery and so forth. The treatment for many types of cancer has also improved over the period of time. Advancements have also been made in the use of surgery, chemotherapy and radiation. All these factors have positively enhanced the health system and mortality rate of human population (Heer and Grigsby 1992).

9.6 Health Condition in India

In 1946, the Health Survey and Development Committee surveyed the reasons for low state of health in India and argued the followings as major reasons:

i. Lack of proper medical care–curative and preventive.
ii. Lack of hygienic environment conducive to healthful living, i.e. lack of safe water supply and sanitation, and absence of proper removal of human waste.
iii. Low resistance due to lack of adequate diet and poor nutrition.
iv. Lack of general and health education.
v. Lack of proper housing.

Apart from the above reasons there are also other factors such as school health, mental health and food adulteration. These reasons have been discussed in detail below.

9.7 Medical Care and Public Health

Prior to independence there was a major crisis of medical facility in India particularly in the rural belts. The number of medical personnel's and provision was very much limited then. In 1951, there was one hospital for fifty thousand people in rural areas and one hospital for twenty thousand people in urban areas. 75 per cent of the doctors lived in cities and only 25 per cent inhabited in rural areas. In order

to narrow the gap of medical provision in urban and rural areas many initiatives were promoted through the Five Years Plans. Some of the steps taken were integration of public health with hospital services, hospitals were transformed to health centres that were to function in the full sense of the term. The rural areas were to have primary health centres at the block level and secondary health units in the tehsil and district levels. The main of the primary health centres was to give personal health services, control of transmissible diseases, water supply, sanitary improvements, family planning and health education to the public. The mobile dispensary facilities were introduced to the primary health centres. Special provisions for controlling malaria, tuberculosis, communicable diseases, leprosy, cholera, smallpox were given importance. There was a significant development in the health sector during the third five-year plan as diseases like malaria, tuberculosis, leprosy among others were curbed and controlled to a great extent.

The health condition of children and women in India is highly vulnerable. The maternity mortality rate and the infant mortality rates are very high. In order to overcome this problem maternity programs and child health centres were opened in rural areas as a part of primary and secondary health units. The provision for a women doctor having specialized training along with two medical experts for training the dais and midwives for maternity cases was also implemented in the secondary units. The aim of the government was to provide one maternity health care unit for a population of 10,000 to 12,000.

9.8 Water Supply and Environmental Sanitation

Public health depends upon a favorable environment. Diseases like cholera, typhoid fever and dysentery have almost vanished in countries with proper water supply and waste management. The need for adequate and safe water supply was recommended by the Environmental Hygiene Committee in 1946. The committee had suggested the issue to be enacted through the five-year plans of the government. Unfortunately, the reality shows a different picture, the problem of water supply remains unsolved. However, the government is trying its best to tackle the crisis. In the rural areas the government aims to provide safe water supply to all the villages within a definite time period. Considering, the issue of sanitation simple latrines which do not need technical servicing has also been constructed. Water supply and

latrine construction projects have been initiated by the government on a subsidized basis.

9.9 Health Education

Public health education is one of the most important features required for acquiring a good health program. Most of the diseases originate and spread due to lack or ignorance of hygienic laws. In order to implement public health education the Central Health Bureau was formulated in 1956 by the Directorate General of Health Services. Various states have also set up their own departments with regarding to the mission for public health education. The major aspect of public health education includes personal hygiene, environmental sanitation, prevention of communicable diseases, nutrition, physical exercise, marriage guidance, pre-natal and post-natal care maternity, and child health. The personals at health centres were given the task of spreading the message of public health. Children are educated in the lines of public health in schools. The significance of public health was also delivered through various mediums like adult education, literature, radio, televisions, cinemas, health exhibitions in fairs and so forth.

9.10 Nutrition

Nutrition is one of the most pertinent elements for maintenance and resistance of disease. The productive capacity of humans depends upon the nutrition that they consume. Cereals, pulses, carbohydrates, proteins along with other foods like milk, meat, vegetables, eggs and fish contains good nutrition. In India the level of under-nutrition and malnutrition is enormous. The deficiency of productive foods has resulted in a defective diet of the people. The Joint Committee of the Indian Council of Medical and Agriculture has prescribed a regular requirement of food per adult per day which suggests cereal 14 oz, pulses 3 oz, green leaf, and vegetables 4oz, root vegetable 3 oz, vegetable oil and ghee 2 oz, fish, and meat 3 oz and one egg. Unfortunately, in most parts of the country the food is composed of cereals but the productive foods such as milk, meat, egg, vegetables, and fruits are lacking. Food deficiency primarily affects the growing children and the poor sections of the society.

Other factors like wrong method of food preparation or processing, lack of transport and refrigeration facilities of perishable items also lowers the nutrition of food.

Under such circumstances, there is a need to education the public about food nutrition and also reach out the nutritional food to the economically vulnerable groups of people. The lessons on food nutrition can be imparted through demonstrations and voluntarily organizations in the villages as a part of community development programs. The medical experts along with educators should also be given trainings in nutrition. The expecting and nursing mothers, infants and children are most vulnerable groups that the most attention. The government's initiative of mid-day meal programme has been quite successful in limiting the problem of nutrition to school going children. Such programmes for expectant and nursing mothers in health centres, maternity and childcare centres could also help in curbing the problem of nutrition. Sadly, the education in nutrition has not been seriously considered.

9.11 Other Health Problems

Three major health problems have been discussed by Madan (2005: 291). They are the school health, mental health and food adulteration.

i. School Health

With the increase in number of schools the number of children going to the school has also increased significantly. The health care of children in school is very vital. The School Health Committee has argued that sickness among school going children was primarily due to malnutrition and lack of preventive measures. The Committee suggested that minimum health care facilities should be provided in the schools. Some of the recommendations were: (a) clean drinking water and sanitary facilities, (b) arrangement for medical inspection, (c) follow up services in association with the primary health unit in the development block and (d) instruction of teachers in health education (Third Five Year Plan, 1961).

ii. Mental Health

An Advisory Committee on Mental Health was constituted by the central government. The Committee recommended the need of mental health services programs for the well-being of public and medical amenities. Factors like

rapid industrialization and movement of people from rural areas to urban areas invites problems like tensions and maladjustments. In order to overcome such challenges mental health service should be made available in hospitals.

iii. Food Adulteration

In both towns and villages food adulteration has become very common. Adulteration in daily consumable items like oil, ghee, spices, flours pulses etc has become very common. The Central Council of Health organized various seminars and various suggestions have come forward. The proposals include punishment for food adulteration under the Prevention of Food Adulteration Act, 1954, strengthening agencies to strictly inspect food products and food testing laboratory facilities. Despite of various suggestions and actions the food adulteration has not stopped in India.

9.12 Control of Population

The drastic increase of population in the country has compelled the policy makers of the nation to think about family planning policies and population control. India stands second in population ranking after China. The national welfare and planning are severely affected by the national population. In India the birth rate has remained fairly constant, and the death rate has lowered due to the introduction and advancement of medical science. Demographers, economists, and other social scientists have suggested three methods to fight the population problem. They are (i) family planning method (ii) migration outside the country or redistribution of population within the country by shifting people from densely populated areas to less densely populated regions and (iii) increase the industrial and agricultural production in a massive scale to generate double national income in short span of time. This suggestion given by the policy makers have failed to work out as second and third options have limitations. The only option left is family planning method.

9.13 Migration

A country with a high population faces the problem of proper resource management and distribution of welfare services. Due to population growth various problems arise

like the imbalance between population growth and means of subsistence, growing unemployment, low standard of living and low per capita income and so on (Singh 2009:96). All these factors affect the health and sanitation of the nation. One probable alternate solution can be relocation of the population. The people from high population density areas can move to regions that are scarcely populated or vacant. In this regard Dr. R.K. Mukherji has strongly suggested for a policy of mass migration of Indians in empty spaces across the world. This would help in overcoming the population and health barriers of India. However, the western demographers and policy makers does not easily accept the viewpoint of Dr. Mukherji. They view that it would be a threat to the world as it would signal the growth of Hindu imperialism across the world. It is also to be noted that western scholars do accept emigration as one of the solutions for population and health management, but it is only accepted and applicable when westerns or white people emigrate to other countries. When the Chinese and Indians, the countries whose population stands highest in the world considers emigration as a strategy for their population distribution and health improvement then it is not accepted by the western thinkers. Moreover, the relocation of population also invites problems related with inter-state envy due to linguicism and provincialism (Madan 2005: 293).

9.14 Sanitation

Sanitation affects the health status in both rural and urban areas. Sanitation primarily deteriorates due to population pressure (density). In addition, sanitation also reflects the level of development of a country. In fact, level of sanitation is very unsatisfactory in most of the developing countries unlike the developed countries. The level of sanitation reflects the development of a country. It can be argued that sanitation is better in developed countries than in the developing nations. However, rapid urbanization and industrialization adversely affected sanitation in most of the metropolitan cities even in the developed countries. Due to education and modernization, sanitation has improved in the developed countries, but it has remained very low in developing countries because of the low social development of the population in these countries.

The level of sanitation indicates the development of a country. Developed countries have better sanitation than the developing nations. It is also to be noted that

sanitation also reflects the cultural diversity of the population because beyond development, sanitation is also conditioned by the culture of the society. For instance, sanitation is of a higher level in Kerala particularly among the Kurichia tribe in the Malabar region and also among certain sects of educated Brahmins. A similar case is also seen in many Asian countries particularly in Thailand, China, and South Korea. Sanitation facilitates the health status of the people. How to facilitate consciousness on health and sanitation should be one of our major concerns today because sanitation negatively affects the well-being of the population which may lead to several common diseases. Diseases like cholera and several other transmissible diseases can be controlled only when sanitation is enhanced. Asian countries like South Korea and China lead with better sanitation which is not there in all other Asian countries except Japan. Next to them is Thailand. It has progressed considerably in the promotion of better environmental sanitation. India and Bangladesh are in the bottom level with very poor sanitation facilities as compared to other Asian countries. Thus, the improvement of sanitation is a major challenge for India.

While most of the population in developed nations tends to have multiple urban centres the developing countries have a different trend. Large number of people in developing economies lives in one large urban center. The growth of population in these urban areas poses a serious threat to infrastructure, transportation and sanitation on physical environment and also increases the problem of pollution of varying types. It is argued that growth of population in urban areas will continue to increase in these developing nations (Heer and Grigsby 1994).

9.15 Impact of Industrialisation and Urbanisation

Industrialization is not only a mechanical process but a social process as well. It is not only about technology and mass production but also a way of life or culture. Therefore, industrialization affects the environment physically as well as socio-culturally. The impact of industry and urbanization has both positive and negative impacts. It brings about population together, enhances the transport and communication system, power supply, dwelling units and so on. At the same time, it also brings the problems related with sanitation like air pollution, water contamination, proliferation of slums, depletion of environment etc. As industrialization and urbanization has spread in a global level it has brought in various threats related with health and sanitation. There are issues of creation of waste which cannot be disposed or

recycled. Global warming has become an international issue. There are indications that even in poles the temperature is rising. Due to excessive emission of carbon dioxide and other polluting gases the natural environment is degrading day after day which is sure to affect the health and sanitation of the world. The industrial and urban waste is being diverted to rivers and sea thus polluting the water. Anthony Giddens is of the view that environment has been damaged irreparably by the process of industrialization. He claims that if the economic growth is to be fostered through industrialization, then there is a need to develop new institutions to cope up with the new emerging environmental challenges, directly or indirectly influencing the health and sanitation condition. Industrialization and urbanization does improve the living standards and medical facilities but it also creates new threats for health (Macionis 2006: 552).

9.16 Morbidity

Morbidity or sickness and the case fatality rate that is the proportion of sick person who die contributes to the mortality rate of any society. Curative and preventive measures in the form of medical institutions and medical professionals try to control the morbidity and aims to reduce the case fatality. Preventive measures focus on reducing both morbidity and case fatality. Some instances of preventive measures are providing a required level of nutrition and exercise, upgrading public health infrastructure, implementing immunization programs and doing away with unhealthy behaviour like smoking cigarettes or alcohol consumption.

The Government of India started the Universal Immunization Programme (UIP) since 1986, with the aim of lowering the mortality and morbidity among children by immunization of all eligible children and pregnant women, against the common and dangerous infectious diseases by the year 2000 A.D. The programme was implemented in the rural areas through the existing infrastructure of primary health centres through the multipurpose health workers, trained dais. The vaccine and the other equipment are distributed from the District Health Authorities. Although malnutrition is not the primary cause for death it is makes people susceptible for being infected with severe diseases. Moreover, it takes a longer time for the malnourished people to get healed or recovery from illness.

According to the findings on Survey of Causes of Death 1964-1994 the combined share of fever, digestive disorder and cough was more than half of the total number of deaths in India in 1971. By 1991 their share decreased to 33 percent of all deaths. Cough remains the major killer in India particularly in the states of Uttar Pradesh and Rajasthan. Bronchitis and asthma accounted for 8 percent of the total deaths in India while Tuberculosis accounted for 6.1 percent.

Deaths occurring from natural calamities and accidental deaths are gradually rising at an alarming level. Such death rate has increased from 3.9 percent in 1971 to 8.3 percent in 1991. Natural calamities like tsunami, earthquakes, super cyclones and heavy downpours, rail and road accidents along with suicides and homicides and deaths from terrorist attacks mostly in Jammu Kashmir and Northeastern states are also responsible as factors of death in India. The provision for the supply of potable water along with liquid and solid waste management is still challenging in the public health sector. Though deaths by gastro-enteritis and dysentery have decreased over the period of time but diarrheal continues to be a major factor for illness and death. The government has also started various programs to cut down the problems of morbidity and mortality. Presently, India and China have become the garbage dumping zone of toxic materials and e-garbage from USA and other advanced countries. The unscientific recycling of mobile phones and other electronic gadgets pollutes the atmosphere with carcinogens. The modern-day competition in terms of gaining success and changing lifestyles are affecting the circulation and nervous system, thereby pushing up the deaths level. World Health Organization (WHO) studies the diseases of different countries. In 1998 half of the burden of disease for India was communicable diseases, maternal and pre-natal conditions, and nutritional deficiencies. Three major diseases which are regarded as changing the causes of mortality are tuberculosis, malaria, and HIV/AIDS (Majumdar 2013:314-315). These diseases have been dealt in detail below.

9.17 Tuberculosis (TB)

On average 2 million Tuberculosis cases are reported in India. TB kills almost 0.4 million Indians every year. The number of people killed by TB is less than the number of deaths related to malaria, meningitis, hepatitis, nutritional deficiencies,

leprosy, sexually transmitted diseases, and tropical diseases which together accounts for 2,58,000 deaths per year in India according to the WHO report 1999. National Tuberculosis program was launched in India in 1962. Unfortunately, it could not achieve its targets due to many flaws like over dependence on x-rays for diagnosis, lack of systematic records and low treatment completions. The revised national tuberculosis program was again implemented in 1993. The WHO recommended Directly Observed Treatment Short Course (DOTS) was undertaken. This program was one of the largest public health policies and was fairly successful. The curative success rate was 89 percent in 2001.

9.18 Malaria

According to the malaria eradication report malaria has increased from 9.72 in 1972 to 35.5 percent in 1995. The impact of malaria over morbidity and economic productivity is remarkable. With the greater urbanization and industrialization malaria has found ways in the urban areas mostly as well as other non-rural ecological regions. In 1953, the National Malaria Control Program (NMCP) was introduced. Then 75 million cases of malaria were reported per year out of which 800,000 ended up in deaths. The NMCP was reinforced with the new name, National Malaria Eradication Program and by 1965 malaria was totally controlled by using the DDT spray. Then after, 1,00,000 malaria cases were reported with zero deaths. Unfortunately, again from 1970s onwards malaria has re-emerged as a death taking diseases. The worst malaria affected Indian states in 1970s were Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa, Karnataka, and Pondicherry. At present malaria is mostly found in poor and densely populated areas of Uttar Pradesh, Bihar, and Bengal. 2.01 million cases of malaria were reported in 2001 in India.

9.19 HIV/AIDS

In the last 30 years new deadliest diseases have been discovered. Out of the many dangerous diseases HIV/AIDS is one of the deadliest diseases. Human Immunodeficiency Virus is lentivirus. The first case of HIV/AIDS in India was reported from Tamil Nadu in early 1986. After 1994 it has rapidly spread in the

country. In 2003 the number of people living with HIV/AIDS reached 5.1 million. Out of which 26 percent were females and 74 percent males. Almost 60 percent of the reported cases were from rural areas. HIV/AIDS is spreading like a fire in India. The number of HIV/AIDS infected people is found more in southern states of India. In case of Manipur, the Northeastern state HIV/AIDS is spreading rapidly due to intravenous drug use.

Tamil Nadu has the largest share of reported HIV/AIDS cases followed by Maharashtra, Andhra Pradesh, Gujarat, and Karnataka. These five states account for about 80 percent of total reported HIV/AIDS cases in India. A separate body for HIV/AIDS has been set up by the national government, the National AIDS Control Organization to control the diseases with the help from state health departments (Majumdar 2013: 314-318).

9.20 Conclusion

The health and sanitation condition in India has developed over a long period of time. The development of medical facilities advanced in a minimum scale since the time of hunting and gathering societies and reached an advanced level in the industrial society. Historically, mortality in India was primarily because of famines, plagues and epidemics but after independence such events have not occurred. Moreover, many infectious diseases which were detrimental earlier have been resolved by the progress in medical science, proper nutrition, and life styles in the developed nations. After independence there has been a remarkable progress in mortality as there is a decline in death rate and infant mortality rate and an increase in year's expectation of life after the independence. Age and sex are considered to be major elements for studying mortality. The gender difference in case of India's mortality condition has been very disturbing. It is observed that young girls are experiencing higher mortality compared to young boys. It is also observed that the mortality is highest among infants but as the child crosses the first birthday then there is a sharp decline in their mortality rate. Mortality has been found to be higher in case of rural areas in comparison with urban areas. The mortality difference between the different states of India is wider and varying. In almost all the parameters in the South Indian states of Kerala and Tamil Nadu are ahead of other Indian states. Both fertility and mortality in these two states are low.

Sanitation level and morbidity rate in developed nations have improved after the twentieth century. Unfortunately, the developing country like India is facing lot of crisis in health sector mostly due to lack of proper health facilities, overpopulation, industrialization and unhealthy life styles. The lack of pure drinking water, use of antibiotics, pesticide use for killing mosquitoes and other insects, fire safety, proper transportation system, improved food delivery system are all important for preventive and curative reasons. Despite of advancement in medical field the health situation is critical and challenging among the people living in rural areas. The major problems of health in India are primarily due to lack of proper medical care, lack of hygienic environment conducive to healthful living, proper water supply and sanitation, and absence of proper removal of human waste, low resistance due to lack of adequate diet and poor nutrition, lack of general and health education and lack of proper housing. The main diseases in contemporary India include tuberculosis, malaria and HIV/AIDS. The government has taken strong initiatives to eradicate these health problems by initiating various medical programmes and free medical services.

9.21 Summary

Health is the most important value for the individual person and for society. Health is a positive concept emphasizing social and personal resources as well as physical capacities. Health is a state of complete physical, mental, and social wellbeing. For a healthy life cycle a person needs to have a balance diet and has to regularly exercise. Bad health affects the efficiency and production system in the human society. Health does not only mean the absence of sickness or disease but the adaptive potential of humans in the physical and social environment. Social health is more than just the prevention of mental illness and social problems. Being socially healthy means increased degree of happiness. Including sense of belonging and concern for others. As we grow, social ties start building their place in our lives.

We should focus on keeping people healthy not just treating the sick. Access to jobs, safe housing, clean water, food, education and transport-are key to health.

A healthy society is about more than just preventing injuries and reducing the death toll from disease. It is also about having access to safe neighborhoods and

affordable housing, broadening job opportunities and reducing income inequality, designing walkable towns and fostering cohesion. Apart from these medical facilities, use of antibiotics, pesticides use for mosquitos and other death causing insects, fire safety, proper transportation system, improved food delivery system-are all important for preventive and curative reasons. Demographers, economist, and other social scientists suggested three methods to fight the population problem. They are - family planning methods, migration outside the country or redistribution.

9.22 Questions

G-A (5 Marks each)

i. Write a short note on morbidity?

ii. How does health shape the society? Discuss briefly.

iii. Write a short note on nutrition.

iv. Discuss the relationship between sanitation and health.

G-B (10 Marks each)

v. Write a note on the development of health system.

vi. Elaborate the major health problems in India.

vii. Critically analyse the major reasons for low health condition in our county.

viii. Write a note on the need on sanitization in society.

9.23 Suggested Readings

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Module V
Migration

Unit 10 ❑ Migration: Types and Problems

Structure

10.1 Objectives

The purpose of this unit is to discuss the following:

- The concept of migration.
- The theoretical background of migration.
- The different types of migration.
- Migration in international context and in India.
- The problems of migration.

Migration has been taking place since time immemorial. It is regarded as one of important factors for demographic change. Various economic, political, socio-cultural, and environmental factors lead to migration. Migration can be of different types,

primarily within or outside the national boundary. The causes and consequences have been enormous and endangering.

10.2 Introduction

Since the very beginning of human existence people have migrated. Migration is one of the major components of population change along with mortality and fertility. Unlike, mortality and fertility migration does not operate purely within the biological framework which is partially influenced by the socio-economic and political factors as well. Migration is an important factor responsible for population change along with fertility and mortality, but migration is not a biological variable unlike fertility and mortality but a product of social, cultural, economic, and political or physical circumstances (Bhende and Kanitkar 2004).

The main cause for migration is mostly related with the economic reasons but socio-political, environmental, and geographical factors have also resulted in migration. The emerging new markets, attraction towards urban lifestyles, advancement in communication and transportation system and a need of economic independence enables people to migrate irrespective of their socio-economic backgrounds (Jha and Singh 2006).

10.3 Definition and Meaning of Migration

The United Nations Multilingual Demographic Dictionary has defined migration as "Migration is a form of geographical mobility or spatial mobility between one geographical unit and another involving a change in residence from the place of the origin or departure to the place of destination or arrival. Such migration is called permanent migration and should be distinguished from other forms of movement which do not involve a permanent change of residence" (Bhende and Kanitkar 2004 : 357). Haq (2007: 157) argues "migration as an important demographic process" which is "concerned with the movement of people from one place to another." Castles and Miller (2009: 20) has viewed migration as "a collective action arising out of social change and affecting the whole society in both sending and receiving areas". Bhende and Kanitkar believe that the change of milieu that implies environment

along with the change in the dwelling place is an important indicator of migration. The nomadic people or groups who do not have a permanent and fixed residence or seasonal movement of people who have two or more places of residence during a year should be eliminated from the concept of migration. Chandna (2009) is of the standpoint that when migration occurs, in whatever form, it affects the area of origin, the area of destination and affects the way of life of the migrants as well. In India only 3.5% of the total population has out-migrated to other states although the percentage of migration flows is small the effects on the place of origin and the place of destination will be fairly large (Weiner 2004).

The concept of fertility or mortality involved only one aspect, either additive or separative, but the process of migration involves the social consequence of both the additive and separative processes (Haq 2007). Bhende and Kanitkar (2004) viewed migration as a major indicator of social change. The process of migration has been very predominant since the very beginning of human history. Various countries, civilizations and cultures have emerged and developed and expired through the very process of in and out-migration. Sociological studies of migration have been diverse and mostly related with kinship, social networks, and economic development (Marshall 2006).

Various reasons associated with agricultural production, war, epidemics and exploitation, displacement and degradation of the environment etc. have been regarded as the prime factors for human migration. However, economic and geographical compulsion and the notion of human development have been analogous with migration since the very ancient times, whether the nature of migration was forced or voluntary (Ketkar 2005). Migration is also facilitated by other socio-cultural practice such as rules of marriage, residence after marriage and inheritance (Palriwala and Uberoi 2008). In case of India, most of the female out-migration is associated with marriage. Almost 50 per cent of female migration in India is related with marital reasons (Haq 2007).

10.4 Theoretical Approaches of Migration

There are multiple theories of migration. Most popular theories of migration are associated with economic factors. Bilton et. al., (1997) argues that the economic and

political inequalities may have shaped patterns of migration. ... studies are the oldest system of analysis of human movement. Migration studies was founded in the late nineteenth century by focusing on economy, geography, and historical demography. Research into progressand decline of early empires, and geographical determinism had a significant impact on the foundations of migration studies. In later decades, migration studies developed primarily on the basis of economics, with their main area of research being the analysis of the determinants of voluntary human mobility. A German-English geographer, Ernst Georg Ravenstein is considered the founder of contemporary migration studies. In his classic publication titled 'The Laws of Migration', published in two volumes in 1885 and 1889, Ravenstein argued that bad or oppressive laws, heavy taxation and unattractive climate, uncongenial social surroundings, and even compulsion (slave trade, transportation) produce flows of migrants, but none of these flows can be compared in volume with that which arises from the desire inherent in the most men to better themselves in material aspects. Ravenstein's theory of migration has empirically generalized and mathematically verified the general patterns of migration. The primacy of economic categories established by Ravenstein strongly dominated the study of migration throughout the twentieth century and continues even in present day. Almost all influential migration theories, such as neoclassical theories, the Hicks model (1932), the Harris-Todaro model (1970), Wilbur Zelinsky`s mobility transition model, or the push-pull theory of Everett Lee, are based on economic categories (Terminski 2013: 5-6).

Everett S. Lee's theory of migration has stressed on the push and pulls factors of human movement. M.P. Todaro has designed the cost and benefit model of migration and John Harris has observed the economic reasons for migration and impacts of migration (Bhende and Kanitkar 2004). Although these theories do focus on the socio-cultural aspects their implications have been circumscribed. According to Anthony Giddens (2005) the famous 'push and pull' theory of migration has been disapproved for providing a mere and an average explanation of multifarious and complex phenomena of migration.

According to Haq (2008) "economic factors of migration which look apparently economic are actually the responses of the social structure of the society in which economic opportunities grows or declines resulting in migration". Migration is also

one of the incorporated components of the society and an inherent element of the larger social system. “Thus, the movement of population becomes an institutionally and normatively or culturally determined phenomenon” (Haq 2008). Narrowing human migration only to economic factors fails to grasp the relevant and immeasurable social aspects, not to mention environmental and climate determinants which were completely marginalized by migration theorists for the whole of the twentieth century. According to some scholars the marginalization of environmental factors within migration theories was associated with Marxist dialectical materialism, which strongly influences social sciences in democratic as well as communist countries. The impact of labour migrations on population growth was one of the fundamental themes of migration studies (Terminski 2013).

Scholars of migration have started to categorise migration as a product of the interaction between the macro and the micro levels of social system. Macro level implies political situation of the region, laws and rules controlling immigration and emigration or change in the economic system while micro level indicates resource, knowledge and rationality of the migrants (Giddens 2005).

10.5 Types of Migration

Migration apart from birth and death is the third major factor for population growth or decline. It is the third basic demographic process in which people of one geographical area of residence moves to another region (Denisoff and Wahrman 1975:374). The term migration refers to permanent movement of individuals or groups within the purpose of changing their place of residence. It may either be external that is between countries or internal that is between regions. When people leave country permanently it is called emigration and the reciprocal process that is when they enter the country it is called immigration.

Migration can be categorised into two types of namely group migration (example migration of nomadic tribes moving from one place to another in pre-industrial times) and individual or family migration (example movement of people from rural areas to cities). The movement of migration can also be classified on the basis of underlying causes. People or groups moves from one habitat to another either because of some force or situations (push factors) or due to some sort of attraction

in the new habitation (pull factor). It is common that both push and pull factors to a certain degree or magnitude decides the volume and direction of migration streams. For instance, in discussing the 'Great Atlantic Crossing' of nineteenth century were almost 20 million people migrated from Europe to the United States of America, one can sense a significant role of the push factor in the sending countries. Some probable factors would include religious and political discrimination, economic unsteadiness, over population in rural areas and reduction of farm labour force due to the advancement of agricultural technology. The exertion of such push factors was balanced by the strong pull factors developed by the United States. The pull factors may include political and religious freedom, rapid economic advancement, availability of lands, high wage jobs in the industries of the USA.

Population movement can also be looked from the lens of voluntary and involuntary migration. Most of the migration that took place in the ancient times was involuntary in nature as people moved primarily because of environmental exhaustion and food producing potential. The involuntary migration is associated with the push factors of migration. The voluntary migration is mostly due to the positive pull factors. Apart from certain exceptions like the migration of war refugees in South East Asia most migration occurring in the world today are individual and voluntary and is highly influenced by the positive pull factors (Denisoff and Wahrman 1975: 374). Migration as social phenomena is a fairly complex and occurs due to several factors. The demarcation of push and pull factors responsible for migration is regarded as the conventional method in the analysis of population movement. International migration alters the place of residence across the national boundaries. International migration has been regarded as an important force for redistributing the world population. Immigration in case of United States of America and Britain has been responsible for population growth.

Another way of categorising migration is in terms of whether it takes place between different countries or within the national boundaries of a country. Internal migration refers to the movement of the people within the national boundary of a particular country and international migration takes place outside the national boundary. Most migration in the contemporary world is internal migration – internal, voluntary migration of individuals who are attracted by the pull factors of countries offering greater opportunities if various types. The internal and international types of

migration are considered as the major classification of migration (Denisoff and Wahrman). Myron Weiner (2004) has classified internal migration in India into several categories. They are as rural to urban migration, rural to urban migration and inter-state migration. Although the urban growth is drastic in India but urbanisation rate (the number of people living in cities) has been gradual in India as compared to USA or European countries. About 13 million people have moved from rural to urban areas in India. The low rate of rural to urban migration in India is a signal that rapid growth of rural population, expanded rural density, rural unemployment, low wages and poverty has not compelled the rural population to push towards the cities. It also indicates that urban areas are not growing rapidly as they are not economically potential to provide employment to all categories of labour from the rural areas. Among the migrants from rural areas to cities every third migrant has lived in cities for less than three years and 15 percent of the male migrants living in rural areas have lived in cities. Many rural Indians migrates to cities and move out for short-term employment.

The Census of India has reported that 30 percent of the rural inhabitants are migrants. The rate of rural-to-rural migration has higher proportion than the rural to urban migration. The number of female migrants is high in rural areas. The reason is they migrate to join their husbands or related with marriage. The caste endogamy along with exogamy results in women to change their residences. Marriage's migration in most cases involves movement of women to near by villages within the district or state. About 33 percent of rural male migrants move to another village of another state and one out of four to villages of the same state. The most crucial time of rural-to-rural migration is during the cultivation and harvest time where large number of agricultural workers from one rural area to another. Almost 95 per cent of people live in the state that they are born, and most have not lived outside their district. Inter-state migration is numerically low in case of India as a whole. Few Indian states do have migrants from other states like Maharashtra, Assam, Punjab, West Bengal, and Delhi. Chain migration can be traced in states where the migrant community has established itself (Weiner 2004).

In present day India many people from small towns and other bigger cities are found migrating to cities like Bangalore, Delhi, Mumbai, Hyderabad, Kolkata and so forth. According to UNO Report June 2006, about 191 million people live outside

their country of origin and migration is recognised as a feature of international life. In the global level, most people migrate to advanced and developed nations like the United States of America, Canada, and countries of Western Europe. It is reported that 75 million people have moved to developing countries. Migration offers both positive benefits for the host nation as well as the country of origin. However, the pace of migration has declined recently due to the global factor of economic recession (Rawat 2015:305-306). Bhende and Kanitkar (2004) in their book Principles of Population Studies have classified internal migration as out-migration and in-migration. Out-migration refers to the movement of the individual or population 'out of a particular area' while in-migration is the 'movement into the particular area'.

Premi (2003) has categorized internal migration into three types. Firstly, intra district migration comprised of people who were enumerated at different place but were born in and moved within the district. Second category was the inter district migration where the people were enumerated in a district but were born in and moved in another district within the state and lastly, in the inter-state migration the people who were enumerated in the state but were born in and move in other states. Another type of migration is seasonal. Other types of migration within the country can be rural to rural, rural to urban, urban to urban and urban to rural. Migration is also classified on the basis of its determinants such as economic migration, social or environmental migration etc (Chandna 2009). In the present era migration is mostly for economic reasons. The poor people migrate for economic reasons primarily for survival and the rich section of the population mostly migrate with economic motives. Abella and Atal (1986) argues that migrants aspire to enhance their existing economic conditions and they are pulled towards the regions with better economic opportunities and remunerations. Migration from rural to urban areas most of the people migrate from their villages due to crisis of unemployment and under employment along with the decrement of available land resulting from increasing population.

10.6 Migration in the International Context

One of the foremost waves of migration was that of the nomadic people towards Europe to Central Asia during the period when the Roman Empire was gradually

diminishing. The Europeans and Africans started to migrate to North and South America and Oceania after Columbus's voyage to America. The migration from Africa to America was mostly due to forced slavery. The first slaves from Africa were brought to Virginia in 1619 and it continued till 1808. Almost four lakhs slaves were brought to America during that period and 1,79,020 of them were of African origin. As industrialisation began to take place in Europe between 1800 and 1925 many people were pushed off the land and they migrated to countries like Argentina, Australia, Canada, New Zealand, and the United States of America. In the first decade of twentieth century the immigration from Europe to America was 9.2 per thousand people while the emigration rate from Europe to America was about 2 per thousand people. World War I resulted in massive migration from European nations to the United States of America where the American government had to come up with a law restricting immigration. Human migration reached maximum before the World War II. The world's largest gross interchange of population occurred in 1947 when the British India was partitioned into India and Pakistan. By 1950s, international migration had become global as more people started to migrate from one country to another (Heer an Grigsby 1994: 63-65).

The first recorded emigration from India was to Sri Lanka in the last phase of the first millennium BC. These migrants were believed to have moved from north-eastern India, developed their Indo-Aryan language known as Sinhalese and became Buddhists. Tamils from south India also migrated to Sri Lanka but they retained their language, their Hindu religion and caste system. These two communities ruled the different parts of the island's nation, in certain cases they were intermixed, the consequence was the emergence of divided society comprising of migrant communities namely, Sinhalese and Tamils with their distinct language, religion, social structure and distinctive identity.

It was not until the nineteenth century that there was a remarkable population movement of emigrants from India. The most important reason was the beginning f indentured labour system. After the abolition of slavery system, the British planters in the colonies faced shortage in labour therefore they started to look towards British for low wage labourers. It is argued that between the years 1830 to 1916 approximately one million Indians went abroad as indentured labourers to work in the British colonies like Mauritius, Natal, Malay, Caribbean, Fiji and East Africa. Most of the

workforce came from highly unemployed and famine affected areas like Uttar Pradesh and Bihar. The contract was mostly for five years but most of the labourers preferred to stay abroad and earn there even after the lapse of the contract. The percentage of out migrants from India was small in scale but in the receiving countries their population was high. By the end of British Raj these migrants had become shopkeepers, salaried workers and professionals, and their number started to siege in the British colonies. Migrants of Indians origin at that point of time formed the highest majority in three countries namely, Mauritius, Fiji and Guyana.

Post-independence three new migration streams have been traced from India namely to countries like Great Britain, United States of America and the oil producing countries of the middle east. All the migration in these three countries was made possible through the migration policy of the receiving countries. In every case it was found that migration chain was established which helped the relatives and friends of these over seas migrants.

10.7 Migration in India

Migration started in South Asia since the middle of the second century BC and it continues in the present times. Migration has altered the social structure, culture and political system of the Indian sub-continent. The Aryans migrated to India around 1500 BC (Weiner 2004; Nehru 2004) and the Muslims came as conquerors from north India or as 'traders, travellers, and missionaries' from the south India. Saint Thomas arrived to Kerala in the first century A.D. in the 6th century the Jews came to India after fleeing persecution in Babylonia. Similarly, in the 8th century the Zoroastrians migrated from Persia due to Islamic domination migrated to India (Tharoor 2007). These instances are some of the recognised historical facts about migration in India. It was not just a human migration but also the movement of various civilizations and cultures as well.

American sociologist and demographer Kingsley Davis was one of the pioneer researchers to study the case of migration in India. He argues that there was a low migration rate in India owing to the prevalence of caste system, lack of education, linguistic and cultural diversity, joint family system, presence of agriculture and semi feudal system (Abraham 2008). Davis advocated that with the development of the

education, transportation and communication system initiated the transformation of agrarian to industrial societies and this ultimately paved the way for population movement (Davis 1951).

In between the year 1981 and 1991, 13 million people from rural areas migrated to the cities Weiner (2004). India's urban population has increased by 138 million since 1980's and today several Indian cities are among the world's largest like Mumbai with 12.6 million people, Kolkata with 10.9 million and Delhi with 8.4 million (Sharma 2008). Yogendra Singh by analysing the study carried out by Donald J. Bogue and K.C Zachariah on rural to urban migration came to a conclusion that 'migration has progressed to the point where residents of almost every village has some relatives or fellow villager who lives in the city' (Singh 2011).

It was only in 1961 Census of India that people's last residence and the duration of their stay in the place of enumeration was recorded. The Indian Census from 1961 to 1991 shows that the migration pattern has been changing very slowly in the country (Majumdar 2013: 319). In case of India a small section of population inhabits outside their place of birth or that of their spouses. Most of the Indians are locally born and not migrants. In between 1981 and 1991, 13 million people from rural areas migrated to metropolitan cities which accounted to only 2 percent of the total population of India. The rural to urban migration is modest in India. About 3.5 percent of the population lives in another state and people born in other countries accounts to less than 1 percent. In case of south Asia only a small population of between 1 and 2 percent lives outside their countries (Weiner 2004: 156). Women in India constitute a good share of internal migrants. The reason behind this is the village exogamy still practised in many parts of rural India (Majumdar 2013: 319).

Although the percentage of migration is quantitatively small but the impact of migration on both the sending and receiving societies are substantive and the issue of migration gets amplified in the political discourse and India's external relations. For an instance the Maharashtra government had made a proposal to deny the entry for migrants of other states. The governing political parties in Assam demanded closing the border with Bangladesh and threatened secession if the union government did not intervene to stop illegal immigration. The Bhartiya Janta Party (BJP) proposed for constitutional amendment to cancel the law relating to restrictions on purchase of land for non-Kashmiris in Kashmir (Weiner 2004: 156).

The Census of India in 1981 address that almost 8 million people, born in other countries were living in India. Majority of this people were young or middle aged. Both Hindus and Muslim migration from Bangladesh to India is still prevalent. Illegal migration into West Bengal and other northeastern states have become phenomenal. The proportion of illegal migrants in India was about 3.89 percent. India has attracted large number of migrants owing to her sufficient resources. Moreover, the trade relation of India with many other countries has facilitated both immigration and emigration in a massive scale.

If we compare the first and the ninth Census of India, then the net migration rate is not very significant. The partition of India and Pakistan has compelled people from both the countries to migrate in a large proportion, but that migration was also a balanced one. Almost 7 million population migrated from both sides. Migration rate both immigration and emigration, from and to the neighbouring South Asian countries like Nepal, Sri Lanka and Bhutan have been very nominal. The 1971, Census of India reported that about 9.4 million people in India were born in other countries. In 1971, after the Bangladesh's liberation war almost 5.64 migrants of the total immigrants came to India. They comprised 1.7 percent of the total population of India. Post liberation war of Bangladesh the absolute immigration rate has dropped. The high percentage of immigration was due to 1965 war with Pakistan. The trans-boundary movement from Bangladesh to India has never stopped primarily because of the political unrest and ill treatment of Hindus in Bangladesh. In between 1971 and 1981 almost 1.8 million people were forced to migrate to India from East and West Pakistan. Only 0.07 percent of immigrants were from Nepal, Malaysia, Sri Lanka and Myanmar (Majumdar 2013).

10.8 Problems of Migration

Out of the three demographic processes (birth, death and migration), the most significant in sociology is the human migration. The major reason behind this is migration brings together diverse group of people into contact and creates the problem of assimilation. Assimilation is the process through which the belief, customs, and behavioural patterns of one group is compounded with that of another group which is generally larger in size. The problems of assimilation are observed

through the presence of ethnic ghettos, marginal men who are trapped between the conflicting values of two communities or culture and higher degree of deviant behaviour among the migrants.

Although not all the bad incidents occur because of separation from the old primary association or groups. The importance of leaving behind the familiar environmental surroundings for new habitation or often strange environment often results in personal and social disorganisation. Therefore, in many cases migrants are more prone to delinquent characteristics, mental sickness, adult crime, prostitution, divorce, and other social problems. Although migration does bring different people with various skills, beliefs, customs, and technology into contact with one another and foster positive influence on the progress of human civilisation. However, at times the consequences of such interactions have been adverse. For instance, the destruction caused by the Mongols while entering the Europe (Denisoff and Wahrman 1975).

The consequences of migration have been diverse. The immigration of the Aryans into India during the 1500 B.C directly affected the socio-religious and cultural practices of the Dravidians because the Aryans brought with them their own divinities which subsequently became the important figures of worship among the Hindus and Sanskrit which was the language of Aryans and their holy text Rig Veda became the major foundation for the development of the Indo-Aryan languages in the Northern India (Weiner 2004). Aryans were followed by other migratory tribes such as the Medians, Iranians, Greeks, Shakas or Scythians, Khusans, Turks, Turco-Mongols and others etc who migrated in small and large groups found a 'home in India' (Nehru 2004).

In 1947, India gained independence from the British and the nation was partitioned into theocratic Pakistan and secular India. Partition of India and Pakistan resulted in migration of Muslims from India to Pakistan and Hindus from Pakistan to India (Castles and Miller 2009), the event was characterized as "the most violent carnage in the region's history, in which nearly half-a-million people were massacred" (Srinivas 2011). Migration also creates the problem of resource scarcity which gradually takes the shape of a political issue and conflict. At times migration is also a main source security risk (Lama 2003). Migration can also emerge as an important factor for social construction of identity and source of social conflict (Weiner 2004).

In Assam in the Northeast Region of India, the major conflict is related to migration and migrants. In the early 1980's, the All-Assam Student Union started a violent movement against foreigners (Lama 2010). Due to the growth of population through migration there are cases of increasing problems of unemployment and the subsequent degradation of the environment. As such migration can become an issue of security concern (Ketkar 2005). Migration can also be basis of spread of contagious diseases like HIV/AIDS (Sundas 2011) challenging the human health security.

In India the major issue of concern in present times is the demographic changes caused by migration. The northeastern states of India have more than 500 ethnic communities owing to migration and invasions. India under the British rule during the 20th century facilitated massive scale of migration in Assam, North Bengal and Tripura. This trend continued even after the independence of India. In 1971, again large number of people moved to West Bengal and northeast India from East Bengal due to the Indo-Pak war. These people never returned to the country of origin. These incidents led to the anti-migration movement in Assam but due to the vote bank politics, the migration trend has not completely stopped even till today.

The effect of immigration is clearly visible in Tripura which comprised of tribal majority in 20th century. At present the tribals have become minority in their own homeland. This has resulted in the emergence of insurgent movements. The northeastern tiny state of Sikkim now has Nepalese majority. Almost 80 percent of Sikkimese population is said to be constituted by the Nepalese. In Assam about 40 percent immigrants of which 30 percent is believed to have migrated from Bangladesh and the remaining from the state of West Bengal, Bihar, Uttar Pradesh, and Rajasthan. This has resulted in the materialisation of ULFA, Bodo, Karbi and Dimasa movements.

The emigration rate from India is not clear. During the British raj many Indians left the country to work in foreign lands on contractual assignments. A sizable amount of Indians settled down in those countries and did not return to their homeland. They have been living for long time, but their exact number is still not available. Many Indians at present are also going to countries like America, Canada, United Kingdom, and other western countries to pursue higher education and employment opportunities. Many of them have obtained citizenship in those countries. The orphans and destitute children are also being sent to their adopted parents in

Europe and other developing countries by missionaries running orphanages. These countries have strict migration policies to curtail illegal migration.

The economic globalisation has also encouraged highly educated and skilled personals to migrate to developed countries. The developing countries have become the employment destination of many skilled, scientific, and technical experts mostly from India and China. There are hardly any universities or research institutes in United States of America and United Kingdom where we don't find Indians. In United Kingdom the number of Indian doctors has sidelined the British doctors. Many aeronautical engineers and computer experts are working in NASA and other big corporate organisations across the world. Indian scientists, engineers and information technology experts are in demand all over the world. Although the Indians are dominating the global job market scenario in one hand, on the other hand there is a brain drain from the country. The government has failed to tap or capture the potential of those migrating skilled labour force for the welfare and development of one's own nation. The brain drain has escalated more after the Indians have proved to be extraordinarily good in software technology. The government has been trying to stop the colossal loss of brainpower. However, the Indian skilled labour force is purchased in heft prices by USA, UK, Canada or Australia.

North America and the Middle East is attracting lot of Indians to migrate to their countries. The decision for international migration depends upon several factors like foreign returns vis-a-vis domestic returns to work. The wages offered by the destination country discounted by the cost of living in the place of living or sending and destination countries, domestic and foreign market conditions and so forth. The massive out migration of skilled labour force has negative affected the labour sending countries. The Gulf countries are a major destination for different types of skilled, semi-skilled and unskilled labourers. Large numbers of immigrants in the Gulf countries are from the Indian state of Kerala. The highly skilled population moves to America, UK and other developed countries while majority of the semi-skilled and unskilled labour force goes to Gulf countries. The primary reason for migration to these developed economies is for better pay, improvement of one's skill and better recognition in the global level. Unfortunately, the movement of labourers of different types to developed countries will surely have an adverse effect on the national labour

force, production activities and generation of better national income (Majumdar 2013). In India cities are characterised by enormous squatters of settlement, high rates of unemployment, soaring level of pollution of different types, sanitation problems, scarcity of drinking water, towering cases of disease, malnutrition and infant mortality, low literacy rate and high rate of child labour. Migration to a certain extent is responsible for the rise of such social problems and challenges (Weiner 2004: 164).

10.9 Conclusion

Migration of people is mostly associated with the economic reasons but socio-political, environmental, and geographical factors are also involved in it. In case of India, it was only after the 1961 Census that the data on migration has been recorded. Migration pattern in India has been changing very slowly. Although the percentage of migration is quantitatively small but the impact of migration on both the sending and receiving societies are substantive. India has attracted large number of migrants owing to her sufficient resources. Similarly, many Indians also migrate to other countries mostly for employment opportunities and the trend has increased after independence. Many highly educated and skilled professional from India are migrating to advanced countries like America, Europe, and Australia. This has resulted in 'brain drain' of skilled people from India.

10.10 Summary

Migration is one of the important factors for demographics change along with fertility and mortality, but migration is not a biological variable unlike fertility and mortality, but a product of social, cultural, economic and political or physical circumstances. Migration refers to the movement of people from one location to another. Migration is a way to move from one place to another in order to live and work. Movement of people from their home to another city, state or country for a job, shelter or some other reasons is called migration. Migration from rural areas to urban areas has increased in past few years in India.

There are two basic types of migration studied by demographers:

1. Internal Migration: This refers to a change of residence within national boundaries, such as between states, provinces, cities, or municipalities. An internal migrant is someone who moves to a different administrative territory.
2. International Migration: This refers to change of residence over national boundaries. An international migrant is someone who moves to a different country. International migrants are further classified as legal immigrants, illegal immigrants and refugees. Legal immigrants are those who move with the legal permission of the receiver nation, illegal immigrants are those who move without legal permission, and refugees are those who crossed an international boundary to escape persecution. Jay Weinstein and Vijayan Pillai (2001) denote a third classification: Forced migration. Forced migration exists when a person is moved against their will (slaves) or the move is initiated because of external factors (natural disaster or civil war).

Migration in India: Most of the Indians are locally born and not migrants. A small section of population inhabits outside their place of birth or that of their spouses. The Indian census from 1961-1991 shows that the migration pattern has been changing very slowly in the country. The rural to urban migration is modest in India.

10.11 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. What is migration?

ii. Differentiate between immigration and emigration.

iii. Discuss the different types of migration.

iv. Write a note on migration in context of India.

v. Critically examine the problems of migration.

G-B (10 Marks each)

vi. What are the various approaches to the study of migration?

vii. Explain migration as a process in the international context.

viii. List the consequences of migration.

10.12 Suggested Readings

i. Abraham, M.F. (2008): An Introduction to Concepts and Theories, New Delhi: Oxford University Press.

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vii. Singh, M.P. (2009): *Sociology: An Introduction*. New Delhi: Jawahar Publishers and Distributors.

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Unit 11 ❑ Migration, Integration, and Assimilation: Issues and Problems

Structure

11.1 Objectives

The purpose of this module is to discuss the following:

- The concepts of migration, integration, and assimilation.
- The different modes of integration.
- The problems associated with integration.
- The various stages in the process of assimilation.
- The obstacles and aids to assimilation.

The movement of population is also associated with integration and assimilation. When people move from their place of origin to new destinations then there are challenges of integration and assimilation. The integration and assimilation of the individual or group with the host community depends upon many factors.

11.2 Introduction

Human migration has been taking place since time immemorial. According to the oxford dictionary of sociology "migration involves the (more or less) permanent movement of individuals or groups across symbolic or political boundaries into new residential areas and communities" (Marshall 2006:415). Francis Abraham (2015:256) has defined migration as "the movement of population from one geographical region to another." Migration is one considered to be one of the major components of population growth or change along with mortality and fertility. However, unlike mortality and fertility migration does not operate purely within the biological framework.

11.3 Migration

Migration is a product of social, cultural, economic and political, physical or environmental circumstances (Bhende and Kanitkar 2004). Haq (2007: 157) argues "migration as an important demographic process" which is "concerned with the movement of people from one place to another." Castles and Miller (2009: 20) has considers migration as "a collective action arising out of social change and affecting the whole society in both sending and receiving areas". Bhende and Kanitkar are of the opinion that the change of milieu implies environment along with the change in the dwelling place is an important indicator of migration. The nomadic people or groups without permanent and fixed residence or seasonal migrants with two or more places of residence during a year should be eliminated from the concept of migration. Chandna (2009) argues that when migration occurs, in whatever form, it affects the area of origin, the area of destination and affects the way of life of the migrants as well. It should be noted that the term migration is a multi-dimensional term and it also includes movement of refugees, displaced persons and uprooted people, labour

migrants and economic migrants. Bhende and Kanitkar (2004) viewed migration as a major indicator of social change.

Basically, there are two types of migration namely, immigration and emigration. Immigration means in-migration. It occurs when population enters into a particular place from another region. Emigration refers to out-migration and occurs when the population leaves the area and moves into a new locality. The difference between immigration and emigration is known as net migration. Sociologists use the term immigration for movement of population outside the national border. The population movement within the national border is called internal migration or in-migration. Kerala is witnessing a massive emigration towards Gulf countries and at time same time it is also experiencing a wave of internal migration of people from Tamil Nadu to work in its plantation and construction projects. Most of the countries do not favour immigration but countries like America, Australia and Canada have majority of immigrant population (Bhusan and Sachdeva 2008).

11.4 Integration

Society is a constellation of groups, organisations, institutions, ecological collectivities and so on and it functions in an interconnected manner. Every individual living in a society is bound together and dependent upon one another in a system of interconnection. This interconnection makes up the overall functional structure of the system. Although every entity of any society is interconnected and dependent yet at times their interconnection or continuity is broken down to a certain degree, a situation which Merton has termed "a strain towards anomie." The degree of anomie may vary from s small confusion or slight contradiction to a serious deterioration or disintegration. However, it should also be kept in mind that along with strain towards anomie" we also have "strain towards consistency". The "strain towards consistency" implies to integration process. According to Bhusan and Sachdeva (2008) integration is the harmonising or unifying process whereby the various structural components of the society are properly organised. Integration does not involve similarity of various structural parts. What is essential for integration is the certain values must be accepted as common and the different institutional agencies should preserve and promote these values. When there is a basic social change through technological use

in the economic sector then the old values start to become inadequate and the structures serving these values stop to function effectively. The new altered values may develop and the newly formed social forms or the old, readjusted forms may serve the changed values. Such development helps in maintaining integration.

Integration along with assimilation, co-operation, competition, and conflict are all forms of social interaction and they are termed as socio-cultural processes. Social processes are those ways of interaction which can be observed when individuals and groups meet and create social relationships, of what happens when changes disturb the already existing modes of life. According to Ginsberg social processes mean the various modes of interaction between individuals or groups including cooperation or conflict, social differentiation and integration, development arrest and decay. The important elements of social processes are sequence of events, repetition of events, relationship between events, continuity of events and special results. Social processes are important because it is through these socio-cultural processes that human beings interacts and develops human relationship. They are forms of behaviour that are often repeated in our social life.

According to Talcott Parsons in the Essays of Sociological Theory "integration is the mode of relation of the units of system by virtue of which, on one hand, they act so as collectively to avoid disrupting the system and making it impossible to maintain its stability and, on the other hand to co-operate to promote its functioning as a unity" (Singh 2009: 28). Social integration is the principle through which the individuals or actors are related to one another in a society. Similarly, system integration is the relationship between parts of society or social system. Social and system integration can invite both order and conflict.

According to Max Weber social stratification found is status-based societies are more likely to bring harmonious forms of social integration and class-based societies can lead to conflictive form of social integration. Integration can be consequence of differentiation or specialisation. The increasing structural differentiation and functional specialisation the need of integration also increases for the maintenance of social order. The objective of integration is to develop harmonious and active relationship between the different structural parts of the society. It does not only help in moving the society forward but also generates meaning and rationale in the lives of people

so that they feel the need to be part of the intelligible and pleasant social life. Integration is thus a process of developing a society in which all social and ethnic groups can equally take part in cultural and economic life, the extent to which an individual experiences a sense of belonging to a social group by virtue of sharing its norms, values, beliefs and so on.

The major objective of integration is to maintain harmonious and efficient relationship between the various parts of the social system. It does not only help in maintaining the active growth of the society but also imparts meaning and purpose to the lives of the members of the society that they are a part of the society and how to live a comprehensible and harmonious social life. Various structures of the society perform functions in relation to the social values. For examples, family endorse sexual relationship between the married couples, socialisation process of the children, education, protection, recreation and so forth. However, in contemporary society many functions of the family are performed by the newly emerging agencies like schools, colleges etc. In order to cope up with such changes taking place within the functions of different structural units of the society, integration becomes an important process for keeping the society alive and active. Therefore, we can argue that integration is the consequence of differentiation and specialisation. If there had been no specialisation and differentiation of functions of structural parts, then there would have been no integration. When there is more specialisation and differentiation of functions of the parts of the society then there would be more need of integration. The modern society with diverse field of specialisation in every sector and complex institutional patterns have made the task of integration very difficult. Integration helps the different institutions, organisations, and other institutional of society to harmonise and organise so that they can come together to serve the need of the society and develop the social entity in an orderly fashion.

11.5 Modes of Integration

Social integration takes place in different ways. In case of authoritarian or totalitarian forms of governance the social life is highly controlled according to the ideologies and goals of the concerned government. Thus, schools, economic organisations, religious institutions, and all other manifestations of collective behaviour

are under the control of the policies of the government. A single political party controls the nation including the family. The communication system and all the agencies are regulated through the direction of the concerned official. Any form of challenge to the government is not accepted or tolerated. In such kind of situation, the integration is achieved through the use of force, power, or threat. Such kind of integration is known as "closely woven" type of integration.

The second kind of integration is known as "loosely woven" kind of integration. In such cases there is a variation not only in individual behaviour but also in case of national behaviour. However, it does not mean that society is not integrated or poorly integrated. It means that there are an absence of rigid social norms and people have a wide range of alternative behaviour open to them. There is no clear-cut group relationship and the social norms are leniently followed.

In order to take off strain towards anomie and make the society efficient integration is crucial. Generally, the members of the society carry out their daily activities in a normative manner. Their activities support the folkways, norms, and other institutional patterns. Beyond the reinforcement of integration through normative activities, deliberate efforts are also made for bringing integration. Therefore, ameliorative programs are carried out for bringing down the cases of delinquency, for educating the voters, to support the underprivileged section of society, to improve the educational, housing medical recreational and administrative infrastructures. These initiatives attempt to bring improvements in the existing social structure without affecting the basic structure of the society in an enormous way.

Many people view integration as not only a social reform but also a social reconstruction. Such people form radical organisations and try to completely abolish the existing social structure and replace it with new structure. They do not accept the idea of halfway measures but seeks to focus on the root of the matter and transform the society in a fundamental manner. For example, despite of removing capitalism and its evils they want to completely uproot and destroy the system by bringing in new social order. For them reintegration means the new order. In between the ameliorative and radical programs, we have social movements. These movements include the movements for abolition of bonded labour, labour movement, education movement, environment movement etc.

Both integration and reintegration programs, to be activated needs social planning. Social planning involves research, decision, and action. In India planning is regulated and implemented by Planning Commission. It is often argued by scholars that in the hands of Planning Commission the economic issues are given more priority than the social issues. It is also to be noted that planning is more difficult task in a democratic country than in a totalitarian nation. However, planning is considered to be one of the most effective methods for achieving reintegration in a complex and more rapidly changing social system.

11.6 Problems of Integration

Integration is also a difficult and a complex process. It has severe complexities like the disparity in the structure of the society makes it very difficult to integrate all its parts and socialize the humans in a smooth manner. The problems of integration are more intricate in complex or multicultural societies than in simple societies. The presence of multi-ethnic or multi-lingual societies also complicates the problems of integration. In the fast-changing society new elements are introduced in an extraordinary manner which at times may increase stress and strain in the system. Under such cases integration maintenance becomes a difficult task. The problems of integration are discussed in detail below.

Firstly, the difficulty in integration depends upon the complex and large size of modern society. In case of simple and small societies the problem of integration is not a complicated task. But in a complex and large society the task to bring harmony and unity is a challenging task.

The second problem is the cultural heterogeneity of the society. The social system characterised by multi-ethnic, racial, and linguistic origins are marked by class, religious, and occupational differentiation. The prevalence of various sub-cultures within a single society increases the problem of integration. This is very much applicable in case of our Indian society. The multi-caste and multi-linguistic society have affected the sentiments of the people and these factors have strongly influenced the social structure. The instance of Hindi language as an official national language of India is facing resistance from the southern part of India.

The third factor is the speed of social change. At present times the new elements are entering into the social structure in an unprecedented scale. Numerous cultural lags has resulted in heightened stress and strain in different parts of the social system.

Lastly, integration is exemplified by the tendency of diligence found in structural form. At times the social system tends to become very rigid and does not prefer to adapt to change or transformation. When vested interested or authoritarianism develops around the structure, it does not allow the system to change. Thus, in industrial societies the capitalists oppose the economic transformation, or the priest becomes rigid in the caste based social system.

11.7 Assimilation

Assimilation is a social process where the culture of two social groups fuse together to form a new one. It is a procedure in which the minority group adapts to the rules and patterns of behaviour of majority or host group ultimately being absorbed in the socio-cultural system of the majority group. There can be an exchange of cultural trait whereby, one group tends to inculcate the cultural of another group. The case of 'Americanisation' is a good example where the immigrant groups contribute some of their cultural traits and they in turn adopted the core-culture of the Americans. It should also be noted that assimilation does not only mean that foreigners assimilate into the culture of host community. It is the process whereby individuals and groups acquire the culture of other groups in which they come to live by taking the attitudes and values, its patterns of thinking and behaving. In short it is a way of life (Bhusan and Sachdeva 2008: 183).

Some of the important definitions of assimilation are as follows:

i. Park and Burgess "Assimilation is a process of interpenetration and fusion in which persons and groups acquire the memories, sentiments, attitudes of other persons or groups and by sharing their experience and history are incorporated with them in a cultural life."

ii. Lundberg "Assimilation is a word used to designate a process of mutual adjustment through which culturally different groups gradually obliterate

their differences to the point where they are no longer regarded as socially significant or observable."

iii. Bogardus "Assimilation is a process whereby attitudes of many persons are united and thus develop into a united group.

iv. Horton and Hunt "The process of mutual cultural diffusion through which person and groups come to share a common culture is called assimilation."

v. Nimkoff "Assimilation is the process whereby individuals or groups once dissimilar become similar and identified in their interest and outlook" (Singh 2009: 26-27).

Fairchild argues that assimilation involves both the process of nationalization and re-nationalization. Assimilation involves the modification of social attitudes. When two different cultures come into contact, there is a prominent tendency of sentiment of mutual conflict but gradually both the cultures assimilate elements from each other. In case of assimilation two groups do not merely compromise or agree to live side by side with one another but they become much like one another, their distinguishable character as separate groups slowly fades away, making them difficult to distinguish from one another. Assimilation is both social and a psychological process. According to Hayes, assimilation is a result of interaction rather than an interactive process (Bhusan and Sachdeva 2008: 184).

It is also to be noted that assimilation is not limited to a single field of study. The best cases of assimilation are those where the foreigners come into contact with the culture of the host group, takes up their culture and gives up their own culture. Assimilation does not end here. Assimilation takes in different cases and conditions. For an example, children learn the ways of life as they grow up and enter into the adulthood. Foster children learn the new culture from their foster-parents sometimes so completely that their old traces of earlier home influence are totally eradicated. At times married couples from dissimilar or different socio-cultural backgrounds may develop a strong sense of unity of interest and purpose. In religious sphere people of one religion may be converted to other religion through religious conversions. Since assimilation is a social process, it is a characteristic of human group life in general and not limited to only a certain kind of group or people.

11.8 Stages in the Process of Assimilation

It is assumed that assimilation is a gradual and a slow process. The process of assimilation involves certain stages. It takes a certain amount of time for the dissimilar individual or groups to become similar. The dissimilar people and groups take time to become identified in their interest and outlook with one another. Acculturation is the stage where one cultural group which is in contact with another appropriates or borrows from it certain cultural elements and incorporates them into their own culture, thus modifying it. When two cultural groups come into contact with one another their interaction affects both of them. However, it is the weaker group that borrows more cultural elements from the bigger or the host group. For example, the American Indians borrowed the culture of the whites with whom they came into contact, the whites appropriated some cultural elements from the American Indians. Therefore, assimilation has two stages or phase. The first part is the suppression of the parent culture, and the second phase is the acquisition of new ways, language and so forth. It may be noted that at times two may overlap.

The adaptation of the dominant social cultural practices by another cultural group makes the way for the absorption of the new cultural group into the dominant group. Some cultural elements are readily adopted even if the two groups are only slightly in contact. For instance, the American Indians quickly learnt the use of firearms and intoxicants from the whites and the early American settlers learnt to consume food stuffs like potato, maize from the American Indians. Likewise, the migrants in America and Europe began to put on American and European clothing styles very quickly.

Therefore, it can be argued that social contacts that are established finally yields in assimilation. The pace of assimilation purely depends upon the nature of contacts. If the contacts are primary in nature than assimilation takes place naturally and more quickly. Likewise, if the contacts are secondary or indirect or superficial then the result is accommodation and not assimilation.

11.9 Obstacles and Aids to Assimilation

Like integration, assimilation is also complex process. There are certain factors that smoothens the assimilation process and others which blocks it. The assimilation rate is dependent upon whether the facilitating or retarding factor predominates. The factors that block assimilation process are isolating conditions of life, attitude of superiority on the part of the dominant group, excessive physiological, cultural, and social differences between the groups and discrimination of the minority by the majority groups.

According to Gillin and Gillin, factors that encourage assimilation are toleration, equal economic opportunity, sympathetic attitude on the part of dominant group towards the minority, exposure to dominant culture, similarities between the culture of minority and dominant group and amalgamation or inter-marriage among the minority and dominant groups. On the other hand, the factors affecting assimilation are isolating, conditions of life, attitudes of superiority on the part of superior groups, excessive psychological, cultural, and social differences between the groups and persecution of the minority groups by the majority groups.

MacIver has given the list of factors which facilitates and obstructs the process of assimilation. They are as follows:

i. The level of development of the host society

The immigrant's reception in the new land is dependent largely on the existing condition of the host society at the time of their entry. For example in America before 1880s all kinds of migrants with diverse skills and potentials were welcomed and accepted in developing the new land and enhancing the growth of industries. Those who migrated to America after 1880s were not accepted in the similar manner. Those who moved to America after 1933 were seen as economic threat to the natives of America.

ii. Level of occupational skills

The migrant with working skills and capacities that is in demand in the new country has better advantage. For example, the worker with industrial skills is accepted more easily in industrial countries and the person with better agricultural skills has more advantage of being easily accepted in the agrarian economy countries.

iii. The numbers involved

It has been noted that the nature of a host group towards the immigrant group tends to be tolerant until the number of immigrants is less in number. For example, a single Indian or Japanese family in a community may be highly respected if the individuals are personally acceptable. If their number increases then the situation may not be the same. The larger proportion of new immigrants results in greater resistance of the host group for integration. Morena in his book titled "Who Shall Survive" has clearly highlighted that the increase in resentment in some cases have been due to the increase in number.

iv. Physical Differences

The difference in physical appearance, facial profile, complexion, skin colour etc. may also affect the process of assimilation. Physical features affect assimilation because one may set aside one's culture, but skin or other physical attributes are clearly visible without even mentioning it. The discrimination of blacks by whites was found across the world. However, the adjustment problems are much easier for groups whose physical appearances are similar to the people of the host land. It may also be noted that physical features alone do not produce hostility between people and groups like in the case of Southeast Asia or Latin America, but other factors operate to produce group antagonism, physical attributes becomes relative to inferiority and undesirability.

v. Cultural differences

The main constituents of culture are religion and language. If the immigrants have same religion or language to that of the people of the new land, then the process of assimilation is easier. In America the English-speaking immigrants do not find it tough to integrate to that society. However, for a non-English speaking person or group the assimilative process becomes challenging. Customs and beliefs are other cultural factors which helps are hinder the assimilation.

vi. The role of semi-community

At times the immigrant group that comes in great number develop their own colonies and practice their own native culture instead of participating in the

culture of the new land. Such semi-communities play an important role in the assimilative process. It helps the new immigrants of the same semi-community to easily settle down and adjust in the new land. At the same time such group is viewed by majority or the people of the host community as alien and distasteful.

Apart from these factors MacIver has also pointed out that prejudice may also obstruct assimilation. If the dominant group prejudges those groups set apart neither the member of that group or the dominant group as a whole can assimilate easily. Prejudice may also hinder the assimilation of the constituent elements of the society. Religious groups often allow the social distance created by prejudice to maintain their separateness. Prejudice may be the result of distasteful experience, fear of losing superior status, fright for economic loss or form of collective phobia.

Assimilation may be considered as a matter of degree. In big and complex societies complete assimilation is theoretical or hypothetical rather than realistic in nature. The minority or the assimilating groups not only contributes to the culture of the dominant or host group but also retains its cultural practices. Consequently, cultural pluralism emerges which implies incomplete assimilation. Should the minority or the immigrant be forced to assimilate with the majority becomes a polemic question. Some argues that it is essential for every individual to share some common ideals and values to participate in the sentiment common to the whole nation. There are also others who views that existence of minority cultural groups produces a richer culture. They believe in cultural pluralism and also uphold that cultural pluralism can solve the problem of prejudice. For instance, India has a rich cultural heritage because of the long-established tradition of cultural pluralism. However, it should also be kept in mind that certain incidents like that of Ayodhya of recent times are seemingly posing a threat to multi- cultural and plural Indian society.

11.10 Problems of Migration

The process of migration is intrinsically conflictual in nature. Generally, migration occurs within and across nations mostly for employment opportunities, higher life

chances, for better income and livelihood. At the same time migration also results in conflicts between the local and the outsider, among ethnic or religious groups. At times people are compelled to migration due to factors like government's decision for land acquisition, domination of territory by outsiders or due to environmental problems. Although migration takes place mostly for economic reasons the consequences of migration may lead to social and political conflict. The migrants may take up the jobs which the locals do not want to perform, they may bring in new skills and technology, take up the waste lands and make them more productive and may also capture the job market and make the locals unemployed. Migrants may also over crowd the place of destination, speak languages and practice socio-cultural or religious beliefs that are alien or offensive to the actual inhabitants of the land. Migrants may also encroach lands and properties. As such the migrants may be viewed as xenophobic, racist, and communal. All these activities of the migrants may result in conflict between them and the locals. The south Asian experience of migration has witnessed that while analyzing migration it is not only the economic determinants and consequences that has to be considered but the socio-cultural and political forces which can create coercion and conflict in sending and receiving areas are also to be noted (Weiner 2004: 170).

Migration brings together people of different groups into contact and creates the problem of assimilation. The problems of assimilation can be seen through the presence of ethnic ghettos, people who are entrapped between the conflicting values of two communities or culture and higher degree of deviant behaviour among the migrants.

Migration often results in personal and social disorganisation when people have to live their places and settle in new areas. Therefore, in many cases migrants are found to be more prone to delinquent characteristics, mental sickness, adult crime, prostitution, divorce, and other social problems. Although migration does bring different people with various skills, beliefs, customs, and technology into contact with one another and foster positive influence. However, at times negative consequences arise out of such interactions. For instance, the destruction caused by the Mongols while entering the Europe (Denisoff and Wahrman 1975).

Migration at times may also be responsible for resource scarcity which gradually becomes the prime cause for political issue and conflict. Migration can also surface as an essential factor for social construction of identity and source of social conflict

(Weiner 2004). In Assam, the major conflict is associated with migration and migrants. Due to the migration induced population growth there are cases of lack of employment opportunities and the subsequent environmental degradation. As such migration can become an issue of human and environmental security (Ketkar 2005).

11.11 Conclusion

In present day India one of the major issues is the demographic changes due to migration. Due to migration and invasions the northeastern states of India have more than 500 ethnic communities. India in 20th century India under the British rule massive scale of migration took place in Assam, North Bengal, and Tripura. This trend continued even after the independence. Again in 1971, large number of people migrated to West Bengal and northeast India from the then East Bengal and present-day Bangladesh, due to the Indo-Pak war. These incidents led to the anti-migration movement in Assam.

The effect of migration can be clearly observed in Tripura which had a tribal majority in 20th century. Now the tribals have become minority in their own homeland. This has resulted in the emergence of social movements like ULFA, Bodo, Karbi and Dimasa movements.

Although the Indians are dominating the global job market scenario in one hand, on the other hand there is a brain drain from the country. The government has failed to tap or capture the potential of those migrating skilled labour force for the welfare and development of one's own nation. The brain drain has escalated more after the Indians have excelled in software technology. The government has been trying to stop the colossal loss of brainpower. However, the Indian skilled labour force is bought in heft prices by developed nations like USA, UK, Canada or Australia.

The massive out migration of skilled labour force has negative affected the labour sending countries. Such migration will surely have an adverse effect on the national labour force, production activities and generation of better national income (Majumdar 2013). According to Weiner (2004: 164) migration to a certain extent

is responsible for the rise of social urban problems like squatters of settlement, high rates of unemployment, soaring level of pollution of different types, sanitation problems, scarcity of drinking water, growing cases of disease, malnutrition and infant mortality, low literacy rate and high rate of child labour.

11.12 Summary

Out of the three demographic processes (birth, death, and migration), the most significant is the human migration in sociology. Migration is one of the important factors for demographic change along with fertility and mortality. But, migration is not a biological variable unlike fertility and mortality, but a product of social, cultural, economic and political, or physical circumstances.

Migration refers to the movement of people from one location to another. It is a way to move from one place to another in order to live and work. Movement of people from their house to another city, state, or country for a job, shelter or some other reasons is called migration. Migration from rural to urban areas has increased in the past few years in India.

Integration occurs in the public and private, realms across generation and at the individual, family, community, and national levels. Integration is the act of bringing together smaller components into a single system that functions as one. These links usually are established between the components of the process and central layers of each system to promote the free flow of a data across systems. How does the integration come into existence?

i) The act/process of uniting different things

ii) The practice of uniting people for different races in an attempt to give people equal rights.

In sociology, the concept of social integration refers to the ways that different groups come together to form a whole in society. It might refer to cases when minority groups become part of mainstream society or when groups of individuals come together to make a cohesive whole.

National integration is the bond and togetherness between people regardless of their caste, creed, religion, or gender. It is the feeling of oneness, brotherhood, and

social unity under communities and society in a country. National integration helps keep the country unified and strong from within despite the diversities. So, the importance of national integration can be from the fact that the nation which remains integrated. It will always progress on the track and development and integrity.

11.13 Questions

Answer the following questions in your own words

G-A (5 Marks each)

i. What is migration?

ii. What is integration?

iii. Briefly explain the different modes of integration.

iv. What do you mean by the term assimilation?

v. What is the major objective of integration?

vi. Highlight the problems of integration.

G-B (10 Marks each)

vii. Write a note on the problems of integration.

viii. Discuss the various stages involved in assimilation.

ix. Examine the problems of migration.

x. Elaborate the factors that assist and obstruct the assimilation.

11.14 Suggested Readings

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Module VI
Population, Development and Environment

Unit 12 ❑ Population growth, Environment and Sustainable Development: The Inter-relationship

Structure

12.1 Objectives

The objective of the unit is to acquaint the students with the interrelationship between environment and development as well as between population and environment.

The objective is to show how both the process of development and the population growth affect the environment adversely. Learners will get the idea how adversely they are affecting the environment and the policy measures adopted in this behalf.

12.2 Introduction

Idea of sustainable development has become increasingly popular in contemporary world. It has become a buzzword being used in too many contexts today. Sustainable development is the meeting of needs and aspirations of the present without compromising the ability of future generations to meet their own needs. In view of the environmental degradation and population growth the concept has earned greater importance for last few decades. In fact, growth of population in the world is unprecedented in the human history, particularly in the developing nations. Rapidly growing population in developing countries is likely to put great strain on the resources and natural reserves of the world. Hence sustainable development would balance the needs of society, the economy and the environment.

12.3 Environment

By the term 'environment' we mean the physical, chemical and biological surroundings in which an organism exists. Environment, therefore, at least initially, was the gift of nature. Prior to 20th century there was no major evidence of human influence on environment. Environmental degradation up to this period was mainly due to natural disaster. However, this does not mean that up to that period natural resources are neither use nor wasted by men. But what happened was that these were not used beyond their regenerating capacity. Therefore, what was used was regenerated. But once the population of this planet exceeded the carrying capacity of the mother earth, the situation started changing. The nature could not get to compensate its resources loss due to over-consumption by the humans. In course of time these led to serious environmental degradation behind which there lies the need and greed of humankind.

12.4 Development and Environment Degradation

Human activity in general and the process of rapid industrialization in particular have been causing massive environmental damage all over the world. Most of the

environmental and ecological damage is irreversible leading to widespread concerns among the environmentalists regarding the sustainability of the present rates of economic growth. Some even question the blind pursuit of such growth. Although quantitative and monetary estimation of environmental degradation is not possible, some estimates for various countries have been attempted in recent years. As far as India is concerned, the latest estimate is for the year 2009 presented in World Bank's report India: Diagnostic Assessment of Select Environmental Challenges released in June 2013. This report estimates the total cost of environmental degradation in India at about 3.75 trillion annually, equivalent to 5.7 per cent of GDP in 2009. In addition to this, India has experienced some damages from natural disasters (floods, landslides, tropical cyclones, and storms). These are not included in the above figures. According to the Report, over the period 1953-2009 damages from natural disasters stood at Rs. 150 billion a year on average and took the form of loss of life and injury, losses to livestock and crops and losses to property and infrastructure. In this context, the following comments by Dreze and Sen on environmental degradation in India are also pertinent, "In India, we have huge reasons to be worried about our treatment of the environment and its implication for the lives people can lead in this increasingly polluted and environmentally devastated country. Indeed, the acceleration of economic growth in recent decades has coincided with unprecedented environmental plunder. Groundwater has been extracted with abandon, leading to sharp fall in water tables in many areas. Majestic rivers have been reduced to a trickle or to sewage drains. Mining activities (often illegal) have spread with few safeguards, destroying forest and displacing communities. Air pollution has risen so far that India is now rated as the most polluted among 132 countries for which comparable data are available. India's natural wealth is estimated to have shrunk by about 6 percent in value terms between 1990 and 2008. And all this might be no more than just a harbinger of things to come: many types of environmental damages are likely to accelerate in the near future, with, for instance, hundreds of dams being planned on the Ganges River and its tributaries alone."

12.5 Environmental Protection

During the last few decades, many experts have drawn attention to the close links between environment and development. The mad rush for industrial growth has, over

the years, led to environmental degradation on a large-scale accompanied by massive resource depletion. In their study The Limits to Growth published in 1972, D.H. Meadows, D.L. Meadows and R. Randers drew attention to the fact that there are a number of non-renewable resources whose present levels of consumption are such that the known reserves will be exhausted in not-so-distant future. Many later studies have also highlighted the danger of environmental degradation. Thus, the focus has now shifted to 'environmental protection'. According to the World Development Report (WDR) 1992, environmental problems can undermine the goals of development in two ways: "First, environmental quality—water that is safe and plentiful and air that is healthy—is itself part of the improvement in welfare that development attempts to bring. If the benefits from rising incomes are offset by the costs imposed on health and the quality of life by pollution, this cannot be called development. Second, environmental damage can undermine future productivity. Soils that are degraded, aquifers that are depleted, and ecosystems that are destroyed in the name of raising incomes today can jeopardise the prospects for earning income tomorrow." Therefore, environmental protection should form a part of any comprehensive programme of industrial development. In this context, the social scientists now emphasise the concept of sustainable development.

12.6 From Un-sustainable to Sustainable Development

Man is part of the nature, and he is bound to obey the laws of nature. He depends on his environment for food, water, air, space, and shelter. His intervention has made more significant changes in the natural environment for his developmental activities like agriculture, urbanization, industrialization mining, transportation, and technology. More developmental activities are adopted in order to increase the quality of life. For that he uses the available resources. The earth has a limited supply of resources and renewable resources. This is all to be managed in a scientific manner so that the generations to come can avail it. Hence developmental activities are to be taken with more care about the environment and its protection.

Over the past three decades the World Commission on Environment and Development (WCED) has come to understand the necessity of developing a linkage between meeting the needs of people for natural resources and conserving for protecting the natural resources and the environment. This linkage has been identified

and named as 'sustainable development'. The WCED's report in 1987 provided a commonly accepted definition for sustainable development that was reaffirmed at the Earth Summit in 1992.

Sustainable development is defined clearly in the Brundtland Report Our Common Future (1987) in the following words: "sustainable development seeks to meet the needs and aspirations of the present without compromising the ability of future generations to meet their own needs." Sustainable development must balance the needs of society, the economy, and the environment.

In the year 1992 the United Nations Conference on Environment and Development (UNCED) held at Rio de Janerio, recognized the pressing environment and development problems of the world. It produced a global program of action for sustainable development into the 21st century by adapting Agenda 21. According to the Agenda 21 the countries should adopt national strategies for sustainable development, which should provide a balance in the needs of plans and policies of society, the economy, and the environment of the country.

The first principle of Rio declaration is the sustainable development. The Rio declaration states that, "human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with the nature. Every generation should leave air, water and soil resources without any pollution as pure as it came to the Earth".

The three important components of sustainable development are:

i. Economic development like industrial development getting job opportunities utilisation of natural resources for developing the quality of life.

ii. Community development providing food shelter cloth education and others essential for the human beings.

iii. Environmental protection providing clean air water and environment for the present and future generations and utilisation of resources in a sustainable manner.

12.7 Sustainable Development—The Core Idea

The term, "Sustainable development" was coined by the Brundtland Commission which observes "living standards that go beyond the basic minimum sustainable only if consumption standards everywhere have regard for long-term sustainability".

Sustainable development is defined as balancing the fulfillment of human needs with the protection of the natural environment so that these needs can be met not only in the present, but in the indefinite future. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment. The field of sustainable development is conceptually divided into four general dimensions: social, economic, environmental, and institutional. The first three dimensions address key principles of sustainability, while the final dimension addresses key institutional policy and capacity issues.

Thus sustainability, is a process which ensures the development of all aspects of human life affecting sustenance. It means resolving the conflict between the various competing goals, and involves the simultaneous pursuit of economic prosperity, environmental quality and social equity famously known as three dimensions with is the resultant vector being technology. Hence it is a continually evolving process. The journey (the process of achieving sustainability) is of course vitally important, but only as a means of getting to the destination (the desired future state). However, the 'destination' of sustainability is not a fixed place in the normal sense that we understand destination. Instead, it is a set of characteristics of a future society.

Sustainable development is an eclectic concept, as a wide array of views fall under its umbrella. Different conceptions also reveal a strong tension between eco-centrism and anthropocentrism. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. As early as the 1970s 'sustainability' was employed to describe an economy in equilibrium with basic ecological support systems. Ecologists have pointed to the limits of growth and presented the alternative of a steady state economy in order to address environmental concerns. The field of sustainable development can be conceptually broken into three constituent parts: environmental sustainability, economic sustainability, and sociopolitical sustainability. Sustainable development cannot ignore any of the three. If we ignore the social dimension, the development process may be viable, if we ignore the environmental dimension, the development process may be equitable and if we ignore the economic dimension, the development process may be bearable, but not sustainable. In other words, the search for equity neglects environmental aspects, and the search for viability neglects social dimension and search for bear ability ignores economic efficiency. Thus, sustainable development process is that trajectory which is the synergy of efficiency, equity and acceptability.

12.8 Sustainable Development—Environment Linkage

Sustainable development integrates the imperatives of developmentalism and environmentalism. It highlights the long-term doomsday scenario and puts emphasis on economic-ecological integration and regional scale. It consists of all the objectives, (Efficiency, growth, production, more consumption, more quantity etc.) of narrow economic system. Ecological sustainability requires economic efficiency. But an efficient use of resources need not be a sustainable one. It shows a compassionate concern for the posterity and for the world as a whole. It contends that environment and growth are not contradictory or incompatible. Healthy environment and sound resource base are rather prerequisites for sustainable development which is defined as the progress that seeks to meet the needs and aspirations of the present without compromising the ability of future generations to meet their requirements. This reconciles the need for conservation with the need for development at one stroke. Sustainable development is based on a broader economic system which fulfils intergenerational equity criteria. Its objectives are future quality, protection, conservation etc. The environmental and natural resources directly affect the standard of living or quality of life of people. The welfare of the individual is ultimately dependent upon the viability of life supporting system. An apparently efficient development path may not be sustainable.

Sustainable development reconciles the need for environmental conservation and developmental thrust at one stroke. It is based upon a broader economic system, which includes all activities that affect the environment and energy base. An analysis of the capability of the economic system for resolving economic problems of allocating scarce resources to different and competing ends must include both the flow of natural and environmental resources into the production process and the flow of wastes from the production and consumption activities back to the environment.

Sustainability necessitates the maintenance of the level of well-being so that it improves, but at least never allows a decline through time. Trends continued cannot be simply assumed. The implications for valuation are quite different, necessarily more stringent than what is implied by consideration of efficiency alone. The broad economic system should emphasise on green growth and green GNP.

Economic development adversely affects the environment, which undermines the health and reduces the quality of life. It eventually slows down the process of economic development. On the contrary sustainable development improves and conserves the environment, which encourages the development process. Development with sound environment and ecological balance improves the health and quality of life which eventually maintains the sustainable development.

Sustainable development can be achieved only if the environment is conserved and improved. Moreover, a development path is sustainable if and only if the stock of overall capital assets remains constant or rises over time. This implies keeping the stock of natural capital at least constant. More strictly, the requirement is for non-negative change in the stock of natural resources and environmental quality. In basic terms, the environment should not be degraded further but improvements would be welcome. The argument quite simply is that the resource base of a country and the quality of its air, water, and land represents a common heritage for all generations. To destroy that endowment in the pursuit of short-term economic gains compromises the gains of future generations and is thus undesirable. Therefore, government must incorporate some form of environmental accounting into its policy decisions. This requires that, the preservation or loss of valuable environmental resources should be factored into estimates of economic growth and human well-being. Alternatively, policymakers may set a goal of no net loss of environmental assets. In other words, if an environmental resource is damaged or depleted in one area, a resource of equal or greater value should be regenerated elsewhere.

12.9 Population—Environment Linkage

Much of the concern over environmental issues arises from the fear that we may reach a limit to the number of people whose needs cannot be met by the earth's finite resources. Some experts have however argued that this fear is unfounded as technological innovations and progress can fulfill the needs of the growing population. For instance, during the 1950s and 1960s, it was widely believed that the developing countries - particularly China, India, and Indonesia - would not be able to feed their rapidly growing populations. However, thanks to introduction of high yielding varieties in agriculture, the doomsday scenario of famines and starvations did not

materialise in these overpopulated, developing countries. In the 1960s and 1970s, the Club of Rome and many other groups forecast that the Earth would rapidly run out of key natural resources. However, this has not happened so far as changes in technology and preferences have allowed the substitution of new resources in place of the existing ones. Nevertheless, all social scientists and environmentalists agree that the rate at which environmental degradation is taking place in the present carries a serious risk and jeopardises the ability of the present and future generations to meet their own needs. A slowing down of population growth rates would help in easing the intensification of many environmental problems.

12.10 Burden of Population on Environment

During the last fifty years, the world's population increased by more than 3.5 billion and 85 per cent of this increase was in the developing and transition economies. The number of people living in fragile rural areas in developing countries doubled posing a serious threat to the rural environment. There was a sharp increase in the urban population of these countries as well because of natural increase of population as a result of excess of births over deaths on the one hand, and migration from rural areas the other hand. Both, pull factors and push factors have operated together to swell the flow of people from rural areas to urban areas. The pull factors include the promise of better employment opportunities in urban areas, better income, better education, and health facilities, and in general a better lifestyle. The push factors include low levels of agricultural productivity in rural areas, widespread open and disguised unemployment, and wide disparity between urban and rural levels of income. As a result of all these mutually dependent and mutually reinforcing factors, the growth of population in urban areas has increased considerably putting severe pressure on urban facilities and resulting in environmental degradation in the form of water pollution, air pollution, noise pollution, increased accumulation of solid wastes, garbage, polythene bags, chemicals, toxic elements, etc., in urban areas. According to World Development Report 2003, in the next 30 to 50 years, the world population is expected to increase by 2 billion to 3 billion and this increase will almost be exclusively (97 per cent) in developing and transition economies. Moreover, this entire increase is expected to be in urban areas. The Report estimates that as

many as 2 billion people will live in two areas that are difficult to manage: fragile rural areas and mega cities.

12.11 Rural Population and Environment

In overpopulated developing countries, there is a large rural population living in extreme poverty and destitution. This 'pressure' of rural population has led to more and more conversion of land to agricultural uses. This extensive cultivation has encroached upon the forest lands as large areas have been cleared for carrying on agriculture. Land-hungry farmers have even resorted to cultivating unsuitable areas-steeply sloped, erosion prone hillsides, arid and semi-arid land. Not only this, more and more intensive use of the existing agricultural land is being undertaken to meet the requirements of the increasing rural population. In many cases, farming has been intensified through shorter fallow periods rather than through the use of better inputs or techniques because of the poverty of the farmers. The 'shortening' of the fallow period lowers fertility as the soil does not get enough time to regenerate itself. It also leads to soil degradation. In those cases where the farmers have resorted to increased use of new agricultural techniques adoption of better seeds, fertilisers, pesticides, etc., agricultural production and productivity has undoubtedly increased. However, there are limitations of this technique as overexploitation of land and excessive use of fertilizers, pesticides lead to soil degradation and deterioration in the quality of land. It is widely reported that soil erosion, salinisation, compaction, and other forms of soil degradation affect 30 per cent of the world's irrigated lands, 40 per cent of rain fed agricultural lands, and 70 per cent of range lands. Cumulative global productivity loss due to land degradation over three decades has been estimated at 12 per cent of total production from irrigated land, rain fed cropland, and rangeland. This yields an average annual rate of productivity loss of 0.4 per cent." Since the 1950s, as much as 2 million hectares of land has been degraded worldwide.

Along with soil degradation, deforestation is proceeding at a fast pace. One-fifth of all tropical forests have been cleared since 1960. According to Food and Agriculture Organization of the United Nations (FAO), deforestation has been concentrated in the developing world, which lost nearly 200 million hectares between

1980 and 1995. One of the important reasons of this rapid deforestation, as stated above, is the expansion of subsistence farming as increasing population has forced man to encroach upon forests in a bid to increase area under agricultural cultivation.

12.12 Urban Population and Environment

Urban living poses environmental hazards, which affect the current population (especially poor people) through immediate, local impacts on health and safety. It also causes environmental degradation, with longer term, wider area and intergenerational consequences. As the population of urban areas has swelled over the years, an increasing number of poor people have been compelled to live in slums which are plagued by problems of overcrowding, sub-standard housing, poor access to safe water and sanitation and deplorable sewage disposal systems. The drainage facilities in slums are inadequate to deal with the increased strains on the system. The open drains often serve as depositors for road sweepings and human wastes. In rainy season water overflows and spreads into streets presenting a dingy view, promoting unhygienic conditions, and causing outbreak of numerous infectious diseases. A large number of families living in slums depend on public water stand posts and often more than 100 families use one tap. Heavy rush for water creates tension and often results in quarrels. Generally, only 5 to 10 per cent of the population in slums has private lavatory facilities either on their own or in common with others. Often more than one-third of the population of the slums uses public latrines. Approximately, 150 to 200 persons use one public lavatory. Consequently, people must stand in queue, sometimes, for more than half an hour to avail of lavatory facilities. Moreover, most of these latrines are in extremely dilapidated condition. Because of these factors, many slum dwellers are forced to defecate in the open or anywhere near their basti. Their excreta cause foul odour, uncleanliness and hence flies, mosquitoes, and diseases such as dysentery and cholera. All these factors lead to high rates of infant mortality.

According to *Human Development Report* 2003, an estimated one-third of the developing world's urban population lives in slums. The position is particularly bad in South-Central Asia and Sub-Saharan Africa. In 2001, more than 70 per cent of the urban population in Sub-Saharan Africa lived in slums.

Box-1: Population and Environment Linkage

- ❖ During the last 50 years, world population increased by more than 3.5 billion and 80 percent of this increase has been in the developing countries.
- ❖ In developing countries, the number of people in rural areas doubled posing a serious threat to rural environment.
- ❖ The growth of population in urban areas has been putting severe pressure on urban facilities and has resulted in environmental degradation in the form of water pollution, air pollution, noise pollution, increased accumulation of solid waste, garbage, polythene bags, chemicals, toxic elements etc.
- ❖ Over exploitation of land and excessive use of pesticides has led to soil degradation and deterioration in the quality of land. It is widely reported that soil erosion, salinisation, compaction and other forms of soil degradation have affected 30 percent of the world's irrigated lands and 40 percent of rainfed agricultural lands.
- ❖ Along with soil degradation, deforestation is proceeding at a fast pace.
- ❖ One-third of the developing world's population lives in slums. Problems of slum dwellers worsen their living in cities and make them more vulnerable.
- ❖ The main problems faced by slum dwellers in urban areas are as follows:
  - Sanitation
  - Drainage
  - Solid waste management
  - Air-pollution
  - Water supply contamination

World Development Report 2003 classifies cities into four categories—low-income cities, lower-middle income cities, upper-middle income cities and high income cities. Particularly worrisome are the environmental problems plaguing the low-income and lower-middle income cities. The WDR specifically points out the following problems:

i. **Waters supply service**. In low-income cities, the coverage of water supply service is low, there is high bacteria contamination, and there is high risk of

food contamination and infectious diseases due to inadequate quantity of water supply for hygiene. In the case of lower-middle income cities, poor residents and informal neighbourhoods have low access to water supply service.

ii. **Sanitation**. In low-income cities, there is very low coverage due to low ratio of public toilets to residents resulting in open defecation in some neighbourhoods. As a result, there is a high risk of diarrheal diseases. The lower-middle income cities have somewhat better coverage of latrines and public toilets, but they are poorly maintained and there is low sewerage coverage.

iii. **Drainage**. Storm drains in low-income cities are very inadequate and whatever drains are there, are poorly maintained. This results in frequent flooding, creating high risk of water-related disease vectors (mosquitoes). Situation in lower-middle income cities is somewhat better.

iv. **Water resources**. In low-income cities, there is mixed sewerage and storm water run-off to water bodies causing bacterial pollution and silting. In lower-middle income cities, there is risk of groundwater contamination from poorly maintained latrines and untreated sewage. The situation in upper-middle income cities is also a cause of concern as private wells are drawing down groundwater. Moreover, industrial, and municipal discharge results in severe pollution.

v. **Solid waste management.** There is little organised collection of solid waste in low-income cities and frequently open dumping or burning of mixed wastes is resorted to. All these result in high exposure to disease vectors (rats, flies, etc.). In lower-middle income cities, there is moderate coverage of collection services. However, there is little separation of hazardous waste and there are many uncontrolled landfills.

vi. **Air pollution**. In low-income cities, there is indoor and ambient air pollution from low quality fuels for household uses and power generation. In all the other three types of cities, there is ambient air pollution from industrial and vehicular emissions.

vii. **Land management.** Due to large-scale migration from rural areas and fast increasing population of urban areas, there is a situation of chaos in land

management particularly in low-income and lower-middle income cities. In low-income cities, there is uncontrolled land development due to intense pressure from squatter settlements on open sites. In lower-middle income cities, there are ineffective or inappropriate land-use controls. These push new settlements toward urban periphery and there is continued high population growth.

From the above discussion, it is clear that many residents in cities at low levels of development face environment risk. In low-income cities, less than half of the households are connected to water and sewerage, and per capita water consumption is half that off cities with lower-middle income rankings. Moreover, less than one-third of solid waste in the poorest cities is disposed of properly. Partly reflecting environmental risks, the average mortality of children under five in the poorest cities is more than twice than that in the next city-income category, and 20 times than those in richest cities.

12.13 Environment Protection—A Necessity

Rapid environmental degradation that has been taking place all over the world in recent decades has alarmed social scientists and environmentalists alike. Most of the economists are now convinced that unless strong steps are taken to preserve environment, the future is sure to spell havoc. The danger in developing countries is that communities may inadvertently, because of ignorance or economic necessity, destroy or exhaust those very resources on which they depend for survival. Rising pressures on environmental resources in developing countries can have severe consequences for self-sufficiency, income distribution, and future growth potential in the developing world.

Damage to the environment has three potential costs to present and future human welfare: (1) it harms human health, (2) it reduces economic productivity, and (3) it leads to loss of 'amenities'—a term that describes the many other ways in which people benefit from the existence of an unspoiled environment.

i. **Environmental degradation harms human health.** As noted by World Development Report 1992, human welfare is reduced by ill health and

premature mortality caused by degradation of air and water quality and by other environmental risks. Pollutants can cause health problems through direct exposure or indirectly through changes in the physical environment-the effects of which range from increased solar radiation to lower nutrition.

ii. **Environmental degradation reduces economic.** Impaired health may lower human productivity, and environmental degradation reduces the productivity of many resources used directly by people. Water pollution damages fisheries, and water logging and salinisation of the soil lowers crop yields.

iii. **Environmental degradation leads to loss of amenities.** Amenities include values that range from those associated with recreation to those associated with deeply held spiritual views about the intrinsic worth of the natural world. Amenities are hard to measure than costs to health and productivity but must be valued just as highly. There is absolutely no doubt that a clear vista or a clean and quiet neighbourhood adds to the quality of life. Environmental assets are often valued even by people who never enjoy them directly but who cherish the thought that they exist and the prospect that future generations will enjoy them too.

The above clearly brings out the necessity of protecting environment. Accordingly, most of the developing economists are now veering around to the view that environment costs associated with various economic activities should form a part of policy initiatives. As correctly pointed out by Todaro and Smith, damage to soil, water supplies, and forests resulting from unsustainable methods of production can greatly reduce long-term national productivity but will have a positive impact on current GNP figures. Therefore, it is very important that the long-term implications of environmental quality be considered in policy analysis. In fact, experts now emphasise the concept of sustainable development. Sustainable development can be achieved by keeping the stock of natural capital at least constant. As stated earlier in this chapter, the resource base of a country and the quality of its air, water, and land represents a common heritage for all generations. To destroy that endowment in the pursuit of short-term economic gains compromises the gains of future generations and is thus undesirable.

12.14 Conclusion

Environment is defined as the physical, chemical, and biological surroundings in which an organism exists. It has a clear linkage with the process of development as well as population growth. The mad rush for industrial growth has, over the years, led to environmental degradation on a large-scale accompanied by massive resource depletion. This has led to the policy makers to widen the horizon still further—from sustainable economic development to sustainable human development. The latter would imply that future generations should be afforded at least the same capacity for human well-being as the present generation. This means that we should ensure that the ecological and environmental limits are not violated—especially because we do not know the long-term implications disturbing many natural systems.

During the last fifty years, the world's population increased by more than 3.5 billion posing a serious threat to the environment, particularly in the developing nations. Rising pressures on environmental resources in developing countries can have severe consequences for self-sufficiency, income distribution, and future growth potential. So, protection and conservation of environment is of dire need for ensuring sustainable world for the future generation.

12.15 Summary

A population is the number of living people that live together in the same place, usually population refers to the number of members in a certain area. Demography is the study of a population, the total number of people or organisations in a given area (the whole number of people or inhabitants in a country or region, the total of individuals occupying an area or making up a whole). Understanding how population characteristics such as size, special distribution, age structure, or the birth and death rate change over time can help scientists or governments make decisions.

Sociologists focus on the socio-cultural factors that influence population rates and trends. They study fertility, mortality, and migration. These variables are profoundly affected by the norms, values, practices and social patterns of a social. The population affects our chances of finding a job and a spouse. Rapid population

growth is likely to reduce per-capita income growth and well being which tends to increase poverty. More people means an increased demand for food, water, housing, energy, healthcare, transportation, and more.

From the time of Malthus onwards, economist, demographers, and other social scientists have been debating whether and how fertility and rapid population growth affect economic outcomes and vice versa. Since the earliest times humans have sought to understand the relationship between population dynamics and the environment. The environted directly affects health status and plays a major role in quality of life, years of healthy life live, and health disparities. Poor air quality is linked to premature death, cancer, and long-term damage to respiratory and cardiovascular systems.

Five important global scale environmental indicators are biological diversity, food production, average global surface temperature and atmospheric co-concentrations, human population and resources depletion.

More people require more resources, which means that as the population increases, the earth's resources deplete more rapidly. As a result, loss of biodiversity is seen as humans strip the earth for resources to accommodate rising population numbers. The impact of so many humans on the environment takes two major forms, (i) consumption of resources, such as land, food, water, air, fossil fuels, minerals, etc, (ii) waste products as a result of consumption such as air and water pollutants, toxic materials and green house gases.

12.16 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. What do we mean by environment?
ii. What is the burden of population on environment?
iii. How does unban population impact the environment?
iv. Why is environment protection necessary? Discuss briefly.
v. Discuss the population-environment linkage.

G-B (10 Marks each)

vi. Write a note on conventional process of development and environmental degradation.

vii. Write a note on rural population and environment.

viii. Elucidate the linkage between sustainable development and the environment.

ix. Why did the idea of Sustainable Development crop up? Discuss its core concept.

x. Discuss the aspects of urban population and environment.

12.17 Suggested Readings

i. Agrawal, A. N. (2010): "Indian Economy-Problems of Development and Planning", 36th Edition, New Age International (P) Ltd.

ii. Anandan, P. and R. Kumaravelan (2009): "Environmental Science & Engineering", Scitech Pub (India) Pvt. Ltd.

iii. Das, K. (2009): Sustainable Development, Reference Press.

iv. Datt, G. and A. Mahajan (2013): "Datt & Sundaram Indian Economy", 69th Revised Edition, S. Chand & Company Pvt. Ltd.

v. Dreze, J. and A. Sen (2013): "An Uncertain Glory: India and Its Contradictions", Penguin.

vi. Puri, V. K. and S. K. Mishra (2014): "Indian Economy", 32nd Revised Edition, Himalaya Publishing House.

vii. Sarkhel, J., S. Selim and A. Bhukta (2017): "Economic Development: Institution, Theory and Policy", Book Syndicate (P) Ltd.

Unit 13 ❑ Human Development Index

Structure

13.1 Objectives

The objective of the unit is to acquaint the students with the interrelationship between environment and development as well as between population and environment. Learners will get the idea how adversely they are affecting the environment and the policy measures adopted in this behalf. Learners will also be familiar with the idea of human development and the construction of human development index with the help of three indicators thereof.

13.2 Introduction

Along with sustainable development the concept of human development has also been a much-talked issue for last few decades. Human development is the process

of enlarging people's choices. Human development paradigm embraces the entire society not just the economy. The political, cultural and social factors are given as much importance as the economic factors. According to the Human Development Index (HDI) has rightly incorporates three indicators: longevity, educational attainment and standard of living. The first two indicators are the social indicators and the last one is an economic indicator.

13.3 Human Development

In recent years the search for an alternative to GNP as a measure of economic development has led to computation of the Human Development Index (HDI). The United Nations Development Programme (UNDP) introduced the HDI in its first Human Development Report prepared under the able stewardship of Mahbub Ul Haqq and published in 1990. The measure has been enlarged and refined over the years and many related indices of Human Development like Gender-related Development Index (GDI), Gender Empowerment Measure (GEM), Gender Inequality Index (GII) Human Poverty Index (HPI) and Multidimensional Poverty Index (MPI) have been developed in subsequent Human Development Reports published annually by the UNDP.

Since its launch in 1990, the Human Development Report has defined human development as the process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living. Additional choices include political freedom, other guaranteed human rights and various ingredients of self-respect. These are among the essential choices the absence of which can block many other opportunities. Human development is thus a process of widening people's choices as well as raising the level of well-being achieved. Thus, as noted by Paul Streeten, the concept of human development put people back at center stage, after decades in which a maze of technical concept had obscured this fundamental vision.

According to Mahbub Ul Haqq, "the definite difference between the economic growth and the human development schools is that the first focuses exclusively on the expansion of only one choice- income- while the second embraces the enlargement of all human choices- whether economic, social, cultural or political." It is sometimes

suggested that the expansion of income can enlarge all other choices as well. This may happen but generally, does not on account of a variety of reasons. First, income may be unevenly distributed within a society. The choices of those people who have either no access to income or a very limited access are very much limited. Thus, economic growth does not trickle-down. Second, and more importantly the national priorities chosen by the society or its ruler and the political structure prevalent in the society may not allow the income expansion to enlarge human options. As emphasised by Mahbub Ul Haqq, 'use of income' by a society is just as important as generation of income itself as would be clear from the fact that income expansion leads to much less human satisfaction in a virtual political prison or cultural void, than in a more liberal political and economic environment. Accumulation of wealth may not be necessary for the fulfillment of several kinds of human choices. In fact, many choices do not require any wealth at all. For instance, a society does not have to be rich to afford democracy. A family does not have to be wealthy to respect the rights of each member. A nation does not have to be affluent to treat women and men equally. Valuable social and cultural traditions can be and are maintained at all levels of income.

There are many human choices that extend far beyond economic wellbeing. Knowledge, health, a clean physical environment, political freedom and simple pleasures of life are not dependent on income. Accumulation of wealth can expand people's choices in these areas, but this is not necessary. It is the use of wealth and not wealth itself that is decisive. Haq thus, rightly warns, "Unless societies recognise that their real wealth is their people, an excessive obsession with creating material wealth can obscured the goal of enriching human life."

13.4 Why Human Development?

According to Paul Streeten, human development is necessary on account of the following reasons:

i. Human development is the end while economic development is only a means to this end. The ultimate purpose of the entire exercise of development is to treat men, women and children-present and future generations-as ends, to improve the human condition to enlarge people's choices.

ii. Human Development is a means to higher productivity. A well-nourished, healthy, educated skilled, alert labour force is the most important productive asset. Thus, investments in nutrition, health services and education are justified on grounds of productivity.

iii. It helps in lowering the family size by slowing human reproduction. It is the experience of all developed countries that improvement in education levels particularly of girls, better health facilities and reduction in infant mortality rates leads to lowering of the birth rates. While improve education facilities make people aware of the benefits of a small family in terms of higher income level, better standards of living etc., reduction in infant mortality rates reduces the incentive of having large families as fewer child deaths are now feared.

iv. Human Development is good for physical environment. Deforestation, desertification, and soil erosion decline when poverty decline. How population growth and population density affect the environment is a subject of controversy. The conventional view is that they have a detrimental effect. However, Paul Streeten cites recent research to show that rapid population growth and high population density, particularly if combined with secure land rights, can be good for soil and forest conservation.

v. Human development and reduced poverty contribute to a healthy civil society, increased democracy, and greater social stability. Moreover, human development can help in reducing civil disturbances in a society and in increasing political stability.

The above discussion shows that human development paradigm embraces the entire society not just the economy. The political, cultural and social factors are given as much importance as the economic factors. What is more, a careful distinction is maintained between ends and means. While people are regarded as the end of development the means are not forgotten. In this context, the expansion of income becomes an essential means for expanding many human options. However, the character and distribution of economic growth are measured in terms of enriching the lives of people. People do not just remain the instruments for producing commodities but acquire the centre

stage. Production processes are not treated in an abstract vacuum but acquire 'human' context.

13.5 Essential Components of Human Development

According to Mahbub Ul Haqq there are four essential components in the human development paradigm: equity, sustainability, productivity, and empowerment.

i. Equity

If development is to enlarge people's choices people must enjoy equitable access to opportunities. Equity in access to opportunities demands a fundamental restructuring of power in many societies and changes along the following lines: (i) change in the distribution of productive assets especially through Land Reforms: (ii) major restructuring in the distribution of income through progressive fiscal policy, aimed at transferring income from the rich to the poor. It is the redistribution of income from rich to poor; (iii) overhauling of the credit system so that the credit requirements of the poor people are satisfactorily met; (iv) equalization of political opportunities through voting rights reforms, campaign finance reform and other actions aimed at limiting the excessive political power of a feudal minority; and (v) undertaking steps to remove social and legal barriers that limit the access of women or of certain minorities or ethnic minorities to some of the key economic and political opportunities.

ii. Sustainability

The next generation's right to enjoy the same well-being that we enjoy now makes sustainability an essential component of the human development paradigm. At times the concept of sustainability is confused with the renewal of natural resources which is just one aspect of sustainable development. As emphasised by Mahbub ul Haq "it is the sustainability of human opportunities that must lie at the centre of our concerns." This, in turn, requires sustaining all forms of capital-physical, human, financial and environmental. Sustainability is a matter of distributional equity- of sharing development opportunities between present and future generations and ensuring intra-generational and intergenerational equity in access to opportunities. However,

as cautioned by Haq, "sustainability does not mean sustaining present levels of poverty and human deprivation. If the present is miserable and unacceptable to the majority of the world's people, it must be changed before it is sustained. In other words what must be sustained are worthwhile life opportunities, not human deprivation". But sustainability also means that wide disparities in lifestyles within and between nations must be re-examined and efforts to be undertaken to reduce them. This is due to the reason that an unjust world is inherently unsustainable- both politically and economically. It may be environmentally unsustainable as well.

iii. Productivity

An essential part of the human development paradigm is productivity which requires investments in people and an enabling macroeconomic environment for them to achieve their maximum potential. Economic development is therefore a subset of human development models- an essential part but not the entire structure. Many East Asian economies like Japan and the Republic of Korea have accelerated their growth through tremendous investments in human capital. In fact, most of the development literature has focused on the productivity of human in the world. Many recent models of development are based primarily on human capital. However, as correctly pointed out by Haq, this approach treats people only as a means of development and obscures the centrality of people as ultimate end of development. Therefore, it is better to treat productivity only as one part of the human development paradigm-with equal importance given to equity, sustainability, and empowerment.

iv. Empowerment

Human development paradigm envisages full empowerment of the people. Empowerment means that people are able to exercise choices of their own free will. It implies a political democracy in which people can influence decisions about their lives. It requires economic liberalism so that people are free from excessive economic controls and regulations. It means decentralization of power so that real governance is brought to the doorstep of every person. It means that all members of civil society, particularly non-governmental organisations, participate fully in making and implementing decisions. The empowerment of people requires action on various fronts: (i)

it requires investment in education and health of the people so that they can take advantage of market opportunities; (ii) it requires ensuring an enabling environment that gives everyone access to credit and productive asset so that the playing fields of life are more even; and (iii) it implies empowering both women and men so that they can compete on an equal footing.

13.6 The Human Development Index

The above discussion shows that the concern of developing economy in recent years has shifted from economic development to human development. For too long, the recurrent question was how much is a nation producing? Increasingly now the question that is being asked is, how are its people faring? The main reason for this shift in focus is the growing recognition that the real objective of development is to enlarge people's options. Income is only one of the options- and an extremely important one but it is not the total of human life. Education and literacy, health, physical environment, equality of opportunities to all people irrespective of sex, caste and creed, political freedom etc., may be just as important as income.

However, while human development is indeed the 'end' of all activity, its measurement is not an easy task. While economic growth has traditionally been measured in terms of national income, it is difficult to decide how human development is to be measured particularly in view of its various dimensions as pointed out earlier. The search for a comprehensive measure that could capture the various dimensions of human development leads to the definition and formulation of Human Development Index (HDI) by the United Nation Development Programme (UNDP) in Human Development Report (HDR) published in 1990. It is of course agreed that the concept of human development is much wider and richer than what can be caught in index or set of the indicators. However, such indexes are useful in focusing attention and simplifying problems. They have considerable political appeal. They have a stronger impact on the mind and draw public attention more powerfully than a long list of indicators combined with the qualitative discussion. As noted by Streeten, the strongest argument in favour of such indexes is that they show up the inadequacies of other indexes, such as GNP. They redirect our attention from one set of items to others- in the case of the HDI, to the social sectors: nutrition education and health.

HDI does not replace GNP but as considerably to an understanding of the real position of a society in many respects as would be clear from the following discussions.

i. Beside income the HDI measures education and health and is thus multidimensional rather than one dimensional;

ii. It focuses the attention of the policymakers on the ultimate objective of development not just the means;

iii. It is more meaningful as a national average than GNP because there are much greater extremes in income distribution than in the distribution of the life expectancy and literacy;

iv. Any upward movement in HDI can be regarded as an improvement;

v. Whereas high incomes for some can cause relative deprivation for others, this is not true for human development. If anything improving the health and education of anyone benefits the entire community;

vi. It shows that human development gaps between nations are more manageable than the ever-widening disparities in income. Since 1960 average life expectancy had increased by 16 years, adult literacy by 40 percent and nutritional levels by more than 40 percent and child mortality rates have been halved. The international gap in these indicators is closing while in the case of GNP per capita it is widening. While average income per head in the Southern countries of the world is 6 percent of that in the Northern countries of the world, life expectancy is 80 percent, literacy 60 percent and nutrition 85 percent;

vii. The HDI can be disaggregated by gender, ethnic group or geographical region and many other ways- to present relevant policy measures and the 'danger points' of explosion.

The principles that have guided the search for HDI are as follows:

i. First, the new index would measure the basic concept of human development to enlarge people's choices.

Those choices covered the desire to live long, to acquire knowledge, to have a comfortable standard of living, to be gainfully employed, to breathe clean air, to be free, to live in a community. Obviously, all these cannot be quantified or measured. The basic idea was to measure at least some more

choices besides income and to reflect them in a methodically sound composite index.

ii. **Second, to keep the index simple and manageable it was decided to include only a limited number of variables.**

For instance, HDR 2009 chose life expectancy at birth as an index of longevity, adult literacy rate (two-third weight) and combine primary, secondary and tertiary enrollment rates (one-third weight) as an index of knowledge, and GDP per capita as an index of access to a multiplicity of economic choices, in other words, a decent standard of living. HDR 2010 made important changes in these definitions.

iii. **Third, it was decided to construct a composite index rather than a plethora of indexes.**

However, this posed several problems. Unlike GDP, for which money serves as a 'common measuring rod', there was no such common currency for measuring socio-economic progress. Life expectancy is measured in years, adult literacy in percentage of adults, and real income in purchasing power parity (PPP) adjusted dollar. How to reduce these indicators to a common denominator? To tackle this question, it was decided to measure the actual progress in each indicator as relative distance from a desirable goal. The maximum and minimum observed values for each variable were reduced to a scale between 0 and 1: each country was at some point on the scale. As far as the question of weightage is concerned, it was agreed to assign equal weights to the three variables on the simple premise that all the choices were very important and that there was no a priori rationale for giving a higher weight to one choice rather than to another.

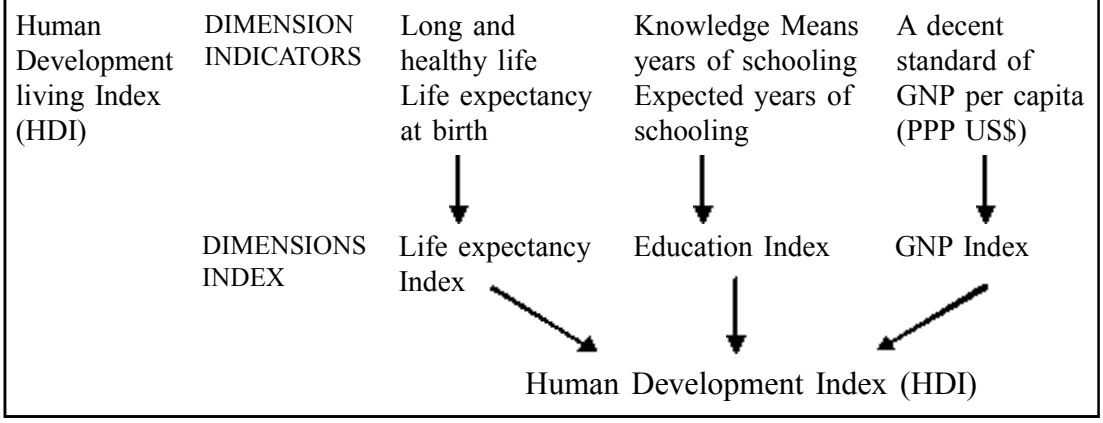
iv. **Fourth, it was decided to cover both economic and social choices in HDI.**

A mistake in the past had been to construct separate measure for economic progress (GNP) and for social progress (such as physical quality of life index, or PQLI). Such a formulation missed the synergy between social and economic progress. The truth of the matter is that economic growth increases the resources and options available for social progress, where as social progress creates a conducive environment for economic growth. Thus, both move hand-in-hand. The real GDP per capita or GNP per capita is economic indicator and like expectancy and education entertainment the social indicators in HDI.

13.7 Construction of Human Development Index

As stated above, HDI is a summary measure of Human Development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. Since 2010, HDI is being defined in HDR as the geometric mean of normalised indices measuring achievements in each dimension (prior to HDR 2010, simple arithmetic means of the three-dimension indices used to be taken).

Graphical presentation of calculating the Human Development Index (HDI)



In HDR 2010, the ability to enjoy a long and healthy life is defined in terms of life expectancy at birth which is the same as in earlier *Reports*. However, changes in definition of the 'knowledge dimension' and 'standard of living dimension' have been carried out. In the earlier *Reports,* GDP per capita in PPP dollars was used as a measure of standard of living while in HDR 2010 it has been replaced by GNP per capita in PPP dollars. This is due to the reason that in a globalised world, differences are often large between the income of a country's residents and its domestic production. While GDP represents the country's gross domestic production, GNP, in addition, captures the country's income receipts from abroad as well. As far as the knowledge dimension is concerned, mean years of schooling replaces literacy, and gross enrollment is recast as expected years of schooling- the years of schooling that a child can expect to receive given current enrollment rates. According to HDR 2010, mean years of schooling is estimated more frequently for more countries and can discriminate better among countries, while expected years of schooling is consistent with the reframing of this dimension in terms of years.

13.8 Creating the Dimension Indices

The first step is to create sub-indices for each dimension. Minimum and maximum values (goalposts) need to be set to transform the indicators into indices between 0 and 1. HDR 2013 takes the maximum values as the highest observed values in the time series (1980-2012). The minimum values can be appropriately conceived of as subsistence values. The life expectancy minimum is taken as 20 years (based on long run historical evidence). Education minimum (for both variables) is taken as zero as societies can subsist without formal education. Minimum income (Per capita gross national income) is taken as $100. The low value of income can be justified by the considerable amount of unmeasured subsistence and non-market production in economies close to the minimum, not captured in the official data. The goalposts taken in HDI 2013 are as follows:

Table-1: Goalposts for Calculating the HDI according to HDR 2013

Dimension	Observed Maximum	Minimum
Life expectancy	83.6 (Japan, 2012)	20.0
Means years of schooling	13.3 United States, 2010	0
Expected years of schooling	18.0 (Capped at)	0
Combined education index	0.971 (New Zealand, 2010)	0
Per Capita Income (PPP $)	87478 (Qatar, 2012)	100

Having defined the minimum and maximum values, the sub-indices are calculated as follows:

$$\text{Dimension Index} = \frac{\text{Actual Value-Minimum Value}}{\text{Maximum Value-Minimum Value}} \qquad \ldots\ldots\ldots (1)$$

For education, equation (1) is applied to each of the two sub-components, then a geometric mean of the resulting indices is created.

For calculating income index, log of income continues to be taken as before.

13.9 Calculating HDI from Dimension Indices

HDR 2011 defined HDI as the geometric mean of the three dimension indices:

$(I^{1/3}_{Life} \cdot I^{1/3}_{Education} \cdot I^{1/3}_{Income})$ ……..(2)

Prior to 2010, Simple Arithmetic mean of the dimension indices used to be taken. Some economics had criticized this methodology as linear aggregation formula implied perfect substitutability across dimensions. Use of geometric mean acknowledges the fact that there is imperfect substitutability among the 3-dimension indices. Moreover, as a basis for comparisons of achievement, this method is also more respectful of the intrinsic differences in the dimension than a simple average is.

13.10 Features of HDI

HDI is a composite of three indicators.

i. Longevity (or life expectancy at birth);

ii. Educational attainment; and

iii. Standard of living (or per capita income).

The first two indicators are the social indicators. Life expectancy, a much-desired objective of human beings, reflects the progress made in such fields as health, infant and child mortality and nutrition. The educational attainment is comprised of adult literacy, and a combined primary, secondary and tertiary enrolment ratio. The per capita income, an economic indicator, is used as a proxy measure for satisfaction derived from a bundle of basic goods and services. It is also assumed to reflect employment levels of people.

The HDI, unlike other indices which measure absolute levels, ranks countries in relation to each other. For this the current minimum value and the maximum desirable value in respect of each of the three elements of the index are taken note of. For example, for life expectancy the current value is 25 years, and the maximum desirable value is 85 years. In the case of the educational attainment the minimum and the maximum values are 0 per cent and 100 per cent. The index then takes the distance travelled (or progress made) from the minimum towards the maximum.

This is expressed in percentage terms. The same exercise is repeated in respect of the third component of income index. The distance travelled in each case has been used as the basis for combining the three indices. This gives a common denominator to rank countries on a uniform scale.

Another novel feature of the HDI is the weight assigned to income which tapers off sharply beyond the threshold income regarded as sufficient for human survival. This means that as the income goes beyond the cut-off point, it becomes increasingly less important, on the valid assumption that the rise in income beyond a certain point is subject to diminishing returns. Therefore, the other two indicators become more influential in determining the index.

13.11 Significance of HDI

The index is useful and meaningful, especially for the less-developed countries. It is much better than other non-income indices. It includes income which is the single most important factor in determining the well-being of the poor in the less developed countries. While it gives importance to income, it does not do so unduly. The decline in its weightage after a certain point, automatically raises the importance of social indicators. This incorporates the present concern of many nations with human development rather than with mere economic growth.

Equally importantly, the inclusion of social indicators, the HDI stresses the importance of the quality of life. This brings in the government expenditure which, with some restructuring, can be helpful in providing more resources for health and education.

The index, by highlighting the distance yet to be covered by the less-developed countries brings into limelight, factually and sharply, the wide disparities that exist in the levels of human development between them and the developed countries.

The index is of special importance as it has the quality of a dynamic index. With changes in the data in respect of its three components including changes in the minimum and the maximum values, the HDI will also change and thereby measures progress along the right lines. Thus, it becomes a measure of movement towards desired objectives.

13.12 HDI for India

In India, GNI(Gross National Income) per capita in 2012 was $3285, life expectancy at birth in 2012 was 65.8 years, mean years of schooling in 2012 were 4.4 years, and expected years of schooling in 2012 were 10.7 years.

Dimension indices are then obtained as follows:

$$\text{Life expectancy index} = \frac{65.8 - 20}{83.6 - 20} = 0.720$$

$$\text{Means years of schooling index} = \frac{4.4 - 0}{13.3 - 0} = 0.331$$

$$\text{Expected years of schooling index} = \frac{10.7 - 0}{18 - 0} = 0.594$$

$$\text{Education index} = \frac{\sqrt{0.331x0.594} - 0}{0.971 - 0} = 0.456$$

$$\text{Income index} = \frac{\log 3285 - \log 100}{\log 87478 - \log 100} = 0.516$$

$$\text{Human Development Index} = \sqrt[3]{0.720x0.456x0.516}$$

$$= 0.554$$

Table-2: Human Development Index 2012 for selected countries

HDI rank country	Life expectancy at birth years 2012	Adult literacy age 15 and above (%) 2005-10	Gross enrolment ratio (%)			GDP per capita 2005 PPP US $ 2011	Human Development Index 2012
			Primary 2002-11	Secondary 2002-11	Tertiary 2002-11		

Very high Human Development Index (HDI 0.8 and above)							
1. Norway	81.3	99.0	99.0	110.0	73.8	46982	0.955
3. United States	78.7	99.0	102.0	96.0	94.8	42486	0.937
10. Japan	83.6	99.0	103.0	102.0	59.0	30660	0.912
High Human Development (HDI 0.7 to 0.8)							
61. Mexico	77.1	93.1	115.0	87.0	27.0	12776	0.775
85. Brazil	73.8	90.3	127.0	101.0	36.1	10278	0.730
92. Sri Lanka	75.1	91.2	99.0	87.0	15.5	4929	0.7 15
Medium Human Development (HDI 0.5 to 0.7)							
101. China	73.7	94.3	111.0	81.0	25.9	7418	0.699
136. India	6.5.8	62.8	118.0	60.0	16.2	3203	0.554
146. Pakistan	65.7	54.9	95.0	34.0	5.4	2424	0.515
Low Human Development (HDI Less than 0.5)							
153. Nigeria	52.3	61.3	83.0	44.0	10.3	222 1	0.4 71
186. Niger	55.1	28.7	71.0	13.0	1.5	642	0.304

Source: UNDP, Human Development Report 2013

In Table-2, Human Development Index for 2012 for selected countries as reported in HDR 2013 is presented. Countries have been grouped under three categories: (i) Countries in the HDI range 0.8 and above are in the Very High Human Development group; (ii) Countries in HDI range 0.7 to 0.8 are in the High Human Development group; (iii) Countries in the HDI range 0.5 to 0.7 are in the range of Medium Human Development group, and (iv) Countries in the HDI range less than 0.5 are in the Low Human Development group.

The data has been collected for 187 countries. Among them 47 countries were in the Very High Human Development range, 47 countries were in High Human Development range, 47 countries were in Medium Human Development range and 46 countries were in Low Human Development in range. In terms of human development, Norway with HDI value of 0.955 ranks first and Australia with a HDI value of 0.938 ranks second. India which was at No. 138 in HDI in 1994, had improved its position to No. 128 in 2005, but in 2012 its position has slipped to 136

in terms of human development out of the 187 countries for which Human Development Report 2013 calculated the index. Democratic Republic of Congo and Niger with a HDI value of 0.304 occupy the last place in HDI ranking.

It may be discerned from HDI table that countries with similar per capita income may have different HDI values, and countries with different per capita income may have similar HDI values. Thus, the HDI ranking of countries may differ significantly from their ranking by per capita income. If a countries GDP rank is higher than its HDI rank, it implies that the country has further potential for improving the standard of living of its people. But it has been less successful in converting its economic prosperity into better lives for its people. On the other hand, if a country's HDI rank is higher than is GDP rank, it implies that the country has effectively made use of its income to improve the lives of its people.

13.13 Inequality—Adjusted HDI

HDR 2010 introduced three new measures- the Inequality-adjusted Human Development Index (IHDI), the Gender Inequality Index (GII) and the Multidimensional Poverty Index (MPI). As far as IHDI (Inequality-Adjusted Human Development Index) is concerned, it considers not only a country's average human development, as measured by health, education, and income indicators but also how it is distributed. Differentiating between HDI and IHDI, HDR 2010 states, "We can think of each individual in a society has having a 'personal HDI'. If everyone had the same life expectancy, schooling, and income, and hence the average societal level of each variable, the HDI for each society would be same as each personal HDI level and hence the HDI of the 'average person'." In practice, of course, there are differences across people, and average HDI differs from the personal HDI levels. The IHDI accounts for inequalities in life expectancy, schooling, and income, by discounting each dimension's average value according to its level of inequality. The IHDI will be equal to the HDI when there are no inequality actress people, but falls father below the HDI as inequality increases. In this sense, HDI can be viewed as an index of 'potential' human development (or the maximum IHDI that could be achieved if there were no inequality), while the IHDI is the actual level of human development (accounting for inequality). The difference between the HDI and the IHDI measures the 'losses in potential human development due to inequality.

13.14 Conclusion

During the last fifty years, the world's population increased by more than 3.5 billion posing a serious threat to the environment, particularly in the developing nations. Rising pressures on environmental resources in developing countries can have severe consequences for self-sufficiency, income distribution, and future growth potential. So, protection and conservation of environment is of dire need for ensuring sustainable world for the future generation.

For few decades, the concern of the policy makers has shown a clear shift from mere economic development to human development. Human development is a process of widening people's choices as well as raising the level of well-being achieved. The Human development Index (HDI) is an alternative measure of development which supplements rather than supplants the GNP measure of economic development. The index stresses on human development which puts people at the centre stage. Mere rise in per capita income does not ensure human development which means a process of enlarging people choices. There are many human choices that extend far beyond per capita income or any other measures of economic well-being. Knowledge, health, a clean physical environment, political freedom, and simple pleasure of life are not dependent on income. It is the use of wealth and not wealth itself that is important for human development.

The HDI is the right step against the misconception of economic development. It must be admitted that the HDI is more plausible than the per capita income as an index of economic development. It stresses on human development, not merely on economic development and economic well-being. The HDI focuses the attention on the ultimate objective of development, not just the means of development.

13.15 Summary

The word 'development' is widely used to refer to a specified state of advancement or growth. It could also be used to describe a new and advanced idea or product or an event that constitute a new stage under changing circumstances. Generally, the term development describes good change.

Human Development is a lifelong process of physical, behavioural, cognitive, and emotional growth and change. Human development refers to the physical, cognitive, and psychological development of humans through out the life span.What types of development are involved in each of these domains or areas, of life? Physical development involves growth and changes in the body and brain, the senses, and health and wellness. Cognitive development involves learning, reasoning, and creativity. Psychological development involves emotions personality and social relationships. HD is a branch of psychology.It is a multidisciplinary study of the psychological, biological, and sociological factors that impact people from infancy through adolescence to adulthood.

Human Development defined as the process of enlarging people's freedom and opportunities improving their benefits. HD is about the real freedom ordinary people have to decide who to be, what to do, and how to live. HD is a process of widening people's choices as well as raising the level of well-being. Its important elements are —long and healthy life, education, and standard of living.

The study of HD came to prominence in the 1970s.The Human Development Index was created as an alternative to measur in gnations by their GDP. The HDI includes health, education, income. The concept of human development was introduced by Mahbub Haq. He described human development as development that broadens people's choices and improves their lives. Moreover, people are central to all development under this concept. More popular as man of vision and compassion Pakistani economist Dr. Mahbub Haq created the Human Development Index in 1990. According to him development is all about enlarging people's choices in order to lead long, healthy life with dignity. Further, the United Nation's development programme has adopted Dr. Haq's concept of HDI to publish the human development report annually since 1990.

HDI illustrates what has been achieved in the key areas of human development. The HDI and the Human Poverty Index are the two important indices to measure human development used by the United Nation's Development Programme. The idea of HDI is supported by the concepts of equity, sustainability, productivity, and empowerment.

The HDI is a summary of measure of average life, being knowledgeable, and have decent standard of living. The HDI is the geometricmean of normalized indices

for each of the three dimensions: 1) The health dimension, 2) Education dimension, and 3) The standard of living dimension.

The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI simplifies the captures only part of what human development entails. It does not reflect on inequalities, poverty, human security, empowerment, etc

Human Development Report(HDR)2010 introduced the three new measures: i)Inequality-adjusted Human Development Index (IHDI), ii)the Gender Inequality Index (GII) and iii) the Multidimensional PovertyIndex (MPI).

As per the UNDP Report Norway toped the index, followed by Ireland, Switzerland, Hongkong, and Iceland. India ranks 131 (December 17, 2020).

13.16 Questions

Answer the following questions in your own words.

G-A (5 Marks each)

i. Briefly state the concept of Human Development.

ii. What is the significance of HDI?

iii. Write note on Inequality-Adjusted HDI.

iv. Briefly state why Human Development is necessary.

v. Discuss the principles that have guided the search for HDI.

vi. Discuss the method of constructing HDI.

G-B (10 Marks each)

vii. What are the features of HDI?

viii. What is HDI? Discuss the superiority of HDI over GNP as a measure of development.

ix. Discuss the essential components of Human Development.

x. What are the components of HDI?

13.17 Suggested Readings

i. Datt, G. and A. Mahajan (2013): "Datt& Sundaram Indian Economy", 69th Revised Edition, S. Chand & Company Pvt. Ltd.

ii. Dreze, J. and A. Sen (2013): "An Uncertain Glory: India and Its Contradictions", Penguin.

iii. Haq, Mehbub ul (1996): "Reflections on Human Development", Oxford University Press, New Delhi.

iv. Puri, V. K. and S. K. Mishra (2014): "Indian Economy", 32nd Revised Edition, Himalaya Publishing House

v. Sarkhel, J., S. Selim and A. Bhukta (2017): "Economic Development: Institution, Theory and Policy", Book Syndicate (P) Ltd.

vi. UNDP (2010): "Human Development Report 2010", New York.

vii. UNDP (2013): "Human Development Report 2013", New Delhi.

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